



CASE STUDY
NEWPORT SCHOOLS, U.K.

**Newport City Council
brings IP Surveillance to
27 schools in South Wales**

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Introduction

Newport City Council was awarded half a million pounds of funding from the Home Office for a ground-breaking IP Surveillance scheme so far deployed across 27 schools within the authority, cutting vandalism and anti-social behaviour, substantially raising morale in these schools and making the communities around them safer. So successful has the Newport 'CCTV in Schools Initiative' been, that it has gained widespread recognition in government quarters as well as across the converging worlds of IT and physical security. It won 'Security Client of the Year Award' at the prestigious Security Excellence Awards in October 2002. Regionally it collected 'Best use of Technology in Government Award' from Technology Wales 2003 (TW03) and the accolade of 'The Most Innovative use of IP Technology in the UK' as nominated by key IT decision-maker publication Computer Weekly.

Newport City Council Fact File

Newport City Council in Newport, South Wales is a unitary authority formed in 1996 and granted city status in 2002. It is the eighth largest unitary authority in Wales, employing more than 7,000 staff and holding a budget of £220 million per year. It supports a population of more than 137,000. It provides all major public services via departments including Corporate Services, Environment & the Economy, Lifelong Learning & Leisure and Social Wellbeing & Housing.

Like all unitary authorities Newport has some key objectives which include targets to increase the quality of education in the borough and reduce crime and anti-social behaviour. It is in this context that the 'Newport CCTV in Schools Initiative' came into being.

The Birth of the Initiative

Newport City Council and Gwent Police had formed the Newport Community Safety Partnership (CSP) in the late 1990s to find ways of reducing crime and anti-social behaviour which was then an increasing problem across the borough. The CSP has a project board and is chaired by Councillor Robert Bright as Cabinet Member for Community Safety and a member of the Police Board. The CSP is a joint officer group comprising interested parties from a number of different departments of the council.

During 1998-9 Nigel Davies, the chairman of the police's project group focusing on the impact of CCTV and member of the CSP identified that the Home Office was offering funding for CCTV projects as part of Phase II of its Communities First Initiative designed to increase safety in communities across the UK.

The prospect of this funding and a recognition of a growing problem of vandalism and anti-social behaviour on school premises right across the borough, drove the creation of the 'Newport CCTV in Schools Initiative'. This initiative was well placed to receive Home Office funding, particularly if Newport could illustrate that CCTV implementation in schools could dramatically reduce crime and disorder in these areas.¹

The Community Safety Partnership forms a vital link between all key public services to ensure that they all work together to reduce crime and make communities safer. Newport's Community Safety Partnership quickly called together a project team to prepare the ground for a bid for Round II of Home Office funding earmarked for CCTV projects. This group was also tasked with driving through the project itself.

The group was originally led by Dave Thompson, since retired, and is now led by public protection manager Mandy Bishop, responsible for Newport's community safety wardens and community safety officers. Others in the project group included community safety warden manager Richard Winfield; Nigel Davies and Nick Haynes from Gwent Police; Phil Hurn, the council's Electrical Surveyor; Tony Wells from the council's Lifelong Learning & Leisure Department, responsible for buildings and capital associated with schools; Sian Brown, Principal Manager of the Community Alarms Control Centre within the Social Wellbeing & Housing Department of the council; and Principal IT Consultant Philip Cox who handled all technical issues associated with the project.

In parallel with this group was the implementation of the National Grid for Learning (NGfL) which set out the aim of providing broadband access to all schools for the purposes of furthering education through use of the internet. As a result of NGfL, the National Assembly for Wales took responsibility for providing Points of Presence (PoPs) for broadband access to the internet to all 22 Local Education Authorities (LEAs) across Wales.

SuperJANET (the IP network infrastructure developed by the universities in the 1970s), won the contract to provide a 100MB PoP to the Newport LEA. Schools in Newport were then invited to connect to this PoP, making the LEA the hub for all connected schools.

Newport City Council provides the network support for the Newport LEA. This put the council in the unique position of effectively providing internet access as well as network support and advice to many schools across its borough. This relationship made it easier to see schools joining a Newport Council-inspired IP surveillance project using an existing connection maintained by the council.

Pilot Stage – Eveswell Primary School chosen

The project team made an initial submission for £3.2 million funding for surveillance of all 68 of Newport's state schools. The team assembled the necessary information, wrote the bid document and submitted it to the National Assembly for Wales. This was then submitted on to the Home Office during the summer of 2000.

As part of the submission process, the project team sought to develop a pilot site to prove the impact of surveillance. Eveswell Primary School was chosen principally because it had detailed the cost of vandalism-linked window replacement as more than £6,000 over the previous year. Other less tangible problems included evidence of children skateboarding off roofs. Eveswell had an escalating problem with vandalism which surveillance could address.

But it was important to inform all teachers, governors and parents attached to this school about what the system would be aiming to achieve and how it would be paid for. A public meeting was held on 14th December 2000 and invitations to this meeting were sent out to all parents with pupils at the school, as well as all houses in the streets close to the school. The scheme was well received by all attendees of the public meeting. Work could begin on selection of partners to assemble the system for Eveswell.

Implementation partners had to be prepared to give of their time, resources and in some cases products to get the pilot site up and running within just three months. IP surveillance technology vendor Axis Communications, central control station software provider Farsight, camera manufacturer Molynx, NTL for a 2MB fibre fixed link to the pilot site and an installer called PFM were all assembled in a few weeks. A number of these providers went on to win contracts for the whole project.

NTL identified potential partners Axis Communications and Farsight. Other partners were identified by these providers or by PFM. There were several issues with the installation not least of which was the fact that the winter of 2000/2001 was a very wet and cold one.

Philip Cox, Principal IT Consultant at Newport City Council and technology leader of the project, recalls one of the difficulties:

“Because it had been raining so much over previous weeks, when the masts were being sunk into the ground in early December, the excavations immediately filled with water. It made the preparation phase much more time consuming than it might have been.”

By the time Newport had assembled all these potential suppliers and designed the solution, installed masts, hooked up a low spec black and white camera and sent the first live pictures to the Community Alarms Control Centre in the civic centre it was late December 2000. The other cameras were finally connected in early February 2001.

Newport City Council held a formal launch event at Eveswell on 24th April attended by David A’Hearn, the Crime Reduction Director for Wales, local civic dignitaries, head teachers and school governors from across the authority. The following day the council held an open day for all parents, neighbours and interested parties. People who attended this event were able to watch a demonstration of the pilot and have questions answered by members of the project team.

Almost simultaneous with this event, one of the schools earmarked for inclusion in the first phase of the ‘CCTV in Schools Initiative’, St Julian’s High School, suffered a severe incidence of arson with one of their temporary teaching blocks being all but destroyed. The case for central monitoring of schools after dark looked even stronger for the council.

After some consideration The Home Office granted Newport City Council a little over £500,000, of the original £3.2m application, enough to provide a centrally controlled surveillance system to at least 20 of the 68 state schools in the region.

Selection of participating schools

From very early on, Philip Cox could see the benefit of building a fully networked surveillance solution so that all sites could be monitored back at the pre-existing 24x7 Community Alarms Control Centre, particularly between the hours of 9PM and 3AM when school sites are most vulnerable to vandalism and other problems.

This approach meant the schools that could be selected had to have already subscribed to the NGfL project and have the fixed lines of between 128KB to 10MB fibre or copper running to them. There are now over 60 schools that had subscribed to receive these links as part of Newport City's implementation of the National Grid for Learning, but at that time schools were still deciding whether they would join in the project.

The other criteria was that they had to have a recognisable problem with anti-social behaviour and must be able to commit to a three year service level agreement with the council to cover the cost of maintaining of hardware, software licenses and additional resourcing needed to man the control centre.

To assess the extent of anti-social behaviour in each school as objectively as possible the project team chose to analyse window glazing bills in all schools, the same measure that had been used at the pilot site. The window glazing bills provided a relatively easily collectible, objective, financially-linked measurement of the cost of vandalism and anti-social behaviour that was not achievable with any other measurement considered by the project team.

And analysis of these bills brought some alarming findings: some schools were spending more than £12,000 per year purely on glass replacement following vandalism incidents. All schools selected were based in post-war buildings with large windows and flat roofs. Flat roofs were a particular area of threat. Children had be known to skateboard, smoke, light fires and fight up on roofs, out of sight of most people passing by.

Some of the twenty schools that were initially earmarked for inclusion in the project chose not to sign up. Some schools chose not to join the project in the early phases because they had their own networks, were already committed to maintenance contracts with telecoms providers and had installed their own stand-alone CCTV systems.

However St Julian's High School did join despite the fact that it had its own network and a CCTV system with more than 20 static cameras in operation, primarily because it recognised after the arson incident, that it needed to have the 24x7 proactive, alarm-based response that the new scheme offered.

Educating the educators

At this stage, project team representatives presented to teachers of all participating schools to explain what their systems would be used for and the limitations of their systems. The system

could not be used to record events during the day because of the limitations of storage space in the control centre.

But this conflicted with some teachers thinking: some were keen that any surveillance system should be used to monitor school car parks to deter theft or damage to cars during the working day. Others wanted it to keep an eye out for anti-social behaviour in playgrounds during the school day, so that teachers could spend less time supervising these activities and more time focusing on preparing the next class or marking books.

Philip Cox explained:

“These requests were all understandable given the potential of the surveillance system as they saw it, but we had to remain focused on the task at hand which was to reduce crime, vandalism and its corresponding costs to schools. We could not do this effectively if we did not have a tight focus to the project.”

Caretakers at schools were also engaged and educated about the council’s plans. Caretakers were seen as vital to the success of this surveillance project because of their knowledge of the trouble spots after hours – the meeting points for gangs, the specific antics that they get up to. Intelligence from caretakers was to prove crucial to the correct siting of masts, cameras, sensors and lighting. In addition when the wardens were deployed to carry out patrols of schools in addition to the estates that they already patrolled, caretakers were again on hand to provide this vital information to make these wardens’ patrols more effective.

Project Definition and ITT Stage

The project had to be completed within two years from launch of the pilot, i.e. by April 2003, so the pressure was on to find the right partners to deliver the project. But because of regulation governing selection of contracts for a project of this size, the project team had to draft a formal Invitation to Tender (ITT) and allow sufficient time for the IT and CCTV community to respond and handle any queries prior to an objective assessment of the best partners.

The team decided to manage the whole tender process electronically using locally recommended firm called AceQuote (acequote.co.uk). AceQuote specialises in conducting electronic tenders. This firm placed the tender document up on their website in May 2001 then worked to direct relevant firms to provide tender responses.

A total of 47 responses were submitted, mostly from traditional CCTV installers who had not worked on an IP surveillance-led project of this magnitude. One of the key elements of the tender was the ability to monitor and control all cameras remotely from a central location proposed as the existing Community Alarm Control Centre based in the Civic Centre.

This Community Alarm Control Centre, which already provided a rapid 24x7 call centre response to social alarms from vulnerable individuals in the community such as old people living alone, was well placed to become the control centre for alarms coming in from the schools participating in this project. The control centre was geared to providing rapid response to alarms, assessing situations and then alerting relevant public services such as nurses, Newport’s

ambulance service, police or wardens. Staff in the control centre were already operating around the clock and were sensitive to relevant issues such as data protection requirements. It was therefore clear that it was a sensible use of resources to base this project's central control centre in the same place.

Technology provider selection and network design

Many traditional installers had no solution at all to this requirement. However after deep consideration of all responses, local installer Camrasonic was chosen as prime contractor.

Camrasonic won the tender based on several factors. Firstly it has the lowest cost of ownership over a five year period which was set as the maximum length of the contract with a break at the end of the third year. It also scored the best in terms of its performance in a site visit test where its team spent a good deal of time gathering information from relevant school staff including the caretakers and teachers. It also presented stronger references than the four competitors that were short-listed.

The product providers chosen were Axis Communications for AXIS 2400 video servers linking CCTV cameras via 128KB to 2MB leased lines. Network communications to the control centre was provided via a Cisco 3660 central router running IP only software. In addition all remote sites have a dedicated Cisco 1605 router also running IP only software.

All school sites have two networks – one for students and a second for teachers. These networks are presented on either Cisco 400 fasthubs or 2924 LAN switches depending on the number of PCs at each school. The schools network uses a RFC1918 class 'C' network with a 24-bit subnet mask.

The Wide Area Network (WAN) connection between each school and the civic centre is presented on an X21 interface at both ends, and uses Cisco' HDLC protocol. The IP addressing on the WAN link uses RFC1918 class 'C' network on a 30-bit subnet mask.

There is no routing protocol running between each school and the civic centre. A separate VLAN runs between the core Cisco 6509 layer 3 switch and the monitoring stations terminating on a Cisco 3512 switch (giving 12 x 10/100 ports with a 1 gigabit up link). Access to this VLAN can be controlled by the Cisco 6509.

As all connections must pass through the civic centre to get to the remote schools networks the core router can control the access to the video server, and from there to access and control the Pelco Spectra III colour/mono changeover Pan, Tilt and Zoom (PTZ) cameras that replaced the Molyx Surcha cameras used in phase I.

The system, which is still working to the original design today, processes the alarms generated by onsite Passive Infrared (PIRs) detectors and presents them to AXIS 2400 video servers at the schools for digital transmission onto the control centre. The Farsight eSurveillance software application installed at the control centre handles the alarms and activates relevant cameras, enabling control centre staff to adjust the cameras so that they generate the best possible pictures. Control centre staff then activate recording to a separate Farsight system (a Constant Video

Recorder or CVR) running on a standard PC with additional 50GB hard disk for background recording where nothing suspicious has been detected.

Two workstations are installed at the control centre to manage the quantity of alarms coming in from all the schools. Two additional staff have been recruited to supplement existing staff in manning these workstations, operate the eSurveillance software and liaise with wardens, police and school caretakers as appropriate.

Following NTL's decision to withdraw from provision of fixed links nationally following a change of business strategy in late 2000, BT resources were relied upon to create the shared infrastructure for this project. Cable & Wireless has an ongoing contract with the council for provision of advice and support. Philip Cox takes the view that the optimum specification for the link should be 2MB or above and all 128KB lines are being phased out with the last one at Somerton School being upgraded before September 2003.

Alarms are generated by movement across all schools and once Farsight's eSurveillance software receives an alarm, it identifies the pre-event buffer from AXIS 2400, automatically logs into the specific site relating to the PIR and the camera that has generated the alarm, and begins recording at three to five frames per second. This frame rate is determined by the bandwidth availability at specific schools as well as the resolution and compression ratios being deployed to move images across.

But there must also be scope to de-activate the alarms when authorised activity such as contractor work is ongoing. In this instance, control centre staff are able to disable the alarm and send images to Farsight's CVR recording at variable rates of between 0.5 frames per second down and one frame every five seconds, just in order to keep an eye on developments. This function was selected to provide background recording should anything untoward occur without clogging the CVR with excess images which can soon fill up the server and prevent further recording.

Compliance with latest legislation and evidential regulation

Sian Brown, the Principal Control Centre Manager, is also in charge of ensuring all recording at the schools is in complete compliance with the latest data protection legislation.

The Data Protection Act (DPA) 1998², Freedom of Information Act (FoIA) 1998³ and the Human Rights Act (HRA) 2000⁴ are key pieces of legislation which needs to be complied with when establishing any surveillance system. The main purpose of those clauses related to surveillance in both the DPA and HRA is to make surveillance operatives fully accountable for what they are monitoring, stating publicly exactly how they will record, for what purpose and where the actual recording will be done. Based on extensive studying of all key legislation, Sian Brown provided advice and documentation to ensure full compliance with the acts. Some of her key considerations are listed below:

- Stored images cannot be saved for more than 31 days. Storing images digitally makes the process of managing recording, accessibility and storage much easier than the analogue equivalent with VHS tapes. VHS tapes need to be physically rotated (most use a different

tape for each day of recording for example) and must be destroyed after only a few uses because quality of recorded images decreases beyond acceptable levels.

- Images can only be viewed at the schools themselves once a request has been made to the control centre in writing
- The recording location needs to be completely secure so that only authorised personnel are allowed into the control centre and guests must be signed in by authorised personnel only
- The HRA demands that all images from surveillance systems that identify individuals must be made available to those individuals on request. Be aware that although individuals are able to request to see themselves on video, they are not allowed to view those around them. It is therefore important to consider how people around individuals will be blanked out for this purpose.

Using digital recording makes this process more cost effective and time efficient than using analogue recording. It is important to be able to do this cost effectively because the same legislation requires that a maximum fee of £20 can be charged for provision of relevant recordings

- The DPA also demands that the control centre is registered with the Data Protection Registrar and that it publishes its own code of conduct
- Because the 'CCTV in Schools Initiative' did not require 'patrolling with a purpose' i.e. covert tracking of individuals using cameras, but instead only recorded if movement was detected after hours, it did not have to register with the Criminal Records Bureau.

In the interests of protecting recorded data and avoiding any breach of data protection legislation, no recording is done at the schools themselves and all recordings taken at the control centre are deleted after 28 days to ensure compliance with the Data Protection Act 2000.

After some consideration Philip Cox decided to use MJPEG compression algorithm⁵ in compliance with the Police Scientific Development Branch's (PSDB)⁶ rules on admissible evidence as detailed in its Digital Imaging Procedure document published in March 2002. The AXIS 2400 Video servers utilise the MJPEG format for digitisation and compression of images for easy transmission over the internet.⁷

To simplify the system Philip Cox routes all images from schools via a specific communications port. This makes for easy diagnosis of a communication fault and also means that the camera's IP address, which provides a unique identifying code for all devices connected to the internet, can be permanently reserved so that new devices cannot unwittingly take the IP address of a surveillance camera.

The operating system for the PCs driving and displaying the images is currently Microsoft's Windows 2000 and the council is committed to move with Microsoft's natural upgrade path so as to ensure the minimum of communications issues. A migration to Windows XP platform across all 27 schools now participating, is widely expected before the end of this year.

Technology Specifications in detail

- 27 AXIS 2400 Video Servers – each server has four alarm inputs, one for each of the four cameras attached to it. Most sites only need four cameras to cover them. All images are viewed at the control centre via the council's own intranet using Microsoft Internet Explorer to the individual video servers. Only those who know IP addresses of these devices and have appropriate access rights and passwords to access the video server are able to access video generated by the cameras.
- Farsight's eSurveillance application – this is installed on dedicated PCs in the control centre, has a direct link into all installed video servers in schools. Alarms generated by these video servers automatically trigger the cameras to record and send pictures for viewing and recording down to the e-surveillance system.
- 112 dome cameras – with the first six sites having Molyx Surcha domes and thereafter Pelco Spectra III colour/mono changeover cameras with 23 times optical zoom, which proved stronger and more resilient against the affects of damp and rain.
- 200 Redwall LRP 100 Passive Infrared Detectors (PIRs) with long range intelligence able to pick up motion up to 100 metres away with a three metre wide beam. Many of these PIRs were caged to avoid people ripping them off the wall or vandalising them
- 60 camera masts – provided by Altron Communications to seven and 10 metre height with specific fittings to go below ground level to avoid children hurting themselves on protruding bolts if they fell near the masts.
- Lighting – After some testing it became clear that it was important to create glaring lighting on sites, triggered by motion detection. Floodlighting acts as a genuine deterrent to children whereas as creating poorly lit areas actually encourages unwelcome visitors to stay around talking, drinking and smoking deep into the night.

While the selection of the right technology solution was a major challenge in itself, perhaps as much of a challenge was ensuring that once the system detected activity on one of the school sites, human intervention is brought into play as quickly as possible to diffuse disputes and prevent escalation wherever possible.

Proactive Surveillance – the holistic approach

Ensuring rapid physical response to anti-social behaviour or potentially escalating situations at the schools is critical to the success of schemes like this.

“It is no use turning in at the control centre at 9AM on the morning following an incident and finding out that three youths have put bricks through every window in a particular school – the damage has been done, the cost incurred,” explained Philip Cox, “But what if the control room can move quick enough to contact a warden to patrol the school as a group comes onto the school premises, heading off the group before the damage is done.”

The project group looked at the resourcing of this school patrol group. Clearly caretakers could do some patrolling but the project team decided that the best equipped people to handle the patrols were the Estate Rangers who were then attached to Social Wellbeing & Housing Department. The rangers are trained to diffuse tense situations and originally patrolled the housing estates often adjacent to the schools. The CCTV in Schools Initiative now required them to extend their patrols onto school premises in the areas they already operated. To illustrate the extension of their remit they were re-branded as ‘Community Safety Wardens’. They now came under the remit of the Community Safety Partnership attached to the council’s Public Protection Department.

The wardens work from 1PM to 12AM midnight which covers the most high pressure period - after the end of the school day and before children go to bed. After midnight, school caretakers are contacted to go onsite while being actively monitored from the civic centre to help assess whether backup is required.

If those going onsite find themselves unable to diffuse the situation, they alert the control centre and staff there pass a message and if necessary images on to the police, so they can assess the need for intervention. In any event, if there was an obvious crime in progress, the police will be alerted by the control centre.

This sort of support is also extended to teachers working late on dark winter nights. They can call the control centre and ask them to view relevant cameras as they lock up the school and head for their car. All this is good for teacher morale, making them feel safer. Anecdotally, assaults as well as teacher harassment by parents and pupils has fallen in schools as a result of surveillance in these schools.

Successful Roll-Out – Demonstrating Return on Investment

Eveswell Primary was initially chosen as the pilot site because it had documented its annual expenditure on anti-social behaviour and had spent £6,000 in 1999-2000 on dealing with this. Eveswell had real problems including children skateboarding off the low sloping school roof. Since the first cameras were installed in December 2000, the number of incidents fell away very rapidly. In April 2001-April 2002 period there was only one incidence of vandalism resulting on glazing replacement and from April 2002-2003 there were no incidents at all in this category.

The project ran in four phases completing installations in 23 schools by the end of Phase IV. Phase I included seven schools and was completed by May 2002. Phase II included a further six and was completed by July 2002. The remaining schools were completed in Phase III and IV by the end of March 2003. The schedule was dependent on schools being able to clear school sites and contractor availability, as well as their individual commitment to the scheme.

Implementation of this large-scale IP surveillance project has been a near total success. There was only one notable exception which was Duffryn Junior and Infant Schools. Duffryn is set in the middle of one of the most deprived estates in South East Wales and is a recognised hang-out for gangs. Once cameras went in at Duffryn they were targeted for vandalism including rifle shots which broke two domes and damaged one camera. The domes have now been replaced and the camera repaired.

As the initiative has been extended, the 27 schools already linked to the system or in the process of installing saved nearly £46,000 in the year to April 2003 on glazing alone. That is a 35.5% saving on the previous year and a reduction of vandalism ‘incidents’ of nearly 29% from 725 to 516 in total.

Savings in other areas such as cleaning up of graffiti and litter collection took savings over £75,000 per year across all schools that have or intend to have surveillance, according to conservative estimates by the council. By contrast those sites not involved in the project saw increases in glazing bills of 50% from £40,500 to £60,600 over the same period, spending more than £20,000 on glazing in the year to April 2003. Understandably many of these schools are now expressing an interest in joining the scheme.

The reduction in criminal damage in participating schools has not been lost on school buildings and contents insurers. Newport Council is now negotiating with insurers to reduce rates for all schools in the borough. Rates went up initially when expensive equipment associated with the NGfL project was installed because insurers were concerned that it might be stolen or destroyed.

Savings in participating and non-participating Newport schools in the last 12 months to April 2003 compared to year before

SCHOOLS VANDALISM COSTS 2001/02 and 2002/03

	2001/2002		2002/2003		Comparison (2002/03 - 2001/02)	
	<u>NO. OF INCIDENTS</u>	<u>TOTAL COST £</u>	<u>NO. OF INCIDENTS</u>	<u>TOTAL COST £</u>	<u>NO. OF INCIDENTS</u>	<u>TOTAL COST £</u>
	SCHOOLS WITH CCTV					
School #1	76	10,865	31	3,363	-45	-7,502
2	9	1,799	8	2,459	-1	660
3	16	1,524	14	2,765	-2	1,241
4	1	116	0	0	-1	-116
5	21	2,643	26	4,057	5	1,414
6	49	9,339	13	3,102	-36	-6,237
7	49	6,732	75	9,954	26	3,222
8	21	5,181	12	2,600	-9	-2,581
9	7	1,586	5	370	-2	-1,216
10	15	8,671	3	1,113	-12	-7,558

11	5	1,295	0	0	-5	-1,295
12	14	1,870	0	0	-14	-1,870
13	48	6,054	19	1,956	-29	-4,098
14	11	2,104	8	788	-3	-1,316
15	16	3,762	11	2,084	-5	-1,678
16	34	4,408	14	3,161	-20	-1,247
17	41	5,305	38	5,910	-3	605
18	30	7,838	20	3,025	-10	-4,813
19	23	6,451	31	4,945	8	-1,506
20	13	933	15	1,393	2	460
21	11	2,861	5	3,127	-6	266
22	18	3,776	12	1,507	-6	-2,269
TOTALS	528	95,113	360	57,679	-168	-37,434

SCHOOLS AWAITING CCTV

23	132	23,043	124	19,413	-8	-3,630
24	5	535	3	293	-2	-242
25	14	2,383	11	1,867	-3	-516
26	43	7,852	14	3,779	-29	-4,073
27	3	242	4	308	1	66
TOTALS	197	34,055	156	25,660	-41	-8,395

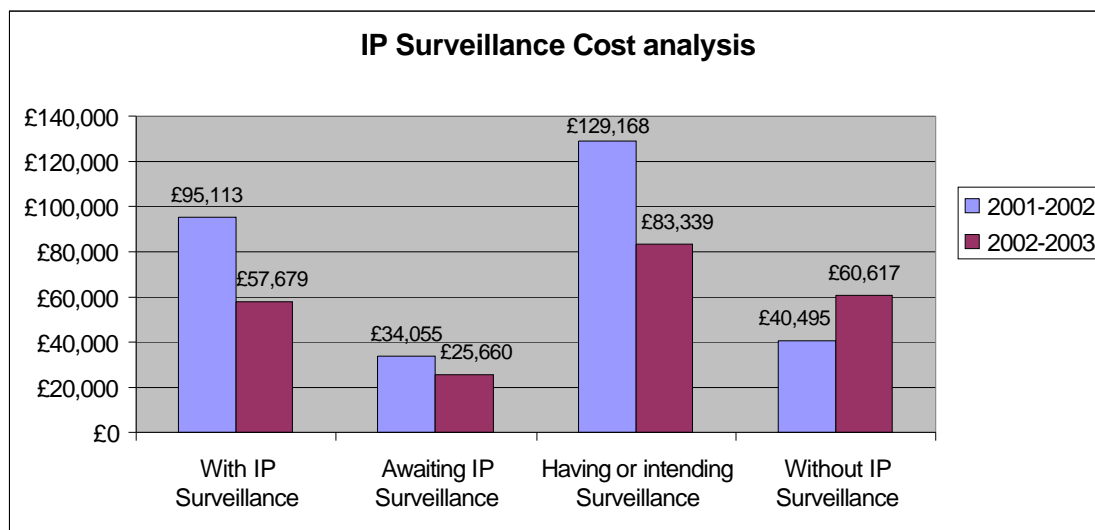
**TOTAL for Schools
having or intending
CCTV**

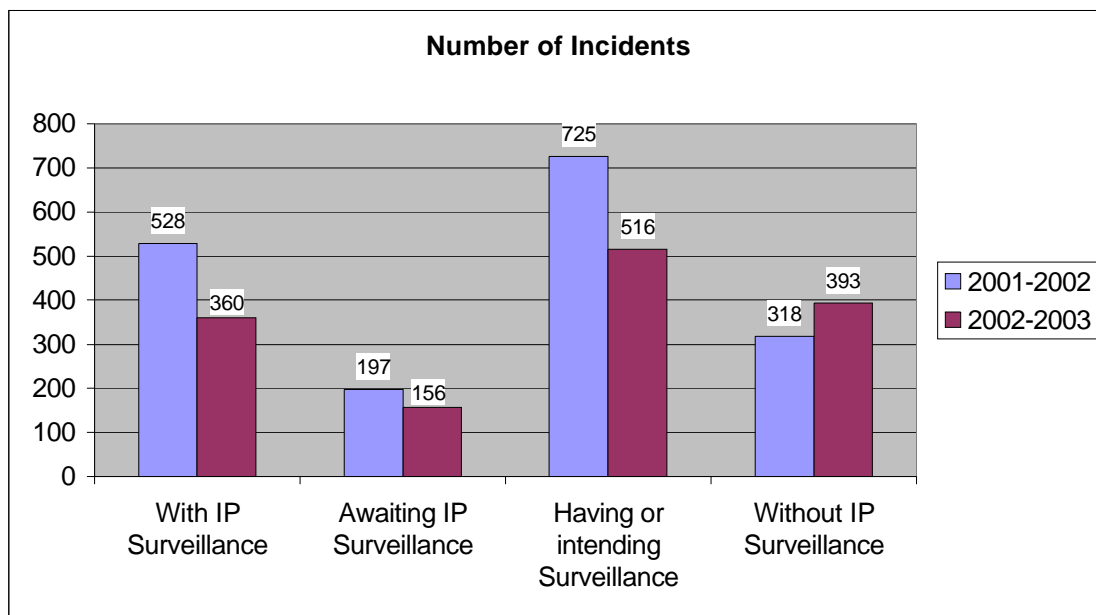
725	129,168	516	83,339	-209	-45,829
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SCHOOLS WITHOUT CCTV

28	61	10,622	97	16,203	36	5,581
29	24	2,116	35	6,450	11	4,334
30	39	3,915	43	6,631	4	2,716
31	29	7,158	43	9,511	14	2,353
32	5	574	5	1,937	0	1,363
33	8	572	12	1,791	4	1,219
34	0	0	3	1,035	3	1,035
35	18	2,556	20	3,543	2	987
36	1	42	7	753	6	711
37	5	1,006	8	1,707	3	701
38	4	502	8	1,190	4	688
39	12	550	17	1,227	5	677
40	6	826	7	1,421	1	595
41	0	0	9	573	9	573
42	4	571	7	710	3	139
43	1	60	3	129	2	69
44	3	208	5	255	2	47
45	1	64	3	110	2	46
46	2	189	2	221	0	32
47	0	0	1	27	1	27

48	0	0	0	0	0	0
49	0	0	0	0	0	0
50	0	0	0	0	0	0
51	1	20	0	0	-1	-20
52	1	20	0	0	-1	-20
53	2	331	3	281	1	-50
54	1	150	1	73	0	-77
55	13	868	11	758	-2	-110
56	7	403	6	273	-1	-130
57	4	259	1	100	-3	-159
58	8	924	3	750	-5	-174
59	3	175	0	0	-3	-175
60	9	599	4	399	-5	-200
61	3	264	1	40	-2	-224
62	21	2,222	22	1,981	1	-241
63	12	543	2	297	-10	-246
64	4	511	4	241	0	-270
65	1	345	0	0	-1	-345
66	1	390	0	0	-1	-390
67	4	940	0	0	-4	-940
TOTALS	318	40,495	393	60,617	75	20,122
Grand Total	1,043	169,663	909	143,956	-134	-25,707





Although these savings are the only ones that can be evaluated in terms of pounds and pence, participating schools are also seeing palpable increases in staff morale and higher teacher retention, which itself creates a positive virtual circle leading to higher quality of teaching and wellbeing generated through added feeling of security, particularly when working late or coming in early in the morning.

Ongoing maintenance and support

The council supplies the software and desktop solutions to all participating schools. All these schools sign up to a three year Service Level Agreement with schools paying around £450 per year, per PC linked to the system. This fee covers desktop support and the software licenses and hardware and software maintenance costs. In the first year it includes costs associated with installation of the fixed line. All the kit is leased so at the end of the three year period schools have an opportunity to turn off the system or refresh to new hardware and software. Newport is now handling the first renewals for systems installed in 2000. These are comprehensive re-installations and include new PCs to the latest specifications, new servers and updated applications.

The NGfL project has created seven new jobs to support the 2000-odd PCs installed at over 60 sites across the city. This team has also taken on the support of some of the CCTV equipment, and liaising with the CCTV prime contractor, Camrasonic, in the investigation of faults.

The CCTV project has created two extra jobs at the civic centre's control room. In addition warden shift patterns have been altered so that more of them are on patrol at any one time although they work slightly shorter hours. There are 18 wardens in total now operating across estates and schools in their area.

Looking into the future

Newport City Council is keen to take full advantage of all the latest technology in surveillance. It is keen to integrate video server technology with other systems so that in the future it should be possible for the control centre to activate a loudspeaker system to warn people triggering alarms to get off the premises if it is clear that they are unauthorised.

They are also keen to explore surveillance system integration with other alarm systems so that if a building is broken into, the site's intruder or fire alarm can be linked directly to CCTV monitoring system and an integrated response can be initiated.

Such is the success of the Newport schools surveillance project that other schools have recently asked to join. Ladyhill Day Care Unit for old people has been linked to the system. In addition Newport City Council owns Tredegar House which is a popular tourist attraction west of the city. For this site a mixture of IP wired and wireless solution is planned because two of the cameras will be sited in remote locations at the perimeter of Tredegar House's grounds. An AXIS 2401 video server will be deployed in each post connecting the dedicated camera to the main network. The remainder of the site is to be covered by a standard system using three Pelco Spectra III cameras. Possible extensions could include more social services centres and adult training centres as well as more schools.

IP Surveillance offers route to additional income streams for Newport

The success of the project is also helping to change the mindset across Newport City Council.. It is also possible to think of installing just one IP network and use it to enable several different applications inside the city centre. Investigations are currently underway to use digital surveillance in the town centre to extend existing coverage and also potentially conduct traffic flow monitoring and even automatic number plate recognition for crime prevention.

It is now possible to consider surveillance installations not only as a method of reducing crime and the costs of crime, but also as potential profit centres for innovative councils interested in providing improved services to council offices across the borough. The advantage of laying fibre under the ground to serve all their applications is that when a new business or marketing idea comes along and a new application is developed it does not mean that the council has to dig up the roads once again.

They simply need to find the right front-end applications and technology providers to put the high speed IP network to work. As such it seems clear that Newport's IP Surveillance in Schools Initiative has created an exemplar for use of efficient use of existing IP network resources and this exemplar may well be noted across many towns and cities throughout the country. Wireless IP surveillance deployment is also ideal in this scenario to cut out this disruption altogether.

City centre surveillance could be extended to cover shopping areas in a more detailed way so that retailers will be able to pay for controlled access to video images so that they can analyse the success of specific shop front promotions as well as looking at footfall peaks.

Awards for Innovation

Such has been the success of Newport's CCTV in Schools Initiative that the council has been awarded recognition for 'The Most Innovative use of IP Technology in the UK' by key IT decision-maker publication, Computer Weekly in July 2003.

The project also collected 'Best use of Technology in Government Award' from Technology Wales 2003 (TW03) where it was considered to be the best example of e-business technology being used to deliver existing public services more effectively or offer new services. The Newport schools project also collected the 'Security Client of the Year Award' at the prestigious Security Excellence Awards in October 2002 – the first IP surveillance deployment to achieve this accolade. Newport was also recently short-listed in the Nabarro Nathanson Technology Industry Awards 2003 in the category of 'Most innovative use of technology in a project'.

Summary

Newport City Council's innovative approach to adoption of some of the latest surveillance technology working alongside traditional equipment, appropriate resourcing of a centralised control centre and onsite patrolling via the wardens and caretakers; has all worked together to create a surveillance solution for Newport schools which is saving each school thousands of pounds per year and improving staff morale markedly. More accolades are likely to come Newport's way this year as the word is spread. Other councils across the UK are already looking at the same model to resource similar schemes in their regions.

-ends-

Further reading:

1. For further information on the government's funding of CCTV projects, go to <http://www.crimereduction.gov.uk>
2. For further information on Data Protection Act 1998 and its implications on CCTV systems and their recording go to <http://www.dataprotection.gov.uk> and <http://www.crimereduction.gov.uk/cctv9.htm>
3. For further information on the Freedom of Information Act 1998 go to <http://www.hms0.gov.uk/acts/acts1998/20000042.htm>
4. For further information on the Human Rights Act 2000 go to <http://www.hms0.gov.uk/acts/acts2000/20000036.htm>
5. For further information on compression techniques including MJPEG: http://www.axis.com/documentation/whitepaper/video/video_compression_html.htm
6. For further information go to Police Scientific Development Branch's Digital Imaging Procedure v1.0 recently updated and available at <http://www.crimereduction.gov.uk/cctvminisite23.htm>. This guide for police forces rules that digital images files can be used in exactly the same way as conventional photography and video with written audit trails. Digital storage does not alter the admissibility of evidence, nor does the compression algorithm used to store and transmit the images. The quality of the image is the key consideration, compression ratios should be kept as low as possible to preserve quality on replay. The procedure gives three key steps to protecting the integrity of digital images – obtaining relevant authorisation, starting an audit trail as soon as it is known that images will be captured, and checking equipment routinely or at the start of any image capture. Details of how to manage an audit trail are included in this document. Details of how best to record to CD/DVD is also covered. WORM-type rather than CD-RW discs are recommended for example. It is also advisable to copy and replay software on the same onto each WORM recording to ensure that they can be viewed regardless of which device they are displayed on. Digital

'watermarking' is not recommended by the PSDB because it gives rise to the allegation of alteration of the original pixels. There are also recommendation for protection and storage of digital evidence

7. For additional reading on evidential requirements go to <http://securityweb.co.uk/ipfile/ipevidence.pdf>

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