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# Evaluating crime and police performance by neighborhood type

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## 1 Context

Crime, the fear of crime and the efficacy of public services are issues consistently at the forefront of both the domestic political agenda and public concern, and thus spatial science research in this area is rapidly developing. This paper outlines the direction and some initial findings of one such collaborative research project examining the current geographical trends in crime and policing at the 'neighbourhood' level. This research is also incorporates current developments in the methods used to assess policing performance of throughout the UK.

A summary of some of the recent work conducted a partnership between Devon and Cornwall Constabulary, the Centre for Advanced Spatial Analysis (CASA) at University College London (UCL) and the Institute of Criminal Justice Studies (ICJS) at the University of Portsmouth is presented. This team has been collaborating over recent months to assess the potential use of geodemographics as a policing tool. The wider project is rapidly increasing with other partners including Durham Constabulary, Sheffield University and South Yorkshire Constabulary. Most recently, Camden Borough Police (London) have expressed interest in this research and we anticipate the group expanding yet further over coming months.

## 2 Policing Performance Assessment Framework

In recent years the government has developed a plethora of guidelines, standards and indicator measures to assess the performance of public services. Most recently these have become focused upon police forces and authorities, with frequent developments and debate surrounding the new Policing Performance Assessment Framework (PPAF). One therefore should consider the potential value of any research into new policing methods by using these official assessment criteria from the outset. The newly adopted PPAF is still a self-confessed ambitious programme with full establishment still some way off. However, great leaps forward have already been made in developing such a framework. The PPAF aims to reflect all policing activity, not just fighting crime, and retains the focus of providing a service for the public. Figure 1 below shows the main domains of policing activity as classified by the PPAF. This framework should be recalled when assessing the value of this, or any, applied research initiatives.

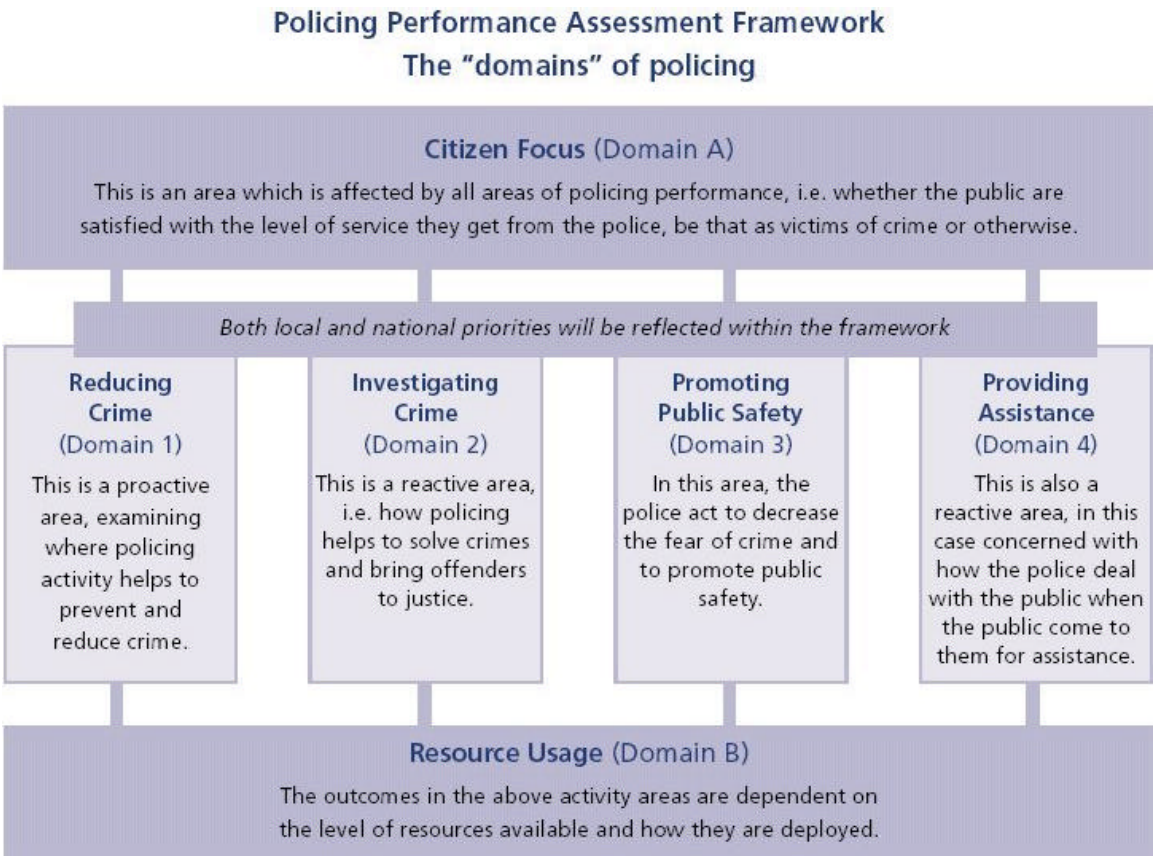


Figure 1: The Policing Performance Assessment Framework (Home Office, 2003, 6)

The PPAF aims to utilise performance monitors (Figure 2) as the primary and most powerful medium through which comparative policing performance information is communicated in summary form (Home Office, 2003, 5). These performance monitors use the 'most-similar forces' principle for comparison; essentially each force is compared only to those forces that are most similar, thereby reducing the likelihood of comparisons between two areas with very different policing environments. The direct comparison of areas with very different policing concerns (for example comparing sparsely populated rural force areas with large, metropolitan forces) has been widely acknowledged as an unfair, impractical and unconstructive practice. Thus, only attempting to compare like-with-like seems a tenable solution and yet following the publication of the Police Performance Monitoring 2001/02 document much of the media still attempted to convert these statistics into a national-league table inevitably highlighting and dwelling upon the forces that fail to meet the most targets.

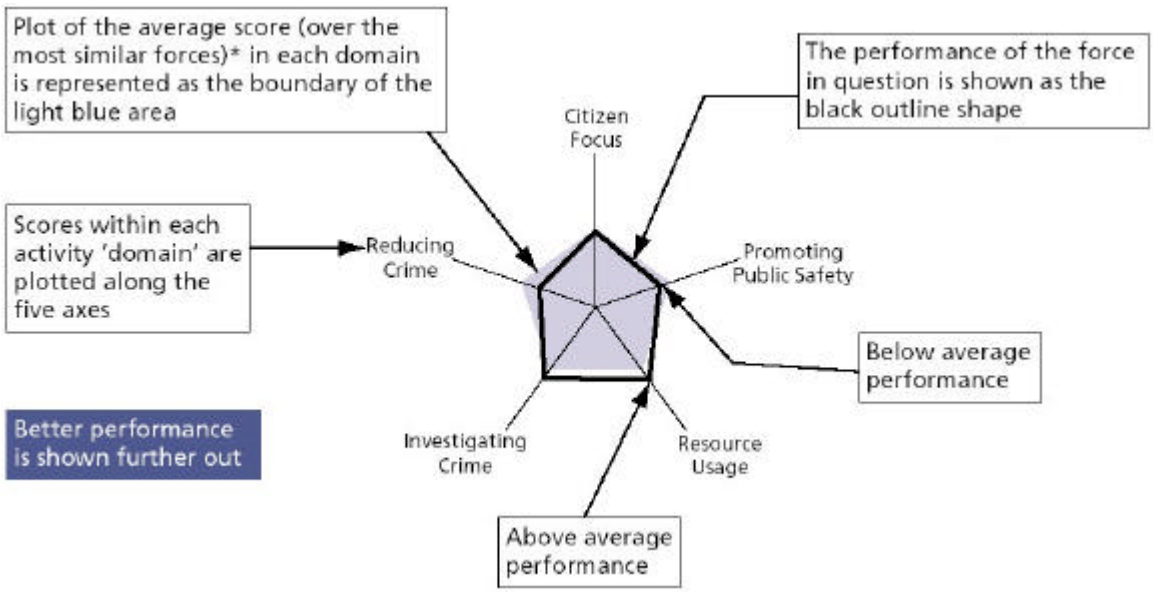


Figure 2: Example of a performance monitor (Home Office, 2003, 14). See source for further explanation.

The PPAF is currently only based on 13 indicator variables for the 5 domains of the spidergram / performance monitor (Figure 2). The 'Reducing Crime', 'Investing Crime' and 'Promoting Public Safety' domains are populated by variables that clearly reflect policing priorities; i.e. burglary, vehicle crime, robbery, number and rates of offences, drugs and violence. The police, as with all public services, are now committed to monitor and meet a great and increasing number of best value performance indicators. However, collecting and assessing data to meet such targets is not a simple task and increasingly such measures are coming under public scrutiny. A recent memorandum to a Commons Committee highlighted that the government has missed or been unable to evaluate more than a third of such targets across key services including the National Health Service, Education, Transport and the Police (Ungoed-Thomas, 2003). The PPAF and related monitoring practices have not surfaced without controversy.

## 3 Devon and Cornwall Constabulary

### 3.1 The Force and Basic Command Unit

Figure 3 details the location of the Devon and Cornwall Force boundaries. This paper focuses on the North and East Devon Basic Command Unit (BCU) only, predominantly on the city of Exeter which accounts for approximately 11% of the recorded crime within the force, and 41% within the BCU (see Table 1).

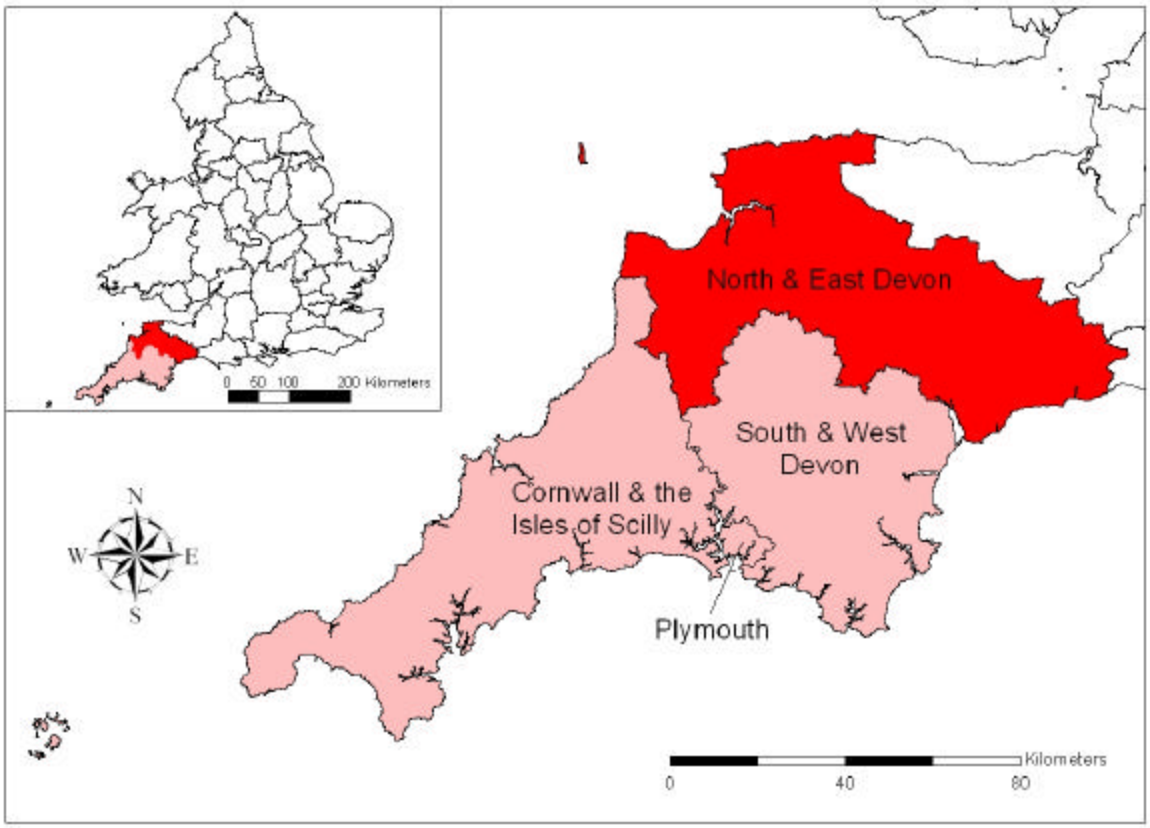


Figure 3: Devon and Cornwall Constabulary location and BCU divisions. The upper-left insert map illustrates the 43 police force boundaries in England and Wales.

| | Total Recorded Crime | House Burglary | Violent Assaults & Murder |
|---|---|---|---|
| ***Devon and Cornwall Constabulary*** | 131,240 (100%) | 7,207 (100%) | 23,722 (100%) |
| ***North and East Devon BCU*** | 34,740 (26%) | 1,825 (25%) | 6,240 (26%) |
| ***Exeter*** | 14,135 (11%) | 763 (11%) | 2,397 (10%) |

Table 1: Recorded crime statistics 2002-3. Crime figures are annual counts, with percentages of the Devon and Cornwall force totals given in parentheses. (http://www.devon -cornwall.police.uk )

Although this paper focuses upon Exeter that is not to say that this city is typical of the BCU or force as a whole. The force area is predominantly rural, with few large cities such as Exeter. In the more rural settings community spirit is likely to differ greatly from areas of Exeter consisting largely of student and immigrant populations. Similarly, Budleigh Salterton is renowned for the high proportion of elderly and retired residents, and thus crime profiles are likely to be very different to that of a big city. Recreation and tourism during the holiday seasons also provide unique challenges for the police, and

inevitably these vary according to the location and neighbourhood type. However, Exeter, from a policing perspective, is very much a pivotal city in the force and BCU. When Exeter sneezes the whole of the BCU and force catches a cold! Therefore, although many interesting policing challenges are surfaced across the rest of Devon and Cornwall, this paper focuses on this city; if substantial improvements are witnessed in Exeter following any new policing initiative, this should be reflected in improved performance across the BCU and force as a whole.

### 3.2 Changing Policing Styles

Policing styles in recent months and years have come under much scrutiny with an increasing direction towards local needs. The local, the neighbourhood and the community have rapidly become the buzzwords and mantra of the moment right across government, including public services such as the police. To this point, there has been realignment in Devon and Cornwall to 'Neighbourhood Policing'. This concept is founded on the adoption of a bottom-up approach to policing, focusing on the neighbourhood beat, each with nominated Neighbourhood Beat Managers which will have a thorough knowledge of their beat, endeavour to be highly visible and prove accessible to local people.

"These changes are not just about introducing a different structure or calling things by a different name – they are about a fundamental shift in culture to provide more of our policing services in a way requested by local communities."

Maria Wells, Chief Constable, Devon & Cornwall Constabulary

Neighbourhood Beat Managers are seen as a very important factor in bringing the public and the police closer together. Their role includes:

- Addressing low level crime and disorder issues
- Involving the community in a positive way to increase public reassurance and community safety
- Working closely with the extended police family, e.g. community support officers, special constables
- Being fully involved in local opinion forming groups
- Having an in depth knowledge of the neighbourhood with ownership for policing issues.

Local policing also assumes that the responsibility and accountability for decision-making and resources are devolved to the lowest appropriate level. To this end policing strategies and resources should be targeted at individual neighbourhoods (however neighbourhoods are to be defined), which provides the impetus behind this assessment of the potential for geodemographics in policing.

## 4 Geodemographics for Policing

With the ever-increasing focus on the local and the dominance of public services in the domestic policy debate, research can and should make an important contribution to the identification and exploitation of opportunities for increased productivity and enhanced performance, whilst at the same time identifying issues that must be addressed in further research. A broader issue here is whether procedures that have been very successful elsewhere, in business and service planning for example, are applicable to policing. This is where the use of geodemographics, specifically MOSAIC classifications, could prove to be a very significant breakthrough in policing local needs, just as it has become an integral part of many commercial and marketing ventures.

### 4.1 What is MOSAIC?

Primarily a brief outline of the MOSAIC classification should be given for those unfamiliar with geodemographic classifications. MOSAIC classifies each of the 1.4 million unit postcodes in Britain (with an average of 17 dwellings in each) into 52 distinct 'lifestyle types' which describe their socio-economic and socio-cultural behaviour. Geodemographic classifiers appeal to the business world because they cluster small areas on the basis of social similarity, rather than locational proximity (a method frequently employed by the government for administrative units) (Webber and Longley, 2003). Over 350 variables taken from sources such as the Census and a wide range of market research data such as Experian Lifestyle surveys, Market Opinion Research Institute (MORI)'s Financial Survey, and Family Expenditure Surveys are used in the statistical cluster analysis to build the 52 neighbourhood types. These 52 MOSAIC types, built by Experian[1], can be further aggregated to 12 MOSAIC groups.

### 4.2 Why MOSAIC?

Detective Chief Inspector Kevin Harris of Devon and Cornwall Constabulary pro-actively sought after the appropriate members of the research community that could provide the expertise to develop geodemographic analysis for crime and policing. After attending a presentation outlining the benefits being reaped by the private, specifically commercial, sector using MOSAIC geodemographic classifications, it became apparent that local policing needs could be served by similar methodologies and tools. Furthermore, sales offers for nappies from a local supermarket were delivered within weeks of his first child being born which provoked further frustration and intrigue about data that were simply not accessed and exploited by public services the way they are in the private sector. MOSAIC can provide an intelligent focus on local communities, drilled right down to the individual postcode level. Whilst classifying postcodes into neighbourhood types could increase the danger of falling foul of the ecological fallacy, using tools that provide further intelligence about a 'neighbourhood' can only benefit policing local needs. It has been highlighted from the outset that MOSAIC will not provide a panacea for all local policing needs, but rather that it is local intelligence that should be used simultaneously with further local knowledge and qualitative information. MOSAIC analysis may well provoke questions previously unearthed and is likely to highlight areas of concern and/or trends that the police should address as a result.

The police have adopted the National Intelligence Model (NIM) nationwide and whilst working to this has certainly aided our understanding of crime, criminal behaviour and incident management little has yet been developed to further our understanding of the communities which are to be policed. Again, geodemographic analysis fills this void and provides valuable ancillary information at a local scale. Furthermore, if one recalls Figure 1, the PPAF, one can immediately identify that such local community intelligence will feed into all four central domains (1. Reducing Crime; 2. Investigating Crime; 3. Promoting Public Safety; and 4. Providing Assistance) whilst simultaneously promoting the effective targeting of resources (B. Resource Usage) and directing all activity to the local public's needs (A. Citizen Focus).

## 5 Analysis and findings

Provided with recorded crime data for the North and East Devon BCU for the 1999-2000 financial year we were able to attribute each crime, victim and offender to a postcode. Given the MOSAIC classifications for each postcode in the study area we were then able to analyse crimes, victims and offenders by neighbourhood type (i.e. the 52 MOSAIC types). We could then calculate index values for each neighbourhood type for a given variable. For example, one could compare the propensity of house burglaries in say neighbourhoods of type A1 (Clever Capitalists) to the rest of the sample region and/or other neighbourhood types. By standardising an index value of 100 as the average value for

[1] For more information go to http://www.micromarketing-online.com/play.htm

each variable across all neighbourhoods in the BCU, one can easily compare individual neighbourhood types with the entire study region, or compare differing propensities for different neighbourhoods. A value above 100 indicates a higher than average risk, whereas values below 100 highlight neighbourhoods less likely to experience the said variable than the region as a whole. These index values are then attributed back to each postcode in the area and the variable propensity mapped in a Geographic Information System (GIS). Table 2 illustrates some interesting example crime profiles by neighbourhood group for the study area BCU.

| % of pop'n | MOSAIC Groups | Total crime incidents | Location: same postcode | When: night | Detection rate | Offenders: offence rate |
|---|---|---|---|---|---|---|
| 7.18 | **High Income Families** | 69 | 84 | 83 | 86 | **37** |
| 10.17 | **Suburban Semis** | 70 | **83** | 109 | 91 | 55 |
| 5.30 | **Blue Collar Owners** | 112 | 85 | 93 | 128 | 124 |
| 5.68 | **Low Rise Council** | 146 | 99 | 111 | **133** | 302 |
| 0.40 | **Council Flats** | **318** | **130** | 93 | 120 | **380** |
| 7.35 | **Victorian Low Status** | 193 | 112 | **134** | 117 | 216 |
| 14.85 | **Town Houses and Flats** | 118 | 99 | 104 | 95 | 111 |
| 3.24 | **Stylish Singles** | 198 | 114 | 102 | 89 | 176 |
| 16.34 | **Independent Elders** | **56** | 105 | 76 | **77** | 41 |
| 5.93 | **Mortgaged Families** | 98 | 98 | 115 | 117 | 126 |
| 24.78 | **Country Dwellers** | 72 | 100 | **74** | 83 | 43 |
| 100.00 | ***Total (Counts)*** | *28,297* | *8,165* | *3,410* | *24.3* | *9,353* |

Table 2: Selected crime profiles, by MOSAIC group, for North and East Devon BCU (1999-2000). The highest and lowest index values for each profile are highlighted in red and blue respectively.

MOSAIC groups categories, rather than the 52 MOSAIC types, are illustrated in Table 2 for simplicity. More information about the groups and neighbourhood types is available on the MOSAIC multimedia CDs (contact author for details) and on the Internet (http://www.micromarketing-online.com/play.htm). The MOSAIC group names are designed to be fairly self-explanatory and have been easily adopted and accepted by the police partners. Some photographs of selected neighbourhood categories were taken by Devon and Cornwall Constabulary and are used later in this paper.

The five profiles given above (Table 2) are selected from approximately 80 variables which were used in the first tranche of analysis. These portray the range of data available; total crime incidents (also broken down into crime types); information on the location of victim, offender and crime; detail of the timing of the event; detection rates; and information on the offender.

### Total Crime Incidents

Although 'Council Flats' only account for 0.4% of the population in the North and East Devon BCU, one can expect over three times the average crime rate in these areas. Neighbourhoods classified as 'Independent Elders' however experience just over half of the average for the entire BCU. The ratio of highest crime neighbourhoods to lowest crime neighbourhoods here is almost 6:1 which inevitably has implications for policing strategies and resource targeting.

### Location: Same Postcode

This specific crime profile refers to the victim of the crime being in the same postcode unit as the offence, thus depicting crimes at home (or very near to it). Here, 'Suburban Semis', 'High Income Families' and 'Blue Collar Owners' all have rates of a similar magnitude, below the BCU average. Many of the neighbourhood types are clustered around the average, but once again 'Council Flats' appear to experience a well above average index value, indicating a higher propensity for a given victim to experience crime at home.

### When: Night

This variable illustrates how neighbourhood crime rates may vary on a temporal scale. One can also analyse the data by day of the week or monthly / seasonal changes. Here 'Country Dwellers' can be generally reassured by a below average crime rate at night, whereas the police may need to adopt bespoke strategies for 'Victorian Low Status' neighbourhoods during the night.

### Detection Rate

An exciting variable in that such analysis is unlikely to have surfaced before. Here one can clearly see that although 'Council Flats' and 'Low Rise Council' may experience higher crime incidence, the police are also performing above average in these areas at detecting crime. Conversely, although there are below average crime rates in neighbourhoods of 'Independent Elders', the crimes that do occur are more likely to go undetected.

### Offenders: Offence Rate

Data recorded about offenders are also georeferenced to the unit postcode so one can analyse which neighbourhoods are more likely to produce the offenders that are detected by the police. Here the ratio of over 10:1 illustrates that 'High Income Families' are far less likely to produce offenders than neighbourhoods falling into the 'Council Flats' category. 'Country Dwellers' and 'Independent Elders' also generate far fewer offenders one would expect across the BCU as a whole.

### Presentation of findings

These findings have proved intriguing and most useful to Devon and Cornwall Constabulary, and the power of illustrating such data in graphical and map form has been consistently emphasised. Figure 4 illustrates the distribution of MOSAIC types in the Exeter region; similar maps illustrating any of the crime profiles can also be created for analysis at various spatial scales. Whilst confidentiality concerns have been addressed in the dissemination of results, such maps (which are largely still works-in-progress) are not presented in such proceedings to prevent publicly stigmatising any specific neighbourhood. Figure 5 charts house burglary by MOSAIC type, and Figure 6 gives photographic examples of selected neighbourhood types.

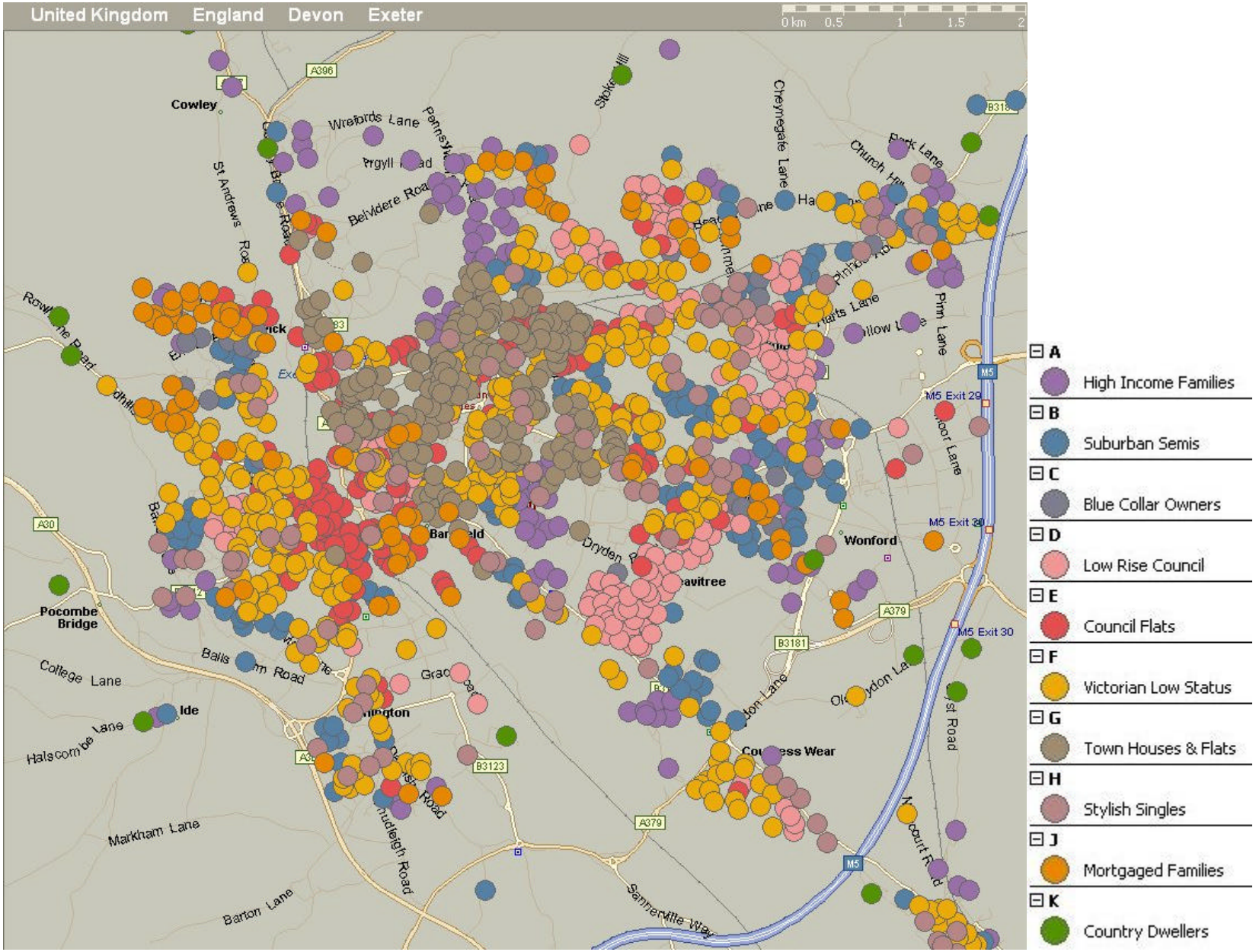


Figure 4: The spatial distribution of MOSAIC groups in the Exeter region.

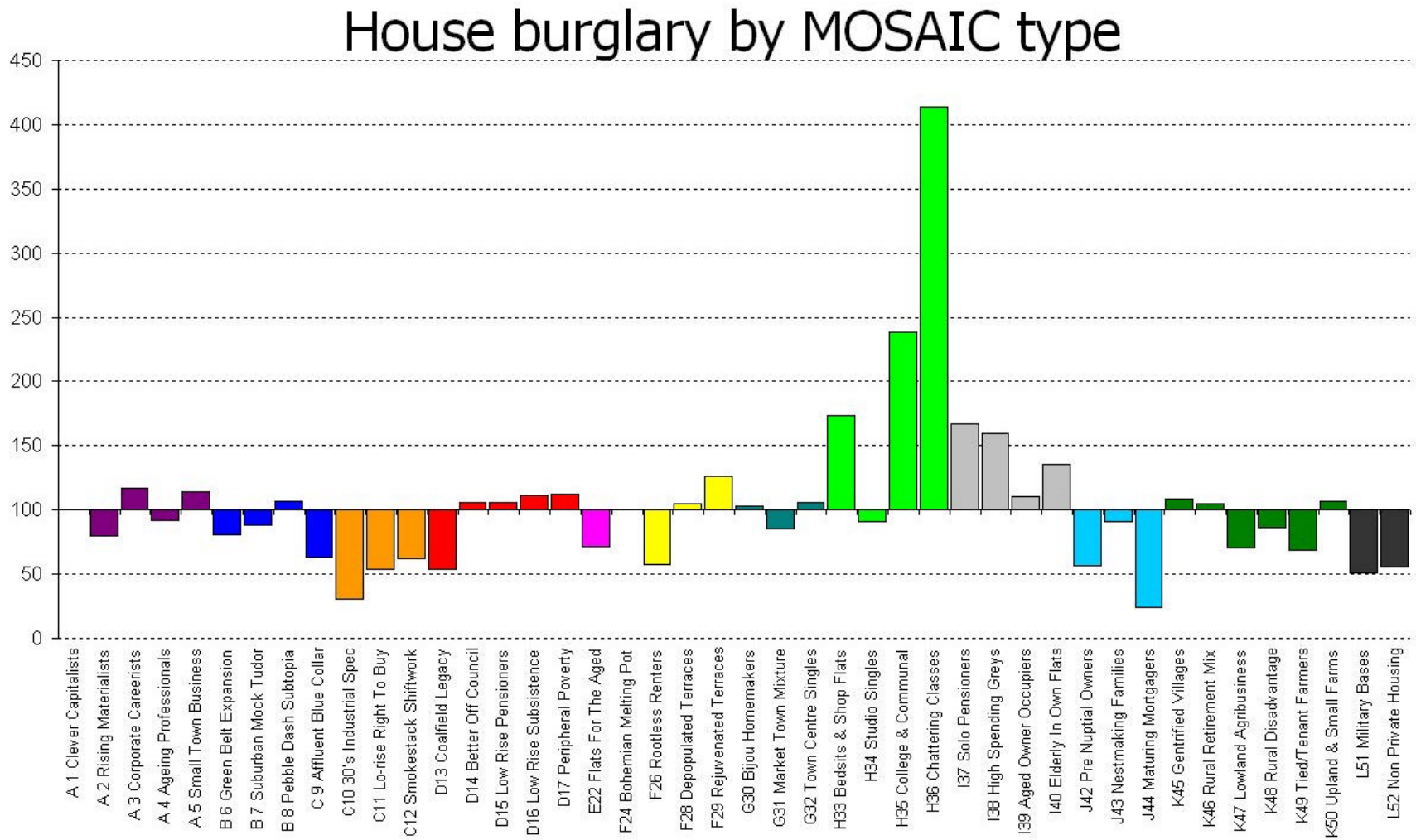


Figure 5: House burglary by MOSAIC type in the North and East Devon BCU.

Figure 6: Photographs representative of selected MOSAIC neighbourhoods in the North and East Devon BCU.
Clockwise from top left; 1. 'High Income Families'; 2. 'Country Dwellers'; 3. 'Council Flats'; 4. 'Stylish Singles'.

### 5.1 Operational Outcomes

British Crime Survey (BCS) data for the year 2000 have also been used in the analysis. Using the same methodology outlined above for the creation of index values for the Devon and Cornwall Constabulary crime data, we created index values for over 300 variables from the responses of the BCS. These range from opinions on the causes of crime, fear of crime, opinions about the local neighbourhood, satisfaction with the police, sentencing information, whether respondents have ever been arrested and, of course, data on personal experiences of crime. These data provide a valuable backdrop to the specific information taken from recorded crime statistics. The c.25,000 responses to the BCS were used to create index values for each variable by neighbourhood type, values which were then extrapolated across all British postcodes. Using MOSAIC and this methodology we can integrate many different data sets to aid our understanding of the local, and help direct policing strategies.

The predictive power of this analysis has been highlighted as one of the greatest benefits of this approach. The police are keen to improve community intelligence and such analysis allows bespoke policing strategies to be deployed based on local evidence. Fundamentally, pro-actively directing policing strategies based upon propensities for crime incidence rather than reacting to reported crimes is an exciting development in this arena. Resource *allocation* will not be differentially distributed on this basis alone, rather, such analysis can provide the evidence base for improving the delivery of effective *targeting* of resources to specific neighbourhoods. This will ultimately improve policing efficiency and performance and subsequently should be reflected in public satisfaction. Returning to the PPAF and the 'most-similar force families', the use of geodemographics to cluster areas based upon social similarities may provide an alternative and/or complimentary approach for assessing comparative performance of forces and BCUs.

Table 3 below summarises the social capital, crime profile and potential policing strategies that could be applied to MOSAIC neighbourhoods. This summary is very much a work-in-progress, with the view that the final output could provide some foundation or framework for the project partners to apply local, neighbourhood policing strategies. The focus here is MOSAIC groups that have already been discussed in this paper. 'Council Flats' consistently featured in the discussion of the crime profiles (Table 2), whereas 'Stylish Singles' (H33 – H36, Figure 4) suffer the worst incidence of house-burglaries. As a priority crime, Burglary Dwelling is a key indicator in the performance of any police force and thus analysing and addressing patterns in these crime types is a major concern.

| | | | |
|---|---|---|---|
| ***Type of Neighbourhood*** | ***MOSAIC group*** | **G & H** | **E** |
| | ***MOSAIC name*** | **'Stylish Singles' & 'Town Houses & Flats'** | **Council Flats** |
| | ***BCU Example*** | Pennsylvania or Credition | Central Exeter |
| ***Social Capital*** | ***Level of Trust*** | Low | Low |
| | ***Informal Contacts*** | Low - medium | Low |
| | ***Formal Association*** | Low | Low |
| | ***Social Capital Summary*** | Low levels of community involvement; students; centred around local shops | Self policing gangs |
| ***Crime Profile*** | ***Fear Level*** | Moderate \|\| Medium | Very high |
| | ***Crime Level*** | High \|\| Medium | Very high |
| | ***Clear up Rate*** | Moderate \|\| Medium | High |
| | ***Common Types of Crime*** | Equipment theft \|\| Burglary | Gangs, domestic violence, drugs |
| | ***Policing Options*** | Focus on security; target hardening; cctv; postcode marking; development of community links | Community development; victim support; zero tolerance |

Table 3: Neighborhood type, crime profiles and potential policing strategies for selected MOSAIC groups.

## 6 Acknowledgements

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For further information on this research visit http://www.casa.ucl.ac.uk/ashby

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