UCL Transport Institute

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Briefing note, May 2014

Transport, Streets and Crime

There has been much recent innovative research into transport, streets and crime which could be incorporated into policy making. This note summarises outputs from a high-level impact seminar organised by University College London (UCL) in collaboration with Transport for London, in February 2014. The seminar presented recent academic research on the topic and considered its relevance for current policy concerns.

Key messages from the presentations

- A range of analysis techniques can be used to **identify potential crime situations** and **implement targeted crime prevention measures**.
- **Mathematical models can test theories** about crime prevention and policing tactics.
- **Measuring fear of crime** and how that changes over place and time could help to target interventions more effectively.
- Traditional **methods for identifying crime hot spots** are not always applicable to route-based transport crime scenarios: more innovative methods are required.

Main conclusions from discussions

- Commissioning appropriate and aesthetically pleasing **street and transport system design** is crucial for crime prevention
- **Micro urban planning decisions** are key to prevent crime, particularly crime in poorer areas
- Further **cross-level and cross-sectorial cooperation** is needed to effectively tackle crime on urban streets and on public transport
- Better **communication between academia and practitioners** would have large potential benefits, both in terms of making new research findings available for application, and in challenging academics to address practical concerns

Areas for further research

- Who are the crime generators/promoters, in different contexts?
- What impact does particular police action, such as front line policing, have on crime levels and patterns?
- How does the provision and use of various social media affect crime patterns?

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EPSRC
Engineering and Physical Sciences Research Council

Summary Presentations

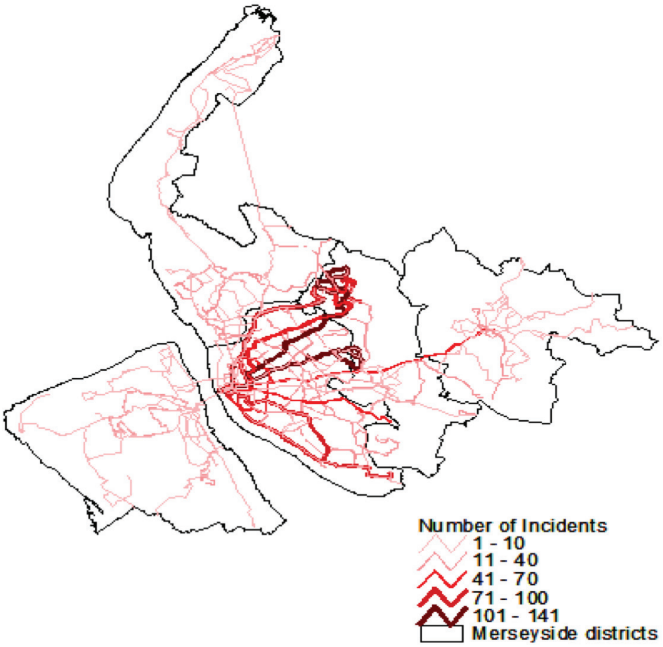
"The challenge of moving hot spots: analysis for crime prevention on public transport" by Andrew Newton, Applied Criminology Centre, University of Huddersfield

The challenge faced by analysts is how to map a spatially ill-defined and moving hot spot. This requires assessing the risky places and times for crime and disorder on a dynamic and highly transient transport system.

There are considerable complexities in analysing crime on a transport network with high and low volumes of people in different locations and at various times of day, and with constant movement of passengers and infrastructure.

Different analysis techniques can inform risk identification on transport networks in different situations. These techniques can be used to target resources and implement crime prevention measures.

Potential crime situation	Analysis technique
Robbery at a bus stop (known place and time)	Point pattern analysis
Criminal damage to a bus stop (known place, unknown time)	Aoristic analysis
Assault on a moving train (multiple places, known time)	Hot routes
Pick-pocketing on a train (somewhere between two places and two times)	Interstitial crime analysis



Number of criminal incidents on the bus network in Merseyside.

"Investigating strategies for the policing of disorder, based on the London riots" by Hannah Fry, Centre for Advanced Spatial Analysis, UCL

The London riots of 2011 saw the worst case of widespread violence, looting and arson in the UK for over 20 years. A **mathematical analysis and model of the events** was created as a partnership between the Metropolitan Police and UCL.

By analysing the arrests made in connection with the events it was possible to discern the key features of the riots at a macro-level, helping to understand:

- how people became involved
- how they interacted with the police
- and crucially, how they chose where to offend.

Using these insights, a mathematical model was created that is capable of replicating the general patterns seen in the data and explaining **why some areas of the city were more susceptible than others**. These factors, along with understanding the effect of police numbers and response time, are essential to informing policing strategy, and have the potential to help bring about a swifter resolution to unrest should similar riots happen again in future.

Visualisation of some of the events on the evening of the 8th of August 2011 during the London riots.

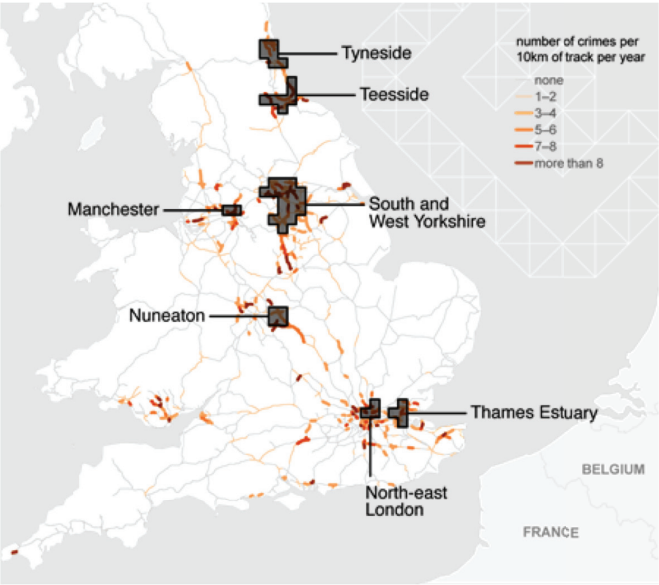
Summary Presentations

"Spatial and temporal variations in metal theft from the British railway network" by Matt Ashby, Security Science Doctoral Research Training Centre

Analysis of reports of 5,000 thefts of live metal from the British railway network committed between 2007 and 2012 shows that **railway metal theft is heavily concentrated in a few areas**, with seven hotspots containing 38% of all offences and many areas having no crimes at all.

Hotspots are typically close to, but outside, built-up areas, in contrast to other railway thefts. Until the beginning of 2012, the frequency of offences closely tracked the changing wholesale price of copper.

Offences are not strongly seasonal but are heavily **concentrated at night**. Temporal patterns vary between hotspots



Number of crimes per 10km of train track.

"Mapping fear of crime as a dynamic event " by Reka Solymosi, Security Science Doctoral Research Training Centre

A mobile application to **track people's everyday experiences** offers a novel approach to mapping hotspots relating to personal fear of crime.

This method better accommodates **the dynamic nature of fear of crime**, as it collects precise data on when, where, and by whom fear of crime is experienced daily.

Findings can be used to:

- Identify potentially unsafe areas, in space and time
- Design targeted situational interventions aimed at enhancing perceptions of safety during the entire journey.

Collecting spatial data on fear of crime.

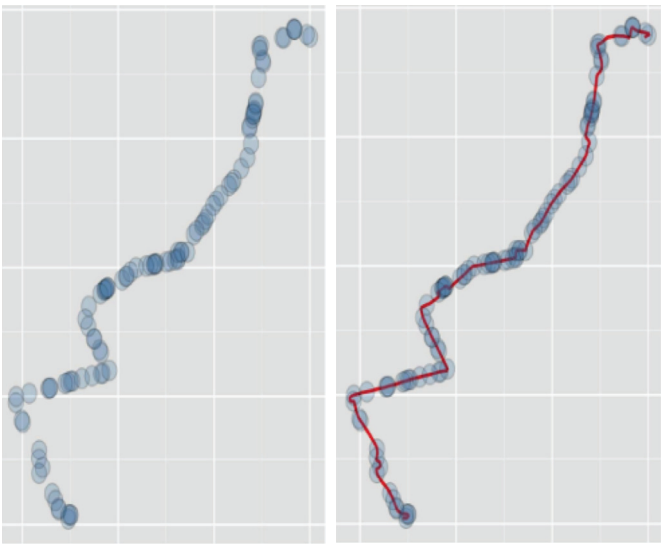
"Does bus-related crime 'float in space'?" by Henry Partridge, Security Science Doctoral Research Training Centre

Traditional spatial analysis techniques applied to bus related crime result in the **false detection of crime hot spots**.

Such techniques assume that crime can happen anywhere and ignore limiting features of the urban environment which constrain travel to specific routes.

Traditional methods of spatial analysis of hotspots are not suitable for crimes that occur on transport networks

The use of **'network' spatial methods** is therefore recommended in such cases.



Traditional spatial analysis technique (Left hand side) versus recommended one.

Summary of the discussions

Commissioning appropriate and aesthetically pleasing street and transport system designs is a crucial element for crime prevention:

- Designing good transport and street facilities should provide a sense of quality, safety and security whilst remaining convenient and robust.
- Co-designing between practitioners, experts and users might provide the best solutions.

Micro urban planning decisions are key to prevent crime:

- It is important to consider the urban environment in which transport systems exist. For instance, locating a bus stop next to a pub might encourage some types of crime.
- A station can be a crime generator (an activity node that pulls in lots of people) or a crime attractor, with known criminal opportunities. The area immediately around the station can also be a generator.

Future policies:

- **Risk perception** needs to be further explored: how to better communicate the real risks to people
- **Social media** is potentially the next big influence on crime and policing
- Need to better understand **contributing factors** to planned criminal activity
- More investment should be made in **intelligence gathering** about crimes. Currently efforts are mainly dedicated to front line policing.

Further cross level and cross sectorial cooperation needed:

- Making sure that all the relevant stakeholders cooperate across levels and sectors is challenging. Currently there is too much work in silos with insufficient linkages between them.

Social action can help to prevent crime:

- Investments in social, cultural or physical activity facilities, for example youth centres, can reduce the number of potential young offenders on the streets, and their propensity to commit crimes.

Better communication between academia and practitioners is needed:

There is a need to get more evidence into practice and to overcome the 'translation' or language barrier.

- Key messages from academic papers could be 'translated' into concise briefing notes accessible to practitioners on the ground. It should be relevant to their current missions.
- The possibility to establish a portal summarizing research was discussed:
  - A central place or forum with 1-2 page summaries of what research is "out there", that front line people can get to and understand.
- Practitioners' knowledge and ideas from "the field" are a very important source of information for academics too. This should be a two-way process.

Background

This seminar is part of a programme of activities funded through an EPSRC 'Impact Acceleration Award'. The initiative aims to create bridges between senior researchers, key policy makers and practitioners working in transport to ensure that significant research outputs are rapidly absorbed into policy making and practice, and have practical impact.

This seminar was an opportunity for key policy makers to hear about recent academics' findings and to discuss with the researchers concerned their relevance to policy making and practice.

The following institutions were represented:

- Home Office
- British Transport Police
- Metropolitan Police
- Transport for London
- Camden Community Safety Partnership
- Association of Train Operating Companies
- Policy Exchange
- Central Saint Martins College of Arts and Design
- Cambridge Institute of Criminology
- Centre for Advanced Spatial Analysis, UCL
- The Bartlett School, UCL
- University of Huddersfield
- Jill Dando Institute of Security and Crime Science
- Civil Environmental Geomatic Engineering, UCL
- UCL Transport Institute

References

Newton, A (2014) 'Crime on Public Transport'. In: Encyclopedia of Criminology and Criminal Justice. London: Springer. pp. 709-720.

Davies, T. P., Fry, H., Wilson, A. G., & Bishop, S. (2013). A mathematical model of the London riots and their policing. Scientific Reports, 3.