HELPING TO CLARIFY CCTV SURVEILLANCE

BEAGLE WATCH

ARMED RESPONSE

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1. Introduction to CCTV surveillance to suburbia:

1.1 The purpose of this document is to assist Residents in understanding the benefits, challenges and limitations of CCTV camera deployments in residential areas. Whilst there are many advantages to having CCTV cameras, it is more important for all contributors to understand fully their operational limitations. This will ensure alignment in Resident expectations and system capabilities.

1.2 Unfortunately, Hollywood has created many myths about CCTV cameras and their capabilities. It is important to understand that image quality and definition of outdoor CCTV cameras are affected by a wide range of environmental factors. Some of these can be overcome by deploying more cameras or more expensive camera types which are designed to overcome these shortcomings, but limitations still remain.

1.3 There are many cases on record where Residents have become disillusioned by the performance of CCTV solutions. In most instances, these are caused by the vast differences between the perception created by Hollywood and reality. As a result of this, it is important for each Resident to understand what to expect and to fully appreciate the limitations of the technology before investing in this technology.

2. What is involved in remote CCTV surveillance?

2.1 CCTV cameras are deployed at strategic points within a suburb and the video images are streamed back to a Control Room via a fibre optic cable. The images are then either processed through functional specific software, monitored by Control Room operators, recorded for later retrieval or a combination of these.

2.2 The cameras would typically be day/night cameras which means that when good lighting prevails, colour images will be provided but at night or in low light conditions, the camera images will switch to black and white. The reason for this is that the cameras are able to make use of ambient infrared lighting which is only effective in the black and white range. Human eyes cannot see infrared light because we see in colour.

2.3 Where necessary, cameras can be fitted with infrared illuminators which will improve images at night.

2.4 CCTV cameras with remote offsite-monitoring have been used for many years in various city monitoring projects. Unfortunately, what we see on "CSI" is only possible through a liberal dose of special effects

generated by Hollywood. Many suburban camera systems have been abandoned for a number of reasons.

2.5   Illustrated below are typical work flows based on information received from CCTV cameras.
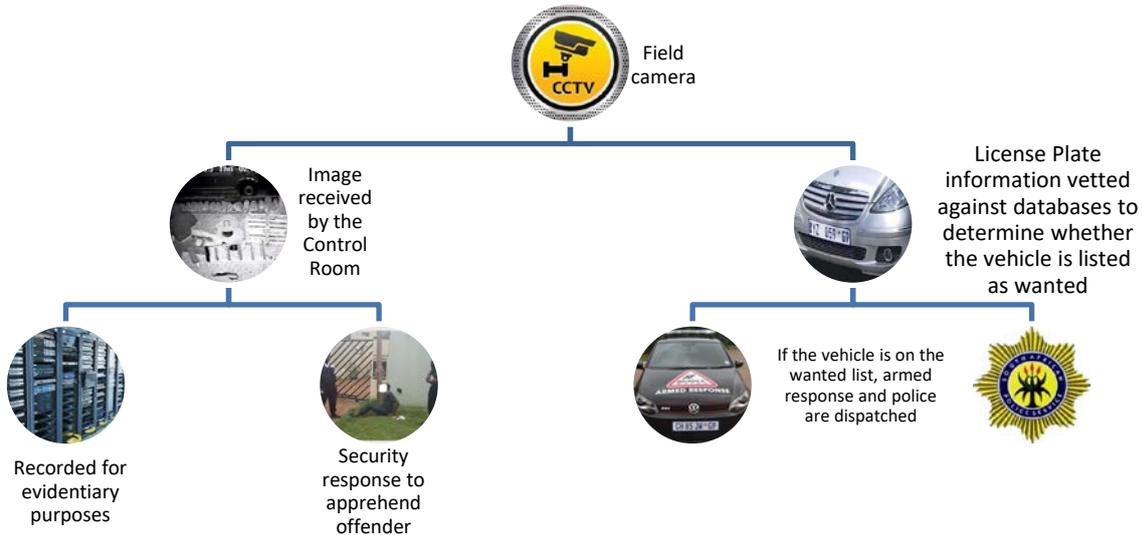
2.6   CCTV surveillance solutions work very well in cities of the world where operators are paid by governments who have the financial resources to do so. Operators typically:

2.6.1   Monitor the activities of people in roadways where it is easy to spot loiterers, suspicious behaviour, pickpockets and the like.

2.6.2   Revisit recordings to obtain evidence – we only have to see what role these played in the identification of the Boston bombers.

2.6.3   Search for vehicles using Licence Plate Recognition (LPR) software.

2.6.4   Detect unattended packages.

2.6.5   Monitor traffic related problems.

2.7   In suburbia, the situation is very different; most criminals drive to their victims in vehicles which are not out of place in the area.

2.8   Trees, roadway layouts and varied lighting conditions all affect the functionality of the system and the quality of the images being captured.

2.9   The deployment of CCTV cameras goes hand in hand with not only capital costs, but also the associated running costs. Having an operator monitor a bank of CCTV monitors is not only very expensive, but the effectiveness of these operators decreases every minute they are staring at monitors. CCTV operators must be relieved from their posts every 20 to 30 minutes in order to ensure their effectiveness.

2.10   In an attempt to overcome this cost element, manufacturers have been hard at work trying to improve the efficiency of CCTV camera monitoring through the use of software, usually referred to as video analytics. In theory, this means that operators are only required to view video images based on exceptions or events generated by software or other triggers. These all work with varying degrees of success. In broad terms, the software provides for alerts based on the following event types:

2.10.1 Unusual Behaviour Detection – this is a "buzz phrase" in which on-going development is being undertaken. It is far from perfect, but it seeks to identify unusual behaviour which is then brought to the attention of the operator for further investigation. The "false alarm" and "failed to alert" ratios are still very high on this type of detection software.

2.10.2 Violations of preprogramed parameters pertaining to direction, speed, time, size and location. This means that a CCTV image is analysed for any one of, or a combination of, the events listed in order to highlight specific activity to an operator.

2.10.3 Alarm inputs – these are traditionally triggered by devices which cause an alarm activation such as an electric fence, outdoor beams, intruder alarm device or other technologies.

2.10.4 Licence Plate Recognition – this technology has been around for many years and enables the system to verify each readable licence plate against databases. These databases may belong to law enforcement or those created by operators which may be flagged as suspicious or on a "wanted list". One thing that must be noted here is that criminals clone and regularly change number plates which affects the performance of this technology.

2.11   All of the above enhancements aimed at reducing the number of necessary operators comes at a cost. As an example, each camera which performs the Licence Plate Recognition and verification function, carries a licence cost.

3. **Other CCTV camera considerations:**

3.1   CCTV cameras are typically immobile and have a fixed field of view. This means that anything which happens outside of the area that the camera is focused on, does not exist.

3.2   As a rule of thumb, the larger the area under surveillance, the less defined the elements within the image will be. This is illustrated in the images below where the larger the zoom lens in use, the more defined the detail but the less of the surrounding area is visible.
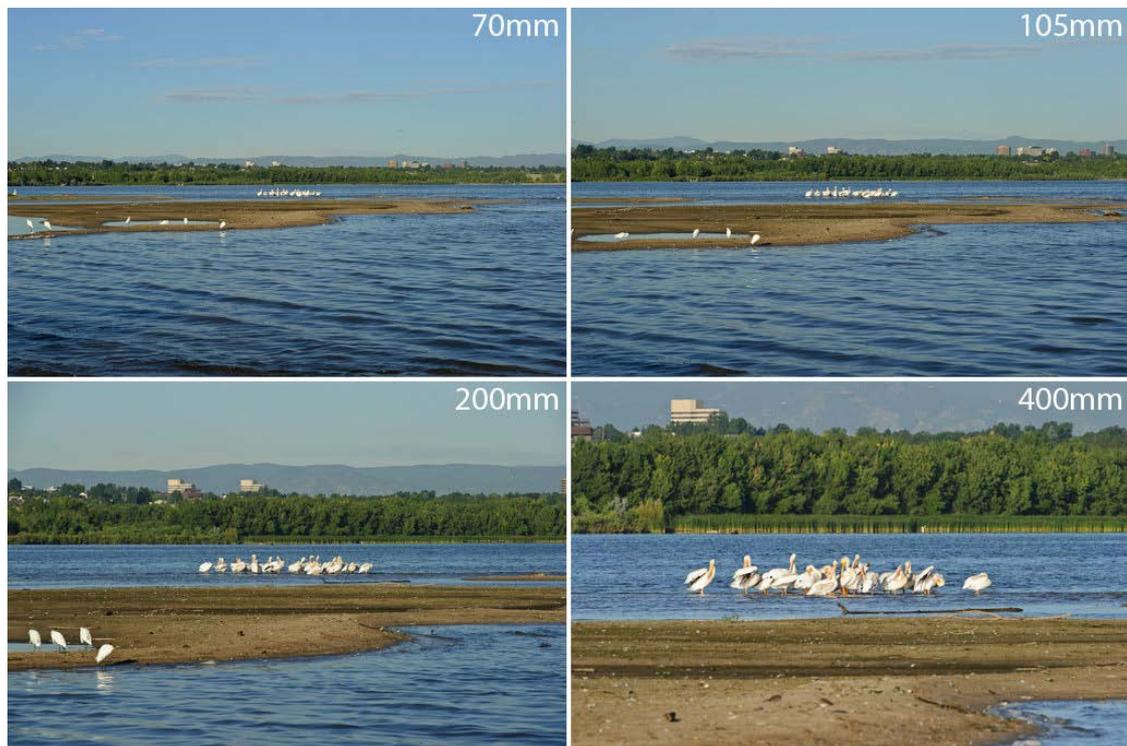
3.3   Should there be a requirement for more detail to be available, it is necessary to upgrade to high definition or mega-pixel cameras which have the capability to provide for more definition. The other alternative is to install pan, tilt, zoom cameras. These cameras allow for an operator to move the camera's field of view and zoom into areas where more clarity is required. These cameras do however require dedicated operators to carry out the monitoring activity which adds significantly to the running costs. The following are considerations in respect of this technology:

3.3.1   Masking will be required so as to ensure the privacy of residents in close proximity to the camera pole. This means that Control Room operators will not be able to see into gardens or homes.

3.3.2   A downside to a PTZ camera is that when the camera is focused in one direction of the street and an incident happens at the opposite end, there will be no record of the incident and the operator will be oblivious to it.

3.3.3   These cameras are significantly more expensive and have higher operating costs.

3.4   The quality of cameras has a direct impact on the quality and usefulness of images being captured. This necessitates suppliers providing demonstrations of the images provided by the exact proposed cameras before any contract is entered into. These images must also be evaluated at different times of the day to understand the impact of different lighting conditions and the associated quality of images being provided.

3.5   Factors affecting clear images of CCTV cameras:

There are a number of factors which affect the images being captured by CCTV cameras, these include:

3.5.1   Vehicle headlights shining towards the camera.

3.5.2   Light from the sun.

3.5.3   Reflections from windscreens and windows.

3.5.4   Movement of the pole onto which the camera is mounted during adverse weather conditions.

3.5.5   Rain, fog and other weather-related issues.

3.5.6   Deliberate tampering.

3.5.7   Vegetation in the roadway.

3.5.8   Prevailing light conditions.

3.5.9   Dirt on camera lenses.

4. **Managing Resident expectations:**

4.1 When residents see CCTV cameras they automatically think of CSI (the TV series) and expect these results from cameras. For this reason, it is very important to ensure that there is an education program in place to inform residents of the elements discussed above. This will ensure support for cameras based on a realistic understanding of the capabilities of cameras.

4.2 The reality is that all of the factors listed above affect cameras to varying degrees. For this reason, CCTV cameras are not the silver bullet solution so many people are looking for but form part of an overall solution.

5. **Contractual issues:**

5.1 A full SLA should be entered in to, to ensure that resident expectations are fully in line with those of the service provider. The following are important to include in the contract:

5.1.1 **Camera purpose** - a detailed description of the purpose of each camera is to be agreed. Here it is important to note that what a person sees at a particular point may NOT be visible to the CCTV surveillance operator. Once installed, a screen shot register is to be signed off by the parties which clearly illustrates the field of view required from each camera.

5.1.2 **Camera types** - must be detailed, this includes the software licence to be run on each camera.

5.1.3 **Recording period** – the number of days which are to be recorded is to be specified.

5.1.4 **Resolution of recorded images** – this is very important to ensure that you have usable images for retrieval. The higher the resolution the better.

5.1.5 **Ratio of operators to number of cameras** – this refers to the number of operators deployed to monitor your cameras.

5.1.6 **Roles and responsibilities of the system and operators** - typically, the operators are responsible to monitor the surroundings, identify suspicious activity and despatch the necessary resource to deal with defined situations. An important element for consideration

is how much time is to be spent on proactive monitoring of high risk areas using overview or PTZ cameras.

5.1.7 **Performance criteria** – this not only refers to uptime but also the recording retrieval process, access rights to recordings, what recordings are to be retained and for what period. This refers to those recording of incidents.

5.1.8 **Compliance with POPI Act** – this is a legal requirement and must be taken into consideration when drafting the agreement to ensure compliance.

5.1.9 **System maintenance** – this element must include preventative maintenance on cameras (painting of poles, cleaning of lenses, refocussing and ensuring the agreed fields of view are maintained) and service restoration time frames in the event of failures.

5.1.10 **Operator requirements in terms of reporting** – typical reporting to be detailed in the SLA include the immediate reporting of camera or system failures and incidents (who must they be reported to, what detail is required etc.)

5.1.11 **System performance reports** – these should be system generated and provide summaries of system uptime, response times between failures and repairs.

5.1.12 **Contract period** – never enter into a long-term contract with a system which has not proved itself. A short-term contract with the option to continue is ideal as it ensures that if you are not completely satisfied, you do not end up with a long-term commitment for a system which is not performing as agreed.

6. **What are the advantages of CCTV cameras?**

6.1 Their deployment is an immediate deterrent which is further enhanced by having armed response officers investigating and questioning those identified as being involved in suspicious behaviour.

6.2 Licence Plate Recognition cameras have illustrated their value on many occasions where vehicles which have been tagged, are identified entering into suburbs.

6.3 Cameras which are recorded provide valuable information for the investigation of crime.