

Crime on public transport can be very difficult to analyse. 'Stealth crimes' like pick-pocketing present a particular challenge because victims often have an imprecise knowledge of the location and time of the offence. In this scenario crime has typically been recorded as happening at the



JDiBrief - Analysis

Interstitial crime analysis: METHOD (3 of 5)

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Interstitial crime analysis (ICA) allows an analyst to identify and map crime concentrations along paths (e.g. sections of a transport network) and connected nodes (e.g. stations and interchanges). Colour and line-width can be used to visualise the results - known as thematic mapping. In this brief we provide an overview of the method; more detailed information can be found in other publications (details of which are in the resources brief).

DATA REQUIREMENTS: Two data files are required at a minimum for the analysis:

- a) Crime data with accurate attributes of start node (e.g. station or bus/tram stop), end node, and if relevant, any interchange nodes used to change direction or path within a network; and
- b) A network layer representing the paths and nodes.

ANALYTICAL PROCESS: The following steps outline the analytical process to produce an ICA map:

1. *Preparing the network layer.* This layer should be split into segments between adjacent nodes with unique identifiers assigned to each segment; these need to be created in a GIS.
2. *Preparing the interstitial values.* Crimes with an unknown location need to be treated differently from those where the location is known (e.g. the theft was noticed by the victim at the time of the offence). In the case of the former, each of the segments of the journey travelled by a victim including any nodes passed through need to have a probability value generated for them. The known location crimes can have a value of 1 assigned to the segment or node where the crime was observed to have taken place.

The probability for all the segments is summed over all the offences, and this is totalled for each segment to generate the associated risk. Once completed you should have risk values for each segment representing all the crimes analysed (see figure 2 which illustrates the ICA calculations).

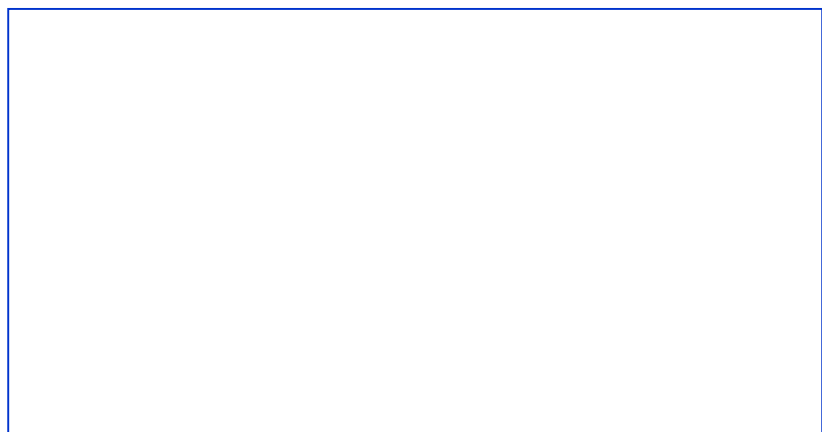


Figure 2 - Example of ICA applied to 4 fictitious thefts upon the London Underground network

3. *Visualising the ICA values.* The interstitial values next need to be joined to the network layer (by the unique identifier common to both data files) in a GIS and visualised with thematic mapping settings. Line thickness and colour can be used to display the variation of ICA values (see figures 3 and 4 in Case Study brief).

GENERAL RESOURCES

Paper presented to the 5th National Crime Mapping Conference. 9th to 10th May 2007.
<http://www.ucl.ac.uk/jdi/events/mapping-conf/conf-2007/conf-pres2007/pres16>

Clarke, R. and Eck, J., (2005) Crime Analysis for Problem Solvers in 55 Small Steps. Washington, D.C.: Office of Community Oriented Policing Services, United States Department of Justice. Available at <http://www.popcenter.org/library/reading/pdfs/55stepsUK.pdf>

A SELECTION OF ACADEMIC PAPERS AND BOOK CHAPTERS