Prediction, priority neighbourhoods and responding with confidence

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Overview

- Priority neighbourhoods
  - Identifying vulnerable neighbourhoods for strategic intervention
- Predictive policing
  - Theory-led predictive analysis
- Responding with confidence
  - Understanding mechanisms and context
  - Examples
    - Neighbourhood Watch
    - Predictive policing (residential burglary)
- Resources

The history of the VLI
(Vulnerable Localities Index)

- The riots of 2001
  - Bradford, Burnley, Wrexham, Oldham
- Government Reviews

  Common themes
  - Fragmented communities
  - Deprived areas
  - Disenfranchisement of young people
  - Preceded with months of tension and minor incidents
  - High unemployment
  - Lack of a strong cultural identity
  - Far right groups active
  - Locals

The history of the VLI

- National Centre for Policing Excellence (2003)
- To develop Community Cohesion Doctrine
  - *"to identify and address issues of disproportionate criminality, victimisation and tension"* ACPO (2004)
  - appreciate factors that influence the undercurrent of disproportionality
  - Identify communities in breakdown ('vulnerable localities')
- Test in eight Police BCU pilot sites

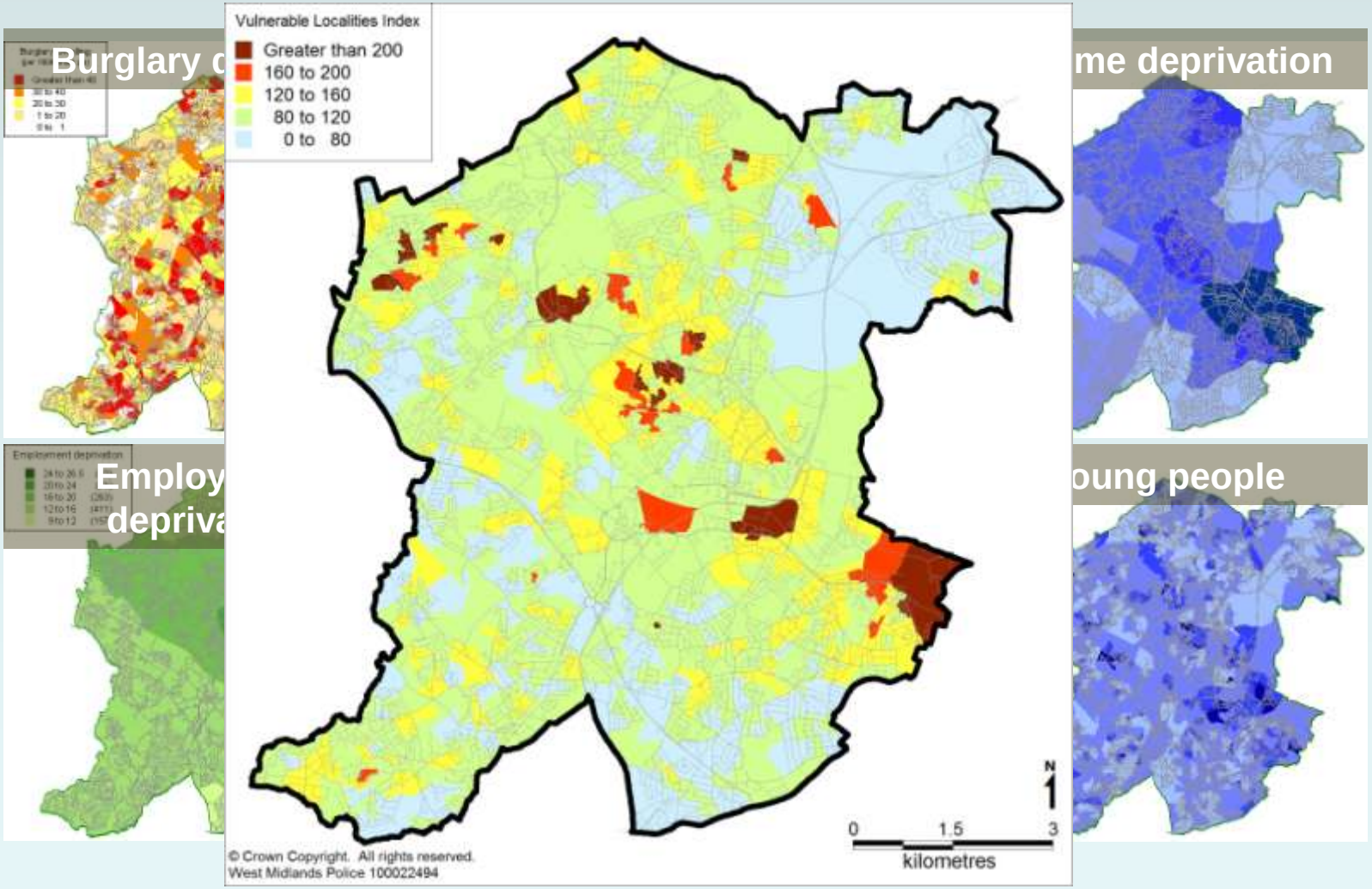
The history of the VLI

- At the same time as the Community Cohesion Doctrine (2003)
  - National Intelligence Model: anything developed under the Community Cohesion Doctrine needed to be NIM compliant
  - Reassurance Policing
  - Signal crimes
  - Neighbourhood Policing
- Neighbourhood Policing 2005
  - Reassurance
  - Signal Crimes
  - Community Cohesion
- Neighbourhood Policing and the NIM
  - Strategic Analysis: '*use the VLI*'
- Intelligence development (e.g. Strategic Assessments)
  - Identifying priority neighbourhoods for strategic attention - using the VLI
  - E.g. GMAC 2005 use of VLI in their first strategic assessments

VLI method - data

- Identify neighbourhoods
  - Census Output Areas, as the aggregate unit for these statistics
- Local statistics - uses local data that is available for all areas
  - Crime statistics (Police crime recording system)
    - Burglary dwelling
    - Criminal damage to a dwelling
  - Deprivation statistics (Neighbourhood Statistics)
    - Income deprivation
    - Employment deprivation
  - Education statistics (Neighbourhood Statistics)
    - Population that has less than 5 or more GCSEs grades A*-C or equivalent
  - Demographic statistics (Neighbourhood Statistics)
    - Population of young people
- Variables were selected after reviewing literature on community cohesion, social efficacy, social capital, and against the 'criteria'

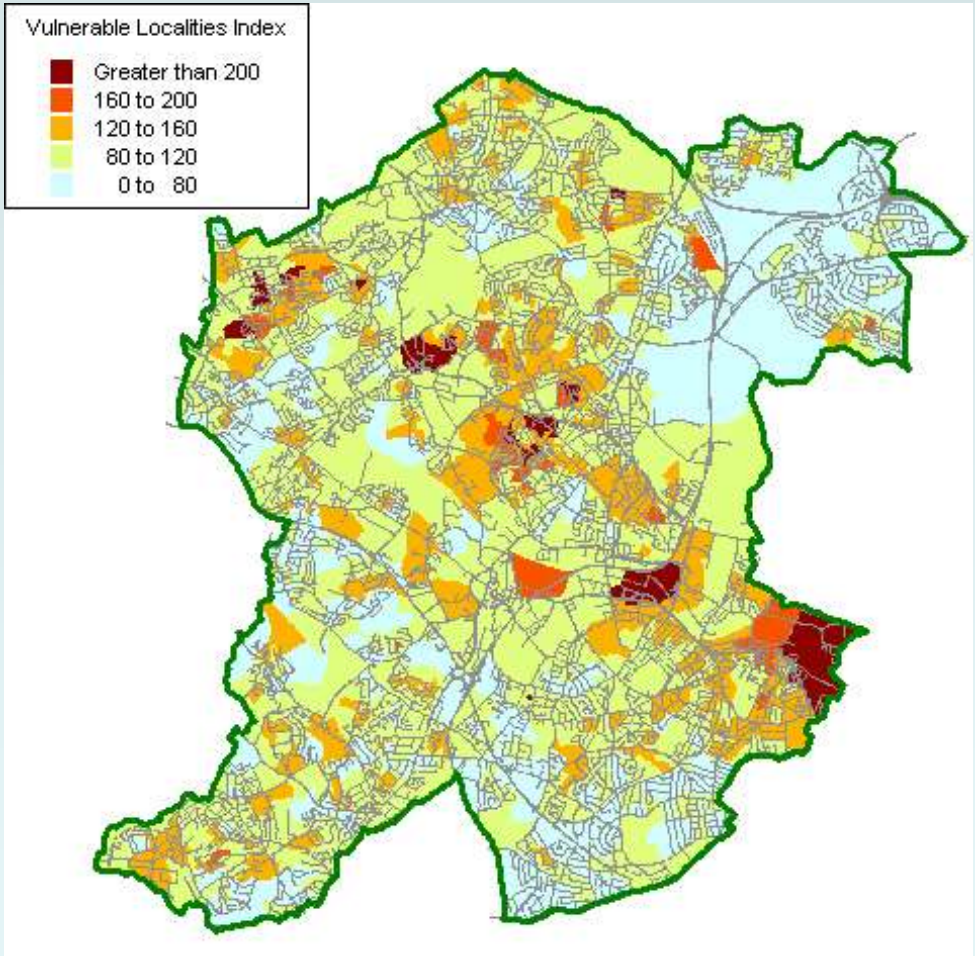
VLI method: Sandwell (West Midlands)



Prioritising neighbourhoods

The Vulnerable Localities Index

- Effective method for identifying vulnerable communities
  - Seeks to identify residential neighbourhoods rather than hotspots in town centres and entertainment areas
  - Used by 100 CSPs
  - Still relevant and accurate even though old Census data
- Acts as starting point on which 'local intelligence' can be further considered
  - Points the suggestive finger at places that warrant further analysis to help understand and explain why they are priorities
- Aligning with other local activities
  - E.g. Neighbourhood Renewal

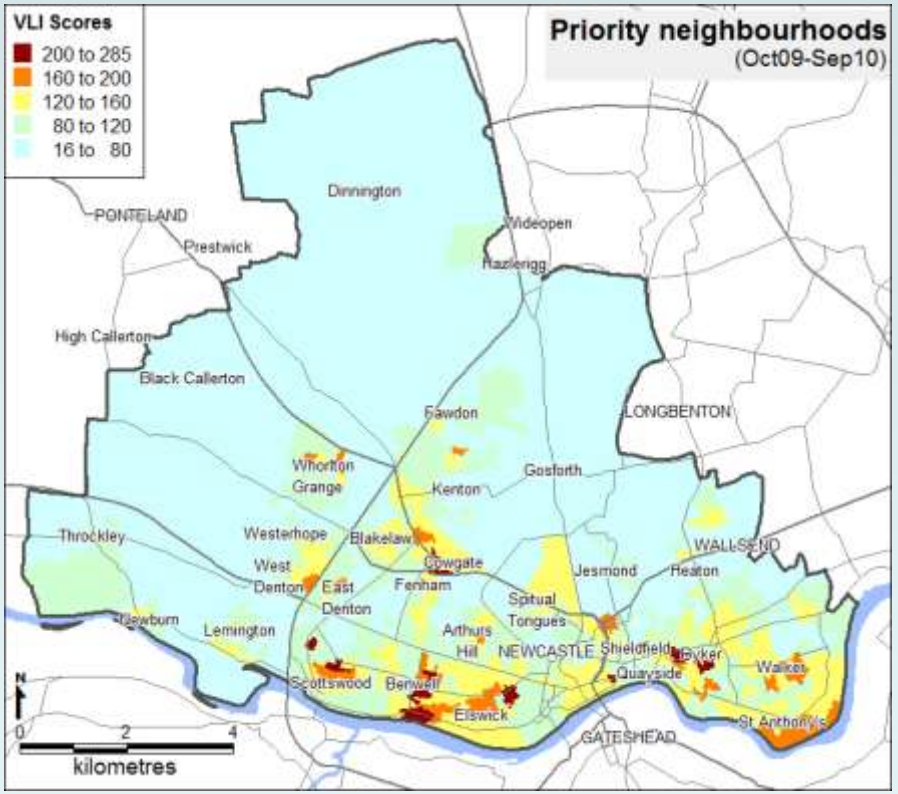


Prioritising neighbourhoods

Example: Newcastle SIA 2010/11

- Priority neighbourhoods
  - Cowgate
  - Scottswood
  - Benwell
  - Elswick
  - Byker
- Issues of crime and ASB alongside socio-economic and environmental conditions

  E.g. Burglary dwelling and criminal damage to dwelling rates over three times Newcastle average



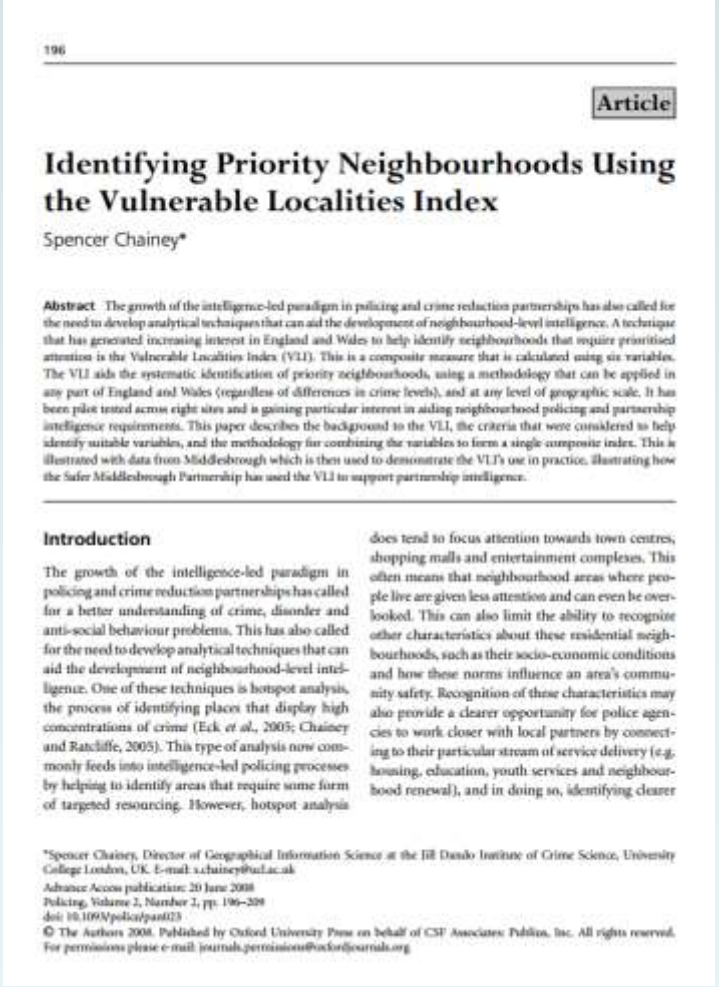
- **Strategic priority:** Targeted focus towards priority neighbourhoods e.g. narrow the gap between worst and other areas

Prioritising neighbourhoods

- Policing: journal of policy and practice
  - Chainey,S.P. (2008). Identifying priority neighbourhoods using the Vulnerable Localities Index. Policing 2(2):196-209
- JDI training course

  (MapInfo, ESRI, Cadcorp users)
  - Neighbourhood Analysis

    Explores analytical techniques for identifying priority neighbourhoods (e.g. the VLI), the utility of geodemographic lifestyle datasets (e.g. MOSAIC and ACORN), discusses the signal crimes approach and the mapping of visual audits and surveys, and explores the data to consider in a Neighbourhood Profile



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Article

Identifying Priority Neighbourhoods Using the Vulnerable Localities Index

Spencer Chainey*

Abstract The growth of the intelligence-led paradigm in policing and crime reduction partnerships has also called for the need to develop analytical techniques that can aid the development of neighbourhood-level intelligence. A technique that has generated increasing interest in England and Wales to help identify neighbourhoods that require prioritised attention is the Vulnerable Localities Index (VLI). This is a composite measure that is calculated using six variables. The VLI aids the systematic identification of priority neighbourhoods, using a methodology that can be applied in any part of England and Wales (regardless of differences in crime levels), and at any level of geographic scale. It has been pilot tested across eight sites and is gaining particular interest in aiding neighbourhood policing and partnership intelligence requirements. This paper describes the background to the VLI, the criteria that were considered to help identify suitable variables, and the methodology for combining the variables to form a single composite index. This is illustrated with data from Middlesbrough which is then used to demonstrate the VLI's use in practice, illustrating how the Safer Middlesbrough Partnership has used the VLI to support partnership intelligence.

Introduction

The growth of the intelligence-led paradigm in policing and crime reduction partnerships has called for a better understanding of crime, disorder and anti-social behaviour problems. This has also called for the need to develop analytical techniques that can aid the development of neighbourhood-level intelligence. One of these techniques is hotspot analysis, the process of identifying places that display high concentrations of crime (Eck *et al.*, 2005; Chainey and Ratcliffe, 2005). This type of analysis now commonly feeds into intelligence-led policing processes by helping to identify areas that require some form of targeted resourcing. However, hotspot analysis does tend to focus attention towards town centres, shopping malls and entertainment complexes. This often means that neighbourhood areas where people live are given less attention and can even be overlooked. This can also limit the ability to recognize other characteristics about these residential neighbourhoods, such as their socio-economic conditions and how these norms influence an area's community safety. Recognition of these characteristics may also provide a clearer opportunity for police agencies to work closer with local partners by connecting to their particular stream of service delivery (e.g. housing, education, youth services and neighbourhood renewal), and in doing so, identifying clearer

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Predictive policing

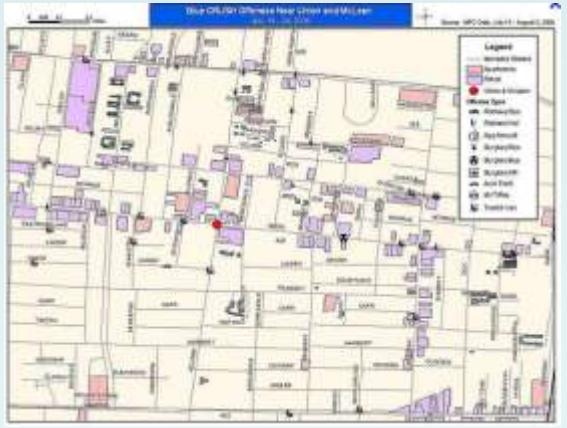
Predictive policing

LAPD predictive policing

- Predictive modelling algorithm: analysing crime patterns from last 3 years to identify future hotspots
- Police officers asked to give additional attention to these areas
  - 500 ft x 500 ft area (one square block)
  - In first week: reduced crime in certain areas by 50%

IBM predictive analytics

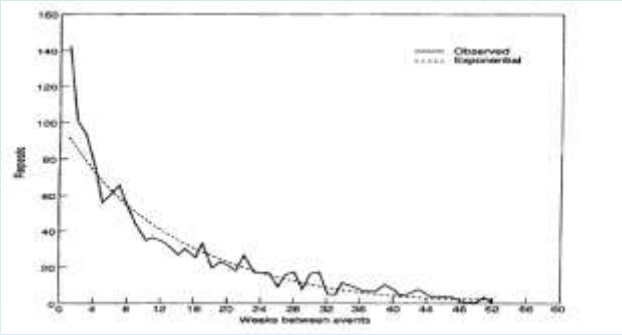
- *"apply statistical data exploration and machine-learning techniques to historical information in order to uncover hidden patterns, associations, correlations and trends ... includes vast amounts of textual or unstructured data [alongside recorded crime] such as emails, videos and chat room interactions"*
- Memphis PD: ↓15% in violent crimes (2006 – 2010)

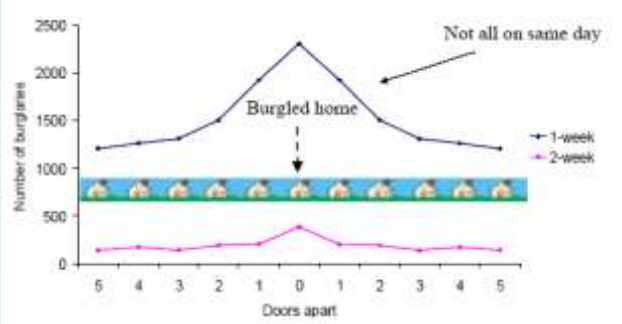


Predictive policing

The Trafford Experiment (focus on burglary)

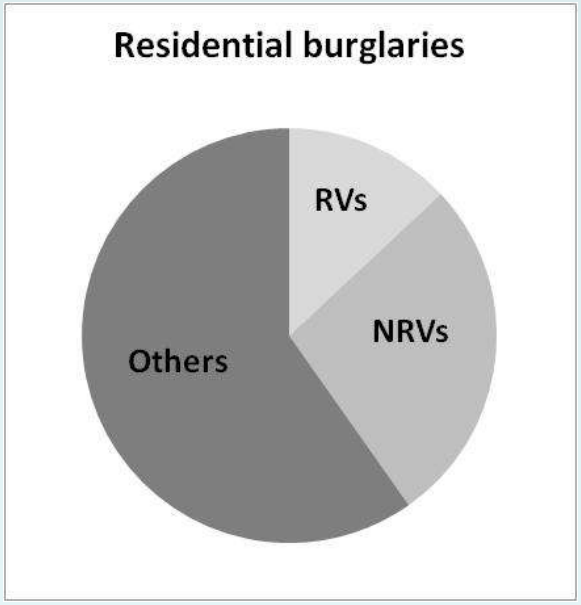
- Theory-led
  - Repeat victimisation
    - Future risk doubles following prior victimisation
    - Decays rapidly (within a few days)
    - 7-15% of all burglaries are RVs
  - Near repeat victimisation
    - Neighbours are at heightened risk
    - Decays rapidly in space and time (within 200m and a few days)
    - 10-30% of all burglaries are NRVs
  - Optimal forager
    - 76% of offenders returned to a number of houses to burglle them 2-5 times Ericsson (1995)
  - Boost account: future victimisation is boosted by previous victimisation

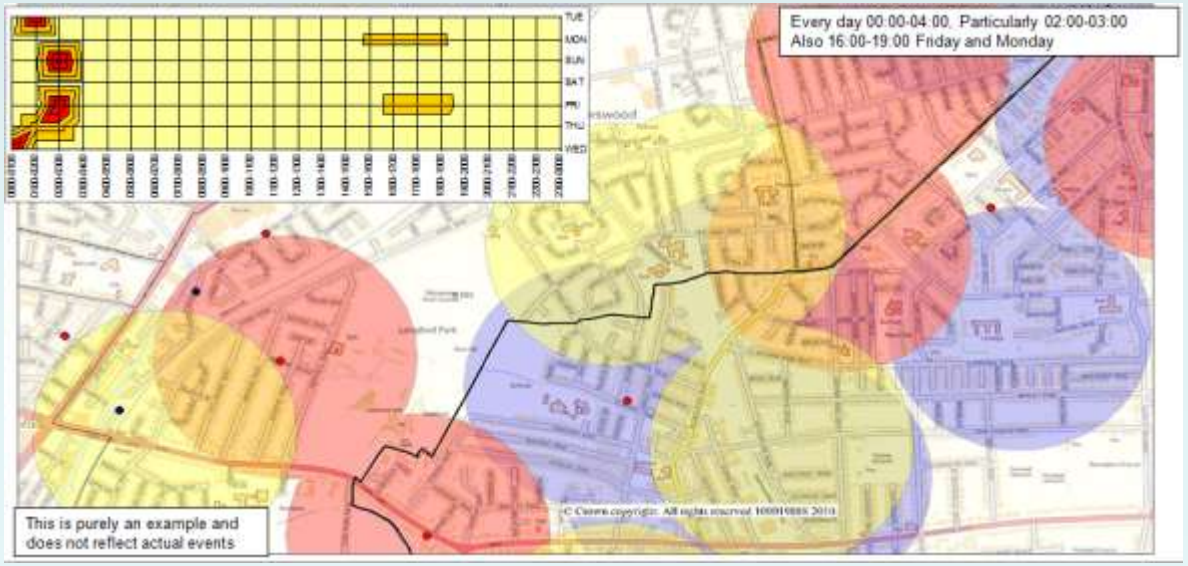




Predictive policing (Trafford, GMP)

- Average 2010/11: four burglaries per day
- Target: reduce burglary in 2011 by 9.3%
- Focus: reduce repeat and near repeat victimisation
  - Produce maps every four days
  - 200m buffer around burgled property
- Task NPTs everyday after a burglary to high risk areas





Predictive policing (Trafford, GMP)

Results

- 27% reduction in burglary
- Hyper-risk areas (orange): 53% reduction
- Non-targeted areas: very little change

BDW Count	Orange	Red	Yellow	Blue	Outside	Total
2009/10	139	234	218	159	479	1229
2010/11	66	128	141	97	470	902
Change	-52.5%	-45.3%	-35.6%	-38.8%	-1.9%	-26.6%

Repeat victimisation

- Expect 4 per month
- 1Oct-31Nov 2011:
  1 repeat burglary

Near repeat victimisation

- Expect 4 per week
- 1Oct-31Nov 2011:
  2 per week

Predictive policing (Trafford, GMP)

- So how did they do it ...?

Mechanisms, context and outcomes

- **Mechanism**: the mechanism describes *how* a programme might exert its effect
  - If you find it difficult to identify the mechanism for your response from one of these than its unlikely top work!

    Increase the effort - increase the risk - reduce the reward - remove the excuse - remove provocations
- **Context**:
  - programmes are sensitive to the social, situational, temporal *context* within which they are introduced
  - crime is context dependent
- **Outcome**: The *outcome* is the result of firing a particular mechanism in a given context i.e. what happened

Neighbourhood Watch

- Anticipated outcome: reduce crime
- Mechanisms
  - Residents call the police if they see a crime in progress **(increase risk)**
  - Street signs plus window and door stickers tell the offender that this is happening **(increase risk)**
  - Residents are encouraged to secure their homes and mark property **(increase effort)**

Neighbourhood Watch

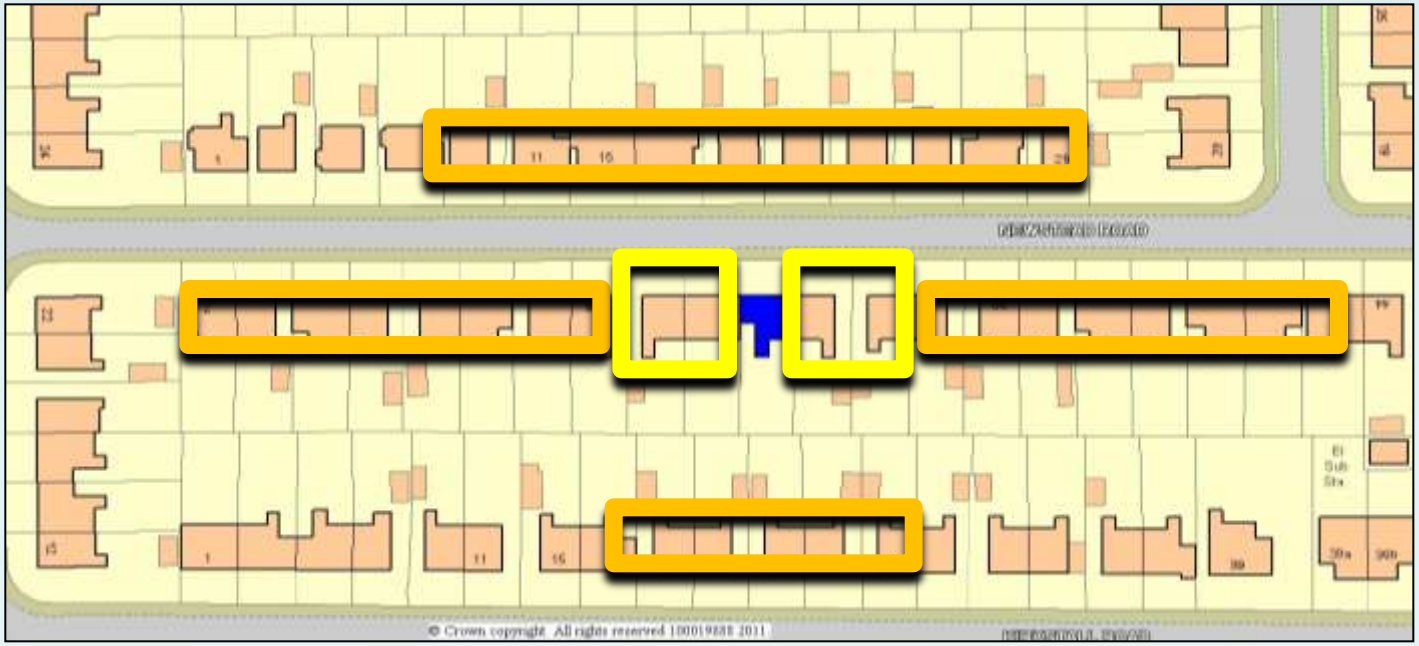
- Context: high/medium/low crime area

- Outcome
  - Reduced crime

Predictive policing – tactical response

Reduce immediate future risk of burglary – ‘super-cocooning’ within 24 hours

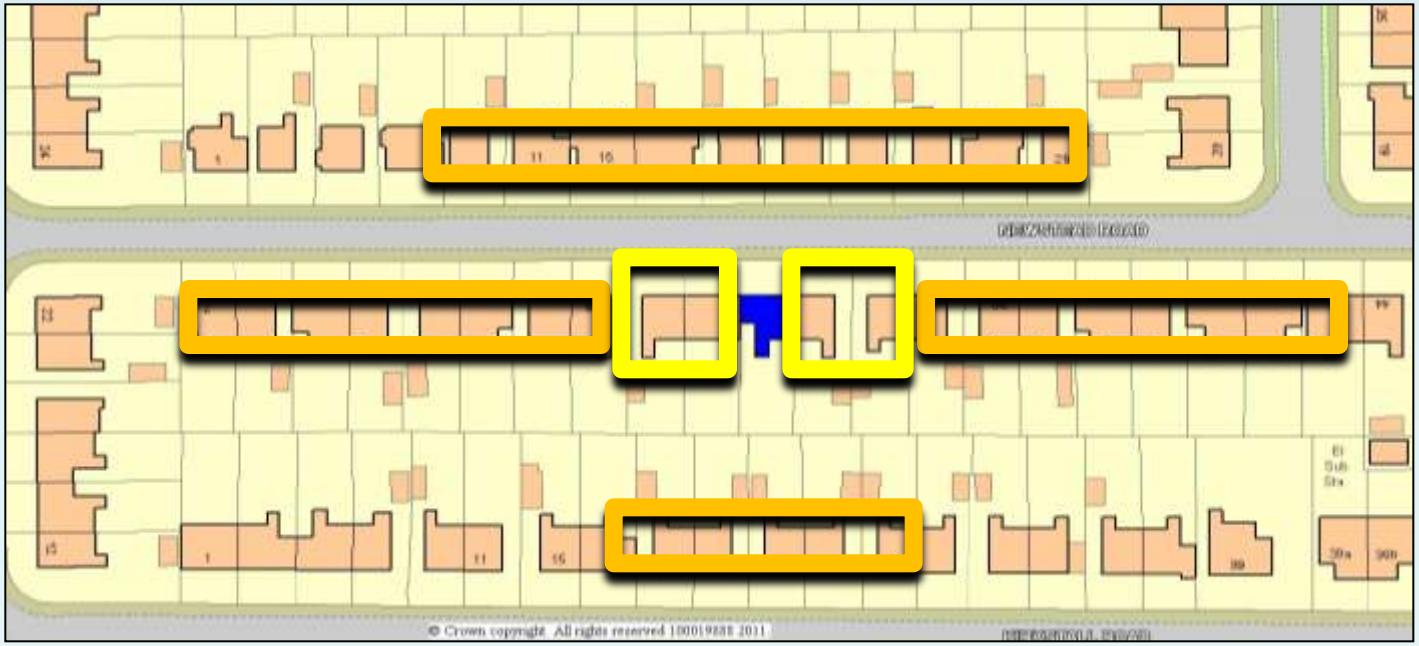
- Automatic task following a burglary
  - Responsibility: Led by NPT Inspector
  - Accountability: monitored and reviewed by Intelligence Hub (daily) and at TCG
- Crime prevention officer – improve security: visit burgled properties and immediate neighbours within 24 hours *(increase effort)*



Predictive policing – tactical response

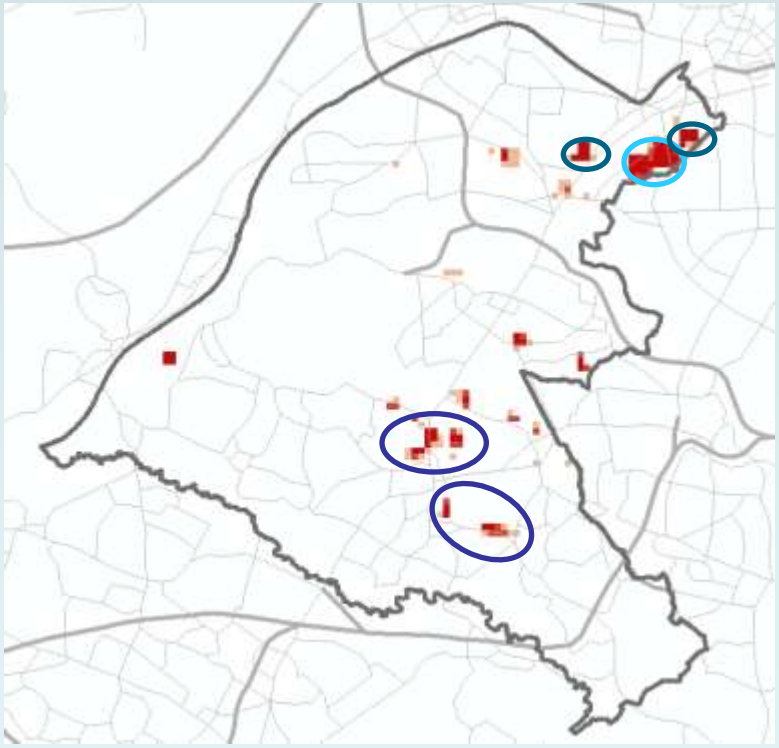
Reduce immediate future risk of burglary – 'super-cocooning' within 24 hours

- PCSOs: visit neighbouring properties, involving as much face-to-face contact with residents as possible:
  - Inform – Reassure – Advise (start with those within 100m) *(increase risk; increase effort)*
  - 50% of residents receive message verbally
  - Positive impact on public confidence



Predictive policing – strategic response

- Persistent and emerging problem areas
  - 20% of burglary dwelling (in addition to RVs and NRVs) in 4% of area
  - High stock of housing association property
    - RSL agreed to invest in security improvements
  - Opportunity for alleygating
    - Council prioritising alleygates to problem streets
  - Crime prevention advice
    - Targeted, tailored and seasonally-sensitive
    - E.g. Targeting of car keys in summer



Summary

- Priority neighbourhoods using VLI
  - Strategic areas for intervention and improvement
- Prediction
  - Theoretically robust, supported with empirical evidence
  - Police in Trafford love it!
    - Borough Comander: reduced crime; improved public confidence; used existing resources
    - NPT Inspectors: given them specific use for PCSOs
    - Intel hub: international recognition! Now applying to other crime types
- Analytically-driven community safety responses
  - Understand the problem, specifically
  - Understand mechanisms and context, specifically
  - Targeted, tailored and seasonally-sensitive responses

Thankyou

Resources

- Priority neighbourhoods
  - VLI paper: link from my profile page
  - Neighbourhood analysis course
- Predictive policing
  - Trafford Experiment blog: link from our website
  - Twitter #predictivepolicing
  - Predictive mapping course **coming soon**
- JDI Masterclass: problem solving, analysis and implementing responses
- Slides on website next week (my profile page)

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