



Infinet
**A National Strategy for
Mobile Information**

Comments

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Status

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Summary

This document sets out a vision for the development and use of Mobile Information. It builds on the work of the Mobile Information User Group and the valuable experience gained in using Mobile Information systems and equipment.

The reason for this document is to stimulate the development of Mobile Information. The Police Service is under increasing pressure to be more visible and more effective. The new national computer systems provided by NSPIS and Valiant will provide standardised working practices and data, but only from desktop computers. What is lacking is a method for providing information to support police work, at the point it is needed and where it can make the most impact. Mobile Information is the means of providing information to and from people while they are working. It is the method for providing support to staff in places and at times when they do not have a networked desktop computer. It can provide the full information support of the Police Service to make staff more effective, and to make more effective use of staff.

The name for this Mobile Information infrastructure is *Infinet*, and terminals then become *Infinet* devices. *Infinet* is then the mobile extension of the Criminal Justice Extranet, CJX.

This strategy and the resulting programme of development are different to other components of the police Information Systems Strategy, in that much of what is described here is already working. Mobile Information already has a wide acceptance and a large base of users. This strategy intends to provide direction for the further development of Mobile Information and its integration into the Criminal Justice infrastructure.

Governance

The *Infinet* strategy is owned by the Mobile Information Strategy Group, which currently reports into the ACPO Communications Committee. This group comprises ACPO, representatives from the Central Customer group, the PITO Mobile Information Programme Manager and the chairman of the Mobile Information User Group.

The Mobile Information User Group is tasked by the Strategy Group to conduct studies and develop best practice and recommendations. The User Group comprises representatives from practitioner forces and all ACPO regions. The User Group is formed into a number of sub-groups, each addressing one component of the whole Mobile Information service.

Requirement

Police work requires information, but is largely performed away from offices. There is an increasing volume of information that a police officer must use to support their job and to make decisions. There is also an increasing burden of information that a police officer must provide from their work to support performance reporting and decision-making.

Until recently, access to information was only available in police stations, by asking over the radio or from what an officer was able to carry with them.

Providing information invariably meant completing forms, either written by hand or on a computer in a police office.

These factors meant that police officers had poor information support at the time of most need - when they were out on the street doing their job. It also meant that they had to spend a large proportion of their time out of the view of the public, completing paperwork. This can cause a perception of there being insufficient police officers. It can also cause a reluctance in the police officers to undertake activities that would result in even more paperwork.

If the provision of information to a police officer and its collection from them could be mobilised, it could be moved from police stations to the point of need: where the job is performed. If this could provide better information support to police officers, it could make them more effective and improve their safety.

If the impact of gathering information could be reduced, it would allow more time to be spent in visible policing. It might also encourage police officers to make more use of the information and powers at their disposal, as the cost to them of doing so would be reduced.

If the 'cycle time' of gathering and using information could be reduced, then the whole process of policing and criminal justice could be made more efficient.

These are the reasons why Mobile Information is required. The Police Service wants to be more effective, more efficient and to provide greater public reassurance. Police officers want to be able to use the wealth of information at their disposal, without suffering the burden of bureaucracy. The Police Service wishes to mobilise the information it holds, and to mobilise the people who work with this information.

Business Case

The Benefits Analysis study for Airwave concluded that "29% of uniformed Constables 'in-station' activity can be impacted by Mobile Data, giving an opportunity cost for an example force of £11m per annum". Studies such as Dairy of a Police Officer show that up to 43% of a Constable's time may be spent in the police station. Combining the two figures and using a working week of 40 hours, shows that up to five hours a week of a Constable's time may be redirected from in-station to outside and visible by the use of Mobile Information.

Assumptions

Police Constable	£39,570	FEC for 10-year Constable
Weeks worked	48	
Hours a week	40	
Hours a year	1,920	
Cost per hour	£20	
Time spent in-station	43%	
Proportion impacted by Mobile Information	29%	
Calculated as hours a week	5	Time that may be influenced or gained
Terminal cost	£200	Assumes annual replacement
Airtime, year	£468	Full list price
Breakeven hours	32	
Hours per week	0.7	Saving required to pay for the system
	1.1	(breakeven for a Probationer PC)

This shows that a typical installation of hand-held Mobile Information terminals offers a potential five times return on the investment.

The 'Diary' study also found that an officer returns to the police station on average 1.7 times during their shift. This is another amount of non-visible time that may be reduced by allowing the officer to complete some tasks outside the station.

The business case model above is based on using cheap handheld PDA-type terminals at around £200 each. The case assumes that the terminals will be replaced each year, either from general wear or for technology refreshing. £200 is the full list price before discount. As a test of sensitivity, substituting an £800 terminal moves the breakeven to just two hours per week. The airtime cost shown is also the full list price before discount. The cost of the infrastructure is not shown, but will be spread across many terminals and several years working life. An estimate based on initial pilot work shows that the infrastructure may add £20 to the cost of each terminal.

This calculation shows that if Mobile Information can save an hour a week of a Constable's time, or allow them to spend that much extra time in visible policing, then the system breaks even. If it can save more time or speed-up the other processes, then the system is in 'profit'. The potential profit margin is 400%.

Car-fit Mobile Information

The case for car-fitted Mobile Information is different. It takes a full day to fit a car set, and the unit itself costs around £2,500. To make a business case, the car-borne set must provide much greater functionality. It may also be possible to integrate all of the car systems into a single unit and to take advantage of pre-wired vehicles, which

may make a business case on ease of fitting. See also the comments on current practice on page 13.

The advantage of handheld terminals over the more powerful car-fitted ones is that they are much cheaper, and make every vehicle and every officer Mobile Information enabled.

Airwave

The business case for Airwave seems even more compelling, as there are no extra airtime costs. However, at the moment there are no Airwave terminals with the same functionality as the commercial PDAs used for handheld Mobile Information. It may still be possible to link a cheap PDA to an Airwave radio or to buy PDAs with Airwave bearer service, to get the best of both.

Benefits streams

The areas where benefits may be obtained from mobilising information fall into the following functions:

- Increased visibility - reduced in-station time through removing the need to return to stations to complete paperwork or obtain information
- Saved time - increased speed of processing and handling of information
- Increased effectiveness - better access to information to support decision making
- Activity costing - more accurate accounting for activity and cost
- Management of resources - more accurate picture of where people are, their status and their support needs

Some benefits will be obtained by saving time and increasing visibility. However, much greater benefits will accrue from changing the way we work to take advantage of Mobile Information. For example, the process of arresting a suspect, taking them to a vacant cell, starting the custody process and then the case preparation process, may be simplified. This could release significant police time and speed-up the process of justice.

We may also need to change the legislation and legal processes around some areas of work. For example, if we were able to stop issuing printed tickets at the time and replace them with copies posted or emailed from the force (or made available on a secure web site), we could reduce both the administrative and the physical burdens on officers. The 'Police Reform - Beating Bureaucracy' study found that there were around 250 different forms in use by police forces. At least some of these must be suitable for converting into workflow processes with a mobile entry point.

There are also benefits in efficiency, safety and decision making in improving the way information is presented. SPIS has commissioned University research into better methods of presenting information. There is also new research into location-based services, where the terminal is aware of its location and uses this to provide relevant information. These are new areas, but show some of the potential for future benefits. However, for now we should concentrate on the concrete and provable benefits - saving an hour a week of a Constable's time is a real, achievable benefit to the Police Service.

The RAC has found that automatic vehicle location (AVL) reduced their response times by up to 10% through the improved ability to select the most appropriate resource. This also gave a reduction in their vehicle fleet mileage and fuel

consumption. While AVL itself is not a Mobile Information tool, it should be considered as a complimentary fitting to Mobile Information equipped vehicles.

The impact of Mobile Information

While this document sets out the potential for using Mobile Information, it cannot accurately describe the eventual impact. At present the Police Service largely keeps information inside Police buildings. Once access to information and the ability to capture it are provided at the place of work, then working practices will change to take advantage of it. This places great emphasis on the reliability of Mobile Information however, as once business process have changed, there may be no fallback to other methods.

For example, consider Command and Control. One common structure is that all incidents are managed by a central function. This function has control of all operational patrol officers, and directs them from incident to incident. At best, a good C&C function will allocate work wisely, based on incident priority, the skills and location of the available resources. At worst, officers will be driven from job to job, in the order in which they arrive, to meet the force's call-handling and incident attendance targets.

When a C&C function is able to see the current location, status and skills of all the deployable resources, and has the ability to transfer 'lists' of non-immediate work for local management, then we may find that we can deploy and respond in new ways. The Metropolitan Police are investigating methods for supporting supervision at street level using remote access to Command & Control and other information.

For a second example, consider the investigation of major crime. The Major Incident Room currently relies on information which may be gathered anywhere, being transcribed into HOLMES 2 before it can be searched and used. Actions are then allocated to officers, which results in a further round of capture, transcribing and eventual use. These cycles take at least a day to complete, delaying the identification and use of crucial information. If all the information could be gathered electronically, it could be made searchable immediately. Actions could be allocated before the officer broke contact with a witness.

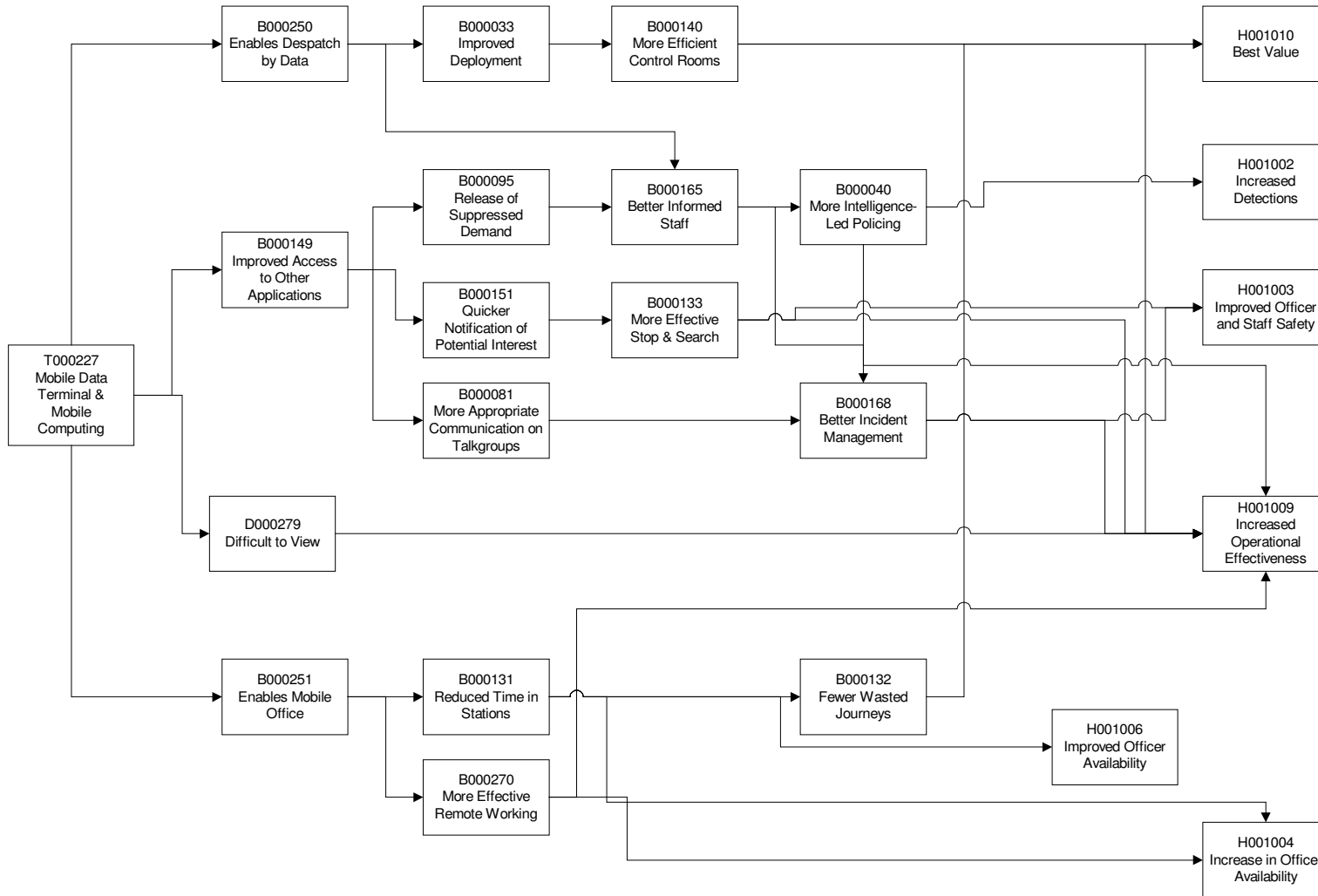
Casualty Bureaux could gather and update central records immediately. House-to-house enquires could be monitored for completeness as they were performed, and the results gathered and used immediately.

Both of these examples show how Mobile Information could change the way we work. Changing to take advantage of this mobility and immediate communication offers the potential for large gains in efficiency and effectiveness. However, the changes will only be seen and developed by the people doing the jobs. This is why it is essential for the success of this strategy for Mobile Information to be developed through practical pilot projects. Each pilot should examine the use of Mobile Information in one area of policing, and be project-managed to report on the benefits, implementation issues, difficulties and changes to working practice. Each pilot will form a model of best practice for the application of Mobile Information to one area of policing. The ACPO-level Mobile Information Strategy Group will gather these individual models through the Mobile Information User Group and use them to form and refine this over-arching strategy. This strategy will also be used to inform development programmes, and provide the tools for mobilising information from the resulting systems.

Airwave model of Mobile Information benefits

The Airwave business case shows the areas of business benefit attributed to the use of Mobile Information using the diagram overleaf. These have not been quantified here in terms of actual benefit to the Police Service, but show where improvements might be found.

Airwave Mobile Information Benefits Model



Definitions

The original definitions of Mobile Data and Mobile Computing were made in the document MOBILE DATA: THE BUSINESS BENEFITS AND REQUIREMENTS. This was produced by the Mobile Information User Group and accepted by ACPO and PITO.

Mobile Data

The provision of pre-defined information to operational officers as a means of enhancing the officers' ability to operate away from police premises. Providing summarised or specific information to support particular tasks. Mobile Data was about dedicated terminals doing limited tasks.

Mobile Computing

The provision of full access to computer systems through a mobile link. Providing desktop computer functionality from a police vehicle or mobile terminal. Mobile Computing was about full-featured laptop computers acting as networked desktop machines.

Data Capture

The use of mobile equipment to collect pre-defined information for transfer into Force systems either immediately or later. Fixed Penalty Notice terminals and printers are an example.

Mobile Information - *Infinet*

It has become obvious that the Police Service needs a range of services, and that neither Mobile Computing nor Mobile Data can be a single or pure solution. Mobile Information is recommended as the name that encompasses both Mobile Data and Mobile Computing. It also better describes the aim of the *Infinet* strategy, which is to make information mobile.

The aim of *Infinet* is to provide an open infrastructure capable of delivering information. It will be independent of the bearer, the terminal or the back-end applications. It may be extended as needed to deliver any suitable information to or from any suitable terminal.

Infinet is not an alternative to Airwave. Airwave will provide a good and secure bearer service that may be used by the majority of terminals. It will also deliver some Mobile Information functionality to some police radios. *Infinet* and Airwave are complementary and support each other.

Background

History

Mobile Information probably began with terminals fitted in cars. The early experience was using the RAM bearer service with a bespoke application that provided full-screen and full-function access to PNC. In effect this was Mobile Computing. It required that the person using the system be fully trained on PNC. While the system was useful in a stationary double-crewed vehicle, it was difficult to use in other circumstances. It also provided too much information, from which the relevant items had to be found.

The majority of forces that adopted Mobile Information used the RAM-based (now known as Transcomm) Interim Mobile Data Network (IMDN). This provided a greatly simplified interface to PNC to search for vehicles and nominals, plus messaging and basic systems security functions. This system has grown to more than 600 terminals in use across around 20 forces. It continues to provide a very quick and effective search tool on PNC.

One notable variation was the system developed by Derbyshire. This used PDAs linked to GSM mobile phones as the bearer. The equipment was cheaper than that needed for the IMDN, and at least as quick in use.

Cleveland has developed purpose-built hand-held Mobile Information terminals or PDTs. These use the RAM bearer and are linked to their Command & Control system for despatching and resource management.

Surrey has provided a Mobile Computing service for around 100 detectives and SOCOs, using laptop computers with a secure dial-up link to the force network.

Terminal types

Mobile Data Terminal (MDT)

The standard IMDN vehicle fitting is a touch screen mounted on or in the vehicle dashboard, which may also have an external keyboard. The screen is driven by a ruggedised computer mounted on the backplane of the vehicle, behind the rear passenger seats. The screen may be colour or mono, and usually has a touch-screen membrane to allow use without an external keyboard.

A body of experience has developed on how best to fit these terminals into different makes and models of vehicle. There is a considerable and complex issue with satisfying Health & Safety requirements.

Later versions of the MDT allow Tracker to be combined into the same screen. This makes vehicle fitting a little easier. Suitcase versions of the MDT have also been built and used. A special version which includes a passport reader, is used by officers working on Eurotunnel trains and at ferry terminals.

Personal Data Terminal (PDT)

The pioneer in using hand-held Mobile Information was Derbyshire. Their system saved money by using standard commercial PDAs and mobile phones, rather than rugged specialist equipment. They found no problems with breakage or reliability, once they had warned their officers that the system was not rugged. The Derbyshire system was cheaper to buy and to run than the RAM system, despite the airtime costs of the mobile phones.

Cleveland has developed at least two generations of purpose-built PDTs. The latest version has a colour screen. While the terminals are very effective, they do suffer from being rather delicate and expensive and quite bulky and heavy to carry. The batteries are also fixed, so each terminal must be taken out of use for recharging.

South Wales has built upon the Derbyshire system, using newer palmtop computers fitted with integral GSM cards and larger batteries. These are as fast as the Derbyshire system, and smaller and lighter than the Cleveland one.

Current practice

The biggest obstacles to the universal use of Mobile Information have probably been its fixation in vehicles, and its size and weight when it is not.

Mobile Information in police cars has been very effective, but only when the vehicle is double-crewed. When the passenger is free to use the keyboard and the driver is free of distraction, it is a very powerful tool for obtaining information in operational situations. When police cars are single-crewed, Mobile Information is rarely used. The reasons are not just the problem of stopping the car to use the terminal, but that a single officer has to leave the car to work, leaving the terminal behind.

Providing hand-held Mobile Information is the answer, but the PDT must compete for space with all the other equipment the officer is carrying. If the terminal is too heavy, too fragile or too large, then it risks being broken or even harming the officer.

Future practice

The Police Service is under pressure to be more effective and more visible.

We have valuable information stored in our computer systems, but we keep it locked-up in police stations.

NSPIS and Valiant will deliver standardised police computer systems, but they are still based on desktop computers inside police buildings.

The consumer pressures on mobile phones, PDAs, MP3 players and so on has driven the technology and capabilities much further and faster than the offerings available to the police market. Making use of cheap mass-market devices may be better value than trying to design our own systems.

We cannot imagine what might be needed or may be possible in future, so we must design a Mobile Information infrastructure that is open. We must be able to use the standard Mobile Information 'pipe' to deliver whatever we invent. The components of the system must be flexible, so that we can move to a better terminal, bearer, or any other component when the opportunity arises.

The requirement for bearer independence was noted in the document NATIONAL MOBILE DATA: THE PITO RESPONSE TO THE REQUIREMENT OF THE ACPO IM COMMITTEE FOR A TECHNICAL SOLUTION TO MOBILE DATA IN NSPIS[®] AND NATIONAL APPLICATIONS published by PITO in August 2000. (para 4.3)

Uses of Mobile Information

The basic IMDN system provides name and vehicle enquiries on PNC. These #VE and #NE transactions have been specially modified by the supplier to provide summarised read-only results. Recent developments on PNC have been matched by the addition of insurance and MOT details, and the system will incorporate Driver Details when they become available.

The basic IMDN system also provides messaging. This may be between terminals or from a central point. If a force develops an interface to its Command & Control system, this may be used for despatching.

The lesson learned with this feature is to use it only for non-urgent incidents and messages. There is a facility to acknowledge receipt of a message, but only direct radio contact can ensure that both the Control Room Operator and the officer are aware of an immediate incident.

Cleveland has developed strong links with their Command & Control system. This is primarily to provide management information of the amount and type of deployment. They are able to provide statistics of how much visible policing was done in each area, and the nature of the duties performed.

Sussex has expanded the vehicle-based IMDN to all operational vehicles. They have incorporated Tracker into the same terminal screens, and send vehicle location (AVLS) information back to their control room.

The experience of the RAC and AA indicates the way ahead for Mobile Information. They use MDTs in their recovery vehicles, and send to them the details of jobs. They have found a large reduction in airtime on their radio network. This comes from the recovery driver having full and accurate supporting information, and not having to ask for repeats or reminders. They find that data traffic is more accurate than voice traffic and quicker to send large amounts of data to be used later.

What makes Mobile Information succeed

- Availability for use - double crewing or hand-held terminals.
- Value - usefulness to the user. If it makes the job easier or more effective, then it will be used.
- Ubiquity - in the right hands at the right time.
- Trust - it must not be seen as a tool for monitoring the officers using it.
- The right traffic - use it for supporting information, system queries and messages. Use it to provide access to the information a person needs to do their job.
- Ease of use - the equipment must be simple to use, easy to carry, and work reliably through a complete shift.
- Simplicity - easy to understand and to make it do what is required.
- Secure - the loss of a terminal must not compromise the system, or overly penalise the officer.

What makes Mobile Information fail

- Suspicion of motives - spy in the cab.
- Lack of availability to use it - single crewing or fixed in cars.
- Poor discipline - it must be used to support work, not play. The information carried on Mobile Information must not be repeated on the radio.
- Health & Safety - vehicle fit, harness, weight, RF emissions.
- Reliability - batteries, coverage.
- Difficult to use - needing excessive training, or having fiddly buttons or menus.
- Fragility - if it gets a reputation for breaking, it will not be used.
- Not useful enough - it must provide the right information to support a job.

The Vision

To provide information at the point of need.

This means providing the right amount and detail of information, the right type of information, and the information that supports the job in hand. It means providing that information in the way the person needs it, at the place and time they need it. It means providing this through a piece of equipment that the person can have with them and use without compromising their job or their safety.

This is not a proscriptive strategy demanding that Mobile Information replace other methods. It may well be that an officer with mobile access to PNC will use the radio or a mobile phone to make a name check if the circumstances are such that it would be unsafe or inconvenient to complete that check by Mobile Information.

The requirements of an ideal Mobile Information service are that it is:

- Job-role related - provides the right supporting information, which will be different for each role.
- Bearer independent - so that we can select the bearer with the best cost or coverage.
- Device independent - so that we can use a range of terminal types and take advantage of developments.
- Integrated information - that it collates and summarises multiple sources.
- Simple - easy to use, easy to administer and run.
- Secure - resistant to scanning or hacking, not compromised by the loss of a terminal.
- Safe - does not harm the person using it.
- Useful - that the system is capable of extension and development. That the system offers a range of benefits to the force.
- Efficient - reduces radio traffic. Is quicker than other methods.
- Cheap - so that we can afford to equip everyone who needs it.
- Effective - that it assists our staff to do their jobs better, with greater visibility, and with less need for paperwork.
- Locatable - providing accurate location fixes so that we can properly record the position of events for use in analysis. This also complements the Airwave radio emergency button. This can't be done now, but is desirable.

Types of connection

There are five types of connection from a Mobile Information terminal, or in other words, four ways that the terminal might be connected and work. These are:

- Messages
- Browsing
- Applications
- Synchronisation
- Remote desktop

1. Messages are like email - they are discrete packages of information. Messages are reliable, as they can sit in an out-tray until the terminal is ready to send or is in coverage for the bearer service. Messages work for information that is not time-critical, but must be delivered reliably. Messages are most suitable for information that may be needed later, as they may be

retrieved and read at will. Examples are copies of incident logs, crime reports, stop and search forms, and so on. Messages require that the terminal have an address, and so must the person using it. Messages are usually delivered in the form of emails, Short Data Service messages, SMS (text) messages or pager messages.

2. Browsing means using the mobile terminal as a window onto a system running elsewhere. The terminal only need run some simple software to format and present the information, just like a browser does for the World Wide Web on the Internet. Browsing requires that the connection be maintained throughout a transaction, or that the back-end system is resilient to terminals being disconnected. The advantages of browsing are that almost any cheap terminal may be used, the information seen is always the most recent version, and there is not (or need not be) any information held in the terminals themselves.
Browsing would usually deliver the results of queries or system checks. It provides an immediate response, but the information is volatile and may require a refresh or repeat query to read it again.
3. Some mobile terminals allow the use of developed applications. These will be small pieces of code that work in their own right, or work with a larger back-end system. Dedicated applications can obviously be tailored to perform any task required. The disadvantage of applications held in the Mobile terminals is that any change to the code requires that all of the terminals are recalled and upgraded. It is possible in theory to send updated code over the bearer service, but there will always be a security risk that the code is also received by unauthorised users.
4. Synchronisation is used when a terminal must carry information, but there is no need to update it immediately. Examples are carrying policy information or work guidelines, or using a terminal for creating fixed-penalty notices. Providing the terminal has sufficient security to protect the data it carries, and measures to prevent the loss of stored work, then the terminal may be docked or connected later for updating.
5. Remote desktop means providing some or all of the features of a networked desktop computer. This is usually achieved with Thin Client software to allow the terminal to emulate a desktop computer, or by packaging sufficient power and storage in the terminal to provide a full desktop environment. The security risk in using this option is that the terminal is a vulnerable network access point, and may contain stored data.

The ideal Mobile Information terminal and Mobile Information infrastructure will provide some or all of these methods of communication. Messages, browser access and dedicated applications will probably be available on all terminals and used in their most appropriate role. Full remote access may require laptop computers.

Early indications are that some bearer services may be more suited to different types of communication. The Mobitex packet radio network has a guaranteed quality of service, so is well suited to browsing and applications where a rapid response is needed. The GPRS network tends to slow-down under load but is reliable, so may be better suited to messaging than online transactions. Airwave may still be an unknown capability in terms of throughput, quality of service and reliability.

Push and Pull

There is a need to both push information to Mobile Information terminals and pull it from them.

Data pull is the traditional use of Mobile Information for making remote queries from police systems - the person using the terminal 'pulls' information from the central systems.

Data push means sending information to the terminal at the request of the person using it, or independently. Data push would typically be used for messages and job queues, but may also be used by a Control Room operator to send the supporting details from an incident record or the results of a system search to an officer who is occupied and cannot use the screen and keyboard. Data push may also be used to send supporting information to an officer engaged in a task. Examples would be Operating Guidelines or relevant PNLID information.

Information required by the user of the system

- System queries
- Supporting information
- Warnings
- Job lists
- Maps, directions, location
- Working times - shifts
- Messages
- Telephone directories
- System updating
- Intelligence
- Briefings
- National Intelligence Model - delivery of products
- Accurate geocoding of incidents
- Feeding back into NIM

Information required by the operator of the system

- Available resources - booking on
- Available resources - duty states
- Location, time and date
- Capability - type of resource, skills
- Transaction log. Not just for audit - can also provide intelligence
- Resulting
- Data capture
- System updating
- Activity reporting - whether directly or by analysis of systems used.

Work by the Information Management strand of Valiant has identified a matrix of information needs, allied to various operational scenarios. There is a copy on page 24. SPIS has done a great deal of work in this area, and has developed an information needs matrix for all of the police roles they have identified.

Mobile Information and Radio

Mobile Information is converging with radio. Airwave will deliver a bearer service that will carry data. Airwave radios will be capable of some Mobile Information functions.

However, the functionality of a radio will be limited by the screen and keypad size available. The manufacturers of radios are being tested in trying to design personal radios that can act as Mobile Information terminals. The opportunities for convergence are best understood from the current operational difficulties.

With both MASC and Airwave radios, it is necessary for an officer to book-on to the system to use it. Booking-on assigns the radio to the officer. This is used by the Control Room Operators to despatch and communicate, and for identifying the officer if the emergency button is pressed. However, when an officer gets into a car, they should book-off their personal radio and book-onto the car radio. This gives them the advantage of a much stronger transmitter, and no shielding by the car bodywork. The car radio works better than the personal radio.

In practice this change-over is often not made, because it leaves the officer vulnerable if they have to get out of the car. Many officers prefer to use their personal radio and accept the poorer reception.

For a personal radio to be used as a Mobile Information terminal, it has to be capable and in the right position. A tiny screen and ten-button keypad would make the radio a last-resort choice for PNC or system checks. If the radio cannot be worn in a position that makes the screen easy to read, it will not be an effective terminal for messages.

The amount, weight and location of personal equipment carried by a police officer are becoming an important health and safety issue. It is increasingly difficult to find good places to carry equipment that allow an officer to work normally, and get into and out of a car. Adding a large PDT to the set of equipment may not be possible.

There is also growing concern over the emissions of radio equipment. While the concerns over Airwave have been answered, a move to use the 2-4GHz range of Bluetooth may be resisted, as this is seen as being 'microwave oven radiation'.

One solution to this would be to separate the voice and data functions. A small palm-sized terminal could have a radio or GSM modem attached, or communicate with the radio to use Airwave as the bearer. If we are considering a range of terminal types, then we should consider one for patrol officers that is shirt-pocket sized and uses the radio as the bearer. This will allow the size of both devices to be minimised. If the radio is equipped with some form of short-range communication, then we could take advantage of this to transfer primacy (the 'booking on' details) between the car and personal radio as officers get in and out of patrol cars.

Ideally, we will offer a range of terminals to suit different job roles. For those who need access to information, a small device with a large screen would be most use. Those who need to enter information will need some form of keyboard. These may be easily satisfied from the existing range of PDAs on widespread sale.

Handheld terminals, or PDTs

The experience of Derbyshire shows that we can use the wide range of commercially-available PDAs without great concerns for reliability of ruggedness. They must be cheap enough to allow widespread use, personal issue, and ease of replacement as designs advance.

They may carry their own bearer link, or use the personal or vehicle radio. They may also use GSM, TETRA, RAM, VHF or any other bearer.

They will range in size from 'readers' - PDAs, to 'enterers' - laptops. The type will depend on the duty: PDAs become the electric pocket book; laptops become the electric clipboard or A4 pad.

Vehicle fit, or MDTs

These are fixed installations, or a docked handheld device using the better power and stronger signal of the vehicle. A demountable device removes the problem of single-crewing, by allowing the use of the terminal by an officer who gets out of the car.

Current equipment available for use

Terminal type	Capability
PDA	'Electric pocketbook' Duty status. Name and vehicle checks. Supporting information. Job lists. Telephone directories. Emergency button. Results codes. Messages. May provide location to the user, or report location. May have own bearer, or use the Personal or Vehicle radio.
Mobile Phone	SMS Messages. Data push of system searches. Name and vehicle checks. Duty status. Constrained by small screen and limited keypad.
'Organiser' phone	As Mobile Phone, but likely to have a larger screen, an on-screen keyboard and to have a browser. Becomes a PDA with in-built bearer.
Palmtop	As PDA, but with more effective and easier data entry.
Laptop	As Palmtop, but with much easier data entry and the ability to carry reference data.
PDT	As PDA. Tends to be more rugged, but heavier and larger. Definitely has its own bearer.
MDT	As PDT, but likely to have a more powerful transmitter. May display or mimic other systems - radio, Tracker, etc.
Personal Radio	As Mobile Phone.
Vehicle Radio	If combined with MDT, becomes a full-function MDT. Otherwise just a radio.

Mobile Information and GPS

If a Mobile Information terminal can include a GPS receiver so that it can send an accurate location, then it would be useful to take advantage of the other facilities provided by handheld GPS. When an officer is despatched to an incident, the Mobile Information terminal could be capable of showing the direction and distance. There is a demand for providing maps and street indexes through Mobile Information, but maps in particular require large graphical files to be transferred or stored. If the real need is to be able to find an incident, then the model provided by handheld GPS receivers may be more practical. These typically show an arrow pointing to the target location, the distance to it, and the time to arrive at current speed.

This feature might also be used when an officer's emergency button is used. It may be possible for the ICCS or Command & Control system to send the grid reference of the emergency to nearby Mobile Information terminals. This would give immediate benefits to officers, and may help to overcome resistance to them being tracked by GPS. See page 28 for an example.

Having an accurate location fix available also makes location-based services possible. This would allow the terminal to present information based on location - offering licensing details and local intelligence when near a pub, for example. This is very much a new area, but is under study.

Security

Mobile Information terminals must carry no usable data or protect it sufficiently to reduce the risk to an acceptable level. It would be false to rely on encrypted storage

or passwords indefinitely, as the device would probably contain some part of the encryption key. Even if did not, an attacker has unlimited time to examine and experiment with the terminal.

Terminals must be capable of remote stun and kill, or of being removed from the bearer network and access gateway. West Yorkshire's experience with MASC radios is that the stun feature (and the management processes to use it) is a vital defence against compromise from the loss of a radio (or PDT). The terminal itself need not respond to a stun command, as long as its access to police systems may be withdrawn.

If locatability (see list on page 15) was built-into all terminals, it would make it easier to find lost or stolen ones.

Terminals must be capable of instant suspension. The current IMDN system has a *suspend* button that locks the terminal and blanks the screen. The terminal may only be returned to service with a password. This feature prevents the unauthorised use or viewing of a terminal.

Terminals must also suspend when inactive. The timeout must be fixed and not alterable by the person using it, as they will always select the most convenient and least secure timing.

Terminals must be identifiable and auditable. Every terminal must be uniquely identified to the Mobile Information system, to prevent attacks from cloning and to make stunning possible. An audit log of activity on the terminal is a further check that the right person is using it at the right time to do the right things.

The full requirements and model for security are being developed by the Security sub-group of the Mobile Information User Group.

Job Roles

Mobile Information is capable of providing access to many systems and performing many tasks. For simplicity in use it may be useful to separate the whole of Mobile Information into specific job-related systems. Each person using Mobile Information will be provided the information they need to support their job, in the best way to make them effective. Rather than Mobile Information becoming an enormous all-encompassing system, it then becomes a series of small and focused applications. Each of these may be assigned to one or a few types of terminal, making the whole system easier to explain and use, and more effective.

Alternatively, a Mobile Information terminal might be capable of performing any job role, with the person using it choosing what is appropriate at the time. For example, an officer sent to a traffic accident will want relevant supporting information and system, but these will be different to the needs of an officer sent to a murder. There is no reason why Mobile Information can't do both: provide job-related devices and services, and task-related information and systems access.

What is likely to be the best and most practical solution is to offer both. A person who has a specific job role may use a terminal that supports that role. A specific example would be a SOCO, who may require the ability to print and scan barcoded labels.

A person with a more general or varied role might use a terminal that supports many different tasks. An example of this might be a patrol officer.

Possible job profiles might be:

Job role	Information needs	
	Receive	Send
The basic role will be Patrol Officer, with other roles providing additional capabilities.		
Patrol officer	Stop checks - PNC and local system searches. Despatches. Duty roster. Policy and guidelines. PNLD - points to prove, etc. Briefings. Intelligence. Missing and wanted persons. National Intelligence Model - delivery of products. Location. Telephone directories. Electoral Roll.	Resulting. Location - 'mark this spot'. Status. Time of arrival. Messages. Intelligence updates. National Intelligence Model - information input to products. Input to Activity Based Costing.
The following roles build upon the basic set of capabilities above.		
Patrol vehicle	Maps. Route finding and directions. Tracker.	Location, speed, time. Status. Events - lights, sirens. Officers in the vehicle.
Traffic Officer	ANPR link.	Breath test results. Drug test results. Location, speed, time. Events - lights, sirens. Officers in the vehicle. Video from the vehicle.
Community Officer	Crime numbers. ASBOs. Vulnerable victims. Repeat offenders. Curfews. Crime and Incident hot spots.	Crime reports, Intelligence updates.
Surveillance team	Intelligence reports and searches. Identification searches.	Intelligence updates.
Firearms team	Planned Operation documents. Policy documents.	Events - gun box opened, etc.
The following roles are distinct and separate from those above.		
Traffic Warden	PNC vehicle checks, combined with local systems vehicle checks. Possibly also despatches, duty roster, policy and guidelines, PNLD, briefings, missing persons.	Intelligence updates.
Control Room operator	Location. Status. Results. Emergency button.	Despatches. Job lists. Messages. Data push of search results and supporting information.
SOCO	Crime number. HOLMES 2 reference. Exhibit numbers or references. Policies and guidelines. Manuals. SOCO system.	Location. Exhibit numbers. Photograph references.
CSO	Despatch information, tasks	Intelligence reports, crime reports - unknown role so far.

Information requirements matrix

Incident/Event nature	Incident type and scale	Required transactions	Task associated risks	Opportunity assessment	Precise location	Routes in and out	History, previous events	Site vulnerabilities	Site hazards	Site plans, contingencies	Key person at venue	Others known, likely at site	History - warning signs	Intelligence, criminal profile	Associate profiles	Lifestyle information	Property types and descriptions	Identifying marks	Associated hazards	Handling instructions
Simple info exchange, enquiry	*	*			*						*						*			
Search	*	*	*		*	*	*		*		*	*	*	*			*	*	*	*
Obstruction, public place	*	*	*		*				*		*						*	*	*	
Noise, nuisance disturbances	*	*	*		*		*		*		*	*								
Report of insecurity	*	*	*		*	*	*	*	*	*	*	*					*	*		
Moving traffic incidents	*	*	*		*	*					*	*	*				*	*		
Traffic incidents	*	*	*		*	*	*	*	*		*	*					*	*		
Other accidents	*	*	*		*	*	*	*	*	*	*	*					*	*	*	*
Domestic, industrial hazard	*	*	*		*	*	*	*	*	*	*	*					*	*	*	*
Substance misuse	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Alarm activation	*	*	*		*	*	*	*	*	*	*	*								
Suspicious event	*	*		*	*	*	*	*			*	*					*	*		
Person concern report	*	*	*		*		*				*	*	*	*	*	*				
Public Safety incident	*	*	*		*	*	*	*	*	*	*	*					*	*	*	*
Crime enquiry, cold scene	*	*	*	*	*	*	*	*	*		*	*		*	*	*	*	*		
Crime in progress	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Violent crime in progress	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
				Events						Places						People				Things

Developing the Strategy

Vanilla Mobile Information

All forces are at different levels of sophistication and reach with their technical infrastructure. Many have an email system and an intranet, but not all have both or can display their operational systems through browser screens.

We will therefore develop the concept of 'vanilla Mobile Information' - a basic working set of components that may be purchased in one go and used immediately.

This will comprise:

Component	Options
PDA's	Choice of perhaps two or three, all on framework contracts. Current choices seem to be the RIM Blackberry, the CNI Grapevine, and the range of PocketPC devices. Perhaps the basic entry point is 50 terminals, with additional increments of 10.
Interface	A standard look-and-feel for terminals. This is likely to be based on the screens described in the document MOBILE DATA: THE BUSINESS BENEFITS AND REQUIREMENTS.
Airtime contract	Choice of perhaps three bearer services. Current choices are GPRS, Mobitex (RAM) and Airwave.
Email server	This will be required if the force has no suitable email system, or wishes to keep some separation from the Mobile Information terminals. The email server will provide basic messaging, and also serve as the transport medium for electronic versions of paper forms.
Web server	This will be required if the force has no suitable intranet, or wishes to keep some separation from the Mobile Information terminals. This will allow any force information to be made available to the Mobile Information terminals, providing it can be presented as browser pages on the server. The web server will also allow the completion of forms, if this route is preferred to email.
Security application	This may be the NSPIS BAC product: Netegrity's SiteMinder application. The understanding, practice and standards for security are under development.

The aim will be to use PITO to obtain national framework agreements for the purchase of vanilla Mobile Information, allowing any force to buy it by simply specifying their choices between the options.

Best Practice models

The pilot projects mentioned on page 8 will be reported to the Mobile Information User Group, which will report the findings and recommendations in standard format to the Mobile Information Strategy Group.

These will then be published as best practice models for the use of Mobile Information in certain business areas. The best practice models will provide business cases for implementation, based on using the vanilla Mobile Information infrastructure.

PITO Procurement will be tasked by the Mobile Information Strategy Group to obtain framework contracts for the recommended infrastructure products and bearer services.

The aim of this work will be to provide working components, that have instructions on how best to use them, and may be bought through framework contracts.

Pilot projects

To make best use of Mobile Information, the Police Service must change its business processes. However, until the full capability of mobile information is known, any such change would be a leap in the dark.

It is therefore proposed that this strategy be developed using demonstrators - short projects focused on specific uses or roles for Mobile Information. Each of these must develop a business case model and provide a full analysis of strengths, weaknesses and lessons learned. These will in turn inform the development of suitable processes to take best advantage of the new facilities.

A number of pilots are known to be running, that will inform the *Infinet* strategy. Examples are:

- Electric desk - West Yorkshire Police
- Electric pocketbook - West Yorkshire Police
- Mobilising Major Crime investigations - Hampshire Police

'Electric desk' is the provision of the basic office desk services to a mobile person: email, diary, telephone, address book, browser access to information.

'Electric pocketbook' is the provision of operational support to patrol officers: PNC checks, copies of incident logs, direct messaging with Control Room, forms (Stop Check, etc), browser access to information.

Major Crime is seeking to mobilise some parts of the HOLMES 2 application and the Major Incident Room work practices: Action allocation, Receiver's in-tray, house-to-house, Casualty Bureau.

The other projects that are known to be running are reported in the minutes of the Mobile Information User Group. Surrey, North Wales, MPS, Staffordshire, Cleveland and other forces are at various stages of development. These projects will provide immediate benefit to the forces concerned, and also contribute to the overall strategy and best practice model.

From the work done so far and presented in this document, it seems that the development of this strategy might proceed along two lines: the development through research of information needs, presentation and methods; and the development through practical trials of solutions to particular needs or job roles. The practical pilots are running, while the research work is suggested below.






Information needs

This is the work shown on the previous pages (begins with Job Roles on page 21). Work will be needed to define what job roles exist, the tasks within those jobs, and the information needs for each task. This may best be developed in workshops of practitioners: the people who do the jobs. They should also be asked to provide a priority order for the information: what do they need to know first? An example of this is the West Yorkshire Police nominal search system, which provides summarised results to answer the questions: can they hurt me, can I arrest them, what else do we know about them?

Presentation

This may be an area best suited to University research, to develop the best methods for summarising information and presenting it in a form that is most easily used by a busy person.

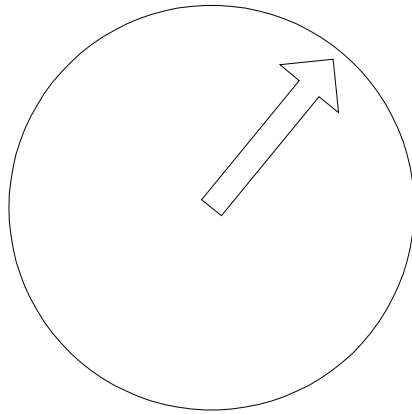
For example, imagine the situation of a police officer despatched to an address. They would like to know the history of who called, who lives at the address, and what else has happened in the neighbourhood. Rather than presenting a list on the screen, it might display a row of symbols:

Caller	Assoc	Car	House	Area
				
2	5	1	23	67

This shows that the caller has 2 previous incidents or records, has 5 items logged for associates, and so on. Power of arrest might be signalled with an audible tone, with a different tone to signal a warning. Perhaps the icons might flash as well. Pressing the icon would then display the relevant information, again in summary and capable of further expansion. SPIS has been investigating the use of text-to-speech and methods of controlling playback. The aims are similar: to provide methods for police officers to receive information without distracting them from the task in hand or their own safety.

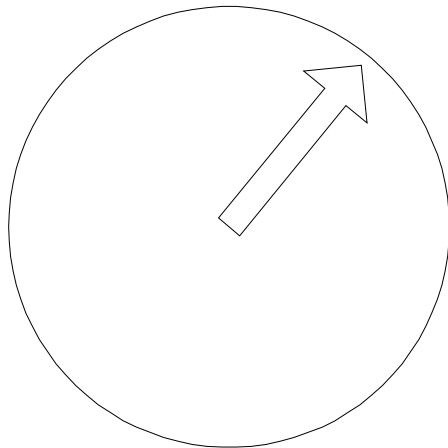
A different form of presentation may be required for geographical information. It is likely that most terminals will not have sufficient storage to hold detailed maps, and that the bearer service will not have sufficient bandwidth to send them quickly. However, a GPS position fix can be transmitted in a few bytes of data. The typical requirement of a person using Mobile Information would be to know where to go. In this case, some of the processing could be done on the main force systems. It may also not be necessary to display a detailed map.

For example, an officer is despatched to an incident. The force host sends the details of the incident log, and a low-resolution position-fix for the location. The receiving Mobile Information terminal compares its own position, gained from its own or an attached GPS aerial, and compares this with the location of the incident. The screen of the Mobile Information terminal displays an arrow and brief text showing where to go.



1 mile
4 minutes
13, High Street

Similarly, when an officer presses the emergency button on their radio or Mobile Information terminal, a GPS position fix is transmitted to the Control Room. This is rebroadcast to all nearby Mobile Information terminals and displayed in the same format.



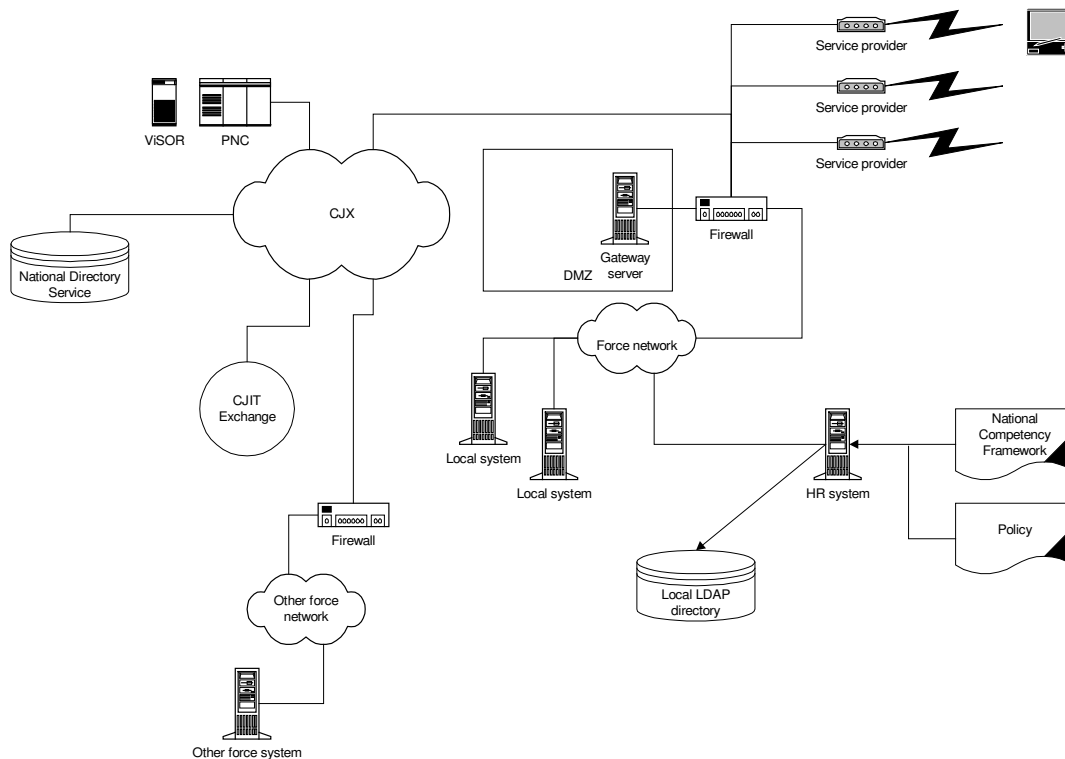
PC99 Smith
19:46hrs
1 mile
3 minutes

Methods

This will encompass all of the experience and current initiatives in the Police Service. If we know of the projects or implementations of Mobile Information, we can build a picture of who is learning what, what types of equipment work best, and build a best practice model for the use of Mobile Information.

The idea would not be to stifle or control innovation, but to capture the experience to form the national model for the best use of Mobile Information.

Architecture model



The Architecture model shows both the intended route for the Airwave PNC service and the proposed route for *Infinet*. The gateway server may be a pair of devices - one for Mobile Information and one for Airwave, or the two may be combined into a single device.

The Mobile Information gateway server is shown near the centre, in a protected zone inside a force's firewall but separated from its network - in the DMZ.

This server is able to support Mobile Information terminals with messages and browser pages. This provides the functionality required by Mobile Information. To do this, the server must be capable of handling XML queries and translating or reformatting the data for both HTML and WAP browsers (to support the different types of Mobile Information terminals).

This means that the server should be capable of handling properly formatted XML queries from any source, not just from Mobile Data terminals. This makes it immediately useful in supporting the CJIT Exchange project.

Further aspects of the integration of Mobile Information with Valiant (ISS4PS) are detailed below.

Identity, authentication and directories

PITO intends to provide a national directory service to define who works for us and what their access rights are. This will support inter-force queries (CRISP) and queries made on national systems (PNC, ViSOR). The root for all this knowledge is the Personnel system each force holds.

If the National Competency Framework can be extended to define the information needs of each job role, then this provides the basic systems access rights. These

standards may be applied to a force's Personnel system, to extract a list of personnel with their (national standard) job titles and access rights. This forms a local directory that may be used to automate the administration of systems access rights.

This directory may in turn be exported to the planned national directory service, where it provides the look-up of authorisation and access rights for police staff making queries of other force's systems or of national systems.

Mobile Information has no direct impact on this plan for local and national directory services, but will use it to control access rights and authorisations.

Standard query access

Each force that installs the standard gateway server developed for 'vanilla' Mobile Information will gain the capability to accept and respond to queries from other forces. The queries may be made from any computer, not just a Mobile Information terminal. Providing the query is made in the standard form, using XML, and the access rights of the person making the query are authorised by the national directory service, then the query is valid and may be supported. The protocols for how information may be accessed and used in the area of Intelligence have been developed by the CRISP project. The same access method and authorisation will also support queries made on national systems, such as PNC and ViSOR.

As with access rights, Mobile Information is not the driving force or the sole enabling technology for inter-force system queries. However, the possession of a standard Mobile Information gateway makes the control and use of such queries easier - there is no need to install more equipment or administration systems to make it possible.

Corporate Data Model

The CorDM is a standard definition of police data structures, which may be provided as a data warehouse. This will in time become the development platform for future information systems. A data warehouse with a standard structure will be an ideal target database for all queries, whether made within the force or coming in from another force.

The CorDM also provides a standard list of data names or titles. If Mobile Information develops to use XML as the standard for queries and presentation, then the CorDM will provide a standard list of field or attribute names and ensure interoperability.

As above, the Mobile Information strategy does not drive the ISS4PS, but is able to use it directly and supports its implementation.

Airwave

Airwave will provide Mobile Information capability to every person equipped with an Airwave radio. The data service is constrained at the moment by the small screen size and limited keyboard available on a radio. However, it is likely that the manufacturers will in time develop their radios to be more like PDAs.

The Airwave service also has a low data rate at this time. This may also improve in future.

Despite these, Airwave will be a national service in common use, and O2 has a strong commitment to providing Mobile Information services.

There need be no conflict between the Mobile Information services of Airwave and *Infinet* - they are very likely to be complimentary. The access gateway servers will be so similar in function as to be identical, the services provided will be identical. The only areas of difference will be in terminal functionality and use - Mobile Information through non-Airwave devices will be available to staff who do not have an Airwave radio, and at least for the early years of Airwave is likely to provide more functionality from the terminals.

CRISP

CRISP is developing protocols for access rights and information sharing that will be re-used by *Infinet*.

CRISP is already developing methods by which some form of national directory service may be used to check and set access rights. This is the path that *Infinet* will follow. It is likely that a separate system for passwords and user access must be created first, just to get Mobile Information systems running. However, the strategy is to adopt a national look-up service for role-based access control. CRISP is developing one, so will be used.

CRISP is also developing protocols for assigning the ownership of information: who is responsible for its quality. This will be also adopted by *Infinet* as soon as it is available.

e-Policing

Infinet will provide a Mobile Information service to the police, which will not be available to the public. However, *Infinet* does support e-policing in two ways.

By making police officers more visible and by providing more information to officers working with the public, *Infinet* supports the aim of making more information accessibly by the public in new ways.

The protocols and methods for making police information accessible over a secure infrastructure will also provide practical support to the e-policing strategy of greater public access.

CJIT Exchange

The CJI Unit is planning a central exchange for Criminal Justice information, based on standard XML schemas for query and interchange. The Mobile Information gateway server supports this, and may even be used as the CJIT gateway. This saves money, and reduces the number of servers that are potential points of vulnerability and must be managed.

A number of the necessary components of the *Infinet* Mobile Information service already exist or are provided by NSPIS and Valiant.

Component	Provided by
Terminal aliasing and management	Same as the management processes for Airwave or Masc.
Access control to local force information	Browser Access Control (SiteMinder)
Access to other forces' staff and contact information	Directory services
Access to information shared by other forces	CRISP

Re-using these components will ensure that *Infinet* maintains compliance with Valiant, and will reduce the work required to make *Infinet* operational.

Interface model

The ideal will be to have a single interface used on all terminals. The options available would vary with job role, so different options may become invisible or inactive for different users.

The prototype for the interface already exists in the IMDN service, which is an implementation of the requirements and screens defined in the document MOBILE DATA: THE BUSINESS BENEFITS AND REQUIREMENTS.

Note that this is a major change for Police Service computer systems. Up until now, each application developer has been free to design their own Mobile Information interface. The change with this strategy is that the presentation and interface will be defined and become a standard, and that any system wishing to provide information to a mobile terminal will have to comply with the standard.

The benefits of a standard interface are that all Mobile Information will look and work the same way. There will be differences in the capability of terminals, and differences in the information provided to various job roles, but in general all Mobile Information terminals will work the same way. This is the equivalent of standardising the control pedal layout in cars.

Security model

Transmissions to and from a terminal must be secure against being read for as long as the information they contain remains active. The security employed must be proportional to the value of the information transmitted. A message despatching an officer to an incident may only need to be secure for as long as it takes the officer to arrive. Intelligence reports from a surveillance may need to be secure at many levels and against sophisticated attack.

The terminals themselves must not be a threat to the integrity of police systems or information. As it is certain that terminals will be lost or stolen, they must contain measures that reduce the risk of them being misused or providing access to police systems. Ideally the terminals would contain no data, and would become worthless (in the sense of being a risk to the police) as soon as their access rights to the realtime bearer or force network were revoked.

The experience of the satellite TV companies is that a determined criminal can break any hardware or software encryption scheme, given time and motivation. This means that any data stored in Mobile Information terminals, even if it is encrypted and

protected with passwords, will eventually be compromised. If the information is time-limited, that is worthless after a certain time, then the encryption scheme need only be strong enough to last that long. If the terminals will be expected to carry information of greater value or that has no 'sell-by date', then the terminals or Mobile Information infrastructure must have the facility to disable and clear a lost terminal. This is the equivalent of the stun command used by Airwave and MASC radios - it causes the radio to clear its memory and encryption keys as soon as it receives the command or the next time it is switched on.

Glossary

Airwave - the name for the Public Safety Radio Communications Service, formerly known as PSRCS and PSRCP.

ANPR - Automatic Number Plate Recognition. A system that links a video camera and computer, to automatically scan number plates and search PNC and other systems.

APD - the supplier and developer of the software used by the terminals and PNC gateway of the IMDN.

ASBO - Anti-Social Behaviour Order.

AVLS - Automatic Vehicle Location System. A system that takes location data from vehicles (usually using GPS) and reports it back into some form of display or report. Can be used to show a real-time moving-map display of resources.

Bluetooth - short range radio carrier for data transfer between devices. Uses the 2.4GHz frequency range.

C&C - Command and Control. The incident-handling computer system and working processes of the Police Service.

C3i - Command & Control, Communications and Information. A military term for Command & Control and the processes around it.

CCTV - Closed-Circuit Television. Strictly meaning a television system that operates over a closed link: cable rather than broadcast. Now taken to be any non-broadcast video or television system.

CJIT - see CJIU.

CJIU - Criminal Justice Integration Unit. Also know as CJIT. An organisation formed by the Home Office, Lord Chancellor's Department and the Attorney General's Office, supported by the Office of the eEnvoy. Charged with integrating the information flow between criminal justice agencies.

CJS Exchange - an infrastructure joining criminal justice agencies, which will allow the query and retrieval of information.

CJX - Criminal Justice Extranet, formerly known as PNN2. The secure network that joins-up all Criminal Justice agencies.

CorDM - Corporate Data Model. The model for all Police Service data within ISS4PS.

CRISP - Cross Regional Information Sharing Project. Evolved from the earlier PNIP, this project will define the protocols to allow the sharing and searching of information between forces.

CSO - Community Safety Officer. See also PCSO.

Data Capture - see definitions on page 11.

Emergency button - a feature available on Airwave radios and some existing force radio systems. Provides an interrupt and alarm to the Control Room operator, and opens the radio microphone for a period to allow hands-free operation by the officer.

GIS - Geographical Information System. A computer system that shows the geographical location of data.

GPS - Global Positioning System. A US military satellite system that allows ground receivers to accurately determine their location, height, speed and the time of day.

ICCS - Integrated Communications Control System. A system that allows a Control Room Operator to manage and use multiple phone lines and radio channels. Often driven by a touch screen. See SICCS.

IMDN - Interim Mobile Data Network. The RAM-based Mobile Information solution used by many forces. Intended to be replaced by Airwave.

ISS4PS - Information Systems Strategy for the Police Service. This is the implementation of Valiant.

Laptop - standard portable computer. Has a full keyboard and the same power and capability as a desktop PC.

MAG - Mobile Access Gateway. A server to be provided by Airwave, to handle data communications with terminals.

Masc - Marconi Analogue Scrambler. An encryption system used on some existing UHF radio systems.

MDT - Mobile Data Terminal. Assumed to be a larger vehicle-fitted device.

MIG - Mobile Information Gateway. A server planned as part of the vanilla Mobile Information architecture, to handle data communications to and from terminals and other devices. Will also process legitimate queries from CJX partners. See MAG.

Mobile Computing - see definitions on page 11.

Mobile Information - see definitions on page 11.

NIM - National Intelligence Model. Best Practice model for the use of intelligence.

NSPIS - the National Strategy for Police Information Systems. A strategy to replace the core and common police systems with national standards. See also Valiant.

Palmtop - a small computer. Smaller than a laptop or standard portable computer. About the size that fits onto one open hand. Usually has a full keyboard. Typical examples are the series 3 and 5 Psion Organisers.

Palmtop - small version of a laptop computer. See also PDA.

PCSO - Police Community Safety Officer

PDA - Personal Digital Assistant. Hand-held electronic organiser, such as a Palm. Does not usually have a keyboard, and relies on handwriting recognition or an on-screen keyboard for data entry.

PDT - Personal Data Terminal. Hand-held Mobile Information terminal.

PIMRD - Police Information Management Requirements Directorate. The ACPO-led Central Customer unit within PITO.

PITO - Police IT Organisation. A non-governmental body that manages IT projects for the English Police Service.

PMR - Personal Mobile Radio. Industry term for a handheld radio.

PNC - the Police National Computer, based in Hendon.

PNIP - Police Networked Intelligence (or Information) Project. See CRISP.

PS microphone - Public Safety microphone. The extension lead, microphone and aerial fitted to a belt-worn radio. Used to bring the aerial into a better position, and make the radio easier to use and carry.

PSRCP - see Airwave.

PSRCS - see Airwave.

RAM - RAM Mobile Data. Now known as Transcom. A supplier of Mobile Data and the provider of the Interim Mobile Data Network (IMDN).

SICCS - Software ICCS. See ICCS. A version of an ICCS where the whole system is controlled in software, rather than by hardware switches. Looks the same and works the same as an ICCS.

SPIS - Scottish Police Information Strategy - the Scottish equivalent to PITO in England.

TETRA - Terrestrial Trunked Radio. A digital replacement for the conventional analogue police radio systems. Operates around 410 to 420MHz

Tracker - stolen vehicle tracking system, using radio signals to locate the direction and range of the stolen vehicle relative to the Tracker unit.

Transcom - the supplier of the IMDN, formerly known as RAM Mobile Data.

UHF - existing police radio band, operating around 450 to 470MHz

Valiant - the Police Information Systems Strategy.

VHF - existing police radio band, operating around 140 to 170MHz.