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# Assessing the Impact of Residential Design on Crime: A Guide to Conducting Case Studies

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## The project

This briefing note aims to guide the reader through the task of conducting a case study to assess the impact of residential design on crime. It is part of a series of themed papers which report the findings from a collaborative project funded by the Home Office and managed by the Commission for Architecture and the Built Environment (CABE). The project set out to strengthen and update the evidence base on the impact of residential design on a range of crime types – with a specific focus on housing developments acclaimed for their innovative design and award winning architecture.

This research was commissioned by two agencies (Home Office and CABE) who were interested in updating the evidence base on the impact of residential design on crime and to ensure that future policy and guidance reflected the findings of a comprehensive and up to date study. The research itself was conducted by an independent consortium of academics with expertise in conducting research yet with no vested interest in the outcome of the study. Although this is an ideal scenario, recent budget cuts have limited the likelihood of agencies such as police, local authorities or Registered Social Landlords (RSLs) being in a position to outsource research. For this reason, this briefing note is designed to guide the reader through the task of conducting a case study. It looks at issues such as sample selection, data collection and analysis as well as problems and issues which may arise. It is hoped that practitioners can use this as a guide to conduct their own research and to inform the planning and development of residential areas to minimise crime risks.

## The methodology

Although this briefing note focuses upon the task of conducting a detailed case study, this research did involve several additional strands. It is unlikely that local agencies would conduct research involving all strands, however, a brief overview of the complete methodology will help the reader to place the case study (Micro analysis) within the context of the wider piece of research.

The following diagram displays the three strands which formed the basis of the research. The first involved scoping the evidence (a literature and policy review), to establish what previous research had been published relating to the impact of residential design on crime, and whether findings were consistent or contradictory. The second strand (Macro Level) involved investigating whether there is a link between housing design quality (as judged by CABE's Housing Audits) and crime. The third strand (Micro Level) aimed to look in detail at the link between specific design features of residential housing and crime.

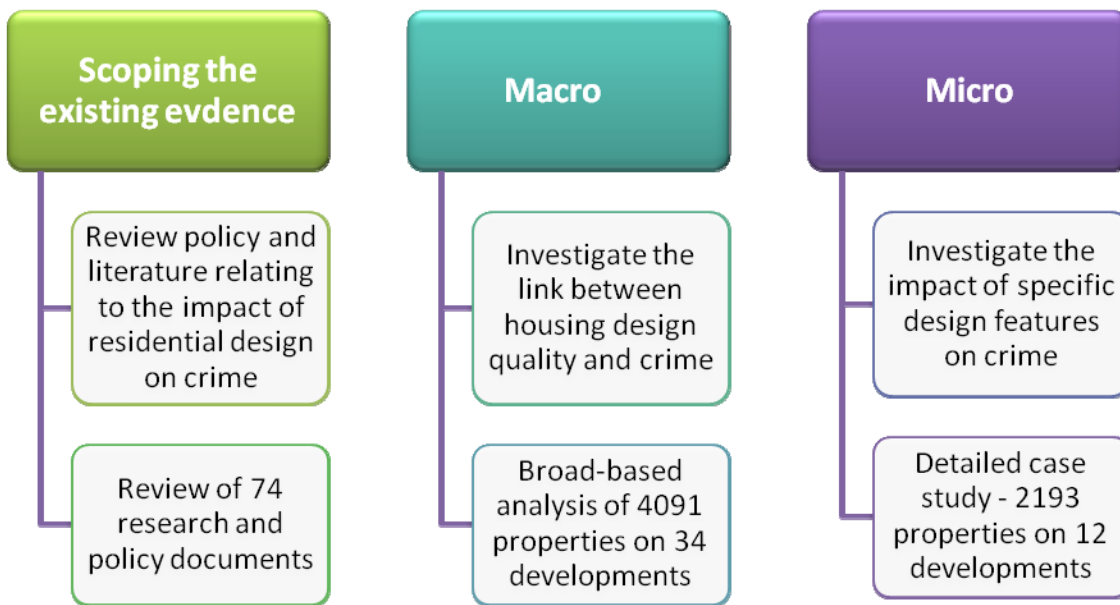
As the diagram reveals, the sample included:

- Scoping the Evidence - 74 policy, guidance and research documents.
- Macro Level – Analysis of crime data at 34 developments (including 4091 properties) from the three police forces Greater Manchester, West Midlands and Kent.
- Micro Level – Detailed case studies conducted at 12 developments (2193 properties) from the three police forces Greater Manchester, West Midlands and Kent.

It is the third level – the Micro Level, which forms the basis of this briefing note.

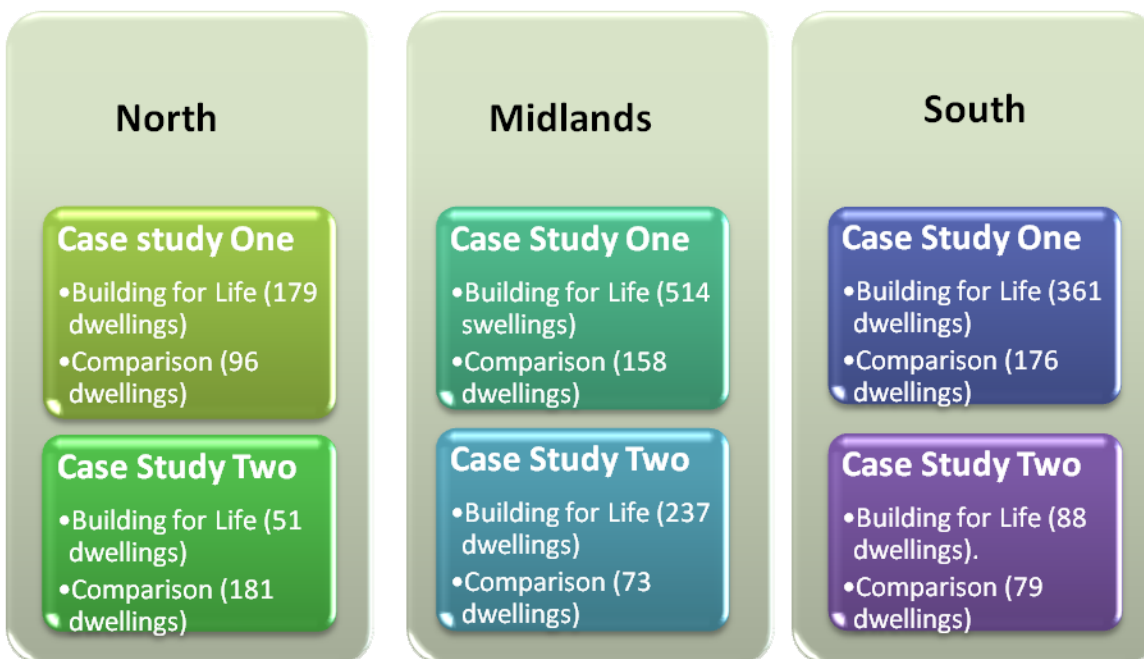


CABE is now part of the Design Council



### The case study approach (Micro Level)

The Micro Level of analysis focused specifically upon an investigation of which specific design features of residential housing impact upon crime levels. This involved six case study sites spread across England – two in the North, two in the Midlands and two in the South. Each case study site included one Building for Life (BfL) development (an example of good practice, innovative design) and one non-BfL comparison site, making a total of 12 developments containing 2193 properties.



When conducting a case study it is essential to ensure that consideration is given to the sample of developments to be included. Whilst practical issues such as time constraints and access to police data have to be considered, the research team must avoid cherry picking a sample which they believe will provide them with the answers that they want to achieve. This is particularly important when the research is being conducted by those who are familiar with the developments and any crime problems which the developments may be experiencing.

The case study section of this particular project included four developments (two BfL and two comparison) from three police force areas. Although not all research projects will include such a large sample, the sampling strategy and principles of selection can be transferred to smaller research projects. In selecting the three police forces which would be included in the research project, the first stage involved identifying the principles upon which the selection would take place. This will differ for all projects, but those selected in this case were:

- A geographical spread of developments to include a police force from the North, Midlands and South of England.
- The inclusion of between ten and twenty developments for each police force. A minimum of ten to ensure at least an analysable number of developments, a maximum of twenty due to the time taken to digitise each development as part of the analysis.
- A defensible minimum number of dwellings within those developments.
- A defensible range of housing audit scores within the selected police force.
- A good prior relationship with each police force to minimise the risk of delays to receiving the required police recorded crime data.

Following the identification of the principles, the research team placed these in order of importance. The final hierarchy of principles was used to select the police forces to be included in the research.

- Geographical spread – one police force from the 'North', 'Midlands' and 'South' CABE Housing Audits.
- The police force must have a minimum of two developments achieving the Building for Life standard – the development must either have achieved Building for Life status or score 70% on the CABE Housing Audit (the score required to achieve Building for Life should the developer apply for the award).
- Police force with sufficient number of developments.
- Police force with the greatest number of dwellings.
- Police force with the greatest range of CABE Housing Audit scores.
- A positive existing relationship with the police force.

In selecting the specific developments to be included within the case study, it is essential that the sample selection must not be influenced by prior knowledge of the sample. As with the selection of police forces, a sampling strategy should be produced for the selection of specific case study sites, this should place the key principles for selection in order of importance. The final hierarchy of principles for the selection of the case study sites is highlighted below, and can be used as a guide those designing a sampling strategy.

- The development must contain an adequate number of properties.
- The development must not be geographically isolated to ensure that a matched-comparison pair can be selected.
- The two developments from each force should include contrasting design types – for example – urban and suburban, low and high density.
- The design of the development may be unique, but not so unusual that findings could not be replicated in other areas.

When conducting research on a project, scheme or initiative it is important to look at the area of interest (i.e. site on which the scheme/initiative has been implemented), but also to look at a control or comparison site where the scheme or initiative has not been implemented. This is to ensure that any change in levels of crime can be compared to an 'average' development and to allow the findings to state with confidence that the change can be attributed (or not) to the scheme. The perfect 'control' site would be one which is similar to the case study development in all respects with the exception of housing design quality. However, in real world research, this represents an ideal which is not obtainable. Although a perfect control site may not be achievable, a 'comparison' site can still be selected which is as similar as possible in all elements except for the key intervention or feature which is being studied – in this case Building for Life status.

The final criteria for the selection of comparator sites included: close proximity to the case study area, similar size area with an equivalent number of dwellings, comparable socio-demographic composition and similar range of housing types and density (e.g. detached, semi-detached dwellings, apartments). The following steps were undertaken to identify sites meeting these criteria:

1. The socio-demographic profile of each case study developments was identified using the Output Area Classification (OAC) geodemographic dataset. OAC uses results from the Census to profile populations and indicate the character of local areas.
2. Areas that were in close proximity to the case study developments were examined using the OAC dataset to identify those which displayed a comparable socio-demographic composition.
3. Potential comparison areas were inspected using aerial, birds eye and street views (where available) available through Google maps and Multi-maps. The Internet maps helped to identify the nature of housing in the surrounding areas, including the proportions of dwelling types (flats and houses) and density of housing in each area. From these maps a shortlist of potential comparison sites, two per case study development, were identified.
4. The shortlisted developments were visited prior to the commission of fieldwork and the final selection made following a site inspection.

## Data collection

### Building the crime story

A case study approach includes data from a variety of sources providing a comprehensive picture of a development's design and the crime it experiences. In the case of this research, the 'crime story' is built from three sources of data. The first is police recorded crime data for the three year period January 2007 to December 2009 for the crime types burglary dwelling and non dwelling, theft of and from motor vehicle, criminal damage, theft from person and assault. These crime types were selected to allow the analysis of crimes likely to be affected by the built environment. It is important, when commencing a research project, to consider the scope and the resources. While additional crime types would have been interesting and relevant, the research team felt that resources should be focused on a detailed analysis of a limited number of crime categories (narrow and deep) as opposed to a lighter approach to more crime categories (broad and shallow). The three year period ensures that sufficient time is given to allow for short-term fluctuations in crime levels which may not be relevant to the design of the property or development. If data cannot be provided for a three year period, it is essential to include at least a one year period to allow for seasonal variations in crime levels. For each crime type police recorded crime data were supplied including the following information: crime reference number, location (easting and northing), full address, date/time and modus operandi details (including point of entry and exit, method of entry, use of tools).

Although police recorded crime data is essential to such as case study, it must be borne in mind that not all crime is reported to the police or recorded by the police. It is estimated (Chaplin et al, 2011) that the police come to know about 38 per cent of all incidents which take place in England and Wales, leaving a large proportion of crime unrecorded by the police (this is often referred to as the 'dark figure'). To ensure that a holistic account of the crime story is provided, interviews were conducted with key representatives from the police. These included a representative from the Neighbourhood Policing Team (NPT) and the Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA). Interviews followed a semi-structured schedule which focused upon crime and disorder issues at the development, concerns highlighted at the planning stage (and whether these were rectified), levels of security at properties on the development and details of retrofit security measures. A key feature of the interviews is that they took place as 'walk-arounds' with the research team. The format included two researchers and key personnel walking around each area of the site and discussing issues relating to the design and any impact upon crime. This allowed the researchers to see issues being discussed in practice, and to apply comments to the context of the development.

The third source of data relating to crime and disorder included fieldworker observations. The same two researchers visited each of the 12 sites over a four-week period. They spent considerable time at each site completing the Design Features Checklist (see below) and interviewing staff. Fieldworkers were required to visit each site in daylight and in the dark and had to be clear about the boundaries and the layout of the development. In familiarising themselves with the site, each fieldworker visited all areas of the site making notes relating to crime and disorder issues and taking photographs to evidence this. These notes were crucial in supplementing interview and recorded crime data.

## Building the design story

The fourth and fifth sources of data related to the collection of detailed data relating to the environmental and design features of each property and the development on which it was located. These data were collected using two tools: 1) The Design Features Checklist and 2) The Design Checklist. The Design Features Checklist was developed as a tool to collect information on specific factors present or absent at both the development and individual property level for case study sites. It contained 56 questions – some related to the whole development (e.g. If there are footpaths within the development, do the footpaths have adequate lighting?), some related to the specific property (e.g. Is the property a corner plot?) and some were specific ‘design’ questions to be answered by the design expert only (e.g. Is the development and its environment of sufficient design quality to enhance the neighbourhood and to attract potential residents to live there?) This checklist provided a source of data relating to 56 specific design questions for every property included within the sample (2193 properties). In addition to the Design Features Checklist, a Design Checklist was completed for each development. This separate tool was formed of 20 questions which were based on CABE’s Building for Life criteria and included the six themes: i) location and access ii) layout and place making iii) streets and parking iv) public realm/open space v) housing design and vi) management and maintenance.

To supplement the design story, interviews also took place with the relevant representatives from the local authority planning department. Questions related to the consideration for crime in the design of the development, crime and disorder issues raised by the ALO/CPDA at planning/concept stage, problems which have emerged since the development was built and their view on the design strengths (and weaknesses) of the scheme.



## Analysis of crime data

The analysis of crime data was separated into three strands: Analysis of crime patterns (detailed mapping and inspection of crime locations), statistical modelling (of crime data against design attributes) and thematic analysis (including interviews and fieldworker observations). This included both quantitative and qualitative methods to ensure that all data sources were considered.

### Analysis of crime patterns

The first stage of the crime pattern analysis included annotating detailed maps of each of the sites to ensure that all issues/features raised in the interviews and fieldworker observations were highlighted. Particular attention was afforded to features identified in the research literature as criminogenic such as footpaths, open land, public buildings and play areas. These annotations were completed blind to the location of crimes on the development i.e. the maps were annotated before the crime locations were plotted. The next step was to overlay crime locations (as well as the modus operandi for each crime) onto the detailed maps to explore the extent to which offences could be linked to the identified design features and whether crimes took place at locations where research evidence suggests that they would.

## Statistical modeling

A regression model was fitted to examine whether there were any consistent relationships between design features and crime. Analysis was repeated for each of the crime types covered by the study. For a detailed discussion of the statistical analysis conducted, see Armitage et al. (2010).

## Thematic analysis

The interviews with key personnel were recorded and transcribed by the research team. Thematic analysis identified consistent themes which were emerging from those involved in the design and management of the developments – these included connectivity, density, car parking and management and maintenance.

## Issues to consider

There are many issues to consider when conducting a case study, however, key factors to emerge from the research include: being aware of the limitations of police crime data, the importance of visiting case study sites as opposed to relying on remote analysis of maps, and remaining objective and independent throughout.

## Limitations of crime recording

The analysis of police crime data was limited to some extent by the quality of the data recorded by the police. Of critical importance was the frequent absence of detailed location data, particularly for crimes within apartment blocks. In one high rise site, of the 31 crimes recorded, only seven specified the actual block (of five blocks) at which the crime took place, and of those seven offences, only four provided an apartment number. At another high rise site, only 15 of the 34 recorded offences specified an apartment number. The exact locations of car crimes were also difficult to ascertain with very few specifying the exact location of the offence – be that car park, on-plot, on street or within underground parking facilities. This is a difficult problem to overcome without long-term interventions to improve police recording practices. However, the research team should remain aware of deficiencies and, where possible, supplement police data with surveys and visual audits/observations.

## The importance of assessing developments on the ground

This unique and painstaking methodology involved the fieldworkers spending at least one day (and evening) at each of the twelve case study sites. Detailed assessments of each property and the development upon which it was located ensured that accurate information on factors such as the presence or absence of footpaths (and where those footpaths led to) and the classification of road layout (true versus leaky culs-de-sac, sinuous versus linear culs-de-sac) was collected. Several examples of potential errors in classification emerged throughout the research phases, these included presence of unofficial short-cuts created by residents that would not appear on official maps but represented important sources of movement throughout sites, as well as the difficulty in categorising a cul-de-sac as true or leaky, sinuous or linear simply through the use of remote maps and plan layouts. Detailed site visits also allowed an assessment of the parking provision allocated to each dwelling to be made. Factors which would have been overlooked through a remote assessment of the sites included the allocation and positioning of parking spaces – an issue which proved to be a concern raised by the interviews with key personnel, and within the analysis of crime statistics. Physically visiting the sites also allowed the fieldworkers to collate information on the presence of retrospective security measures (such as the application of anti-climb paint to fences/walls) or crime prevention initiatives (such as Neighbourhood Watch schemes) as well as the actual application of these measures (were the security gates actually locked? Could the fieldworkers access an area supposedly limited to residents only?). The methodology adopted in this study contrasts sharply with studies that classify road layouts remotely via computer algorithms – notably Space Syntax. Although Space Syntax allows a greater number of dwellings to be included within a sample, road layout is not manually assessed and therefore classifications do not always reflect the true layout of a road (or use of a road by residents).

## Remain objective

Although this research project was conducted by a team of independent researchers with a specialist interest in designing out crime, the team held no prior knowledge of the sites included within the research, or of the crime problems experienced at these sites. The research team also had no vested interest in the direction of the results and remained neutral throughout the collection and analysis process. This is an ideal situation, and one which will not be easy to replicate. Where possible, if an independent research team cannot be used, those conducting the research must ensure that they follow the guidance highlighted within this briefing note in terms of sample selection, data collection and data analysis. This will maximise the credibility of the research conducted.

## References

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- Chaplin, R., Flatley, J., and Smith, K. (2011) Crime in England and Wales 2010/11. Findings from the British Crime Survey and Police Recorded Crime (first edition). Home Office, London.

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<sup>i</sup> The report upon which these briefing notes are based was jointly written with Professor Ian Colquhoun, Professor Paul Ekblom, Leanne Monchuk, Professor Ken Pease, Michelle Rogerson.

<sup>ii</sup> The production of these briefing notes was jointly funded by ACPO CPI Ltd, CABE and the Home Office.

<sup>iii</sup> From 1 April 2011 CABE became part of the Design Council and operates as Design Council CabE

<sup>iv</sup> A limit of no more than twenty developments was imposed due to the time it would take to digitise all developments for the crime analysis.

<sup>v</sup> <http://areaclassification.org.uk/getting-started/>

<sup>vi</sup> <http://www.google.com/maps>

<sup>vii</sup> <http://www.multimap.com/>

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