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Research in Practice

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Considerations for establishing a public space CCTV network

Garner Clancey

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Acronyms

AIC	Australian Institute of Criminology
ASIAL	Australian Security Industry Association Ltd
BOCSAR	Bureau of Crime Statistics and Research
CBD	central business district
CCTV	closed circuit television
CD	compact disc
CPTED	crime prevention through environmental design
DVR	digital video recorder
LAN	local area network
IP	internet protocol
PTZ	pan, tilt and zoom
OCSAR	Office of Crime Statistics and Research
SOP	standard operating procedures
SMART	specific, measurable, achievable, realistic, time-bound
UK	United Kingdom
VIIDO	Visual Images, Identification and Detections Office
WAN	wide area network

Introduction

Public space closed circuit television (CCTV) systems can prevent crime. However, this is generally only achieved when careful consideration is given to all of the components of the system and where there is a detailed understanding of crime in the local area. Given the significant investment required to establish and maintain a public space CCTV system, it is therefore essential that adequate planning be undertaken before embarking on this form of crime prevention.

CCTV is not a panacea for crime. Studies have shown increases in crime after installation of public space CCTV systems, minor displacement of crime and a host of problems with monitoring, maintenance and system upgrades. Once installed, systems are rarely removed, necessitating a long-term financial commitment. It should also be noted that many crime prevention outcomes are best achieved through a combination of measures, rather than relying solely on one approach, and CCTV is no exception.

Purpose of this manual

In recent years, there has been increased use of CCTV systems in public spaces. Improved technology, high crime rates, terrorism and health and safety concerns are just some of the reasons contributing to this.

This manual has been developed for local government authorities, chambers of commerce and other Australian organisations involved in the establishment of public space CCTV systems. This manual aims to guide organisations through some of the many steps and considerations necessary to establish a public space CCTV system.

Information relevant to a diversity of locations has been included, although specific local circumstances will ultimately shape how this manual is used.

This manual is not exhaustive and does not canvass in-depth all of the technical and legal issues relevant to establishing a public space CCTV system. Relevant agencies, legislation and policy guidelines operating in individual jurisdictions will need to be consulted and legal advice sought as required.

CCTV systems

A CCTV system consists of a series of components. These components each contribute to the smooth and effective running of the system. The core components of a public space CCTV system include:

- cameras;
- footage;
- monitoring; and
- governance arrangements.

Understanding how all of the components operate and interact is critical to any decisions to establish a public space CCTV system—there is clearly much more to consider than simply installing CCTV cameras.

Public space

This manual only relates to CCTV systems operating in public spaces. Public spaces generally include areas that the public can freely access. Malls, CBDs and public streets are public spaces that have, in recent years, attracted greater CCTV surveillance.

The distinction between public and private space has blurred over time. While the manual specifically covers public space, the integration of public and private CCTV systems will need to be considered in particular areas. The operation of CCTV systems in private space is not considered here.

Steps for establishing a public space CCTV system

The following steps are recommended for establishing a public space CCTV system:

- understanding crime and crime patterns (including spatial and temporal trends);
- conducting a site analysis;
- establishing objectives;
- scoping the system, including comprehensive analysis of each component of a CCTV system
 - cameras
 - monitoring
 - footage
 - governance;
- accurately estimating costs (including installation, maintenance, monitoring, staff and opportunity costs);
- installing, trialling and running the CCTV system; and
- monitoring and evaluating the effectiveness of the CCTV system.

Each of these steps will be considered in this manual. It should be noted that these steps will rarely work in a direct linear fashion as outlined above, but will depend on local needs and conditions.

Box 1 A public space CCTV system in action

Violent and property crimes had increased significantly in the central business district (CBD) of Harmony Heights. The local government authority reviewed the local crime data (provided by police) and conducted an audit of the CBD. Lighting was improved, maintenance regimes were adopted to keep the area clean, rapid graffiti removal procedures were initiated and rangers deployed in the CBD. Joint police and ranger operations were also conducted during peak offending periods. While there was a small reduction in crime through these measures, it was considered that the installation of a public space CCTV system throughout the CBD would help combat the incidence of assault, street robbery and malicious damage to property and stealing from motor vehicle offences.

After thorough analysis of crime trends and local conditions, it was decided that an optic fibre-based CCTV system would be introduced. Conduit laid for telecommunication systems was utilised to transmit images from the cameras to a new control room in the council administration block (adjacent to the main street of the CBD). A mixture of fixed cameras and pan, tilt and zoom (PTZ) cameras were installed to maximise the surveillance area and to enable control room monitoring staff to visually track would-be offenders.

Sufficient cameras were installed to monitor the areas with the greatest foot traffic and covering the known crime hot-spots. All cameras fed live images into the control room that was staffed on Thursday evenings and then 24 hours a day throughout the weekend period. Outside of these times, footage was recorded for later use and review. The control room was equipped with computers to store the digital images (25 frames per second of footage

captured and stored for 28 days). Strict protocols governed access to the control room and protection of data.

During the installation of the system, considerable time was spent ensuring that the quality of images captured from the cameras (both day and night) was of a suitable standard to be utilised by police for the purposes of courtroom evidence. The improved lighting levels in the CBD and good quality cameras ensured that images captured during the evening and night could be tendered as evidence in the prosecution of offenders.

A significant advertising campaign, including installation of signage throughout the CBD, informed visitors of the operation of the CCTV system. Telephone numbers were also promoted for contacting the council for any queries or grievances that might be held in relation to the CCTV system. Detailed guidelines developed by the council (in conjunction with police, community representatives and business representatives) outlined when images could be accessed and who could access them, how to raise complaints and the responsibilities of staff when using the system.

After 12 months of operation, a comprehensive independent evaluation was conducted. It revealed that there had been modest reductions in the key target offences, all requests for images had been met and police were generally happy with the quality of the images supplied. The equipment performed well, with few inoperative periods and perception surveys revealed high levels of community approval for the system.

This case study provides some insight into the components and factors that work together to establish a successful public space CCTV system.

Box 2 Practitioner comments—Starting out

What advice would you give to a local government authority embarking on the development of a public space CCTV network?

Make sure your council does its homework and plans well ahead. If using a consultant, make sure they are very experienced in public place systems. The outcomes you want should be clear from the start and then ensure that designs reflect this. There are so many CCTV options available for varying situations (night, day and both) and if you pick the

wrong system, cameras, design etc you may not get the outcomes you want. Look for opportunities to partner in different ways with other government bodies—the police should be at the top of the list. Please don't skimp on the investment and make sure your council contacts other councils and gets the good, bad and ugly of the system they have in place.

Source: Paul Fanning, General Manager, Wollongong City Centre Ltd, personal communication (2009)

Effectiveness of public space CCTV systems

A number of studies have examined whether CCTV is an effective crime prevention strategy in public spaces. Many have suffered from methodological flaws and very few have been undertaken in Australia. Some key research findings are outlined below.

International research

A meta-analysis of research findings from 41 studies (22 of which relate to city or town centre systems) undertaken by Welsh and Farrington and published in a report released on 2 December 2008 stated the following:

Results of this review indicate that CCTV has a modest, but significant, desirable effect on crime, is most effective in reducing crime in car parks, is most effective when targeted at vehicle crimes (largely a function of the successful car park schemes) and is more effective in reducing crime in the United Kingdom than in other countries. These results lend support for the continued use of CCTV to prevent crime in public space, but suggest that it be more narrowly targeted than its present use would indicate. Future CCTV schemes should employ high-quality evaluation designs with long follow-up periods (Welsh & Farrington 2008).

Welsh and Farrington (2008: 19) further stated that 'exactly what the optimal circumstances are for effective use of CCTV schemes is not entirely clear at present'.

Australian research

One of the most comprehensive Australian studies of public space CCTV systems was undertaken by Wells, Allard and Wilson (2006) at Surfers Paradise and Broadbeach in Queensland. During the research, the authors undertook observational analysis (100 hours in control rooms), interviewed key personnel, reviewed relevant documentation, surveyed the public and analysed crime statistics.

Key research findings included:

From the 100 hour observational study of the [Gold Coast] control room, 181 incidents were surveillance (sic) by camera operators leading to 51 arrests. Just over 15% of the observational period was dedicated to the active monitoring and active searching of incidents with crime and good order (ie alcohol-related violence) accounting for over three-quarters of all incidents surveilled (sic) (Wells, Allard & Wilson 2006: ii).

From the survey research, the majority of respondents strongly supported the use of CCTV cameras. Although CCTV surveillance was generally not considered to be an invasion of privacy, respondents did question the effectiveness of surveillance in terms of deployment of police to an incident and whether cameras were being actively monitored (Wells, Allard & Wilson 2006: ii).

From the impact studies, it appears that CCTV is effective at detecting violent offending but does not prevent any type of offending. The introduction of CCTV in Surfers Paradise resulted in significant increases in the extent of total offences against the person (including assault, robbery, other offences against the person and sexual assault) and *Weapons Act 1990* (Qld) offences. CCTV was found to have no significant impact on total offences, total offences against property (including other theft, unlawful entry, other property damage, unlawful use of a motor vehicle and handling stolen goods) and total other offences (including drug offences and liquor but excluding drunkenness) occurring in Surfers Paradise. Findings from Broadbeach indicated that CCTV had no impact on total offences, or total offences against property (Wells, Allard & Wilson 2006: iii).

This research prompted the authors to conclude

The effectiveness of CCTV as a crime prevention tool is questionable. From this research, it appears CCTV is effective at detecting violent crime and/or may result in increased reporting as opposed to preventing any type of crime (Wells, Allard & Wilson 2006: iii).

Step 1: Understanding local crime and crime patterns

Understanding local crime and crime patterns will be central to decisions about how crime can be prevented and the potential role that a public space CCTV system will have in an overall crime prevention regime. Deciding if the volume and nature of crime deserves, and will be positively affected by, a public space CCTV system requires detailed insights into local crime trends.

Under-reporting and recording of crime

It is widely accepted and understood that many crimes are never reported to, or recorded by, police. Any analysis of crime data must acknowledge the associated limitations.

The low level of reporting of some offences is demonstrated in *Australian Crime: Facts & Figures 2008* (AIC 2009). Based on victimisation surveys:

- Motor vehicle thefts (90%), followed by home break-ins (74%), were reported more often to police than other major categories of crime.
- Robbery (39%), attempted break-in (31%) and assault (31%) were less likely to be reported by victims to the police.

Consideration must be given to this 'dark figure' of crime (ie level of unreported and unrecorded crime) when interpreting recorded crime data. Adjusting for the low levels of reporting of offences against the person will ensure a more accurate picture is developed.

To develop a comprehensive understanding of local crime and crime patterns, the following should be considered:

- long-term crime trends in the area;
- spatial distribution of crime; and
- temporal crime trends.

Long-term crime trends in the area

It will be important to gain an understanding of the number and rate of different offence types in the identified area over an extended period (ideally five to 10 years). Establishing the long-term trends in particular crimes will help to determine if the existing crime levels warrant investment in a public space CCTV system and whether, once operational, the system will contribute to a reduction in crime.

Given the sheer number of crime categories, it might be beneficial to limit the number of offences included in the analysis. For example, it is unlikely that travelling on public transport without a ticket would be positively affected by the installation

of a public space CCTV system, despite it being likely that a high number of these offences will be recorded in a CBD. Consequently, the data analysis might exclude less relevant offences.

A challenge often confronted in accessing crime data of this nature is the discrete geographical area of interest. Police, however, may be in a position to provide data linked to specific geographical areas.

Spatial distribution of crime

Crime mapping techniques have improved markedly in recent years. Crime maps reveal important spatial relationships, like the clustering of particular offences in particular locations (often known as hot spots), the relationship between offences and infrastructure, such as train stations, and potential relationships between various offences (eg drug supply and street robberies). Detailed spatial analysis will demonstrate where offences are concentrated, which will provide insight into potential camera locations.

Crime mapping

Some central agencies responsible for the collection and analysis of crime data also provide access to crime maps. For example, the South Australian Office of Crime Statistics and Research (OCSAR) operates a crime-mapping function from their website. This enables analysis of the spatial distribution of crime.

Not all Australian jurisdictions have such advanced publicly available information. However, local police generally utilise mapping capabilities and may be able to assist with spatial analysis of local crime.

While great advances have been made in crime mapping, it is important to recognise the limitations of spatial crime data. The following example demonstrates the potential limitations:

A crime occurs in a particular location. That crime will be reported to police, at which time a geographical location will be provided (the corner of Smith and Jones Streets, Harmony Heights). The offence is then geo-coded to link it to the particular spot where the offence occurred. However, for areas like parks, malls, shopping centres and similarly large venues, the accuracy of the spatial information provided is often less reliable. All offences in a mall might be linked to a central point in that mall or all offences in a shopping centre might be linked to the front entrance. This can be problematic when trying to specifically highlight spatial dimensions of crime.

Temporal analysis

Crime is not distributed randomly or evenly over time. Rather, there are times, days and seasons when particular crimes are more likely to be committed.

Areas that support a late-night economy will generally have elevated numbers of assaults on Friday and Saturday evenings, due to increased movement of people and increased levels of intoxication at these times (Graham & Homel 2008). Understanding the temporal trends in crime can help guide when cameras are monitored and the type of cameras

to be located in particular areas. For example, more sophisticated cameras with the ability to zoom in and to capture good images at night might be required near late-night economy locations.

A detailed understanding of local crime patterns and trends will provide the basis for considering the steps outlined in this manual.

Box 3 Making a crime data request

A detailed understanding of local crime patterns and temporal trends can assist in determining where a CCTV system may be best placed. Local crime data is one resource that can be used in such an analysis. Police are the main agency responsible for collating local crime data and councils and other organisations looking to implement a CCTV system can make a crime data request to police. In order to obtain the most relevant information, requests for crime data should be clear and specific about the information needed.

Generally, most data requests should ask for information covering offences. For example, the type of offences, the number of offences that occurred in a specific area over a given period and the time and date of offences. This will provide

annual trends across particular crime types within the specified area.

Crime data requests can also provide information on perpetrators and victims of specific offences within a given location. This may provide beneficial insights into the dynamics of offending in an area.

Another key field should be the time period the crime data will cover. For example, a 12 month period may be all that is required to sufficiently highlight spatial and temporal trends. The time period should also reduce the volume of records that will be included in the file to a more manageable size for analysis. The format of the data, such as knowing the type of file the data will be provided in, will ensure appropriate analysis can be conducted.

Box 4 Real life example 1 – Engaging with the key target audience and combining CCTV with other community development strategies (City of Gosnells, WA)

The City of Gosnells employed a strategic approach when looking at undertaking work at the Thornlie Precinct. As one of the major concerns was the interaction between activities within the skate park area and the users of the adjacent facilities, the city consulted with young patrons of the skate park as well as users of adjacent facilities. This occurred mainly through two youth services officers employed by the city who regularly attended the skate park and interacted with the young people there, including teaching them new skate tricks. From this interaction, the city was able to identify exactly what improvements the youth would like to see at the skate park and surrounding area, and how they felt about crime, graffiti and other community safety-related issues. This was the main strategy in getting the youth involved as it gave them a sense of ownership of the issues and provided a way for them to suggest solutions which would potentially reduce acts of antisocial behaviour in the future.

Extensive community consultation has also occurred throughout the project, with ongoing communications including emails and surveys on how the community felt the project was coming

along (which will be continued). The survey feedback was obtained from young people using the skate park, those using the car park, accessing the library, shops and leisure centre, as well as local business operators and police.

The City of Gosnells developed a marketing strategy which included newspaper advertisements to increase the number of positive media reports and decrease the number of negative reports relating to community crime and behaviour in the area and mobile phone SMS messages to young people about the status of the project.

In the future, the City of Gosnells will look for the following as indicators that their project has had positive impacts:

- fewer reports to police of antisocial behaviour occurring in the Thornlie Precinct;
- an increase in the number of young people using the facilities in a productive way in the area;
- an increase in the number of positive media reports; and
- a decrease in the number of negative media reports relating to crime and antisocial behaviour occurring on site.

Step 2: Conducting a site analysis

Based on the information gleaned from reviewing crime data, a site analysis should then be conducted. A detailed site analysis of the area being considered for the public space CCTV system will highlight various factors contributing to crime in the area and will provide insight into the potential effectiveness of a CCTV system.

Community safety audits are a common form of site audit that are conducted in locations across Australia. These audits generally involve crime prevention specialists (ie police, local government personnel) and community members walking through a location and recording their observations. Day and night audits are conducted to identify any environmental factors contributing to crime. Comprehensive audits consider the social and demographic characteristics of an area, the land use, vehicular and pedestrian traffic, the adequacy of services in the area to cater for the local population (both resident and transient) and the views of users of, and visitors to the area. Surveying users and visitors can determine if there are areas that are perceived to be less safe, what impact CCTV cameras might have on these perceptions and how different groups within the community experience the area.

Conducting a comprehensive site audit allows for identification of relationships between crime problems, environmental design, social and demographic factors and public space management, and helps inform decisions about potential treatments.

By conducting a site analysis and highlighting recommended treatments, a public space CCTV system can be considered within an overall plan to prevent crime in the area.

Approaches to a site audit

There are different approaches to conducting a community safety audit (or equivalent). Some approaches are comprehensive, requiring training for audit participants and involving numerous audits over an extended period. Surveys of visitors and users of the area augment crime and demographic data analysis. Other audit methodologies adopt a more modest regime and focus on easily remedied issues such as improving natural surveillance and improving the maintenance of the area.

The European Forum for Urban Safety (2007) has published a comprehensive report on community safety audits called *Guidance on Local Safety Audits—A Compendium of International Practice*. The Queensland Police Service also provides simple resources to help conduct a community safety audit.

Step 3: Establishing objectives

Public space CCTV systems tend to operate with different objectives. Establishing clear objectives will influence how the CCTV system develops and is later evaluated. Without clear objectives and a clear understanding of what can be expected from a CCTV system, it will be difficult to determine effectiveness.

The City of Sydney's (NSW) *Council Street Safe Camera* program (City of Sydney Council 2005) has the following objectives:

- to assist in the prevention of crimes against the person, particularly the following:
 - armed robbery;
 - robbery with wounding;
 - robbery in company of others;
 - extortion;
 - assault;
 - assault occasioning grievous bodily harm;
 - assault occasioning actual bodily harm;
 - sexual assault; and

- aggravated sexual assault.
- to assist in the prevention of other serious criminal offences, particularly the following:
 - stealing a motor vehicle;
 - stealing from a motor vehicle;
 - other stealing;
 - break and enter;
 - malicious damage to property;
 - firearm offences;
 - receiving stolen goods; and
 - dealing and/or trafficking in drugs.

In contrast, the Orange City Council (NSW) has identified the following objectives in their *Code of Practice: Crime Prevention through CCTV Project* (Orange City Council 2008):

- to reduce crime levels by deterring potential offenders;
- to reduce fear of crime;
- to help ensure an effective police response in emergency situations;

Box 5 Expert insights 1

Apart from cost, what should local governments consider in establishing a public space CCTV network?

In my opinion, the key question to be considered when installing CCTV is whether it actually addresses the issues it is supposed to. Councils really need to consider CCTV as only one crime prevention measure among many possibilities.

Would other community safety strategies be just as, or more, effective in terms of cost, social justice and community wellbeing, and sustainably address the issue without generating other undesirable consequences?

Source: Dr Dean Wilson, Monash University, Victoria, personal communication (2009)

Box 6 Real life example 2—Deciding what to do when there are different expectations for the CCTV system (City of Wanneroo, WA)

During the consultation stage, the City of Wanneroo was faced with having to figure out the best way to deal with their stakeholders' different expectations for the CCTV system. The CCTV project team were unable to find a guide to help them make an informed decision, so they came up with a creative solution themselves.

The CCTV team devised a template matrix system in which they rated each suggestion according to its statistical analysis suitability, local crime knowledge and its administration rating, such as the possibility of it being implemented within council guidelines. This matrix also took into account statistics around antisocial behaviour among particular areas within the city. A community safety working group was also devised and provided input into the location of the cameras.

Applying the system consistently was considered the fairest and most practical way to determine where CCTV was needed. This approach also allowed the council to justify why and how the CCTV sites were chosen to the community and their stakeholders.

'The locations nominated for the CCTV cameras are based on a balance of perceived and recorded crime and antisocial behaviour activity locations. As the locations (chosen) reflect a combination of these aspects, it is likely that perception and real time data will reflect a positive impact on both crime and antisocial activity in the nominated areas.'

(City of Wanneroo staff member, personal communication 2009)

- to assist in the detection and prosecution of offenders; and
- to help secure a safer environment for those people who live in, work in and visit Orange's CBD.

These two examples show different approaches to establishing objectives for a public space CCTV

system. The objectives developed for the City of Sydney CCTV public space system focus on specific crime types, with greater weight given to crimes against the person. In contrast, the objectives for the Orange City Council public space CCTV system seek to achieve more diverse outcomes.

Box 7 Practitioner comments—Mobile CCTV

Given that Swan Council is about to embark on using mobile CCTV technology, could you describe how this will work and why you have augmented your fixed camera system with mobile units?

The City of Swan is looking at implementing the most flexible model for CCTV technology within its district. We realise that there is a need for fixed systems and they have a function and purpose in our overall strategy of developing a CCTV network. However, in an area of over 1,000 square kilometres, it is not economically viable to look at a fixed system to service the entire area.

Mobile CCTV technology will provide us with the flexibility to put cameras in hot spots or identified areas that are experiencing certain activities. Invariably, once strategies are put in place and activity decreases, then the systems can be deployed to other areas. In the City of Swan, we see one of the main advantages of this type of system is its portability, especially when you want to monitor events that only occur infrequently.

Source: Jeremy Edwards (Manager Community Safety and Places, City of Swan) Personal Communication 2009

Step 4: Scoping the system

Having established the need for a public space CCTV system, it is then important to scope the specific system requirements. Through this process, it will be possible to estimate the capital and recurrent expenditure required to establish and maintain a system and to sketch the exact specifications of the system.

Locating the right consultant

Table 1 Security Industry Regulator by jurisdiction

ASIAL has compiled a list of agencies responsible for the regulation of the security industry in each Australian state and territory.

Australian Capital Territory

Regulator: Office of Regulatory Services
Phone: 02 6207 0400

New South Wales

Regulator: Security Industry Registry (NSW Police Force)
Phone: 1300 362 001

Northern Territory

Regulator: Office of Racing, Gaming and Licensing
Phone: 08 8973 8170

Queensland

Regulator: Department of Justice and Attorney-General
Phone: 1300 658 030

South Australia

Regulator: Office of Consumer and Business Affairs
Phone: 08 8204 9686

Tasmania

Regulator: Consumer Affairs and Fair Trading
Phone: 03 6233 2199

Victoria

Regulator: Licensing Services Division (Victoria Police)
Phone: 03 9247 3737

Western Australia

Regulator: Commercial Agents (Western Australia Police)
Phone: 08 9231 7199

At this point, it may be beneficial to engage the services of an appropriately qualified and experienced security and/or CCTV consultant. A consultant familiar with all of the technical specifications necessary for building and operating a public space CCTV system will provide invaluable input when numerous decisions need to be made. The consultant will be able to advise on the requirements for a system which reflect local conditions and the latest technical developments. Given the significant advances in CCTV technology, specialist advice can avoid outdated equipment and incompatible components being purchased.

The Australian Security Industry Association Limited (ASIAL) provides a free service on its website to help

identify appropriate security consultants and CCTV installation companies. A quick search can identify appropriately qualified organisations and individuals across Australia.

See <http://www.asial.com.au/FindASecurityProvider> for further information.

Selecting the right consultant is important. Some qualities of an appropriate consultant include:

- *vendor independence*—a consultant with relationships to either one, or only a small number of suppliers may be less able to provide appropriate, independent advice. Selecting a consultant with knowledge of the latest products and an understanding of what will work best in specific local conditions (irrespective of the manufacturer of the equipment) may be beneficial;
- *qualifications*—the consultant should be appropriately qualified and be able to provide evidence of relevant qualifications and registration with an Australian security organisation;
- *licence*—each state and territory has different licensing requirements for security personnel. Consultants should have the relevant licence issued by the appropriate authority. In New South Wales for example, a consultant would be expected to have a 2A and 2F licence. See Table 1 for a list of Australian security industry regulators;
- *experience*—ideally, a consultant would have previous experience in similar projects. With the growth in recent years of CCTV systems in public spaces, there are an increasing number of consultants who have worked specifically on such projects.

Whether the scoping of the public space CCTV system is driven internally or by a consultant, it is important to engage appropriate stakeholders. Police, local government, business representatives, organisations providing social and community services, relevant legal experts and stakeholders representing the views of users of the identified spaces have important perspectives to contribute during this process. Many local government authorities have existing systems to engage key stakeholders in scoping public space CCTV system requirements. Crime prevention and community safety committees, resident panels, council/police meetings and numerous other avenues can be easily utilised to engage the appropriate stakeholders.

While local conditions will ultimately shape and inform how a public space CCTV system project is scoped, Table 2 outlines some key considerations that should be addressed in this process. Addressing each of these issues will assist in preparing a budget for, and specifications of, the CCTV system.

Table 2 Key considerations in establishing a CCTV project

Key considerations	Implementation
CCTV system component: Cameras	
Which cameras to purchase?	PTZ cameras will be required for the greatest manoeuvrability. They will often be combined with fixed cameras.
How many cameras are needed?	Good visual fields are promoted by dense camera coverage. Tracking offenders will be aided by a dense system of cameras.
Where to position the cameras?	Cameras must be located in key areas. Negotiating placement of cameras on private property will require approval from owners. Camera domes and cameras positioned to prevent easy access will prevent damage. Optic fibre cabling is still used in many systems due to reliability. Unclean cameras and domes obstruct vision. Quarterly cleaning regimes maintain good vision.
How to protect the cameras from damage?	Boring and laying conduit for the optic fibre can be very expensive. Once locations of cameras are identified, obstructions to vision will have to be removed and lighting improved.
Will they be wireless or operate on an optic fibre platform?	Wireless systems require clear lines of sight and must be periodically re-calibrated.
How often will they be cleaned and maintained?	
What requirements are there for installation (including excavation)?	
Which fixtures, trees and lighting will need to be altered to enable the cameras to work effectively?	
What considerations are there for wireless systems?	
CCTV system component: Monitoring	
Will the cameras be monitored? If so on what basis?	Monitoring improves effectiveness of crime detection, but is expensive. Peak periods might be monitored.
Who will monitor the cameras?	Trained control room operators are recommended.
How will these staff be trained and what ongoing training will they receive?	Staff should be trained in the technical features of the system and be given guidance on what they should be looking for.
What type of control room is required?	There are different standards of control room. The number of monitors and data storage will be two critical considerations for a control room. Back-up energy and data protection will also be required.
Where will it be located?	The control room should be away from public vision.
Who will have access to the control room?	Protocols should dictate who can gain entry.
Will there be a supervisor(s)?	The more strategic functions should sit with a supervisor.
What will the staff-to-monitor ratio be?	There are physical limits to the number of screens that can be monitored effectively.
Which communication systems will operate?	Direct communication with police will facilitate quicker response times.
What relationship will exist between police and the control room?	Some systems provide live feeds to police stations.
What instructions will be provided to guide the work of control room staff?	Standard operating procedures (SOPs) should govern the work of control room staff.
CCTV system component: Footage	
What file size will be used to store the footage?	Storage capacities are improving, reducing the need for large computer processing units.
What system will be used to store the footage?	Internet protocol (IP) systems are increasingly being used.
How long will footage be stored for?	28 days is the usual storage period.
How will police and external agencies access footage?	Clear procedures should be established for accessing images, including for media.
Who will process requests for footage?	Control room staff generally complete such requests during their daily duties.
Is there a regular check that the date and time stamp recorded on the images is accurate?	Periodic auditing of this will be crucial for ensuring the quality of images as evidence.

CCTV system component: Governance	
How has the system been funded and what are the ongoing reporting requirements?	Public space CCTV systems are funded in various ways. Some funding bodies are required to obtain financial and other auditing and reporting.
Who will check that all relevant statutory and policy requirements are satisfied?	External legal advice might be required regarding liability and privacy considerations.
What will be the central focus of the CCTV system (ie what crimes will be targeted)?	Identifying the specific objectives of the system ensures related procedures match objectives.
What signage is required to inform the public of their operation?	Signage will have to be erected within the CCTV system area.
Who will develop the Code of Practice and SOPs guiding the operation of the system and what will be the key requirements of the operation of the system?	There are many existing examples that can be utilised to inform local SOPs and Code of Practice documentation. Accessing images, responsibilities of key stakeholders and complaint procedures are just some of the critical considerations.
What auditing and evaluation procedures will be adopted?	Some authorities utilise external consultants to periodically audit the operation of the system. Oversight committees might also review the ongoing practises of the CCTV system.
How will relationships with critical stakeholders be maintained?	Regular meetings with police and other stakeholders will ensure that communication systems operate effectively and will keep key stakeholders informed of appropriate developments.
Who will be responsible for media requests?	Having a clear policy for responding to the media will alleviate any problems that emerge.
How will calls for the system to be expanded be dealt with?	When one area gets a CCTV system, surrounding areas often expect similar treatment.

Although Table 2 outlines some key considerations for developing a public space CCTV system, the list is not exhaustive. Local conditions and issues will also need to be reflected in the scoping of the system.

CCTV standards

Standards Australia currently has four standard documents covering CCTV. These include:

- Part 1: Management and operation (AS4806.1–2006)
- Part 2: Application guidelines (AS4806.2–2006)

- Part 3: PAL signal timings and levels (AS4806.3–2006)
- Part 4: Remove video (AS4806.4–2008)

Parts 1 and 2 provide detailed guidance on the establishment of CCTV systems. Parts 1 and 2 also provide comprehensive technical guidance, including guidance on installation, testing and commissioning CCTV systems. Review of these standards is strongly recommended and all project staff (whether internal or contracted) should be familiar with the key features of these standards.

Box 8 Practitioner comments—Choosing a system

In your opinion, what are the advantages of an IP-based CCTV system over alternative system arrangements?

Wollongong has a full IP-based system which covers the wider city centre, Crown St Mall and council-owned buildings inside and out. A total of 160 cameras provide great coverage and it's the biggest IP street system in Australia. Not only that, but with clever planning and design it is getting real

results—the stopping and/or detection of crime in so many areas. The IP system has it all from the camera direct to hard drive. No more of the old technology (DVRs, CD libraries and running power cables to every camera). The future that was once IP technology is now here. Quick, efficient and proven.

Source: Paul Fanning, General Manager, Wollongong City Centre Ltd, personal communication (2009)

Box 9 Real life example 3—Understanding network systems (City of Swan, WA)

Utilising their in-house IT team's knowledge, City of Swan were aware that when looking at building a network system, new equipment needs to be compatible with existing systems. This covers network systems software, cameras and data storage and management units. The implications for councils are that if they happen to choose one brand for cameras and that brand is only

compatible with same-brand software, they are limited in their future options. City of Swan suggested councils do thorough research into identifying multi-compatible network systems, which will allow them to choose the most cost-effective option, and also fulfil any tendering/evaluation processes their council requires them to go through before purchasing new equipment.

Box 10 Talking technology

Keeping up with CCTV developments is a real challenge during these times of significant technological advances. Robert Portelli worked on enhancing the Melbourne public space CCTV system for the Commonwealth Games in 2006 and has provided answers to some common questions.

Some local government authorities have chosen wireless networks, while others have opted for networks run on optic fibre. Can you explain the relative merits/drawbacks of each?

Wireless is a good media; however, it is important to understand that the site, along with the environment and every other factor which needs to be taken into consideration when placing wireless for your application, can produce a hit-and-miss scenario. I have found wireless to be very good for the last mile applications, when it is just too hard to cable or fibre to the device. What wireless has in its favour is that an installation can be turned out quite fast as long as line of sight is not a problem.

For optic fibre, the data which is to be transmitted is guaranteed to reach the other end. There are no environmental problems, rain does not affect it and it's hard to interfere with as generally it is installed underground away from the world. In most cases it's future-proof when it comes to increasing bandwidth, which is not the case for wireless. Signal strength is never flaky and the integrity of the signal is always there. Its drawback is that if there is no infrastructure in place then the initial cost to install the optic fibre can be more expensive.

IP systems are being increasingly used. Can you provide a simple explanation of what an IP system is?

There are basically two forms of IP solution:

There is the digital video recorder (DVR) which resides upon an IP network with analogue or IP cameras pointed towards the DVR for recording and viewing. The client will view the DVR images via a web browser or application which had been installed upon their computer. The other form of IP solution is where all devices are of an IP nature and there is no DVR, which limits the number of cameras. This solution makes the streaming of video images across LANs or WANs much easier, with the ability to reduce the bandwidth of the streaming device dependent on the infrastructure available.

An IP system is one which allows the user to stream video, data and the associated information across the same network of the current computer or network devices. Viewing video from a network or IP camera is just like viewing images from a website. The network camera produces digital images, so there is no quality reduction due to physical location

In your experience, what should local government authorities look for in a camera for a public space CCTV network?

Important features which should be included for cameras being installed in a public space are:

- low light properties;
- ability to work under harsh environmental conditions; and
- optical length of camera vision.

Source: Robert Portelli (Director, Teknocorp Australia Pty Ltd), personal communication (2009)

Step 5: Accurately estimating costs

Accurately estimating the costs of establishing and running a public space CCTV system will be central to whether an organisation will commit to such an initiative.

A thorough analysis of the costs associated with public space CCTV systems was undertaken by Wilson and Sutton in 2003. Their comparative analysis of systems across Australia reveals indicative costs for establishing and running a public space CCTV system.

Installation costs

Table 3 reveals the estimated installation costs of major public space systems across Australia. Many of these costs are quite dated and were for the establishment of small systems (ie only a few cameras). While many system component costs have fallen as the technology has improved, it is also true that many of these systems have expanded since commencement. Consequently, a larger and newer system would be likely to have greater initial costs than those listed below.

Capital works: can you afford them?

The cost of capital works (eg installing poles, digging up pavements to lay conduit etc) was

widely recognised among *Safer Suburbs* grants program case study sites as something to keep in mind. These can cost thousands of dollars, so it is important to recognise and estimate these costs prior to installing a CCTV system.

Monitoring and other recurrent costs

Beyond installation, there are numerous ongoing costs associated with running and maintaining a public space CCTV system. Different monitoring regimes are adopted in different locations, which are reflected in the disparity of estimated ongoing costs listed below.

Table 4 Estimated ongoing costs

Location	Annual cost (\$'000)
Ipswich	444
Sydney	900
Fairfield	340
Melbourne	400
Adelaide	310
Toowoomba	85
Brisbane	270

Note: figures were collected some years ago, so it is likely that these costs will have increased

The City of Sydney has the highest estimated ongoing costs at \$900,000 per annum. The City of Sydney CCTV system is monitored 24 hours per day, 7 days a week. Other locations adopt a more modest monitoring regime, with designated staff only deployed

Box 11 Expert insights 2

In your experience, what are some of the ongoing costs of running a public space CCTV network?

There are two ongoing costs that a council should consider. The first is the cost of ongoing monitoring, which can be a substantial outlay—particularly if 24 hour 'active' monitoring is entered into. The second significant cost is that any system is likely to require upgrade within a five year period, given

the progress of the technology. Moreover, systems have a tendency to expand, often fuelled by demands from areas outside the surveillance area to be covered. Therefore, councils need to be realistic about the possible future growth of any system installed.

Source: Dr Dean Wilson (Monash University, Victoria), personal communication (2009)

Table 3 Estimated installation costs

Location	Year of installation	Number of cameras installed	Estimated installation costs
Dubbo	1999	11	\$225,000
Fairfield	1996	14	\$652,000
Sutherland	2002	11	\$600,000
Brisbane	1993	13	\$250,000
Cairns	1997	14	\$500,000
Ipswich	1994	13	\$640,000
Bunbury	1998	14	\$200,000
Melbourne	1997	10	\$1,033,344
Adelaide	1995	12	\$530,000

Box 12 Real life example 4—Estimating staff time (Gosford Shire Council)

When estimating costs and staff time for CCTV implementation, tasks may be overlooked. Gosford Shire Council highlighted some of the tasks involved with preparing and running a CCTV system that are not often considered.

These include:

- organising and attending oversight committee meetings;
- setting up the system;
- identifying locations;
- preparing tender documentation;

- reviewing proposals;
- liaising with building owners where cameras are to be located;
- establishing procedures for the operation of the system;
- preparing and delivering presentations about the system to interested stakeholders (both internal and external); and
- preparing and attending the opening of the CCTV system.

for 'hot' times like Friday and Saturday nights and for special events. This reduction of monitoring brings down costs, but also has consequences for the effectiveness of the CCTV system to enable immediate intervention (and ideally apprehension) when a crime is occurring.

While these costs highlight major expenditure, they tend not to reveal the costs over the life of a CCTV system. Those systems that were installed in the mid-1990s will have invariably undergone major upgrades. Cameras will have been replaced, new control rooms may have been built, data storage systems overhauled and damaged signage advertising the existence of the cameras replaced. CCTV systems, once installed, are rarely disassembled. Consequently, budgets should be based on costs over decades rather than shorter periods.

Staff costs

A driver of costs that rarely seems to receive attention is that of internal staff time. Staff time will be invested in preparing briefing papers for elected officials, researching CCTV system components, drawing up tender specifications to recruit consultants and companies to install the CCTV system, liaising with key stakeholders and monitoring progress. In some instances, it will be necessary to temporarily or permanently appoint a staff member to manage the CCTV system.

Opportunity costs

Beyond the actual costs associated with a CCTV system, there is also merit in considering opportunity costs. This involves considering what programs and activities will not be undertaken or invested in, due to time and resources being directed toward a CCTV system. If, based on a conservative estimate, \$500,000 is invested in the installation of a CCTV system and \$250,000 goes toward monitoring and

maintenance costs, then what other crime prevention measures might have been purchased for \$750,000 in year one and for \$250,000 in year two, year three, year four, year five etc? Would alternative crime prevention techniques deliver greater outcomes?

While local circumstances and conditions will ultimately determine the total costs of installing and running a public space CCTV network, the budget checklist in Table 5 highlights some of the key component costs to be considered:

Table 5 Budget checklist

Activity	Components	Cost
Preparatory work	Crime analysis Research Internal briefings Stakeholder meetings Consultant	
Installation	Cabling Cameras New poles Signage Lighting Removal of impediments	
Monitoring	Control room establishment Data storage Monitoring staff costs	
Maintenance	Cleaning of camera domes Pruning trees Replacing light globes Replacing damaged signage Regular system maintenance Replacing damaged cameras System upgrades	
Governance	Development of SOPs Audit/evaluation Oversight committee expenses	
Legal fees	Staff costs Insurance premiums	

Cost-benefit considerations

Estimating the cost-benefits of a CCTV system can be difficult and will be dependent on numerous local variables. Nonetheless, considering whether the money spent on a CCTV system delivers a good return on investment should be an important consideration for all agencies contemplating this approach to crime prevention.

Some of the key costs have been previously identified. Some of the potential savings derived from prevention of crime is best illustrated in *Counting the Costs of Crime in Australia: A 2005 Update* (Rollings 2008). The report compiles the total costs of crime for particular offence categories. Where provided, *per incident* costs have been listed for particular crime types. This information can be helpful in determining the benefits accruing from a crime prevention intervention like CCTV.

Some of the offences listed in Table 6 are likely to be influenced by the installation of a CCTV system. By utilising these figures, it is possible to complete rudimentary analysis of the cost-benefits of

establishing a CCTV system based on the reduction in particular offences and the associated financial benefits, compared with the total costs of installation and operation.

Table 6 Estimated costs of crime in Australia (2005)

Offences	Cost per incident	Total cost
Fraud	No per incident cost	\$8.5b
Burglary	\$3,000	\$2.23b
Drug offences	No per incident cost	\$1.8b
Arson	No per incident cost	\$1.62b
Criminal damage	\$1,250	\$1.58b
Assault	\$1,700	\$1.41b
Homicide	\$1.9m	\$950m
Shop theft	\$125	\$875m
Sexual assault	\$7,500	\$720m
Vehicle theft	\$7,000	\$600m
Theft from vehicles	No per incident cost	\$529m
Robbery	\$2,300	\$225m

Source: Rollings (2008).

Step 6: Installing, trialling and running the CCTV system

After careful consideration has been given to the costs and the potential effectiveness of the public space CCTV system (based on a thorough understanding of local crime), then arrangements should be made for installing and trialling the system. This process will involve the coordination of numerous activities and require the involvement of numerous stakeholders.

Promotion of the CCTV system

The NSW Government Policy Statement and Guidelines for the Establishment and Implementation of CCTV in Public Spaces (NSW Government 2000) stipulates the need to develop information strategies to inform the public about the operation of the scheme. This helps to address concerns that people may be unwittingly watched. Beyond the civil libertarian arguments, there are also potential crime prevention benefits in such promotion.

Some research suggests that advertising and promotion of crime prevention initiatives, including CCTV, can have a positive impact, with reduced crime rates often prior to the actual commencement of the specific initiative. This phenomenon is known as the 'anticipatory benefits effect'. By alerting would-be offenders to the operation of the CCTV system, it is possible that decisions to engage in offending may change.

First, decisions will have to be made regarding:

- establishing the objectives for the system;
- the type of system to be installed—a wireless system will have different requirements to a digital or internet protocol system;

- the number and location of cameras to be installed;
- the location and specifications of the control room;
- the installation of signage to promote the presence of the cameras; and
- modification of existing infrastructure to ensure optimum vision for cameras.

Second, some of these processes will include:

- engaging a consultant or CCTV company to undertake this work;
- identifying existing fibre optic cabling or conduits to run fibre optic cabling;
- understanding the power requirements of the chosen cameras;
- negotiating with private property owners if cameras are to be placed on their buildings;
- creating signs/symbols to warn people that CCTV cameras operate in the area;
- trialling cameras in different locations to see if any climatic conditions (especially severe heat) and lighting conditions adversely affect the quality of the images;
- printing captured images to determine their utility for evidentiary purposes;
- trialling the control room systems to ensure that cameras can be manoeuvred;
- testing communication systems to ensure that control room staff can liaise swiftly and directly with local police;
- drafting SOPs and checking that they are workable, then revising as required;
- establishing systems to record requests for images and procedures for granting permission to access images; and
- devising complaint procedures and promoting these procedures.

Box 13 Real life example 5—Taking your time to find the best solution: partnerships within council (City of Swan, WA)

Swan Council has applied an innovative approach in implementing its CCTV system. A key goal has been to focus on building an integrated, holistic system with high levels of collaboration across council and a clear idea of what the requirements are before installing any cameras. Community Safety & Places has worked closely with the council's IT department and building asset management, to plan and take the extra time to develop a future strategy for the council, which includes a CCTV system as one component.

This strategy has meant the council is able to ensure the foundations are laid for a network system which will allow greater capabilities.

As such, incorporating extra cameras in the future will be easier. Swan Council has spent time investigating the type of network and IT infrastructure that will best suit its needs and will be capable of handling increased activity through the network. Swan Council also upgraded its existing data storage unit, to increase its capacity, before installing any cameras.

'Take your time and have a clear picture in mind of what your requirements are and then source the best solution, which should also incorporate a solid plan for the future.'

(Swan Council staff member, personal communication 2009).

Box 14 Privacy considerations

Some of the criticisms raised in relation to CCTV systems are the spread of surveillance and the associated breach of privacy, a failure to clearly identify who can access the images, the practices of control room staff and decisions about who they decide to monitor, the right to access and use public space free of electronic surveillance and wider concerns about social control.

The Australian Government's Office of the Privacy Commissioner published the *Community Attitudes to Privacy 2007* report, which contains the findings of questions posed on privacy issues. Of the 1,503 respondents, 79 percent stated that they were not concerned about the use of CCTV in public places. A small sample (203) of this larger group (1,503), were asked about their main concerns regarding CCTV in public places. The list of concerns included the following:

- information may be misused (54%);
- invasion of privacy (45%);
- it makes me uncomfortable (13%); and
- not effective in stopping crime/false sense of security (4%)

A useful publication is the CCTV Code of Practice developed by the Information Commissioner's Office (2008). While the report relates to the United Kingdom, the issues raised regarding data protection for CCTV systems are relevant to the Australian context.

The establishment of public space CCTV systems should consider the following as ways of addressing privacy concerns:

- Comply with state and territory privacy legislation—each Australian jurisdiction has various government controls regarding maintaining privacy and protecting personal information. The relevant legislation should be consulted and agencies responsible for privacy contacted to ensure all relevant considerations are addressed.
- Policies on accessing images—establishing procedures for accessing images will help protect privacy. If the images captured are to be used for law enforcement purposes, then there should be clear procedures on how police (and related agencies) can apply for and access particular images.
- Complaint procedures—establishing and advertising complaint procedures will ensure that there is an opportunity for people to raise concerns about the operation of the public space CCTV system. These concerns will then ideally be considered by a relevant committee or group with authority to make changes where required.
- Guidance and training for control room personnel—all staff involved in monitoring the captured images should be educated on the ethics of monitoring. Inappropriate use of the cameras and images gathered will undermine confidence in a public space CCTV system.
- Audits—conducting regular audits of the system, which involves checking the images gathered by control room staff and the images provided to law enforcement agencies, will help to maintain the integrity of control room staff, the collection of images and the system as a whole.

Step 7: Monitoring and evaluation

Ongoing monitoring of the public space CCTV system will be critical for ensuring that it operates smoothly and that any problems are swiftly addressed. There are various methods for monitoring all elements of the system, including:

Oversight/steering committee—some authorities have appointed oversight/steering committees to monitor their public space CCTV system. Community members, council personnel, police, security personnel and other interested stakeholders may be represented on such a committee. The committee would be responsible for reviewing any complaints, reviewing logs maintained on people entering the control room and requesting access to images.

Internal audit—internal analysis of the system can provide beneficial insights into its operation. Many local authorities have considerable expertise throughout the agency that can be utilised to review the efficacy and functioning of the system.

External audit—some authorities utilise external consultants to conduct annual audits. These audits may include reviewing camera operation, control room functions, competencies of control room personnel, procedures associated with accessing images, communication procedures between the control room and police and systems for managing the overall operation of the CCTV system.

Evaluation—given the substantial capital and recurrent investment in a public space CCTV system, it would be expected that a comprehensive evaluation be conducted further to these regular monitoring procedures. A comprehensive evaluation will demonstrate whether the objectives of the system have been realised, whether the investment was

beneficial and what might need to be altered to maximise the return on investment.

There are many issues that could be considered in an evaluation. Use of a realistic evaluation framework is one option. From this perspective, the following are some suggested evaluation considerations:

- reductions in identified target crimes in the specified area;
- changes in the type of crime and of criminal opportunities in the area;
- the number of convictions attributable to the CCTV system;
- spatial distribution of crime and evidence of geographic displacement; and
- consequences of any publicity campaigns.

Furthermore, consideration should be given to:

- establishing control groups (or areas) to measure displacement and diffusion of benefits and to enhance the power of any findings;
- conducting research over an extended period with a time series design. This involves measuring crime rates over an extended period, rather than calculating fluctuation in crime at one particular point in time. Short follow-up periods might overestimate the positive consequences of CCTV due to the anticipated benefits effect; and
- controlling for other interventions implemented during the CCTV system evaluation. CCTV systems are rarely the only form of crime prevention implemented in a particular location over a specific period. Improved street lighting, changes in police practices, crime prevention through environmental design-inspired treatments, watch schemes and other crime prevention initiatives often operate in concert. Controlling for the relative impact of each form of intervention is necessary to identify the actual effects of CCTV.

Box 15 Expert insights 3

Professor Paul Wilson suggests that ‘local government must assess the effectiveness of CCTV over a range of offences in preventing and detecting crime, as well as how this affects the public’s sense of security in public spaces. Ideally, this would be a cost-effectiveness evaluation comparing, where possible, CCTV with other possible crime prevention measures’.

In conducting a comprehensive evaluation, Professor Wilson suggests consideration of the following techniques:

- analysis of crime data (various offences) pre- and post-implementation of the CCTV system;

- observation of control room operations and operators;
- review of appropriate documentation, including log books of when images are requested by police;
- interviews with key stakeholders, including police, local government personnel, local residents, visitors to the area and local business owners; and
- review of costs and in comparison to expenditure on alternative crime prevention strategies.

Source: Professor Paul Wilson Bond University, Queensland, personal communication (2009)

Displacement and the diffusion of benefits

One of the key challenges facing public space CCTV systems is displacement. This occurs when offenders alter the place, the time, the crime, the perceived rewards or the way in which they undertake offending due to the CCTV system. Geographical displacement is when crime in one area moves to another in response to CCTV (or other crime prevention measures). An evaluation should look to establish evidence for any geographical displacement, as this

might be an unintended negative consequence that produces no net reduction in crime.

Conversely, evaluators should also be alert to the potential for reductions in crime beyond the area covered by a public space CCTV system. Studies have shown that areas not covered by a CCTV system have enjoyed crime reductions due to would-be offenders believing that the system operates in a wider area than it actually does. This is known as a diffusion of benefits and requires data capture beyond the specific area in question.

Conclusion

Public space CCTV systems can prevent crime. However, this will generally only be achieved when careful consideration is given to all of the components of the system based on a detailed understanding of crime in the local area. Given the significant investment required to establish and maintain a public space CCTV system, it is therefore essential that adequate planning be undertaken before embarking on this form of crime prevention.

This manual has been compiled to assist local government authorities and other relevant agencies in their deliberations about establishing a public space CCTV system. The steps outlined in this manual should be considered in light of local conditions. Budgetary, political, geographical conditions, existing crime prevention initiatives, organisational capacity and numerous other conditions will greatly influence relevant local decisions.

Beyond the suggestions provided here, the great tradition of sharing ideas and resources between local government authorities ensures that practical insights can be quickly transferred between personnel and agencies. The sharing of Consultant Tender Specifications, Codes of Practice, SOPs and technical system specifications can greatly help in the establishment of new public space CCTV systems.

Finally, it should be remembered that CCTV is not a panacea for crime. Studies have shown increases in crime after installation of public space CCTV

systems, minor displacement of crime and a host of problems with monitoring, maintenance and system upgrades. Once installed, systems are rarely removed, necessitating a long-term financial commitment. Many crime prevention outcomes are best achieved through a combination of measures, rather than relying solely on one approach—CCTV is no exception.

Predicting the future

Given the rapid changes in CCTV technology, it is impossible to accurately predict future developments. Some of the current trends suggest that CCTV will become more intelligent, require less human monitoring and be able to better isolate individuals in crowded settings. Systems utilising facial and gait recognition, algorithms that detect abnormal behaviour in public spaces, automatic number plate recognition systems and greater integration of public and private CCTV systems are just some of the emerging trends that will potentially change the landscape of CCTV. Whether these developments will prove effective in preventing crime in public space and whether the technology will prove to be a wise investment for local authorities will be determined in the years to come.

The Australian Customs and Border Protection Service has a CCTV Advisory Service on its website (<http://www.customs.gov.au/site/page.cfm?u=5966>). It contains detailed information about technological developments which highlights some of the emerging trends in CCTV.

Box 16 Final comments from CCTV headquarters (the United Kingdom)

Rod Cowan suggested that ‘despite CCTV’s continued popularity, particularly with politicians, serious questions are being raised about its effectiveness in combating crime’ (Cowan 2008: 23). Cowan quotes Detective Chief Inspector Mike Neville (head of New Scotland Yard’s Visual Images, Identifications and Detections Office)—‘[b]illions of pounds have been spent on CCTV kit, but no thought has gone into how the police service is

going to use the images and how those same images are utilised in courts’ (Cowan 2008: 23). With only three percent of London’s street robberies solved using CCTV images, due in part to the quality of images and difficulties accessing images, Neville suggested that significant sums of money was being invested into a CCTV network that was an utter fiasco.

Further reading

All URLs correct as at 9 December 2009

ARTD 2001. *Final report: Evaluation of the NSW Government Policy Statement and Guidelines for Closed Circuit Television (CCTV) in Public Places*. <http://www.dlg.nsw.gov.au/Files/Information/CCTV%20final%20report.PDF>

Barthe E 2006. Crime prevention publicity campaigns. *Problem-oriented Guides for Police: Response Guides Series no. 5*. Washington DC: US Department of Justice. http://www.popcenter.org/Responses/PDFs/publicity_campaigns.pdf

Brew N 2005. *An overview of the effectiveness of closed circuit television (CCTV) surveillance*. Research note no. 14, 2005–06. Canberra: Commonwealth Parliamentary Library. <http://www.aph.gov.au/library/Pubs/RN/2005-06/06rn14.htm>

Coumarelos C 2001. *An Evaluation of the Safe City Strategy in Central Sydney*. Sydney: NSW Bureau of Crime Statistics and Research. [http://www.lawlink.nsw.gov.au/lawlink/bocsar/ll_bocsar.nsf/vwFiles/r51.pdf/\\$file/r51.pdf](http://www.lawlink.nsw.gov.au/lawlink/bocsar/ll_bocsar.nsf/vwFiles/r51.pdf/$file/r51.pdf)

Fairfield City Council 2002. *Cabramatta TownSafe 5 year review*. Sydney: Fairfield City Council. <http://www.fairfieldcity.nsw.gov.au>

Farrell G, Bowers K & Johnson S 2005. Cost-benefit analysis for crime science: Making cost-benefit analysis useful through a portfolio of outcomes, in Smith M & Tilley N (eds), *Crime science: New approaches to preventing and detecting crime*. London: Willan Publishing

Gill M et al. 2005a. Assessing the impact of CCTV (the impact of fourteen case studies). *UK Home Office Research Study no. 292*. London: Home Office. Assessing the impact of CCTV

Gill M et al. 2005b. Control room operation: Findings from control room observations. *UK Home Office Online Report*. London: Home Office. <http://www.homeoffice.gov.uk/rds/pdfs05/rdsolr1405.pdf>

IRIS Research Ltd 2005. *Australian Council's CCTV Survey 2005*. Wollongong: IRIS Research

Klepczarek J 2003. *To CCTV or not to CCTV—that is the question but is it the answer? A practitioner's point of view*. Paper presented at the Graffiti and Disorder Conference, Brisbane: 18–19 August 2003. http://www.aic.gov.au/events/aic_upcoming_events/2003/-/media/conferences/2003-graffiti/klepczarek.ashx

Keval HU & Sasse MA 2006. *Man or a gorilla? Performance issues with CCTV technology in security control rooms*. http://hornbeam.cs.ucl.ac.uk/hcs/publications/IEA2006_Keval.pdf

Levesley T & Martin A 2005. Police attitudes to and use of CCTV. *Home Office online report*. London: Home Office. <http://www.homeoffice.gov.uk/rds/pdfs05/rdsolr0905.pdf>

Lyon D 2007. *Surveillance studies: An overview*. Cambridge: Polity Press

Ratcliffe J 2006. Video surveillance of public places. *Problem-orientated guides for police response guides series no. 4*. Washington: US Department of Justice. http://www.popcenter.org/responses/video_surveillance/

Sherman L, Farrington D, Welsh B & MacKenzie D 2002 (eds), *Evidence-based crime prevention*. London: Routledge

Smith G 2004. Behind the screens: Examining constructions of deviance and informal practices among CCTV control room operators in the UK. *Surveillance and Society* 2(2/3): 376–395

Surette R 2005. The thinking eye: Pros and cons of second generation CCTV surveillance systems. *Policing: An International Journal of Police Strategies and Management* 28(1): 152–173

Welsh B & Farrington D 2006. CCTV and street lighting: Comparative effects on crime, in Perry A, Macdougall C & Farrington D (eds), *Reducing crime: the effectiveness of criminal justice interventions*. London: Wiley and Sons

References

All URLs correct as at 9 December 2009

Australian Institute of Criminology (AIC) 2009. *Australian crime: Facts & figures 2008*. Canberra: AIC. http://www.aic.gov.au/publications/current_series/facts/1-20/2008.aspx

City of Sydney Council 2005. *Code of practice: Street Safety Camera Program*. Sydney: City of Sydney Council. <http://www.cityofsydney.nsw.gov.au/Community/documents/Safety/CCTVCodeofPractice2005.pdf>

Cowan R 2008. Fiasco and function blurs CCTV's image. *Security Insider Jun/Jul*. Australian Security Industry Association

European Union for Urban Safety 2007. *Guidance on local safety audits: A compendium of international practice*. <http://www.fesu.org/index.php?index.id=664>

Graham K & Homel R 2008. *Raising the bar: Preventing aggression in and around bars, pubs and clubs*. Devon, UK: Willan Publishing

Information Commissioner's Office 2008. *CCTV code of practice*. Cheshire, UK: Information Commissioner's Office. http://www.ico.gov.uk/upload/documents/library/data_protection/detailed_specialist_guides/ico_cctvfinal_2301.pdf

NSW Government 2000. *NSW Government Policy Statement and Guidelines for the establishment and implementation of CCTV in Public Spaces*. Sydney: NSW Attorney Generals Department. [http://www.lawlink.nsw.gov.au/lawlink/cpd/ll_cpd.nsf/vwfiles/cctv.pdf/\\$file/cctv.pdf](http://www.lawlink.nsw.gov.au/lawlink/cpd/ll_cpd.nsf/vwfiles/cctv.pdf/$file/cctv.pdf)

Office of the Privacy Commissioner, Australia 2007. *Community Attitudes to Privacy 2007*. Sydney: Office of Privacy Australia. <http://www.privacy.gov.au/materials/types/download/8820/6616>

Orange City Council 2008. *Code of practice: Crime prevention through CCTV project*. <http://www.orange.nsw.gov.au/go/building-our-city/safety-in-our-city>

Rollings 2008. *Counting the costs of crime in Australia: A 2005 update*. Research and public policy series no. 91. Canberra: AIC. http://www.aic.gov.au/publications/current_series/rpp/81-99/rpp91.aspx

Standards Australia 2006. *Closed circuit television (CCTV)—part 1: management and operation*. AS 4806.1-2006. Sydney: Standards Australia

Standards Australia 2006. *Closed circuit television (CCTV)—part 2: application guidelines*. AS 4806.2-2006. Sydney: Standards Australia

Standards Australia 2006. *Closed circuit television (CCTV)—part 3: PAL signal timings and levels*. AS 4806.3-2006. Sydney: Standards Australia

Standards Australia 2008. *Closed circuit television (CCTV)—part 4: remove video*. AS 4806.4-2008. Sydney: Standards Australia

Wells H, Allard T & Wilson P 2006. *Crime and CCTV in Australia: Understanding the relationship*. Qld: Bond University. http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1071&context=hss_pubs

Welsh B & Farrington D 2008. *Effects of closed circuit television surveillance on crime*. Campbell Systematic Reviews, The Campbell Collaboration 2008: 17

Wilson D & Sutton A 2003. Open-street CCTV in Australia. *Trends & Issues in Crime and Criminal Justice* no. 271. Canberra: Australia. <http://www.aic.gov.au/documents/1/7/8/%7B178BCC40-683D-4D19-B9AC-EB0937090141%7Dtandi271.pdf>