



In 1854 John Snow proved that a water pump in Soho, central London, was the cause of a cholera outbreak. He did so by plotting the deaths caused by cholera on a map to prove to the authorities there was a link between the location of the pump and the proximity of the victims. Since then mapping has become an integral part of work undertaken by emergency services. The ESRI UK Conference on October 29 illustrated how far mapping has come since 1854 and the benefits of the latest technological advancements.

The award-winning Queen Elizabeth II Conference Centre is a purpose-built venue uniquely situated in the shadow of Big Ben, Westminster Abbey and the London Eye.

Anthony Hamber, Hitachi Consulting

Anthony Hamber of Hitachi Consulting discussed the role of a number of prototype GIS applications developed within the National Offender Management Service of the Ministry of Justice to assist with the management of offenders. As Hamber explained, offenders have several specific addresses in their profile including, home address, next of kin and release addresses. Other addresses relevant to offenders include locations such as police stations, courts and probation offices and with over 894,000 escort movements between prisons, police stations and courts a year, the need for a system that can manage and process such geographic information is becoming increasingly significant.

Using geocoded addresses on a map-based system allows relevant information to be processed and displayed in a clear and understandable way. Additional functionality also can be exploited, as Hamber explained. "Using the shared digital mapping service means you can set up victim exclusion zones on the map outlining where the offender may not enter, usually an area where the victim lives. These

zones can be stored centrally and called up as required. You can also overlay transport routes onto the map so if the offender claims they have to travel through an exclusion zone on public transport to visit their family or place of work, you can determine if this is true."

Hamber's final point centred on the need for a common symbol set for these maps so they can be easily shared and viewed by other stakeholders without the need for training.

Major Waleed Alhamadan – Ministry of the Interior, Bahrain

Major Waleed Alhamadan began by explaining the role of his department, "the preservation of homeland security and public safety and law enforcement," adding that the use of mapping technology was helping with this role. Major Waleed Alhamadan also explained that the increasing rise in population and therefore increased building and living spaces in Bahrain had made the need for geo-spatial data even more important.

Major Waleed Alhamadan demonstrated the use of ESRI software on his system and how both control room staff

and vehicle operators could access data on roads, traffic flows and locations of other vehicles to provide a coordinated response. The system had been implemented over the last two years and was a first-time system, so there hadn't been the problem of replacing legacy systems.

DCI Simon Jones – Leicestershire Constabulary

DCI Simon Jones from Leicestershire Constabulary spoke about Project Mercator (named after the Flemish cartographer) and their use of GIS in the fight against serious and organised crime.

DCI Jones explained that through the use of maps they had been able to better understand the workings of the organised crime network in their area and the patterns. DCI Jones explained that mapping software from ESRI called Pictometry had given them a big advantage by allowing them to scope out buildings for heights, widths, and entrance and exits, without having to travel to them. With cocaine routes into Loughborough originating in Spain, DCI Jones explained they had worked with Spanish police to tip them off about a factory where they believed the cocaine was coming from and so passed on information on the building without having to even leave their control rooms.

The use of maps also made it a lot easier to present information to others. DCI Jones explained this by showing a map of the drugs route through Europe and the links between gang members by their locations on a map. He added that this ability was an important stage in the policing process: "It's not enough to have knowledge of something, you need to turn that knowledge into intelligence before you act on it. Using intelligence means you may not go straight for the first person you suspect but act on the information you have to follow it through to a more worthwhile conclusion."

DCI Jones' final point concerned the help of the public. "Maps are a great way of getting the public to give information without them knowing it, or compromising an operation. We can take information we receive and plot it on the map and build a view of the area. This in turn allows better deployment of officers and technology."

Ian Oldfield and Peter Bleakley – Metropolitan Police

The next talk of the session looked at the use of GIS systems to help detect the possible locations of criminals based on their patterns of offending. Ian Oldfield and Peter Bleakley from the Met Police explained how they had developed this with a prototype ESRI-based model called Interactive Offender Profiling System (IOPS).

With almost a million crimes recorded in London every year and many more calls for service, the Met's need for accurately mapped data is very high. Bleakley pointed out that despite the widespread deployment of Mobile Data Terminals (MDT) in police vehicles in London, they were still only linked to its Command and Control system. Other police forces had expanded the information available via such mapping terminals to include real/near time intelligence to assist officers in making the best use of emerging geospatial intelligence tools, to display crime hotspots and criminal locations.

Oldfield explained the nature of criminal behaviour lent itself to being plotted on a map and the information could be used to build up a picture of where the criminals might

be found, based on anchor points such as their home or work. Research showed offenders travelled out from these anchor points, revealing their links to a geographical area. The IOPS system is built on ESRI software and compatible with the Met's Command and Control system, although the two are not yet linked.

Further studies involving solved cases and research on an offenders' "mental map" revealed that features such as rivers, canals, major highways and railway lines could often create a "mental barrier" constraining the offender's movements. GIS helped to bring all the components of criminal activity and constraints together to enable the police to locate likely offenders.

Gary Birchall – South Yorkshire Police

The next talk looked at the use of applications on GIS to bring extra value. The Crime Analyst Toolbox is one such application being used by South Yorkshire Police. Birchall started by saying the value of maps had always been known, citing the use of pins in maps that had often been associated with traditional policing but explained that by using technology this could be improved on massively.

The improvement came when three doctors from the University of Sheffield came to the police with the idea of mapping the crimes on the system. As a result the university secured a grant from the Home Office and had computer systems designed to implement these tools.

The system allows data to be input, plotted, analysed and manipulated to highlight patterns of when crimes are most frequent with regards to times, dates and locations to give officers an increased understanding of the nature of the crimes they are dealing with. The system was designed to be simple to use and training takes only two days.

Andrew Watson – British Transport Police

Andrew Watson spoke on the topic of improving UK policing through Geographic Information (GI) from his perspective both within the British Transport Police (BTP) and also as the ACPO lead on the subject.

Watson explained that when crimes are reported spatial data was the most abundant type of data, with around 94 per cent of it including time, date, location and so on. Utilising data as much as possible was a key part of policing and GI is a great way of doing this.

Watson continued by looking at the rise of investment in mobile data terminals and how these could be linked in with GIS to bring addresses and maps together. This led on to his point that access to GI had to be simple to use, run and update so that people could adapt to using it regularly.

Watson then looked at the real policing benefits of linking maps with handheld devices. He showed a map of Camden tube station that included instructions for areas to be cordoned off and where traffic should be re-directed. He then made the point that relaying this same information by voice, probably before officers arrived on the scene, would mean it would be forgotten, or confused, and not result in clear or coherent policing. But by having it on a screen, clearly marked with instructions, officers could work far more effectively. A final point outlined the need for a common symbology, as touched on by Anthony Hamber, so all officers understood what was meant by certain symbols.

"Maps are a great way of getting the public to give information without them knowing it, or compromising an operation. We can take information we receive and plot it on the map and build a view of the area."

DCI Simon James,
Leicestershire
Constabulary.