INTRODUCTION

Revised October 2011

CONSIDERATIONS FOR THE USE OF CCTV IN A PARKING FACILITY – BY ANDY BROOKS OF TELEVIGIL ASSOCIATES.

This paper has been prepared to help and assist in identifying and determining the risk that could be associated with a type of parking facility, and being aware of the measures available that could be used to provide a level of Closed Circuit Television (CCTV) surveillance that is suitable and appropriate for the location and purpose of the parking facility and customer’s safety. In most circumstances the use of CCTV should be considered as part of a scheme including the physical security and operational requirements of the parking facility, and whether it would benefit the operator to be part of a larger scheme e.g. a town centre surveillance scheme. Each and every parking facility will be unique by nature of design, functionality and location; a 300 space public car park in a rural town will be unlikely to have the same problems that may be associated with a 300 space public car park in a city centre.

In recent years the planning and design of car parks has been undertaken by professional practices that have knowledge and experience to deliver what is required to provide the best solution and a safe parking facility. Operators of existing facilities may benefit by carrying out an assessment of their parking facility and compare their notes with the Park Mark® Assessment Guidelines, about which further information is available from the BPA or visit www.britishparking.co.uk.
CONTENTS

SECURE BY DESIGN
OR BY IMPROVEMENT ................................................................. 4

CONTROL ROOM DESIGN ............................................................. 5

SYSTEM DESIGN – POSITIONING
OF CAMERAS ................................................................................. 6

CHOOSING THE CORRECT CAMERA
FOR THE LOCATION ........................................................................... 6

CAMERA HOUSINGS ............................................................................ 7

CONTROL, MANAGEMENT STORAGE
AND VIEWING OF IMAGES ............................................................ 8

USE OF AUTOMATIC NUMBER PLATE
RECOGNITION (ANPR) CAMERAS IN
PARKING FACILITIES ........................................................................ 9

CCTV SYSTEMS AND THE DATA
PROTECTION ACT 1998 (DPA) ....................................................... 10

CCTV SYSTEMS SERVICE,
MAINTENANCE AND ENSURING
COMPLIANCE ..................................................................................... 12
SECURE BY DESIGN OR BY IMPROVEMENT

The parking facility operator should discuss and seek advice from the local crime prevention liaison officer in assessing the risks associated with the parking facility. A comprehensive security and vulnerability risk assessment should be undertaken with the assistance of the local Police Park Mark ACPO Accredited Assessor and the Safer Parking Development Manager with a view to developing and producing an Operational Requirement document (OR) for the parking facility.

Many factors, including car park size, location, construction, accessibility, lighting, location of control room, location of parking equipment, payment machines and staffing will determine the type and extent of system that would meet the requirements of the Car Park Management Team. Over the last 20 years, the installation of CCTV within parking facilities has been widely employed and generally accepted as being successful, providing the following benefits:

• Assisting to deter and detect criminal and antisocial behaviour and in some instances, information recorded by cameras has provided valuable information for operators making information available to the police authorities in the pursuance of criminal activity and anti-social behaviour and also;
• Assisting to monitor and record events that could result in legal action against the operator;
• Assisting to monitor areas where health and safety and risk to staff or the public may be a concern, so enhancing customer’s safety;
• Providing information that may be of benefit for the purpose of marketing and management.

The risk assessment will highlight areas of the car park where the employment of CCTV cameras may be beneficial or essential. The areas that are likely to benefit from CCTV surveillance will include the following:

• Vehicular and pedestrian entrances to and exits from the car park;
• Stairwells, lobbies, lifts & WCs;
• Car park payment machines,”Help points” (if installed) and public telephones.

If justified, the next level of surveillance may provide coverage of the car parking areas, affording a general overview of areas by use of fixed cameras, or larger areas can be monitored if high performance cameras which are discreetly able to pan, tilt and zoom to pre-programmed “tours”, are installed.

Only when a strategy and the OR has been agreed, can you start designing and budgeting for a system based on camera locations deemed to be of strategic importance with video management display and recording equipment, and then consider whether the cost of installing cameras in other areas can be justified. The design package could then be put together and submitted. The submission would be in two parts. Part one would be a Car Park Facility management team’s specification which would include the technical specification of all products selected in the proposal. Part two would be the commercial itemised list of products used and the pricing.
CONTROL ROOM DESIGN

The correct control room environment and console design is essential to ensure alertness, well-being and freedom from fatigue for personnel operating equipment over extended periods of time. Control room operators that monitor public space should be managed and operated in accordance with BS7958:2005 B1.4. Operators are the most expensive ongoing cost of a control room, so this highlights the importance of their role.

Coupled with this is the important aesthetic dimension. Many installations are in view, not only by operators, but also by the public and invited guests on a daily basis. An obvious situation is within a reception area or window where it is important to create the right impression for customers and other stakeholders with a vested interest. The console should be aesthetically pleasing, uncluttered and virtually cable free as well as being functional. In these cases, utilitarian is not good enough! Several important factors should be considered when designing a room to house technical furniture and equipment:

• Function is paramount. The installation must be laid out to group the equipment, monitors, keyboards, and communications in a manner that is not only logical but also intuitive. Current legislation also plays a pivotal role in console arrangement, as it is important to adhere to the Data Protection Act. In order to do this, the monitors have to be out of view from those without authorisation. When designing for the Disability and the Equality Act 2010 the aim is to eliminate discrimination in the field of employment against anyone. In doing so, designs have to provide sufficient space for manoeuvrability and make all equipment and facilities accessible to all.

• To achieve operator freedom from fatigue, each unit must be ergonomically designed from anthropometrical data related to viewing angles and ease of reach, desk height, chair design. For added safety and looks, cable management should be incorporated. Full free access is vital for equipment service and maintenance, affording the least possible disruption to operations.
SYSTEM DESIGN – POSITIONING OF CAMERAS

The system design and the type of camera/ lens combination required will be determined by the site specific Operational Requirement, but generally speaking, to achieve optimum benefit consider:

• Where, for deterrence, they can be easily seen, none obscured by trees or structures
• Where they provide the optimum field of view whether close, wide or long
• Where they can be fixed securely to the side/corner of a wall or ceiling mounted or pole mounted at a height at which they cannot be tampered with easily;
• Where scene illumination quality is most constant and not less than 25 Lux (otherwise where artificial lighting can be easily provided);
• Not in direct view of bright lights - for example, the sun's angle at certain times of day and/or year is a major consideration for external camera views.

CHOOSING THE CORRECT CAMERA FOR THE LOCATION

With the rapid advance of technology associated with video technology, advice should be sought from someone with good knowledge of CCTV, who is up to date with the product available and has a clear understanding of what is expected with respect to performance, coverage and costs involved with the supply, installation and serviceability of systems.

There are two types of camera generally used in surveillance:

• A “Static” or “Fixed” camera is one that when installed and set up correctly will provide a constant field of view of a predefined area that needs to be monitored e.g. an entrance door, pay station etc;

• A Pan, Tilt & Zoom camera is one that when installed and set up correctly can be operated or programmed to move and view through up to 360 degrees, and with a motorised zoom lens could be used to recognise or identify a person at a distance of 50 metres or more. Dome cameras and technology can now offer system versatility in operating automatic tours and even object tracking of a moving object across a scene by use of video analytics or alarm inputs from sensing devices.

Systems can be configured and set to work on a timed basis where facilities are unmanned and remotely monitored during certain times, though CCTV cameras remotely activating an alarm to an off site monitoring station must conform to BS 8418.

As a rule, an analogue camera should be able to provide at least 470 lines of resolution and a digital camera that is to be connected to a LAN or WAN should be capable of capture and Transmitting a D1 image composed of 720 by 520 pixels. Though now HD and Megapixel cameras are being offered by installers which have some advantages including much higher resolution but may require higher bandwidth for data and greater storage capacity for recording.

Choosing the correct lens can be one of the most important factors that will determine the performance of the CCTV installation. It is preferable that good quality Auto Iris lenses with a low “F”
stop are specified as these are able to adjust for changes in light levels with minimal loss of performance. You can decide upon the lens you will need by using a hand held view finder or lens calculator. When you know the horizontal angle of view from the position the camera is to be installed, your installer will be able to advise on the correct wide, standard or telephoto lens required. Installers are able to offer vari-focal lenses that would allow the angle of view to be adjusted within certain parameters. Remember, the wider and higher the field of view the less detail will be available and vice versa.

Home Office Guidelines by the Centre for Applied Science & Technology, have assisted the industry in formulating standards that are now widely used in defining the Operational Requirement and Operational Performance of a camera.

There are five image standards see below.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>Monitor &amp; Control - Monitor the number, direction and speed of people across a wide area.</td>
</tr>
<tr>
<td>10%</td>
<td>Detect - Following an alarm/alert an observer would be able to search the screen and assess whether or not a person is present.</td>
</tr>
<tr>
<td>25%</td>
<td>Observe - Details such as clothing and activity surrounding an incident can be seen.</td>
</tr>
<tr>
<td>50%</td>
<td>Recognise - Ascertain whether or not an individual is the same as someone they have seen before.</td>
</tr>
<tr>
<td>100%</td>
<td>Identify - The identity of an individual can be established beyond reasonable doubt.</td>
</tr>
</tbody>
</table>

**CAMERA HOUSINGS**

Camera housings which protect the camera equipment against a wide variety of environmental conditions and from being vandalised, are available for internal or external use and include standard environmental housing with sunshield, Ceiling Wedge-shaped, Corner mounted, vandal resistant domes. These are special casings within which cameras positioned in vulnerable areas should be housed. They are generally more expensive than normal environmental housings, but are ideal for installation in car parks where ceilings are generally low. Not only might the camera itself have to be protected from vandalism but also it's cabling, which should be contained within galvanised steel conduits.
CONTROL, MANAGEMENT, STORAGE AND VIEWING OF IMAGES

The old method of recording video images on video cassette recorders is discouraged and indeed, manufacturers have now discontinued production of equipment. Recordings are now made in a digital encoded format either from collection of analogue signals onto a digital recorder, or IP network cameras and video servers that are directly connected to a PC network (Ethernet or TCP/IP).

Many manufacturers are working towards a common standard ONVIF which will ensure global standardisation of Network Video. One important advantage of this being that stored information is more accessible. Investigation of stored images can be shared and retrieved either by event, date and time, or by more advanced analytical search features. By this method the operator can select a camera and area of view and the device will provide only the files of interest (where there has been activity). This saves the operator of the system the all-important element of time have incorporated features into their products that enable the operators to control PTZ cameras, set tours, mask scenes (for privacy), and operate with macros when integrated with other building management, parking and security systems.

The recording and storage of images (Data) can only be kept for a limited period of time under the DPA regulations. This time will be justified and stated within the OR for the scheme. The length of time may also be dependent on the recording frame rate cameras are running at, the number of cameras, amount or activity and the size of the storage capacity of the system. A small rural Car park may only require storage for 7 days but a busy car park in a major city may be able to justify 90 days or more. It is not for the police or any other party to determine storage times. It is the Data Controller that must justify this as part of the OR and so the type and amount of storage required for the scheme to operate.

As camera technology and performance has improved, so have compression techniques used to compress the volume of data produced. Various compression algorithms are employed that enable captured images to be compressed; stored and transmitted, though H264 is generally accepted as being a good standard.

The recording ratios for image capture rate will differ for recording modes, i.e. background and real time event will determine the amount of storage or bandwidth required for transmission. The end result for the user should be increased efficiency for their particular application with the very best image quality. A background recording rate of 6 images per second from each camera, at an image capture resolution of D1, which is an image made up of 720 horizontal pixels and 520 vertical pixels of digital information, is thought acceptable, and for “real time” recording, a minimum of 12-13 to 25-26 images per second from a camera, at an image capture resolution of a D1. To calculate the amount of Hard Disk Storage required will depend on the type of system installed and the method of compressing images that is used by the manufacturers of Digital Recording and Networking Product. Further advice should be sought from a consultant or manufacturer.
USE OF AUTOMATIC NUMBER PLATE RECOGNITION (ANPR) CAMERAS IN PARKING FACILITIES

ANPR cameras provide valuable additional information to car park operators should clear identification of a vehicle be required. Usually located at the entrance and exit, these cameras capture and store the license plate and time of each vehicle as it enters and leaves the facility.

These cameras are equipped with infra-red filters and lights which allows the capture of the license plate in all light conditions. With the addition of an overview camera operating in the visual spectrum and, assuming sufficient ambient light, it is also possible to capture images or even video of the vehicle. This information can provide commercial and safety benefits to operators.

License plate information can be used to enforce lack of payment or overstays at facilities without barriers. It can also, with the permission of the driver, be used to manage payment. Recent developments in mobile payment technologies and the ubiquitous nature of smart phones render this combination a viable option for many operators looking for alternatives to barriers, payment machines and enforcement staff.

Cost savings are generated through the reduction in physical infrastructure and staff whilst the automated nature of payment speeds cash-flow.

For drivers, mobile payment solutions can improve customer satisfaction through the avoidance of costly penalties, often inadvertently collected. But if drivers over-stay or are not registered, these solutions also give the operator the means to easily generate penalty charge notices via established, authorised suppliers.

Operators can also use information gleaned from these cameras to understand patterns of usage, frequency and regularity which can be of value, particularly to retailers.

Clear identification of vehicles and drivers knowing that images are being recorded confers benefits to customer safety beyond that afforded by static or PTZ security cameras. Blacklisted vehicles can be flagged and an alarm raised or, if barriers are in place, access denied.

ANPR cameras and the software used to manage them can provide valuable additional images, video and usage data and can also provide a route to automation beyond existing physical systems.
CCTV SYSTEMS AND THE DATA PROTECTION ACT 1998 (DPA)

Video recordings that may eventually be used as evidence in a court of law must have been demonstrably and effectively managed throughout their lifetime within the system. Furthermore, if the evidence you may rely on does not comply with the law it may be successfully challenged by the other party. The Data Protection Act compliance and the Home Office CCTV Operational Requirements Manual lay down the benchmark standards for satisfactory CCTV system operation which include the following information which will form part of the Operational Requirement Document or Operational Policy:

1. Appointment of a Registered Data Controller who will be responsible for how the system is managed and notifying the Information Commissioner about the scheme and how it is managed.

2. What the purpose of the scheme includes, for example “Crime prevention and detection and the apprehension and prosecution of offenders” and any further purposes.

3. Location and brief description of the scheme.

4. Name of the person nominated as Data Processor and those people nominated and responsible for the processing of CCTV images.

5. Details of the organisation responsible for maintenance of the scheme and what procedures are in place for service.

6. A schedule of all cameras included in the scheme detailing the Camera reference as displayed and recorded, area of surveillance, operational requirement, camera type i.e. Static, PTZ, ANPR. Percentage person screen height, privacy compliance.

7. Monitors location and viewing capability, if the monitoring of cameras takes place from a control room then compliance with BS7958:2005 B 1.4 should be recorded.

8. The performance and operation of recording equipment including archive period, recording rate, replay quality and security of access to images.

9. The viewing and disclosure of images to third parties and any subsequent removal from site should only be allowed by the Data Processor and recorded.

10. Under the terms of the DPA an individual or third party may apply to obtain access to personal data of which that individual is the subject in the form of a recording if certain criteria are satisfied. Any such requests need to be referred to the Data Controller and all requests documented, recorded and actioned following subject access guidelines contained in the DPA.
11. All data images copied including prints from the recording equipment must be strictly controlled and subject to compliant practice procedures and a documented audit trail.

12. Where a scheme includes monitoring of public space or incidental monitoring of public space, CCTV operators need to be made aware of their responsibilities and may be required to be trained and have on display the appropriate SIA license as CCTV operators.

13. The public are entitled to a statement describing the purpose of the scheme and how they may be affected by the scheme and their rights. This information will need to be displayed on clearly visible statutory information signs adjacent to and within the scheme location.

14. A complaints procedure will need to be in place whereby the Data Controller or nominated individual will acknowledge, investigate and respond to any complaint received within 25 days.

15. The CCTV system operators should ensure the following are in place:

- Operator duty log.
- Incident download log.
- Recorded material handover log.
- Recording hard drive Unique reference Number and removal from site log.
- Subject right of access application.
- Visitor viewing log.
- CCTV maintenance and service log.
- Time and date/recording check log.

16. An Operational Policy will include a statement of the system activity and assessment of the CCTV schemes impact on crime, and should be carried out by an independent assessor.
CCTV SYSTEMS SERVICE, MAINTENANCE AND ENSURING COMPLIANCE.

All CCTV systems should be periodically tested to BS:50132 as recommended by BS:7958 Operation and Management of CCTV which also recommends that to ensure the satisfactory performance and compliance with the DPA an independent assessment and Operational Policy for the scheme should be undertaken annually by an independent assessor.

A DVD: CCTV Related Publications v5.0 which covers most of above is available on request from the Home Office Scientific Development Branch (HOSDB). Tel: 44 (O)1727 865051 or by email hosdb@homeoffice.gsi.gov.uk

Copies of the CCTV Code of Practice and other publications are available on website:

Secured by Design www.securedbydesign.com has details of SBD certified companies that can offer accredited related security product and services.

Further information about security in parking facilities is available from the BPA Product and Services guide. Visit www.britishparking.co.uk.