



JDiBrief - Analysis

Street Networks and Risk: CASE STUDY (4 of 5)

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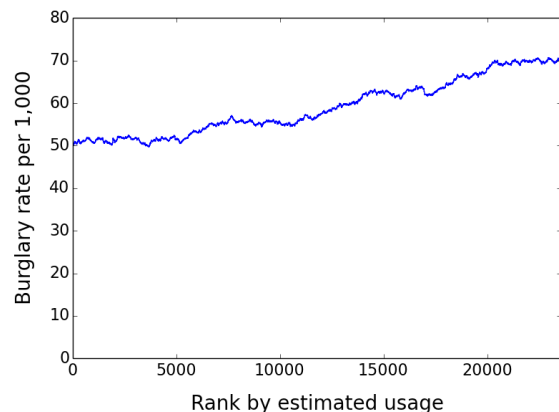
APPLICATION: Analyses for one policing area on Merseyside (UK) examined how the risk of residential burglary varied for cul-de-sacs and other types of road. Very clear findings emerged (see Table 1). More detailed analyses conducted using a sophisticated type of statistical model confirmed that these results could not be explained by other factors (e.g. levels of deprivation). It was also apparent that risk was higher on street segments that were more connected to others, and therefore potentially more likely to be used on journeys. Finally, additional analyses suggested that the differences in risk were more apparent during the day than at night.

Burglary rate	A&B Roads	Minor Roads	Local Roads	Cul-de-sacs	Private Roads
Overall	46.3	36.9	29.2	19.9	15.4
Day	63.9	49.4	32.5	24.7	23.4
Night	43.8	41.9	38.4	23.4	17.9

Table 1 Rate of residential burglary by type of street segment (Johnson & Bowers, 2010, 2013)

In a second example, an analysis of residential burglary in the West Midlands used the graph theory approach discussed in the Method brief (as well as the Ordnance Survey (OS) road classification system) and found a clear association between crime risk and estimates of how regularly street segments were expected to be used by people.

Figure 3 The relationship between estimated usage and crime risk: a) street network with segments coloured according to their estimated use; and b) (smoothed) average crime rate when segments are ordered according to this estimated use.



Interestingly, the research presented in the second example suggested that while the OS street classification used above (e.g. A Roads and Local Roads) was useful in the analysis performed, it is not always reliable. That is, in some cases roads that would be expected to be used more than others based on their description (e.g. an A Road) were actually estimated to be used less frequently using the graph theory approach, suggesting that the latter approach may be more reliable and offer further insight than the OS classification system. This may be particularly helpful in identifying and differentiating between those streets that have the highest *potential* for crime.