

The AGI Foresight Study - The UK Geospatial Industry in 2015

An Expert Paper



Crime and public safety

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Crime has an inherent geographical quality. For a crime to occur it involves some form of interaction between an offender and a suitable target, at a location. It also involves the offender originating from a location and travelling along a particular route, and some form of similar origin-destination movement when the target is a person. When a target is fixed (e.g. a building), there is some form of attraction - often connected to its geography - that makes it more suitable than another target for the commission of an offence to occur.

Geographic information and mapping plays three key roles in policing, crime reduction and public safety – it pinpoints where an incident has occurred and where an immediate response should be targeted to; it forms a component of crime analysis and intelligence development in order to provide public protection through the management of certain offenders, criminal investigations, and inform operational tactics and strategic interventions for deciding on the deployment of resources; and provides a means through which to assist in informing the public about recent crime trends, communicating messages of reassurance and police and local partner activities aimed at improving community safety.

The application of GIS and other forms of spatial technology will continue to improve service responses to incidents, and will help to improve the effectiveness of publishing crime figures and the manner in which messages of reassurance are provided using online mapping tools. This will tick along quite nicely over the next 5 years. I anticipate that two more significant developments will take place in this time, but will only be fully realised if they receive some support from the GI industry and others.

From too little, too late, to too much and not really knowing what to do with it all

The UK is blessed with rich sets of geographic information. While we may occasionally voice complaints and grievances about geographic information in our country, I am always struck at how well off we actually are in the UK with the geographic information that we can use when I compare it to other countries that I travel to. We also have a rich source of information that is being recorded by our public authorities, and while it is not all quite perfect, it certainly offers something to the enquiring mind looking to tackle and reduce crime.

The richness of what is out there and how it can be accessed is only now beginning to be better recognised by those working in analytical and intelligence professions in policing, crime reduction and public safety. The UK also has a strong public agency partnership ethos when it comes to tackling crime and improving community safety, yet again it is only in recent years that value in using other agencies data alongside one's own agency is being better realised.

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A key principle in tackling crime and improving public safety is to actually begin by understanding what the problem is! Now this may sound obvious, but in practice crime problems are often poorly understood or not considered from other dimensions. Let me give an example. Over the last 10 years there have been good improvements in how violent crime is recorded by police forces. The majority of recorded violent crime is not the serious stuff (such as murder and rape) and but is made up of the fights that take place in our town centres, and those that take place in the home. When we think about violent crime and how it can be tackled we most usually automatically think about the police and their role. OK, so the police can analyse the problem using data that are recorded on their systems, see where these take place and respond accordingly (perhaps by targeting more patrols to the town centre at night). But when I then tell you that 70% of those who present themselves to the local A and E department after sustaining an injury from a punch up do not report it to the police, it shows that at best, the police are basing their decisions on little more than 30% of the information that relates to the problem. Many of those who are injured after a fight just go home and don't report it to the police and patch their wounds up themselves so any data the authorities have is already only going to be partial. So on their own, do the police really have a good understanding of the violent crime problem?

Information sharing amongst those agencies that protect us, try to prevent us from being victims of crime, and try to catch those who may have committed a crime is certainly improving, and will continue to improve I believe at quite a pace over the next five years. I think it is only now that more are actually seeing the benefit that comes from information sharing, and with it recognising the key role that geography plays in helping to knit all this data together. To date, the reliance has been on police recorded crime data, but in recent years more and more police forces and their partners involved in Crime and Disorder Reduction Partnerships have been accessing data on Council databases about anti-social behaviour, Fire and Rescue service deliberate fires, Probation Service clients, Youth Offending Service clients, admissions to accident and emergency departments, hospital admissions for drug or alcohol abuse, records from the Drugs Service on clients receiving drugs or alcohol treatment, Council recorded data on environmental crime, Environment Agency data on environmental crime, police data on drugs tests, stop and search, and recorded incidents of disorder, Prison service releases and then there is all the data from voluntary, community and business groups. This, I believe, whilst welcoming in helping to better understand crime, does create the problem of how to simply manage these data and get from them something that is useful, meaningful, and can be effectively interpreted in order for it to help tackle the problem. I think the GI industry is well placed to help these agencies, from assisting them in managing data through to providing analytical techniques that help search for patterns between these disparate data sources.

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Catch me if you can

Another change I foresee is the greater use of geographical analysis techniques in supporting criminal investigations. For some years a technique called geographic profiling has been used to assist investigations into serious serial crime in the UK. Geographic profiling uses the locations of a connected series of crime to determine the most probable area of offender residence or some other location from which the offender anchors their activities (e.g. place of work or the zone in which they hunt for their victims). It was used effectively to help identify Clive Barwell, a serial rapist who operated around the Leeds area from 1982 – 1995, it was used in swiftly helping to identify the offender in a serial armed robbery case that had previously seen little investigative progress by the police over the 10 years the series took place, and was used to help target where a decoy should be located to trap an offender who had committed a series of sexual assaults in Bath in 2005.

Geographic profiling has also most recently proven to be effective in helping to catch serial offenders of what are termed 'volume' crimes. These are crimes that are not as rare as murder, armed robbery, and rape, and include crimes such as burglary, street robbery, criminal damage, vehicle crime and arson. Indeed, it has been argued that the majority of volume offences are actually committed by serial offenders, in that the offence they committed was probably not their first and not their last; therefore there is some serial nature to their offending. Catching most types of offenders is hard work, and indeed the chances of catching the average offender of a volume crime at the moment is pretty slim – usually no better than 1 in 5 or at worse 1 in 30.

As more police forces become aware of geographic profiling they will want to explore how it can be applied to volume crimes. However, a key principle behind an accurate geographic profile is the ability to be able to successfully link together the connected series of crime that an offender has committed. By their nature and name, there are many more 'volume' crimes to try to link, with the added difficulty in working out which ones are connected to just one offender from the high number of crimes that were committed by other offenders. Connecting the series most usually relies on three main methods:

- Physical evidence, such as DNA profiling, fingerprinting, ballistics, and shoeprints, but for volume crimes these are rarer to come by than in more serious offences
- Offender description – this relies on a witness description of the offender, but for the types of crime we are referring to, with the exception of street robbery, the victim or any other person were not present and so are not able to offer a description
- Crime scene behaviour – this involves comparing similarities and differences between offences in the behaviour of the offender at the crime scene.

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It is in the analysis of crime scene behaviour where geography comes in as it provides one of the best available means of helping to link the series. The key variables that are explored with the crime scene behaviour are:

- the proximity in space and time between offences
- the method of operation (modus operandi), and
- any presence of a 'signature'

Any signature offers little that connects it to the use of geographic information and is often a rare commodity to find anyway. The proximity of space and time is obviously geographic. And the modus operandi? Here we are interested in understanding victim/target selection methods, using information from the crime scene to determine for example, the certain attributes about the offender such as whether they are simply an opportunist (finding victims and targets when they come across them), or are seeking out and exploring for their targets with greater planning and thought. Without going into details here, there are variables that relate to crime science behaviour that can help us determine these types of subtle but important geographic differences and which in turn can be vital to the investigation. In addition, clues such as the pre-offence direction of travel and post-offence direction of travel also can be significant geographically in helping us to compare similarities and differences between offences and provide information that can help connect a series of offences together.

Connecting these types of offences is still very problematic and will hold back the application of geographic profiling if effective tools for linkage analysis are not developed. I believe that a crucial variable and one of the only known clues that is left behind at the scenes of these crimes is the geography of the offence – both in terms of where it happened but also the micro-geography of the characteristics about the crime scene.

Summary – five key points

- Geography and geographic information will continue to play a key part in policing and crime reduction over the next five years.
- Applications such as calls for service and the publishing of crime statistics using online crime maps will continue to tick along.
- Improvements in information sharing may result in creating an information explosion that results in those at the receiving end of information having too much information, and not enough time or tools that help them make sense from all this information.

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- Geographic profiling will extend its application by helping to support volume crime investigations, but this opportunity will not be realised if developments in the tools to support linkage analysis are made.
- The geographic information industry is well placed to assist in these two areas by helping to support the management of information, how it can be joined up, and identify the most significant patterns of interest.

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