

The products and services supplement for Police Review

Footprints lead to suspects

By Carol Jenkins

THE Forensic Science Service (FSS) has set up a database, which will for the first time ever, provide forces with valuable intelligence allowing them to link offenders to crime scenes by their shoeprints.

The database, which will be launched this month, will be available as a software package for forces to buy and to access via the secure Criminal Justice Service network.

Jonathan Goodyear, footwear sector leader at the FSS, said: 'Footwear is an extremely valuable way of linking crimes together and it is something that has so far been underused.'

'It is easy not to leave fingerprints and DNA at a scene but it is very difficult not to leave a shoeprint mark.'

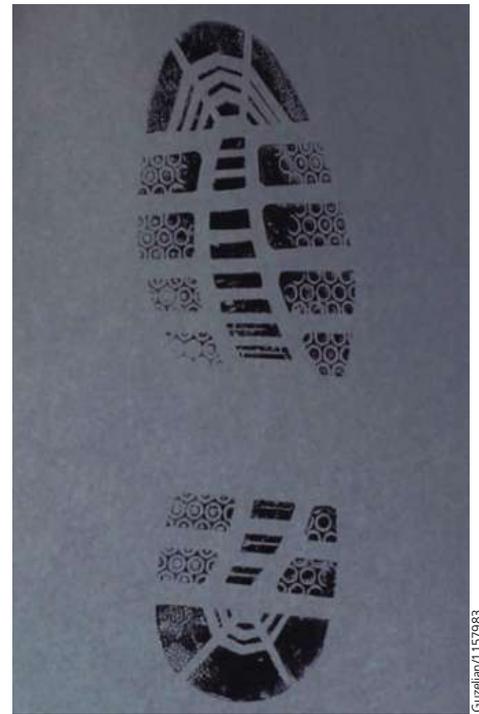
Mr Goodyear emphasised that shoeprint marks in themselves cannot identify the name of a suspect but they can link a suspect to a crime scene and are effective when used in conjunction with DNA and fingerprint evidence.

He said: 'Where the database will be useful is that very often you will find a burglar, for

instance, will wear the same pair of shoes to commit several crimes, so this allows us to effectively link the offender to a series of crimes.'

He explained that experts look at aspects such as the pattern, size and wear of the shoe and that although the majority of shoes are mass produced what makes each one identifiable is their 'unique damage feature' which could be anything from a scratch to an imprint made by gravel.

Shoeprint marks are found at half of all crime scenes and are the third most common type of evidence after blood and DNA. The Serious Organised Crime and Police Act 2005 (SOCAP) gave forces new powers to take imprints of suspects' shoes while in custody and to record this intelligence in the same way they gather fingerprint intelligence. They have already been used in a number of high profile cases including that of Damilola Taylor, where spots of blood on the shoe of Danny Preddie were used to successfully link him to the manslaughter of the 10-year-old boy in 2000.



Getty/115983

A footprint database will help officers to identify potential suspects

Head cameras allow officers to capture real time intelligence

USE of new lightweight head cameras by patrol officers in Warwickshire has seen a reduction in disorder and anti-social behaviour on the streets of Nuneaton and Bedworth.

The 'Robocams' are mounted to officer's helmets to help them record evidence as it happens. The compact digital cameras transmit images via a cable to a small VCR held in the officer's body armour. Once evidence has been gathered officers can take the cameras back to the station and footage can be projected onto a TV screen, allowing them to share intelligence in 'real time'.

The force has six cameras in use – three in Nuneaton and three in Bedworth. They have been funded through the Government's Tackling Violent Crime Programme.



Robocam images can be used in briefings

Insp, Steve Hall, from Warwickshire Police said: 'It was amazing just how quickly we saw a change in behaviour.'

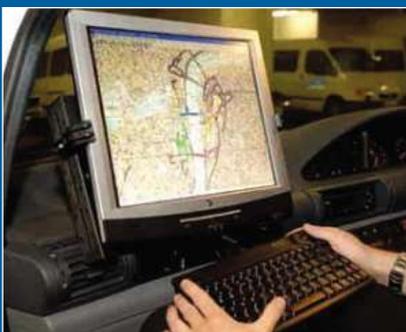
'The cameras are head-mounted so what officers see, you get. We have already had two sets of video evidence from the Robocams and magistrates will be able to see in real life exactly how the people behaved.'

The cameras can record up to four-and-a-half hours of footage at once and store up to 120 hours of evidence, whereas editing of images cannot be done on the recorder, which ensures it is fit for evidential purposes.

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Rising cost of security

What is a fair market price for security? Any attempt at an answer will vary hugely depending on the size and nature of the thing you are trying to secure.

Yet it is a question that organisations, communities and governments are having to quantify. Given the present perceived high nature of threat from terrorism and other forms of crime, making anything secure today, as opposed to 20 years ago, comes with a high price tag.

Conceivably there is no limit to the amount that could be spent on consultancy, manpower and new technology. And what is the right mix of public and private provision?

For example when the London 2012 Olympics bid team put their case to the International Olympic Committee (IOC) they went armed with a detailed security and risk assessment put together by the Met and private contractor, G4S.

The news that London had made a successful bid for the Games was then almost immediately overshadowed by the July 7 bombings in the capital. The risk assessment changed and so did the costings.

Nobody yet knows how much it will cost to keep the London games secure, but the amount spent on security is increasing all the time.

In November the EU announced its intention to try and establish a security template for such events in order to try and reduce costs and encourage best practice. This may well be completely impractical but it is also an attempt to wrest the security equation away from the powerful grip of market forces.

Gary Mason, editor, *Police Product Review*



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NEWS IN BRIEF

Geographical systems agreed

THIRTY seven police forces have signed contracts with Hemel Hempstead-based company Northgate Information Solutions to continue using its geographical information systems (GIS) until 2010. The technology allows police forces to build up detailed crime maps, which can then help officers to identify particular crime hotspots and the underlying causes of crime, along with related trends and patterns.

Keeping an eye on valuables

THE Trace database which contains information on lost and stolen items has now been made available to the public free of charge. It is already used by law enforcement agencies worldwide as well as auction house dealers, insurers and pawnbrokers to provide an online tool for anyone dealing with valuable items to confirm whether items have been reported lost, stolen or looted. Trace also allows police to update the list of lost or stolen items.

Force hires non-police officers

WARWICKSHIRE Police is now one of four forces to use non-police custody officers supplied by Reliance. The company employs over 330 custody assistants who operate throughout 27 custody centers within Warwickshire, Sussex, Thames Valley and West Mercia Police areas. Reliance won a four year contract to provide custody officers for Warwickshire Police based at custody suites in Nuneaton, Rugby and Leamington Spa.

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DNA database network

Profile exchange between the EU member states gives vital information on travelling violent offenders

A TREATY between eight EU countries that allows the exchange of DNA profiles held on criminal databases is helping with the investigation of unsolved crimes.

The Prüm Treaty, was signed by Belgium, Germany, France, Luxembourg, the Netherlands, Austria and Spain, and under the terms of the treaty Austria and Germany have been able to check the contents of their national DNA databases against each other since December 2006.

This is the first time that the two countries have granted each other access to their national police databases on a hit/no hit basis. In just six weeks of cross checking nearly 3,000 matches were found.

'On the basis of these results, where untraceable people could be matched with a person in the database, police investigators are now able to match hits with

unsolved crimes,' said EU Federal Minister of the Interior, Dr Wolfgang Schäuble.

'These figures are proof that the idea behind the Prüm Treaty to create a network of existing national databases is a simple, yet very effective means to fight cross-border crime and international terrorism.'

The exchange of information under the Prüm Treaty also extends to granting other member states access to national fingerprint files and motor vehicle registries.

Dr Schäuble said that member states will begin to share this information in the first half of this year. He added that all EU members states should be able to benefit from the treaty. A proposal has been put forward by the German presidency, along with the other Prüm signatories and the European commission, to integrate the treaty into EU law.

Under the terms of the treaty, police services may launch a query in the data system of another member state to find out whether it contains data concerning a specific profile, and are automatically informed of the result within a matter of minutes.

Further information, such as personal data, can then be obtained in the course of mutual legal assistance.

The treaty also contains provisions for the exchange of information for counter-terrorism and data about travelling violent offenders, such as football hooligans and violent protestors.

It also provides for various types of joint operations such as patrols and cross-border intervention to avert immediate danger, and for granting executive powers to police officers of other contracting states.

No hiding from the radar



Prism 200/117106

A 'through wall' radar evaluates the position and movement of people in rooms

A RADAR sensing device that reduces the risk involved in tactical entry, siege or hostage situations has been launched.

The prism200 is a briefcase-sized 'through wall' radar sensing device and employs

software to evaluate the position and movement of people in rooms and buildings. The product, launched by Cambridge Consultants, is useful in a number of situations where it would be otherwise impossible for officers or special forces to gain such intelligence.

Capable of working to distances of up to 20 metres, Prism200 incorporates three tools including a portable radar device; smart radar signal processing that senses human movement and position; and data presentation in forms to suit the user, including plan, elevation or 3D views.

Alan Wiltshire, product manager, said: 'The device helps tip the balance in favour of security operatives.'

CCTV camera images come of age

A TOTAL of 85 per cent of members of the CCTV sector have seen their business increase over the past 12 months according to research by the British Security Industry Authority (BSIA).

The remaining 15 per cent of those surveyed said their business had remained the same.

Pauline Norstrum, BSIA CCTV section chairman, said: 'The London bombings saw

CCTV come of age as it proved that it is now an integral part of any policing operation because it can track down criminals within days.

'If you look at the footage that was published following the bombings you will see that gone are the days when the images are just unidentifiable figures and what you are now getting is high quality images that can be used as reliable evidence in court.'



Metropolitan Police/117107

7 July 2005 Met commander has been appointed as a senior consultant for G4S

Former Met chief takes on new role

G4S Security Services (UK) has appointed Mick Messinger, a former commander in the Met, as a senior consultant.

Mr Messinger, who was responsible for public order policing, emergency planning, officer safety and counter-terrorism, will provide advice to both the management and specialists across the company.

During his time with the Met, Mr Messinger co-ordinated the multi-agency response to the 7 July 2005 terrorist attacks on London and the counter-terrorist response to the 11 September 2001 attacks.

Sensors combat gun crime

US forces use acoustic sensors to automatically detect gun shots and deploy officers to the scene

A SYSTEM to locate shootings and gun shots is being used by police forces in more than 10 US cities to help them tackle gun crime.

Using an array of small sensors in sites throughout the city, the ShotSpotter GLS can automatically detect and locate gunshots in seconds, enabling 911 personnel to dispatch police to the scene of a shooting far quicker than with any other method.

Police in Minneapolis were the latest force to install the system at the end of last year and officials in Boston are also considering installing it in a six square mile area where most gun crime takes place.

The Minneapolis project was initiated in an effort to address the 22 per cent increase over last year of incidents of police officers being dispatched to investigate shots fired.

Until now, local law enforcement agencies have relied on traditional street patrols to prevent gun violence, which often puts the safety of the public and police officers at risk.

If a gunshot is fired within the coverage area, the system will immediately notify the Minneapolis Emergency Communication



Acoustic sensors can automatically detect the location of a gunshot

Center (MECC) which will dispatch police officers to the scene.

'The gunshot location system will reduce gunshot-related injuries and deaths, and allow officers to get illegal guns off the streets' said Timothy Dolan, Minneapolis chief of police.

According to the manufacturers, other US cities have reported a significant decrease in the number of shots fired after installing the system. In Redwood City, California, the authorities reported a 75 per cent fall in firearms discharges.

Cross-border data swap is 'vital project'

DATA sharing between police and justice agencies within the EU does not require new or centralised systems to be procured, a meeting of European Justice ministers was told last month.

Brigitte Zypries, federal minister of justice for the EU, told the meeting in Dresden that providing comprehensive electronic access to the justice sector throughout Europe was an ambitious but vital project.

Differences in legal systems in the individual member states and technical incompatibilities meant that judges and lawyers were seldom familiar with cross-border issues.

But this could be solved without building expensive bespoke systems, she added.

'In my view, solving these questions does not require the creation of a new central infrastructure at the European level. Information technology systems that function well and that meet the special

requirements of national legal systems are already established in the member states to support the justice sector.

'The aim should be coordination and networking among the individual member states' systems, which will continue to operate in a decentralised manner.'

She said that a good example of this approach is a project conducted by Germany, France, Spain, Belgium, the Czech Republic and Luxembourg to network national criminal registers (see page 4).

Since 2006 information on the registers held by these individual states has been electronically exchanged on a routine basis.

'This project's success proves that it is possible to ensure the fast and efficient cross-border exchange of information without having to make major alterations to national IT systems,' Mrs Zypries said.

Digital network to improve safety

THE MUNICIPAL police force in Nimes, France is to use Sepura TETRA terminals within the framework of a digital geo-localisation service implemented by the French company SyS&COM.

In 2003, Nimes employed a new digital radio communication network based on the TETRA standard. This was driven by the need to improve radio communication between city departments, and the gradual implementation of new services aimed at improving the job of the city's administrators and specifically user safety.

The technology will be used for flood monitoring and vehicle location via GPS. The manufacturers said that Sepura mobiles and hand-held radios indicate the accurate location of their users even in built-up areas and inside most buildings, thus improving the safety of police officers.

More time on the street

New scheme allows North Wales Police officers to access data on the street, saving time and money

A PILOT project run by North Wales Police to equip officers with mobile devices has been extended after figures revealed use of the technology has saved the force £636,000 – equivalent to 29,000 productive hours.

The BlackBerry devices are networked to the force's Niche Records Management System (RMS) allowing officers to access crucial information quickly and identify and apprehend criminals.

Test results from the pilot project showed that using BlackBerrys to access Niche RMS resulted in officers spending almost one hour more per shift out of the police station and in the community, as well as significant reductions in time officers spend escorting suspects to the station.

Sgt Aled Eynon, quality assurance officer on the project, said: 'The officers that already have BlackBerrys will have 3,300 more productive hours at their disposal or the

equivalent of two officers. Police visibility and crime solving rates have improved and the force looks forward to continued success.'

The force first implemented the pilot project in 2002. Earlier last year, 300 BlackBerrys were distributed to a mix of users and based on the pilot's success additional BlackBerrys are being deployed.

The force has three main goals with its mobile data access initiative, which include getting officers onto the streets, a reduction in travel time and more effective, information led-policing.

John James, director of operations and business development for Winnipeg-based company Niche Technology Inc, said: 'Combining Niche RMS with mobile data solutions such as BlackBerrys provides enhanced access to information and delivers it where operational staff need it most – on the street.'



North Wales police/117093

The mobile device helps save officers' time

Nine other forces are also using the system, including Merseyside, Cheshire and Wiltshire.

New grant will help data technology become an essential tool for officers

THE Scottish Executive has awarded a £388,000 grant to a data specialist company to conduct mobile technology development for UK forces and government departments.

Glasgow-based company Beat Systems has been given the money to allow it to expand its specialist in-house skills and develop the concept of mobile data technology. The firm already supplies the technology to British Transport Police, Strathclyde and Cheshire.

The money comes from the Scottish Executive Spurplus programme, which provides grant support for expensive leading edge technology development in areas such as telecommunications and biotechnology.

Roy Hawes, commercial director of Beat

Systems, said: 'The award is critical to the successful rapid development of this radical technology. With this funding, the benefits that the mobile technology brings to the police forces and local authorities will increase tenfold in a shorter lead time.'

The mobile data system is a fully integrated hand-held and vehicle mobile system which allows officers on the beat to perform live searches and interrogate multiple national and local police systems.

British Transport Police is the first force to roll-out the technology fully. Paul Robb, assistant chief constable of the force, said: 'Mobile data has the potential to be the most significant advance since foot patrol officers were given radio communication.'

Compact ANPR camera

A NEW compact traffic enforcement camera has been launched by Gatsometer (pictured right). According to the manufacturers, the GS11 camera provides both enforcement and Automatic Number Plate Recognition (ANPR), and can capture images across up to four lanes of traffic. A burst rate of four images per second ensures that all offending vehicles are captured, even in high density traffic.



Gatsometer/117102

System helps eliminate forms

THE Police Service of Northern Ireland has introduced a covert mobile surveillance tool that manages requests for communications data such as mobile phone, internet and postal records.

The product abmpegasus Telecoms, which was developed by ABM, is a piece of software designed to manage requests for accessing and analysing an individual's communications data, as required under the Regulation of Investigatory Powers Act (RIPA) 2000.

The company said it has helped the force eliminate hand-written forms, reduced time-intensive paperwork and largely automated the request approval procedure.

Since the beginning of October 2006, when the product was introduced, the force has reduced the time taken to manage aspects of the process from half a day to 20 minutes.

Det Insp Kevin Geddes, of the PSNI, said: 'Previously the process of requesting authorisation to access telecoms records was very paper intensive and would result in documents having to be physically signed.'

'Now the process has dramatically speeded up the administration time.'

"The Dream Policing Team were excellent and helped the force review and improve homicide investigations."

ACC Adam Briggs, Cleveland Police

"Thank you so much for the thorough presentation and report consequent upon your completion of your review into the sudden death of XXXX. The work of your team has been thorough, professional, and helped by providing the necessary independent reassurance in this tragic and difficult matter.

We would use you again."

ACC John Crosse, Humberside Police

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Det Supt Tony Hutchinson, Cleveland Police

"The course notes prepared by Dream have proven invaluable. They are clearly distilled from decades of experience in the investigative processes. I have used them as a template to undertake the reviews and to prepare the final reports."

Bill Clarke, Senior Investigator, IPCC

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Forces work towards safer in-car prisoner transport

Increased safety measures aim to protect the welfare of officers and prisoners transported to custody

FORCES have been looking into the safety of officers while transporting prisoners to custody, in response to the tragic death of Northumbria officer, PC Joe Carroll.

PC Carroll and a colleague were taking a prisoner to custody in a police car when the prisoner grabbed the handbrake causing the vehicle to crash.

As a result of these serious safety issues, forces are investigating alternative ways to transport prisoners more safely and securely. Scottish-based company, Crown Conversions, is working with a number of forces, including Durham, North Yorkshire, PSNI and Cambridgeshire Constabulary, to supply them with specialist cell conversions which are fitted to vehicles.



The transport cells help to keep officers safe

The company has also supplied conversions to Strathclyde Police, Scotland's biggest police force, for the past three years and successfully retendered for the contract, which it won in December.

The cells are independently built of the vehicle, allowing the unit to be recovered should the vehicle be written off.

The cells are also fully welded cubes so there are no weaknesses from bolts and rivets, the makers claim.

It is lined with polycarbonate spit screens and power coated in white, which makes it extremely hard wearing and allows officers to see any contamination in the cell, therefore reducing the health risk to the officer and prisoners.

David Greer, managing director of Crown Conversions, said: 'More and more forces are starting to use this type of vehicle for prisoner handling as it is considered safer for the officers involved.'

Charger gives faster access to data

NORFOLK Police is one of six forces using a mobile phone charger that can help power the majority of makes of mobile phones in just 10 minutes – allowing for the rapid recovery of critical evidence.

The force is using the product in response to the fact that growing use of mobile phones in crimes presents new challenges for them to recover evidence in a fast, safe and convenient way.

The AnyFill Rapid Battery Charger, distributed by Hertfordshire-based



The battery charger can power up the majority of mobile phone makes

company TeleAdapt, is a portable device that can be used as a support tool in mobile phone forensic examinations by allowing the crime lab to quickly re-charge a mobile phone needed as evidence in any investigation.

Robert Holliday, an engineer with Norfolk Police Tactical Support Unit, said: 'Mobile phones are now an everyday part of crime scenes in our force, particularly in relation to road traffic incidents.

'My job has been made so much easier since we started using the charger simply because I can now charge the phones in half the time it took me before.

We used to spend valuable time hunting around for specific chargers, sometimes having to pay up to £15 a time for them, so in the long run we'll hopefully save money as well.

The AnyFill charger is compatible with more than 95 per cent of existing mobile phone batteries worldwide, the manufacturers say.

It is also currently being used by Grampian, Hertfordshire, Norfolk, Nottinghamshire, Greater Manchester Police, Derbyshire Constabulary, Forensic Science Service and the National Mobile Phone Crime Unit.

Crime patterns easier to detect

LOCATING crime hotspots is being made easier for 30 forces across the country with the use of Analyst's Workstation, software that works out the most common items being stolen and identifies potential offenders.

Manufacturing company i2 says it is particularly useful for high value goods such as satellite navigation systems, mobile phones and MP3 players.

The product incorporates the Analyst's Notebook, iBase and Dataminer which allows intelligence analysts to search data across disparate databases within their organisation giving them a full picture of crime in the area.

Rosie Smith, senior product manager, said: 'Analyst's Workstation allows forces to quickly gain insights into crime patterns and trends, which in turn means they can effectively allocate resources and tackle the problems they face.

'Criminal activity can be mapped to reveal hotspots and statistical information can be explored further, providing officers with detailed crime analysis, strategic reports and bulletins, allowing them to focus resources on areas of concern and easily assess operational results.'

Scanning the streets

Portable numberplate recognition trial gives community officers the upper hand over criminals

NORTHAMPTONSHIRE Police is taking part in a national trial of new technology that could bring the benefits of Automatic Number Plate Recognition (ANPR) to community police officers and community support officers.

The Police Standards Unit is funding the trial, named Project Roman, which will test the potential of a new 'palm pilot' that is portable but has the same capabilities as a traditional ANPR unit.

The force has been provided with 20 hand-held units that will be used by community teams, police officers and CSOs while they are out and about.

Using the palm pilot, officers can check suspicious vehicles to see if they are stolen or of interest to the police for any other reason. The device has a built-in camera that officers can simply point at a car to scan and check the numberplate. The numberplate can also be input manually on a keyboard that appears on the screen. Any vehicles that are found to be suspect can then be dealt with quickly.

Within days of starting the trial, a CSO working as part of the Castle safer community team in Northampton identified a

stolen VW van by using the palm pilot.

The device can be used to help with other community problems, such as tracing the owners of vehicles who regularly park dangerously, or persistently drive anti-socially.

Insp Sarah James, who is managing the trial in Northamptonshire Police, said: 'ANPR is a proven technology that operational officers use every day to target priority crimes and criminals. This device has the potential to bring this technology out into the community, so that CSOs in particular can quickly check vehicles that may be stolen and deal with them rapidly.'

The device can take and store biometric information such as fingerprints and photographs from people who are stopped by police.

Any such data collected in this way will only be used for the purposes of the trial and stored for just three months so that researchers can explore how this technology could be used in the future.

The forms that police officers and CSOs are required to give to people they stop can also be printed out on these palm pilots using a small portable printer.



Northamptonshire Constabulary/117104

The palm pilot can function as an ANPR unit



Northamptonshire Constabulary/117104

Officers can check suspicious vehicles while out on patrol in the community

Biometrics used to secure borders

A DATABASE of biometric information to be taken from all non-EU citizens resident in Britain is among the measures announced by the Government's UK Borders Bill in January.

The database would form part of the National Identity Register for the ID scheme.

From 2008, foreign nationals benefiting from living in the UK will face additional obligations, including having to apply for a biometric immigration document.

Failure to obtain biometric ID will put the person at risk of losing their leave to remain in the UK and/or a civil penalty of up to £1,000.

The Home Office claims the use of biometrics, including fingerprints, iris scans and facial recognition, will help secure Britain's border and crackdown on illegal working and organised crime.

Between January and May 2006 there were more than 7,000 positive hits by enforcement officers using mobile fingerprint

equipment. According to the Home Office, more than 51,000 people have enrolled in the Government's secure immigration scheme Iris, exceeding the 40,000 target set out in the Immigration and Nationality Department review.

Liam Byrne, Immigration Minister, said: 'Compulsory biometric identity for foreign nationals will help us secure our borders, shut down access to the illegal jobs, which we know attracts illegal immigrants, and help fight foreign criminals.'

Biometric ID visas are currently issued at 42 posts abroad and by 2007 that figure will have been expanded to 150. By 2008 we will have biometric ID requirements in place for everyone outside the other 28 European Economic Area (EEA) nations coming to the UK for work, study or to stay for longer than six months, plus anyone coming to visit from the 108 visa nations.

Sale 'will not affect Airwave'

PITO has issued assurances that any future sale of the current Airwave system will not affect the delivery of service to forces.

This comes after speculation in the national media that the Australian bank, Macquarie, expressed an interest in the business to Telefonica, O2's Spanish owners.

Martha Wooldridge, director of communications at PITO, said: 'Last year's sale of O2 to Telefonica did not adversely affect the quality of the Airwave service.'

'With the help of its partners and advisers, PITO intends to use the protections contained in the Airwave contract to ensure that any future sale has no adverse impact on the day to day operational delivery of the service.'



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Mike McBride, editor of Jane's Police and Security Equipment, reviews products such as an observation helicopter and covert body armour

Intelligent search software

A NEW system has been developed to enable analysts to search and use information from previous investigations that may contain data vital to current enquiries.

The i2 ChartExplorer allows a fast yet thorough search of analysis charts and documents by browsing files in their system location and providing users with comprehensive answers to simple questions.

The intelligent search mechanism gathers results which are spelt similarly or are typos and sound alike, therefore reducing the likelihood of overlooking or missing essential information. The system is also aware of common name variations and nicknames.

The results from a search are ranked and presented in order of relevance and can also be previewed in their original document

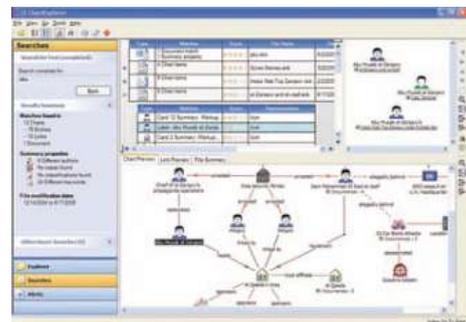
to help determine their relevance.

The i2 ChartExplorer automates repetitive and time consuming tasks associated with tracking information on a subject and alerts users to changes in information.

This allows analysts to spend more time analysing the data and less time finding information.

The software enables analysts working on the same or related projects – viewing the same files – to keep in touch with ongoing investigations and share information. As i2 ChartExplorer is built onto the user's existing file system, there is no need to introduce a new server or database and all files can remain in their original location.

As well as integrating with the existing security to ensure no new security issues



The i2 ChartExplorer allows thorough searches of analysis files

are introduced, the i2 ChartExplorer allows users to search and explore i2 Analyst's Notebook, i2 Visual Notebook and i2 TextChart files for information. It also supports Microsoft Office, PDF, plain text, rich text, HTML and XML formats.

Forensic spray and coding system wages psychological war on criminals

A SUSTAINABLE criminal deterrent has been developed to tackle crimes such as burglary, robbery, theft from motor vehicle, hate crimes and domestic violence.

The SmartWater Strategy is based around an holistic approach which uses high-impact messages aimed at both the criminals and the general public and high-visibility



The DNA-style chemical trace marks the skin and clothing of the criminal

searches and covert operations – all backed up by a co-ordinated media strategy.

The strategy is complemented by two products; the SmartWater Forensic Property Coding, which marks property with a DNA-style chemical trace; and the SmartWater Index Spray System, which complements the property-coding schemes to target and convict persistent offenders.

The system sprays intruders with an invisible forensic liquid, which marks the skin and clothing of the criminal and provides irrefutable forensic proof linking the criminal with the scene of the crime.

SmartWater, which has previously won the Prince of Wales Award for Innovation, offers support through a national police liaison team, which provides free training and consultancy.

Helicopter camera aids surveillance

AN OBSERVATION helicopter has been designed to collect and store data through an integrated video camera and a GPS.

The Infotron Drone IT 180-5, which has counter-rotating rotors, is available in liquid fuel and battery-powered versions and is suited to observation, surveillance and location for both military and police missions.

The device can be fitted with a gyro-

stabilised or fixed video camera of variable focal length with a real-time link and on-board storage.

The drone can be flown manually or pre-programmed and is suited to border control, identification of clandestine bases, laboratories or narcotics growing areas, site surveillance and location of pollution sources.

Comfort armour

A COVERT body armour vest has been designed for officers who need to wear them during long operations.

The Comfort II Discrete has two adjustable side fastenings and a flat shoulder area, which is made from breathable fabrics. A female version with an anatomically formed front panel is also available.

The side fastenings have double elastic straps and the armour is cut for freedom of movement during typical police activities, with armour panels providing full side protection.

The outer shell is made from water-repellent fabric, while the body side has a moisture-absorbing cotton liner for dealing with perspiration. The protective panels are sealed in a waterproof envelope and further encased for protection against humidity, ultraviolet light and mechanical stress. The protective inserts are fully interchangeable with overt covers made by Mehler Vario System GmbH in order to provide a vest design that suits different roles as the situation demands.

There are 50 male and female standard sizes with made-to-measure and special sizes also available.

Details of these new products, and thousands of others, are available in Jane's Police and Security Equipment reference book and online at <http://jpse.janes.com>

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Decoding the web

International growth in the use of internet telephony and encrypted data is causing concern within the law enforcement community. Gary Mason reports

Surveillance operations mounted by police and the intelligence agencies have proved to be highly successful in targeted operations against major criminals and terrorists.

But they are both expensive and manpower intensive with limitations on what orthodox static and mobile surveillance teams can achieve.

This is because major criminals tend to be extremely surveillance conscious and once they suspect the police are targeting their activities they immediately change their behaviour and tactics.

In such circumstances, instead of putting officers 'on the ground' with the risk that they will be spotted by the target criminal, policing agencies resort to monitoring and interception.

The explosion in the use of mobile phones and other digital communication devices over the internet has been a double-edged sword for law enforcement.

On the one hand, it has provided surveillance teams potentially with more opportunities to monitor criminal activity and gain evidence. But it has also given criminals the technical means to adopt counter-surveillance measures and cover their tracks.

The use of encryption for both mobile communications and on files of data has become common practice. For example in 1996, a police operation culminated in the arrests of several leading members of a Northern Irish terrorist group and the seizure of computer equipment containing encrypted files. The files held information on potential terrorist targets such as police officers and politicians. The data was eventually retrieved but only after considerable effort.

Unbreakable encryption

The potential of encryption technology to frustrate police surveillance operations has been recognised at government level for six years. In 1999, the Cabinet Office's Performance Innovation Unit's task force published a report on encryption and law

enforcement. The report warned: 'The widespread use of encryption means that it will become increasingly difficult for law enforcement agencies to make use of communications when they are lawfully intercepted.'

'The problem is urgent. There is a general acceptance that encryption will become a more generic technology and thus integrated into an ever larger number of applications and products. For example, there are indications that some internet service providers in the UK will make strong encryption tools available on their introductory CDs, giving many internet subscribers the opportunity, at little cost to themselves, to use strong encryption techniques for both their stored and communicated data.'

Much of the encryption used when communicating or storing data will be

'The use of encryption for mobile communications has become common practice'

effectively unbreakable by the authorities.

Digital encryption keys are classified according to how many bits they have. A 128-bit key would take a decrypter 10,000,000,000,000 years to try all the possible combinations.

The advent of internet telephony and of encrypted mobile phones also has the potential to reduce the information that can be derived by law enforcement agencies from interception under warrant.

One of the major areas of concern that police and security agencies have about this technology is Voice Over Internet Protocol (VoIP) Services.

Voice and data are increasingly converging onto a single Internet Protocol (IP) based transport network.

Consumer demands

The attraction for consumers is that internet telephony service providers can provide regular and enhanced phone line services – often at substantially lower prices than land lines or mobile network services.

Most telephone calls use the (circuit switched) Public Switched Telephone Network – where a path is opened across the network between the two people making a call for its duration. In an IP communication however, the call is divided into numerous packets of data which are sent individually via a number of different routes and reassembled at the other end.

With ordinary land lines and mobile phones a register of the caller and the person called is readily traceable. But this is not the case with VoIP calls that bypass the normal route of internet service providers. And police and security agencies in the US and Europe fear that this is exactly the route that organised criminals and terrorists will take.

Internet telephony gives callers the ability to make voice calls over any IP connection, particularly broadband, using VoIP. IP communications also enable a multi-media set of advanced services, including video, high definition sound, instant messaging and presence (ability to see who is logged on to a network).

VoIP services emulate the telephone network on the internet, based around dialling numbers as you would with an analogue phone. But native internet services do not work this way. A caller can simply enter a URL or other address, that is looked up in the Domain Name System to be routed. Clicking on another person's phone URL via an internet browser connects the caller directly to the other person's phone or their phone switching device (PBX).

The Cabinet Office task force report also notes: 'Operators wishing to attract new customers or to make additional revenue from their existing customer base are likely to offer encryption services as value added services.'

With the emergence of VoIP technology, an international battleground is emerging between the industry, consumer groups and law enforcement agencies over how the industry should be regulated and monitored.

For example, by 2010, all internet telephony companies in the EU will be required by Directive 2006/24/EC to store details of internet phone calls, though not their content.

In the US the FBI has fought a long series of legal battles in an attempt to gain access to network traffic. The Federal Communications Commission (FCC) is an independent US government agency, directly responsible to Congress. It is responsible for regulating interstate and international communications by radio, television, wire, satellite and cable.

The FCC is pressing ahead with a plan to force all providers of internet access to allow monitoring of internet telephony. Broadband providers and internet phone services have until spring this year to follow a new and complex set of rules designed to make it

easier for police to seek wiretaps, US federal regulators have ruled.

In the UK, Ofcom, the telecommunications regulatory body, has been charged with coming up with concrete proposals for a regulated VoIP industry.

In May last year, the Association of Chief Police Officer's (ACPO) Information Management Business Area Communications Portfolio submitted a detailed response to Ofcom's draft recommendations.

It warns that VoIP communications outside those supplied by internet service providers could pose a serious threat from criminality.

The report notes: 'Location information for the majority of fixed location services should not be an issue and can be covered by simple registration of the installation address.'

'However, Naked DSL or Nomadic systems, which are those that are more likely to be used for criminal or subversive purposes, will present a potential threat to the well being of citizens under the current proposals.'

A major implication of an extension of the unregulated VoIP industry, identified by the police, is that people using the technology will not have automatic access to the emergency 999/112 networks (see box below).

But ACPO stresses that the ramifications of the current Ofcom stance extend 'far beyond the impact upon emergency service provision or crime prevention and investigation.'

'There are numerous other issues to be considered within this debate that would again point towards the need for Ofcom to adopt a more robust stance in respect of the regulation of VoIP services.'

The Cabinet Office report warned that there would be opposition to surveillance of internet-based services and this is now proving to be the case.

'The task force noted that there is a general public acceptance of the use of telephone and mail interception under warrant with the aim of protecting society,' it said.

'Yet there appears to be a very strong aversion in some quarters to law enforcement agencies having similar warranted access to the electronic communications that are the common currency of the internet community. The task force believed it was important that the development of electronic communications which promises many benefits to businesses and individuals should not also give assistance to those who are engaged in serious crime.' ■

HOLD THE LINE

One of ACPO's ongoing concerns about VoIP technology is that members of the public using such services will not have guaranteed access to the emergency 999 network. Since 2004 the association's communications portfolio group has consistently outlined these concerns to Ofcom and remains unconvinced that they are being taken seriously enough.

In its May 2006 response, ACPO says its concerns have been diluted 'in favour of the desire to allow the market forces of supply and demand' to determine which of the services currently incorporated within PSTN (Public Switched Telephone Network) telephony will be made available on VoIP systems. It added: 'ACPO would strongly argue that the provision of access to the emergency services via 999 (or 112) should be a prerequisite of any publicly accessible telephony system, irrespective of its platform, and should not be an optional extra.

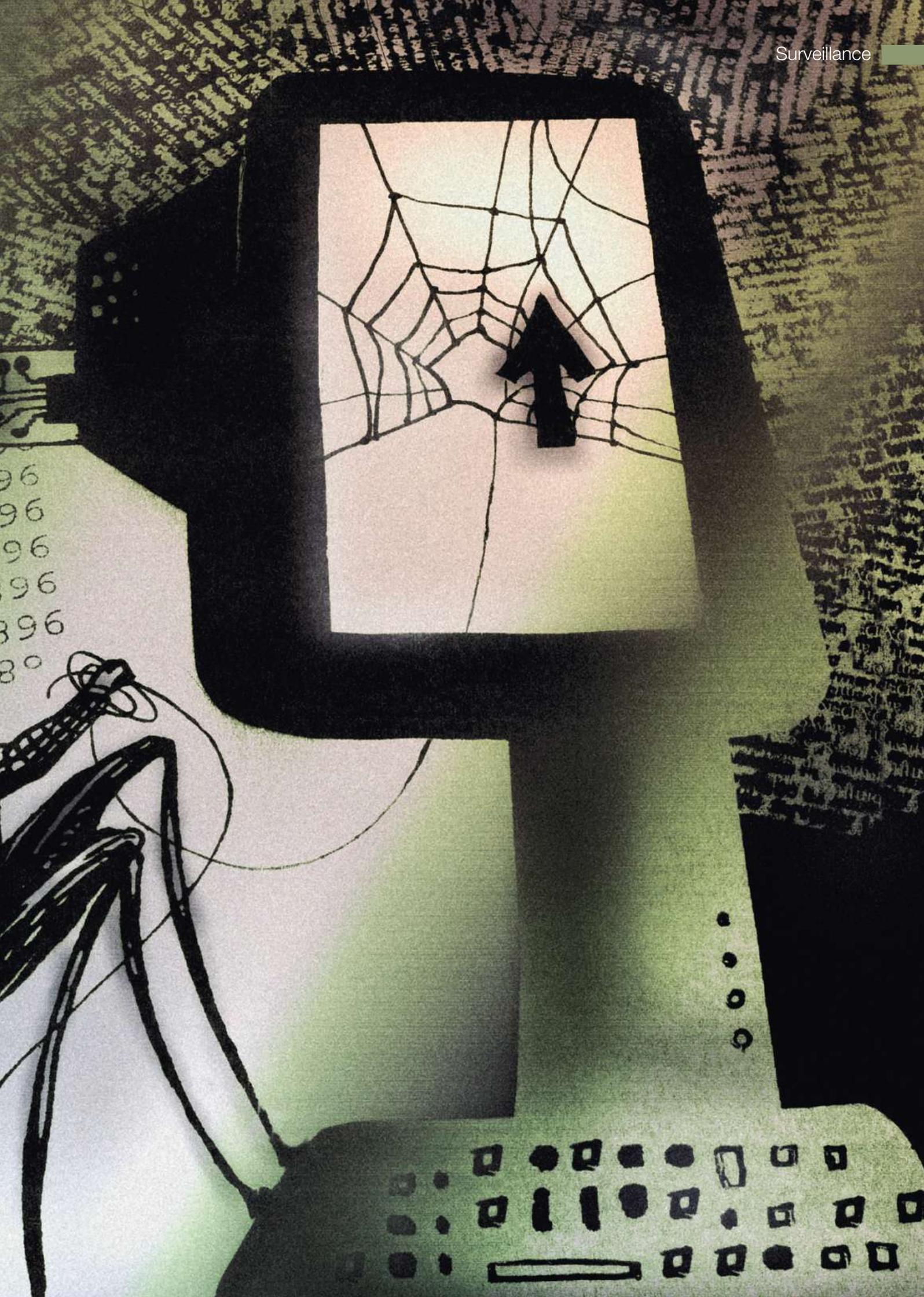
'The 999 emergency number is enshrined within the culture and psyche of the UK population, and has fostered an underlying assumption based on fact that when our citizens dial 999 (or 112) for the emergency services they get an instant response. There are, on rare occasions, instances when the emergency call handling structure fails, with the consequence that the public and media demand an explanation for the failure and assurances that such failures will not be repeated.

'Ofcom intends to rely on the incentive of providing number portability as being sufficient to encourage suppliers to elect to include 999 access in their services. ACPO is not convinced that this will give any certainty whatsoever and will only serve to fragment the market and result in consumer confusion. It is likely that the more established and responsible providers will voluntarily provide emergency number access, but the more transient providers looking to cherry pick services for short term gain will not.'

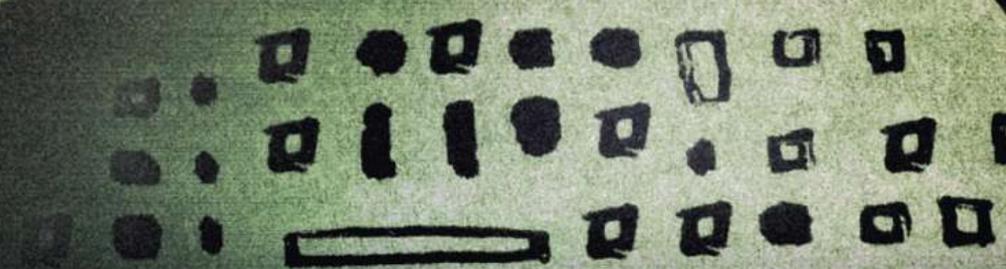
Ofcom's interim solution is for the VoIP customer to have a notice on the handset stating that access to 999 is not available.



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Tough technology

In the future nanotechnology may provide materials which will increase the protection offered by police body armour. Gary Mason reports

Getty Images/117109

West Yorkshire PC Sharon Beshenivsky was killed in November 2005 when a bullet passed through the edge of the armour she was wearing.

At the trial of her killers in October 2006 at Newcastle Crown Court, a ballistics expert, Dr Philip Alexander, said that the fatal shot had passed through the corner shell of the armour she was wearing, which was not covered with ballistic-resistant material.

In a second shooting in February 2006, probationary Nottinghamshire PC Rachael Bown was seriously injured when she was shot in the abdomen, below the area covered by her force-issued vest.

Following that incident, Alan Simpson, local MP and David Davis, the Shadow Home Secretary, called for a review of the effectiveness of police body armour.

Yet the reality is that both of these officers were wearing armour that is specifically

designed for a civilian policing role and a generalised threat assessment – that of sharp edged weapons and low to medium calibre handguns.

Specialist firearms officers and combat troops have access to kit that provides a much greater range and depth of protection, but this would be completely incompatible with the requirements of an eight-hour policing shift. It is also designed to be worn by people who are extremely physically fit.

These systems start with a fabric vest similar in size and weight to that worn by most UK police officers. Soft panels can then be inserted to provide greater protection and there are also detachable elements to protect the neck, throat and groin. Ballistic plates can also be inserted to provide protection against high velocity rounds.

While these systems have undoubtedly saved lives, they are hot and heavy to wear, even for combat troops, and the materials used are bulky and have very limited flexibility.

The answer may lie in the developing field of nanotechnology. Put simply nanotechnology is the manipulation of substances at the molecular level so that they develop different properties and behaviour under stress.

In theory it should be possible to take man made fibres such as nylon and use nanotechnology to make them much stronger when they impact with other objects.

Research conducted by the Daresbury Laboratory in Warrington, Cheshire, Liverpool University and two US universities; Tuskegee in Alabama and Florida Atlantic, is analysing how the technology could be used to design new materials for the production of flexible, light-weight body armour.

They have found that when materials such as Nylon 6, polyethylene and polypropylene are infused with nanoparticles, or multi-walled carbon nanotubes, the new material has significantly improved structural strength.

While a workable prototype of nanotechnology body armour may still be years away, the science is already proving successful in developing new protective fibres in the commercial market.

UK-based company d3o Lab, which has twice been awarded funding by the Government, has developed d3o, a soft and flexible material that hardens on impact.

According to the manufacturer, d3o is produced by combining a viscous fluid with a polymer. 'It is a specially engineered material made with intelligent molecules. They flow with you as you move, but on shock, lock together to absorb the impact energy.'

The molecules are weakly bound and move very slowly under normal conditions, making the material very soft and flexible. However, a sudden impact causes the chemical bonds to strengthen and the molecules to lock together. The material becomes a hard, protective shield. This process happens in less than one thousandth of a second. The faster the impact, the more rapidly the molecules respond.

The material has already been used to make protective suits for the US and Canadian Olympic ski squads and other applications are in the pipeline, according to the developers.

Meanwhile in the US, the military is testing nanotechnology armour made from material which is impregnated with liquid silica.

The silica nanoparticles move around like a liquid under normal conditions, but when struck they lock together in a solid lattice-like structure that lasts only as long as the impact.

A lightweight vest designed for police has already been tested and has proved able to stop low calibre bullets and knives. ■



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Staying on track

Despite the cost benefits of electronic tagging, a House of Commons report has highlighted flaws in the Home Detention Curfew scheme finding that prison governors are unable to make informed decisions

Many of the highly publicised problems swamping the Home Office centre on the issue of offender management.

Not imposing custodial sentences or having to release prisoners early is an offender management issue, as is releasing the wrong prisoners. But whether offenders have been released because of a deliberate policy decision or because of some administrative error, the system stands or falls on the quality of information it has about the offender.

Technology clearly has an important role to play both in terms of giving police, prison and probation services quick and accurate access to the same information and providing the means to monitor offenders who are not in custody but still pose an element of risk to the public.

Cheaper alternative

Currently monitoring of offenders through the use of electronic tagging devices is the only

significant physical means of tracking such offenders in England and Wales at present.

At the end of last year, the House of Commons Public Accounts Committee published a detailed report on the programme, *The electronic monitoring of adult offenders*.

The report concluded that while electronic monitoring was a cheaper alternative to custodial sentences the inadequate sharing of information between different criminal justice agencies slowed down the process of possible early release under a Home Detention Curfew (HDC) order and made it difficult for prison

governors to make informed decisions about eligibility.

Under the scheme, prison governors are responsible for deciding whether prisoners should be released on Home Detention Curfew.

Home Office guidelines state that the cost benefits of HDCs should be weighed up against the potential risks of re-offending. Keeping offenders on electronically monitored curfews is some £70 cheaper, per offender per day on average, than prison. But the Public Accounts Committee report found that

prisoners released on HDC have committed 1,021 serious violent offences while on curfew. These include four cases of manslaughter, one murder, 562 assaults and 145 assaults on police officers.

Governor feedback

The report concluded that governors did not have at hand all the information necessary to make an informed decision.

'Governors are not provided with feedback on whether the prisoners they have released had successfully completed their curfew, even though this could help to inform future decisions,' it said. 'Lowest risk offenders are most likely to be released early on HDC. However, some offenders who had committed indictable offences could be released early if a more thorough assessment indicated that they posed minimal risk.'

The report also found that the Home Office does not monitor offences committed by offenders on Curfew Orders.

Another weakness in the system identified in the report is that the majority of prisons participating in the electronic monitoring early release scheme did not have access to the criminal records held on the Police National Computer to check whether individuals were eligible for release.

Only 44 of the 113 prisons that release prisoners on HDC have access to the PNC. The 69 prisons without access have to request the details from their nearest prison with access to the PNC, which then posts the details to the requesting prison.

'This has introduced additional delays into the assessment procedure,' the report said. 'The Home Office is liaising with the police service over improving access to the PNC.'

Poor information sharing between prisons made the system unduly bureaucratic, the Public Affairs Committee report found.

When prisoners were transferred between prisons, their security files are transferred with them. Other records, however, are not routinely transferred with prisoners, including their Home Detention Curfew eligibility assessments.

'As a result, some assessments are wholly or partially repeated, increasing resource usage and delaying release of prisoners under HDC,' the report stated.

In the long term, the Home Office hopes to eliminate this problem by making all prisoners' full records available electronically to all prisons by rolling out the National Offender Management Information System.

In a sample reviewed by the National Audit Office, 52 per cent of prisoners eligible for

Home Detention Curfew were released after their eligibility date.

The Public Accounts Committee said this was an unacceptable waste of resources. 'If this performance was replicated across England and Wales, delays in releasing prisoners would cost £9.3 million in unnecessary custody costs. Delays occur when prisoners are given short sentences because prisons sometimes have as little as a month in which to carry out assessments before the eligibility date. When courts impose a short sentence, they should carry out the eligibility assessment for Home Detention Curfew at the time of sentencing.'

The Home Office successfully negotiated a 40 per cent reduction in the price of the contracts when it renegotiated with two suppliers.

The report states that the Home Office originally let three contracts to run electronic monitoring services. In April 2005 it re-tendered

'The Home Office successfully negotiated a 40 per cent reduction in the price of the contracts'

the service and awarded new contracts to two of the three original contractors. Contractors fit tags, supply and maintain equipment, monitor compliance with the curfew conditions and report breaches.

The Home Office now has real-time access to the contractors' databases which it can use to monitor the contractors' performance in any on-going HDC case.

The contracts included performance deduction penalties for failing to meet particular conditions. The Public Accounts Committee report said that Group 4 Securicor (G4S) Justice Services incurred around £100,000 of deductions during 2005/06. These deductions were mostly at the start of the new contracts in April 2005 and mainly for failing to call offenders within 15 minutes if they were absent from home for more than five minutes. Payments to Serco Home Affairs were reduced by £41,000 in 2005 for failing to meet performance targets.

Financial penalties

The report found that the contractors improved their performance after incurring these financial penalties.

It added that the Home Office should build on the successful use of financial penalties by making further use of them in other contracts with private companies.

'Contractors had improved their rate of reporting breaches from slightly over half at best, to 96 per cent on average from the start of the new contracts in April 2005 to February 2006,' the report said.

'The contracts stated that contractors should visit curfew addresses at least every 28 days to check the equipment. Group 4 Securicor carried out their tests when they visited addresses for any other reason and claimed that this meant equipment was checked on average every 15 days. The National Audit Office's tests, however, showed that some 30 per cent of equipment had not been checked for over 28 days.'

Further research

The Public Accounts Committee report concluded that there is insufficient evidence available to determine whether electronic monitoring helps to reduce re-offending or promote rehabilitation. It said the Home Office

should carry out further research in this area and make the results available to courts and prisons, which make decisions on whether to place offenders on curfews.

Responding to the report's findings both the Home Office and its contractors have defended the use of electronic monitoring.

A Home Office spokesman said that of the 130,000 low-risk offenders who have been released on home detention curfew since its inception in January 1999 less than four per cent have re-offended. This compares with a figure of 67.4 per cent re-offending rate for all prisoners released from prison within two years.

G4S Justice Services (UK) said it strongly supported the report's recommendation that further research should be undertaken about the role that electronic monitoring could play in minimising offending.

The company also said the report had underlined the value for money provided by electronic monitoring.

Paul Moonan, director of electronic monitoring for G4S Justice Services, commented: 'We are determined that tagging should represent value for money and have invested heavily in our technology and operations in order to drive down costs and to pass on those benefits to the Home Office, as the report highlights.' ■

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New technology will allow officers to make a real time search of the national fingerprint collection

Simon Barber/1161977

Mobile fingerprinting

Mobile fingerprint technology will trigger a change in the law allowing police forces to take mandatory prints of people at the roadside if a new pilot device is deemed successful by the end of the year

Ten forces in England and Wales are currently taking fingerprint identity checks by the roadside as part of the national Lantern project, managed by the Police Information Technology Organisation (PITO).

Lantern will enable the capture of fingerprint details suitable for identifying individuals in an operational environment for the first time. It allows real-time searching of the national fingerprint collection on the National Automated Fingerprint system (IDENT1).

Chris Wheeler, head of fingerprint identification at PITO says: 'The pilot will help us explore the accuracy and capacity issues around the device in a live scenario as part work towards a national solution.'

The pilot device was developed in conjunction with Northamptonshire Police and technology company Northrop Grumman.

The device works by electronically scanning the subject's index fingers. The data is then sent to the central fingerprint database using encrypted wireless transmissions. A real-time search against the national fingerprint collection of 6.5 million prints is then made.

Any possible matches are identified and returned to an officer in a target time of less than five minutes.

Northrop Grumman have supplied a hundred of the handheld devices being used in the pilot, with communications company Sagem providing search engines. Cable &

'PITO estimates that if the project proves successful, annual savings of £2.2 million can be made'

Wireless provide the encryption services and secure connection to the IDENT 1 database.

The pilot is scheduled for completion in December and PITO says an analysis of the results will ratify a national roll out.

Changes brought in by the Serious Organised Crime and Police Act 2005 allow officers to take prints without consent. But fingerprints using the Lantern system can only

be taken from the public with their consent during the trials as the legislation allowing officers to take mandatory fingerprints outside the custody suite has not been enacted.

It is expected that the Home Office will enact the legislation if the pilot trial shows that the technology works.

An earlier pilot of a prototype device by Northamptonshire Police proved successful but a number of issues were identified including a separate power source for the fingerprint reader and the level of accuracy the readers were able to provide once someone's fingerprints had been taken.

The fingerprint reader was located between the two front seats and attached to an on-board computer and the vehicle's battery. Suspects were asked to provide two print samples on the reader, one from each index finger. Those images are transmitted via the General Packet Radio Service (GPRS) to the fingerprint database for checking.

The quality of the fingerprints taken by the new readers and the speed and accuracy of responses from the IDENT 1 database will be crucial if the law is to be changed PITO says.



If the pilot scheme proves successful, new legislation must be enacted to allow officers to take prints outside the custody suite

Simon Barber/161980



Simon Barber/161976

In advance of the pilot scheme, the project team collected sample fingerprints on the device to enable Northrop Grumman to conduct accuracy tests. 'This will ensure that the accuracy threshold set on the device will be of an acceptable level in the operational environment,' PITO says. 'The objective is to minimise the chances of failing to identify individuals whose prints are on the database and of false positive identifications.'

It will also closely monitor what officers think of the system's usability.

The project's main purpose is to establish a person's identity using their fingerprints, away from the station, without having to take them into custody immediately. At present the officer would need to arrest the suspect and take them to a suitably equipped custody suite in order to take the prints with a Livescan device and check the marks against the national database.

PITO estimates that if the project proves successful annual savings of £2.2 million can be made through time saved in pursuing people who give a false identity when asked for their details by officers.

It is also expected that the technology will increase annual revenue from Fixed Penalty Notices (FPN) by ensuring that those issued with tickets do not give false details to avoid paying the penalties. It will also save time because forces will not have to re-execute warrants.

If successful the project could also have an impact on other areas of law enforcement,

PITO says. 'The options to provide real-time searching of the Police National Computer (PNC) and other databases such as Immigration and Nationality Directorate (IND), Facial Images National Database (FIND) and Intelligence Management, Prioritisation, Analysis, Co-ordination and Tasking (IMPACT) are being investigated.'

Bedfordshire Police was the first Lantern live trial force to roll out the system. Mobile fingerprint devices are being used by the force's Automatic Number Plate Recognition (ANPR) team. The initial Lantern technology was based on ANPR sweeps to identify vehicles that are of interest to the police. If a vehicle is stopped by an ANPR team, officers need to identify the driver and the occupants to make a decision

about the next course of action.

At present approximately 60 per cent of drivers stopped do not give their true identity according to PITO.

Ch Supt, Nicky Dahl, who oversees the work of Bedfordshire's ANPR team says: 'If you can quickly establish someone's identity it means that officers are safer, fewer criminals can evade justice and innocent members of the public are less inconvenienced.'

The 10 police forces taking part in the pilot are Bedfordshire Police, British Transport Police, Essex Police, Hertfordshire Constabulary, Lancashire Constabulary, the Met, North Wales Police, Northamptonshire Police, West Midlands Police and West Yorkshire Police. ■

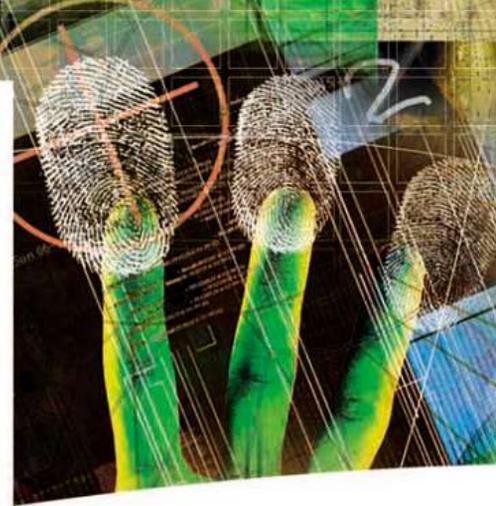
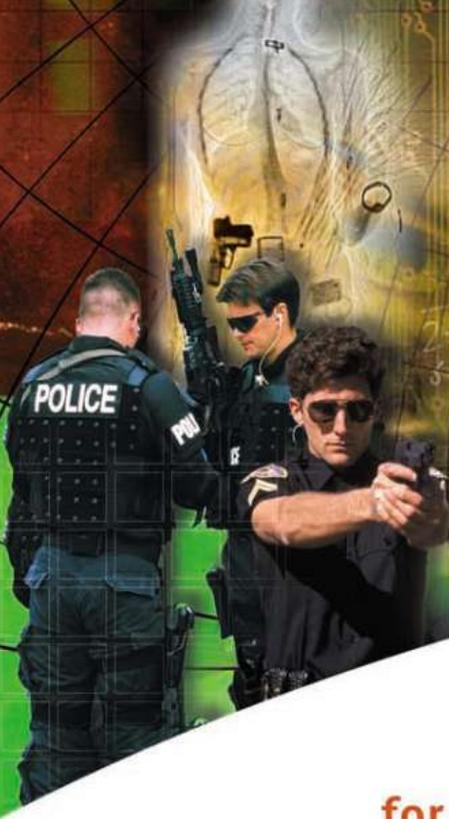
TEST SITE

West Yorkshire Police was one of the first forces to go live with the Lantern pilot on December 5. Ten of the units have been distributed in Bradford and Wakefield primarily for use by proactive Roads Policing units working with ANPR (Automatic Number Plate Recognition) technology, for an initial 12-month period.

Officers using the devices have already been able to positively identify at the roadside a suspect who gave false details, had two outstanding warrants and who

attempted to disguise his appearance.

Jawaid Akhtar, assistant chief constable of the force, says: 'In the past it could have taken up to three hours to take a suspect back to a police station to check that they are who they say they are. A Lantern search should taken no longer than five minutes maximum and in most cases less than a minute or two. This therefore enables officers to stay out of the office, responding to incidents and providing a visible presence.'



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Guardian angels

A combined European effort, co-ordinated by Interpol, is helping to find the essential last piece of the puzzle in child sexual abuse cases. Gary Mason reports

Police agencies throughout Europe have long recognised that the online sexual abuse of children is a growing and complex international problem where it can be extremely difficult to trace both the offenders and victims of abuse.

But in the last six years Interpol has used a combination of technology and an international network of specialist officers to identify, locate and rescue an increasing number of child victims.

Since 2001, the agency has been developing a child abuse image database which can compare seized and intercepted images of abused children with those already held on the system.

The database started with 50,000 images of abused children but by 2006 that number had grown to 500,000. It is added to and analysed by a network of 50 specialist police officers working in 20 countries.

Through this team, and Interpol's network of 186 National Central

Bureaux, the agency says it was able to identify, locate

and rescue more than

500 victims of online abuse in 2006

compared to just 30 when it first started in 2001.

The agency's work in this area of policing was outlined last month by Ronald Noble, Interpol secretary general, at a conference on missing and sexually exploited children in Paris.

Mr Noble says that Interpol's database was developed using the

Swedish National Child Abuse Image Database as a template.

'The principle is simple: the database takes an image and compares it automatically with images already stored in the database,' he says. 'Thereafter, when a police officer seizes a child abuse image and asks, "Who is this child?" and "Is this sexual abuse still going on?," Interpol provides a way to give answers quickly and efficiently.

'By sending the image to Interpol, our unit can often tell whether this victim is already identified by comparing the image to other images in our database. The police officer who found the image can be told: "We know her; she has been rescued" or "This is a new image; here is what we need from you to help us."

Working together

Delegates at the Paris conference were given an example of a successful Interpol operation using the database.

In October 2003, the Swedish police discovered around 100 photos of a girl being sexually abused and sent the photos to Interpol's Trafficking in Human Beings Sub-Directorate.

After viewing the images, Interpol's experts concluded that the photos were most probably produced somewhere in Eastern Europe but after consulting its international network of specialised investigators, the exact location could not be established.

Almost two years later, in August 2005, the Toronto Police Service in Canada found 20 films. Instead of just putting the films in an unsolved case file at the national level, the films were sent to Interpol. The same girl that appeared in the Swedish photos appeared in these films.

The films were manually and painstakingly analysed by a Swedish officer, Anders Persson, who has been seconded



to Interpol by his force. He was able to find a film where the child victim could be heard saying a few words in a language but he could not identify it.

A sound-clip was extracted and sent to Interpol's national central bureaux in eastern European countries. Staff at Interpol's headquarters in Lyon were also asked for help in identifying the language. It was ultimately determined that the language spoken by the young girl was Polish.

A report with all relevant information was sent to Interpol's national central bureau in Warsaw. A Polish police officer was sent to Interpol's headquarters for one month to help Interpol further analyse the films.

Interpol investigators concluded that the child sexual abuse depicted in the films probably occurred in Warsaw.

'After several months of extremely good police work, the location was found, the young girl rescued and the perpetrator arrested,' Mr Noble told the conference.

'This young girl was seven years old when the sexual abuse began and 11 years old when she was rescued. The abuser was a relative and her godfather.'

Attention to detail

Mr Noble says that the case proved how labour intensive such investigations can be even with the help of technology. But it also shows how effective networking between countries can produce results.

'Interpol's approach reduces the amount of duplicate investigative work – and often provides our member countries with the last piece of the puzzle needed to identify or locate a new victim. But the work of our specialised unit is ever increasing and never-ending.

'For example, recently we received a 200GB hard drive from the BKA (Federal Police) in Germany containing 120,000 images relating to or of child sexual abuse. What does this mean to our specialised unit?

'Each image is an image of a crime scene; each image therefore needs careful analysis, as it is likely to contain a number of leads that are important to the investigators. One never knows what clue might become that last piece of the puzzle.'

Interpol has identified victims and abusers through a wide variety of small clues, such as a T-shirt with the name of a school in the US, a bottle of shampoo of a brand that was only marketed in Germany, landmarks, grass, rocks and posters on the wall.

In order to identify these objects and link them to a specific place, Interpol works with botanists, geologists, private companies, the US-based International Center for Missing and Exploited Children and other experts.

Mr Noble told the conference an emerging and disturbing trend in online abuse of children is where the internet offers deceptive and disguised websites, such as 'young model sites,' where young girls are shown clothed and are presented as child models.

'An emerging and disturbing trend in online abuse of children is where the internet offers deceptive and disguised websites'

Once paedophiles enter the site they can obtain explicit images of children being sexually abused or can obtain access to the pictured girl so they can take their own photos or can physically abuse the girl.

'This is an area which is not covered by most national legislation and which we cannot attack using even the most sophisticated version of our Interpol Child Abuse Image Database,' Mr Noble told the conference.

In order to attract their potential clients, these sites are often marketed as 'pre-teen glamour sites', 'Lolita series sites' or 'child

erotica'. Children in these images and films are generally shown partially clothed and sometimes in sexually explicit poses, but the images stop short of displaying anything that would make them illegal in most countries.

The use of lingerie, adult jewellery, suggestive poses and make-up are used to create the 'subtle' sexual overtones, Mr Noble says.

Interpol is launching a new initiative called Project Guardian which aims to encourage

law enforcement agencies in all member countries to pass on leads about such sites to the agency so that it can compare the images on its database and launch investigations where necessary.

'Interpol and its member countries have seen evidence that these sites are often only fronts or covers for the abuse of children,' Mr Noble says. 'What is even more disturbing is that sites like this one have been linked to organised crime. Where organised crime meets children under these circumstances, children become a disposable commodity.' ■

SOFTWARE BLOCKERS

To prevent child pornography sites simply changing IP numbers to avoid being blocked, Sweden's National Criminal Police uses a computer programme developed by the Stockholm Technical University to update changed IP numbers every 24 hours.

The National Criminal Police makes a manual check of the changed IP numbers and, if they are sites carrying child pornography, the relevant internet providers are informed to block that content.

The police force works closely with the Swedish branch of children's rights organisation ECPAT (End Child Prostitution, Child Pornography and the Trafficking of Children for Sexual Purposes) to block child pornography sites.

According to ECPAT suspect sites are identified initially via its public hotline. The hotline's software, NetClean Analyze, distinguishes new material from old, and forwards reports with the new material to the National Criminal Police and Interpol.

The National Criminal Police decides which of this material should be classified as child pornography from a legal perspective and forwards a list of the relevant URLs to the internet service provider companies that have agreed to block such material. They then block the child pornography using the same technique for dealing with denial of service and similar attacks.

ECPAT Sweden says most internet surfers who came across child pornography moved on to other sites without reporting them because the content was so offensive.

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Intelligent approach

Collection methods for digital forensic evidence used in criminal cases are likely to face stronger challenges in court, warns Andy Gill

There has never been such a demand for reliable evidence in court and, more often than not, it is the police service which is the scapegoat if it all goes wrong.

There used to be a time when intelligence was separate from evidence. By definition intelligence is the capacity to acquire and apply knowledge, while evidence refers to oral statements and material objects helpful in forming a conclusion or judgment.

Blurring of this distinction can be seen when the Attorney General, Lord Goldsmith, recently supported the General Medical Council's right to punish expert witnesses found to be giving evidence which was later found to be flawed. The ruling was based on the case of the paediatrician, Prof Sir Roy Meadow, who was struck off by the GMC after giving evidence at Sally Clark's 1999 trial for the murder of her sons. He was reinstated after a ruling by the High Court that he was not guilty of serious professional misconduct. But it leaves the question: is evidence given in such cases that later proves to be inaccurate, false evidence or bad intelligence?

Indisputable evidence

While courts try and make sense of the issue, law enforcement agencies have been under a great deal of pressure over the past few years to gather and present in court hard, substantiated evidence that will lead to a conviction. Collection methods are becoming increasingly sophisticated requiring greater technical expertise, but indisputable evidence is being produced and there is a general feeling of satisfaction at improvements in this area.

However, with the public becoming increasingly savvy to the importance of evidence in high profile cases, especially those that are complex and where forensic evidence is vital, such as that of Damilola



Andy Gill/117100

'Complacency will lead to the police fending off more accusations'

Taylor, a 10-year-old who was stabbed to death in 2000, some industry experts are concerned that any complacency will lead to the police fending off more accusations.

If we take the example of mobile phone analysis, there have been astonishing developments in technology that allow law enforcement agencies to collect data from both SIM cards and handsets under forensically sound conditions.

The police are now able to carry out examinations themselves to high evidential standards, thus keeping full control of their intelligence, which is potential evidence in court. This also speeds up the investigation as officers will not be waiting for an outsourced examination to be returned to them. But I feel that confidence does seem

to be wavering in this area of forensics.

One of the problems is that the companies that used to outsource forensics are now looking for an alternative way of earning money using their knowledge, and their next logical step is to cross over and work for defence counsels. I envisage we will soon see lawyers in court who have extensive knowledge on the subject and have technical expertise behind them, giving them more ability to question the accuracy and credibility of data collection methods. The evidence may no longer be in question, but the process will.

Couple that with the increasing functionality of modern technology (new smart phones are practically pocket computers), and the speed at which developments are being introduced, there can be no room for complacency. We need to continually update, educate and refer to codes of practice such as the Regulation of Investigatory Powers Act 2000 (RIPA) and the Police and Criminal Evidence Act 1984 (PACE) to ensure that consistent and wholly defensible results are being achieved at all levels.

High standards

So if the process of gathering the intelligence is being questioned as a way of invalidating what used to be seen as concrete evidence, what is the solution?

As far as I can see, from the moment a decision is made on which methodology should be used to gather information during an investigation, every procedure must be carried out to a very high evidential standard and in line with the current codes of practice. It is only by being aware of current trends and thus working at an evidentially sound level from the outset, that we can be sure that the police will continue to achieve viable and defensible results which will stand up to any challenges in court. ■

Andy Gill is managing director of Radio Tactics Limited, a digital forensic technology company

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We list below reports of 4 rescues achieved by Constabularies with the use of BELLs – most would have been very difficult or impossible with any other lines!

A mounted horse patrol on the long flat beaches at Cleethorpes. Where people are frequently trapped by fast incoming tides.

Suicide Attempt

1830/300800/Tower Bridge,
London SE1/South Span



Young male had climbed over the railings and was threatening to jump but slips off. Tide was coming in and a good flow was running. River police launch in attendance. Lad panics in water and launch has difficulties manoeuvring due to flow.

The BELL was thrown about 30 metres, very accurately to within his grasp and he was able to be held up until launch could heave to and pick him up. Only one of us held the line. If the BELL had not been used he would have been taken off by the flow so this made the pick up easier.

The Thames along this stretch in particularly dangerous as it has very strong currents and undertow, which often results in suicides disappearing below the surface very quickly just as soon as their clothing becomes waterlogged.

Yours

Ian Girard PC455A

Emergency lifeline gets good response

None of the rowers were hurt, but were extremely cold and shocked and all went to hospital for checkups etc.

The two officers commented on how easy it was to use the lifeline. Neither have had any training in its use and were impressed with the distance thrown (25-30 metres) and the accuracy they achieved. There was obviously a substantial weight involved

in the fact that the scull was partly submerged but there was no evidence of skin damage or chaffing of hands, wrists etc to either the police officers or the rowers.

To quote constable Bourne, he said "They were very lucky girls. Lucky we were there, and lucky that we had a brilliant piece of kit."

Steve Clark Sergeant 3

This is a copy of a report that appeared in The Law magazine of Essex Constabulary June 2005. 577 of the repackable model of the BELL – BELLRP – have recently been ordered and supplied to the Essex Constabulary.



NORTHUMBRIA POLICE

On Thursday 30 March 2006 at 1523hrs, police received a report of an unconscious male stuck on one of the pillars of the Royal Border Bridge which spans the River Tweed and is a considerable height above the river.

Officers attended the vicinity of the bridge on both sides of the Tweed and eventually located the male in the river adjacent to the Berwick side of the river. The officers at this location identified that one male was in the river clinging to the bottom of one of the bridge pillars, some 30 feet or so into the river. The river was in spate and it would clearly be dangerous to attempt a rescue by swimming out to the pillar.

On arrival at Berwick Railway Station, which provided the nearest vehicular access to the scene and whilst officers made their way to the river on foot accompanied by paramedics, PC Marchant took the BELL device and made his way quickly to the top of the Bridge overlooking the scene of the incident and threw it down to the officers at the riverside; a distance/height of 50-60 yards. PC Davidson took possession of the BELL device and at the second attempt managed to throw the device to the male clinging to the pillar with which he was then pulled to the shore and made safe.

This highlights the professionalism of all the officers involved and particularly that of PC Davidson who effected the rescue from the fast flowing river using the BELL device.

M Bayliss Inspector 7905



Port of Liverpool Police

On Saturday 7 February 2004 at about 1pm, Constables Bourne and Hamon of the Port of Liverpool Police were on mobile patrol on the quayside at West Float Dock, Birkenhead in the Port of Liverpool, Merseyside.

Their attention was drawn to a rowing scull crewed by five female students from Liverpool University who were using the dock for training purposes. The waters of the dock were very choppy due to a strong wind and their scull was taking on water rapidly as the waves spilled over the side of their craft. The officers could see the scull partly submerged and the fear of the occupants was evident as they were in a distressed state shouting for help and waving their arms for attention.

There were no other vessels in the area that could assist the rowers and the officers quickly made their way to the far side of the dock where the scull was approximately 20-25 metres away from the quayside.

The BELL Lifeline is carried in our patrol vehicles as part of our emergency equipment. Constable Bourne retrieved it from the vehicle and from the quayside edge, threw the line across the bow of the craft and the leading rower was able to grasp the line. She wrapped the line around her wrist and within a few minutes, the two officers were able to pull the scull containing all the rowers to the edge of the quayside.

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