INTERNATIONAL CRIME AND INTELLIGENCE ANALYSIS CONFERENCE
The UCL JDI is once again delighted to host the International Crime and Intelligence Analysis Conference. The UCL JDI is the first Institute in the world devoted to Crime Science. Research is concentrated on new ways to cut crime and increase security, drawing upon UCL's vast experience in related disciplines, including architecture, economics, engineering, geography, medicine, statistics, psychology and town planning. The JDI brings together 30 top research departments and research groups across UCL all with a working interest in the field of security and crime.

The JDI aims to promote multidisciplinary research in crime and security and also promote multidisciplinary conferences, events, training and short courses in these fields. Our partners and clients include organisations from academia, industry, commerce and government.
The ACIA brings together analysts and researchers from both the public and private sectors across the UK and Ireland. It enables members to develop their skills and progress their careers by linking them with like-minded individuals from a diverse range of backgrounds and organisations and by providing a range of ways by which they can swap ideas and interact.


The ACIA is an interactive association with member participation a key component. It is not a service you buy but an association you join. ACIA is the sum of its parts – its membership and its successes are all due to its members’ activities. Together we can achieve great things!

If you would like to contribute to one of the projects then there are many ways you can get involved including assisting in facilitating the annual conference and awards process. Please get in touch via info@acia.org.uk
International Crime and Intelligence Analysis Conference programme

Thursday 25th February
9.00 – 10.10 Registration, refreshments and exhibition

10.10 – 11.30: 1st Plenary (Exchange room 11)
- Welcome, Spencer Chainey, University College London and Conference Chair; Keith Jackson, President - Association of Crime and Intelligence Analysts (ACIA)
- The Scottish Business Intelligence Toolkit and associated deployment model - Alex Kelly and Scott Hamilton, Police Scotland
- Safe and Sound Partnership – managing the night time economy using situational crime prevention techniques (International POP Goldstein Award Winner 2015) - Iain Agar, London Borough of Havering
- Exhibitors and Poster Showcase – a series of 60 second showcases from each exhibitor and poster presenter

11.30 – 11.55 – BREAK AND EXHIBITION

12.00 – 13.00: Parallel session 1
1A Seminar stream - Serious and organised crime: paths and pathways (Exchange room 11)
- Pathways into serious and organised crime Edward Doughty and Helen Brayley-Morris, Prevent Intelligence Analysis Team, UK National Crime Agency
- Detection, investigation and monitoring of organised crime groups using forensic intelligence: a promising path forward Simon Baechler, School of Criminal Justice, University of Lausanne, and Forensic Science Service, Neuchâtel Police Department, Switzerland

1B Seminar stream - Tales from Two Andys! (Police effectiveness and MCC hotspots) (Exchange room 10)
- Crime and the night-time economy: multi-classification crime (MCC) hot spots in time and space Andrew Newton, Applied Criminology Centre, University of Huddersfield

Class 1C (Exchange room 6/7): ACIA class: A practitioner’s guide to working in academic projects - Jenny Martin and Sam Todd, West Midlands Police

Class 1D (Exchange room 4/5): Improving the explanatory content of analysis products using hypothesis testing - Spencer Chainey, University College London

13.00 – 14.00 – LUNCH and EXHIBITION

14.05 – 15.05: Parallel sessions 2
2A Seminar stream - Excellence in analysis (ACIA award runner-ups) (Exchange room 11)
- The Cambridgeshire Risk Matrix Model Emily Doran, Amanda Huggins and Sally Brierley, Cambridgeshire Constabulary
• Operation Churchill - the analysis of a commercial burglary series Steve French, Devon and Cornwall Constabulary

2B Seminar stream - Fear, perceptions and victimisation (Exchange room 10)
• Perceptions of security and its relationship with crime - an example from Mexico Rafael Prieto Curiel, Department of Mathematics, University College London
• Comparing predictors of victimisation and attitudes towards crime across five European countries Peter Baudains, Department of Security and Crime Science, University College London

Class 2C (Exchange room 6/7): ACIA class: Infographics – putting analysis in the picture - Paul Eggleston, ACIA (Norfolk and Suffolk Constabularies)

Class 2D (Exchange room 4/5): What is new in IBM i2 Analyst’s Notebook 9 - Janet Warner and Mark Fleet, Shortest Path Training

15.05 – 15.35: BREAK AND EXHIBITION

15.40 – 16.40: Parallel sessions 3
3A Seminar stream - Risky business – MoRiLE (Exchange room 11)
• Management of Risk in Law Enforcement (MoRiLE): Delivering contextualised risk modelling for law enforcement Chris Dowen and Amanda Huggins, West Midlands Police
• The Management of Risk in Law Enforcement (MoRiLE): Using logic and collective expertise to establish strategic Community Safety Partnership priorities Harry Stanton, Birmingham Community Safety Partnership

3B Seminar stream - Developing intelligence products (Exchange room 10)
• Changing perceptions and influencing decision makers: producing meaningful strategic intelligence Ciaran Walsh, Chris Lowe and Sam Todd, West Midlands Police
• Partners working together to achieve one goal: developing organised crime local profiles for CSE and modern slavery Jenna Thomas, Debbie Unwin and Ceri Lloyd, Devon and Cornwall Police

Class 3C (Exchange room 6/7): ACIA class: The analyst in court – preparing telephone data as evidence Steve French, Devon and Cornwall Police

Class 3D (Exchange room 4/5): What Works? Integrating evidence into crime prevention decision-making Lisa Tompson and Amy Thornton, representing the Commissioned Partnership Programme supporting the What Works Centre for Crime Reduction

16.45 – 18.00: ACIA AWARDS CEREMONY AND DRINKS RECEPTION - raise a glass with us to toast and congratulate the 2015/16 ACIA Award winners for excellence in analysis.
Friday 26th February
9.15 - 9.45 Refreshments and exhibition

9.45 – 10.45: Parallel session 4
4A Seminar stream – Cybercrime (Exchange room 11)
• Cybercrime: is your criminal intelligence function ready? A UK perspective and the lessons learnt so far Owen Gillard, PA Consulting Group
• Profiling the cybercriminal Jason Nurse, Cyber Security Centre and Maria Bada, Global Cyber Security Capacity Centre, University of Oxford

4B Seminar stream - Scaling up (Exchange room 10)
• Task the nation: tactically assessing the Environment Agency Matt Hind, Environment Agency
• From divisional analysis to force level analysis – the challenges of upscaling (a child sexual exploitation case study) Danielle Williams, Greater Manchester Police

Class 4C (Exchange room 6/7): ACIA class: Open source research tips and tools you can use right now! - Neil Smith, K&T Research Services (www.uk-osint.net)


10.45 – 11.15: BREAK AND EXHIBITION

11.20-12.20: Parallel session 5
5A Seminar stream - Data challenges for analysing serious crime (Exchange room 11)
• The categorisation of rape offences in Lancashire Catherine Woodward, Lancashire Constabulary
• Female genital mutilation in the West Midlands Mark Hadley, West Midlands Police

5B Seminar stream - Analyst skills development (Exchange room 10)
• Towards the holistic training of law enforcement intelligence analysts Aleksandra Bielska and Chris Pallaris, i-intelligence GmbH, Switzerland
• Six skill domains for the next generation analyst Jenny Martin, Chris Lowe, and Sam Todd, West Midlands Police

Class 5C (Exchange room 6/7): ACIA class: Analysis of competing hypotheses - Owain Gower, Sussex Police


12.20-13.20 – LUNCH AND EXHIBITION
13.25-14.25: Parallel session 6
6A Seminar stream - Human trafficking and modern slavery (Exchange room 11)
• Practical approaches to improving the evidence base about modern slavery in the UK Olivia Hesketh and Christine Cooper, Home Office, and Clare Gollop and Sian Bevan, Modern Slavery, Organised Immigration Crime and Migration Related Matters National Policing Portfolio and the Welsh Regional Organised Crime Unit
• Turning information into intelligence and intelligence into evidence – the role of the analyst in tackling human trafficking and modern day slavery in Rochdale Danielle Williams, Greater Manchester Police

6B Seminar stream - Analytical methods and their application (Exchange room 10)
• Theory of change, improving standards of evidence: an application on youth crime and gang prevention Iain Agar, London Borough of Havering
• The value of hypothesis testing in analysing organised crime Matt Ashby, College of Business Law and Social Sciences, Nottingham Trent University

Class 6C (Exchange room 6/7): ACIA class: Targeting domestic abuse using the Cambridge Crime Harm Index - Matt Bland, Vice President ACIA (Norfolk and Suffolk Constabularies)

14.35-15.30: 2nd Plenary (Exchange room 11)
• Operation SEBRING - murder investigation - Sue Sumner, Lancashire Constabulary (2015/16 ACIA award winner for excellence in analysis)
• The value of research in modern policing - Nerys Thomas, UK College of Policing

15.30: Conference prizes
CLOSE: 15.40

Posters
• Understanding the variations in spatial-temporal patterns of motor vehicle theft in Riyadh, Saudi Arabia under western environmental criminology Nawaf Alotaibi, Andy Evans, Alison Heppenstall, and Nick Malleson, School of Geography, University of Leeds
• Data breach (credit card fraud): a potential indicator and warning Michael Davies, Centre for Doctoral Training in Cyber Security, University of Oxford
• Directing patrol routes using predictive policing Lisa Jackson, Johanna Leigh and Sarah Dunnett, Department of Aeronautical and Automotive Engineering, Loughborough University
• Assessing the potential prevalence of child sexual exploitation through data Matthew Lloyd, London Borough of Brent Community Safety Partnership
• Serious and organised crime local profile Kath Tyler, Staffordshire Police
• Crime scripting in action - the analysis of modern slavery including child sexual exploitation Debbie Unwin, Jenna Thomas, Ceri Lloyd and Holly Ricketts, Devon and Cornwall Police
• Crime analysis in Belize: a developing concept Jane Usher, Belize Police Department
Exhibitors and Abstracts

International Crime and Intelligence Analysis Conference programme

Exhibitors

Create Intelligence

Esri(UK)

1st Plenary

The Scottish Business Intelligence Toolkit and associated deployment model

Safe and Sound Partnership – managing the night time economy using situational crime prevention techniques (International POP Goldstein Award Winner 2015)

1A Seminar stream - Serious and organised crime: paths and pathways

Pathways into serious and organised crime

Detection, investigation and monitoring of organised crime groups using forensic intelligence: a promising path forward

1B Seminar stream - Tales from Two Andys! (Police effectiveness and MCC hotspots)

Reconciling SARA assessment and evidence-based policing: reflections from the Police Effectiveness in a Changing World project

Crime and the night-time economy: multi-classification crime (MCC) hot spots in time and space

Class 1C ACIA class: A practitioner’s guide to working in academic projects

Class 1D: Improving the explanatory content of analysis products using hypothesis testing

2A Seminar stream - Excellence in analysis (ACIA award runner-ups)

The Cambridgeshire Risk Matrix Model

Operation Churchill - the analysis of a commercial burglary series

2B Seminar stream - Fear, perceptions and victimisation
Perceptions of security and its relationship with crime - an example from Mexico .......................................................................................................................... 20

Class 2C: ACIA class: Infographics – putting analysis in the picture....... 22

3A Seminar stream - Risky business – MoRiLE........................................... 23

Management of Risk in Law Enforcement (MoRiLE): Delivering contextualised risk modelling for law enforcement................................. 23

The Management of Risk in Law Enforcement (MoRiLE): Using logic and collective expertise to establish strategic Community Safety Partnership priorities.................................................................................................. 24

3B Seminar stream - Developing intelligence products................................... 24

Changing perceptions and influencing decision makers: producing meaningful strategic intelligence ................................................................. 24

Partners working together to achieve one goal: developing organised crime local profiles for CSE and modern slavery ................................................. 25

Class 3C: ACIA class: The analyst in court – preparing telephone data as evidence ............................................................................................................ 27

Class 3D: What Works? Integrating evidence into crime prevention decision-making........................................................................................................... 27

4A Seminar stream – Cybercrime.............................................................. 27

Cybercrime: is your criminal intelligence function ready? A UK perspective and the lessons learnt so far ................................................................. 27

Profiling the cybercriminal ........................................................................ 28

4B Seminar stream - Scaling up.................................................................. 29

Task the nation: tactically assessing the Environment Agency .................. 29

From divisional analysis to force level analysis – the challenges of upscaling (a child sexual exploitation case study)................................................. 30

Class 4C: ACIA class: Open source research tips and tools you can use right now! ................................................................................................. 31

Class 4D: Advancing crime analysis with R and Shiny............................... 32

5A Seminar stream - Data challenges for analysing serious crime............ 32

The categorisation of rape offences in Lancashire................................. 32
Crime scripting in action - the analysis of modern slavery including child sexual exploitation ................................................................. 47
Crime analysis in Belize: a developing concept ................................................. 48
Create Intelligence is a UK headquartered specialist provider of data-analytics solutions to global law enforcement, central government, Defence agencies and corporates. Our leading-edge technology “Chorus” is rapidly becoming the de-facto analytical solution for cleaning and analysing complex datasets; including call data records, handset downloads computer forensics, financial transactions, ANPR, Wi-Fi, covert intelligence, cell tower dumps, GPRS data and others. It is currently deployed in some of the largest law enforcement agencies in the UK, supporting Major Investigation Teams, Serious and Organised Crime Units, Counter Terrorism Units and other specialist teams. Chorus has assisted in securing convictions in many high-profile cases.

The Chorus solution is unique as it cleans all types of digital data and then provides the analytical tools to allow analysts to immediately answer the key investigative questions. The platform ingests all types of digital data and meta data and allows users to generate court room ready reports straight from raw data in minutes. Chorus reduces the time it takes to identify links between suspects and to help analysts and operational leads to uncover previously hidden connections and open up new lines of enquiry.

Chorus empowers the analysts and intelligence community to deliver results fast.

Esri(UK)

Smart Policing = Safer Communities

Esri UK provides GIS technology that helps law enforcement to utilise new, smarter approaches to policing. Whether it is used for analysis, for command & control, predictive policing or response planning, our GIS software enables police personnel to capture and create one common operational picture in the form of interactive maps and reports on the desktop, laptop, handheld, or in emergency vehicles.

GIS allows law enforcement and criminal justice personnel to plan effectively for emergency response, determine mitigation priorities, analyse events, and predict future events. Vitally, increasingly limited resources can be directed to the most appropriate locations, to deliver the best possible service, for citizens.

Working with location information, GIS software and solutions from Esri UK gives you the power to solve problems, you encounter, every day. As the world leader in GIS technology, Esri offers innovative solutions that will help you create, visualise, analyse, and present information more clearly. To find out more about how Esri’s GIS solutions can help you unlock the spatial component of your valuable data, and see your organisation’s information from a new perspective, visit our stand or go to www.esriuk.com/industries/public-safety
Presenter abstracts

Abstracts are listed in conference programme order.

1st Plenary
The Scottish Business Intelligence Toolkit and associated deployment model
Alex Kelly and Scott Hamilton, Police Scotland

While an evidence-based approach is a fundamental ingredient to effective policing, understanding where to prioritise resources is central to the framework of effective policing delivery. The process for identifying neighbourhoods for Police attention continues to be ad-hoc, based on analysis and contextual interpretation. Consequently, opportunities are potentially being missed to reduce the harm within our most vulnerable and marginalized communities.

Police Scotland has developed an innovative Business Intelligence Toolkit (BIT) that provides a systematic means of prioritising neighbourhoods. The toolkit was rolled out forcewide in 2015 and has become integral for determining where and when to deploy officers to address identified problems and emerging trends. Data from the toolkit, along with local context and intelligence, feed into an overarching Violence Prevention Deployment Model. Reviews of on-going deployments are undertaken during weekly Deployment Assessment Meetings, ensuring officers are directed to the right places, at the right times, to prevent harm. At the conclusion of sustained deployments, reports are produced using statistical data from the toolkit, helping evidence that pre-deployment objectives were met. These reports also identify policing tactics / partnership activities that were effective in the circumstances to which they were applied, thereby allowing for wider learning and sharing of “what works”.

The toolkit and its associated deployment model have received significant attention from other police forces who are keen to consider the benefits of Police Scotland’s innovation, with other opportunities being considered to help in the tool’s further development.

Safe and Sound Partnership – managing the night time economy using situational crime prevention techniques (International POP Goldstein Award Winner 2015)
Iain Agar, London Borough of Havering

The Safe & Sound NTE initiative in Havering has helped transform Romford town centre from a perceived violent crime and alcohol disorder hotspot to a diverse space where clubbers, young people and families can safely enjoy the night time facilities on offer. There are 41 restaurants, 21 bars, 3 night clubs, 2 cinemas, bowling and a NAMCO arcade open during the evening in Romford.

In 2009/10 Romford had the highest rate of violence per 100,000 visitors of all regional metropolitan centres in London, following a 27% rise in police reported violence and a 16% rise in ambulance assault patients over the previous three years. Press responses to rising violence and our unfavourable ranking in the London context were damning and public attitude surveys also revealed that 37% of residents thought drunk and rowdy behaviour was a problem, and just 55% felt safe after dark.
Violence in Romford Town is disproportionately concentrated within the Friday/Saturday evening periods when there are up to 11,000 visitors to drinking establishments each night. Those aged 18-29 and male were significantly overrepresented with many consuming high levels of alcohol – in 58% of violent incidents victims could not recall what had happened due to their level of intoxication. The overwhelming majority of cases involved parties unknown to one another.

Key problems identified during the analysis, which could be seen to contribute to the problem included:
- Inadequate safeguards against people who are intoxicated
- Higher socio-economic costs to services due to injury sustained by glass
- Customers already entering town/venues intoxicated
- Responses focused on detecting offences late, rather than removing potential offenders (or victims)
- No fear of consequences
- Unregulated space and street furniture creating bottlenecks where different groups can come head-to-head
- Closing times not staggered, pushing large volume of people into the street at once
- Insufficient transport to leave location and no alternatives venues in which to wait

A number of key initiatives have been implemented by the Safe & Sound Partnership to address each aspect of the problem analysis triangle (victims, offenders and locations) using an array of situational crime prevention measures.

These initiatives include a Safe Haven venue, Street Triage, Marshalled Taxi Ranks, good use of licensing conditions (to stagger closing times, ban irresponsible drinks promotions, restrict advertising of drink promotions, control tools and weapons, control and screen exits to outdoor areas and smoking areas), barred from one barred from all initiative, radio-link network and ID scanning.

Since the scheme began there has been a 29% reduction in ambulance call outs for injuries and illnesses. The socio-economic costs saved in reduced seriousness of injury from glass is estimated at £437k annually. More than 215 people have been banned from entering the town centre for periods of 3-weeks to 5-years. There has been an increase in the proportion of offenders identified, increased detections and increased confidence with more victims willing to proceed allegations. Overall violence reduced by 58% since 2009/10.

Romford has the fastest falling rate of violence of all Metropolitan Centres in London.

Parallel session 1
1A Seminar stream - Serious and organised crime: paths and pathways
Pathways into serious and organised crime
Edward Doughty and Helen Brayley-Morris, Prevent Intelligence Analysis Team, UK National Crime Agency

Key words: Prevent, Organised Crime, Intelligence, Pathways, Partnerships

In January 2015, the National Crime Agency, in collaboration with the Home Office,
created a new Prevent Intelligence Analysis Team. As a team we are focused on developing a detailed understanding of the different pathways that individuals can take into committing serious and organised crime. The outcome of this work is designed to help inform future Prevent activity, aimed at reducing the number of people from being drawn into criminality or from re-offending.

Working with law enforcement, central and local government, the third sector and academia, we have produced our first assessment entitled ‘Pathways into Serious and Organised Crime’, which is currently being prepared for public release (due January 2016). Cutting across multiple crime types, this assessment explores pathways into a wide range of serious offending including child sexual exploitation and abuse, firearms, organised immigration crime, human trafficking, modern slavery, cyber crime, drugs, economic crime, and organised acquisitive crime. Our report discusses the role of family, friendship, ethnic and cultural influences; the importance of individual or business vulnerabilities; the part that prisons play; and the coercion, corruption and collusion of professionals. We have found that there are diverse pathways into offending but that it is possible for people of any social or economic background to become serious and organised crime offenders.

Our assessment sets out an initial understanding, based on a six month consultation period, where we had access to a range of open source and restricted data. The insights we offer can help local, as well as national, partners to identify and intervene with those most at risk of becoming serious and organised crime offenders and we have been working with other government departments and agencies to make sure our work can influence activity. There are, however, still gaps in our knowledge, and publishing the report will encourage new thinking amongst partners to help fill these. We are a small team, but are spearheading a shift in approach; assisting others in identifying, collating, and utilising Prevent related intelligence to help reduce serious and organised crime.

Detection, investigation and monitoring of organised crime groups using forensic intelligence: a promising path forward

Simon Baechler, School of Criminal Justice, University of Lausanne, and Forensic Science Service, Neuchâtel Police Department, Switzerland

Keywords: Organised crime; Monitoring method; Intelligence integration; Forensic intelligence; Forged and counterfeit documents

The presentation introduces an innovative crime monitoring method based on forensic intelligence designed to support the proactive detection and investigation of organised crime and terrorist groups that produce, disseminate and/or use forged and counterfeit identity documents. This method developed at the University of Lausanne is viewed as a promising source of crime intelligence and is in the process of being implemented by Swiss police departments.

A case study concerning an Asian criminal network involved in human trafficking and human exploitation is used to illustrate the method and its contribution to tactical and operational crime intelligence. At first sight, separate investigations on isolated illegal aliens holding counterfeit Portuguese passports did not raise much attention. However, suspecting the potential involvement of an organised crime group, a systematic forensic intelligence monitoring was triggered and brought investigators, crime analysts
and forensic scientists to collaborate actively. In combination with traditional police investigation methods, the monitoring method revealed material connections between a hundred persons of interest located in eleven Swiss jurisdictions, as well as links with cases in other European countries. Forensic intelligence was helpful to detect and demonstrate the presence of an inconspicuous criminal network active at the national and international levels, which enabled the investigation team to make targeted decisions and to be resourced adequately. Throughout the investigation, forensic intelligence also provided key insights for investigators and for the prevention of further cases. It assisted for instance in understanding the modus operandi, in locating the forgers, and in extending the investigation by proving that the network did not focus exclusively on counterfeit Portuguese passports of very high quality but produced also other documents such as counterfeit British passports. The successful implementation of the method in this case paves the way in Switzerland for a new approach of investigations on organised crime groups that produce, disseminate and/or use false ID or travel documents for various crime purposes.

Building on the case study, the presentation generalises the method capacity to point to potential crime groups, prolific offenders and prominent modus operandi, as well as its ability to support the detection and monitoring of crime patterns, trends and links between cases. Challenges and specifics associated with data collection, data management, analysis and dissemination of crime intelligence using this novel method are discussed. In particular, integration and fusion of intelligence derived from various sources and formats is raised as a pivotal issue (forensic intelligence with other forms of intelligence). The presentation concludes by underlining how bridging university with police can foster innovative research for policing.

1B Seminar stream - Tales from Two Andys! (Police effectiveness and MCC hotspots)
Reconciling SARA assessment and evidence-based policing: reflections from the Police Effectiveness in a Changing World project
Andy Higgins, The Police Foundation

Key words: SARA, assessment, evaluation, burglary, violence

The Police Foundation’s Police Effectiveness in a Changing World project set out to generate insights into how the police, in collaboration with other agencies and the public, can effectively tackle crime at a time when both the crime problems faced and the resources available to address them, are changing at an unprecedented pace.

Working with the police and their partners in two towns – Luton and Slough – over a four-year period, and following problem-oriented (SARA) principles, the project set out to develop, implement and assess locally-tailored, evidence-based, sustainable solutions to persistent crime problems. Focussing on burglary in Luton and violence in Slough, and on two wards in each town, the team used quantitative analysis and qualitative research to inform crime reduction interventions that took account of the way that life, crime and policing in these towns was increasingly impacted by forces of national and global change. Most importantly it set out to learn from the process of doing so.

This presentation will reflect on the challenges faced by the project team in delivering robust and useful (SARA) assessments in both sites, and more broadly on the role that
SARA and good assessment can play in responding to the call that policing must become increasingly ‘evidence-based’.

Although both SARA assessments and evidence-based policing (EBP) seek to answer questions about impact and effectiveness, the preoccupations of the latter with randomisation and multiple units of analysis offer surprisingly little to the analyst seeking to assess local, problem-oriented crime reduction initiatives in a ‘real world’ setting. While the evidence-base tells us that crime can best be tackled by focusing on specific problems in ‘micro-locations’ and by developing tailored and nuanced multi-agency responses, doing so rarely results in interventions of a form, scale and simplicity that lend themselves to the robust evaluation methods advocated by proponents of EBP.

Drawing on examples from the assessments of the Slough Violence Multi-Agency Panel (a mechanism for directing problem-solving attention towards individuals recurrently involved in violence), and Luton’s Burglary Reduction Initiative (a programme for improving home security and building community resilience in long-term hotspots), the presentation will describe how this paradox can be best negotiated. Three principles are put forward: 1) identifying the most appropriate available comparison sites or groups; 2) being highly specific about the expected outcomes corresponding with impact; and 3) following a broadly ‘realist’ approach. Planning for assessment and the importance of process evaluation will also be emphasised.

A tentative model describing how SARA and EBP (and therefore crime analysts and academics) can work in a mutually supportive way, with analysts seeking to be ‘evidence-oriented’ (and ‘pragmatically-oriented’) as well as problem-oriented, and academics using the findings of SARA assessments to generate hypotheses for testing in evaluated pilot trials, will also be put forward.

Crime and the night-time economy: multi-classification crime (MCC) hot spots in time and space
Andrew Newton, Applied Criminology Centre, University of Huddersfield

Key words: Policing; Licensed premises; Alcohol; Multi-classification crime (MCC) hot spots; Spatio-temporal analysis

Overview:
This presentation examines crime hot spots near licensed premises in the night-time economy (NTE) in both TIME and PLACE. It investigates whether hot spots of four different classifications of crime and disorder co-occur in time and place, namely violence, disorder, drugs and criminal damage.
It introduces the concept of multi-classification crime (MCC) hot spots; the presence of hot spots of more than one crime classification at the same place. Furthermore, it explores the temporal patterns of identified MCC hot spots, to determine if they exhibit distinct spatio-temporal patterns.

Methods
Getis Ord (G*I) hot spot analysis was used to identify locations of statistically significant hot spots of each of the four crime and disorder classifications. Further temporal profiling tested whether these hot spots co-occurred by time of day and day of week over the 168 hour week.
Results
As expected, strong significant spatial correlations were found between licensed premises and each of the four crime and disorder classifications analysed. Further to this, MCC hot spots were identified near licensed premises. Temporal profiling of the MCC hot spots revealed all four crime types were simultaneously present in time and place, near licensed premises, on Friday through Sunday in the early hours of the morning around premise closing times. At other times, criminal damage and drugs hot spots were found to occur earlier in the evening, and disorder and violence at later time periods. Criminal damage and drug hot spots flared for shorter time periods, 2–3 hours, whereas disorder and violence hot spots were present for several hours. There was a small spatial lag between Friday and Saturday, with offences occurring approximately 1 h later on Saturdays.

Implications
This presentation has important implications for hot spot policing, tackling crime in the NTE, and tactics thereof. Implications and possible tactics for hot spot policing of the NTE and other environments are discussed in this presentation.

This paper is available open access (free) to download at: http://www.crimesciencejournal.com/content/4/1/30

Class 1C ACIA class: A practitioner’s guide to working in academic projects
Jenny Martin and Sam Todd, West Midlands Police

Key words: Analyst, Academia, European, Benefits, Complications.

Nature of the Work
Since 2014, the analyst function at WMP has been the end-user for a €13.1 million project which will create a system that facilitates human reasoning and analytic discourse within the criminal intelligence community. The name of the project is “VALCRI” Visual Analytics for sense-Making for CRiminal intelligence analysis (and please visit Valcri.org for more information) which runs over 4 years with three end-users (ourselves at WMP and Belgium Federal Police and the Antwerp Police) and involves 15 other partners from across Europe - a mixture of academia and industrial partners.

Our paper is a “warts and all” reflection on what working within a complex research and technology development environment is truly like, from concerns around the UK potentially leaving Europe, change in internal champions and a legal challenge, managing a commercial partnering arrangement and intellectual property right issues, confidentiality issues, building relationships despite language and cultural barriers, to more mundane issues like balancing budgets (Euros to Pounds to Euros and back to Pounds!!!), getting staff involvement, selling the project to the host organisation and project management.

Who has been using it / practical application
Yet despite this, the benefits have been considerable and far more wide-reaching than we had ever expected. Firstly, having a system being tailored specifically for an intelligence analyst is an extraordinary privilege, and has put us in touch with people
from such a wide range of backgrounds and education, e.g. from the soft disciplines, experts in privacy, computational ethics, cognitive psychologists, to the hard disciplines of knowledge engineering, information security, data mining and visual analytics, to address the very multi-disciplinary problems found in intelligence analysis. Secondly, there has been a range of benefits which we never expected such as having experts at hand for a discourse around purpose limitation and data protection in big data environments (directly resulting in the organisation creating an ethics committee) and the setting up of an Academia Project Board. We have been able to use training materials, make use of the Hydra suite, build our understanding about how and why we think the way we do and there is also potential to work with a Swiss partner to develop training material and post graduate courses.

Our talk will conclude with the lessons we have learnt so far, and why you should or shouldn’t get involved with academia. Our advice is definitely to choose the project wisely and be aware of the commitment you are making. We are learning the art of knowing when to flexible and when to stand firm, when to share knowledge and when to be aware of a legal ramification and when to challenge internal colleagues and when to accept their advice.

And our talk will be able to introduce the VALCRI project to a new range of stakeholders (i.e. analytical community). Our key message is to make sure it’s the right project for you - the timing will never be right and you may never have the exactly right people but these may be small issues in comparison to the benefits you will gain.

Acknowledgements:
The research reported here has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) to Project VALCRI under the EC Grant Agreement N° FP7-IP-608142 awarded to Middlesex University and partners.

Class 1D: Improving the explanatory content of analysis products using hypothesis testing
Spencer Chainey, University College London

Key words: hypothesis testing, analysis products, problem profiles, target profiles

Analysis is an integral part of police and public safety decision making – if a crime problem is clearly understood, it can help identify the solutions that will most likely be effective. Although the profile of analysis has been raised in recent years, its routine production has often resulted in many analysis products often offering only a descriptive presentation of the problem that is being examined, rather than one that is explanatory in its tone. In this class we introduce the use of a hypothesis testing approach to improve the explanatory content of crime and intelligence analysis, and illustrate its use with several examples. We argue that this approach produces analytical products that are richer in explanatory and interpretative substance, helps to improve commissioning dialog, makes analysis more interesting (!) and generates results that help to more specifically identify how a crime problem can be tackled.

Parallel sessions 2
2A Seminar stream - Excellence in analysis (ACIA award runner-ups)
The Cambridgeshire Risk Matrix Model
Emily Doran, Amanda Huggins and Sally Brierley, Cambridgeshire Constabulary

In 2010, analysts from Cambridgeshire’s Force Intelligence Bureau identified the need for NIM compliant, robust, evidence-based products to help prioritise resources according to strategic policing risk. Emily Doran and Sally Brierley developed the first element, a strategic risk matrix that was successfully launched in 2010. Amanda Huggins, following its principles, then developed a matrix suitable for operational policing which introduced elements to assess weekly tactical demands and opportunities for activity. These, along with a process to prioritise covert operational activity, introduced a suite of tiered products and processes which together allowed Cambridgeshire to understand its overall policing risk, and to assess operational and strategic priorities in light of current capacity, capability and knowledge. These concepts have been significant in collaborative development, with colleagues from a range of law enforcement agencies, of the national strategic matrix through the MoRiLE (Management of Risk in Law Enforcement) project.

Operation Churchill - the analysis of a commercial burglary series
Steve French, Devon and Cornwall Constabulary

Operation Churchill was a long and complex investigation looking at an Organised Crime Group charged with conspiracy to burgle. The group were involved in the planning and orchestration of over 50 burglaries in Devon and Somerset, all of which were committed against commercial premises, ranging from small independent jewellery shops to entire industrial estates. Steve French, the lead analyst for this operation, was responsible for producing evidential documents that would finally lead to this group being brought to justice. To put the scale of the operation into context:

- All the offences were committed over a six month period between May and October 2012
- The combined financial loss and damages were close to a quarter of a million pounds
- Three members of the group were found guilty in June 2015 and received combined jail sentences totalling 21 years.

At sentencing the judge commended the Police for the investigation and the manner in which the case was built, making particular reference to the quality, relevance of, and accuracy of the analysis charts. Positive comments were also received from defence barristers detailing how impressed they were with the manner in which the case was displayed and how the charts enabled the trial to be heard in a swift, timely and fair manner.

2B Seminar stream - Fear, perceptions and victimisation
Perceptions of security and its relationship with crime - an example from Mexico
Rafael Prieto Curiel, Department of Mathematics, University College London

Key words: Perception, Security, Crime, Concentration, Memory.

The perception of security, local to regional, is not only affected by the crime that is suffered, but it is also related to demographic variables such as age, gender, race and income and even the physical condition of the neighbourhood. A person might consider a place to be either secure or insecure based on their previous experience in that place, what they have heard or seen, the amount of street lighting, how rundown the area is and
Whilst it is natural to consider demographic variables to study the perception of security, they only provide a micro-scale measure, that is, individuals that are affected by their own attributes, such as gender, age or income. From a global perspective though, interest should focus on the mean perception of security from a population group, rather than individual attributes. The mean perception of security is a useful way to quantify the perception of security that a whole population has, allowing us to determine if the mean perception of security is related to the actual crime suffered by that population, how this changes over time and how it varies from one region to the other.

Using a victimisation survey from Mexico, a quantitative approach to the mean perception of security of a region is considered, and its relationship with regional measures, such as crime rates and population density is estimated using a regression technique.

Results show that a) the perception of security is, not surprisingly, related to the crime suffered in the region, but different types of crime have different impact on the perception, where a person suffering a kidnap is far more relevant than vandalism or burglary, for example, b) the perception of security is affected by both previous experiences and how the county was perceived in past years and c) a counterintuitive result is that the level in which crime is concentrated in certain population groups affect the perception of security, and a population with a higher level of concentration of crime is perceived as being more secure.

When people believe that they are vulnerable to crime they react to those beliefs by modifying their behaviour and, whilst a moderate fear of crime might encourage healthy precautions, it has been identified that it might have a negative effect upon the quality of life. Therefore a quantitative approach to the mean perception of security has impact on urban planning and policy design.

Comparing predictors of victimisation and attitudes towards crime across five European countries
Peter Baudains, Department of Security and Crime Science, University College London

Key words: Victimisation surveys, cross-national comparisons, regression modelling, attitudes towards crime, feelings of safety.

International comparisons of crime and attitudes towards crime can help us understand where and how certain country-specific demographic, socio-economic, and geographic factors can coexist with low crime rates and high feelings of safety and security. However, such comparisons are difficult for a number of reasons (differences in the official recorded definitions of crimes and reporting practices across countries, for instance). Both national and international victimisation surveys can be used to make cross-national comparisons unhampered by differences in police recording systems. International surveys offer a more standardized approach to capturing country-level experiences of crime but are costly and have small sample sizes. National surveys with large sample sizes are routinely administered in Europe but analysis needs to account for differences in survey design across countries.

As part of the EU funded Project MARGIN, a collaboration involving universities and
researchers from Paris, Barcelona, London, Milan and Budapest that aims to better understand crime and public safety experienced by marginalised communities, data on each country’s victimisation survey and data on recorded crime have been brought together to make cross-country and cross-city comparisons. In this talk, data is utilised from national victimisation surveys from the five European countries the MARGIN project partners represent – Spain, France, England and Wales, Hungary and Italy. A series of logistic regression models are employed to identify demographic characteristics that are predictors of victimisation and predictors of unfavourable attitudes towards crime at the national level. We identify a number of characteristics that are consistent predictors (such as gender) and, perhaps more interestingly, some characteristics whose effect is different and in the opposite direction across countries. We discuss some of the challenges in working with such survey data cross-nationally and identify variables that should be included in future victimisation surveys to better improve our understanding of how crime varies across countries.

Class 2C: ACIA class: Infographics – putting analysis in the picture
Paul Eggleston, ACIA (Norfolk and Suffolk Constabularies)

Paul Eggleston is the Strategic Analysis Manager for Norfolk and Suffolk Constabularies. In the last year his team have replaced their core product ‘Strategic Profiles’ (often running to 50 pages and over) with Infographics. In this session he will cover:
• what is an infographic?
• the rationale for moving from written analytical reports to infographics
• the benefits of this approach
• some of the pitfalls involved, and how to mitigate then
• tips and ideas for producing infographics, and some examples.

Class 2D: What is new in IBM i2 Analyst’s Notebook 9
Janet Warner and Mark Fleet, Shortest Path Training

The new version of Analyst’s Notebook has a new interface that includes functions to improve workflow. This presentation will highlight some of the changes and quickly help you find your way around the software.

Key features covered includes; the ribbon interface; changes to the importer to help you find and re-use relevant saved specifications; easier options for copying charts, including changing the chart style. If time allows we will also show features introduced in the later versions of 8 such as; Find Connecting Networks; Activity View and Saving a Redacted Copy of a Chart.

We will be at the conference on Thursday so feel free to come and find us and ask any questions you may have about the use of i2 software or any training requirements you may have.

Janet Warner and Mark Fleet are 2 senior trainers at Shortest Path Training. They were both trainers at i2 for many years and between them they have over 40 years’ experience using and training IBM i2 products. They have written and delivered courses at the highest level to students from both the private and public sector in Cambridge and around the world. Their knowledge of the i2 products and how they are used by the customers is unsurpassable.
Parallel sessions 3
3A Seminar stream - Risky business – MoRiLE
Management of Risk in Law Enforcement (MoRiLE): Delivering contextualised risk modelling for law enforcement
Chris Dowen and Amanda Huggins, West Midlands Police

Key words – Contextualised, Risk Modelling, Law Enforcement

The Management of Risk in Law Enforcement (MoRiLE) is a National Police Chiefs Council (NPCC) Intelligence Portfolio project focusing on the creation and delivery of bespoke risk modelling solutions for Law Enforcement. The project was created in 2014 by DI Chris Dowen (West Midlands Police and MoRiLE project lead) in response to an identified need for Law Enforcement to develop a bespoke and nuanced risk modelling solution that could be used by all Law Enforcement Agencies. The project has two core members who are supported by a “virtual team” of over 250 practitioners, decision makers and academics from the UK and internationally. This approach allows a collaborative approach to be taken to the development of solutions, and the identification of future work streams.

The project objectives and design principles focus on developing a range of intuitive risk models that inform and assist decision making across the full spectrum Law Enforcement risks. Draft Thematic (Strategic) and Tactical models have been developed with colleagues from a myriad of Law Enforcement Agencies, and the Thematic model is being tested by over 55 Law Enforcement Agencies nationally as part of their Strategic Assessment processes for 2016/17. This includes Forces, The National Crime Agency (NCA), Regional Organised Crime Units, Home Office Law Enforcement Agencies, Community Safety Partnerships (Birmingham CSP), and agencies linked to Law Enforcement such as the Insurance Fraud Bureau, Foods Standards and Environment Agencies, and the Ministry of Defence. The project has recently broadened the scope to include the following:
1. Development of a suite of complimentary tools
2. Exploration of an IT Solution
3. Implementation of the MoRiLE methodology within national tasking processes
4. Developing a whole system risk modelling approach

Development of a suite of complimentary tools – As stated above the Thematic and Tactical models have been created to test the principles in an operational context. The project has also engaged with academics from UCL (Hervé Borrion, Security and Crime Science department) and RUSI to support the review of the methodology. The Vulnerability and Organisational Risk models are currently in development and will be the focus of 2016.

Exploration of an IT Solution - The solution would enable the assessment of individuals, groups, events and thematic crime areas across the full spectrum Law Enforcement risks. The solution would also support bespoke contextualised information sharing across agencies based upon identified risks, rather than the sharing of a broader range of data sets or information.

Supporting the implementation of the MoRiLE Thematic and Tactical models within
national tasking processes – The project is supporting the NCA in embedding the MoRiLE Thematic methodology into the National Strategic Assessment process for 2016/17, and the Tactical methodology into the National tactical tasking arrangements during 2016.

Developing a whole system risk modelling approach – This is an area of development for 2016/17. The principle is to develop an approach where all decision making, from operational deployment to recruitment, training, procurement and other enabling functions are supported through a consistent risk modelling approach.

The Management of Risk in Law Enforcement (MoRiLE): Using logic and collective expertise to establish strategic Community Safety Partnership priorities
Harry Stanton, Birmingham Community Safety Partnership

Key words: MoRiLE, strategic, political-interference, pragmatic, partnership

The Management of Risk in Law Enforcement (MoRiLE) is a UK wide project that was created in 2014 in an attempt to develop an approach to risk prioritisation that could be used by all law enforcement agencies in a structured and consistent way. The aim was to introduce an intuitive thematic (Strategic) risk model that was easy to use and understand, and that assisted senior decision makers. The model was developed with colleagues from a myriad of Law Enforcement Agencies, and the Home Office.

The Thematic model is designed to be used as part of a strategic assessment or planning process, and over 50 Law Enforcement Agencies have confirmed that they will be using it as part of their process for 2016/17. Birmingham Community Safety partnership is the first local authority group in the UK to utilise the model.

The presentation will describe the use of MoRiLE in establishing the strategic priorities for the Birmingham Community Safety Partnership (BCSP) for 2016/17.

It will refer to the challenge in:
• Bringing together over one hundred and fifty thematic experts and practitioners from across the largest local authority area in Europe to listen to their views.
• Assessing over one hundred different varied issues (including illegal plying for trade by taxi drivers, bus lane contravention, cannabis cultivation, ‘legal highs’, child sexual exploitation, cyber-crime, extremist speakers etc.) in terms of their threat to the CSP.
• Overcoming internal partnership politics (and real world ‘Politics’!) to provide an auditable, logical approach to presenting the most pressing issues, according to informed group consensus, and understanding the underlying causes including mental health, violence, and the role of demographics and deprivation in community safety.

3B Seminar stream - Developing intelligence products
Changing perceptions and influencing decision makers: producing meaningful strategic intelligence
Ciaran Walsh, Chris Lowe and Sam Todd, West Midlands Police

Key words: Strategic Analysis; Intervention; Violence; Influence; Decision makers

Nature of the work:
We have been developing our approach to producing a meaningful Strategic Assessment over the last 5 years. This has been paralleled by an increasingly mature approach and appreciation of structured analysis. Our customer, the Deputy Chief Constable, has been a critical friend and supported our journey from producing a traditional annual review of crime to an aspirational assessment of how we should work with our partners to prevent violence and focus on effective intervention strategies.

Our journey used hypothesis testing, story boarding, a technique called BBC (Build, Blur, and Corrode) used in editing. By building on last year’s understanding of violence and how it can be prevented, sound arguments were constructed that were tested as part of the assessment processes through a range of academic studies and a case study.

The use of case study allowed us to not only illuminate the reality of the academic findings, but also to challenge our perceptions by investigating the case of a young man living in the West Midlands who was convicted of a serious violent offence. Using both police data and that of partner agencies we developed a detailed picture of how being born into deprivation, to inadequate parents involved in criminality and subsequently being failed by the care system affected his life chances and those of his siblings.

Specifically, by taking a detailed and holistic approach to understanding a complex family and by talking to partner agencies about their data and processes we found our perception of young offenders and how they should be managed has been changed. We have used our learning journey to challenge the cognitive biases of decision makers and practitioners both within the Force and amongst our partner agencies.

At a time when our Force is facing immense change our Strategic Assessment provides our decision makers with an aspirational view of where the Force should be in 2025.

Who has been using the work and its practical application?
As effective analysts we have followed Ratcliffe’s 3i model. We have interpreted the ‘criminal’ environment, but through a different lens than is usual for a law enforcement assessment. We have influenced our key decision maker at a time when our Force is being restructured. The story we told him has resulted in him preparing to change the way we think about how to have an impact on the ‘criminal’ environment.

Our Strategic Assessment was used to launch a partnership conference, ‘Creating Safe and Healthy Futures,’ hosted by the West Midlands Violence Prevention Alliance. The day was opened by a government minister and began with a film we produced of the case study. The aim of the day was for partners to begin to make collective decisions about how to implement the most effective strategies for reducing the effects of violence within our region.

Attendees at the conference were both at Chief Executive and practitioner level. Thus, these decision makers had the authority to make a real impact on the environment encountered by children facing severe and multiple disadvantage.

**Partners working together to achieve one goal: developing organised crime local profiles for CSE and modern slavery**

*Jenna Thomas, Debbie Unwin and Ceri Lloyd, Devon and Cornwall Police*
Three years ago, members of our team presented to this conference on our approach to partnership working in the successful development of a Peninsula Strategic Assessment (PSA). When the Home Office guidance for Serious and Organised Crime Local Profiles (OCLPs) was published in November 2014, we saw this as an opportunity to develop our partnership working to another level.

The challenge we immediately faced was how to take eight different and complex themes and persuade a range of new partners to allocate their limited time and resources to become engaged in addressing these issues, many of which had not previously been identified as peninsula priorities. Our approach was to ensure that our partners were fully involved from the start. We were innovative in deciding to take a staged thematic approach and invited the Community Safety Partnerships (CSPs) to join us in a prioritisation process that identified Modern Slavery (MS) and Child Sexual Exploitation and Abuse (CSEA) as the two most urgent topics.

As the OCLPs were involving such a wide range of partners, we needed to ensure that everyone was working with the same level of knowledge. We therefore began by producing a detailed Overview document for each theme, which explained what we know already, provided definitions, the national picture, academic research and an indication of the current picture across Devon and Cornwall. The HO guidance stated that the OCLPs should provide partners with specific information about the nature of the problem in their local area. However, Devon and Cornwall is vast geographically with a range of rural, urban and coastal areas. It was deemed necessary to produce four local profiles, for each CSP area: Devon, Torbay, Plymouth and Cornwall.

Understanding the nature of MS and CSEA in each of these four areas was not possible as analysts working in isolation. It was necessary to engage with a wide range of people both within the police force and externally in local government departments, non-government organisations, charities and religious groups. A number of different analytical techniques promoted at the conference three years ago, were employed in the production of the profiles, including hypothesis testing, Why workshops and crime scripting. Although we as police analysts took the lead in writing and producing the profiles, our partners were consulted at regular intervals, ensuring that the right messages were being conveyed, using appropriate language, and encompassing partners’ priorities, experiences, best practice and lessons learned.

The result is that both the MS and CSEA profiles have been enthusiastically received by the CSPs and thematic Boards, who are developing their action plans informed by the evidence base provided by the profiles. They are generating conversations and are being used as springboards for multi-agency working across different geographical areas. The presentation would cover:

- Introduction into OCLPs
- How we interpreted the guidance
- Prioritisation process of the thematic approach
- Negotiating and influencing partners
- Writing the profiles and the analytical techniques employed
• Challenges faced
• Embedding the profiles in multi-agency working
• What next?

Class 3C: ACIA class: The analyst in court – preparing telephone data as evidence
Steve French, Devon and Cornwall Police

This class is perfect for analysts who are preparing evidence for court and focuses on the presentation of telephone data. The class will use as a centrepiece a presentation that was prepared for court and shown to a jury on Day One of a trial – and resulted in the offenders changing their pleas before any other evidence was produced. It focuses on the events of the August 2013 Bank Holiday in which four men from the Bristol area travelled to Devon and committed a violent and well planned armed robbery at a busy Holiday Park.

The session will provide analysts with an overview of the incident itself, and show the how the telephone analysis was crucial to the investigation and the successful outcome at the end. It will give the analyst practical tips on the many ways that telephone data can be used in court – it will show how to use text messages, attribution charts, and cell site data in evidence, as well as showing the impact it can have when placed alongside CCTV data, ANPR Data, Handset Data and other forms of data.

Class 3D: What Works? Integrating evidence into crime prevention decision-making
Lisa Tompson and Amy Thornton, representing the Commissioned Partnership Programme supporting the What Works Centre for Crime Reduction

This session will encourage participants to use the existing evidence base to inform their decision-making on crime prevention. The (current) evidence base will be explored, and participants will be introduced to the What Works Crime Reduction toolkit which synthesises this evidence at the intervention level. The capabilities of the toolkit will be demonstrated, and participants will be taught about the different elements of the evidence which they can find information about – not just whether the intervention appears to work, but how it works, where and for whom it may work, how to implement the intervention, and how much it may cost. Two exercises will be run to enable participants to explore the evidence on interventions that look to reduce alcohol-related crime and crime committed by young people. A key focus of these exercises will be to assess which interventions might work in reducing problems in the participant’s local area. The session will conclude with a group discussion on how practitioners can get involved in generating a stronger evidence base.

Parallel session 4
4A Seminar stream – Cybercrime
Cybercrime: is your criminal intelligence function ready? A UK perspective and the lessons learnt so far
Owen Gillard, PA Consulting Group

What is cybercrime?
As technology has evolved and taken a more prominent part in our everyday life’s the debate about what constitutes a cybercrime has often hampered progress in developing a consistent response. We will explain how UK law enforcement agencies have developed a deeper understanding of cybercrime and defined a common lexicon that differentiates between the different crime types.

What do the public think about it?
Law enforcement investment in cybercrime has to compete with a range of other high-profile threats including child exploitation, terrorism, and human trafficking. Police leaders need to make wise choices particularly when it comes to expensive technology investments. Key to this is understanding the public perspective on the problem. What are the public most concerned about? What cybercrimes do they want the law enforcement to focus on and who else do they expect to play a part?

We will explore the findings of a national survey of over 1000 UK citizens conducted by PA Consulting Group that is helping to shape the national debate on how to tackle the problem. What is the impact on policing?

Cybercrime has had a dramatic effect on the crime statistics in the UK. In 2014 the Office for National Statistics reported a doubling in the crime figures once they were adjusted to include cybercrime.

In this part of the presentation we will present the findings of a survey of UK analysts. The survey explored the impact that the influx of cybercrime was having on their workload and whether they felt they had the necessary skills and capabilities to effectively deal with the problem. What capabilities and skills are required to meet the challenge?
Society’s expanding use of digital communications and the onset of the internet of things is creating a new dimension for law enforcement to police. We will discuss how the UK is approaching the problem of capability gaps and the challenge of upskilling its workforce.

What is the UK doing about it?
We will talk about a number of programmes where we are actively involved in supporting UK law enforcement to respond to cybercrime. These include the Digital Investigations and Intelligence Programme, the Work of Regional Organised Crime Units, and UK Law Enforcement’s Digital Ethics Panel.

Profiling the cybercriminal

Jason Nurse, Cyber Security Centre and Maria Bada, Global Cyber Security Capacity Centre, University of Oxford

Key words: cybercrime, criminal profiles, cybersecurity, law enforcement

The Internet has drastically transformed the way that we as a society communicate, interact and trade. Unfortunately, it has also opened us to a variety of new threats and risks which could originate from any part of the world. Cybercrime, or simply crime perpetrated using online technological means, is set to drastically increase in the future, motivated by automated cybercrime tools and lucrative payoffs, amongst other things.
Whilst there have been various proposals to address cybercrime, it continues to be a significant challenge for governments and law enforcement to respond to. Some of the main reasons include the amount of incidents, the pseudo-anonymity available online (thus difficulty to trace perpetrators) and the cross-national nature of the Internet (hence, lack of agreement on prosecution across countries).

To consider the cybercrime problem more broadly, we need to look at the cybercriminal, the attack, and the impact on the victim. Thus far, there has been a notable amount of work, both in industry and research, on understanding the attack and its impact. By concentrating on these areas, appropriate attack prevention and detection techniques (e.g., anti-virus tools) can be developed, and impact metrics (e.g., assessing the cost of cybercrime) defined. The topic of the cybercriminal however, has somewhat lagged behind with mainly anecdotal evidence supplied. The reason for this is an obvious one, a vast majority of these individuals are never apprehended. Nonetheless, an understanding of why cybercriminals act as they do and their different characteristics and profiles could provide law enforcement with much needed insight, potentially towards advancing themselves in tackling the issue of cybercrime.

While profiling a cybercriminal, there are specific common characteristics classified under four categories that need to be investigated: a) technical know-how; b) personal traits; c) social characteristics; d) motivating factors. Often, the prime motivator for the majority of cybercriminals is not only easy profit, but also curiosity. Furthermore, in evaluating the motivation of cybercriminals, it is safe to state that some criminal action will be motivated by “need” or by work / environment characteristics.

In our presentation therefore, we will seek to reflect on the challenge of cybercrime generally and then concentrate on the cybercriminals themselves. We shed light on who they are, their motivations, their characteristics, and types of cybercrimes certain attackers may be likely to engage in. This presentation is grounded in an analysis and synthesis of a variety of sources, including research articles, industry-based reports and anecdotal evidence. Each of these adds a unique perspective and provides value to the discussion, but in their consolidation is where we seek to draw the most insight. Our ultimate aim is to use such insight to decode the cybercriminal mind-set, and gain a better understanding of the psychological, criminological, and sociological aspects of cybercriminal profiles. If cybercrime is seen in a holistic approach, countries can reach an advanced maturity to prevent and tackle cybercrime. We believe that this presentation would be of great value to the crime and intelligence analysis field.

4B Seminar stream - Scaling up
Task the nation: tactically assessing the Environment Agency
Matt Hind, Environment Agency

Key words: Tactical, Tasking, Crime, Continuous Improvement, Agency

Illegal and poorly performing waste sites pose a real threat to the environment, contaminating land and rivers. They also pose a risk to human health and blight communities, threatening air quality with fumes from illegally burnt materials and causing noise and odour problems. Waste crime – such as dumping large amounts of waste illegally, running a waste site without the right permits or not following the rules of a permit – diverts up to £1 billion from legitimate businesses each year and the
Environment Agency both regulates the waste industry and enforces against breaches of these regulations.

The Environment Agency’s intelligence function currently focuses on the criminality within and surrounding the waste industry and is a vital component in driving the agency’s enforcement response.

In January 2015, the agency underwent a major workforce re-structure and its intelligence function changed significantly. Intelligence changed from locally embedded teams supporting six ‘regional hubs’ to a national function supporting 16 ‘areas’ from a central location.

These changes posed the question of how a centralised function can provide an effective tasking and coordination service on a national scale?

Pre-January 2015, tasking and coordination was achieved through Area Crime Team meetings, supported by local Tactical Assessments produced by local intelligence teams. Since the re-organisation, the agency has been without a formalised Tactical Assessment.

The intelligence team have been charged with creating a new Tactical Assessment to direct the work of enforcement teams across England. This means creating an intelligence product that is right for 16 distinct areas, all with differing needs both in terms of their geography (some rural, some urban and some a mix of both) and their targets and priorities.

The project started in November 2015 where, using Continuous Improvement techniques, we asked representatives from areas what they need from a Tactical Assessment and tasking process. It became apparent that this product could not be ‘everything for everyone’. In effect, this project will bring together several strands of enforcement business into one place so that informed decisions can be made based on threat, risk and opportunity for the agency as a whole regardless of the agency’s boundaries.

The next steps were to examine discreet areas of business within the enforcement community and see what would provide the best start for the assessment. This focus has fallen on Organised Crime Group Mapping, ‘Hot Nominals’ and the analysis of national and localised patterns and trends in waste criminality.

This presentation will focus on the process of creating a new national Tactical Assessment and discuss some of the challenges and solutions we’ve encountered along the way. By the end of the February 2016, the first issue of the document will have been published so the presentation will also aim to share some of the feedback from this first iteration and how the assessment will evolve into the future.

**From divisional analysis to force level analysis – the challenges of upscaling (a child sexual exploitation case study)**

*Danielle Williams, Greater Manchester Police*

Key words: data collection, CSE, partnership,
In 2015 I was asked to write the force problem profile on child sexual exploitation and having already completed a divisional problem profile I thought it would be a relatively simple process. Surely it wouldn’t be that difficult to widen the data collection parameters. My predictions were way off the mark. This presentation will detail some of the main problems of collecting data from the police and partner agencies and how these were overcome.

The initial commissioning meeting was very productive and the terms of reference set out what we thought were realistic aims for data collection and analysis utilising similar methods to those I had used previously. I was offered extra staff to assist in the data collection and cleaning. A full plan was put in place with timescales to ensure the completion of the project within 6 months. This was submitted for sign off and that was where the problems began. Offers of staff to assist were withdrawn so the methodology had to change. Data recording and access issues dogged the project from start to finish.

Having previously solved the problem of creating a reliable dataset of Child Sexual Exploitation offences, it became insurmountable on such a large scale. In Rochdale I had manually selected the crimes but with over 1300 crimes in one year this was not possible for this problem profile. It was clear that analysis of crime was not going to be the main focus of this problem profile. So I had to look for other datasets.

For the last two years there has been a single measurement of risk tool in use across Greater Manchester. This tool is used to assess the risk posed to an individual suspected of being at risk of CSE based on 10 risk indicators. I was given access to over 400 completed assessments and this proved a rich source of quantitative data for statistical analysis. This resulted in highlighting those areas that posed the most risk and identify areas for intervention and prevention initiatives.

Gathering datasets from ten local authorities was incredibly problematic despite having the Project Phoenix lead on board. The main problem was how differently each local authority retained data to the point where datasets were incomparable.

The government response to tackling CSE outlines ambitions for much greater data recording, sharing and analysis and this is something all forces are trying to move forward with. This problem profile highlighted that co-located teams are very good at sharing data on a case by case and tactical basis but data sharing at a strategic level is not yet in place. In contrast to the Rochdale Problem Profile which gave great insight into CSE this problem profile seemed to revolve around data issues that are applicable to all vulnerability issues, not just CSE.

Class 4C: ACIA class: Open source research tips and tools you can use right now!

Neil Smith, K&T Research Services (www.uk-osint.net)

Open Source Intelligence and Internet Investigations is more than just Google and gossip. It is also more than some of the limited courses forced on law enforcement.

Neil Smith is an experienced Open Source Intelligence Investigator and Trainer. In this class he aims to show some useful databases and techniques that he uses daily in his own enquiries and teaches on his courses. From free sites and techniques that will take
your web site enquiries forward to maximise the amount of information you can locate about a subject; to opening up a Facebook account which looks to have its privacy setting set to the max; to databases both free and paid for, maximising what you know about a subject.

Class 4D: Advancing crime analysis with R and Shiny

*Henry Partridge, Transport for London*

Key words: R, data visualisation, transport-related crime, spatial analysis, knowledge sharing

R is an open source programming language for statistical analysis and data visualisation. R has become the most popular language for data science with major companies like Google and Facebook running complex statistical analyses and the New York Times and FiveThirtyEight rendering sophisticated data visualisations with it.

R is also ideal for crime analysis. There are R packages that help analysts conduct advanced spatial analysis like K-functions (spatstat) and geographic profiling (Rgeoprofile), crime series identification (crimelinkage), and even aoristic analysis (aoristic). The open nature of the R language also encourages transparency, reproducibility and automation. R scripts explicitly document every step of an analysis enabling others to run and re-run code with new and existing datasets.

The recent development of the Shiny package has enabled R programmers with no knowledge of HTML, Javascript or CSS to create complex interactive web applications. Analysts can share sophisticated data visualisations and interactive maps created in R to internal and external colleagues using any modern web browser.

This presentation will demonstrate how R and Shiny have enabled analysts in Transport for London (TfL) to analyse crime and to share the results with non R users. An overview of R and the Shiny package will be provided with a demonstration of the some of the apps that have been developed at TfL.

Parallel session 5

5A Seminar stream - Data challenges for analysing serious crime

The categorisation of rape offences in Lancashire

*Catherine Woodward, Lancashire Constabulary*

Key words: partnership, statistics, pubic protection, media and engagement, organisational change

In April 2012, the head of Public Protection at Lancashire Constabulary requested that a problem profile be produced focusing on rape offences in the County. This was in order that the senior managers and decision makers of the Rape Steering Group could have a better understanding of what the specific problems were in relation to rape in Lancashire.

During the collection phase, data was obtained from a wide variety of internal and external systems and sources including crime and custody databases, data from the Crown Prosecution Service and information from the Lancashire SAFE (Sexual Assault Forensic Examination) Centre.
It was identified that the way that rape offences were categorised both in house and by partner agencies was very vague and did not provide officers with enough detail as to the nature of the offence. In house, there were only four categories to identify the relationship between the offender and the victim – ‘stranger’, ‘partner / family member’, ‘acquaintance’ and ‘other’.

After the collected data had been examined, the analyst proposed 10 new categories to identify the relationship between the offender and the victim in rape offences. These included ‘historic’, ‘breach of trust’ and ‘familial’ which were very topical issues but could not be captured easily with the crime recording systems in place.

By grouping the rape offences into these 10 specific categories, the analyst was able to provide a very detailed picture of the nature of rape offences in Lancashire. Emerging issues were highlighted that would not have been identified without the categorisation of offences – an increase in rape offences committed by ex-partners was just one such issue.

Statistical testing techniques were used to examine the relationships between the different categories of rape and other variables. For example, it was found that offences where the victim and / or offender were under the influence of alcohol were less likely to have a successful outcome at court. It was also identified that victims who were subject to an offence by someone well known to them took longer to report the incident to the Police than offences involving a stranger or recent acquaintance.

The findings were presented to the Rape Steering Group who used the new information to produce the Rape Action Plan, a large element of which focused on media and engagement. One particular initiative that was launched as a direct result of the problem profile was a media campaign encouraging males to ‘think’ before having sex with a heavily intoxicated female. The problem profile also triggered a change in the way that rape offences are investigated in Lancashire with the establishment of new ‘rape teams’ and the allocation of certain types of offences to CID officers.

Further rape problem profiles have been produced since the initial tasking in 2012 and the categorisation of offences continues. Officers recording rape offences now document the ‘category’ of the offence within the crime report enabling faster analysis and identification of emerging issues.

Female genital mutilation in the West Midlands

Mark Hadley, West Midlands Police

Key words: FGM, Demographics, Strategic, Partnership Data

Aim of presentation:
To share the findings of research into the nature and scale of Female Genital Mutilation (FGM) in the West Midlands and to share and reflect on some of the challenges, experiences and analysis involved.

Nature of the Work:
FGM is a serious form of child abuse, known to have affected a number of women
and young girls living in the West Midlands. I was tasked with establishing the nature and scale of FGM in the West Midlands so that West Midlands Police (WMP) could re-evaluate its strategic response to FGM. Owing to the ‘hidden’ nature of this crime, I was faced with significant challenges: not least, how do you establish the scale of an issue when WMP and other forces are struggling to identify any victims, let alone bring any successful prosecutions?

In recent years, the number of reports of FGM recorded by WMP has tripled, but there has been no concurrent rise in the number of successful investigations. These reports provide little to no opportunity to identify potential victims of FGM (under UK legislation).

A Comparative Case Analysis, looking at each of the FGM-related reports in detail identified significant gaps in intelligence and understanding, which is potentially placing young girls at risk. For instance, WMP receives fewer reports during and prior to the summer holidays, when girls are known to be most at risk of FGM.

In fact, just 3% of the force’s intelligence around FGM could be shown to have originated from community members, with the majority of referrals coming from midwives and other professionals. Although well-intentioned, these reports provide little scope for WMP to investigate effectively and sometimes are time-consuming to investigate. Furthermore, differences in recording practices across the seven Local Authorities served by WMP, means that this data provides a ‘false picture’ of the scale of FGM across the West Midlands and where it might be happening.

To improve the response to FGM, strategies must focus on improving community engagement and intelligence collecting. I used demographic data and methodologies adapted from academia to estimate the number of women and girls living with FGM in the West Midlands and the number of newborn baby girls who could be at risk each year. Finally, I used this data to identify the areas and communities which would benefit from improved engagement and intelligence gathering.

Practical Application of Work:
This work has been presented to a number of senior officers within WMP (including DCC and ACC) and is currently informing the force’s strategic response to FGM. This work will soon be presented to the West Midlands multi-agency FGM task-force, and it is intended that it will inform and influence this task-force’s future activity.

WMP services one of the most diverse communities within the UK, with larger populations from FGM-practising countries than most other forces. It is hoped that the methodologies and findings of this work can influence other forces in their assessment of FGM and development of strategies to deal with it.

5B Seminar stream - Analyst skills development
Towards the holistic training of law enforcement intelligence analysts
Aleksandra Bielska and Chris Pallaris, i-intelligence GmbH, Switzerland

Key words: intelligence, intelligence training, law enforcement, criminal intelligence analysis, VALCRI

This presentation outlines a holistic approach to the training of intelligence professionals
working in law enforcement. We argue that traditional training programs do not always provide the skills needed to operate in a dynamically changing environment. Training is limited to those activities delineated by the traditional intelligence cycle, focusing in particular on the collection, analysis and communication of data. Our research on the EU-funded VALCRI project* suggests such training is insufficient.

Enhancing analytic “know-how” obliges us to consider a different approach to intelligence training, one that expands the analyst’s skill set as well as their ability to manage the many enablers and constraints of analytic performance. To this end, we present the Five Architectures Framework, a holistic model that can be used to enhance intelligence training and the development of criminal intelligence units. The framework posits that effective intelligence work requires knowledge of five separate but interconnected domains, namely:

- The organisational domain, e.g. with regard to organisational development, strategy development, resource allocation, staff management, etc.
- The operational domain, e.g. with regard to operational planning, project management, workflow optimisation, legal and ethical restraints, communication, etc.
- Informational domain, e.g. with regard to document management, source management, information sharing, etc.
- Technological domain, e.g. those activities concerned with the use and management of IT, database and other IT assets.
- Cognitive domain, e.g. those activities pertaining to the analysis of data, including critical thinking, red teaming, sensemaking, etc.

Each domain is distinguished by a body of practical and theoretical knowledge that is highly interdisciplinary and applicable to multiple intelligence challenges. Moreover, each domain is supported by a unique set of tools and techniques that are intended to enhance the analyst's strategic and operational performance. Our presentation goes on to present a training curriculum developed as part of the VALCRI project in collaboration with law enforcement professionals from West Midland's Police in the UK and Federal and Local Police Forces in Antwerp, Belgium. This curriculum is intended to help analysts master the body of knowledge needed to improve critical thinking, optimise strategic and operational workflows, and enhance analytic performance. Further, the curriculum is intended to help analysts identify, manage and respond to the internal and external challenges that shape their work environment, whether current or prospective.

To enable such adaptability and resilience, our curriculum combines traditional intelligence disciplines with knowledge of other domains such as systems theory, risk management, human cognition, information and knowledge management, leadership, communication and others. The value and utility of such disciplines will be presented and elaborated on. Although the VALCRI project is ongoing, we intend to present the most recent version of the curriculum, discuss the analytic challenges it is meant to address, and solicit feedback from other conference participants. We will also outline our tentative plans to invite intelligence practitioners to a number of trial seminars we intend to run as part of the VALCRI project.

* VALCRI (Visual Analytics for Sensemaking in Criminal Intelligence Analysis) is a project funded by the European Union under the Seventh Framework Program (FP7) and led by Middlesex University.
Six skill domains for the next generation analyst

Jenny Martin, Chris Lowe, and Sam Todd, West Midlands Police

Key words: Analyst, Domains, Skill, Cognitive, Tool,

Nature of the Work:
Our work proposes that in order for next generation analysts to be ready for increasingly complex challenges, there is an alternative model for professional development which we have called the “6 Skill Domains”. These are:
1. Critical Thinking domain: this looks at the skills and techniques used when analysing complex data, for example System 1 / System 2 thinking, unconscious bias, inference development, building insights, finding patterns
2. Productivity domain: this is about how to maximise your own efficiencies such as time management, influencing and managing others.
3. Tool Development domain: this looks at the technical tools required to perform an analytical job such as GIS systems, force systems, MS Excel and MS Word, i2 products to but also allows the domain to grow to potential use of Hadoop, Visual Basic and MoRiLE
4. Statistical domain: this is about the statistic toolset required to validate and test findings, linking into the Evidence Based Policing agenda
5. Subject Matter Expert domain: this domain varies for each law enforcement agency and is about the experiential knowledge developed by each person about how work works, building on theories from academia such as Routine Activity
6. Visualisation domain: this is about the selling skills of an analyst and how to present large complex analyses into simple concepts using techniques such as infographics.

Using a domain methodology allows for some areas to be larger than others whilst acknowledging that each domain has a right to exist. Critically, this means that (a) one domain cannot be more important than another; and (b) that as individuals we need to recognise when we enjoy being in one domain more than another and use this knowledge to understand and correct our behaviour. And thinking about skills in terms of domains rather than a checklist means that domains can grow and contract over time and be tailored to the needs of each agency.

Who has been using it / practical application
WMP analytical function is using this to assess current skill sets. We are building an understanding of how long it takes to acquire knowledge for the less well known domains through discussions with other practitioners as well as trying to identify potential training partners.

The 6 domains infographic is helping us to present this information in such a way that people do not become defensive about the results.

Our results have shown us that we have gaps in the tool and statistical domains and crucially that acquiring this knowledge is also timely. This may mean a different recruitment strategy if we wish to get these skills quickly or a development programme for talented individuals.

Our ambition is to use the model in developing a learning curriculum for our intelligence analysts. The other potential application of the model could be to replicate it across many
forces, to identify a picture of current levels of learning but critically where there are pockets of expertise, so that a more national knowledge sharing programme can develop.

**Class 5C: ACIA class: Analysis of competing hypotheses**

*Owain Gower, Sussex Police*

Analysts are employed to deliver objective insight, context and clarity to decision makers. Analysts face various challenges in this endeavour, including issues with incomplete data, insufficient time, political or organisational pressure in some circumstances and on top of this, the many cognitive limitations that colour all of our thinking, analysts and clients alike. This all takes place within the high stakes context of a profession that deals with significant threat, risk and harm, where the consequences of failure are great. One way in which analysts can tackle these challenges is to employ effective analytical techniques to help structure their thinking and organise their findings. Former CIA analyst Richards Heuer wrote in ‘Psychology of Intelligence Analysis’ that:

“Analysis of competing hypotheses, sometimes abbreviated ACH, is a tool to aid judgment on important issues requiring careful weighing of alternative explanations or conclusions. It helps an analyst overcome, or at least minimize, some of the cognitive limitations that make prescient intelligence analysis so difficult to achieve.

ACH is an eight-step procedure grounded in basic insights from cognitive psychology, decision analysis, and the scientific method. It is a surprisingly effective, proven process that helps analysts avoid common analytic pitfalls. Because of its thoroughness, it is particularly appropriate for controversial issues when analysts want to leave an audit trail to show what they considered and how they arrived at their judgment.”

The session will outline how the technique has been practically applied in a policing and community context and how analysts can seek to apply it for themselves.

**Class 5D: Analysis to action: what you need to consider when developing problem-oriented interventions**

*John Chapman, The Police Foundation*

SARA is a widely used problem solving methodology, which nominally breaks down the problem solving process into four consecutive and convenient steps: Scanning, Analysis, Response and Assessment. The apparent simplicity of this four-stage process is one reason why the SARA approach is so widely heralded within policing and crime reduction circles.

However, the successful application of SARA theory in a real-world context – particularly the post-analysis sequence – is far more convoluted. Although the SARA acronym might imply otherwise, problem-oriented responses do not follow automatically (or indeed, simply) from analyses. Rather, they are the product of an active and involved design process in which new local insights can be blended with the broader evidence-base and (often) pragmatic considerations of what are the most feasible response options. Furthermore, once designed, problem-oriented responses do not just happen – robust implementation requires thorough planning and preparation, stakeholder consultation and ultimately, sufficient resourcing.

This class focuses on this crucial ‘hinge’ in the SARA process. It considers some of the
intervening actions and core dependencies that need to be in place to enable successful transition from desk-based analytical insights towards practicable, localised responses. As part of the learning, the class will draw on practice examples from The Police Foundation’s project work with community safety partners in Luton and Slough. There will also be a focus on audience interaction, with participants encouraged to critique the ideas presented, and offer their own professional insight into and experiences of applying the SARA process – both the pitfalls and possibilities.

Parallel session 6
6A Seminar stream - Human trafficking and modern slavery
Practical approaches to improving the evidence base about modern slavery in the UK
Olivia Hesketh and Christine Cooper, Home Office, and Clare Gollop and Sian Bevan, Modern Slavery, Organised Immigration Crime and Migration Related Matters National Policing Portfolio and the Welsh Regional Organised Crime Unit

Key words: Modern Slavery, Human Trafficking, Organised Crime, Strategic Analysis, Data Sources

The UK’s new Modern Slavery legislation covers human trafficking, sexual exploitation, labour exploitation, criminal exploitation, domestic servitude and organ harvesting.

This presentation provides an introduction to the current evidence base about Modern Slavery in the UK, identifying the strengths and limitations of different datasets and approaches to understanding the problem. Examples at a national level that are directly translatable to applications at Force, Regional or Agency level will be shared.

The presentation will be jointly delivered by the analysts who are working within key national functions and have helped to establish the Critical Reference Group which supports the National Modern Slavery Threat Group, reporting to the Minister for the Prevention of Abuse and Exploitation. The practical challenges of fusing intelligence and information from different agencies into one national picture of the threat, and our progress against it, will be covered.

The presentation will share the key findings of literature reviews, performance analysis and strategic intelligence analysis and highlight some important research questions that remain and are relevant to both practitioners and academics.

Alongside articulating the space for researchers and analysts to contribute to knowledge about this issue, the presentation will share some potential practical solutions to assist analysts involved in modern slavery investigations (particularly those which cross international borders), or in developing proactive and partnership activity.

The presentation will describe the lessons learnt and good practice examples in debriefing, recording, and analysing modern slavery that were identified throughout the 2015 national review, and trials of various data tools and processes in different agencies.

The Modern Slavery Strategy, published under the Coalition Government in November 2014, recognised the need to improve knowledge of the criminals who commit modern
slavery crime. This presentation will discuss an approach by the Crime & Policing Analysis Unit to fill some of the evidence gaps about modern slavery offenders and crimes. This involved drawing on the in-depth knowledge and experience of local practitioners involved in tackling modern slavery.

The Modern Slavery Strategy also identified the need to improve the flow of data and information and to increase the strength and ability of local partnerships to tackle Modern Slavery. This presentation will share progress made by the National Policing Portfolio in these areas, including the products that resulted from the feedback generated by ICIAC15, emerging guidance and tool-kits. ICIAC16 will provide the national launch for practitioners for the Modern Slavery Threat Groups Analytical Strategy.

**Turning information into intelligence and intelligence into evidence – the role of the analyst in tackling human trafficking and modern day slavery in Rochdale**  
*Danielle Williams, Greater Manchester Police*

Key words: intelligence, investigation, partnership, trafficking, inference development

This presentation will outline the analyst’s role in uncovering the nature and extent of Human Trafficking in Rochdale, Greater Manchester. This presentation shows how analysis can turn small pieces of information into intelligence and then that intelligence into evidence to prosecute slave owners in 21st Century Great Britain. The journey has revealed shocking practices that were thought to be extinct in the civilised world. This work was analysis driven identifying safeguarding and prosecution opportunities and prioritising actions. This is a great example of how analysis can steer an investigation and explain complex issues in simple terms for various audiences.

In 2013 a Housing Enforcement Officer raised concerns around three males who were thought to be “controlling” large numbers of Eastern European families. These males appeared to be providing housing and employment for these families and assisting them in obtaining benefits. The names of the three males and the names and addresses of all the families were passed to the analyst and an initial assessment of the information held by police and partners was undertaken. This developed an inference that vulnerable families were being controlled by these key individuals and were being exploited for forced labour, sexual exploitation and the commission of immigration offences. The report brought partner agencies together to discuss the intelligence gaps and develop our knowledge of the problem. The Partnership Enforcement Team (PET) was used to engage with and monitor the Eastern European Families in Rochdale. Throughout the investigation information and intelligence in relation to large numbers of people had to be assessed, analysed and prioritised.

This allowed the partnership to gather information and intelligence and offer other avenues of assistance than their reliance on the three key individuals. Health workers raised concerns about a pregnant female who did not share a common language with her husband. This victim disclosed that her husband had bought her so he could get a visa to remain in the UK. The analysis of her account and her call data identified possible offenders, including one of the key individuals first identified, and this eventually led to six people being charged with human trafficking and immigration offences. But this was just the tip of the iceberg. At every turn the original inference was confirmed and developed.
Operation Retriever in numbers:
- Began with 24 families of 107 individuals and 3 suspects
- Expanded to 394 exploited or vulnerable people
- 3 large and complex investigations
- 16 forced labour crimes, 4 charged, £1m contract with national chain lost, HMRC £500,000 unpaid tax
- 20 sham marriages identified, each costing the tax payer £40,000
- 33 individuals declared as victims of Human Trafficking by the National Referral Mechanism.
- 40 charges for slavery and immigration offences
- 3 organised crime groups mapped
- 33% of all human trafficking in Greater Manchester occurs in Rochdale
- £375,000 fraudulent benefit claims

A key feature of this work was that it was qualitative analysis and not quantitative analysis. Understanding and assessing the source of the information was particularly important to develop inferences.

6B Seminar stream - Analytical methods and their application
Theory of change, improving standards of evidence: an application on youth crime and gang prevention
Iain Agar, London Borough of Havering

Key words: evidence, impact, outcomes, evaluation, validation

Havering borough became an Ending Gangs & Youth Violence Borough as a result of inward migration, from inner London, of individuals listed on the Metropolitan Police Trident gang’s matrix. Their relocation to Havering has coincided with a visible growth in street based dealing of drugs. Local young people are being used to sell, look after and carry drugs by these individuals, whilst reports of children missing from home, incidences of serious youth violence and street robbery are rising significantly.

In 2014 the Mayor’s Office for Policing and Crime (MOPAC) allowed Havering to realign funds from the London Crime Prevention Fund for gang prevention work. We also agreed to work with Project Oracle to ensure the quality and evidence, and evaluation of our provider would be outcome focused. Havering is one of three pilot boroughs (alongside Westminster and Lambeth) who have been supported by Project Oracle to evaluate the impact of gang prevention projects, measuring outcomes on offending, behaviour, attitudes, self-esteem and health.

The work involved firstly developing a ‘Theory of Change’ (ToC), a non-linear model that helps us explain how changes happen, justifying each step and how something (activity, output) will cause something else (outcome). For example, challenging attitudes towards women (activity), may result in increased respect for women, contribute to healthier relationships and reduce the likelihood or seriousness of domestic abuse (outcomes), and meet the overall aim to reduce violence reoffending.

The ToC was developed by our service provider (ex-offender led mentoring and outreach), youth offending and IOM practitioners.
The second part of the project involved developing an evaluation plan using the ToC and Project Oracle Youth Outcomes Framework. This included identifying the indicators we would measure and how they would be measured (i.e. self-esteem is measured using Rosenberg self-esteem scale, offending using PNC and CRIS data), comparison groups, frequency of data collections, and data analysis processes. The key aims being measured across all three sites are reduced reoffending, reduced seriousness of offending, ETE take up, improved self-esteem and changing attitudes towards life choices.

Young people involved in group/gang based offending (robbery, serious violence, drug dealing) are engaged by our commissioned service, Spark 2 Life (S2L). S2L are ex-offender led practitioners (credible messengers) who work with clients to address their Criminogenic Needs – factors which contribute to their lifestyle/offending, such as accommodation, employment, finances, thinking and behaviour. A key underlying assumption in the longer term success of the programme is that viable alternatives are available to targeted individuals.

Early analysis has found significant improvements in self-assessed self-esteem and realistic life choices of clients and a 56% reduction in reoffences during intervention periods. However, post intervention recidivism rates are high for those who have completed. The project is currently ongoing.

With continued cuts to funding, there is increasing need to build evidence in understanding what services are most successful in order to assist decision making and commissioning processes. The ToC is one way of presenting this and contributes to shared learning across boroughs on how to improve services.

The value of hypothesis testing in analysing organised crime
Matt Ashby, College of Business Law and Social Sciences, Nottingham Trent University

Key words: Hypothesis testing, organised crime groups, evidence-based policing, metal theft, offender data

Hypothesis testing is an approach to crime analysis that generates ideas about the key features of a crime problem and then tests those ideas to see if they are supported by the available evidence. This can be used to ensure that analysis is evidence based and can help stop police activity from being ineffective because it is based on a misunderstanding of the problem.

This presentation will show how the hypothesis-testing approach can be applied to the analysis of crime problems believed to be associated with organised-crime groups (OCGs). Using the example of metal theft in England and Wales, the presentation will show what analytical techniques can be used to assess the extent of OCG involvement in a crime type – with particular focus on analysis of data from the Police National Computer and intelligence information held by the National Crime Agency – and how the products of that analysis can inform police choices of crime-prevention measures.

This presentation would be suitable for intelligence analysts and also for senior investigating officers and intelligence managers who commission and consume
intelligence products.

**Class 6C: ACIA class: Targeting domestic abuse using the Cambridge Crime Harm Index**

*Matt Bland, Vice President ACIA (Norfolk and Suffolk Constabularies)*

Crimes do not all cause equal harm; a common assault is not the same as a grievous bodily harm, a burglary is not the equivalent of a murder. But the England and Wales Police tradition is to count every crime the same. This class will explore an alternative - the Cambridge Crime Harm Index. It will cover the background of this developing instrument, tips on how to apply it and some practical examples of how it can be applied.

**2nd Plenary**

**Operation SEBRING - murder investigation**

*Sue Sumner, Lancashire Constabulary (2015/16 ACIA award winner for excellence in analysis)*

On Saturday 23rd August 2014 a savage attack (with multiple injuries) occurred in Preston. Jon-Jo Highton (18) died from a fatal neck wound following a chase by masked men from two rival gangs in two vehicles. No eye witnesses nor direct CCTV. The only weapons recovered were a broken samurai sword blade and a golf club head left at the scene. Jon-Jo’s blood and DNA was not recovered anywhere other than the scene. Eight men charged with murder, three assisting them. Eleven stood trial at Preston in February 2015.

The attack was gang related, linked to Jon-Jo’s associates assaulting a family friend of Owen Whitesmith the previous evening. Whitesmith gathered henchmen to seek retribution; joined by other young cannabis dealers who had been repeatedly “taxed”. Initially five agreed they were at the scene, three relying on alibi but all denied any “joint enterprise, murderous intent”. A full murder team was assembled; expert detectives, Analyst, HOLMES, ANPR, CCTV, H2H search, forensic/scientists. 18 people were arrested.

Two products were used at court. A “Storyboard” PowerPoint to explain the prosecution narrative. SOE for all relevant evidential telephone, ANPR/CCTV data including hyperlinks to exhibits, mapping, locations etc. After a three month trial, 6 men were found guilty of murder. 3 guilty of assisting an offender. 2 guilty to conspiring to cause grievous bodily harm. 3 others pleaded guilty to attempting to PVC. Prison sentences total 170 years; some of the highest tariffs given in British judicial history to young adults.

**The value of research in modern policing**

*Nerys Thomas, UK College of Policing*

The demands faced by modern policing have changed in recent years. Alongside the need to continue to provide an effective local presence to prevent and investigate ‘traditional’ crime, the police are now dealing with new threats, such as cyber-crime, that operate across national and international borders. This changing demand is occurring against a back-drop of limited public resources and it is important that these resources are used effectively. This presentation will explore the role of research in helping police
forces better understand the demands they are facing and develop and test interventions to reduce the demand and deliver better outcomes for the public. Delegates will hear how the UK’s College of Policing, with its central aim of identifying, developing and promoting practice based on evidence, is supporting police forces in the UK to embed evidence-based approaches and make research evidence and science part of practitioners’ professional expertise.
Posters

Understanding the variations in spatial-temporal patterns of motor vehicle theft in Riyadh, Saudi Arabia under western environmental criminology

Nawaf Alotaibi, Andy Evans, Alison Heppenstall, and Nick Malleson, School of Geography, University of Leeds

Key words: Motor Vehicle Theft, Spatial Analysis, Environmental Criminology Theory, Saudi Arabia.

Environmental criminology theories were proposed and developed within a western context. However, a theoretical concern arises in terms of the applicability of these theories to new geographical and social contexts, such as that of Saudi Arabia (SA), where the demographics, culture, built environment and legal systems are substantially different. In SA, the few studies that have emerged to investigate the occurrence of crime from a geographical perspective suffer from shortages of particular theories, perspectives, data and methods; in short they lack appropriate contextualisation. Moreover, though motor vehicle theft (MVT) has accounted for the largest proportion of property crime incidents for decades in SA, particularly in Riyadh, to date few studies have been conducted to investigate this crime. Those that have, primarily focused on the characteristics of car thieves, and most have overlooked any spatio-temporal distribution of MVT incidents. Therefore, the work described in this paper represents initial steps in addressing this substantial research gap by exploring the two principal aspects of MVT crime, space and time, under the theoretical framework of environmental criminology.

This exploratory spatial analysis of MVT began by identifying MVT hotspots and detecting the statistical significance of these clusters. The data were then examined for any significant changes or differences between MVT incidents that occurred during different time periods within a day and week. One of the key findings of this work is that the clustering of the MVT patterns is statistically significant. Furthermore, the results show statistically significant differences in MVT occurrences on working days and weekends within Riyadh’s neighbourhoods. The next step will be to investigate factors that might be causing the statistically significant spatial-temporal patterns of MVT incidents and contextualise them within the theoretical frameworks developed in environmental criminology.

Data breach (credit card fraud): a potential indicator and warning

Michael Davies, Centre for Doctoral Training in Cyber Security, University of Oxford

Key words: Dark Net - Data Breach - Credit Card Credentials - Black Market Archive

This poster supports an 8-week project that was undertaken as part of the initial, taught element of the 4-year Centre for Doctoral Training program in Cyber Security, at the University of Oxford.

There is growing anecdotal and research evidence that cyber criminals are employing business methods and criminal markets to facilitate and enhance their activities. Increasingly IRC channels and Dark Net sites accessed with anonymity via TOR Services are used to advertise and market a vast range of items including stolen credentials and
narcotics. While there is debate over the true value of such activity, what is not in dispute is that the detrimental impact of cyber criminals, who appear to be able to breach the cyber defences of major organisations, seemingly at will, is significant.

The main idea of this pilot study was to use the concepts of a ‘cyber-criminal market’ and economic theory, to examine if a relationship, between the fluctuations in price of stolen credit card credentials advertised on Dark net carding sites, and the incidence of breach, could be used as an indicator or warning of a significant breach of credit card data. Using basic economic theory of supply and demand, research was undertaken in an attempt to establish the possibility of employing observed price suppression as an indicator that significant credit card data breach had occurred. The study uses a small subset, of a very important resource of stolen credit card data, recently added to the Internet Archive, that covers the period June 2014 – March 2015; as well as publicly accessible data on credit card data breaches.

This study, while not conclusively demonstrating a causal relationship, clearly demonstrates the research potential of this significant data resource and points the way for possible further research in this area.

Directing patrol routes using predictive policing
Lisa Jackson, Johanna Leigh and Sarah Dunnett, Department of Aeronautical and Automotive Engineering, Loughborough University

Key words: directed patrolling, predictive policing, kernel density maps, directed patrolling

Police forces are constantly looking for ways of reducing cost. Making these cost reductions is not possible without improving the efficiency of procedures and resources. Incident response is an area where compromising the number of response officers could have devastating consequences if those remaining resources are not used more efficiently. One method of increasing their efficiency is considering strategically directing response officer patrols. The positioning of response officers must consider the ability for officers to reach possible incidents within response time targets. This is quantified by measuring demand coverage; the demand which can be reached by officers within response time limits. Along with attending incidents it is necessary for response officers to provide a community presence in high crime areas, hotspots, to reduce crime. It has previously been proven that the presence of a uniformed police officer in a hotspot area reduces overall crime. Due to the need for visibility in multiple hotspot locations whilst also maintaining high levels of demand coverage when officers are being relocated to attend crimes the positioning of response officers is a dynamic problem and hence needs a real time solution. Implementing dynamic predictive positioning into the police response service progresses their patrolling methods from random patrolling to organised patrols based on the current state of resource. This results in improved positioning to lower response times and allows hotspot targeting.

This research develops a method of dynamic predictive patrolling through a computer aided positioning system which works in real time. This system uses historical call data to predict demand and uses historical crime data to identify hotspot locations. It utilises this information along with the current positions and availability of officers to determine which hotspots are the optimal locations to send officers. The method developed considers the varying levels of demand required and city and rural response time targets. Available
officers are then allocated a hotspot to patrol. The patrol location is then communicated to police officers along with information on the highest crimes in that area. Relocation will be performed when new officers become available and the frequency hotspots require visiting is factored in. Future work by the police will develop activities to perform in these areas to specifically target the main crimes occurring in that area.

This work has taken place in collaboration with Leicestershire Police. Currently methods of testing this process are being formulated. Initial testing will investigate the effect of targeting the hotspot locations. This will validate the crime mapping process before using the patrol directing system to allocate specific officers the hotspots identified in real time.

Assessing the potential prevalence of child sexual exploitation through data
Matthew Lloyd, London Borough of Brent Community Safety Partnership

Key words - CSE, data, prevalence, vulnerability, insight

This poster describes a method to use analysis of risk to identify a cohort of vulnerability to CSE, and its practical application in a local authority area. After being tasked to look at Child Sexual Exploitation (CSE) in Brent, it soon became apparent that there was very little data available to provide a meaningful intelligence picture. Despite the lack of data directly linked to CSE incidents, there is a wealth of data held by the Police, social services, youth offending service and schools which, if merged at an individual level, can indicate the potential prevalence of CSE in the borough. The indicators were identified by the Office of the Children’s Commissioner:

Using the indicators from the Child Sexual Exploitation in Gangs and Groups study as a guide, I carried out CSE prevalence analysis for the London borough of Brent. These indicators were pulled together from multiple databases and each was linked to the relevant child in a master spreadsheet. Each indicator was given a nominal value of one which allowed a total for each child to be calculated.

After assessing the data available the number of indicators surpassed the template (11) due to multiple scoring of certain single indicators. For example, someone that goes missing/absent once scores one on the indicator score, but someone that goes missing multiple times will score two. This was also the case with victims of sexual offences and victims of multiple sexual offences, and with exclusions, multiple exclusions and permanent exclusions. It was believed that by adding these extra indicator scores it could move the spreadsheet from looking solely at CSE prevalence to also assessing a child’s vulnerability to CSE. For example, a child that goes missing regularly would be perceived to be more vulnerable to CSE than a child that has gone missing once.

Indicators were also added for a child that has been a victim of CSE, captured as a named victim on a CSE non-crime police report and a referral to the MASE panel. This was deemed necessary due to victims of CSE are more vulnerable to CSE in the future.

The potential CSE prevalence pyramid below gives an overview of the numbers of children in Brent which hit one through to 11 CSE indicators from the data sets provided. The total number of children in Brent from the 2011 census makes the base of the pyramid as all children have a potential to be a victim of CSE.
Serious and organised crime local profile
Kath Tyler, Staffordshire Police

Staffordshire Police Intelligence Analysts have taken a different approach to completion of their Serious and Organised Crime Local Profiles. The organised crime element of SOC Local Profiles is implicit but how do you realise the inter-relationship with vulnerability; what perpetuates the cycle and what is the impact on the health of communities. Staffordshire Police have used a breadth of data sources to understand both – producing a profile designed to inform strategically and tactically and at varying tiers, from senior managers and partner agencies right through to PCSOs.

The profile is written at distinct layers for different customers, strategic analysis on threats including Organised Crime Groups; Firearms Threat; Drugs Supply; Child Sexual Exploitation; Modern Day Slavery; High Risk & Organised Acquisitive Crime; Financial Crime as well as Counter Terrorism. The profile contains detailed geographical analysis, creating hotspots including organised crime and ASB hotspot analysis, overlaid with vulnerable people, repeat offenders, IOMs, VSOMs, and OCG members. Schools, care homes, known CSE locations feature with analysis from a multitude of strategic products included, Emerging Minority Communities, Business Crime, Cyber-crime, HBV, FGM and Forced Marriage profiles as well as detailed socio-demographic analysis - educational attainment, languages spoken in schools, safeguarding referrals. Non police data sources have included Troubled Families, County Council data, Community surveys, Local Education Authority, Census data, Indices of Deprivation & Action Fraud.

Crime scripting in action - the analysis of modern slavery including child sexual exploitation
Debbie Unwin, Jenna Thomas, Ceri Lloyd and Holly Ricketts, Devon and Cornwall Police

Key words: Strategic analysis, Modern Slavery, labour exploitation, sexual exploitation, interventions

Three years ago members of our team attended the ICIA Conference and learned about the development of crime scripts in the academic world. They returned to Devon inspired and determined to incorporate the use of crime scripts into our strategic analysis and understanding of operational policing.

Crime scripts have since been developed as an analytical tool and used within Devon and Cornwall Police in a variety of ways, from ‘generic’ scripts layering multiple cases, to detailed scripts of single complex investigations. The main topics tackled to date have been labour and sexual exploitation. Part of the process has been introducing key stakeholders to crime scripting as a powerful analytical tool to gain their advocacy. The scripts have been displayed and discussed at regional modern slavery conferences, as well as at national level meetings and by other national partners.

The scripts have proved invaluable in allowing us to present vast amounts of complex and confidential information to partners in a simple-to-read, single page and sanitised format. It has allowed partners to identify for themselves possible intervention points, where they may have come into contact with victims or offenders, and identify what they could do differently in future. This has much more impact than the police trying to force
recommendations on them.

The qualitative approach has enabled us to analyse new and rapidly advancing crime types where numerical data is lacking. The scripts have also provided a method for capturing individuals' qualitative and contextual knowledge and experience, as well as best practice and lessons learned.

The team have identified a number of ways in which crime scripting can still be developed further within policing and are keen to present some of these ideas at the conference. For example, the next step would be to layer operational crime scripts to enhance the strategic picture and enable us to draw conclusions, hypothesis testing and identifying intervention points. This has the potential to find ways to help safeguard vulnerable people at an earlier stage as well having positive financial/resource implications from more efficient working for the police, partners and our communities.

Our poster would include the following:
• Two/three examples of our crime scripts;
• An explanation of the methods used to produce the scripts;
• A summary of the benefits/uses of crime scripts;
• Ideas for further development of crime scripting within operational policing, partnership working and the strategic arena.

Crime analysis in Belize: a developing concept
Jane Usher, Belize Police Department

Key words: Informative, Visual, Novel, Engaging, Analytical

Belize is a small but beautiful country located in Central America. Still a developing nation, Belize’s 8,867 square miles is home to only 334,297 inhabitants (2013 estimate). With her pristine magnificence and promising people, Belize was once hailed as “a tranquil haven of democracy”, proudly achieving her independence through a peaceful, constructive revolution. That serenity, however, has been threatened in recent years, by record-breaking increases in violent crime.

Each year, crime in Belize continues unabated, and crime generates a climate of fear, diminishing a nation’s growth and development. Consequently, those mandated to protect the welfare of the state have received unrelenting pressure to “do something about it”. But, in order to address the situation, we must first understand it.

In an effort to protect the safety and security of all residents, the Belize Police Department has re-vamped its image and tactics, embracing community policing and intelligence-led policing. Following the lead of other international Police Departments, the Belize Police Department has realized and embraced the vital role of crime analysis in an effort to be less reactive and more proactive.

Accordingly, in September 2015, a Crime Analysis Office was established within the Eastern Division South of The Belize Police Department. Tasked primarily to study major crimes within Belize City, three young Belize City police officers have been challenged not only to study the data and identify patterns, trends and problems, but also to develop knowledge of specific criminal incidents, particularly gun and gang related crime, in
an effort to learn the who, what, when, how and why of the emerging crime. Almost as soon as the office was formed, these officers were thrust into the role of not only crime analysis, but also crime intelligence analysis and crime investigative analysis.

To achieve this, the officers use the sources of information available - police reports, CompStat data, and intelligence and investigative officer’s information and interviews, pouring over details, summarizing the specifics for their commanders, analyzing the data to identify the most affected persons and places, and using their limited knowledge to make humble suggestions on future crime prevention efforts and strategies.

Effective analysis has the potential to turn data into information, which, when successfully communicated and shared with command staff, decision makers and other police officers, will become the knowledge needed not only to identify and apprehend suspects; but also, to police more effectively and efficiently by prioritizing patrols and deploying our limited resources more sensibly. With reliable information, the internal operations are gradually optimized and investigations accelerated.

The task is arduous, though, especially the communication aspect. It is possibly the most difficult challenge, as often times the right information is known, but we struggle to disseminate it to the right people and more so at the right time. Lack of proper equipment and helpful software means the process is mostly manual, causing information to be produced at a slower rate.

Nonetheless, the Belize Police Department has embraced the effort and aims toward a common goal – a safer Belize.