



Bromsgrove District Council

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Review of Public-Space CCTV Systems for Bromsgrove District Council.

Prepared By:



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EXECUTIVE SUMMARY

CDC Technical Services Ltd have been appointed to undertake an independent review of the public-space CCTV systems in Bromsgrove, Redditch and Wyre Forest.

This report concentrates only on the CCTV systems within Bromsgrove and provides an overview of the findings of site surveys to all Bromsgrove District Council (BDC) camera locations, BDC transmission, control & recording systems (located at Parkside offices) and observations from site visits to the CCTV control room at Redditch Borough Council.

Site Surveys

Summary of findings –

- In general, the BDC CCTV scheme provides good coverage of the areas being monitored with overlapping camera coverage (i.e. from multiple cameras) as expected from best practice system design;
- The current system control and recording technology is old and, in the main, obsolete;
- Current CCTV maintenance spend is over £15K per annum (cameras only);
- There is a significant amount of repeated camera maintenance issues to be addressed;
- The current preventative maintenance regime provided by the maintenance contractor should be assessed against the requirements of the original tendered CCTV Maintenance Specification;
- Current CCTV signage is non-compliant, and more signs need to be provided – especially in regard to the requirements for ICO and GDPR compliance;
- Current BT fibre spend is over £67K per annum;
- Upgrading or replacing part of the system will have a knock-on effect to other parts of the system that need to be upgraded as well – i.e. an upgrade in camera technology will require an upgrade in digital recording technology;

Invest-to-Save Summary

Site surveys have been carried out for the implementation of new digital wireless transmission and an 'invest-to-save' proposals have been made as follows –

- to save circa £18K per year on BT rental costs in Bromsgrove by investing circa £72K to upgrade the transmission network in Bromsgrove town centre. The likely payback period being less than 4 years;
- to save circa £20K per year on BT rental costs in Rubery, Hagley and Barnt Green by investing circa £63K to upgrade the transmission network in all three village centres. The likely payback period being less than 3.5 years;

Furthermore, budget costs for the necessary upgrade of digital recording systems have been provided and the likely payback period for all upgrade works (i.e. wireless network and digital recording upgrade) at all sites calculated at less than 4 years.

Recommendations

Several recommendations have been made throughout the report and these are summarised as follows –

- On expiry of the existing CCTV maintenance contract in 2019, a new maintenance specification should be compiled to include the following –
 - Bespoke specification to meet the needs of RBC and BDC;
 - KPI-based to improve (and ensure) contractor performance;
 - Improved PPM programme over the full contract timescale (instead of focussed maintenance twice a year);
 - Obsolescence management is included to provide early identification of equipment that may become obsolete during the contract period;
 - Identification of system vulnerabilities and critical points of failure to allow forward planning/mitigation by RBC/BDC;
 - The use of IT Health Check testing to ensure security and integrity of the CCTV network is robust and network vulnerabilities are minimised;
- The specification for any new capital investment upgrade works should include the requirements for a new maintenance contract as a combined procurement exercise. This will save costs and provide a better solution to RBC/BDC for ongoing service and maintenance;
- It is recommended that the CCTV control room technology AND environment be considered for upgrade as part of any capital investment based upon the site survey information provided;
- It has been identified that, whilst a wholesale system upgrade is not necessarily required at this current time, it is recommended that BDC makes plans for the digitization of the CCTV scheme with the upgrade of cameras, transmission, control room and control and recording systems in a staged approach over the next 3-5 years.
- It is recommended that independent specialist advice be sought for the implementation of any system upgrade works – including the compilation of technical specifications and assistance with the delivery of capital works to ensure compliance;
- Recommendations for the compilation of a redeployable camera policy and procedure have been outlined to ensure compliance with all regulations and to ensure the overall effectiveness of any redeployable camera technology investment;

Finally, through identifying the key phases of any proposed upgrade project, information outlined in this report will allow the RBC/BDC CCTV team to bid for available funding from the West Mercia Police Crime Commissioner to fund the development and future-proofing of the RBC/BDC CCTV scheme and plan for the years ahead.

The report acknowledges that the operation and maintenance of a 24/7 CCTV monitoring presence can be costly to a local authority and therefore some considerations for future potential opportunities and way forward options have been summarised for further exploration.

Section 1. INTRODUCTION

1.1 GENERAL OVERVIEW OF CONSULTANCY WORKS

The public-space CCTV review is to include a detailed written appraisal outlining the following information (but not limited to) –

- Survey and condition report of all camera locations that form part of the CCTV scheme at Bromsgrove, Redditch and Wyre Forest;
- Survey and condition report of all CCTV hardware and associated transmission equipment at all collection points/hubs that form part of the CCTV scheme;
- Survey and condition report of the control room and control room systems;
- Capability and limitation information for all CCTV assets including details of expected life-cycle and potential for future expansion;
- Assessment of current analogue transmission systems and recommendations for upgrade to digital transmission including options for wireless transmission equipment;
- Budget costings for all recommended system and transmission upgrades;
- Details of potential revenue costs savings based on recommended system changes including effect on system maintenance costs;
- Provide guidance and recommendations on the use of the most appropriate redeployable camera technology;
- Provide some guidance on how West Mercia Police might access RBC/BDC CCTV images remotely in the future;
- Provide way-forward options and recommendations for future monitoring opportunities and revenue-generating potential;

1.2 REPORT BRIEF

The basis of this report is to address some of the initial consultancy scope of works outlined above and provide summarised information on the condition of the existing CCTV systems specifically within Bromsgrove District Council.

This report should be read in conjunction with the following complimentary documents –

- Bromsgrove District Council Individual camera condition surveys;
- Wyre Forest District Council: Review of Public-Space CCTV Systems;
- Redditch Borough Council: Review of Public-Space CCTV Systems;

Section 2. CCTV EQUIPMENT CONDITION SURVEYS

2.1 GENERAL

As part of the initial consultancy brief, surveys of all CCTV hardware and associated transmission equipment at all collection points/hubs that form part of the Bromsgrove public-space CCTV scheme have been undertaken.

Additionally, each listed camera location has been visited and an individual condition survey report compiled (provided as separate documents to this report).

The following section summarises the findings from these surveys.

2.2 EXISTING SYSTEMS – RBC CCTV EQUIPMENT ROOM

It is understood that although the CCTV monitoring centre is located at Redditch Borough Council (RBC), BDC has 40% ownership and responsibility.

Equipment Room – CCTV Rack 1

- 1 no. Cisco Catalyst 2960G 24-port network switch;
- 1 no. Cisco 2811 network router (linked to 1st floor riser);
- 1 no. Axis 291 1U video rack;
 - c/w 1 no. Axis Q7406 6-channel video encoder card;
- 1 no. Axis P7701 1-channel video encoder;
- 1 no. TP-Link TL SG1008D 8-port network switch;
- 1 no. Netgear GS108 8-port network switch;
- 1 no. Netgear ReadyNAS Duo network attached storage drive;
- 1 no. HP Proliant DL360P Gen8 server (VTAS Pro server);
- 1 no. Dell Poweredge R710 server;
- 1 no. Moxa NPort 5410 serial server;
- 1 no. Veracity Timenet GPS NTP Master time server;

Equipment Room – CCTV Rack 2

- 1 no. Synectics SLC 256x32 matrix (RBC cameras only);
- 4 no. Synectics SYN PC232 interfaces;
- 1 no. Axis P7701 1-channel video encoder;
- 1 no. GE700 3U cage c/w –
 - 1 no. G7-GEN card;
 - 1 no. G7-GEP card;
 - 1 no. G7-GED4 card;
 - 2 no. G7-GET4 card;
 - 1 no. G70GEK3-4 card;
 - 1 no. G7-GEV card;
- 1 no. COE fibre Tx equipment cage c/w 8 no. fibre cards;
- 1 no. COE fibre Tx equipment cage c/w 9 no. fibre cards;
- 2 no. 24-way Multimode fibre termination patch panels;
- 1 no. GE VR7820-2DRDT 8-channel video/2-channel data fibre Tx equipment;
- 7 no. COE XNET OPT-IR optical receiver fibre Tx equipment;
- 1 no 4-channel Commend signal convertor units;
- 1 no. AMG 2252 Vision 2000 fibre Tx equipment;

- 2 no. BT RS3000 fibre Tx equipment (Police Monitor video feeds?);

2.3 EXISTING SYSTEMS – RBC CCTV CONTROL ROOM

The existing RBC CCTV control room is a very busy environment and whilst it is clear that the room has been constructed and configured for CCTV monitoring, the much of the day-to-day work undertaken by staff is in relation to the shared Telecare service¹ provided by RBC and BDC.

The room itself is one that has clearly evolved over the last decade to respond to changes in different technologies and the rationale at the time in relation to public-space surveillance.

The main control desk consists of a three (3) individual operator positions, each with CCTV control/monitoring and Telecare capabilities. A fourth Telecare position is located at the rear of the room which does not have CCTV control/monitoring capability.

The main CCTV display wall consists six large flat-screen monitors in a 3x2 format as follows –

- 2 no. JVC GM F470S 47-inch monitors;
- 3 no. Flatvision 48-inch monitors;
- 1 no. Philips 48-inch monitor;

IMAGES REMOVED

¹ Not part of the CCTV system review.

CCTV Review Suite

A separate review suite exists within an adjacent office to the main CCTV and Telecare control room.

The VTAS Pro workstation provides review-only functionality with the ability for DVD burning of recorded footage.

2.4 EXISTING CCTV SYSTEMS – BDC PARKSIDE OFFICES HARDWARE

A summary of the existing control and recording systems hardware and software that makes up the Bromsgrove District Council (BDC) and Wyre Forest District Council (WFDC) public-space CCTV schemes is given below.

BDC are the owners of all CCTV equipment within the IT server room and allow WFDC shared use as part of their contractual arrangement.

IT Server Room – CCTV Rack 1

- 1 no. Cisco Catalyst 2960G network switch;
- 1 no. Cisco 2811 network switch (not connected);
- 1 no. Axis 291 1U video rack;
 - c/w 1 no. Axis Q7406 6-channel video encoder card;
- 1 no. Moxa NPort 5610 8-port RS232 serial server;
- 4 no. Synectics SYN PC232 interfaces;
- 1 no. Synectics SYN SCAN8/DIMPLUS telemetry interface;
- 1 no. Synectics SYN NETX16 network expander;
- 1 no. Synectics SYN FV telemetry interface;
- 1 no. Synectics SYN PEL32 telemetry interface;
- 1 no. Synectics Matrix Manager;
- 1 no. Synectics ST 32x8 matrix (MSCP – marked up Asda);
- 1 no. Synectics SLC 128x16 matrix (BDC);
- 1 no. Synectics SYN X250 master keyboard;
- 1 no. Axis Q7401 1-channel video encoder;
- 1 no. 17 inch LCD test monitor;
- 1 no. Engineering PC;
- 1 no. Hytera retail radio system (Bromsgrove Storenet);

IT Server Room – CCTV Rack 2

- 7 no. Instek Matrividuo DR3816-3U 16-channel digital video recorders (DVRs);
 - Running Ver 5.1.6 NVR software;
- 2 no. Veracity Coldstore storage units;
 - CS4 – 15 no. HDDs fitted;
 - CS5 – 12 no. HDDs fitted;

2.5 CAMERA CONDITION

On the whole, the camera condition and the images produced by the cameras are at an acceptable level for the current operational requirement.

However, there are too many repeated instances of relatively minor issues that would undoubtedly improve camera performance through more proactive and observant maintenance.

Specific details for each camera location are included on the individual site surveys.

2.6 MAINTENANCE ISSUES

Camera Image Issues

The number of camera image maintenance issues is higher than expected and improved management of the maintenance contract by the maintenance contractor would undoubtedly alleviate some of the problems identified with poor quality camera images.

In general, these include (but are not limited to) –

- Focus issues from poorly back-focussed cameras resulting in 'soft' or blurred images, especially at night;
- Lens level adjustment issues relating to bright/dark images and 'pulsing' images;
- Scratched or dirty dome covers resulting in poor images;

Functionality Issues

In addition to the camera image issues, there is an equally high number of functionality issues that affect camera performance, some of which have consequential effect on image quality.

In general, these include (but are not limited to) –

- Wiper faults – control of camera wipers is at best, intermittent. There appears to be a fundamental issue with the control room software (icomply VTAS) which doesn't allow wipers to be switched off without selecting another camera. There are many wipers that do not work at all and there are some cameras that have had wipers removed (and are now obsolete);
- Infra-red (IR) light faults – for cameras that have IR lights, there is no manual control of the IR lights from within the control room software. Some IR lights are not properly aligned which effects the night-time image and defeats the purpose of having IR lights in the first place;
- Control issues – there are some cameras with zoom and pan faults which prevent or limit full control of the camera;
- Preset issues – stored preset locations on some cameras are incorrect and should be reviewed and adjusted to ensure the views from the cameras (when on tour) are useful and in line with the camera's operational requirement;

Software Issues

In conjunction with the Redditch Borough Council (RBC) CCTV scheme and the shared use of the CCTV control room software, there are a number of software issues that BDC should be aware of that may have a direct effect on the operation of the BDC CCTV scheme.

icomply VTAS Pro

The VTAS Pro software currently installed in the RBC CCTV control room is version 6.x and is over 5 years old.

The latest version of VTAS Pro² is 8.15 and contains many new features and software fixes that Redditch, Bromsgrove and Wyre Forest are not currently benefiting from.

Microsoft Windows Operating Systems

From April 11th 2017, support for the Microsoft Vista operating system was withdrawn and as such software fixes, virus and security updates no longer provided.

Systems using this operating system are therefore susceptible to the latest security vulnerabilities.

The following icomply VTAS Pro hardware are all running Windows Vista operating system –

- 1 no. review suite workstation;
- 3 no. display wall servers;

All other icomply VTAS Pro hardware is running on the Windows 7 Pro operating system.

2.7 ROUTINE & PREVENTATIVE MAINTENANCE

Legacy Issues

From the information provided, it is understood that a dilapidation report was never undertaken by the maintenance contractor at the beginning of the maintenance contract.

Without this, it is difficult to ascertain exactly what legacy issues remain from the previous maintenance contractor.

However, given that over two years have passed since the start of the maintenance contract in April 2016, legacy issues should now have been identified by the maintenance contractor and brought to the attention of the client – including any legacy issues that involve significant costs to rectify.

It would be expected that any minor legacy issues be rectified as part of the normal day-to-day maintenance regime.

Examples of legacy issues noted as part of the survey works include –

- Missing wipers;
- Missing privacy plug-on card from Synectics telemetry receivers;
- Water ingress to columns;
- Non-activation of wipers from icomply VTAS Pro;
- Non-operation of IR lights from icomply VTAS Pro;
- Auto-focus not working for multiple MIC1 cameras (primarily for WFDC scheme);

² Icomply have recently been acquired by Veracity UK Ltd and as part of a corporate rebranding exercise, the icomply business is now known as Veracity Systems Ltd and VTAS Pro now named VIEWSCAPE. For the purpose of this report, the icomply and VTAS Pro names have been retained.

- Random privacy masks not cleared from camera images (primarily for WFDC scheme);

Maintenance Specification

The original CCTV Maintenance Specification (tendered in April 2016) clearly outlined the level of works expected from the maintenance contractor in terms of the planned preventative maintenance.

From the information summarised in this report and noted on the individual camera survey reports, it is very apparent that some of the maintenance work is not being provided to the levels expected.

The following table (below) outlines the expected maintenance checks stated in the CCTV Maintenance Specification and the items highlighted in **red** indicate some of the more obvious areas where the current maintenance regime is under-performing for the BDC scheme.

Maintenance Check Table

Description		Minimum Requirements	
Cameras			
Camera		<ul style="list-style-type: none"> • Visual check for vandalism/damage. • Check all seals, joints and repair/renew as necessary. • Check and clean housing and glass and repair/renew as necessary. • Check connections to camera and repair/renew as necessary. • Set back focus. • Check full operation of iris and zoom repair/renew and adjust as necessary. • Clean lens with appropriate cleaner. • Check/replace wiper blade and wiper function. • Check and replace any privacy zones that have disappeared. • Check housing water tight and weather proof. • Check tour operation. • Check camera stop limits. • Confirm output level. • Change IR bulbs. • Check image quality in Monitoring Centre. 	
Wireless		<ul style="list-style-type: none"> • Check battery (if fitted) • Ensure strong signal to produce high quality image and control. 	
Lenses		<ul style="list-style-type: none"> • Lenses to be cleaned. • Auto iris level to be set. • Focus to be set of fixed cameras • Set back focus on near and far zoom. 	
Pan/Tilt Unit		<ul style="list-style-type: none"> • Check full operation of pan/tilt mechanism, repair/renew and reset limits as necessary. • Clean and check for corrosion. • Check presets. • Check seals and joints repair/renew when required. • Check wiring and cables repair/renew when required. • Check security of unit. 	

Continued...

Bracket/Mounting Pole	<ul style="list-style-type: none"> • Check for secure fixing and repair/renew fixings as necessary. • Clean and check for corrosion. • Check quality of painted surface. • Ensure access hatch is secure and functional. • Carry out maintenance as per manufacturers advice.
Cables	<ul style="list-style-type: none"> • Check all internal/external cables for damage and repair/renew as necessary. • Check cables are appropriately supported. • Check conduit for signs of damage.
Street box	<ul style="list-style-type: none"> • Check cabinet for vandalism • Ensure box and doors are secure and functional. • Check earth connectors and earth leakage protection. • Confirm power supply. • Check heater and thermostat if fitted. • Check air vents. • Check for water ingress.

Monitoring Centre	
Monitors	<ul style="list-style-type: none"> • Clean monitors • Set brightness and contrast • Check cables
Controls, console, GUI, and Printer	<ul style="list-style-type: none"> • Control pads and keyboards to be cleaned. • Install VTAS Pro software updates. • Work station towers to be cleaned. • Check response to all commands. • Camera selection. • PTZ operation. • Check printer function from each work station. • Check automatic clock. • Play back selection. • Quad units functionality. • Transmission including wireless and hard-wired fibre/cables. • Reception of video.
DVRs	<ul style="list-style-type: none"> • Service as per manufacturers instruction • Make and play back a 10-minute recording to check play back quality.

Maintenance Reporting

Furthermore, the CCTV Maintenance Specification stated the requirement for detailed reporting for works carried out at each camera location supplemented by a weekly update report summarising all maintenance work done and any recommendations made.

From the information provided, it is understood that this reporting process is lacking regularity and any kind of consistency in terms of written details of work done or work being proposed by the maintenance contractor.

2.8 RECOMMENDATIONS

The level of service support currently being offered by the current maintenance contractor is of a relatively good standard and is not in question. However, as is usually found on long-standing contracts of this type, complacency starts to creep in and relatively minor maintenance issues that ought to be addressed as part of the maintenance provision, get forgotten about and then become long-standing issues as summarised above and detailed on each of the camera site surveys.

Going forward, the following recommendations should be considered to further improve the maintenance contract and the service being provided to BDC.

Maintenance Cover

Generic specifications and maintenance cover can sometimes not meet the bespoke nature of a local authority public-space CCTV scheme and so it is important that BDC have their own tailor-made specification for service and maintenance of CCTV and associated systems to ensure that their own requirements are being fully met.

It is advised that any such specification should be KPI-based (key performance indicators) for response and fix times and include genuine penalty costs for poor contractor performance.

Routine Maintenance Works

The routine maintenance work for all CCTV systems should be spread over the whole maintenance period – i.e. 12 months.

In order to ensure that all sites and locations are captured, it is important that a full planned preventative maintenance (PPM) programme of works is drawn up at the beginning of the maintenance period and that this work is spread over the whole 12-month period and not concentrated into two very short periods during the year.

This ensures that engineers attending site are aware of the PPM that has been previously done and that which is still scheduled. This helps to reduce PPM repetition and minimise the risk of sites and locations being missed altogether.

Additionally, on any public-space CCTV system that relies heavily on digitally recorded information, PPM works should be included for the recording and storage systems to ensure proper operation and that information being recorded is of the expected standard and that all storage hard drives are replaced with new over a period of 5 years³.

Furthermore, it is recommended that camera presets and privacy zones are checked and updated as part of the routine maintenance works.

Combined Capital & Maintenance Works

The existing CCTV maintenance contract is due to expire in 2019 and rather than extend to 2021, it is recommended that a new CCTV maintenance specification is compiled (which includes the considerations outlined above) and packaged together as a combined procurement exercise with any planned capital works investment.

This approach will mitigate the risk of 'grey' areas of responsibility that could potentially exist between new upgraded systems and any legacy systems that are retained (or planned for upgrade at a later stage).

³ 5 years is the generally expected life cycle for hard drives used in CCTV systems.

Obsolescence Management

It is essential that some form of obsolescence management is included in future maintenance contracts to put the responsibility on the maintenance contractor to provide early identification of equipment that may become obsolete during the maintenance period and provide options/solutions for client consideration.

Without this in place, the risk of obsolescence is increased year-on-year to the point where wholesale upgrades to systems can be required at a significant (and mostly unplanned) cost to the client.

System Vulnerabilities and Single Points of Failure

It is equally important for maintenance contractors to identify key areas of the CCTV scheme where failure of hardware would have the highest impact on the CCTV monitoring service – i.e. single points of failure.

The client should know exactly where these key areas exist in order to mitigate risk and be able to plan accordingly.

Alternatively, any new CCTV maintenance contract should put the onus on the maintenance contractor to ensure single points of failure or other system vulnerabilities are adequately covered and solutions provided for the eventuality of key hardware failure.

Control Room

In general, the lifetime of any 24/7 control room is approximately ten (10) years before the age of furniture, fixture, fittings, technology and general environment start to show.

The refit of any 24/7 control room is a significant undertaking and the RBC CCTV control room is no different - not only in cost but also in logistics and temporary relocation of the CCTV and Telecare operation.

As part of any future plan, it is recommended that the following are considered (in no particular order) –

- The upgrade of the technical furniture to provide individually adjustable-height desks to allow staff to work at different heights or a standing position;
- The upgrade of technical furniture to provide more efficient use of desk space and reduce equipment clutter;
- The upgrade of the display wall to provide better use of space, provide increased visibility of cameras through additional monitors and generally reduce clutter;
- The removal of equipment from under the desks – not only to reduce heat and risk of fire, but also to improve longevity of the equipment and maintenance access;
- The full refit of the control room to make better use of the space available and provide an improved environment and working space for the operation of the CCTV and Telecare service in years to come;

New Camera Installation(s)

For any new camera (or equipment) installation, it is recommended that more rigorous inspection of the work done by the maintenance contractor is undertaken.

This is to ensure that operational requirements for the new cameras/equipment are confirmed by the client and any resulting changes to existing CCTV infrastructure do not affect existing cameras or system operation.

The maintenance contractor should provide clear commissioning documentation to outline the work done and any changes to the system that have resulted as part of an agreed handover process.

IT Health Check

Given the likelihood of future IP network implementation within the RBC/BDC CCTV scheme, it is important to ensure this network is configured correctly and maintained efficiently.

As such, it is recommended that the CCTV IP network be included in the annual RBC/BDC IT Health Check (undertaken for Public Services Network or PSN compliance) to provide information in relation to security vulnerabilities and network device issues which may affect the CCTV service as a whole.

Microsoft OS software issues (such as those outlined previously) and out-of-date device firmware would be highlighted as requiring urgent attention under any approved IT Health Check security network scan. These issues could then be addressed by the maintenance contractor to ensure the CCTV IP network is fully secure to an approved level.

Furthermore, RBC/BDC IT department should be involved in ensuring that firewalls are installed and correctly configured to protect the CCTV network from outside connectivity – especially where broadband/ADSL lines are used for remote connectivity or remote support.

Section 3. CCTV EQUIPMENT CAPABILITY

3.1 GENERAL

The purpose of this section of the report is to provide additional information on the capability of the existing CCTV systems hardware and software used by BDC and highlight any limitations for future use or upgrade.

3.2 OBSOLESCENCE

An important part of any system review is to understand where obsolete or end-of-life hardware and software exists so that contingency plans can be put in place and changes to maintenance and support contracts made.

This information also helps to mitigate the impact on budget forecasting and aids any future planning for system upgrades.

Obsolescence is a fact of life with all technology and ever-changing advances in hardware and software results in an ever-decreasing life cycle for equipment. This is no different for the electronic security industry and given the age of the main components of the BDC public-space CCTV scheme and shared components of the WFDC and RBC CCTV schemes, it is no surprise that a significant amount of equipment falls into the 'obsolete' category.

Synectics – Analogue Equipment

Synectics announced the end-of-life (EOL) of all its analogue product portfolio from 31st May 2016 and from this date, recommended the purchase of spare parts to provide reassurance against analogue equipment failure.

A major component of the BDC CCTV system is camera control (telemetry) and video switching (matrices) and this functionality is achieved using Synectics analogue equipment, the failure of which represents a significant risk to the day-to-day operation of the service.

The following Synectics equipment is EOL –

- 4 no. Synectics SYN PC232 interfaces;
- 1 no. Synectics SYN SCAN8/DIMPLUS telemetry interface;
- 1 no. Synectics SYN NETX16 network expander;
- 1 no. Synectics SYN FV telemetry interface;
- 1 no. Synectics SYN PEL32 telemetry interface;
- 1 no. Synectics Matrix Manager;
- 1 no. Synectics ST 32x8 matrix (MSCP – marked up Asda);
- 1 no. Synectics SLC 128x16 matrix (BDC and WFDC);
- 1 no. Synectics SYN X250 master keyboard;
- 50+ no. SYN DCRX mini receiver cards for individual camera telemetry⁴;

⁴ All shoebox type cameras and Mark Mercer domes assumed to utilise Synx DCRX mini receiver boards for telemetry control.

Mark Mercer D500 (and Siemens PhotoScanner) Dome Cameras

These camera assemblies are essentially the same product, based around the original Mark Mercer D500 dome-style housing with 'quick-switch' cradle arrangement inside. Camera and lens technology will likely vary from one camera to another and are inter-changeable from most manufacturers, so can be replaced easily. Telemetry control boards are also inter-changeable but generally based (in the case of BDC) around the use of Synectics DCRX mini receiver boards (see above).

These camera assemblies are end-of-life and no longer have manufacturer support.

However, there are a number of 3rd party companies (one of which is in Redditch) that can provide repair services and in some instances, larger CCTV maintenance providers can also provide their own limited service and repair capability.

Instek Digital Recording and Veracity Coldstore Storage Equipment

An equally important component of any CCTV system is the digital recording and storage platform and after discussions with maintenance providers and manufacturers, it has been confirmed that the following equipment is now EOL and unsupported –

- 7 no. Instek Matrividio 16-channel digital video recorders (DVRs);

The existing 2 no. Veracity Coldstore storage units are still supported by the manufacturer.

Windows Vista Operating System

As stated earlier in this report, Microsoft withdrew support for Windows Vista on 11th April 2017 and any PC hardware running this operating system is at risk of the latest security vulnerabilities.

For reference, the following hardware is running Windows Vista operating system –

- 1 no. icomply VTAS Pro review suite workstation;
- 3 no. icomply VTAS Pro display wall servers;

3.3 CAMERA TECHNOLOGY

Existing Analogue Cameras

It should be noted that despite maintenance issues summarized in this report and itemized in the camera survey reports, the existing analogue camera technology utilised within the BDC public-space CCTV scheme is still capable of meeting the original operational requirement (OR) in relation to public-space CCTV monitoring.

There is no pressing need to unnecessarily upgrade camera technology to high-definition (HD) or otherwise unless the OR for a specific location(s) changes.

Upgrade to HD Cameras

Whilst there may be no pressing need to upgrade existing analogue cameras to HD, the benefits of doing so cannot be ignored and some of these are listed below –

- Clearer images due to higher resolution of cameras – HD cameras have over 5x higher resolution than a standard analogue camera;
- Higher resolution cameras provide an increased level of detail for observation – e.g. the expected operational requirement to provide 'identification' of an unknown person is reduced from 100% screen height to just 40% screen height;
- Increased zoom distance – depending on type, HD cameras can provide 2x further monitoring reach;
- Higher quality live images mean higher quality recordings;
- The latest camera imaging technology will provide enhanced images in low light areas – reducing the need for additional IR lighting and any effects from upgraded street lighting;
- Built-in video analytics to provide added functionality such as ANPR, vehicle or person tracking, footfall counting;

However, the upgrade of analogue cameras within the BDC public-space CCTV scheme is not as straightforward as it might seem as it will firstly require the provision of some form of digital infrastructure (i.e. wireless transmission or upgrade of existing BT fibre) to facilitate the installation of new digital cameras.

The existing BT fibre analogue infrastructure does not allow the transmission of digital HD cameras.

However, the provision of a new digital infrastructure will provide BDC with the option to use existing analogue cameras and any new digital HD cameras alongside each other and therefore the opportunity to replace existing cameras on a planned programme of works over a pre-determined amount of time.

Information on the provision of digital wireless network infrastructure is given later in this report in Section 5.

Furthermore, the installation of digital HD cameras will have an adverse effect on the existing digital recording platform as more storage is required for HD images and so consideration to relevant and necessary upgrades of the recording platform will also have to be considered as part of any planned upgrade programme.

Budget costs for the provision of a range of HD cameras are provided later in this report.

3.4 WEST MERCIA POLICE REQUIREMENTS

It is understood that West Mercia Police and the Warwickshire Police and Crime Commissioner (PCC) are enabling the new Warwickshire Operation Communications Centre (OCC at Stuart Ross House) and the West Mercia Police HQ at Hidlip (Southwell House) with the Saab SAFE software technology.

The Saab SAFE software product utilizes the FLIR Latitude software platform as a basis to manage CCTV video feeds from disparate systems into a single and easy-to-manage solution for police end-users.

The image below shows a schematic of the expected configuration.

IMAGE REMOVED

RBC and BDC Requirements

In the first instance, the facility to provide video feeds into the new Saab SAFE system is relatively straightforward and from a technical point of view, can be achieved in a number of different ways.

However, insufficient detail is available at this stage on the full requirements of the WM Police in regard to access to RBC, BDC or WFDC existing or new cameras – for example, it is unknown if the WM Police require viewing access to all CCTV cameras or only a few and whether PTZ control of cameras is required.

At present, only a single video feed can be presented to the Hindlip Police HQ from Redditch and Bromsgrove via the existing BT RS1000 analogue circuits.

For the purpose of this report, an assumption has been made that multiple CCTV video feeds would need to be viewed by both the Police HQ and the OCC. The most cost-effective method⁵ to achieve this is to provide a multi-channel video encoder (FLIR type) within the RBC equipment room and upgrade the existing analogue BT fibre to a BT RS1000D 100Mbps circuit⁶.

Video feeds could then be switched from the existing Synectics matrix to provide the Police with the cameras they wish to view.

Other configurations of connectivity exist but it should be noted that the extent to which the RBC/BDC CCTV scheme may be upgraded in the future is still unknown and this upgrade will undoubtedly affect the method in which CCTV video feeds are presented to the Saab SAFE system. As such, further development on the full understanding of this remote-access facility is required before a final design can be compiled.

The benefits to both WM Police and RBC/BDC for providing this remote-access facility would include (but not limited to) –

- Timely release of CCTV data/images to WM Police officers following an arrest or incident;
- Free up CCTV control room staff time as WM Police would do their own reviews;
- Free up WM Police resource as travelling between towns would be reduced;
- Less visits to the CCTV control room by WM Police officers;

⁵ Using the current Synectics analogue technology.

⁶ The receiving end of the BT fibre circuit may need to be relocated depending on the location of the Alliance Data Centre.

Section 4. COMPLIANCE

4.1 GENERAL

For the purpose of this report, the following items have been identified as needing attention –

- CCTV signage;
- Privacy zones/privacy masking;

4.2 CCTV SIGNAGE

The Information Commissioner's Office (ICO) provides detailed guidelines for informing the public about the use of public-space CCTV systems and their CCTV code of practice⁷ states the following under section 9 (Responsibilities) –

“You must let people know when they are in an area where a surveillance system is in operation. The most effective way of doing this is by using prominently placed signs at the entrance to the surveillance system's zone and reinforcing this with further signs inside the area.

Clear and prominent signs are particularly important where the surveillance systems are very discreet, or in locations where people might not expect to be under surveillance. As a general rule, signs should be more prominent and frequent in areas where people are less likely to expect that they will be monitored by a surveillance system.

Signs should:

- be clearly visible and readable;
- contain details of the organisation operating the system, the purpose for using the surveillance system and who to contact about the scheme (where these things are not obvious to those being monitored);
- include basic contact details such as a simple website address, telephone number or email contact; and

be an appropriate size depending on context. For example, whether they are viewed by pedestrians or car drivers.

Example: *Images are being monitored and recorded for the purposes of crime prevention and public safety. This scheme is controlled by Greentown Borough Council. For more information, call 01234 567890...*

GDPR and DPA 2018

The General Data Protection Regulation (GDPR), and consequently the Data Protection Act 2018, reinforces the requirements on data controllers to be fully transparent in their processing of personal data and to provide the means whereby the data subject gives full consent to the use of their data.

In terms of CCTV signage, CCTV surveillance in general relies on the notion of 'surveillance-by-consent' and in order to meet some of the requirements for this idea, it is very important to inform data subjects (i.e. the public) that they are in an area under CCTV surveillance⁸.

⁷ <https://ico.org.uk/media/1542/cctv-code-of-practice.pdf>

BDC Outlying Villages

No CCTV signage was observed in Rubery, Hagley, Barnt Green, Alvechurch and Wythall at the time of the camera site surveys.

This should be addressed as a matter of urgency as part of the next system audit/impact assessment to avoid costly ICO fines and any negative publicity that this may bring.

Bromsgrove Town Centre

On the contrary, there are a number of CCTV signs within Bromsgrove town centre (see photos) but with regards to the requirements of the ICO code of practice, these are not fully compliant.

It is recommended that, in line with the ICO requirements outlined above, a full review of CCTV signage be undertaken throughout all CCTV-monitored areas of the Bromsgrove district and new CCTV signage erected as a matter of urgency.

IMAGES REMOVED

⁸ Full requirements for 'surveillance-by-consent' are outlined in the Surveillance Camera Commissioner's CCTV code of practice - <https://www.gov.uk/government/publications/surveillance-camera-code-of-practice>

4.3 PRIVACY

Camera Privacy Masking

As part of the survey work undertaken by CDC, camera privacy masking is not currently used on any of the BDC public-space CCTV cameras.

Additionally, and somewhat more importantly, there are concerns that the majority of cameras no longer have the technical capability of being able to create privacy masks.

The implementation of privacy masking on cameras that currently use the Synectics DCRX telemetry receiver requires the additional installation of a Synectics Privacy (SYN PRIV) plug-on card (which is now obsolete and unavailable to purchase).

Due to the installation location of the telemetry receiver (i.e. at high level – sometimes within the camera head), the site surveys have not identified if this privacy card is actually in place (or whether it has been disconnected).

This issue could affect up to 48 no. of the current BDC camera stock.

Privacy Impact Assessments (PIAs)

This report does not include any PIAs. However, all camera site surveys include comments and observations in regard to privacy issues for each specific location which should be considered at the next PIA for each camera location.

Furthermore, there are a number of camera locations that ought to be considered for decommissioning as part of their next PIA as follows –

- Camera 5 – Recreation Road, Bromsgrove – Car park has been redeveloped for private accommodation and views onto playing field are restricted by trees. Position and use of camera is now questionable;
- Camera 24 – Whetty Lane, Rubery – Use of PTZ camera questionable for entrance to A38 subway views – Static camera may be better option if view is still required;
- Camera 30 – A38 subway/New Road, Rubery – Position and use of PTZ camera is questionable for A38 subway views – Static camera may be better option if view is still required;
- Camera 32 – A38 subway/Callowbrook Lane, Rubery – Position and use of PTZ camera is questionable for A38 subway views – Static camera may be better option if view is still required;

Data Analysis and Crime Statistics

It is recommended that further analysis of crime statistics for the areas currently monitored by CCTV cameras in the Bromsgrove district is undertaken.

This information will provide up-to-date information on the potential influence that CCTV surveillance may be having in specific locations and will supplement any privacy impact assessment and support any decisions to retain, remove or relocate CCTV cameras.

Section 5. TRANSMISSION AND CONNECTIVITY

5.1 EXISTING TRANSMISSION CONFIGURATION

General

Bromsgrove District Council currently utilise leased BT fibre circuits for connectivity of their public-space CCTV cameras.

In general, all fibre circuits are terminated at the BDC Parkside offices within the IT comms/server room before limited onward connectivity is provided to the CCTV control centre at Redditch Borough Council offices.

BT Fibre Costs

Information provided to CDC for the purpose of this report outlines that the cost for the leased BT fibre circuits are as follows –

Location	Cost £
Bromsgrove Town Centre (20 no. cameras)	£17,568.24
Bromsgrove MSCP (27 no. cameras)	£3,004.50
Aston Fields (2 no. cameras)	£2,502.10
Sanders Park (2 no. cameras)	£1,390.32
Rubery & Rubery Park (17 no. cameras)	£15,258.65
Barnt Green (4 no. cameras)	£6,473.05
Hagley (8 no. cameras)	£3,637.20
Wythall & Hollywood (5 no. cameras)	£8,644.40
Alvechurch (5 no. cameras)	£7,461.81
Worcestershire Police Control Room	£1,338.31
Total BT Fibre Costs for BDC	£67,278.58

5.2 WIRELESS NETWORK TRANSMISSION

General

As part of the individual camera survey works, CDC have investigated the possibilities for the implementation of wireless transmission as an alternative to the current connectivity provided by BT.

Indicative designs and budget costings have been provided for areas within the Bromsgrove district that would provide an easy way forward for the installation of a wireless transmission network.

The areas identified are –

- Bromsgrove town centre;
- Rubery village centre;
- Barnt Green village centre;
- Hagley village centre;

It should be noted that the use of wireless transmission must be appropriate, practical and cost-effective against the use of leased BT fibre. In instances where this is not the case, the use of BT fibre should be retained, or another alternative transmission method sought – such as ADSL or SDSL broadband⁹.

Wireless Network Designs

Information obtained from the street-level investigations during the site surveys and from further desktop investigation work using tools such as Google Earth has revealed that the full implementation of wireless transmission for some areas in the Bromsgrove district is not straightforward.

Alvechurch Village Centre

The configuration of the camera locations in Alvechurch does not allow for straightforward connectivity using wireless transmission due to the lack of line-of-sight between camera locations.

The camera locations in the centre of the village are all hard-wired to the BT collection cabinet so do not need any wireless connectivity. However, the outer locations at C37 and C38 would require the use of relay points (usually street lighting columns) to provide wireless connectivity to the village centre and this would have to be explored further and permissions sought to use any identified locations.

In reality, the only camera location that could easily be connected to the village centre via wireless transmission is C41. However, given the cost to implement this change and the relatively small saving that could be achieved, for the purpose of this report it has been deemed not cost effective at this stage to explore further.

Wythall Village Centre

A similar position exists in Wythall whereby all cameras are 'scattered' around three local shopping locations in Drakes Cross, Station Road and May Lane.

This configuration does not lend itself for straightforward deployment of wireless transmission and for the purpose of this report, has been deemed not cost effective at this stage to explore further.

⁹ ADSL/SDSL – (Asymmetric/Symmetric) Digital Subscriber Line.

5.3 BROMSGROVE TOWN CENTRE – WIRELESS NETWORK CONCEPT

Surveys of Bromsgrove town centre show that the implementation of wireless transmission is relatively straightforward and that connectivity to most camera locations can be achieved using a centralised collection point (referred to as a point-of-presence or POP) on the roof of Poundland on the High Street.

Image 1 shows the indicative wireless network design and the following assumptions have been made for the purpose of this report –

- Permissions to use all rooftops has been assumed and any final wireless network design is subject to approval from building owner/landlord.
- C5 is to be removed as per recommendations given in this report;
- Connectivity to C2 has been omitted due to likely relocation of camera due to sale of land;
- Sanders Park (C21 and C22) and Aston Fields (C55 and C56) cannot be practically connected by wireless due to line-of-sight issues and are excluded from the indicative design and costings;

Image 1 – Indicative Wireless Network Design for Bromsgrove Town Centre

IMAGE REMOVED

Capital works to provide a new wireless network for Bromsgrove town centre has been budgeted as follows –

Description of Works	Cost £
<u>Camera Works</u>	
Typical works required at each camera location includes –	
Provision of new 1-channel video encoder;	£300
Provision of new unlicensed wireless link;	£500
Installation & commissioning (incl. all sundry items)	£500
Subtotal (per camera)	<u>£1,300</u>
Above works required at the following 17 no. locations – C1, C3, C4, C6 to C20	
Subtotal (17 no. camera locations)	<u>£22,100</u>
<u>Relay Points</u>	
Typical works required at each relay point includes –	
Provision of new unlicensed wireless link;	£500
Installation & commissioning (incl. all sundry items)	£500
Subtotal (per relay point)	<u>£1,000</u>
Above works required at the following locations – Lighting column adj. C1, Poundland rooftop and legacy CCTV camera location on Worcester Rd near to C10;	
Subtotal (3 no. locations)	<u>£3,000</u>
<u>MSCP Rooftop</u>	
Typical works required includes –	
Installation of new Cat5/6 cabling to rooftop (from BT cabinet);	£1,500
Provision of new managed network switch (within BT cabinet);	£500
Provision of new 32-channel video encoders;	£3,000
Provision of new licensed high capacity (200Mbps) wireless link to Poundland;	£incl. in Poundland roof costs
Rooftop bracketry and associated items;	£use existing
Installation and commissioning;	£1,500
Subtotal (MSCP)	<u>£6,500</u>

Continued...

<u>Poundland Rooftop Point-of-Presence (POP)</u>	
Typical works required includes –	
Installation of new mains power supply (PC sum);	£500
Provision of new managed network switch;	£500
Provision of new external-rated enclosure;	£200
Provision of new licensed high capacity (500Mbps) wireless link to Parkside offices;	£4,000
Provision of new licensed high capacity (200Mbps) wireless link to MSCP;	£3,500
Rooftop bracketry and associated items;	£300
Installation and cabling (2 men);	£1,500
Commissioning;	£500
Subtotal (Poundland)	<u>£11,000</u>
<u>Parkside Offices Rooftop</u>	
Typical works required includes –	
Installation of new Cat5/6 cabling to rooftop (from IT server room);	£1,500
Provision of new managed network switch (within CCTV racks);	£use existing
Provision of new licensed high capacity (500Mbps) wireless link to Poundland;	£incl. in Poundland roof costs
Rooftop bracketry and associated items;	£300
Installation and commissioning;	£1,000
Subtotal (Parkside)	<u>£2,800</u>
<i>Subtotal for <u>ALL WORKS</u></i>	<u>£45,400</u>
Allow contingency of approx. 20%	£9,000
TOTAL BUDGET CAPITAL COST	<u>£54,400</u>

Additional BT Fibre Upgrade Works

In order to facilitate the transition to a full (or part) digital wireless network it will be necessary to upgrade other elements of the wider transmission network, in particular the link between BDC’s Parkside offices and the Redditch Borough Council CCTV control room.

There is currently an existing BT digital fibre circuit (RS1000D) that provides a capacity of 100Mbps and this will need to be upgraded to a 300Mbps circuit to allow for the additional digital traffic.

Description of Works	Cost £
Typical upgrade costs of existing 100Mbps BT RS1000D fibre circuit to a 300Mbps RS1000D digital fibre circuit.	£9,000
Typical rental costs of RS1000D 300Mbps circuit.	Circa £2,500 per annum

BT Fibre Analogue Circuit – Cost Saving

The above-mentioned upgrade works will immediately realise a cost saving of circa £3K per annum on the existing analogue BT fibre circuit between Bromsgrove Parkside offices and Redditch CCTV control room that will no longer be required after the upgrade to digital.

Digital Recording Systems Upgrade

Furthermore, consideration must be given to the upgrade of the existing digital recording system (currently residing at BDC Parkside offices).

Any upgrade to digital transmission will require an investment to the digital recording system in order to accommodate the transmission changes.

As previously mentioned, the existing digital recording system is now obsolete and whilst options exist to re-use this equipment, the amount of investment required to achieve this is not cost-effective and will not provide any assurances on hardware life-cycles.

The recommendation is to replace the existing digital recording system with new and a budget cost¹⁰ has been given below for specific hardware upgrade to accommodate the Bromsgrove town centre and MSCP cameras only

However, it should be noted that economies of scale will exist if the digital recording hardware upgrade were to incorporate other BDC village sites such as Rubery, Hagley and Barnt Green as well as cameras from WFDC.

Description of Works	Cost £
PC Sum for the provision of new 64-channel digital recording platform to accommodate new encoded video images for Bromsgrove TC and MSCP only.	£7,000
Installation and commissioning.	£1,000

¹⁰ Costs for digital video recording solutions vary significantly based on functionality and the amount and type of storage included (or not) as part of the hardware.

For the purpose of this report, budget costs for replacement of the digital recording platform are based on a like-for-like replacement (i.e. manufactured by Instek Digital) to ensure that additional integration costs into icomply VTAS software are not incurred and the use of the existing Coldstore storage devices is retained.

TOTAL BUDGET CAPITAL COST	<u>£8,000</u>
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Payback Period

Estimated changes to the BT fibre rental costs PER ANNUM for Bromsgrove are –

- Existing rental costs for Bromsgrove TC - £17,568.24 per annum
- Existing rental costs for Bromsgrove MSCP - £3,004.50 per annum
- Total existing rental costs - £20,572.74 per annum

- New estimated rental costs - £2,500 per annum
- Estimated savings - £18,072.74 per annum

Given the above-mentioned cost changes and necessary additional capital works costs, the expected payback period for any capital investment to upgrade to a new digital wireless network is outlined below.

Description of Works	Cost £
Installation of new digital wireless network transmission (as previous).	£54,400
Typical upgrade costs for 300Mbps BT RS1000D digital fibre circuit.	£9,000
Budgetary cost for digital recording system upgrade ¹¹ .	£8,000
TOTAL BUDGET CAPITAL COST	£71,400
Payback period vs. NEW BT fibre rental <u>savings</u> of approx. £18K per annum	< 4 years

5.4 RUBERY – WIRELESS NETWORK CONCEPT

Similar to Bromsgrove town centre, surveys of Rubery show that the implementation of wireless transmission is relatively straightforward and that connectivity to most camera locations can be achieved using a centralised point-of-presence at C25 on New Road.

Image 2 shows the indicative wireless network design and the following assumptions have been made for the purpose of this report –

- Permissions to use all identified assets (i.e. Police ANPR column and lighting column to rear of Rubery Market) has been assumed and any final wireless network design is subject to approval from asset owner or service provider.
- Rubery Park (C43 and C44) cannot be practically connected by wireless due to line-of-sight issues and is excluded from the indicative design and costings;
- Installation of 6-8m street lighting style columns (adjacent A38 subway BT cabinets) has been assumed;

¹¹ Economies of scale exist for this cost if other sites are incorporated into the digital recording system upgrade.

Image 2 – Indicative Wireless Network Design for Rubery

IMAGE REMOVED

Capital works to provide a new wireless network for Rubery has been budgeted as follows –

Description of Works	Cost £
<u>Camera Works</u>	
Typical works required at each camera location includes –	
Provision of new 1-channel video encoder;	£300
Provision of new unlicensed wireless link;	£500
Installation & commissioning (incl. all sundry items)	£500
Subtotal (per camera)	<u>£1,300</u>
Above works required at the following 7 no. locations – C34, C26, C42/91, C33, C27, C28, C29	
Subtotal (7 no. camera locations)	<u>£9,100</u>
<u>Relay Points</u>	
Typical works required at each relay point includes –	
Provision of new unlicensed wireless link;	£500
Installation & commissioning (incl. all sundry items)	£500
Subtotal (per relay point)	<u>£1,000</u>
Above works required at the following locations – Lighting column to rear of Rubery Market and legacy Police ANPR camera location on New Rd near to A38;	
Subtotal (2 no. locations)	<u>£2,000</u>
<u>A38 Subway North Collection Point</u>	
Typical works required includes –	
Installation of new 6/8m street lighting column adjacent to existing BT cabinet (PC Sum);	£2,000
Provision of new managed network switches (within BT cabinet & C32);	£1,000
Provision of new 4-channel video encoder;	£500
Provision of new unlicensed wireless link;	£500
Provision of Ethernet-over-coax convertors for network connectivity to C32;	£1,000
Installation and commissioning;	£1,500
Subtotal (A38N subway)	<u>£6,500</u>

Continued...

A38 Subway South Collection Point	
Typical works required includes –	
Installation of new 6/8m street lighting column adjacent to existing BT cabinet (PC Sum);	£2,000
Provision of new managed network switch (within BT cabinet);	£500
Provision of new 4-channel video encoder;	£500
Provision of new unlicensed wireless link;	£500
Installation and commissioning;	£1,000
Subtotal (A38S subway)	<u>£4,500</u>
C33 BT Cabinet	
Typical works required includes –	
Additional cabling and containment to high level on building adjacent BT cabinet (PC Sum);	£1,000
Installation and commissioning;	£500
Subtotal (C33)	<u>£1,500</u>
C25 Collection Point	
Typical works required includes –	
Provision of new managed network switch (within column base);	£500
Provision of new 1-channel video encoder;	£300
Installation and commissioning;	£1,000
Subtotal (C25)	<u>£1,800</u>
<i>Subtotal for <u>ALL WORKS</u></i>	<u>£25,400</u>
Allow contingency of approx. 20%	£5,000
TOTAL BUDGET CAPITAL COST	<u>£30,400</u>

Additional BT Fibre Upgrade Works - Rubery

In order to facilitate the transition to a full (or part) digital wireless network it is necessary to upgrade other elements of the wider transmission network, in particular the link back to the collection point at BDC's Parkside offices.

The indicative design recommends a new local collection point within Rubery at camera location C25 and the existing analogue BT circuit at this location would need to be upgraded to a new BT digital fibre circuit (RS1000D).

Description of Works	Cost £
Typical upgrade costs of existing BT analogue fibre circuit to RS1000D digital fibre circuit (100Mbps capacity).	£3,750
Typical rental costs of RS1000D 100Mbps circuit	£1,300 per annum

Payback Period

The estimated payback period for the above-mentioned works is outlined in section 5.8

5.5 BARNT GREEN – WIRELESS NETWORK CONCEPT

Similar to Bromsgrove town centre and Rubery, surveys of Barnt Green show that the implementation of wireless transmission is relatively straightforward and that connectivity to most camera locations can be achieved using a centralised point-of-presence at C47 on Hewell Road.

Image 3 shows the indicative wireless network design and the following assumptions have been made for the purpose of this report –

- Permissions to use all identified assets (i.e. lighting column on Hewell Road) has been assumed and any final wireless network design is subject to approval from asset owner or service provider.

Image 3 – Indicative Wireless Network Design for Barnt Green

IMAGE REMOVED

Capital works to provide a new wireless network for Barnt Green has been budgeted as follows –

Description of Works	Cost £
<u>Camera Works</u>	
Typical works required at each camera location includes –	
Provision of new 1-channel video encoder;	£300
Provision of new unlicensed wireless link;	£500
Installation & commissioning (incl. all sundry items)	£500
Subtotal (per camera)	<u>£1,300</u>
Above works required at the following 2 no. locations – C45 and C46	
Subtotal (2 no. camera locations)	<u>£2,600</u>
<u>Light Column Relay Point</u>	
Typical works required at relay point near to junction of Hewell Rd and Sandhills Ln includes –	
Provision of new unlicensed wireless link;	£500
Installation & commissioning (incl. all sundry items)	£500
Subtotal (relay point)	<u>£1,000</u>
<u>C47 Collection Point</u>	
Typical works required includes –	
Provision of new managed network switch (within column base);	£500
Provision of new 4-channel video encoder (to include C47 and C48 also);	£500
Installation and commissioning;	£1,500
Subtotal (C47)	<u>£2,500</u>
<i>Subtotal for ALL WORKS</i>	<i>£6,100</i>
Allow contingency of approx. 20%	£1,300
TOTAL BUDGET CAPITAL COST	<u>£7,400</u>

Additional BT Fibre Upgrade Works – Barnt Green

In order to facilitate the transition to a full (or part) digital wireless network it is necessary to upgrade other elements of the wider transmission network, in particular the link back to the collection point at BDC's Parkside offices.

The indicative design recommends a new local collection point within Barnt Green at camera location C47 and the existing analogue BT circuit at this location would need to be upgraded to a new BT digital fibre circuit (RS1000D).

Description of Works	Cost £
Typical upgrade costs of existing BT analogue fibre circuit to RS1000D digital fibre circuit (100Mbps capacity).	£3,750
Typical rental costs of RS1000D 100Mbps circuit	£1,300 per annum

Payback Period

The estimated payback period for the above-mentioned works is outlined in section 5.8

5.6 HAGLEY – WIRELESS NETWORK CONCEPT

Surveys of Hagley show that the implementation of wireless transmission is relatively straightforward and that connectivity to most camera locations can be achieved using a centralised point-of-presence at C52 on Worcester Lane.

Image 4 shows the indicative wireless network design with the following considerations for the purpose of this report –

- Hagley Rail Station cameras (C53 and C54) cannot be practically connected by wireless due to line-of-sight issues and are excluded from the indicative design and costings;

Image 4 – Indicative Wireless Network Design for Hagley

IMAGE REMOVED

Capital works to provide a new wireless network for Hagley has been budgeted as follows –

Description of Works	Cost £
<u>Camera Works</u>	
Typical works required at each camera location includes –	
Provision of new 1-channel video encoder;	£300
Provision of new unlicensed wireless link;	£500
Installation & commissioning (incl. all sundry items)	£500
Subtotal (per camera)	<u>£1,300</u>
Above works required at the following 3 no. locations – C49, C50 and C51	
Subtotal (3 no. camera locations)	<u>£3,900</u>
<u>C52 Collection Point</u>	
Typical works required includes –	
Provision of new managed network switch (within column base);	£500
Provision of new 4-channel video encoder (to include C61 and C62 also);	£500
Installation and commissioning;	£1,500
Subtotal (C52)	<u>£2,500</u>
<i>Subtotal for <u>ALL WORKS</u></i>	<u>£6,400</u>
Allow contingency of approx. 20%	£1,400
TOTAL BUDGET CAPITAL COST	<u>£7,800</u>

Additional BT Fibre Upgrade Works - Hagley

In order to facilitate the transition to a full (or part) digital wireless network it is necessary to upgrade other elements of the wider transmission network, in particular the link back to the collection point at BDC's Parkside offices.

The indicative design recommends a new local collection point within Hagley at camera location C52 and the existing analogue BT circuit at this location would need to be upgraded to a new BT digital fibre circuit (RS1000D).

Description of Works	Cost £
Typical upgrade costs of existing BT analogue fibre circuit to RS1000D digital fibre circuit (100Mbps capacity).	£3,750
Typical rental costs of RS1000D 100Mbps circuit	£1,300 per annum

Payback Period

The estimated payback period for the above-mentioned works is outlined in section 5.8

5.7 DIGITAL RECORDING SYSTEMS UPGRADE – REMOTE SITES

For the same reasons as explained for Bromsgrove town centre, any upgrade to digital transmission will require an investment to the digital recording system in order to accommodate the transmission changes and the most cost-effective approach is to incorporate Rubery, Hagley and Barnt Green as a single upgrade path to take advantage of economies of scale.

The recommendation is to replace the existing digital recording system with new and a budget cost¹² has been given below for specific hardware upgrade to accommodate Rubery, Hagley and Barnt Green cameras only – a total of 25 no. cameras.

Description of Works	Cost £
PC Sum for the provision of new 32-channel digital recording platform to accommodate new encoded video images for Rubery, Hagley and Barnt Green only;	£5,000
Installation and commissioning (incl. allowance for new NVR configuration);	£1,000
TOTAL BUDGET CAPITAL COST	<u>£6,000</u>

¹² Costs for digital video recording solutions vary significantly based on functionality and the amount and type of storage included (or not) as part of the hardware.

For the purpose of this report, budget costs for replacement of the digital recording platform are based on a like-for-like replacement (i.e. manufactured by Instek Digital) to ensure that additional integration costs into icomply VTAS software are not incurred and the use of the existing Coldstore storage devices is retained.

5.8 PAYBACK PERIOD – REMOTE VILLAGE SITES

Given the above-mentioned wireless network upgrade costs and necessary digital recording system upgrade costs, the expected payback period for any capital investment at the remote village sites is outlined below.

Estimated BT Rental Savings

Estimated changes to the BT fibre rental costs PER ANNUM are –

- Existing rental costs for Rubery (excl. Rubery Park) - £14,111.62 per annum
- New estimated rental costs for Rubery - £1,300 per annum
- Estimated savings for Rubery - **£12,811.62 per annum**
- Existing rental costs for Hagley (excl. Hagley railway station) - £3,737.20 per annum
- New estimated rental costs for Hagley - £1,300 per annum
- Estimated savings for Hagley - **£2,437.20 per annum**
- Existing rental costs for Barnt Green - £6,473.05 per annum
- New estimated rental costs for Barnt Green - £1,300 per annum
- Estimated savings for Barnt Green - **£5,173.05 per annum**
- TOTAL ESTIMATED SAVINGS - **£20,421.87 per annum**

Description of Works	Cost £
<u>Rubery</u>	
Installation of new digital wireless network transmission (as previous).	£30,400
Typical upgrade costs for BT RS1000D digital fibre circuit.	£3,750
<u>Hagley</u>	
Installation of new digital wireless network transmission (as previous).	£7,800
Typical upgrade costs for BT RS1000D digital fibre circuit.	£3,750
<u>Barnt Green</u>	
Installation of new digital wireless network transmission (as previous).	£7,400
Typical upgrade costs for BT RS1000D digital fibre circuit.	£3,750
PC Sum for the provision of new 32-channel digital recording platform to accommodate new encoded video images for Rubery, Hagley and Barnt Green only (incl. installation & commissioning);	£6,000
TOTAL BUDGET CAPITAL COST	£62,850
Payback period vs. NEW BT fibre rental <u>savings</u> for all 3 sites of approx. £20K per annum	< 3.5 years

5.9 DIGITAL (HD) CAMERA UPGRADES

As previously mentioned, before any upgrades to digital/HD camera technology can take place, the necessary upgrades to the transmission network have to be put in place.

The choice of digital HD camera is vast and as part of the decision-making process for any camera upgrade, the operational requirement (OR) for the camera and camera location should be considered.

When presented with very high-quality images from multi-megapixel cameras and video analytic packages that allow cameras to provide automatic number plate recognition (ANPR) without the use of specialist technology or to track persons/vehicles without the use of an operator, it is easy to see how end-users can succumb to the use of technology for technology's sake.

Without specialist advice, this can become a costly and mostly unnecessary road to travel.

Budget Costs

Budget costs for typical configurations of HD camera are shown below (installation costs not included) –

Description of Works	Typical Cost £
<p><u>Ruggedized PTZ HD dome camera</u> Typical functionality should include –</p> <ul style="list-style-type: none"> • 1080P HD images; • Multiple H.264 video streams (3 minimum); • 30x (minimum) optical zoom lens with auto-focus; • Low-light sensitivity for night time viewing; • Day/Night switching into black & white/mono mode; • Multiple programmable privacy masking; • Built-in wiper; • Bracketry, PSU and other accessories included; 	£2,500
<p><u>Ruggedized PTZ HD dome camera c/w IR or White Lights</u> Typical functionality should include –</p> <ul style="list-style-type: none"> • 1080P HD images; • Multiple H.264 video streams (3 minimum); • 30x (minimum) optical zoom lens with auto-focus; • Low-light sensitivity for night time viewing; • Day/Night switching into black & white/mono mode; • Multiple programmable privacy masking; • Built-in wiper; • Built-in infra-red (IR) and/or White light; • Bracketry, PSU and other accessories included; 	£3,250

Continued...

<p><u>PTZ HD dome camera</u> Typical functionality should include –</p> <ul style="list-style-type: none"> • 1080P HD images; • Multiple H.264 video streams (3 minimum); • 25x (minimum) optical zoom lens with auto-focus; • Low-light sensitivity for night time viewing; • Day/Night switching into black & white/mono mode; • Multiple programmable privacy masking; • Built-in wiper; • Swan-neck bracket, PSU and other accessories included; 	<p>£1,750</p>
<p><u>PTZ HD dome camera (cost effective version)</u> Typical functionality should include –</p> <ul style="list-style-type: none"> • 1080P HD images; • Multiple H.264 video streams; • 15x (minimum) optical zoom lens with auto-focus; • Low-light sensitivity for night time viewing; • Day/Night switching into black & white/mono mode; • Multiple programmable privacy masking; • Swan-neck bracket, PSU and other accessories included; 	<p>£750</p>

5.10 REDEPLOYABLE CAMERAS

The choice for redeployable cameras is more often than not, confusing to end-users.

Usually this is not for any particular technical reason but because of the marketing methods adopted by manufacturers and supplier, yet despite convincing claims from manufacturers/suppliers that their particular camera is best suited for the purpose at hand, there is no 'one-size-fits-all' solution.

In reality and in most situations, redeployable cameras are installed for a specific purpose to monitor a specific fixed location or scene (i.e. park areas, skate parks, fly tipping areas, local shops), and for this reason it is sensible to utilise static redeployable cameras that can provide high-quality images (day and night) of the area of interest.

However, in some circumstances, where a location/area needs to be monitored as an extension of general public-space monitoring (i.e. areas within the town centre for specific annual events such as a Christmas market/fayre or annual street parade), the use of PTZ redeployable cameras is clearly advantageous.

Given these reasons, the ideal scenario is to have both types of redeployable camera available for use.

Installation Considerations

One of the main challenges for the installation of any redeployable camera is finding a suitable location for installation and in most urban environments, the use of street lighting columns is usually deemed the most appropriate.

However, this itself is not always as straightforward as it seems and there are **three** main considerations to be considered ahead of any camera deployment.

1. Height

The height of the street lighting column is paramount to ensure that any redeployable camera mounted to it, is not within easy reach for vandalism.

It is not recommended to use any street lighting column where the camera mounting height is likely to be under 6m.

2. Power

The installation of a permanent power supply to street lighting columns can sometimes be cost-prohibitive for any redeployable camera deployment.

County Council Highways and/or their appointed maintenance provider do not always allow the structural integrity of street lighting columns to be affected by the installation of commando-style power sockets and sometimes insist that this work is undertaken by their own or approved engineers to ensure the electrical connections remain safe and changes to the structure of the column is minimised.

Options exist to avoid both of these issues by using an in-line power adaptor to provide the power to the camera via the lighting head photocell. However, the use of these power adaptors depends on the type of photocell fitted to the lighting head and it should be noted that more modern lighting heads sometimes utilise different photocells.

3. Permission

The most important factor to consider before any deployment of CCTV to street lighting column is to obtain permission from the County Council Highways team and/or their appointed maintenance provider.

Asking permission to install any device to street lighting columns will always raise further queries over height, weight, wind calculations, power requirements and whether the camera will be permanently fixed or just for a short duration.

Added complications exist over the age and type of chosen street lighting column and whether the structural integrity of the column is suitable for the installation of a camera.

Additionally, permission will be required for the use of the above-mentioned in-line power lead and whether the Highways team/maintenance provider would prefer to install their own power supply.

Furthermore, it is understood that Worcestershire County Council have provided the following details for consideration regarding potential redeployable camera locations on the public highway.

WCC General Requirements

- Attachment to concrete, composite or aluminium lighting columns are not permitted under any circumstances;
- Redeployable cameras may be attached to steel street lighting columns subject to prior permission sought from the WCC Street Lighting Team;
- Providing approval is granted any work undertaken on the highway may only be carried out by WCC's street lighting maintenance contractor (Prysmian Cables and Systems Ltd.) or other approved, suitably qualified contractor. They must comply with the requirements and in accordance to within Chapter 8 of the Traffic Signs Manual;
- No works by any approved contractor may commence until proof of Public Liability Insurance for the sum of £5m in any one claim is provided;

WCC Requirements Specific to Redeployable Cameras

- WCC Street Lighting Team will assess those columns identified for mounting cameras to ensure the structural integrity is suitable for the extra loading;
- Should there be a need for a column to be tested independently for structural capacity by a specialist column testing company, then all costs must be covered by the applicant;
- A suitable double pole / double fused fixed isolator is fitted if required in the street light column at the expense of the applicant;
- No installation may take place unless the relevant Town or District Council has provided confirmation that an appropriate tariff has been agreed with their energy supplier;
- The camera is mounted high enough as to be considered out of reach to the public - a minimum of 6m above ground level;
- Any permanent electrical connection is to be made by a fully qualified, approved electrical contractor and a member of the HEA (Highway Electrical Association);
- Any hole drilled in the column must be no greater than 15mm in diameter with any exposed metal protected with zinc-based paint. No more than one hole per lighting column;
- Any installation is made using an appropriate MEWP (mobile elevated working platform). Ladders are not to be used;
- WCC is indemnified against any accident, damage or injury which is deemed to have occurred as a result of installing a CCTV camera;
- WCC reserves the right to remove the camera or column without notice should either element be deemed a danger to the public;
- No temporary redeployable camera shall be in position in the same location for more than 3 months;

Budget Costs

Budget costs for typical configurations of redeployable camera are shown below –

Description of Works	Cost £
<p><u>Static redeployable camera</u></p> <ul style="list-style-type: none"> • Supply of redeployable camera complete with 2 x static high-quality day/night HD cameras with IR lighting; • On-board NVR for local recording; • On-board 3G/4G¹³ and Wi-Fi modem c/w high-gain antenna for remote and local connectivity; • (Installation not included – typically around £265 per camera¹⁴) 	£3,000
Mains Power Adaptor for easy connection of redeployable cameras into local street lighting power supply (where applicable);	£200

¹³ SIM card data contract required for 3G/4G connectivity – additional costs will apply.

¹⁴ Costs based on typical contractor costs.

<p><u>PTZ redeployable camera</u></p> <ul style="list-style-type: none"> • Supply of redeployable camera complete with fully functional high-quality day/night HD cameras with IR lighting; • On-board NVR for local recording; • On-board 3G/4G³⁴ and Wi-Fi modem c/w high-gain antenna for remote and local connectivity; • (Installation not included – typically around £265 per camera¹⁵) 	<p>£4,000</p>
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5.11 RECOMMENDATIONS

Use of Specialist Consultant

Prior to the implementation of any system-wide or localized system upgrades, it is recommended that a specialist consultant be appointed to compile a detailed technical specification for the proposed upgrade works as well as any new maintenance requirements. The consultant should also assist with the procurement of the works and final project delivery to ensure all technical and operational requirements of the specification are understood and met in full.

Redeployable Camera Policy and Procedure

Given the above-mentioned considerations and detailed requirements from WCC for the installation of redeployable cameras, it is essential that a policy and procedure for deployment of any such mobile camera is compiled to address the items listed below (but not limited to) –

- Decisions and recommendations regarding location of camera deployment;
- Liaison with WM Police where necessary;
- Any requirements for RIPA – including applications to courts where necessary;
- Liaison with WCC Street Lighting Team where necessary;
- What resources/utilities are required such as WCC Street Lighting Team or CCTV maintenance contractor;
- Monitoring of installation to ensure safe and compliant (i.e. signage where necessary) deployment;
- Duration of deployment;
- Monitoring of effectiveness of deployment;
- Coordinating footage review and download where applicable;
- Ensuring compliance with council's retention policy for recorded footage – footage can sometimes be stored within the redeployable camera for many months;
- Camera equipment service and maintenance – equipment should be included in CCTV maintenance specification/contract;

The final policy for redeployable camera should be the responsibility of a named person(s) within the council.

Section 6. WAY FORWARD OPPORTUNITIES

6.1 GENERAL

The aim of this section of the report is to summarise possibilities for future monitoring opportunities which could expand the capabilities of the existing RBC/BDC CCTV monitoring service and, where applicable, generate revenue to assist with the future running costs of the service or provide savings to the council by providing services that may be currently outsourced.

6.2 CCTV MONITORING

Some of the possibilities for future CCTV monitoring opportunities include –

- CCTV monitoring of council-owned remote sites/systems – such as Council offices, Town Halls, Museums and Libraries;
- CCTV monitoring of annual events (within RBC, BDC and WFDC) using redeployable cameras;
- Social Housing CCTV systems;
- Fly tipping sites;
- ASB hot spots;
- Parks and Recreation grounds;
- Leisure Centres;
- ANPR and/or video analytics for traffic enforcement;
- Mobile body-worn cameras for street/traffic wardens;

6.3 ALARM MONITORING

Possibilities for future alarm monitoring opportunities include intruder alarms, fire alarms, personal attack alarms and plant monitoring at the following –

- Council buildings, offices, leisure centres, libraries, schools etc.
- Social Housing properties – incl. lift alarms, roof vents and bin roof fire detection/sprinkler systems;
- Temporary building sites or scaffolding alarms;
- Waste depots;
- Maintenance depots;
- Void properties;
- Critical plant monitoring – UPSs, water tanks, fuel tanks, heating and air conditioning systems;

Insurance Company Requirements

Ahead of any plans to undertake monitoring of intruder, personal attack or fire alarm systems, WFDC should seek advice and clarification from their insurance company.

In most circumstances, it is insurance providers that determine the level (or grading) and type of monitoring that is required from any given alarm system based on their assessment of risk associated with the building and the contents. This assessment will also determine the type of response required to an alarm activation – i.e. Police or Fire brigade.

Where Police or Fire brigade response is not required (i.e. keyholder only), it is likely that the insurance company will accept the monitoring to be done via the RBC CCTV control room and it is these sites where opportunities exist for cost savings to the council.

6.4 ASSET TRACKING

Alongside the CCTV and alarm monitoring further functionality for Asset Tracking could also be implemented within the RBC/BDC CCTV monitoring service.

Some possibilities for Asset Tracking opportunities are –

- Council vehicles;
- Plant and machinery;
- IT equipment;
- Keys;

6.5 PUBLIC-ACCESS WI-FI & SHARED SERVICES

As part of any digital wireless network infrastructure installation, the opportunity exists to provide public-access Wi-Fi within the town and village centres as a supplementary service.

Furthermore, the potential for the provision of other shared services via the new digital wireless infrastructure also exists and as such, any new wireless infrastructure should be designed to provide expansion capabilities to allow connectivity of –

- CCTV systems;
- Redeployable cameras;
- Public-access Wi-Fi;
- Traffic enforcement cameras such as ANPR and bus lane enforcement;
- Traffic signals – County Council connectivity of traffic signals and traffic cameras;

People & Vehicle Counting

The use digital HD cameras can also provide RBC, BDC and WFDC with video analytic functionality for people and vehicle counting capabilities to assist town centre management to provide footfall data to local businesses.

ANPR and Vehicle Emission Monitoring

Similarly, additional video analytic packages could allow new digital HD cameras to provide automatic number plate recognition (ANPR) functionality for car park control/monitoring and possible links to the DVLA open database to provide vehicle emission information for environmental monitoring purposes.

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