SECURED BY DESIGN – AN INVESTIGATION OF ITS HISTORY, DEVELOPMENT AND FUTURE ROLE IN CRIME REDUCTION

RACHEL ANNE ARMITAGE

A thesis submitted to the University of Huddersfield in partial fulfilment of the requirements for the degree of Doctor of Philosophy

The University of Huddersfield in collaboration with West Yorkshire Police

September 2004

Contents

List of Tables

List of Figures

Acknowledgements

I would like to thank the agencies who were involved in this project, in particular West Yorkshire Police who provided support, advice and access to crucial data sources. Thanks also to the residents who took the time to answer my questions, without your help there would be no thesis.

I would like to thank Dr. Jeanette Garwood, Professor Ken Pease and Professor Graham Farrell for their supervision and advice over the last five years and Dr. Mandy Shaw and Sylvia Chenery, without whom I would not have embarked on this adventure. Thanks also to Dr. Steve Everson, Pete Woodhouse and Stephen Town for their technical expertise on the subject of designing out crime.

Most importantly, I am indebted to Wendy and Dorothy for their babysitting duties over the last year (I could not have done this without you) and to my gorgeous partner and son who have given me the time and space to be moody, grumpy and intolerable – sorry!

And last but by no means least to my Dad, who died shortly before this thesis was completed. Thank-you for teaching me about persistence and determination, two qualities required to complete a PhD. I know you would have been proud.

Abstract

Secured by Design (SBD) is an award scheme, managed by the Association of Chief Police Officers (ACPO) and supported by the Home Office, which aims to encourage house developers to design homes so as to minimise the crime opportunities which they present. Unlike many crime reduction measures, particularly those addressing the behaviour of offenders or potential offenders, the SBD initiative is proactive – the aim being to intervene prior to a crime problem emerging as opposed to reacting after the event. The implementation of SBD requires the co-operation of a variety of agencies, from police and local authorities to architects and housing developers, and the mechanisms through which it aims to reduce crime have the potential to impact upon the victim, the offender and the location. Recent legislation, in the form of the Crime and Disorder Act 1998 and the Human Rights Act 1998, have placed crime reduction on the agenda of many agencies for whom the issue had historically been of little importance. In the current climate of multi-agency working, initiatives such as SBD have the potential to flourish, but do they actually impact upon crime, disorder and the fear of crime, and are they being used to their maximum potential? This thesis addresses the past (history), present (current practice) and future (potential refinements) of SBD. How did planning become encapsulated into criminology? Does SBD reduce crime, disorder and the fear of crime? What are the current weaknesses within SBD and how can the initiative be improved?

The findings presented within the thesis reveal that properties built to the SBD standard experience lower levels of crime (and their resident's lower levels of fear of crime) than Non-SBD estates matched according to age, housing tenure, location and environmental factors. Whilst the difference in crime rates is not strongly statistically significant, the improving performance of the scheme suggests that a more recent sample would reveal a stronger relationship between SBD status and crime levels.

Having established that SBD estates confer a crime reduction advantage, the thesis focuses upon identifying how the scheme can be improved as well as the enablers and constraints which exist for those within the social and private sector in deciding whether (or not) to build to the SBD standard. Areas of improvement include ensuring that the scheme implements its own principles, incorporating repeat victimisation packages into its standards and considering the threat to revoke the scheme for estates found failing to maintain the SBD standards. Levers to encourage social and private sector developers to build to the SBD standard include enhanced funding from the Housing Corporation, the appeal of additional security for homebuyers and the savings incurred through reduced levels of crime and disorder.

Continuing its improvement orientation, the thesis presents a risk assessment mechanism to be used by crime reduction practitioners as a means of identifying which properties will become vulnerable to crime if built (therefore allowing them to challenge planning applications) or in the case of properties already developed, allowing resources to be directed towards properties at most risk. The environmental factors which emerge as associated with elevated crime levels (and therefore score highly on the checklist presented) suggest that higher levels of movement past a property are generally associated with higher levels of risk. Thus in the somewhat heated debate about the role of permeability in enabling crime, the general thrust of the data suggests that high permeability (as proxied by the presence footpaths, levels of pedestrian and vehicular movement and road network) is indeed associated with higher levels of crime.

Chapter One
Introduction

Chapter One – Part One
Principal Themes

Recent Thinking about Crime Reduction:

The last two decades have seen a major change in the perception of how a reduction in crime in England and Wales is to be achieved. This change can be characterised as having two primary facets, which are closely linked. The first is the advance of situational crime prevention (SCP), following the demonstration that crime trends are more readily understood in terms of the supply of crime opportunities than the distribution of criminal propensity across the population (Mayhew *et al*, 1976; Felson, 1998; Felson and Clarke, 1998). This insight has been reinforced by the demonstration that the regulation of opportunities will impact on rates of crime (Clarke, 1992). The doctrine of SCP, and the contributions which diverse applied sciences can contribute to the discipline of crime reduction, has been exemplified by the founding of the Jill Dando Institute of Crime Science at University College London, under the direction of Professor Gloria Laycock. Crime Science, as Laycock (2001) suggests, involves the application of scientific principles to the reduction of crime. It is outcome focused, evidence based and aims to enhance the knowledge of crime and its control through the engagement of academics from a variety of disciplines.

The second facet of the change in the perception of crime reduction flows from the first, but in fact developed alongside it, with its first expression being found in the Morgan Report of 1991 (Home Office, 1991). This is the recognition that the supply of crime opportunities is under the control of agencies other than the police, such that the historic reliance upon the police as the primary crime reduction functionaries was misguided, and certainly unfair.

The domain of crime reduction historically comprised its detection (for which responsibility predominantly lies with the police), the apprehension and incapacitation of offenders following detection and the prevention of recidivism (which involves agencies such as the police, the prison and probation services as well as the judiciary). These traditional responses focused upon offenders rather than the supply of criminal opportunities and were predominantly reactive in nature. Intervention prior to a crime taking place has historically taken a back seat to detection and apprehension. Although the prevention of crime was the principal duty of the police service when first established in 1829, in reality, this role involved prevention through the targeting of high crime areas and of particular individuals and groups, rather than by arranging the

environment so that crime opportunities were limited (Hughes, 1998). It was in the period following World War II that some police officers came to be designated as having a special responsibility for crime reduction, specifically following the recommendation by the Cornish Committee on the Prevention and Detection of Crime (1965) that an officer of at least Inspector rank should be designated force crime prevention officer. However, even with this recognition, those responsible for crime prevention have never represented more than a small minority within the police service, with this position being viewed as one of low status and low interest when compared to those involving detection or apprehension (Graef, 1989). As Weatheritt (1986) suggests, the role of crime reduction officer is often viewed as one in which pre-retirement officers serve out their time.

> "Until recently, when the figure has fallen to about fifteen years, the average length of service of constables and sergeants attending the basic training course for newly appointed crime prevention officers at the Crime Prevention Centre was twenty years, just five years short of the period at which police officers become eligible for pensionable retirement on half pay" (Weatheritt, 1986 p.49-50).

The numbers of police officers designated as responsible for crime reduction is, although interesting, a side issue. The real change came with the assumption of responsibility for crime reduction of those outside the police service, a recognition which saw relevant authorities becoming responsible for considering the crime and disorder implications of every decision that they made, be that awarding planning permission to a new nightclub or the decision not to install street lighting within a high crime area. The Crime and Disorder Act (in particular, sections 5, 6 and 17) recognised that those who supply criminal opportunities can and should be responsible for their control. The changing landscape of crime reduction is discussed in Byrne and Pease (2003) who recognise that an increasing number of individuals and agencies are becoming interested in crime prevention because they have a stake in it and are jointly responsible for the failure to reduce or prevent it.

As crime prevention becomes the princess who finally makes the ball, and leaves behind its Cinderella of the service label (Byrne and Pease, 2003), the belief that crime reduction is more than detection, apprehension and incarceration and that crime control requires the intervention of more agencies than the police and judiciary, have become more commonplace. As Pease (1997) suggests:

> "Because an action is a crime, this does not mean that the best way to control it is through the police and the courts. The behaviour itself must be understood, to determine where change can be best brought in" (p.963).

The importance of this statement is highlighted by figures which show the attrition through the Criminal Justice System. Barclay and Tavares (1999) estimate that of the 100% of offences which are committed, approximately 45.2% are actually reported to the police by victims of these crimes; 24.3% are recorded by the police (i.e. these crimes become a statistic); 5.5% are cleared up by the police; 3% result in a caution or conviction and 0.3% result in a custodial sentence. The last decade has seen an increase in partnership approaches to crime reduction and a growing recognition that relying upon the criminal justice system will leave a large amount of crime untouched, the most significant demonstration of this viewpoint being the introduction of the Crime and Disorder Act (1998).

The introduction of the Crime and Disorder Act (1998), described by Laycock (2001) as "one of the most significant pieces of legislation in support of crime reduction" (p.21), represented the culmination of the process begun by the Morgan Report and informed by the scholarly literature on situational crime reduction. This act has gone some way towards addressing the mismatch between control over crime opportunities and responsibility for crime reduction. In particular, Section 17 of the Crime and Disorder Act (1998), which places a responsibility upon the 'relevant authorities'[1] to consider the crime and disorder implications of every decision that they make and states that "it shall be the duty of each authority ... to exercise its various functions with due regard to the likely effect of those functions on ... crime and disorder in its area" (Great Britain, 1998a). This section of the Crime and Disorder Act requires a variety of agencies (for whom crime and its prevention may never have crossed their minds) to consider crime and disorder in every decision that they make. Moss and Pease (1999) suggest that "...it is difficult to conceive of any decision which will remain untouched by s 17 considerations" (p.16), and provide examples of decisions which may be influenced by this legislation. These include granting planning permission to a new housing estate and the extent to which those homes are built to the Secured by Design (SBD) standard; local authority policies relating to the

[1] Local Authorities, Joint Authorities, National Park Authority, Broads Authority and the Police were defined as relevant authorities in the 1998 Crime and Disorder Act. The Police Reform Act 2002 stated that relevant authorities would extend to Primary Care Trusts (April 2004), Fire Authorities (April 2003) and Police Authorities (April 2003).

repair of council homes which have been burgled, or a council's failure to upgrade street lighting within a residential area. All of which (as will be discussed in more detail in Chapter two, part five) could result in legal action against the local authority.

The earlier claim that this act has only gone some way towards addressing the mismatch between control over crime opportunities and responsibility for crime reduction, relates to the exclusion of both central Government and the private sector from the provisions of the Act. This was recognised as a problem by the second report of the Government's Foresight committee on crime, with a recommendation (Recommendation 4) that the principles of Section 17 should be extended to cover the actions of central Government (Department of Trade and Industry, 2000). The specific problems regarding the separation of responsibilities in the planning process are identified by Moss (2001) who highlights the legal loophole which has left government bodies such as the Planning Inspectorate exempt from the provisions of this Act. In cases such as *Aquariam Entertainments Ltd. v Brighton and Hove Council,* this loophole in the legislation has allowed developers, denied planning permission on the grounds of crime prevention, with the opportunity to appeal to the Planning Inspectorate who, exempt from Section 17 considerations, grant permission for the original development. Moss (2001) identifies how in 2001 there were already 20 cases which had been contested on this basis, a figure likely to have risen substantially in the ensuing three years. Moss (2001) highlights the consequences of this loophole which has not only frustrated Crime and Disorder Partnerships (CDRPs), but has left developments permitted which police and local authorities consider to be potentially criminogenic.

> "The interpretation pf S.17 by the Planning Inspectorate has essentially created a bizarre situation where Local Authorities make decisions based on crime and disorder criteria they have to consider. If developers (who have their own agendas) disagree with these decisions, this then goes to the Planning Inspectorate who reverse these decisions because they say that these *same* criteria are irrelevant. What is more, all this is carried out at public cost" (Moss, 2001 p.8).

How to Reduce Crime:

The method through which agencies choose to reduce crime is dependent upon their view of the causes of crime, and it is probably fair to say that the balance of effort made by local authorities over-emphasises traditional above situational approaches more than the research literature would justify. This is evident in the three-yearly audits and strategies which CDRPs

must conduct under the provisions of Sections 5 and 6 of the 1998 Crime and Disorder Act. Analysis of local crime and disorder data, as well as consultation with service users and providers helps to shape the priorities assigned within the Strategy which is submitted to the regional Government Office. On interrogation of the local data, Partnerships must ask themselves, is a particular crime problem related to an individual offender? In that case, action might be taken to remove the particular offender (such as incarceration or diversion activities) or remove their desire or need to commit that crime (for example treatment for drug use). Is the crime problem related to the victim? In which case, action may be taken to reduce the risks of vulnerable people becoming victims. Or is the crime problem related the environment in which that crime is taking place? In that case, action may be taken to address issues such as poor lighting or building design.

Although many criminological theories (and therefore crime prevention interventions) focus solely upon one of these elements, in reality, much crime prevention activity is often holistic in nature, aiming to address the offender, the victim and the environment (albeit not always in equal balance). As Levi and Maguire (2004) suggest "modern crime reduction approaches are not based solely upon situational principles: they have tended to mix victim and target protection with interventions aimed at actual and potential offenders, using 'cocktails' of multiple techniques and agencies" (p.16). Findings from Tilley and Laycock (2002) as well as Bullock and Tilley (2003) suggest that co-ordinated, multiple interventions are often more effective than those which focus upon one element of the criminal event. There are, however, different views about this. For example Byrne and Pease (2003) rail against the balance between the demonstrably effective and the demonstrably ineffective in local strategies, which they imply is caused by the vested interests of well-established agencies such as the probation service exerting an influence. Whatever the truth, the reality on the ground for the foreseeable future is that local partnerships will proceed on the basis of a mixture of approaches.

Models such as the Problem Analysis Triangle (Leigh *et al.*, 1996) and Ekblom's (2000) Conjunction of Criminal Opportunity (adapted from Felson's Web of Informal Control, 1998) go some way towards explaining the increasing popularity of crime reduction interventions which consider all elements of the crime event. As Byrne and Pease (2003) suggest, frameworks such as Ekblom's help crime reduction practitioners to integrate different approaches to crime reduction. Each conceptualises crime into the different elements which must be present for it to occur. For example, Felson (1998) suggests that for a crime to take

place there must be motivated offender, a suitable target and the absence of a capable guardian. To prevent a crime taking place their must be an intervention to remove the target (be that a person, item, building etc.), introduce a capable guardian (be that formal such as CCTV, police or security guards, or informal such as neighbours, shoppers or passers by) or remove the likely offender (either through physical barriers to keep them out or interventions to change their motivation to offend). The Problem Analysis Triangle identifies how a response to a crime problem requires interventions to address the offender, the victim or the location. The intervention must alter the situation which was conducive to the crime taking place by addressing at least one of these three elements. For example, the problem of high levels of violence in a town centre nightclub may require interventions to address the offender – barring them from the club, the victim – educating them in self defence, or the location – re- designing the layout of the club to minimise the opportunities for violence. This may include ensuring that chairs are positioned away from the bar to avoid customers being disturbed as people queue for their drinks, or clarifying the position in which people should stand when queuing for drinks.

Multi-Agency Crime Reduction:

In light of legislative requirements to show that they are working together to reduce crime and disorder, many agencies looked towards existing crime prevention initiatives and research relating to what works in crime and disorder. One particular initiative which requires the intervention of a variety of agencies such as architects, police and local authority planning departments, and works upon all elements of Felson's (1998) Web of Informal Control (removing suitable targets, introducing capable guardians and removing likely offenders), is the SBD initiative, which is the focal concern of this thesis.

SBD is an award scheme, established in 1989, which aims to encourage housing developers to design out crime at the planning stage. The scheme is managed by the Association of Chief Police Officers (ACPO) and supported by the Home Office. The scheme sets standards for compliance (drawn up in consultation with the Department of Transport, Local Government and the Regions - now the Office for the Deputy Prime Minister, as well as trade, industry and standards organisations) which are based largely upon the principles described below. A more comprehensive description of both principles and specific standards can be found on the official SBD website.

Physical Security:

SBD sets standards of physical security for each property and its boundaries. The aim is not to create a fortress in which residents are constantly reminded of the risk of victimisation, but to combine effective target hardening measures into the original build of the estate. For example, windows must meet the standard BS7950:1997 and doors must meet both PAS 24-1 (physical security) and PAS 23-1 (fit for purpose).

Surveillance:

SBD estates are designed to achieve maximum natural surveillance without compromising the need for privacy. For example, houses are positioned to allow neighbours to view each other's properties without obstructions from shrubbery or high walls. The informal social control which emerges from the design of SBD estates is accentuated through ensuring that each estate contains a mix of dwellings designed for the needs of a variety of resident types (i.e. elderly, families, young couples). In doing so, the likelihood that at least one neighbour will be at home throughout the day and night is increased.

Access/Egress:

SBD estates are designed to include a minimal number of access/egress points in an attempt to avoid unnecessary entry onto the estate by non-residents and potential offenders. Through-routes and footpaths provide the opportunity for offenders to attach an area to what Beavon *et al* (1994) refer to as their awareness space. Like everybody else, offenders become familiar with locations they frequent whilst travelling between work, school, home and leisure activities. Giving an offender reason to pass through an estate not only increases their familiarity with the area, but also provides a justification to be there.

Territoriality:

In an attempt to achieve maximum informal social control, SBD draws upon Newman's principles of Defensible Space (1973). This states that if space has a clearly defined ownership, purpose and role, it is evident to residents within the neighbourhood who should, and more importantly who should not be in a given area. SBD achieves this by ensuring a clear demarcation between public, semi-public, semi-private and private space. For example, a change in the road colour and texture will act to highlight the move from a public space (outside the estate) to a semi-public space (inside the estate). A gate or hedge surrounding the

front garden marks the change from semi-public space (within the boundaries of the estate) to semi-private space (a resident's front garden) and a front door, fitted with appropriate security measures, marks the change from semi-private to private space.

Management and Maintenance:

The management and maintenance of SBD estates is an issue of continuing importance. Several studies have suggested that if crime and disorder is not addressed, it can act as a catalyst for more serious crimes. Skogan (1990) refers to this as the "Contagion theory", suggesting that the "presence of vandalism stimulates more vandalism" (p.39). This is supported by studies such as Zimbardo (1970) and Finnie (1973) which found that the presence of disorder such as vandalism, rubbish or criminal damage leads directly to more anti-social behaviour. Kelling and Coles (1997), in reference to an article by Wilson and Kelling (1982), refer to this as the "Broken Windows Theory" (p.16). In their original article, Wilson and Kelling (1982) used the image of broken windows to describe how neighbourhoods may decline into disorder if they are not managed and maintained.

> "If a window in a building is broken and left unrepaired, all the rest of the windows will soon be broken...One unrepaired broken window is a signal that no one cares, so breaking more windows costs nothing...Untended property becomes fair game"(Wilson and Kelling, 1982 p.31).

The suggestion being that an area with existing deterioration such as graffiti and vandalism conveys the impression that a) nobody cares so apprehension is less likely, and b) the area is already untidy so one more act will go unnoticed. Because of its existing deterioration the area is not only an easy target, it is also fair game. Kelling and Coles (1997) suggest that low level disorder such as graffiti, squeegeeing and fare-dodging, although small-scale when taken as single offences, can lead to more serious crimes as well as increased levels of fear of crime. Kelling and Coles (1997) use several examples to highlight the crime reduction benefits of this theory. These include the Clean Car Program which involved removing subway trains from use until graffiti had been removed, the idea being that "Graffitists would never see their tags on clean trains again" (p.116); Operation Enforcement, which succeeded in reducing crime in general within the subway system, and the reduction of squeegee merchants within New York City.

> "And while change is clearly evident in terms of quality of life and a reduction in low-level crimes and incidents of disorder, a new development is the dramatic reduction as well in index crime, as reflected not only by what citizens experience but also in the crime statistics" (Kelling and Coles, 1997 p.151).

Although there is very little written regarding the emergence of SBD and the principles which underpinned its formation, it is suggested by several authors (Cozens *et al,* 2001; Pascoe and Topping, 1997) that the initiative is based largely upon Newman's theory of defensible space (1973) as well as other theories relating to SCP and offender decision making. Newman's theory of defensible space (which will be discussed in more detail throughout Chapter two) argues that the physical design of a neighbourhood can either release or inhibit people's latent sense of control over the spaces in which they live. This is achieved through four elements – territoriality, natural surveillance, image and, milieu. Pascoe and Topping (1997) make some attempt to explore the theoretical underpinnings of the SBD scheme and suggest that the "claims of the SBD authors straddle two lines of thinking – environmental criminology...and a behavioural approach looking at the decision making of offenders" (p.163). Although Cozens *et al* (2001) reiterate the suggestion that defensible space played a large part in the development of the SBD scheme, they also recognise that its influence is somewhat surprising given the widespread criticism which Newman's theory had received in the years leading up to SBD's inception. Authors such as Mawby (1977), Bottoms (1974), Wilson (1978) and Merry (1981) have criticised Newman on the grounds of methodological weaknesses as well as the presentation of findings. Others suggest that the term defensible space contains a "rat's nest of intertwining hypotheses" (Rubenstein *et* al, 1980 p.6) making it difficult to measure and define (Cozens *et al,* 2001) and that Newman over-emphasised the physical environment at the expense of socio-economic and demographic variables (Wilson, 1978; Mayhew, 1979; Poyner, 1983; Moughtin and Gardner, 1990). Although in the case of the latter point, Wilson (1978), Heck (1987) and Cozens *et al* (2001) highlight how Newman's later work (1975, 1976) recognised the need for both social and physical crime reduction measures even suggesting that the influence of social factors (such as the percentage of residents receiving welfare and *per capita* income of estate residents) actually exceed that of physical design.

As was mentioned earlier within the thesis, legislative changes such as the Crime and Disorder Act (1998) placed a requirement upon agencies to show that they were working together to reduce crime and disorder. Short timescales and the lack of financial assistance led many

agencies to look towards existing initiatives and research relating to 'what works' to help meet this legislative requirement (Byrne and Pease, 2003). The SBD initiative appeared to be a perfect example of a crime reduction measure which required multi agency collaboration. However, research to assess its effectiveness was lacking.

The introduction of the Crime and Disorder Act (1998) and the requirement (Sections 5 and 6 of the Act) placed upon key agencies (local authorities, police, fire authorities, police authorities) to form partnerships to reduce crime and disorder within their area, has been a positive step for crime reduction in that, as noted earlier, it partially reconciled the supply of crime opportunities with the responsibility for crime reduction. However, whilst the last two decades have seen an increasing recognition of the contribution that both multi-agency working and design/planning can make to crime reduction, three obvious weaknesses still remain. It is these weaknesses which this thesis aims to address.

1. First, at the time when the research on which this thesis was based began, the SBD initiative, which was already being used as a tool to encourage multi-agency working, had not been independently evaluated. Whether for this or other reasons (in the writer's view other reasons predominated, since many person-oriented crime reduction measures have proven remarkably robust in the face of unflattering research evidence), confidence in its ability to reduce crime was low. It became evident that although criminological research had shown that the individual principles of the scheme - minimising access (Brantingham and Brantingham, 1975, 1993, 2000; Brantingham *et al*, 1977; Brown and Altman, 1983; Newlands, 1983; Greenberg and Rohe, 1984; Cromwell *el al,* 1991; Bevis and Nutter, 1997; Mirlees-Black *et al*, 1998), increasing physical security (Brown and Altman, 1983; Cromwell *et al,* 1991) and increasing territoriality (Brown and Altman, 1983; Brown and Bentley, 1993) each worked to reduce crime and disorder, it was unclear whether the initiative as a package was acting as an effective crime reduction measure.

2. Second, those working within crime reduction are not the same people who a) design houses and b) make the decisions about planning applications. It was clear that research findings must begin to transcend these two fields.

3. Finally, complacency is used to describe those who are contented or self satisfied to a fault, and any initiative which does not contain within itself the mechanism for self-improvement, risks complacency. To become complacent about the merits of any crime prevention measure, would be to ignore the evolving nature of crime and those who take part in it. Criminals change and what may act to deter them from offending against a property in 1998, may no longer prevent their offending in 2001. As Ekblom (2002) suggests "Knowledge of what works becomes a wasting asset that needs constant replenishment" (p.38). For this reason, the final aim of the thesis was to identify the particular environmental factors which increase a property's vulnerability to crime as well as those which act to protect it. It is hoped that these findings can be used to maximise understanding of criminal behaviour as well as to improve the performance of the SBD standard.

As a response to these three areas of weakness, the aims of this thesis fall largely into the categories of past, present and future considerations.

Past

- To investigate the emergence of planning and design issues within criminology;
- To outline what the SBD initiative is and how it has developed;

Present

- To investigate the criticisms of SBD;
- To highlight contradictory legislation/guidance;
- To establish whether SBD housing experiences lower levels of crime and disorder than control sample housing;
- To establish whether SBD can reduce the fear of crime amongst residents;
- To investigate whether SBD has evolved as a standard.

Future

- To identify weaknesses within SBD and highlight areas for modification/improvement;
- To develop a practitioners' checklist to enable crime reduction resources to be directed towards the most vulnerable properties.

Chapter Two
Literature Review

Chapter Two - Part One
Crime and Criminology

The SBD scheme is just one initiative which aims to reduce crime through the design of the environment. The principles behind SBD incorporate elements from many criminological theories and perspectives. These principles are based upon the following assumptions.

- Crime and criminality are not inevitable. Consequently interventions to reduce the incidence of crime can succeed;
- Individuals offend in response to opportunity. While they may bring varying levels of criminal propensity to any situation, they make choices about their offending behaviour based upon the information available to them;
- One of the most influential factors in an offender's decision making process relates to the environment surrounding that individual. For this reason, the manipulation of the environment can act to reduce crime.

Is Crime inevitable?

There is an abundance of theories as to why individuals offend. Consequently there are many intervention points for the reduction of offending - some of which focus upon the offender (programmes to reduce drug use), some the victim (crime prevention publicity) and others the location in which crimes take place (street lighting, CCTV). But to what extent can crime be controlled?

Early exponents of the suggestion that criminality can be explained (at least in part) through biological or developmental factors include Cesare Lombroso and his *scuola positive* in the late nineteenth century whose focus lay upon distinguishing the characteristics of the born criminal. More recently, biological and developmental criminologists have identified factors associated with increased risk of criminality. Although these do not focus exclusively upon the biological, factors such as hyperactivity and impulsivity (Satterfield and Schell, 1997; Klinteberg *et al.*, 1993), low birth weight (McGee *et al,* 1984; Kolvin *et al,* 1990) and brain damage (Brennan *et al,* 1991; Michaud *et al,* 1993) have been identified as risk factors associated with criminal and anti-social behaviour.

Authors such as Caspi and Moffit (1995) also emphasise both biological and social processes in crime causality, suggesting that transient, delinquent behaviour can be linked to social factors such as a desire for autonomy and peer delinquency and that the factors distinguishing these short-term offenders from long-term, persistent offenders lay within neurodevelopmental processes. Moffit's (2003) review of the causes of anti-social behaviour distinguishes between two prototypes – life-course-persistent and adolescence-limited. According to Moffit (2003), the former has its origins in neurodevelopmental processes, begins in childhood, and continues into adulthood. The risk emerges from "inherited or acquired neuropsychological variation" (Moffit, 2003 p.50) and is exacerbated by a high-risk social environment, including factors such as inadequate parenting, disrupted family bonds and poverty. The latter has its origins in social processes, begins in adolescence and desists in young adulthood. Moffit (2003) suggests that this type of anti-social behaviour emerges in puberty in the period referred to as "the maturity gap" (p.50), this representing the "role-less years between their biological maturation and their access to mature privileges" (p.50). According to both Moffit (1990, 1993, 1994, 1997 and 2003) and Caspi and Moffit (1995), life-course-persistent antisocials are few, persistent and pathological, whilst adolescence-limited antisocials are common.

The focus upon genetic factors in criminality, and in particular the recent work of Moffit (2003), does not focus exclusively upon the biological at the expense of situational factors. In fact, the suggestion that life-course-persistent anti-social behaviour has its origins in early life, but is exacerbated by a high-risk social environment, with adolescent-limited anti-social behaviour emerging in puberty as a response to the maturity gap (Moffit, 2003), is entirely consistent with the need to limit criminogenic opportunities, thus minimising the likelihood that those with a propensity to offend will be provided with that opportunity. The view that crime and criminality is abnormal or unusual has declined in popularity over the last half of the twentieth and early part of the twenty-first century, and this decline in popularity has not been limited to the more obvious theorists (see below). In fact, Moffit (2003) hypothesises that abstainers from delinquency are rare and that adolescent-limited delinquency is "normative adaptational social behaviour" (p.60).

Many theories emerging over the last 30 years (often referred to as the New Opportunity Theories) view criminals not as pre-determined or different, but simply as individuals who give in to temptation when faced with opportunities to do so. Although still popular in the early

twenty-first century, these theories which include Routine Activity Theory, Rational Choice Theory and Crime Pattern Theory as well as their practical applications (SCP and Crime Prevention through Environmental Design - CPTED) are not new, and as Laycock (2003) highlights, the Home Office (Mayhew *et al,* 1976) were publishing research on crime and opportunity more than quarter of a century ago. The paper by Mayhew *et al* (1976) made a significant distinction between opportunities which are attached to people (opportunities to commit crime, or to become a victim of crime vary according to age, gender and lifestyle) and those which relate to objects (opportunities are affected by the supply of goods, the physical security of particular products and the levels of surveillance and supervision surrounding a product). Mayhew *et al* (1976) also highlighted how opportunity can relate to the occasion as well as the temptation for action. It is clear from this brief discussion that the findings discussed within this paper formed the basis for many theories which followed, including those discussed throughout this chapter.

Crime as a response to Opportunity:

Since the early 1970s much evidence-based criminological theory has been moving towards a focus upon criminal events as opposed to the offender. Although these theories differ in their focus, many share the theme that opportunity generates crime and begin from the premise that crime is normal as opposed to something unusual which has to be explained.

> "Crime becomes a risk to be calculated (by the offender and the potential victim) or as an accident to be avoided, rather than a moral aberration which needs to be specially explained" (Garland 1996 p.450-451).

The New Opportunity Theories suggest that opportunities play a role in causing crime. Based upon this premise, the reduction of crime must focus upon the reduction of opportunities for crime to occur. Examples of interventions to reduce opportunities include locking the door when you leave the house, removing valuables from sight, educating children not to talk to strangers and leaving lights on when the house is empty after dark. These simple measures are collectively thought of as SCP and CPTED (to be discussed in more detail throughout this chapter). Although they differ slightly in their focus (routine activity focuses upon society, rational choice focuses upon the offender and pattern theory the local area), the three criminological theories Routine Activity Theory, Rational Choice Theory and Pattern Theory

have been grouped together under the title New Opportunity Theories because of the themes which they share.

Routine Activity Theory (Cohen and Felson, 1979) considers how the structure of modern society and the routine activities of everyday life have created more opportunities for criminal activities. Opportunities in the form of an increase in easily accessible consumer products, opportunities in the form of surplus time and energy as well as the dispersal of individuals into more households, travellers into more vehicles and activities away from the home. The first point refers to the correlation between rises in crime and the availability of easily accessible, valuable consumer products such as televisions and videos. Cohen and Felson (1979) used the acronym VIVA (Value, Inertia, Visibility and Accessibility) to describe suitable targets. Clarke (1999) expands upon this using the acronym CRAVED (Concealable, Removable, Available, Valuable, Enjoyable and Disposable) to identify hot products. For example, a laptop computer would be concealable and removable (weighing approximately 3 kg[2]), it would be widely available, valuable (approximately £900[3]), enjoyable for personal use and disposable should the offender choose to sell the product. On the other hand, a fridge freezer would be available (with most households containing one), reasonably valuable (costing approximately £240[4]), but would be very difficult to remove, conceal or dispose of without drawing too much attention to yourself (a fridge freezer would weigh approximately 47 kg, with a height of 140 cm, a depth of 60 cm and a width of 55 cm[5]). According to these theories, a laptop would make a much more suitable target than a fridge freezer, thus the increase in the use and availability of small, valuable products such as mobile phones, i-pods, game boys, cam-corders and hand-held computers have fuelled the opportunities for crimes to be committed. The second point refers to the changes within modern society which have left adolescents with time and energy to spare, thus increasing the likelihood that they may become involved in crime and anti-social behaviour. For example fewer jobs require physical strength, academic qualifications are pre-requisites (thus delaying entry into energy and time consuming jobs) and the widespread availability of consumer products such as dishwashers, microwaves, ready-made meals and washing machines, free adolescents from chores or household tasks which would have previously tied them to the home. The final point refers to the changes in individuals' living and working arrangements. A growing number of people work long distances from their home,

---

[2] The Advent 7035 weighs 3.4 kg, it is 39.5 mm high, 332 mm wide and 288 mm deep.
[3] The Advent 7035 was available from Currys on the 5th December 2003 for £899.
[4] The Zanussi Z57 was available from EmpireDirect.co.uk on the 5th December 2003, priced £247.99.
[5] The Zanussi Z57 weighs 47 kg, has a height of 140 cm, a depth of 60 cm and a width of 55 cm.

thus increasing the time which their home stands empty. The last few decades have also seen an increase in the number of women going out to work (as well as their husbands/partners), again increasing the likelihood that homes stand empty for perhaps eight hours of the day. As well as work drawing people away from their homes, changes in leisure activities have also seen an increase in individuals spending their leisure time away from their home, for example, attending a gym, eating out or late night shopping. All of these changes increase opportunities for crimes to be committed against residential properties in the absence of capable guardians.

Cohen and Felson (1979) state that the increase in crime in the United States since 1960 is not so much an indicator of social breakdown, as a "by-product of the freedom and prosperity within the routine activities of our everyday lives" (p.605) and Garland (2000) states that "Crime is a supply-side phenomenon – a consequence of the production and delivery of opportunities to commit offences" (p.217). As noted earlier, from the perspective of Routine Activity Theory, for a crime to be committed there must be a 'motivated offender', a 'suitable target' and the absence of a 'capable guardian'. A situation in which a motivated offender comes into contact with a suitable target, with the absence of a capable guardian is likely to lead to the committal of a crime. Therefore, an intervention which removes/de-motivates the offender, deems the target unsuitable, or introduces a capable guardian, is likely to prevent crime taking place.

Another perspective, grouped into the New Opportunity Theories is Rational Choice Theory. This perspective is influenced by economic thinking and assumes that offenders seek to maximise the benefits of offending and in doing so make rational choices or decisions based upon the information or cues available to them at the time of offending. Decision processes are likely to vary according to the different stages of criminal involvement, between offenders (based upon age, experience etc.) and between different offence categories. Preventive suggestions seek to influence an offender's decision or choice to commit a crime through 1) increasing what they perceive to be the risks involved in committing that offence (installing a burglar alarm, designing housing estates to maximise natural surveillance), as well as 2) reducing the rewards should that crime occur (property marking). The aim is to ensure that for the offender the perceived costs outweigh the perceived benefits of offending.

Pattern Theory suggests that crimes "do not occur randomly in time or space or society" (Brantingham and Brantingham, 1993 p.264). For example, as Brantingham and Brantingham

(1993) suggest, bar fights are more likely to occur in Friday nights than Tuesday afternoons, income tax evasions are likely to cluster around the dates in which payments are due and pilfering of office supplies is likely to cluster geographically around areas with a high density of offices. Pattern Theory suggests that crimes will cluster around nodes (the places where people travel to and from), along pathways (the paths along which people travel to get to different nodes) and at the boundaries to both nodes and pathways (edges). If offenders are viewed as being no different to everybody else (other than their readiness to commit crime), the way in which they select a target against which to commit a crime is much the same as the method we use to select a service station in which to fill our car with petrol. We a) pass the petrol station just as we realise we need some petrol or b) have passed the petrol station on a previous occasion and know that it offers good value for money, therefore making a particular journey back to that area as and when we need petrol. If the same goes for offending patterns, offenders will select their target because a) they pass it on their way to school/work, to visit a friend or attend a leisure facility (it is in their activity/awareness space) and realise it has poor security, looks unoccupied or has valuable goods on show (or all of the above), therefore selecting to offend against the target there and then or b) they have passed/noticed the target on a previous occasion and decided to offend against the target at a later date. One of the key points of this theory is that offenders are not abnormal. Like everybody else they spend much of their time travelling between the places they live and the places they attend as part of their leisure/school/work activities and like everybody else, they choose their targets from within their activity and awareness space.

> "Since burglars are, in a time-budget sense, primarily non-burglars, their activity spaces, or places they usually spend time, are most likely similar to the activity spaces of non-burglars from similar backgrounds and living in similar areas" (Brantingham and Brantingham, 1984 p.80).

Several research studies support the theory that crimes are likely to cluster around offenders' activity and awareness spaces. Wiles and Costello (2000) found that offenders generally select a burglary target because they are passing it, or have passed it on an earlier occasion. 63% of their sample stated that they selected a burglary target through 'chance'. A further 31% stated their reason for target selection as 'passing and it looked easy (poor security)', 26% stated that they were 'passing and it looked easy (unoccupied)' and 26% stated that they were 'passing and it

looked easy (isolated/quiet)'. The key to these findings being that the vast majority of offenders were selecting targets that they had passed as part of their everyday activities.

> "Offenders do not inhabit a world in which offending and non-offending routines are straightforwardly dichotomised. Offending, therefore, fits in with other routines as opportunities, needs or temptations present themselves and routines themselves can include both deviant and non-deviant behaviour" (Wiles and Costello, 2000 p.40).

Taylor and Gottfredson (1987) suggest that an offender's selection of an area is based upon cognitive images of particular neighbourhoods that they build up over time (much like any normal individual building up an image of areas which they are familiar with). They suggest that these images are based upon five classes of factors. These are 1) physical/environmental features, 2) policing patterns, 3) offenders' collective social knowledge of the locale, 4) resident socio-demographic characteristics and behaviour patterns, and 5) the knowledge and disposition of the particular offender. Other studies which support Pattern Theory include Greenberg and Rohe (1984) and Rengert and Wasilchick (2000). Rengert and Wasilchick (2000) conducted interviews with incarcerated burglars and analysed burglary data as a means of establishing a) how burglars select from the properties available and b) what makes victimised properties different from those which have not been burgled? The results revealed that "for criminal activity individuals tend to extend familiar habitual paths, rather than travel in an unfamiliar direction" (p.72).The majority of burglars selected properties which were within their travel path to work or leisure activities. Rengert and Wasilchick (2000) suggest that the position of both workplace and recreational places (although slightly less so than workplace) are important in influencing the location of target selection.

> "It seems that both work and recreation travel tend to orient the direction of the burglar's search behaviour. However, the direction of the workplace seems more important than the direction of the recreation place" (Rengert and Wasilchick, 2000 p.79).

If, as is suggested by the new opportunity theories discussed above, individuals commit crime as a response to opportunities that arise and that these opportunities are shaped by their views of the environment surrounding them, it follows that crime can be reduced through the manipulation of the environment. Crime prevention interventions which aim to achieve this include SCP and CPTED.

The Role of the Environment in Crime Reduction:

According to Clarke (1992) SCP comprises opportunity reducing measures that are directed at highly specific forms of crime and involve the management, design or manipulation of the immediate environment in as systematic and permanent way as possible, so as to increase the effort and risks of crime and reduce the rewards as perceived by offenders.

The mechanisms through which SCP reduces crime are:

1) **Increasing perceived effort.** This may include target hardening measures such as improving door and window locks;
2) **Reducing anticipated rewards.** This may include property marking or measures to disable stolen mobile phones;
3) **Increasing perceived risks.** This may include the installation of CCTV or burglar alarms, increasing the likelihood that an offender will be seen and potentially apprehended;
4) **Removing excuses.** This may include the use of signs which state that shoplifters will be prosecuted removing an offender's excuse that they were not aware that they were doing anything wrong.

SCP interventions work on the premise that offenders make calculated decisions (of limited rationality in formal decision theory terms) about the most suitable targets to select. Therefore, altering the target (installing a burglar alarm or CCTV), or portraying the message that you may have altered the target (installing a dummy burglar alarm or installing CCTV in some shops but not others) should render that target less suitable, as perceived by the potential offender.

As noted earlier, SCP increased in popularity in the late 1970s and 1980s following a period in which criminology was predominantly focused upon the Criminal Justice System and the offender. The Home Office established its Crime Prevention Unit at this juncture, headed first by Kevin Heal and latterly by Gloria Laycock. Garland (2000) suggests that its re-emergence, alongside other similar theories of criminology, can be explained by:

1) SCP's use of economic language such as rewards, risks, demand and supply fitted well with the Conservative government of that time.

2) SCP interventions were typically short-term and relatively inexpensive compared to social programmes which aimed to alter criminal behaviour.
3) SCP provided practical solutions, rather than simply postulating as to why crime is committed. This was attractive to practitioners who had to implement such theories on the ground.

The appeal of this type of intervention over long term, resource intensive offender based interventions is highlighted by Smith (2000). For practitioners who are tasked with achieving crime reduction targets within a short timescale with very little additional resources, many crime reduction theories (and accompanying interventions) are unfeasible.

> "It is easy to see that happy families tend not to produce criminals.
> It is hard to see how public policy can decree that family relationships
> be constructive and positive" (Smith, 2000 p.149).

Similar to SCP in that it attempts to reduce crime through the manipulation of the environment, CPTED focuses solely upon designing (or altering post design) the features of the environment (be it a housing estate, park, shopping centre or café) in an attempt to:

a) Physically increase the difficulty in committing a crime. This may include the installation of gates, locks or grills;
b) Create an environment in which an offender or potential offender perceives the risks associated with committing a crime within this location to be high. This can be achieved through informal, unobtrusive measures such as symbolic barriers (a change in road colour or texture) at the entrance to an estate which portray a message that this area is private even through there is no actual barrier.

According to Poyner (1983) CPTED generally covers four areas. These are:

a) Surveillance – To increase the likelihood that an offender will be observed through measures such as enhanced lighting, the removal of blind-spots, the introduction of formal (security guards) or informal (neighbourhood watch) social control;

b) Movement Control – To limit the movement through an area by minimising the number of access and egress points, the use of real or symbolic barriers at the entrance to a site as well as security measures such as locks;

c) Activity Support – Increasing the likelihood that people will make use of public area and therefore act as additional surveillance;

d) Motivational Reinforcement – Increasing residents' desire to engage in their own crime prevention activity.

The principles through which SBD aims to reduce crime draws upon the new opportunity theories and brings together elements of both SCP and CPTED into a recognisable, saleable package.

Designing out crime – An Age Old Phenomenon:

The concept of manipulating the environment as a means of preventing crime (or attack) is not new. Mediaeval castles were designed to be impenetrable - sited on high ground with towers from which troops stood watch. These castles were surrounded by moats, spiked barriers, portcullis and machicolations. The towers had thickened walls and were rounded in shape with slightly flared bases to deflect canon shot. Barriers have also been used as a means of defence against attack for thousands of years. For example, the city of Jericho was protected by a wall 21 feet high encompassing an area of 10 acres, with an outer moat 15 feet wide and 9 feet deep. The walled city was built around 7000 BC and designed to protect the goods reaped from the agricultural revolution. Other examples of the early use of environmental design as a means of protection include the Great Wall of China (built in the 3rd century BC), which was designed to protect China's Northern frontiers against Nomads; Hadrian's Wall (Britain); the Walls of Anthemius (Constantinople) and the Maginot Line (France).

In his 1751 Treatise, Henry Fielding also gave an account of the causes and means of preventing crime which bear remarkable similarities to the New Opportunity Theories. Fielding (1988) suggests that luxury, and the temptations which it offers, goes some way towards explaining the crimes committed amongst the 'lower orders of society' who whilst enjoying this luxury to the same extent as 'upper part of life', have no way of gratifying it without resorting to crime and delinquency. According to Fielding (1988), as with Felson (1998) and other Opportunity Theorists, the most effective means of reducing crime is to remove the temptation (or opportunity) to offend. Fielding (1988) highlights the limitations of reactive measures which

simply act to 'patch-up the disease' without addressing its causes. In a similar vein to the New Opportunity Theorists discussed throughout this chapter, Fielding advocates prevention as a more effective strategy.

> "The gentlest Method which I know, and at the same Time perhaps one of the most effectual, of stopping the Progress of Vice, is by removing the Temptation. Now the two great Motives to Luxury, in the Mind of Man, are Vanity and Voluptuousness. The former of these operates but little in this Regard with the lower Order of People. I do not mean that they have less of this Passion than their Betters; but the apparent Impossibility of gratifying it this Way deters them, and diverts at least this Passion into another channel" (Fielding, 1988 p.78-79).

Fielding's (1988) suggestions for reducing crime bear many similarities to the principles of SCP as well as CPTED. On the issues of punishment for receivers of stolen goods, Fielding (as has Clarke, 1992) stresses the role which reward has in encouraging individuals to offend. Without the opportunity to dispose of stolen goods, the risks of offending would be more likely to outweigh the potential rewards. On discussing the laws relating to vagabonds, Fielding (1988) suggests that one explanation for the increase in robbery lies with the probability of escaping punishment due to the layout of many neighbourhoods throughout London.

> "First then, The Robber hath great Hopes of being undiscovered: And this is one Reason, why Robberies are more frequent in this Town... Whoever indeed considers the Cities of *London and Westminster,* with the late vast Addition of their Suburbs; the great Irregularity of their Buildings, the immense Number of Lanes, Alleys, Courts and Bye-Places; must think, that, had they been intended for the very purpose of Concealment, they could scarce have been better contrived" (Fielding, 1988 p.131).

The recognition that the environment can influence behaviour dates back thousands of years, but the formal study of the geography or pattern of socio-economic variables (and the social problems associated with these) began largely with the University of Chicago School of Sociology in the 1920s and 1930s (Burgess, 1916, Park *et al*, 1925). Although the geography of social problems such as unemployment, delinquency and deprivation had been researched long before, specific reference to the potential to reduce crime through the design or manipulation of the environment began in the 1960s and 70s with research conducted by authors such as Jacobs (1961), Jeffery (1971) and Newman (1973).

Jacobs' work raised many issues which are still debated decades later. These can be summarised into four points. First, design should not be paternalistic and planners must not assume that they know what residents want. Second, that there should be a clear demarcation between public and private space. Third, that buildings should be oriented towards the street to increase the level of 'eyes on the street' which can act as natural surveillance. Finally, that streets should be used as continuously as possible thus bringing more people (eyes on the street) to the area and creating a vibrant atmosphere which encourages people living and working within the area to watch the street from their building (Jacobs states that people do not watch empty streets). The debates surrounding the issues of natural surveillance and mixed land use will be discussed in more detail throughout this chapter, however, it is worth raising several key points at this stage. Firstly, the crux of Jacobs theory relates to the trust between those using the street (be they shopkeepers, residents or passers by) to intervene should a crime take place. However, research suggests firstly that people do not always notice crimes taking place (Gelfand *et al,* 1973; Mayhew *et al,* 1979) and if they notice them, they do not always intervene (Rosenthal, 1964; Latane and Darley, 1970). The second point, which is raised by Jacobs herself throughout her work, but which is often excluded from debates surrounding the issues of designing out crime, is that Jacobs' theories relate to cities and were never intended to be translated to towns or suburbs.

> I hope no reader will try to transfer my observations into guides as to what goes on in towns, or little cities, or in suburbs which still are suburban. Towns, suburbs, and even little cities are totally different organisms from great cities...To try to understand towns in terms of big cities will only compound confusion" (Jacobs, 1961 p.26)

Much of the research conducted into designing out crime (including that upon which this thesis is based) is conducted within residential neighbourhoods within suburban areas. As Jacobs (1961) points out, many people choose to live in cities for the very reasons which make them different from towns or suburban areas i.e. flexibility, mobility and relative anonymity. For these reasons, the dynamics of those living and working within a city will not translate to suburban areas. Finally, Jacobs' theories are often simplified to something along the lines of busy, well used streets are safer than quiet *culs de sac.* Not only does this fail to point out that her research does not apply to the type of suburban area in which *culs de sac* might be located, it also fails to acknowledge the similarities between her theories and those used in interventions

such as SBD. For example, there is a need to make a clear distinction between public and private spaces and that reducing crime through the built environment is about more than bricks and mortar alone, it is about the social dynamic that the environment facilitates.

> "When we try to justify good shelter instead on the pretentious grounds that it will work social or family miracles we fool ourselves. Reinhold Niebuhr has called this particular self-deception, 'The doctrine of salvation by bricks" (Jacobs, 1961 p.123).

Jeffery coined the phrase Crime Prevention through Environmental Design in his 1971 book of the same title. Jeffery was disillusioned with the ineffectiveness of the criminal justice system and was searching for a new theory of crime prevention based upon the relationship between humans and their environment. Jeffery drew upon a 'biosocial theory of learning' and argued that crime prevention must take into account both the effects of the environment upon human behaviour as well as the genetic predisposition towards criminal activity. As Clarke (1992) states, "Jeffery's general theory of criminal behaviour has enjoyed less support than his concept of CPTED" (p.6) and the term CPTED (pronounced Septed) has influenced both theory and intervention over the last three decades.

Oscar Newman's work (1973) played a large part in the development of designing out crime. Although written from the perspective of an architect, the principles introduced by Newman can be seen in many modern crime reduction theories and interventions. Although Newman's work has been criticised for its methodological weaknesses and the emphasis placed upon natural surveillance (Bottoms, 1974; Mawby, 1977; Wilson, 1978; Mayhew, 1979; Merry, 1981) its appeal lies in its promise of practical benefits in terms of crime reduction. Perhaps because of Newman's architectural background, his work goes beyond that of vague or elusive theory to offer practical solutions relating to development design. Newman's work was based upon a multi-unit public housing project in America (Pruitt-Igoe).

> "The project was designed by one of the country's most eminent architects and was hailed as an example of the new enlightenment... Residents were raised into the air in elevenstorey buildings so as to keep the grounds and the first floor free for communal activity. The buildings were given communal corridors on every third floor to house laundry, storage, garbage and communal rooms" (Newman, 1995 p.150).

As Newman (1995) states, "the design proved a disaster" (p.150) with high levels of crime and disorder and low levels of occupancy. In contrast to Pruitt-Igoe, Newman became aware of a smaller, row-house complex (Carr Village Square) which was occupied by a similar population, yet experienced low levels of crime and disorder and high levels of occupancy. Newman found that areas where a smaller number of families shared a corridor were well tended, whereas corridors shared by larger numbers of families had higher levels of disorder and lower levels of maintenance. He concluded that areas shared by more people (i.e. public space) do not "evoke feelings of identity or control" leaving it "impossible for residents to develop an accord on what was acceptable behaviour" (Newman, 1995 p.150).

Newman's theory of defensible space (1973) argues that the physical design of a neighbourhood can either release or inhibit people's latent sense of control over the spaces in which they live. This is achieved through four elements:

- Territoriality – Newman categorised space into public (i.e. the road in front of a property), semi-public (the front garden), semi-private (the back yard) and private (inside the property itself). He argued that all space should have a clearly defined ownership, purpose and role (increasing the level of private and semi-private space by designating public areas to individual families) thus allowing residents to develop proprietary feelings towards the space within, and more crucially, surrounding their property.
- Natural surveillance – The positioning of housing to allow maximum surveillance from neighbouring properties.
- Image – Designing buildings to avoid the stigma of public housing.
- Milieu – Locating residential properties near to areas of the city considered to be safe.

Newman has since applied his theory to three residential housing projects within Ohio and New York (1995) to reveal lower levels of crime and fear of crime and higher levels of occupancy, property sales and property values.

Early research into the influence of the environment upon human behaviour were written largely from a planning perspective and although the theories could transcend both fields of architecture and criminology, the transition from planning based research to practical solutions

applicable to crime reduction practitioners, criminologists and architects alike, began in the 1980s and 1990s with (amongst others) work conducted by Brantingham and Brantingham (1981), Poyner (1983) and Poyner and Webb (1991). The work of these authors will be discussed in more detail in Part Four of this chapter.

Chapter Two – Part Two
Negative Implications of Designing out Crime

The previous part of this chapter looked at the principles of CPTED and highlighted how the environment has been used as a means of protection for centuries. It was noted that the specific use of design as a crime reduction measure, however, has emerged more recently with initiatives such as SBD drawing upon the principles of rational choice, routine activity and pattern theory and from crime prevention techniques such as SCP. Although many CPTED initiatives such as SBD aim to design out crime using subtle techniques such as changes in the road colour or texture at the entrance to an estate to portray the impression to potential intruders that they are entering a private area, there still remains the view from some critics that such initiatives promote a fortress mentality. One of the explanations for this is the tendency for CPTED interventions to be grouped together, when in reality their means of reducing crime are very different. For example, gated communities, which are rising in popularity throughout the world, particularly in America where Ellin (1997) estimates that approximately eight million residents reside. These utilise physical barriers, security guards and other means of formal surveillance to keep non-residents out. On the other hand, initiatives such as SBD aim to design out crime without physically preventing non-residents from entering the estate. This is achieved through discreet measures which leave intruders feeling conspicuous as opposed to physically blocking their entry.

Before focusing upon the specific details of the SBD initiative, this chapter will explore some of the criticism levelled at CPTED interventions. These can be categorised into four main areas. First, do CPTED interventions provide a lower risk of victimisation for the privileged at the expense of the most vulnerable sectors of society? Do CPTED measures burden potential victims with the responsibility to prevent their own victimisation? Are CPTED measures short-sighted? And finally, do CPTED measures over emphasise the physical environment at the expense of social factors?

Them and Us:

One of the main criticisms of interventions such as gated communities, or the privatisation of crime control, is that it creates a them and us society whereby those who can afford are offered protection against crime at the expense of the most vulnerable sectors of society. Ellin (1997) likens the restrictive nature of modern gated communities to the social control gained through the use of restrictive covenants in residential housing. Restrictive covenants were used in the Industrial Revolution as a means of ensuring that tenants were not able to convert certain areas of agricultural land into factories. However, their use began to expand with the growth of large developments to include restrictions upon race and class. This was viewed as a means of ensuring that property values were maintained within these residential developments. Examples of the modern use of these restrictions are highlighted by Ellin (1997):

- In Monroe, New Jersey, a homeowner association took a married couple to court because the wife, at age 45, was 3 years younger than the association's minimum for residency.

- In Boca Raton, Florida, an association cited a homeowner and took her to court because her dog weighed more than 30 pounds, a violation of association rules.

The creation of areas of land, be they housing estates or shopping malls, which restrict certain sectors of the community, raises several ethical concerns. First, the enhanced security offered by these housing estates usually equates to higher house prices. If this is the case, such initiatives are effectively offering a reduced risk of victimisation to those who can afford, at the expense of those who cannot. Is crime therefore being displaced from the rich to the poor?

The second concern is that introducing formal security to physically keep non-residents from an area removes the trust that needs to exist in civilised societies, whereby individuals police or control their own behaviour based upon the social norms of that society. This self discipline is discussed by Foucault (1991) in relation to Bentham's Panoptican. In the Panoptican, prison cells were arranged around a central watch tower from which a supervisor *could* constantly survey their behaviour. Prisoners could never be sure whether they were actually being watched and as such gradually began to police their own behaviour.

> "Bentham laid down the principle that power should be visible and unverifiable. Visible: the inmate will constantly have before his eyes the tall outline of the central tower from which he is spied upon. Unverifiable: the inmate must never know whether he is being looked at at any moment, but he must be sure that he may always be so" (Foucault, 1991 p.201).

When applying this point to modern residential housing, the question remains as to whether the physical removal or barring of certain individuals from an area will actually address criminal intent in the long term. An initiative which restricts an individual's entry into a housing estate does not address the rationale behind their decision to offend. Is it therefore simply delaying or displacing that offence? The final concern is whether the exclusion of individuals from certain areas based upon their class or race, removes their liberty and freedom to enter public areas?

Although the subject of displacement warrants a thesis in itself, the above points have raised this as an issue which must at least be briefly addressed. Displacement argues that in introducing a crime prevention measure, opportunities for crime will be blocked and therefore offenders (intent upon committing crime) will decide to commit the same crime elsewhere, at a different time, or make a decision to commit a different crime altogether. Displacement can be:

- Temporal – when faced with factors preventing the committal of a crime, the offender makes a decision to commit the same crime type, in the same location, but at a different time;
- Geographical – when faced with a crime prevention measure, the offender makes a decision to commit the same crime type elsewhere;
- Crime Switch – when faced with a crime prevention measure, the offender makes a decision to commit a different offence within the same location at the same time.

The displacement of crime has been a constant criticism of SCP measures such as SBD and one which has been described by Barr & Pease (1992) as "an albatross around the neck of purposive crime prevention" (p.197) and by Brantingham and Brantingham (2000) as "the spectre that haunts environmental criminology and situational crime prevention" (p.5). Barr and Pease (1992) suggest that this pessimism is in part due to the ability to prove displacement, but the inability to disprove it. "The fact remains that no-one can demonstrate that displacement/deflection is less than total" (p.199). The case for displacement, however, is not

always clear cut and it is by no means inevitable that the restriction of an offence will always result in its displacement. Research suggests firstly that many offenders have a limited sphere of influence in which they will consider offending (Decker, 1972; Forrester *et al,* 1988; Wiles and Costello, 2000) and that if displacement does occur, the results need not always be considered negative. Barr and Pease (1990) suggest that the deflected or displaced crime may cause less harm than the original offence.

Crime often occurs in a particular place and at a particular time due to a window of opportunity. If that opportunity to commit crime at a particular time is blocked, offenders will not always try again at an alternative time. Bennett & Wright (1984) found that burglars will not always return at a later time, reasons for this being planning, fate or timing. Offenders may also be reluctant, when faced with a blocked opportunity, to travel elsewhere. Many research findings support the theory of distance decay - that an offender will not automatically travel to find a target which is not protected by such crime prevention measures. This is highlighted by the following studies:

- Wiles and Costello (2000) found that the average distance travelled to offend was 1.93 miles. Domestic burglary was 1.88 miles, Theft from vehicle (1.97 miles), TWOC (2.36 miles), Non-Domestic Burglary (1.83 miles) and ABH (1.49 miles).
- Decker (1972) suggests that the introduction of slug-rejecter devices in parking meters did not lead to people parking their cars in the nearest town without these devices.

Table 1: Distance to Offend

Auto Theft

Study	Miles to Offend	Location
White (1932)	3.43 miles	Indianapolis
Phillips (1980)	1.15 miles	Lexington-Fayette, Kentucky
Gabor and Gottheil (1984)	1.24 miles	Ottawa

Adapted from Wiles and Costello (2000)

Burglary

Study	Miles to Offend	Location
White (1932)	1.76 miles	Indianapolis
Phillips (1980)	1.05 miles	Lexington-Fayette, Kentucky
Gabor and Gottheil (1984)	0.35 miles	Ottawa
Reppetto (1974)	0.5 miles	Boston and a nearby small city
Pyle (1974) – residential	2.48 miles	Akron, Ohio

Pyle (1974) – non-residential	2.34 miles	Akron, Ohio
Rhodes and Conly (1981)	1.62 miles	Washington D.C

Adapted from Wiles and Costello (2000)

The concept of action being based upon opportunity and hence not necessarily displaced is summed up by Clarke & Mayhew (1988) who showed that the change from toxic to natural gas in the 1970s reduced the number of suicides using domestic gas without a displacement to other methods of suicide. The premise of this theory being that gas as a means of suicide was available, painless and lethal. Those who may have chosen to commit suicide using this method, had it been available, will not necessarily take the time or effort to select a more difficult method of suicide. Displacement in this case is not total. Examples of research studies which have shown some evidence of displacement include:

- Brown's (1995) study of Birmingham and Tilley's study of car crime (1993) showed evidence of displacement following the introduction of CCTV systems;
- Barr and Pease (1990) found evidence of spatial displacement of about one quarter of the burglaries prevented;
- Chaiken *et al* (1974) found that a reduction in robberies achieved by 'exact fare' systems on New York buses was accompanied by an increase of robberies in the subway;
- Allatt (1984) found that the decrease in burglaries on a housing estate following extensive target hardening measures was almost matched by the increase in burglaries on a nearby estate.

Contrary to these, there are suggestions that crime prevention initiatives can succeed without displacement and may even benefit surrounding areas (diffusion of benefits).

- Poyner and Webb (1987) found that measures to reduce thefts from shopping bags in some city areas seemed to reduce thefts in other city centre areas.
- Poyner (1988 & 1992) found that CCTV in both car parks and on buses appeared to produce a diffusion of benefits to areas without CCTV in place.
- Scherdin (1986) found that the introduction of an electronic security system in a library reduced thefts of items which were not tagged as well as those which were.

The Burden of Responsibility:

Duff and Marshall (2000) raise the concern that crime prevention measures such as CPTED which offer advice and information relating to the potential threat of victimisation and the associated measures which can be taken to reduce this risk, place an unnecessary burden upon victims or potential victims. Does the availability of information which could prevent victimisation place the onus upon the wrong party – the victim as opposed to the offender? Clarke (2000) suggests that offering advice and information relating to crime prevention is both valuable and welcome and does not have to result in blame being placed upon individuals who go on to become victims. He suggests that the only place for blame, within the field of crime prevention, is in shaming manufacturers who produce criminogenic products, for example the publication of league tables relating to the make of stolen cars.

> "It is indefensible to blame rape on short skirts and other 'sexually provocative conduct'. Nonetheless, there is a place for giving people information about behaviours that put them at risk of crime" (Clarke, 2000 p.106)

Architectural Determinism:

One of the criticisms levelled at CPTED, in particular Newman's earlier claims (1973), are that they over-emphasise the physical environment at the expense of social factors such as resident income and child density or population (Wilson, 1978; Mayhew, 1979; Poyner, 1983 and Moughtin and Gardner, 1990). Wilson's (1978) study of vandalism on 38 housing estates within an inner London borough revealed that although there was evidence to suggest that in blocks with low child density (between 0 and 2 children per 10 dwellings) defensible space features such as the extent of public versus private space, territoriality and through-routes did influence levels of vandalism, the single most important factor in explaining variations in levels of vandalism was child density. Features such as design classification, height of block, size of block, privacy, real/symbolic barriers, entrance type, access, age of block, landscaping and child population/density were measured and compared against both recorded (local authority repairs) and observed levels of vandalism. As was suggested above, the study did give some limited support to Newman's (1973) contentions, with blocks with low child densities experiencing higher levels of vandalism where space was classed as impersonal, public or semi-public, where blocks were high rise and where entrances were used as through routes to other blocks. However, the findings did not support Newman's (1973) early suggestions that physical design features are more influential than social factors. Although these criticisms raise caution over architectural determinism, it would be misleading to claim that CPTED holds only

defensible space principles as its basis and that Newman's early suggestions remained unrefined. In relation to the latter point, Newman's later work (1975, 1976) recognised the importance of social factors, with the percentage of one parent families and population of teenage children revealed as the factors most likely to influence levels of crime in his 1975 study of 100,000 units of public housing in New York.

A study by Bottoms *et al* (1992) also suggests that although the physical design of residential housing can have some influence upon crime levels, the alteration of the environment cannot act alone to inhibit or encourage crime. In their study of two housing estates within Sheffield. Bottoms *et al* (1992) found that the direct and indirect influences of the housing market were vital in understanding the offender and offence rates of these communities.

> "in order to understand and explain offending behaviour by residents of particular areas, it is vital to consider who lives in these areas; how they came to live there in the first place; what kind of social life the residents have created; how outsiders (including official agencies) react to them; and why they remain in the areas and have not moved" (Bottoms *et al*, 1992 p.122).

Bottoms *et al* (1992) suggest that the housing market - that is the process which enables or restricts people from moving into a property, or restricts people from leaving a residence should they desire, affects the crime levels experienced within a given area through direct and indirect influences. The obvious influence being the allocation by housing providers of different groups of individuals to different housing estates based upon socio-demographic factors such as age or marital status, with these socio-demographic factors in turn influencing an individuals propensity to offend. For example, a policy which houses young, single males on a given housing estate may increase the likelihood that the offence/offender rate will rise. In contrast, a decision to locate pensioners within that housing estate may have the opposite effect upon the local offence/offender rate. Bottoms *et al* (1992) demonstrate how the housing allocation policy within Sheffield, which utilises a date-order system whereby individuals are placed in one of four categories – A, B, C and D (A being urgent and D being the general waiting and general transfer list) perpetuates (and even exacerbates) the crime problems within certain areas by encouraging those who are desperate to be housed to accept low demand housing estates, leaving the only residents who are confident to select high demand housing (with a waiting list of over ten years) being those already housed within another area. As Bottoms *et al* (1992) suggest, the proportion of transfers to general waiting list applicants for a housing estate is a

good indicator of the perceived desirability of that estate. Those who are in a position to choose will, those who are not will accept the low demand, high crime areas. Just as Bottoms *et al* (1992) caution against relying upon the influence of design in determining the extent to which a residential housing estate will or will not experience crime, they are also clear in stating that the influence of the housing market "does not operate alone in the creation of offender-based residential community crime careers" (p.123). Rather, they suggest "it interacts with a range of other aspects of social life to create the relevant social effects" (p.123) these being the social networks of the area, socialisation processes affecting the children within that area, the work of social control agencies, the development of reputations or labels of a given area, the economic development within the area, as well as the physical design of the built environment.

Criminals Adapt:

The final point to be discussed within this chapter is the criticism that the reliance upon physical barriers alone fails to acknowledge that criminals are able to adapt their methods to overcome the barriers which face them. In the case of the Constantinople, the walls which had acted as protection were weak from above (bombardment) and below (mining) once attackers had adapted to the restraints that faced them.

> "The first transforming event was the fall (or liberation, for Muslims) of Constantinople in 1453 when the Ottoman Turks were able – assisted by gunpowder … and cannon … to lob 800 pound cannon balls against the city's walls, breaching them over the course of fifty days. These were the same walls that had withstood the onslaught of Islam for 700 years" (Schneider and Kitchen, 2002 p.77).

For this reason, crime reduction practitioners must avoid complacency by continuing to research the effectiveness of any crime reduction measure which they are implementing. A measure which has worked to reduce crime in the past will not automatically continue to do so once criminals adapt their methods.

To avoid this criticism, CPTED interventions must continue to evolve by carrying out research with an improvement orientation. It is not sufficient to accept that a crime reduction measure works per se, the focus must be placed upon ensuring that standards continue to evolve faster than criminals' abilities to overcome them.

> "Reacting once crime harvests happen is the least desirable state of

affairs. Scanning for new threats and reacting quickly to spread the alert is better than waiting for the future to take us entirely unawares. And anticipation – seeing the wave coming and taking avoiding action – is best of all" (Ekblom 2002 p.38)

Chapter Two – Part Three
Secured by Design

SBD is a UK based initiative, managed by ACPO Crime Prevention Initiatives Ltd. (ACPO CPI Ltd.), which aims to encourage the building industry to design out crime. SBD was devised in 1989 by police forces based within the South East of England, with the aim of countering the rise in household burglary (Pascoe and Topping, 1997). Very little has been published on the origins of the scheme and the theories upon which it was based, however, papers by both Cozens *et al* (2001) and Pascoe and Topping (1997) suggest that the initiative was based, in some part, upon Newman's theory of defensible space (1973). In an attempt to establish how far the SBD scheme was theoretically and empirically supported at the time of its inception, Pascoe and Topping (1997) conducted a review of the available documentation as well as interviews with 15 police officers. They suggest that the scheme was influenced by both environmental criminology (including SCP and defensible space) as well as theories which focused upon offenders as decision makers (including rational choice theory). Although it is estimated that in the seven ensuing years, 35,000 SBD homes were built on nearly 3,700 estates these figures are no longer updated by the Crime Prevention College and unlike the Secured Car Park scheme, there is no national database which monitors the number of houses or estates built to the SBD standard. There have, however, been several legislative and policy developments since this figure was published which anecdotal evidence suggests have contributed to a rise in the use and popularity of SBD. These include the Crime and Disorder Act 1998, the Human Rights Act 1998, Housing Corporation incentives such as enhanced funding for meeting additional security requirements, Best Value Performance Indicators relating to crime reduction and multi-agency working as well as the Home Office Circular 5/94.

SBD includes both the Developers' Award and Licensed Products. The Developers' Award is a certificate given to building developments which are built to the SBD standard. That is, following consultation with the police Architectural Liaison Officer (ALO) or Crime Prevention Design Advisor (CPDA) the development is deemed to conform to the appropriate ACPO guidelines. SBD guides exist for a variety of buildings and spaces including new homes, refurbishments, sheltered accommodation, multi-storey dwellings, car parks, railway stations, caravan parks and play areas. It is the Developers' Award element of SBD - that which deems a property/area to be SBD or not, upon which this thesis is focused.

The second element of SBD, which has been more recently developed, is Licensed Products. ACPO CPI Ltd. may award SBD Licensed Company status to companies which produce doors and windows which pass the standards and tests required to achieve the SBD status. The minimum standards for SBD are prepared through consultation with the ACPO Project and Design Technical Committee, as well as other relevant agencies, and are subject to regular review. The specific standards for SBD developments are included at appendix 1 and can also be accessed via the SBD website (Standards and Testing, 2004).

The SBD scheme was developed in consultation with the Department of Transport and the Local Regions as well as trade, industry and standards organisations. It also has the backing of the Home Office. Although the SBD scheme requires the input of a variety of agencies such as local authority planning departments, registered social landlords (RSLs) and architects, it is managed and promoted primarily by the police. Each police force has a number of ALOs or CPDAs who work in consultation with these different agencies to ensure that as many developments as possible are designed and built (or refurbished) to the SBD standard. It is the responsibility of ALOs and CPDAs to assess planning applications from a security perspective and to work with developers to attempt to address any design weaknesses which emerge. The process from the submission of a planning application to the ALO/CPDA awarding SBD status may vary considerably depending upon the police force as well as the client involved. Where a client is required to build all new homes to SBD standard (this is the case for several RSLs) and is familiar with their appointed ALO/CPDA and the process of applying for the SBD award, applications are likely to be submitted at the concept stage with plans which already meet (or almost meet) the required standards. In this instance, the work of the ALO/CPDA would differ greatly from a case whereby plans were submitted at the post-planning stage with designs which would require major alterations to ensure that the development complied with the scheme. A more common scenario is likely to be somewhere between these examples, with ALO/CPDA and client negotiation taking place at the planning stage. Again depending upon the police force/local authority area, this negotiation process is likely to rely heavily upon both national and local policy such as the Unitary Development Plan and any Supplementary Planning Guidance, which should emphasise the importance of security considerations.

Although it is the responsibility of individual ALO/CPDAs to determine whether a development receives the SBD award, there is an appeal process should developers disagree

with the decision made by the ALO/CPDA. Although a developer has never appealed against a decision made within the West Yorkshire region and only four appeals have been made nationally in the first eight months of 2004, ACPO outline the appeals procedure as follows:

- ALO/CPDA refuses to offer SBD certification;
- Developer contacts the Chair of ACPO Crime Prevention Design Group (CPDG);
- A nominated representative is allocated to the appeal. This representative will not be from the same region as the ALO/CPDA in question;
- The representative submits their findings to the Chair of ACPO CPDG for consideration by the committee;
- Assuming that there are no difficulties arising from the representative's interpretation of SBD or any other facts involved in the case, the decision will be made at committee level;
- If there is still a problem, then the appeal will be heard by the ACPO Officer responsible for the ACPO CPDG. This will take the form of a hearing

As was mentioned within the opening paragraph, the principles of SBD draw largely upon the New Opportunity Theories of crime and upon crime prevention measures such as SCP and CPTED which assume that crime is a response to opportunity, therefore removing the opportunity can reduce crime. These theories also place an emphasis upon the role of the environment in creating or impeding these opportunities. The principles of SBD fall largely into the following categories:

- Physical Security: SBD sets standards of physical security for each property and its boundaries. These include BS: PAS 23-1: 1999 (general performance), BS: EN 1303: 1998 (lock cylinders for multi-point locking), BS 3621: 1998 (locks), BS: PAS 24-1: 1999 (security performance), LPS 1175: Issue 4, 1998 (specification for testing) for doors and BS: 7950 (security performance), BS 7412: 1991 (plastic windows), BS 644-1: 1989 (wood windows), BWF: TWAS (timber windows), BS 6510: 1984 (steel windows), LPS 1175: Issue 4, 1998 (specification for testing) for windows.
- Surveillance: SBD estates are designed to achieve maximum natural surveillance without compromising the need for privacy.
- Access/Egress: SBD estates are designed to include a minimum number of access/egress points in an attempt to avoid unnecessary entry onto the estate by non-residents and potential offenders.

- Territoriality: In an attempt to achieve maximum informal social control, SBD draws upon Newman's principles of Defensible Space (1973). If space has a clearly defined ownership, purpose and role, it is evident to residents within the neighbourhood who should, and more importantly who should not be in a given area.
- Management and Maintenance: SBD estates should have a programmed management system in place to maintain the area. This includes the removal of litter and graffiti.

Chapter Two – Part Four
Principles of SBD

As was discussed within part two of this chapter, the main premise upon which initiatives such as SBD are developed is that crime is a response to opportunity and that opportunities are largely influenced by the environment in which offenders or potential offenders operate. This section of the chapter will focus upon previous research carried out into the influence of the environment upon offender decision making. This will be broken down into the main principles of SBD - these being physical security, surveillance, access and egress, territoriality and finally management and maintenance.

Physical Security - Can I get in?

Although SBD does not rely solely upon physical security, the standards set to which doors, windows, fences etc. must adhere to, suggest that physical security is viewed as a crucial factor. Previous research into this subject is mixed, with several studies suggesting that the actual home break-in requires little in the way of technical sophistication and is a low priority for burglars when searching for targets (Reppetto, 1974; Maguire and Bennett, 1982). However, the majority of studies appear to suggest that with all other factors being equal, burglars would prefer to offend against properties with lower levels of physical security. Cromwell *et al* (1991) used staged activity analysis (interviews and ride-alongs) with a sample of 30 active burglars as a means of establishing which (if any) environmental cues influenced target selection. Although the majority of participants initially stated that they were not deterred by locks or alarm systems, during burglary reconstructions it was discovered that given two potential sites, all other factors being equal, they would prefer to offend against properties with lower levels of physical security. Over 90% of the sample stated that they would not choose a target with an alarm system and 75% of the sample stated that they would be deterred by a sign or a window sticker that stated that the house was protected by an alarm system.

Brown and Altman (1983) studied the environmental features of 306 burgled houses on burgled blocks, non-burgled houses on burgled blocks and non-burgled houses on non-burgled blocks and found that when compared with non-burgled houses, those which had been burgled had fewer symbolic barriers characteristic of primary territories and more indicators of public territories (i.e. stop signs). These properties also had fewer actual barriers such as fences and

locked gates protecting private territory from public access. Brown and Bentley (1993) studied a group of 72 incarcerated burglars who were each shown 10 pictures of homes - half burgled, half non-burgled. They were asked to rate the properties on a number of risk factors as well as judge their burglary status. Across all 10 homes, houses judged as difficult to enter were perceived as being non-burgled.

Surveillance - Is Anybody There?

As was discussed within the previous section, SBD estates are designed to achieve maximum natural surveillance without compromising the need for privacy. This is achieved through a variety of methods. Houses are positioned so that entrances face the street, foliage, walls and fences must not obstruct sightlines and wherever possible, estates include a mix of dwelling types suited to a variety of residents such as families, elderly and young couples, thus maximising the likelihood that at least one neighbour will be at home throughout the day and night. Research suggests that the issue of surveillance is crucial in offender decision making, with occupancy or signs of occupancy, the location of neighbouring properties and the level to which they can remain anonymous influencing a burglar's target choice.

Offenders prefer to avoid confrontation with residents (Rengert and Wasilchick, 2000) and where possible, select targets which are unoccupied (Reppetto, 1974, Cromwell *et al* 1991). Reppetto (1974) found that the most common reason given by 97 convicted burglars for avoiding a particular target was that there were 'too many people around' – over a third of the sample gave this as a reason for avoiding a particular target. Cromwell *et al* (1991) found that over 90% of participants (n=30 active burglars) stated that they would never enter a residence that they knew to be occupied. Brown and Bentley (1993) asked 72 incarcerated burglars to assess from photographs whether or not properties had been burgled. Across all ten homes, the houses judged to be occupied were perceived as being non-burgled.

In determining whether or not a property is occupied, offenders look for clues or traces of occupancy. Brown and Altman (1983) studied 306 burgled and non-burgled properties and found that burgled houses showed fewer indications of the probable presence of residents than non-burgled properties. These signs or traces included toys strewn across the yard or sprinklers operating in the garden.

As well as occupancy, the likelihood that offenders will be noticed by neighbours also appears to be crucial in the decision making process. Reppetto (1974) found that over a fifth of the sample of 97 convicted burglars stated that the possibility of neighbours watching them deterred them from selecting a property. This research also suggests that burglars select locations where they feel less conspicuous – race being a particularly important factor in this decision making process. In support of Reppetto's findings, Brown and Altman (1983) found that burgled properties had less visual access to immediately neighbouring properties than non-burgled properties.

Territoriality - Does Anybody Care?

The principles of SBD incorporate much of Oscar Newman's theory of Defensible Space (1973). Newman categorised space into public (i.e. the road in front of a property), semi-public (the front garden), semi-private (the back garden) and private (inside the property itself). He argued that all space should have a clearly defined ownership, purpose and role (increasing the level of private and semi-private space by designating public areas to individual families) thus allowing residents to develop proprietary feelings towards the space within, and more crucially, surrounding their property. Newman argued that the physical design of a neighbourhood can either release or inhibit people's latent sense of control over the spaces in which they live. SBD aims to encourage what Newman refers to as territoriality through ensuring that private and semi-private space is maximised and public space is kept to a minimum. Front gardens are bounded by fencing – not to physically prevent entry, but rather to convey a message that 'this area is private'. Entrances to estates are also narrowed with a change in road colour and texture to portray the impression to outsiders that they are entering a private area. Research relating to territoriality is mixed. Whilst Newman (1973, 1995) found that housing estates designed with higher levels of communal space and a lack of clear demarcation between private and public space experienced higher levels of crime and disorder, others question the influence which architectural design can have upon resident's willingness to actually intervene if a crime were to take place. The extent to which architectural design *alone* can influence resident behaviour is questioned by Merry (1981) who supports the suggestion that housing estates in which residents show increased levels of social cohesion, social organisation and interaction experience lower levels of crime and disorder, but questions the direct relationship between the architectural design and the residents' behaviour.

Merry (1981) examined the link between social organisation and crime and disorder in an American housing development which had been built to encompass many of the design features of defensible space. Within the housing project which Merry examined, 78% of the first floor residents had installed expensive iron bars over their windows. In the 4 years 1972-1976, police recorded statistics suggested that the project had suffered 117 robberies and purse snatches and 40 burglaries. Merry's own victimisation survey suggested that there had been 89 burglaries, 50 robberies and purse snatches and 10 assaults within the project area. Over half of these robberies reported in the victimisation survey took place in areas which were architecturally defensible. Merry suggests that the benefits of designing housing estates to maximise territoriality and surveillance fail to account for the behaviour of many residents who a) are not always present to look out of their window – which has been designed to overlook the neighbouring properties, b) may not be able to distinguish neighbours from strangers, c) may not be able to distinguish a 'domestic' from a 'brawl' – due to different social and cultural backgrounds and d) may be afraid to intervene due to fear of retribution.

> "Architectural design is necessary to create spaces which can be defended, but in this setting, actual intervention seems to depend on a sense of responsibility and control over territory, access to effective modes of intervention, commitment and involvement in the neighbourhood, and as a result of these factors, relatively little fear" (Merry, 1981 p.412).

Several research papers support the premise that neighbourhoods in which residents display signs of territorial behaviour actually experience (or are judged by offenders to be likely to experience) less crime (Brown and Altman, 1983; Brown and Bentley, 1993). However, the direct ability to link that territorial behaviour to the architectural design of the property (and the neighbouring estate) is limited. Evidence supporting the premise that properties are less likely to be burgled if their residents show evidence of territorial behaviour i.e. well tended garden, signs on the gate or fences bounding the front garden, cannot be used as support for the theory that the design of the house or the layout of the estate created that territorial behaviour.

Just as evidence to support the direct link between architecture and resident behaviour is limited, those who raise doubts about defensible Space tend to question the architectural determinism, rather than raising evidence to suggest contrary findings i.e. that architectural design can *increase* as opposed to *reduce* crime. Unfortunately, the abundance of research which has studied the factors which predict territoriality through behaviour such as membership of

Neighbourhood Watch or other forms of crime prevention scheme, has focused largely upon personal factors such as gender, age, ethnicity and prior victimisation and does not include the design and layout of the housing estate in which they live. As was highlighted by Merry (1981), the territoriality created by defensible space may not always be adequate to overcome the crime and disorder problems within a neighbourhood and other factors such as fear of retribution, confusion and simply being unaware must be taken into account. Residents/shoppers/passers by do not always notice a crime taking place (Gelfand *et al* 1973; Mawby 1977; Mayhew *et al* 1979) and even if they notice the crime, they do not always take action to prevent it (Rosenthal, 1964; Latane and Darley, 1970).

Access/Egress - Encounter versus Enclosure:

One of the major current debates surrounding designing out crime within residential housing is that of permeability (through-movement). The debate centres upon the benefits of facilitating movement within an area weighed against the risks of potentially criminogenic design. Those who argue in favour of permeable housing believe that residential areas should encourage movement and thus allow passers by to create an informal surveillance or act as guardians for that area. Much support for the issue of permeable housing estates emerged following the Rio Earth Summit of 1992 (United Nations Conference on Environment and Development, 1992) and its product document Agenda 21 which encourages sustainability – getting people out of their cars and onto their feet and bicycles. In contrast, the principles of SBD draw upon research which suggests that encouraging movement through a housing estate allows offenders to attach that area to their awareness space as well as giving them a legitimate reason to be where they should not be. For example, if a housing estate is permeable with an abundance of footpaths, this gives an offender the opportunity to notice a vulnerable property en-route to school, work or leisure activities and to familiarise themselves with the daily routines of those living within the target property. As well as increasing the likelihood that an offender will notice the property, permeable estates give offenders an excuse to be within a given area. A resident living within a property which has a footpath running at the rear of the back garden may notice a stranger acting suspiciously, yet apprehension of that individual would likely be ineffective due to the possible legitimate nature of that individual's journey. Put simply, a resident has no right to apprehend an individual whom they feel may be considering their property as a potential target for burglary because that individual could simply reply that they are on their way to the shops or to visit a friend.

For those whose job it is to make decisions about planning applications regarding the design and layout of residential housing, there remains a conflict in advice. Whilst a large proportion of criminological research warns of the dangers involved in increasing access and permeability, several research studies, as well as design guidance (Department of the Environment, Transport and the Regions, 1998; Department of the Environment, Transport and the Regions, 1999) have suggested that through movement and permeability is preferable to limited access when attempting to reduce crime (Rudlin and Falk, 1995; Hillier and Chi-Feng Shu, 1998; Chi-Feng Shu, 2000).

> "It seems that burglars avoid dwellings on linear constituted through carriageways and also on the first line into the cul-de-sacs off integrated streets, and instead look for those in the deeper, more segregated parts of the tree like cul-de-sac complex, especially those with unconstituted back access" (Chi-Feng Shu, 2000 p.187).

As well as the design guidance and research discussed, there also exists a design movement termed New Urbanism (also known as Neo-Traditional Town Planning and Traditional Neighbourhood Development) which argues that vibrant streets and walkable neighbourhoods will reduce opportunities for crime. Schneider and Kitchen (2002) highlight how although the ultimate aim of New Urbanism is the same as SBD (that being to regenerate neighbourhoods and reduce crime and disorder as well as the fear of crime and disorder); the means by which they aim to achieve this are, in many instances, very different. New Urbanism encourages walkable neighbourhoods, mixed land use, using rear access alleys, hiding garages and eliminating *culs de sac* in favour of permeable street networks - measures which would not be acceptable within SBD housing. In contrast, there exists an abundance of criminological research which suggests that crime is higher along major vehicular or pedestrian pathways as opposed to within closed estates such as *culs-de-sac* which limit through movement (Brantingham and Brantingham, 1975, 1993, 2000; Bevis and Nutter, 1977; Brantingham *et al*, 1977; Brown and Altman, 1983; Newlands, 1983; Greenberg and Rohe, 1984; Cromwell *et al*, 1991; Mirlees-Black *et al*, 1998; Rengert and Wasilchick, 2000). The rationale behind these findings falls largely into the following categories:

a) Permeable neighbourhoods offer ease of entry and escape;

b) Offenders are more likely to be aware of potential targets that they pass on a day to day basis. Therefore, crime will be higher along travel paths, both pedestrian and vehicular;

c) Permeable neighbourhoods offer increased anonymity for potential offenders.

Research supporting the first rationale – that offenders prefer permeable neighbourhoods due to the ease they offer in terms of entry, through movement and escape, includes Taylor and Gottfredson (1987) and Poyner and Webb (1991). The second explanation for higher crime within permeable neighbourhoods, suggests that offenders have to be aware of a property's existence before they can select it as a target for crime. As offenders spend much of their time travelling between home, work, school or leisure activities, the properties that they become aware of are likely to be along the travel paths that they frequent.

> "Since burglars are, in a time-budget sense, primarily non-burglars, their activity spaces, or places they usually spend time, are most likely similar to the activity spaces of non-burglars from similar backgrounds and living in similar areas" (Brantingham and Brantingham, 1984 p.80).

Research which supports this perspective includes that of Wiles and Costello (2000) who used interviews with offenders, police recorded crime data and forensic science data from the police DNA database as a means of investigating the distance which offenders will travel to offend. Their findings suggest that burglars are largely opportunistic, with the selection of a particular target taking place as they pass properties and notice their suitability.

> "Offenders do not inhabit a world in which offending and non-offending routines are straightforwardly dichotomised. Offending, therefore, fits in with other routines as opportunities, needs or temptations present themselves and routines themselves can include both deviant and non-deviant behaviour" (Wiles and Costello, 2000 p.40).

Additional research findings which support the premise that offenders select properties as they take part in day to day activities include Letkemann (1973) who found that burglars interviewed in British Columbia stated that they generally kept their eyes open for targets all of the time. Rengert and Wasilchick (2000) found that convicted Philadelphia area burglars usually picked their targets within a limited distance of their normal travel paths, primarily along the axis of their usual home-to-work travel path. Feeney (1986) and Gabor *et al* (1987) found that individual choice of robbery locations was oriented or directed towards personally well known locations. Beavon (1984) analysed police recorded crimes and found that for all types of crime (with the exception of bicycle theft) crime decreased the further the target was located away

from highly accessible roads. Taylor and Nee (1988) found that burglars express a consistent preference for corner houses.

The rationale behind this preference may relate to awareness of the property as well as the increased ease through which they can enter and escape from a corner home. And finally, Poyner and Webb (1991) suggest that through routes allow offenders to search for potential targets. The final rationale, that offenders prefer targets located within areas of high pedestrian movement due to the anonymity which this movement provides, is supported by Angel (1968), Suttles (1968), Brantingham & Brantingham (1975), Taylor and Gottfredson (1987) and Poyner and Webb (1991).

> "Avoid creating pedestrian routes through housing areas as this encourages search behaviour by prospective thieves. It gives them an opportunity to wander freely through any housing area without looking out of place" (Poyner and Webb, 1991 p.95).

Those who offer the counter argument suggest that through movement encourages people to the area who can subsequently act as guardians and enhance informal social control. Jacobs (1961) is often quoted as a supporter of 'eyes on the street' as a means of reducing crime. However, as was discussed earlier within this chapter, Jacobs' theory that increased movement can act to reduce crime, was never meant to be applied to towns, villages or housing estates and should only be applied to cities.

Management and Maintenance:

In recognition of research which highlights that anti-social behaviour can act as a catalyst for increased crime and disorder, higher levels of fear of crime and a reluctance by residents to engage in informal crime prevention activities (Skogan, 1990), SBD places a large emphasis upon management and maintenance. Several studies have suggested that if low level disorder such as vandalism and litter are not addressed, they can act as a catalyst for more serious crimes. Skogan (1990) refers to this as the contagion theory, suggesting that the "presence of vandalism stimulates more vandalism" (p.39). Wilson and Kelling (1982) refer to this contagious effect as the "broken windows theory" (p.16). This suggests that an area with existing deterioration such as graffiti and vandalism conveys the impression that a) nobody cares so apprehension is less likely and b) the area is already untidy so one more act will go unnoticed. Because of existing deterioration, the area is not only an easy target, it is also viewed as fair game. This is supported

by Zimbardo (1970) and Finnie (1973) who found that anti-social behaviour such as vandalism, rubbish or criminal damage leads directly to more anti-social behaviour. Taylor and Gotttfredson (1987) also found that physical incivilities indirectly influence offenders' perception of risk in that they portray a resident's level of care or concern for the area in which they live, thus acting as an indicator for the likelihood that they will intervene if they detect an offence taking place.

> "The incivilities thesis proposes a process that links residents making inferences about potential offenders and offenders making inferences about potential interventions by residents" (Taylor and Gottfredson, 1987 p.405).

Chapter Two – Part Five
The Current Climate within the UK

Since its inception in 1989, SBD has seen policy and legislative changes which have both encouraged its development as well as hindering its progress. The majority of policy developments have been favourable, with the increasing importance placed upon both community safety and multi-agency crime reduction. One of the most important legislative changes has been the Crime and Disorder Act 1998 which has placed a statutory responsibility upon partners such as local authorities and the police, to work together to reduce crime and disorder. It seemed appropriate to the writer to include in the thesis the legislative and policy framework within which SBD has to be considered.

The Crime and Disorder Act 1998:

The Crime and Disorder Act (1998) emerged as a result of the 1991 report entitled Safer Communities: The Local Delivery of Crime Prevention Through the Partnership Approach (otherwise known as the Morgan Report) and was the work of an independent working group convened by the then Home Office Standing Conference on Crime Prevention, under the Chairmanship of Mr James Morgan. The report underlined the need for broadly based, multi-agency approaches to crime prevention and reduction, within which agencies could co-operate as well as deliver their own contribution.

The Crime and Disorder Act introduced many changes to the field of community safety. However, the elements which impacted most prominently upon crime reduction schemes such as SBD, were Sections 5, 6 and 17. Under sections 5 and 6 of the Crime and Disorder Act 1998 relevant partners were set the task of compiling Crime and Disorder Audits designed to ascertain the extent, level and locality of crime and disorder within their area. The audit document had to be presented to the public in a consultation exercise before a Crime and Disorder Strategy was compiled which set out clear aims and objectives for reducing crime and disorder. This placed a requirement upon the police and local authorities to work together to reduce crime in their area and led to the development of multi-agency partnership groups whose task it was to devise, implement and measure local and national crime reduction targets. This climate of multi-agency working between departments who had previously been excluded from the crime reduction agenda, such as Development and Control and Housing and Planning departments has created a perfect arena within which SBD can flourish. Partnerships are

searching for interventions which allow them to demonstrate their commitment to work together to reduce crime, the fact that SBD requires the input and expertise of so many of these agencies, renders it a ideal choice to demonstrate compliance.

As was previously mentioned, the Crime and Disorder Act placed a requirement upon partnerships to produce crime and disorder strategies every three years. The first strategy had to be published by April 1999, often leaving newly formed partnerships very little time (Byrne and Pease, 2003 suggest that partnerships had little more than six weeks) to compile an audit, consult with service users and service providers, set aims, objectives and targets for the reduction of crime within their area and publish a three year strategy containing these findings. As Sampson (2000) highlights, this left little time for partners to consider the remaining sections of the Act which were less urgent in terms of imposed deadlines. As a result, many partnerships failed to realise that the Crime and Disorder Act had far more depth and that these partners would be required to do more than provide data for the audit, or contribute to the development of local targets. Through Section 17 they would be required to demonstrate that they had considered the crime and disorder implications of every decision that they made. Section 17 of the Crime and Disorder Act 1998 states that "it shall be the duty of each authority to which this section applies to exercise its various functions with due regard to the likely effect of the exercise of those functions on...crime and disorder in its area" (Great Britain, 1998a). This means that all relevant partners must be able to demonstrate that they have considered the crime and disorder implications of every decision that they have made and consequently, that they have done all that they reasonably can to reduce crime and disorder within the area. Examples of these decisions include the decision to grant planning permission for new housing estates, maintenance of open spaces, housing allocation policies, the levels of security in council owned car parks or the maintenance and level of street lighting. Moss and Pease (1999) refer to Section 17 as "the most radical part of the Act" (p.15), suggesting that "it is difficult to conceive of any decision which will remain untouched by s 17 considerations" (p.16).

Bullock *et al.* (2000) highlight the legal implications of non-compliance with Section 17. These broadly translate to a) Liability in private law for breach of statutory duty, and b) Liability to judicial review under the doctrine of *ultra vires*. Under the first option there exists three possibilities:

- **Careless exercise of statutory powers and duties:** In this case it must be proven that the plaintiff suffered damage and that the public body owed the plaintiff a legal duty of care. In making judgements about potential breaches the courts must also look at two further issues, these are i) reasonableness and ii) the intentions of Parliament and the public interest i.e. what was the thinking behind the Act? For example, Clunis was found guilty of the murder of John Zito following his release from a psychiatric hospital, he sued the local authority for negligence under Section 117 of the Mental Health Act 1983, stating that it was their duty to provide aftercare for the mentally disordered. The court's response was that they did not believe that parliament intended alleged failures of this duty to be actionable in damages and he therefore failed (*Clunis v Camden and Islington Health Authority, 1997*).

- **Failure to exercise a statutory power:** This could only occur in very limited cases where the plaintiff could prove that i) the failure was irrational, ii) that a finding of liability would not be contrary to the policy considerations of the Act. For a court to reach this finding, they must be able to identify the Act's requirement precisely. With the wording of Section 17 of the Crime and Disorder Act 'all that it reasonably can', this would not be straightforward.

- **Breach of statutory Duty:** In this case the plaintiff must prove that the public body was under a statutory duty to take a particular course of action, that the duty was not fulfilled and that this failure caused damages.

The second option involves a Judicial Review. A Judicial Review allows people with enough interest in a decision made by a public body to ask a judge to assess its lawfulness. It does not assess the merit of a decision, merely its lawfulness. Remedies include: i) Certiorari - quashing a decision, ii) Prohibition - preventing a public body from making an illegal, irrational or improper decision, iii) Mandamus - forcing a public body to reach a decision when it has failed to do so, but it does not determine outcome, iv) Declaration - declares the way in which the act should be interpreted in the future, v) Injunction - prevents an illegal act and enforces the performance of a public duty and vi) Damages - compensation payable to individuals against whom unlawful decisions have been made. There are several ways in which a local authority can be found to have made an unlawful decision, and these are known as 'grounds' or 'heads of

review'. These are i) Illegality (under which comes failure to fulfil a Statutory Duty) ii) Irrationality iii) Procedural Impropriety and iv) Incompatibility with European Law (this includes Section 6 of the Human Rights Act 1998 – 'Breach of a Convention Right). Moss and Pease (1999) highlight one of the many outcomes of non-compliance with Section 17 of the Crime and Disorder Act.

> "There are many circumstances in which an individual citizen, a business or a residents group could plausibly argue that a local authority had breached s.17. To take one example: someone moves into new home. She is told by the police that her home is not built to SBD standards, despite the area's high rate of burglary. A Residents' Association meeting is convened and she finds that the experience is not unusual: burglars always gaining entry in the same way because of the clear design weaknesses. With the Association's support she successfully seeks a judicial review of the authority's actions, with the expectation of a decision of mandamus, whereby the security uprating of the homes to SBD is ordered" (Moss & Pease,1999 p.16).

Although building homes to SBD standard is not a requirement of Section 17, or any other part of the Crime and Disorder Act, these legislative requirements have created an arena in which partners are seeking interventions which will not only reduce crime and disorder, but will explicitly demonstrate that they have worked together as a partnership.

Human Rights Act 1998:

The Human Rights Act 1998 came into force on the 2nd October 2000 and includes many elements which are relevant to SBD and crime reduction. Section 6 states that it is unlawful for a public authority to act in a way which is incompatible with a convention right. Schedule 1 - Part 1 includes articles 5 and 8 which state (respectively) that individuals have the right to liberty and security of person and respect for private life, the family and the home. Article 1 of the First Protocol (Part 2) states that individuals have the right to the peaceful enjoyment of possessions and the protection of property. The Human Rights Act spreads its net much wider than Section 17 of the Crime and Disorder Act and applies to all public bodies.

Countryside and Rights of Way Act 2000:

Another legislative change which has eased the implementation of certain designing out crime measures (such as closing footpaths and alley-gating) is the Countryside and Rights of Way Act 2000 which states that highways can be closed or diverted on crime reduction grounds. Schedule 6, Part 1, Section 8 states that under Section 118B, which is inserted after 118A of the

1980 Highways Act, highways can be 'stopped up' or diverted where their existence is facilitating the persistent commission of criminal offences, where premises adjoining or adjacent to the highway are affected by high levels of crime, or for highways that cross land occupied by school premises, where that diversion would prevent crime and disorder against school staff or pupils. This Act is highly relevant in terms of rectifying already existent design mistakes in residential areas where footpaths are facilitating the commission of crime either by aiding the entry/escape to properties or by giving an offender a reason to be in an area. Until this act, the closure of alleyways still considered by opponents to be public rights of way, was a complex and costly legal process resulting in many local authorities choosing to avoid this course of preventative action (Kodz and Pease, 2004).

Planning Guidance:

As Schneider and Kitchen (2002) highlight, although planning departments hold much of the decision making powers relating to housing design and layout, they traditionally have very little knowledge of crime prevention theory or best practice. However, the introduction of the Planning Circular 5/94 (Department of the Environment, 1994), as well as the many other legislative changes discussed within this chapter, has aided the partnership working between planners and police, ensuring that crime implications are at least considered (if not accepted) in all planning decisions.

> "Given the fundamental significance of crime impacts and costs to urban liveability in Britain and the United States, it is extraordinary how peripheral a role urban planners and designers have played in place-based crime prevention" (Schneider and Kitchen, 2002 p.22).

Circular 5/94 placed the consultation between police ALO/CPDAs and Planning departments on a more formal footing as well as recognising the link between design and crime. Although the circular did not make consultation between police and planners mandatory, it encouraged it as best practice and urged planning authorities to consider crime prevention in their development plans. The Urban Policy White Paper (Office of the Deputy Prime Minister, 2000) proposed that circular 5/94 should be reviewed and in 2004 Safer Places – The Planning System and Crime Prevention (Office of the Deputy Prime Minister, 2004) was published. Although this guide highlights the importance of crime reduction considerations in planning and design, its seven attributes of safer places have not addressed the confusion surrounding access and movement and the message conveyed still remains unclear. For example, the guide

highlights how safer places will have "well-defined routes, spaces and entrances that provide for convenient movement without compromising security" (p.16). Yet the following paragraph highlights how crime and anti-social behaviour are more likely to occur if "there are several ways into and out of an area – providing potential escape routes for criminal activity" (p.16). The answer, according to this guide, is that "too few connections can undermine vitality, too many – and especially too many under-used or poorly thought out connections – can increase the opportunity to commit crime" (p.16). Although this guide emphasises the importance of crime reduction in planning and design, and recognises that structure, surveillance, ownership, activity and management and maintenance are key factors when designing safer communities, it is unfortunate that its message has failed to clarify many of the issues relating to through movement and housing layout.

Chapter Two – Part Six
Conflict, Confusion and Contradiction

Recent legislative change has seen the responsibility for crime reduction extended to agencies for which this issue had held very little prior significance. Coupled with the increasing emphasis placed upon the identification and implementation of what works, the stage should be set for a harmonious, multi agency approach towards crime reduction - yet advice remains confusing and contradictory. The main area of conflict within the field of designing out crime has been the issue of permeability or through movement. This debate (which has rather simplistically been presented as one of *culs-de-sac* versus through roads) has dominated much of the discussion surrounding SBD over the last five years, with headlines such as "End of the Road for the Cul-de-Sac" (Fairs, 1998, p.1), "Culs-de-Sac Hit the Skids" (Stungo, 1998, p.2) and "How Brookside Boom Helped the Burglars" (Summerskill, 2000, p.16). Those in favour of limiting through-movement generally argue that a residential area which encourages movement (be it vehicular or pedestrian) gives offenders an opportunity to attach that area to their awareness space. If a property is located on a through road which is used as part of an individual's route to work, school or leisure facilities, that individual will become familiar with who lives where, what time they leave for work, what car they drive and will generally feel less conspicuous within that neighbourhood. Those in favour of permeable, walkable neighbourhoods argue that sustainability - meeting the needs of the present without compromising the ability of future generations to meet their own needs, is the most important issue in future design considerations.

Crime and Disorder Reduction Partnerships (CDRPs) consist of statutory and non-statutory agencies such as Police, Local Authorities, Primary Care Trusts, Fire Service, Probation service, Victim Support, local business and community representatives. Although some multi-agency partnerships existed pre-1998, primarily in Labour-controlled authorities which took note of the Labour opposition's intention to implement the Morgan recommendations on coming to power, the majority were developed as a response to the 1998 Crime and Disorder Act (Sections 5 and 6). Although these partnerships are guided by several policy and legislative requirements, it is the Crime and Disorder Act which forms the basis of their work. As was discussed in part five of this chapter, Section 17 of this Act placed a responsibility upon these authorities to do all that they reasonably can to reduce crime and disorder within their area and

to consider the crime and disorder implications of every decision that they make. As the majority of partners work within a crime and disorder arena, the sources from which they draw most of their information are criminological in nature, with a large proportion of this research suggesting that unnecessary footpaths should be avoided, access and egress minimised and permeability limited (Brantingham and Brantingham, 1975, 1993, 2000; Bevis and Nutter, 1977; Brantingham *et al,* 1977; Brown and Altman, 1983; Newlands, 1983; Greenberg and Rohe, 1984; Beavon, 1984; Taylor and Gottfredson, 1987; Cromwell *et al,* 1991; Poyner and Webb, 1991; Rengert and Wasilchick, 2000; Wiles and Costello, 2000). As well as seeking guidance from criminological research, CDRPs may also look for guidance from the police. Again, this advice would suggest limiting footpaths and through-movement.

> "It is recognised that too many footpaths and through roads in developments help to make crime easier to commit. They provide choice of alternative escape routes from the scene of the crime, rather than obliging the offender to return by the way he came. The opportunity to take a different route gives him the anonymity and safety he seeks, as opposed to the dangers of returning the same way, where he may have already been noticed. The more alternative routes there are, the more confident the wrongdoer feels, and the easier it is to commit crime" (Standards and Testing, 2004).

In contrast, the sources of guidance for planning departments, whose task it is to make decisions regarding the design and layout of residential housing, offer very different advice regarding permeability and accessibility. Planners work for local authorities; local authorities have a statutory duty to reduce crime under Section 17 of the Crime and Disorder Act 1998. They are also bound by Section 6 of the Human Rights Act, which states that it is unlawful for a public authority to act in a way which is incompatible with a convention right. Three convention rights (Schedule 1 – Part 1, Articles 5 and 8 and Article 1 of the First Protocol, Part 2) relate to security and safety:

The conflict for those working in planning departments emerges when their sources of guidance are scrutinised. Places, Streets and Movement. A Companion guide to Design Bulletin 32 – Residential roads and footpaths (Department of the Environment, Transport and the Regions, 1998) states that "The principle of the walkable neighbourhood is the key to creating a sociable, sustainable community" (p.39). Towards an Urban Renaissance (Department of the Environment, Transport and the Regions, 1999) also makes contradictory suggestions relating to housing layout.

> "A user friendly public realm should make walking and cycling easy, pleasant and convenient by keeping the size of urban blocks small, with frequent pedestrian cut-throughs to make a new development permeable and accessible to the existing neighbourhoods" (Department of the Environment, Transport and the Regions, 1999 p.71).

Many agencies are required under current legislation to do all that they reasonably can to prevent crime and disorder within their area. In the case of the design of residential housing this is not an easy task. That the current government places an emphasis upon evidence led practice is a positive step. The fact that this evidence is producing contradictory findings and guidance has led to confusion amongst many key agencies involved in the design, development and ultimately the granting of permission for residential housing. If it were as straight forward as Schneider and Kitchen (2002) suggest, the issue of designing out crime would be in that state of harmonious multi-agency working described within the opening paragraph. It is as a response to the current state of confusion that this thesis has been developed, one of the main aims being to clarify the position regarding permeability and crime and disorder.

> "Indeed, the notion of sustainability – defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (UN Commission on Environment and Development, 1987) is highly compatible with place-crime prevention planning. The latter is presumed to enhance community stability, by helping discourage among other things crime-generated urban out-migration and related economic and social disorder, while improving overall life quality for present and future residents" (Schneider and Kitchen, 2002 p.16).

Chapter Two – Part Seven
Predicting and Preventing

To return briefly to Garland's (1996) quotation discussed in the introduction to this chapter, the extent to which crime is viewed as "an accident to be avoided" or "a moral aberration which needs to be explained" (p.450-451) largely influences the benefits that will be seen in intervening to prevent crime taking place. If as the New Opportunity theories suggest, crime is a response to opportunity, then the future of effective crime reduction is in predicting and blocking future gaps or opportunities.

Historically, those who design and manufacture products have largely ignored the crime and disorder implications of what they are producing. As Pease (1997) suggests, innovations go through three phases – First, design without consideration for the crime consequences; second, reaping the crime harvest, whereby criminals recognise and exploit vulnerabilities, and finally retro-fitting a solution (which is usually only partial). Modern examples of this include mobile phones, the internet or the design of certain types of residential housing. This weakness, however, is not exclusive to modern technology. As Pease (1997) highlights, the Penny Black postage stamp was introduced in 1840 and withdrawn in 1841. The reason for this withdrawal was that the Penny Black was franked with water soluble red ink, which resulted in people washing the ink off and re-using the stamp. The Penny Black had to be replaced with a Penny Red which was franked with an black ink, which could not be removed. A more desirable sequence of events would be that the crime consequences are considered at the design stage, with a regular flow of information between those concerned with crime reduction and those involved with the product's design and maufacture. Ekblom (1997) highlights how designers need to be encouraged to shift their perspective from solely user to user and misuser. Ekblom also highlights how for this to occur, crime reduction information must become more accessible for designers.

> "Much remains to be properly evaluated, and the working knowledge of prevention that exists is couched in a tangle of inconsistent and loosely defined terms and concepts which render it difficult for designers to access, to think about and to apply" (Ekblom, 1997 p.249).

The historical lack of communication between those whose task it is to reduce crime and those whose task it is to design products has led to the development of products, buildings, systems

and even urban spaces which are conducive to the committal of crime and disorder. In these instances, the prime objective has to be reactive i.e. minimising the impact of the crime harvest rather than a more favourable preventative approach. Unfortunately, these bolt-on solutions are often significantly more expensive and as the crime event has already occurred, the victim is left both traumatised by their experience and more vulnerable to future crime and disorder events.

There is however, recent evidence that Government, as well as academics and practitioners are recognising the weaknesses in this reactive response and attempting to anticipate the future impact of the introduction of products (Clarke, 1999; Clarke and Newman, 2002), scientific and technological innovations (Future Scanning Sub Group of the Police Science and Technology Group set up to deliver the Police Science and Technology Strategy), systems and processes (McKinnon and Tallam, 2002; Clarke and Newman, 2002), legislation and regulation (Leppa, 1999) as well as building design (Winchester and Jackson, 1982; Coleman, 1985; Groff and La Vigne, 2001). The Government's Technology Foresight Programme, which aims to identify the technological and business opportunities that will emerge over the next ten to twenty years included a thematic panel on crime reduction in its second round which commenced in 1999 (the findings from the first round failed to highlight crime as an issue of concern). Research is also currently being conducted by the Jill Dando Institute (in collaboration with European partners and funded by the European Commission) which will develop mechanisms for assessing the risk of crime due to legislation, regulation and products – the aim being to anticipate the unintended (criminological) consequences of the introduction of legislation as well as electronic products in order to proof them against this risk.

Risk assessment in criminology is not new; however, the emphasis has largely focused upon the risk factors which increase the likelihood that individuals will become involved in crime, as opposed to the likelihood that products or buildings will become victimised, or legislation, regulation, products or systems will become conducive to the commitment of crime by individuals. Recent legislative requirements which have placed a responsibility upon the Chief Executives of Local Authorities to produce a local prevention strategy for children and young people by April 2003, have brought much of this research to the fore and publications by agencies such as the Youth Justice Board (2001) and Nacro (Wong, 2003) have made some attempts to translate these findings into practical applications for practitioners working within crime and disorder related partnerships. Although there is an abundance of research into the factors which increase an individual's risk of becoming involved in criminality, the identification

of the risk factors which increase a property's vulnerability to crime remains in its infancy when compared to offender focused studies. However, several environmental risk indices have been published, and it is upon these that the methodology for Chapter Four is based.

Winchester and Jackson (1982) created an Index of Risk using 14 variables. The presence of each variable meant the allocation of 1 point. A property with a score of 14 had all environmental factors, a property with 0 had none. Winchester and Jackson's Environmental Risk Factors were:

1. Situation – Located in the country;
2. Isolated;
3. In a location with few (less than 5) other houses in sight;
4. Road Type-Major Town Road or Village Lane;
5. Set at a distance from the road in which the house stands;
6. Located on the nearest major road;
7. Housing plot not adjacent to gardens of other houses;
8. Housing plot adjacent to private, open space;
9. Access at both sides of the house from front and back of the plot;
10. Not overlooked at the front by other houses;
11. Not overlooked on either side by other houses;
12. Majority of sides of the house not visible from a public area;
13. Set at a distance from the nearest house;
14. Frontage obscured from roadside view.

Groff & La Vigne (2001) adopted the idea of designing a predictive tool to help identify desirable and undesirable locations of burglaries. The paper uses as its theoretical underpinning, the work of opportunity theorists who work upon the assumption that certain situational factors can help to translate offender motivation into the committal of an offence. Using Geographical Information System (GIS) mapping, Groff and La Vigne created an opportunity surface which incorporated several grids each representing a different environmental characteristic. Each cell was given a score of 1 for present and 0 for absent based upon environmental variables which it possessed. The variables utilised within this study were:

1. Land use – 1 for residential, 0 for all others;
2. Housing tenure – 1 for renter occupied, 0 for owner occupied;
3. Vacant Unit – 1 for vacant unit, 0 for occupied;

4. Substandard Housing – 1 if it had a reported housing code violation, 0 if not;
5. Nuisance Violations – 1 if it had a reported nuisance violation, 0 if not;
6. Street Lighting – 1 for dark areas, 0 for illuminated areas;
7. Corner Lots – 1 for a corner lot, 0 for a non-corner lot;
8. Wooded areas – Areas adjacent to a wooded area or vacant lot are coded as 1, and all other areas are coded as 0;
9. Proximity to a major thoroughfare – Areas within a 2-block radius (1,000 feet) of major roads were coded as a 1, all others were 0;
10. Proximity to likely offenders – A doughnut-shaped buffer was created, coding units greater than 500 feet but less than 1,500 feet away from the residence of an arrested burglar as 1 and all others as 0.

The final opportunity score for each cell represented the sum of the scores for each of the variables. The results revealed that the majority of burgled cells had either an average opportunity score or higher. All repeat victims had a higher than mean opportunity score. The vast majority of cells which had not been burgled had an absence of the predictive environmental variables.

Coleman (1986) also established a list of factors which she believed contributed to the social and physical decay of housing estates, this was entitled the 'design disadvantage score'. The table below summarises Coleman's environmental factors.

Table 2: Design Disadvantage Score

Size Variables	**When Harmful**
Dwellings per block	13+
Dwellings per entrance	7+
Number of storeys	4+
Flats or Maisonettes	Maisonettes
Circulation Variables	**When Harmful**
Overhead walkways	1+
Connecting entrances	2+
Connecting lifts/stairs	2+
Dwellings per corridor	5+

Entrance Variables	When Harmful
Entrance type	Individual ground floor doors, no gardens
Entrance position	Facing inside estate, far back from road
Doors or apertures	Open aperture
Stilts, garages or shops	Characteristics of the grounds
Blocks per site	2+
Access points or gaps	2+
Play areas	1+
Spatial organisation	Confused space

Although risk-assessment measures can aid the prediction and prevention of crime, research conducted by Ellingworth *et al* (1997) and Ashton *et al* (1998) highlight the dangers of relying upon risk-assessment mechanisms for predicting both single and repeat victimisation and suggest that environmental factors are more useful for assessing the risk of first victimisation as opposed to repeats. Ellingworth *et al* (1997) utilise British Crime Survey data to analyse the relationship between prior victimisation and the probability of suffering another event. One of the interesting findings revealed within this paper is that different factors are important risk predictors for prior victims and for prior non-victims. The paper presents the log odds ratio of being victimised for properties with certain environmental and lifestyle features. For example, for properties which have not experienced a prior victimisation, the likelihood of being victimised increases as the number of cars at that household increases, until it reaches 4+ cars, whereby, the likelihood of being victimised reduces.

- A property with 1 car has a log odds ratio of 1.137 times that of a house with no cars of being a victim of property crime;
- For a property with 2 cars, the log odds ratio increases to 1.455 times that of a property with no cars;
- For a property with 3 cars, the log odds ratio increases to 1.590 times that of a property with no cars, however;
- For a property with 4 or more cars, the log odds ratio reduces to 0.856 times that of a property with no cars.

However, when the data are analysed for prior victims, the pattern differs. As opposed to being less likely to experience property crime once the number of cars per household reaches 4, the likelihood of victimisation for these properties dramatically increases.

- A property with 1 car has a log odds ratio of 1.346 times that of a house with no cars of being a victim of property crime;
- For a property with 2 cars, the log odds ratio increases to 1.374 times that of a property with no cars;
- For a property with 3 cars, the log odds ratio increases to 1.447 times that of a property with no cars, however;
- For a property with 4 or more cars, the log odds ratio increases to 10.683 times that of a property with no cars.

The same pattern is shown for other environmental and lifestyle factors. For example:

Table 3: Environmental Factors and the Likelihood of Victimisation

Factor	Likelihood of Non-Prior Victim being victimised	Likelihood of Prior Victim being victimised
Council House	**1.400**	**1.551**
Housing Association	**0.997**	**2.849**
Private Rented	**0.993**	**1.538**

For properties which have not experienced a prior property crime, a council house is 1.4 times more likely than an owner occupied house to become a victim of property crime. This being the tenure with the highest risk of victimisation. However, for properties which have experienced a prior victimisation, the most risky tenure becomes housing association owned homes, which are 2.849 times more likely than owner occupied houses to experience property crime. For properties which had never experienced victimisation, the risk for housing association homes was only 0.997 times than of owner occupied properties.

"For prior non-victims an exp (B) of 0.987 implies that each year of age (of the head of household)..reduces the odds ratio by about 1.3%, but the protection per year effectively halves to about 0.6% for prior victims. Prior victimisation substantially nullifies the protection from crime which older people enjoy" (Ellingworth *et al,* 1997 p.209).

The findings of this study support the event dependency view that a prior event changes the probability of suffering a subsequent victimisation, rather than the risk heterogeneity view which suggests that repeat victimisation is a result of pre-existing risk variables.

These findings are supported by Ashton *et al* (1998) who found that what offenders find when they enter a property is as important in influencing the possibility of a repeat offence as the external factors which influenced their initial perceptions. Examples include: "Because the first time was profitable and goods of value remained", "because once the lie of the land was known it became easy" and "because new goods would be available after replacement". These findings support the suggestion that although certain environmental factors influence an offender's choice of target for first victimisation, the decision to return to that property is based largely upon what the offender finds when they enter the property and not the factors which influenced their perception of risk in the first instance.

The prediction of crime risk, although important to the future of criminology, remains meaningless unless those introducing and implementing legislation and regulation, or designing and manufacturing products have some incentive to consider the crime and disorder implications of their actions. At present, many of the design features which render products popular with users also make them attractive to misusers. For example, many mobile phone users prefer pay-as-you-go phones because they are flexible and do not bind the user into any contractual obligations. However, these same factors make the product attractive to criminals who can make phone calls with less risk of being traced. Other disincentives for manufacturers to design out crime include sales figures, which are likely to increase if their product is easy to steal. Products which are more likely to be stolen will need to be replaced more often, therefore inflating sales of this product. In order to improve the likelihood that designers will consider crime reduction, they need to be educated and encouraged. As Rogerson *et al* (2000) highlight, we need the manufacturers of products to know that designing out crime can have commercial benefits. This requires; 1) Fostering awareness that design can influence crime, for better or for worse; 2) The dissemination of knowledge of what the risks are and how to tackle them and 3) to motivate industry to tackle these risks.

Although the SBD scheme includes a retrofit element which encourages the refurbishment of buildings following development, these form only a small proportion of all SBD properties (at the commencement of this thesis, 6% of the SBD schemes within West Yorkshire were

refurbishments), with the vast majority of properties being newly built to the required standard. The SBD scheme exemplifies proactive, multi-agency crime prevention, with the crime implications of every development considered by crime reduction specialists (ALOs) before any building takes place. It is to the specifics of the scheme which this thesis now turns – has this ideal scenario actually resulted in reductions in crime and the fear of crime, are there any weaknesses within the current scheme and how can these be modified or improved?

Chapter Three

Is Secured by Design an Effective Crime Reduction Measure?

Chapter Three - Part One
Aims

As was discussed within the introductory chapter, the aims of this thesis fall largely into the three categories of past, present and future – How did planning become encapsulated into criminology? Does SBD reduce crime, disorder and the fear of crime, and what are the current weaknesses within the scheme? The initial aim of this thesis is to establish to what extent the SBD scheme actually works as a crime reduction measure. Only when this question is addressed can an improvement-orientation be introduced. The analysis contained within this chapter is broken down into three areas, each with subsequent sub-categories:

Do SBD estates experience less crime that their Non-SBD counterparts?

a. Refurbished Estates – Two refurbishment schemes were randomly selected from the database of SBD schemes (provided by West Yorkshire Police). As these housing estates were upgraded from Non-SBD to SBD status, the analysis simply compares crime rates pre and post refurbishment.
b. New Build: As the sample of SBD properties only included two refurbishments, the majority of housing estates included within this study were newly built to SBD status. As the estates did not exist prior to their SBD status, control estates had to be selected for comparison.
   - Detailed Analysis - A sample of 25 SBD estates were matched as closely as possible with a control sample of 25 Non-SBD estates. Each matched pair were comparable in terms of age, location, housing tenure and external environmental factors. The crime rates (incidence, prevalence and concentration) for each matched pair were analysed.
   - Broad-Based Analysis – A sample of 50 SBD estates were matched with a control sample of 50 Non-SBD estates. The control estates were selected based purely upon geography in that they were located directly adjacent to the SBD estate. The crime rates (incidence, prevalence and concentration) for each matched pair were analysed.
c. Residents' Survey – As the previous two levels of analysis focused solely upon police recorded statistics, it was essential to include a self-reporting element to this study. 250

SBD residents and 250 Non-SBD residents were asked questions relating to their experiences of crime and disorder. Levels of prior victimisation were compared.

Do residents living within SBD housing estates feel safer that those living within Non-SBD areas?

a. 250 SBD residents and 250 Non-SBD residents were asked questions relating to their fears, experiences and perceptions of crime and disorder within their area. Attitudes expressed by residents living within the two samples were compared.

To what extent has the SBD scheme improved over the last decade?

a. The specific standards of the SBD scheme have not remained constant since its inception in 1989. For example, the physical security standards of PAS 24-1 (doors) and BS7950 (windows) were only introduced in 1999. This section of the thesis aimed to establish whether the crime reduction performance of the SBD scheme have improved since 1989.

Chapter Three - Part Two
Methodology

Selection of Location:

Although SBD is a national scheme, the analysis included within this thesis focuses solely upon schemes within the county of West Yorkshire. The explanations for this selection were twofold. Firstly, the author resides within this county and it was felt that due to the number of visits required to each estate, this would save both time and money. Below is an indication of the fieldwork required for Chapter three alone which should highlight the difficulties which would have been faced in conducting the analysis on a national basis.

a. Each of the 25 SBD estates was visited to compile Winchester and Jackson's (1982) Environmental Risk Index. The survey took approximately 10 minutes per property, with some estates containing as many as 72 properties;
b. Approximately 30 Non-SBD estates were visited in the process of selecting 25 estates as a control sample for the detailed analysis – again the Winchester and Jackson survey was carried out at each property within these estates;
c. 50 SBD estates were visited to select the closest Non-SBD estate for the broad-based analysis;
d. 250 residents from 25 SBD estates and 250 residents from 25 Non-SBD estates were visited in the process of completing the residents' survey.

In addition to the analysis discussed within this chapter, the analysis conducted for subsequent chapters required extensive visits to 1058 properties to conduct in-depth surveys, as well as travel to and from the offices of RSLs, Architects and Quantity Surveyor's to conduct qualitative data collection.

The second explanation for selecting the county of West Yorkshire relates to the police recorded data used for a large section of the analysis. Although the analysis used victimisation surveys to establish perceptions and personal experiences of crime (whether reported to the police or not), a large proportion of the analysis relies upon police statistics for which access to the Police Criminal Intelligence System (CIS) was essential. As West Yorkshire Police had agreed to act as a collaborating establishment for this thesis (which included providing access to CIS) the county of West Yorkshire was selected for the analysis conducted within this thesis.

Refurbishments:

For estates which were refurbished to the SBD standard (there were only 2 of these within the analysis) crime rates (number of crimes divided by the number of properties within that scheme) were simply compared pre and post certification. The time periods between development and certification to SBD standard (pre) and between certification and commencement of the analysis (post) were not comparable. To ensure standardisation, analysis had to take into account the number of months which the estate had existed as a Non-SBD building and the number of months which it had existed as a SBD property to produce an average monthly crime rate.

New Build Properties - Detailed Analysis:

All SBD estates within West Yorkshire were recorded on a database provided by West Yorkshire Police. As the detailed analysis was to involve extensive travel to and from sites, a decision was made to select just 25 estates for this level of analysis. The first stage of this selection process involved excluding all estates built post-April 1998. The rationale for this exclusion was to ensure that crime data were available for a full year following the estate's development. As the analysis of crime data for this section of the thesis began in April 1999, this meant excluding properties built after April 1998.

The next stage of the selection process involved ensuring that the 25 estates were spread evenly throughout the West Yorkshire force area. The county of West Yorkshire includes towns and cities which vary dramatically in terms of socio-demographic variables such as crime rate and deprivation. For this reason, it was essential to ensure that the 25 estates were selected from each of the five postal districts of Bradford, Halifax, Huddersfield, Leeds and Wakefield. This involved stratification, using the five postal districts as separate strata. All properties built prior to April 1998 were grouped according to the postal district within which they were located and the number of properties within each area was divided by five to produce the sampling interval. For example, if there were 50 schemes in Huddersfield, the 10^{th}, 20^{th}, 30^{th}, 40^{th} and 50^{th} were selected. Unfortunately, the lack of SBD schemes within the Halifax area meant that once properties built post April 1998 were excluded, only five remained. Therefore, these five estates had to be selected. In order to avoid any bias in the selection process, the names of estates were excluded from the database to leave just the scheme number e.g. 306/97E. At this

early stage in the analysis, the name of the scheme could not be recognised simply by this number.

Once the SBD estates had been selected, a control sample of Non-SBD properties had to be established. As was alluded to within the opening paragraphs of this chapter, the majority of SBD housing estates within West Yorkshire are new build. As these estates did not exist prior to their certification to the SBD standard, the analysis required the selection of a matched pair for each of the SBD estates. For the detailed level of analysis these matched pairs were carefully selected to ensure that they were comparable in terms of housing age, location, housing tenure and environmental/physical characteristics. The rationale was that in removing as many intervening variables as possible, any differences in the levels of crime and disorder between the samples could be attributed with more confidence to the implementation of SBD levels of standards.

The 25 SBD estates selected for this analysis were built between 1988 and 1998. To ensure that extraneous variables relating to the age of the property were excluded from this analysis, all Non-SBD estates had to have been built within this ten year time frame.

The 25 SBD estates selected for the analysis were owned by a variety of Registered Social Landlords (RSLs). Research suggests that the housing tenure of a property can influence its subsequent victimisation, with social rented housing more than twice as vulnerable to burglary victimisation than owner occupied properties (Kershaw *et al,* 2000), therefore, all Non-SBD estates selected for this sample were owned by RSLs.

In order to maximise the environmental/physical similarities of the SBD and Non-SBD properties within this level of analysis, control areas were selected which had the same physical and environmental features. This was achieved using Winchester and Jackson's Environmental Risk Index (1982) which assigns a score between 0 and 14 to each property based upon features of its design and location. This score enables each property to be graded according to its vulnerability to burglary. As a means of determining the relationship between environmental risk and burglary victimisation, Winchester and Jackson produced an index based upon 14 different variables of access and surveillance which were found to be particularly effective in discriminating between houses lived in by the victim sample and those lived in by the general household sample. The more factors possessed by a particular dwelling, the higher its chance of

having been burgled. Houses with a score of 0 on the risk index had a 1 in 1,845 chance of being burgled, those possessing 9 or more features had an average of 1 in 13 chance of being burgled. The median score on the Environmental Index of Risk for victims' houses was 5, compared to a median score of 2 for houses lived in by the general household sample. Multiple victims (those who had been burgled on more than one occasion during the period that the present household had lived there) had a median score of 7 on the index. The difference between the single victim group and the non-victimised general household sample was statistically significant ($p < .05$).

The index was established through the procedure of assigning a score of 1 for any surveillance or access risk factor present and adding these scores together for each property. The variables used to construct the Index of Environmental Risk were discussed in more detail within Chapter two, part seven. Within this thesis, factor 4 - Road Type-Major Town Road or Village Lane was excluded due to the lack of clarity in the explanation regarding which road type is given a score of 1. It was not clear as to whether both village lane and major town road received a score of 1, or simply one of these road types. It was concluded that as long as the site surveys were consistent between SBD and Non-SBD, this would not affect the quality of the research. However, when the site surveys were carried out, the type of road was noted to ensure that future researchers attempting to expand or replicate this evaluation would be able to do so. Therefore, a maximum score in this study was 13, as opposed to Winchester and Jackson's 14.

Litton (1991) attempted to replicate the Winchester and Jackson study but on a much smaller scale. The study, which was carried out in Harrogate, North Yorkshire, found that at a significant level, the environmental risk index is predictive of burglary, although not every constituent of the index is equally important. This thesis utilises Litton's (1991) method of categorising houses into 3 risk levels, high (7 and above on the environmental risk index), medium (3 to 6) and low (0 to 2).

Each of the 25 SBD estates within this thesis was awarded an average (mean) environmental risk score. This involved visiting each individual property within the sample of 25 estates to complete Winchester and Jackson's Environmental Risk Index. Each property was individually assessed; the scores for all properties were then totalled and divided by the number of properties on that estate to produce a mean Environmental Risk Index for each estate. Although

the sample of 25 estates were each based within the West Yorkshire region, they were spread evenly throughout towns and cities such as Bradford, Halifax, Huddersfield, Leeds and Wakefield and travel between the sites was time consuming. Once at each estate, it is estimated that the survey took approximately 10 minutes per property to conduct (it is worth reiterating that some estates contained as many as 72 properties), with additional time to input and analyse the data. Although the scores for each estate were slightly different, they were all categorised as low risk according to Litton's method of categorisation. Therefore, the Non-SBD matched pairs selected for this level of analysis each had to be categorised as low risk to ensure comparability. Selection of these Non-SBD matched pairs involved asking all RSLs to provide details of estates located within West Yorkshire and excluding those which were not built within the relevant time period. Although this was a paper-based exercise, it involved extensive correspondence with RSLs to collect details of each estate's age. Once information had been provided, the process of selecting the appropriate estates was again a time-consuming exercise. All properties built within the relevant time period were visited to conduct the Winchester and Jackson survey and to establish which were categorised as low risk in terms of their environmental features. Approximately 30 estates were visited at this stage of the data collection process and those which were categorised as medium or high risk were excluded from the possible sample. Again, the author would like to highlight the time-consuming task of identifying these sites, travelling between sites, conducting the survey and analysing the results. Although the results, of this exercise simply reveal 25 control estates, the process of selection was not a straightforward task.

The final task, with all other factors comparable, was to select the best match in terms of location - to ensure that the pairs were located within as close a proximity as possible. Due to the complexity of the selection process, there was no set boundary within which the control estate had to be located; instead the selection involved finding the estate which was as close as possible to each SBD estate (taking all other factors into account). In general, the majority of estates were located within the same village.

Tables 4-8 below display each matched pair, alongside the number of properties within each estate, as well as the year in which each estate was built.

Table 4: Matched Pairs in Bradford

Bradford					
Secured by Design	**No. of properties**	**Year Built**	**Non-Secured by Design**	**No. of Properties**	**Year Built**
Fell Lane, Keighley	40	1994	Brierley Close, Poplar Road, Shipley	10	1998
Beldon Road, Great Horton)	39	1995	Bowater Court, off Kesteven Road *(BD4)*	12	1995
Kettlewell Drive, Canterbury *(BD5)*	16	1997	Ardsley Close *(BD4)*	8	1995
Bierley House Ave, Bierley *(BD4)*	72	1995	Tawny Close *(BD4)*	7	1997
Broadstone Way, Holmewood *(BD4)*	39	1995	Gilpin Street, off Barkerend Road, Laisterdyke *(BD4)*	10	1989

Table 5: Matched Pairs in Halifax

Halifax					
Secured by Design	**No. of properties**	**Year Built**	**Non-Secured by Design**	**No. of Properties**	**Year Built**
Wainman St, Pellon *(HX1)*	9	1998	Reservoir Road, Pellon *(HX1)*	4	1998
Cherry Court, Pellon *(HX1)*	48	1997	Thrum Hall Drive, Shalimar Street *(HX1)*	91	1994
Lawler Close, Ovenden *(HX3)*	33	1994	Wheatley Lane, Ovenden *(HX3)*	16	1991
St. George's Road, Lee Mount *(HX3)*	14	1997	Lincoln way, Boothtown *(HX3)*	14	1996
Lister Lane *(HX1)*	3	1997	Madni Close, Lister Lane *(HX1)*	39	1988

Table 6: Matched Pairs in Huddersfield

Huddersfield					
Secured by Design	**No. of properties**	**Year Built**	**Non-Secured by Design**	**No. of Properties**	**Year Built**
Littlewood Croft, Newsome *(HD4)*	20	1997	White Hart Drive, Newsome *(HD4)*	10	1997
Park Drive, Gledholt *(HD1)*	12	1995	Spire Court, Marsh *(HD1))*	26	1997
Beaufort Ave, Shelley *(HD8)*	28	1997	Fairfield Rise, Kirkburton *(HD8)*	11	1994
Wentworth Ave, Emley *(HD8)*	10	1997	Lydgate Close, New Mill *(HD7)*	15	1994
Trafalgar Close, Brackenhall *(HD2)*	19	1996	Leonard Street, Fartown *(HD2)*	21	1997

Table 7: Matched Pairs in Leeds

Leeds					
Secured by Design	**No. of properties**	**Year Built**	**Non-Secured by Design**	**No. of Properties**	**Year Built**
Haslewood Drive, Gardens, Burmantofts *(LS9)*	43	1994	West Grange Road *(LS10)*	15	1996
Simpson Grove, Armley *(LS12)*	28	1996	Pepper Gardens *(LS13)*	12	1994
Moynihan Close, Gipton *(LS8)*	22	1996	Amberton Garth, Gipton *(LS8)*	28	1993
Beechwood Court, Boggart Hill Gardens *(LS14)*	30	1996	Mowbray Court *(LS14)*	19	1994
Ekota Place *(LS8)*	18	1995	Devonshire Ave, Close & Sutherlands Crescent *(LS8)*	59	1989

Table 8: Matched Pairs in Wakefield

Wakefield					
Secured by Design	**No. of properties**	**Year Built**	**Non-Secured by Design**	**No. of Properties**	**Year Built**
Buckingham Court, Belle Vue, Wakefield *(WF1)*	14	1995	St. James Park, Wakefield *(WF1)*	13	1997
The Wickets, Batley *(WF17)*	21	1997	Benny Parr Close, Batley *(WF17)*	26	1997
Oaklands Drive/Laithe Croft, Batley *(WF17)*	55	1997	Browns Place, Batley *(WF17)*	11	1997
Victoria Drive/Road, Dewsbury *(WF12)*	16	1998	Crow Nest View, Dewsbury *(WF13)*	20	1994
Quarry Court, Barnes Road, Castleford *(WF10)*	11	1998	Hunza Court, Dewsbury *(WF13)*	25	1997

Although the age of the two members of each matched pair was similar, they were not exactly the same. Because each matched pair were being compared in terms of crime and disorder levels experienced, it was essential to ensure that the time period for which each estate had been exposed to victimisation was exactly the same. An estate built in January 1997 would have been exposed to an additional 12 months of potential victimisation than an estate built in January 1998. A simple analysis of all crimes experienced on each estate since they were built would have produced an inaccurate picture of crime risks of each estate and favoured estates built more recently. A decision was made that crimes which occurred on the Non-SBD estate before the SBD comparison had been built (and vice versa) were excluded from the analysis. For example, if the SBD estate in a matched pair was built in April 1996, but the Non-SBD pair was built in October 1995, only crimes dating from April 1996 to the commencement of analysis were included.

New Build Estates - Broad-Based Analysis:

The broad-based level of analysis, as the account above hopefully makes clear, included 50 SBD new build estates. These included the 25 estates included within the detailed analysis, plus an additional 25 selected from the West Yorkshire Police database using the same method as that applied to the detailed analysis. However, unlike the detailed analysis, the method of selection for the control sample simply involved visiting the SBD estate and identifying the Non-SBD

estate located closest to it. This method of selection did not take into account any intervening variables such as housing tenure or age. As with the detailed analysis, crime levels were calculated using police recorded crime data extracted from West Yorkshire Police's CIS. Again, as the age of each estate was not comparable, the period for analysis of crime data was selected using the same process as that described above. For example, crimes which occurred on the Non-SBD estate before the SBD comparison had been built (and vice versa) were excluded from the analysis.

Residents' Survey:

Alongside the broad-based and detailed analysis of crime and disorder levels on SBD and Non-SBD estates, a residents' survey was carried out at the 25 SBD and 25 Non-SBD estates selected for the detailed analysis. The objectives behind this survey were:

a) To avoid comparisons based solely on police recorded statistics;
b) To ascertain the residents' opinions and perceptions of crime and disorder in the area, as well as their actual experiences of crime.

10 addresses from each of the estates were visited, giving a maximum total of 250 SBD and 250 Non-SBD interviews. The 10 addresses were chosen by listing all house numbers on each estate, summing them, rounding the number down to the nearest divisible of 10 and dividing this figure by 10 to produce the sampling interval. For example, if there were 47 addresses on an estate, this was rounded down to 40 and the 4^{th}, 8^{th}, 12^{th}, 16^{th} etc. addresses were selected. If estates had less than 10 addresses (for example 367/98E in Halifax which only has 9 addresses) an alternative estate within Halifax, for example 056/94E, would receive 1 extra questionnaire. The questions contained within the interview/questionnaire were based upon the British Crime Survey to ensure that in addition to the comparison between SBD and Non-SBD estates, national comparisons could also be made. All questions were closed-ended, with either yes/no answers or multiple choice options from which the respondent could select (see appendix 2 for a copy of the questionnaire).

The process of carrying out the survey involved visiting each property (following an introductory letter explaining the research, the issue of confidentiality and giving a contact name and number should they wish to verify the legitimacy of the project), and asking the questions face to face to the person who answered the door. If a child answered, they were asked if their mother or father was present. Children were not used as respondents. If the

residents were not at home, the questionnaire was posted through the letterbox, along with a stamped addressed envelope and a note explaining what the research was about, how sorry the researcher was that they had missed them and how their opinions were still valuable in this research project. As the questionnaire was designed with self-completion in mind (short and easy to comprehend with tick box answers to all questions) the less preferred option of posting the questionnaires was still considered to be acceptable. As a means of avoiding exclusion of residents who did not speak/read English, a representative from the relevant RSL was invited to attend all interviews to assist with translation. Unfortunately, this was not always feasible. If a RSL representative was available, the visits took place in the day. If there were no representatives available, a decision was made to conduct the surveys in the evening. It was felt by the RSLs that the majority of children would be willing and able to translate for their parents, therefore, waiting for them to return home from school would be preferable. By spreading the visits between evenings and daytime, the problem of over-representing those who were at home in the day (females/unemployed) was also minimised.

The response rate for the residents' survey was 47% of which 45% were SBD respondents and 55% Non-SBD respondents. It is suggested that the high level of responses is in some part due to the effort taken to write to respondents in advance, to visit the properties and conduct the questionnaires as interviews (where possible) and to ensure that RSLs were offered the opportunity to assist in the exercise (where they felt that language difficulties may be a problem). A postal survey would have saved a large amount of time visiting each of the 500 properties and conducting a survey which took approximately 15-20 minutes for each resident. However, it is suggested that a postal survey would have produced a far lower response rate than that acheived for this study.

SBD as an Evolving Standard:

In an attempt to establish whether the performance of SBD is improving as lessons are learned and new standards are introduced, the burglary rates of SBD estates built in 1994 through to 1998 were expressed as a percentage of the burglary rates of their Non-SBD matched pair. If lessons are being learnt, the more recently developed sites should experience lower levels of crime than those built in the early stages of SBD.

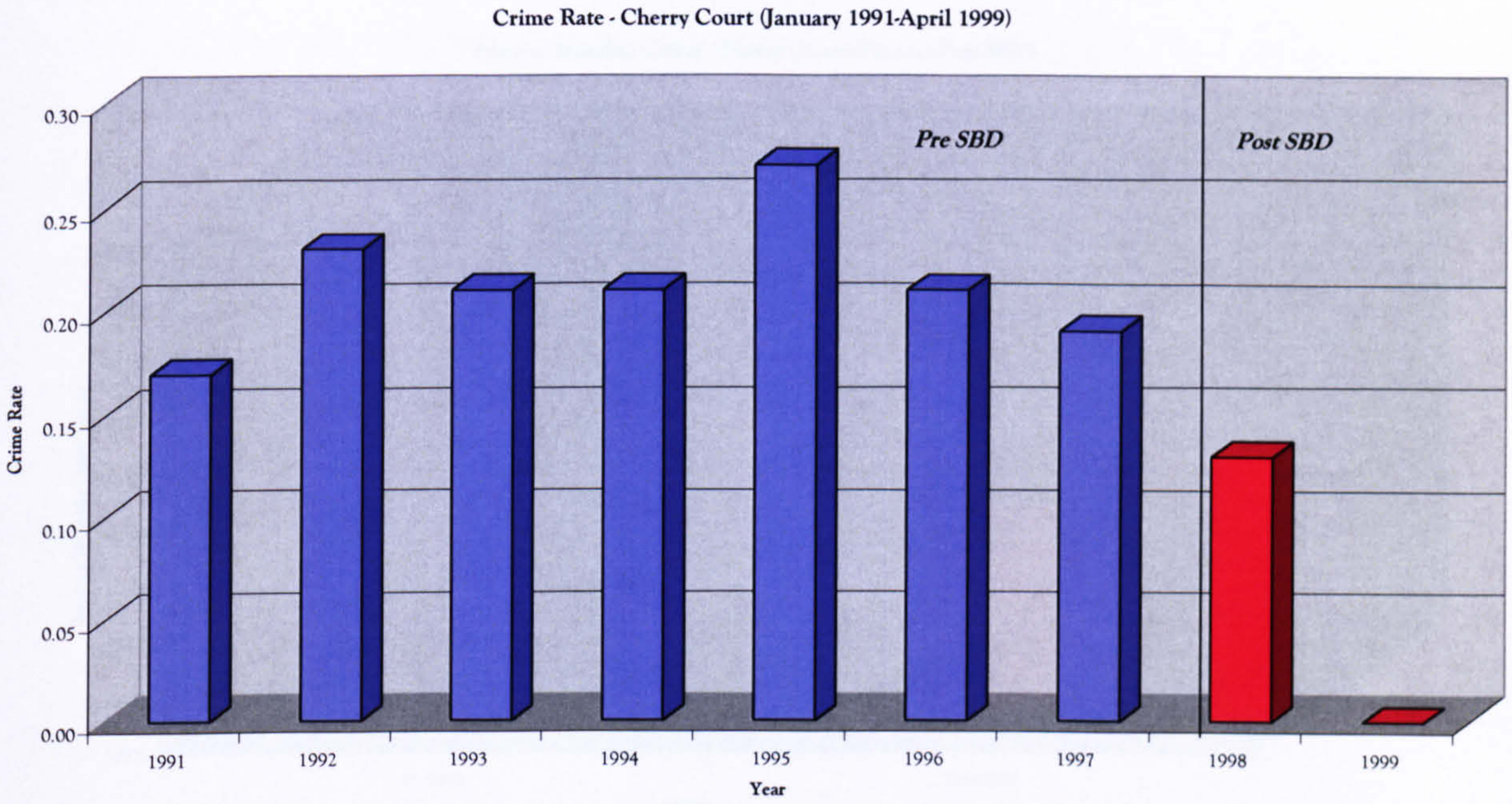
Chapter Three - Part Three
Results

Refurbishments:

Estates which had been refurbished to SBD standard were analysed on a before and after basis as opposed to selecting a Non-SBD matched pair. There were two refurbished estates included within this analysis; these were Cherry Court/Crossley Gardens in Halifax and Appleton Court/Saville Green in Leeds. As was discussed within the methodology section, crime levels were measured using police recorded data extracted from West Yorkshire Police's CIS. 36 crime categories were included within the analysis. With the exception of several offences considered to be irrelevant to this study (for example, sex offences) this included all crime types experienced by the properties selected for this study. The process of data collection from the police system was conducted according to West Yorkshire Police's data protection protocols. The author was required to take part in a short training exercise, to sign a data protection declaration and to conduct all data extraction and analysis within the police station.

Cherry Court (previously known as Crossley Gardens) was refurbished to SBD standard in January 1998. The first full year for which crime data were available pre-SBD status was 1991, therefore a decision was made to use crime data for the period January 1991 to April 1999 (when analysis commenced). The graph (figure 1) below displays the yearly crime rates at Cherry Court for the period January 1991 to April 1999. These figures represent the total crime within each year divided by the number of properties on that estate (48), and represent the incidence as opposed to prevalence rates.

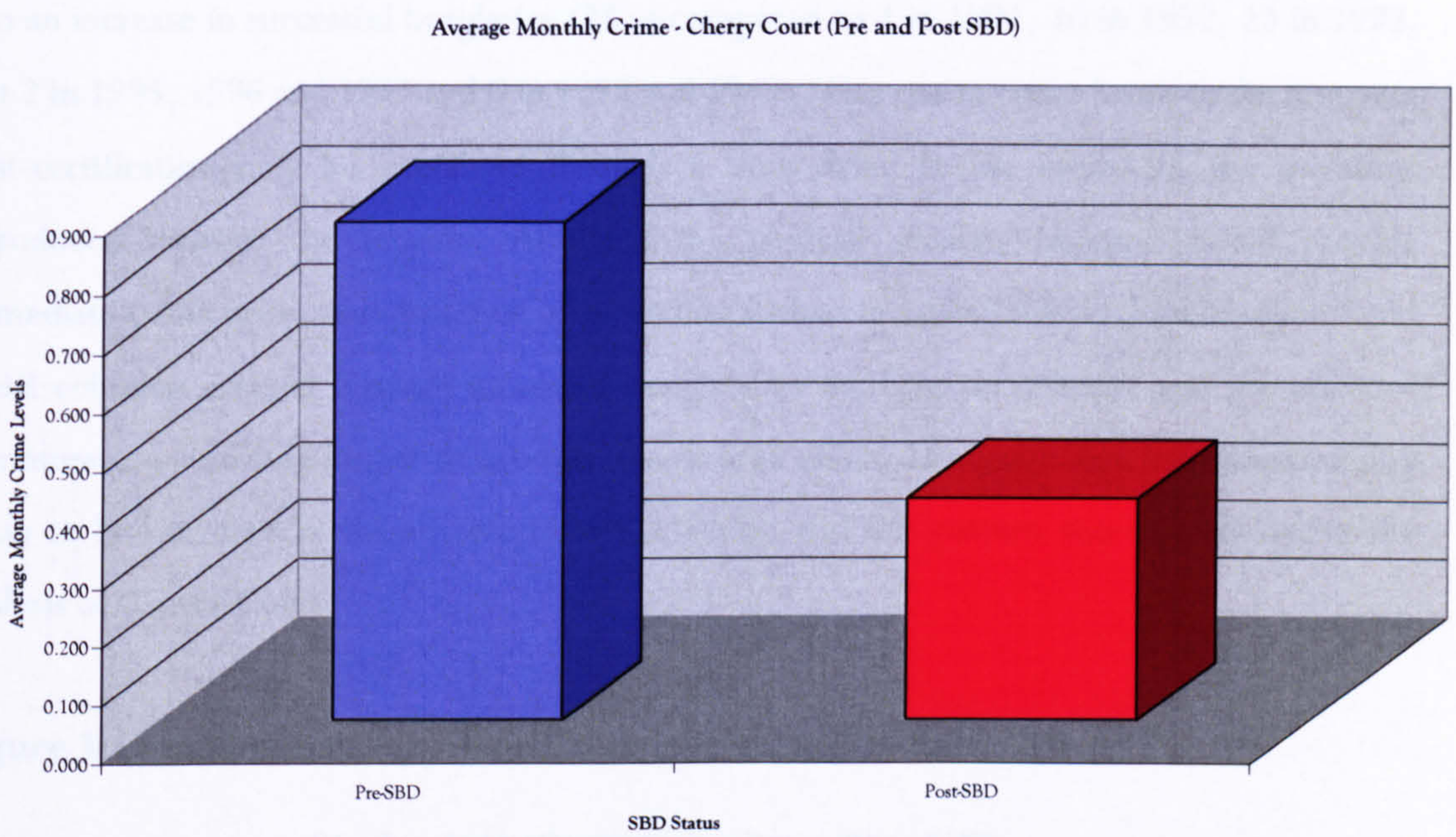
Figure 1: Crime Rate at Cherry Court between 1991 and 1999



The crime rate in 1991 was 0.17, in 1992 it was 0.23, in 1993 it was 0.21, in 1994 it was 0.21, in 1995 it was 0.27, in 1996 it was 0.21 and in 1997 it was 0.19. Following refurbishment to SBD in January 1998, the crime rate dropped to 0.13 and 0 for the first four months of 1999.

When comparing the two periods pre and post SBD, the results reveal that following certification to SBD, total crime fell by 55% relative to the pre-SBD period (see figure 2 below). This figure is calculated by adding the crimes experienced within the pre-SBD period and dividing this figure by 84 (the number of months between January 1991 and January 1998). Adding the crimes experienced post-SBD and dividing this figure by 16 (the total number of months post certification) to create the two figures 0.85 (average monthly crime levels) and 0.38 (average monthly crime levels).

Figure 2: Cherry Court Pre and Post SBD

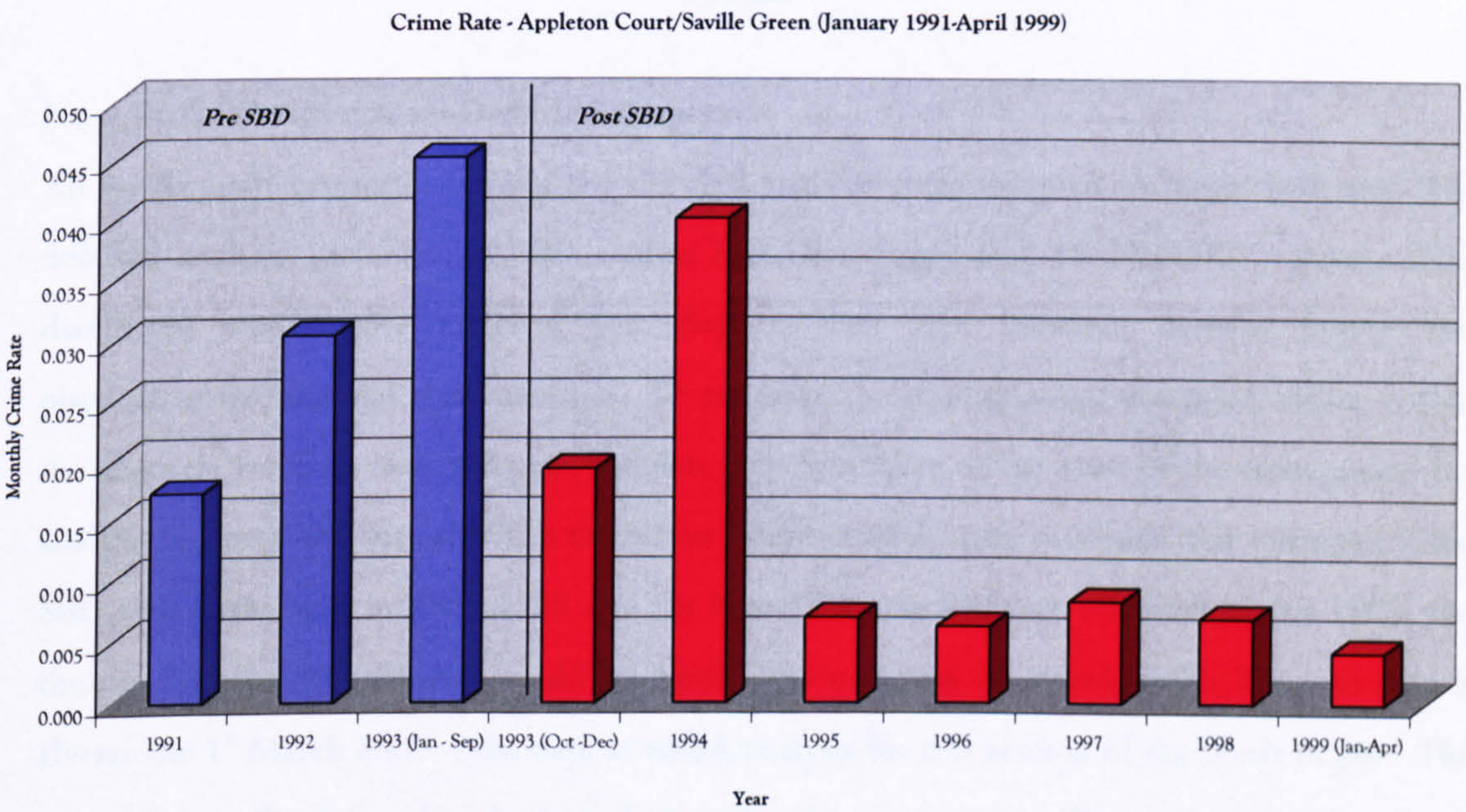


The second refurbished estate was Appleton Gardens/Saville Court in Leeds. This estate was refurbished to SBD standard in October 1993. As with Cherry Court, the crime data were analysed for the period January 1991 to April 1999. As this estate was refurbished mid-1993, it was easier to compare the periods pre and post SBD using a monthly as opposed to yearly crime rate. Therefore, the total crime for each year was divided by the number of properties on the estate – this figure was then divided by the number of months within that period of analysis. For example, for 1992, the total crimes (44) were divided by 120 (number of properties) to produce a crime rate. This figure was then divided by 12 to produce an average monthly crime rate. However, for 1993, the year in which the refurbishment took place, the crime rate was divided by either 9 (for the period pre-SBD) or 3 (for the period of October to December). The results (displayed in figure 3 below) reveal positive yet surprising findings. For the first three months following certification to SBD standard, the average monthly crime rate reduced dramatically. However, for the following year (1994) the rate rose to a level similar to that experienced in the pre-SBD period. In 1995 the average monthly crime rate reduced and remained consistently low until the end of the sample time period.

A possible explanation for the rise in 1994 could have been a high level of attempted burglaries, whereby offenders were still attempting to commit crimes against the previously vulnerable properties, having not yet realised that they had been upgraded. However, although there were

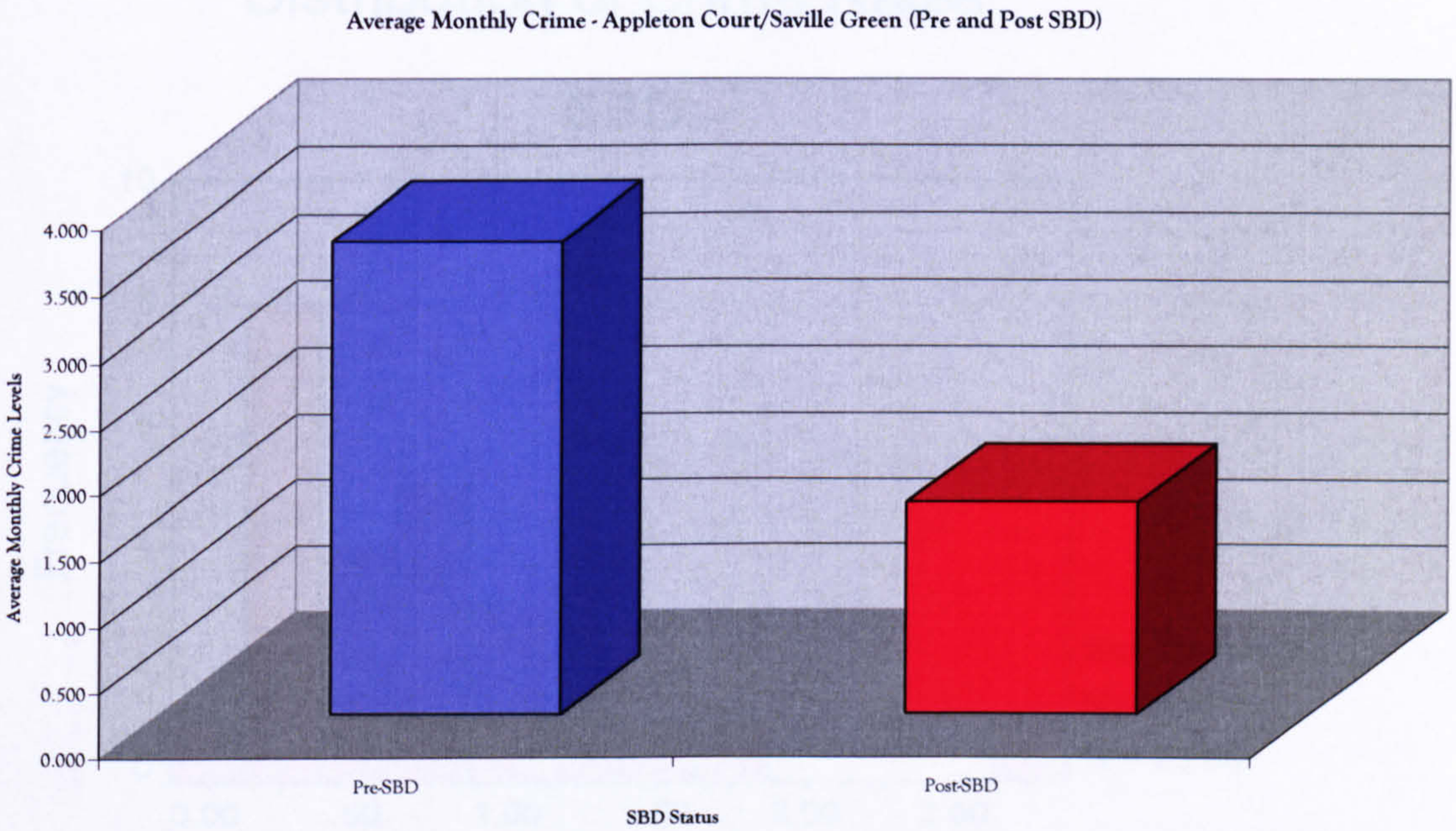
a higher number of attempted burglaries within this year, 7 as compared to 0 in 1990, 0 in 1991, 4 in 1992, 0 in 1993, 0 in 1995, 0 in 1996, 0 in 1997, 0 in 1998 and 0 in 1999, there was also an increase in successful burglaries (25 as compared to 4 in 1991, 10 in 1992, 23 in 1993, just 2 in 1995, 1996 and 1997 and 0 in 1998 and 1999). This rise in crime levels in the first year post-certification may be explained through a time delay in the effects of the measures introduced through the scheme. Although the physical security changes should provide immediate crime prevention benefits, other factors such as increased informal social control and social cohesion created through measures designed to increase surveillance and the sense of community, could take longer to produce the desired effect. However, one would expect any delay to be universal across all refurbished schemes, and this pattern was not evident in the analysis of Cherry Court.

Figure 3: Crime Rate at Appleton Court between 1991 and 1999



By comparing the average monthly crime levels pre-SBD with those experienced in the post-SBD sample period, the data reveal that crime levels fell by 55%, the same figure as that experienced by Cherry Court. As with Cherry Court, this figure was calculated by adding the total number of crimes within the pre-SBD period and dividing this by the number of months within that sample period to create a pre-SBD average monthly crime level. The total number of crimes within the post-SBD period was then divided by the number of months within that given period to create an average monthly crime level for the post-SBD period.

Figure 4: Crime Rate at Appleton Court Pre and Post SBD



New Build Properties – Detailed Analysis:

All newly built properties within the detailed analysis were assigned to a matched pair. The detailed analysis included 25 SBD estates (660 dwellings) and 25 Non-SBD estates (522 dwellings) which were matched according to their age, location, housing tenure and physical/environmental characteristics. To reiterate the methodology discussed earlier within the chapter; for each matched pair, the date which is taken as the start of the time period for analysis is always the date at which the newer member of the pair was built. For example, if the SBD estate was built in April 1995 and the Non-SBD matched pair was built in Jan 1995, the time period for data analysis would be April 1995 until the 1st March 2000. The end date is always the 1st March 2000 – the date at which analysis for this section of the thesis began. The crime data utilised for this thesis includes 36 crime categories. These vary from property offences such as burglary dwelling and theft of and from vehicle, to violent crime such as GBH and ABH.

The data were analysed to establish whether there was a normal distribution. As there were only 25 pairs within the sample, this was carried out using the Shapiro-Wilk test. The results revealed that the data differed significantly from a normal distribution (0.001). The histograms below display how the crime rates for both SBD and Non-SBD pairs differ from a normal distribution.

Figure 5: Distribution of Crime Rates within the SBD sample

Figure 6: Distribution of Crime Rates within the Non-SBD Sample

As the crime rates within both SBD and Non-SBD samples differed from a normal distribution, a non-parametric test was selected for analysis of these data. The Wilcoxon Test is a non-parametric version of the Paired Comparison T-Test which was selected due to the nature of the data being studied. The sample includes one measurement i.e. the crime rate for a matched pair of subjects i.e. the SBD sample and the Non-SBD sample. The null hypothesis being tested was that there will be no difference between crime levels on SBD and Non-SBD estates.

The results revealed that the mean crime rate (total crime levels divided by total number of properties) within the SBD sample was 0.70. This is compared to a Non-SBD rate of 0.94, suggesting that total crime was lower within the SBD sample.

Table 9: Summary of Total Crime Data

SBD Status	Mean Total Crime Rate
SBD	0.70
Non-SBD	0.94
Shapiro-Wilk (test for normality of distribution)	0.001
Wilcoxon	0.1

Statistical analysis (Wilcoxon) revealed that the difference between the crime rate within the SBD sample and Non-SBD sample was not statistically significant at a probability of 0.05 (one-tailed test).

When excluding all crimes other than burglary in a dwelling, the results revealed that the mean burglary rate was lower within the SBD sample. The mean burglary rate within the SBD sample was 0.17, this is compared to a rate of 0.29 within the Non-SBD sample. The Shapiro-Wilk test was again used to establish whether the data differed significantly from the norm in terms of its distribution. The results revealed that once again the data were not evenly distributed, this can be seen in the histograms presented below.

Figure 7: Distribution of Burglary Rates within the Non-SBD Sample

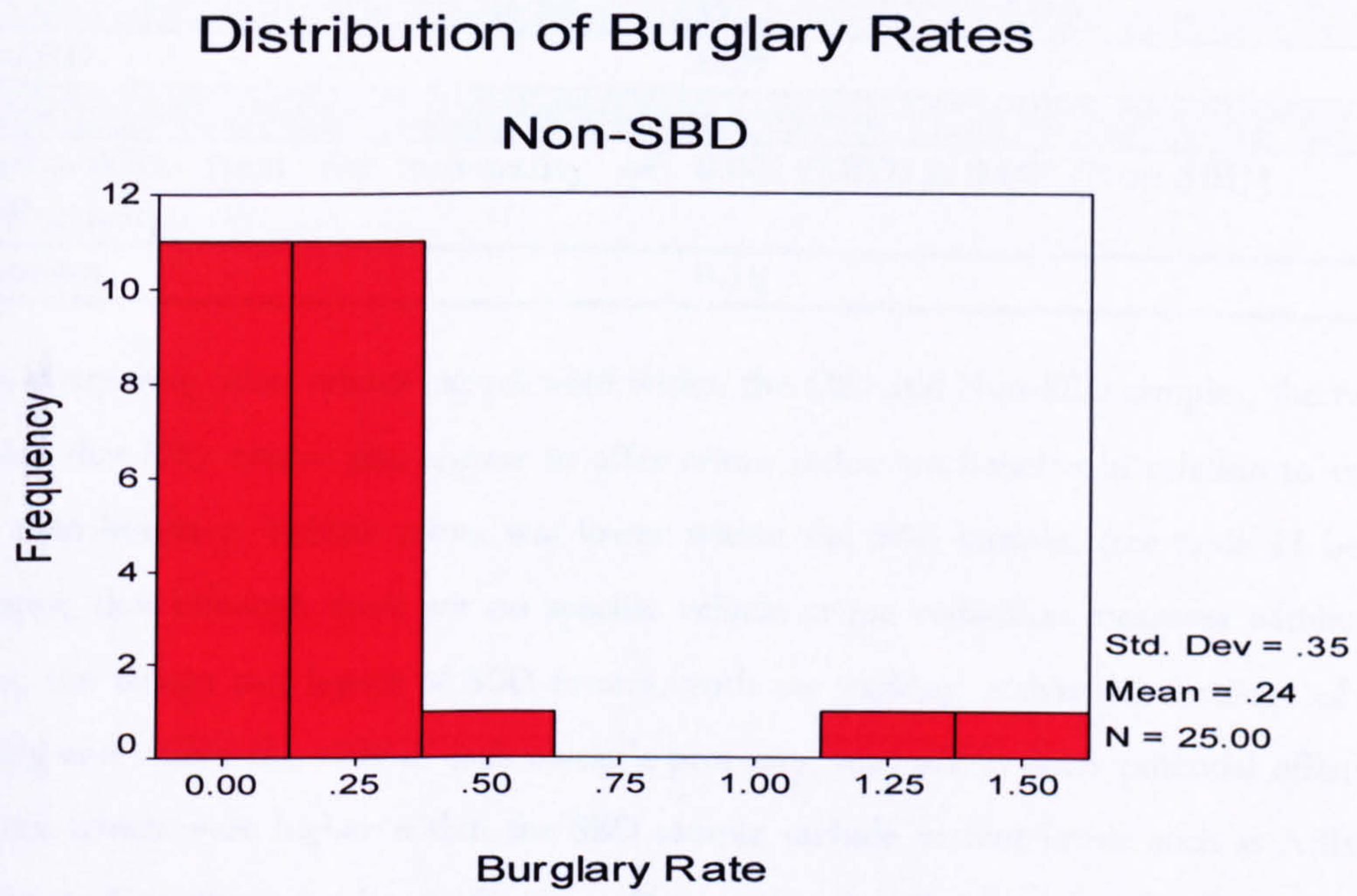
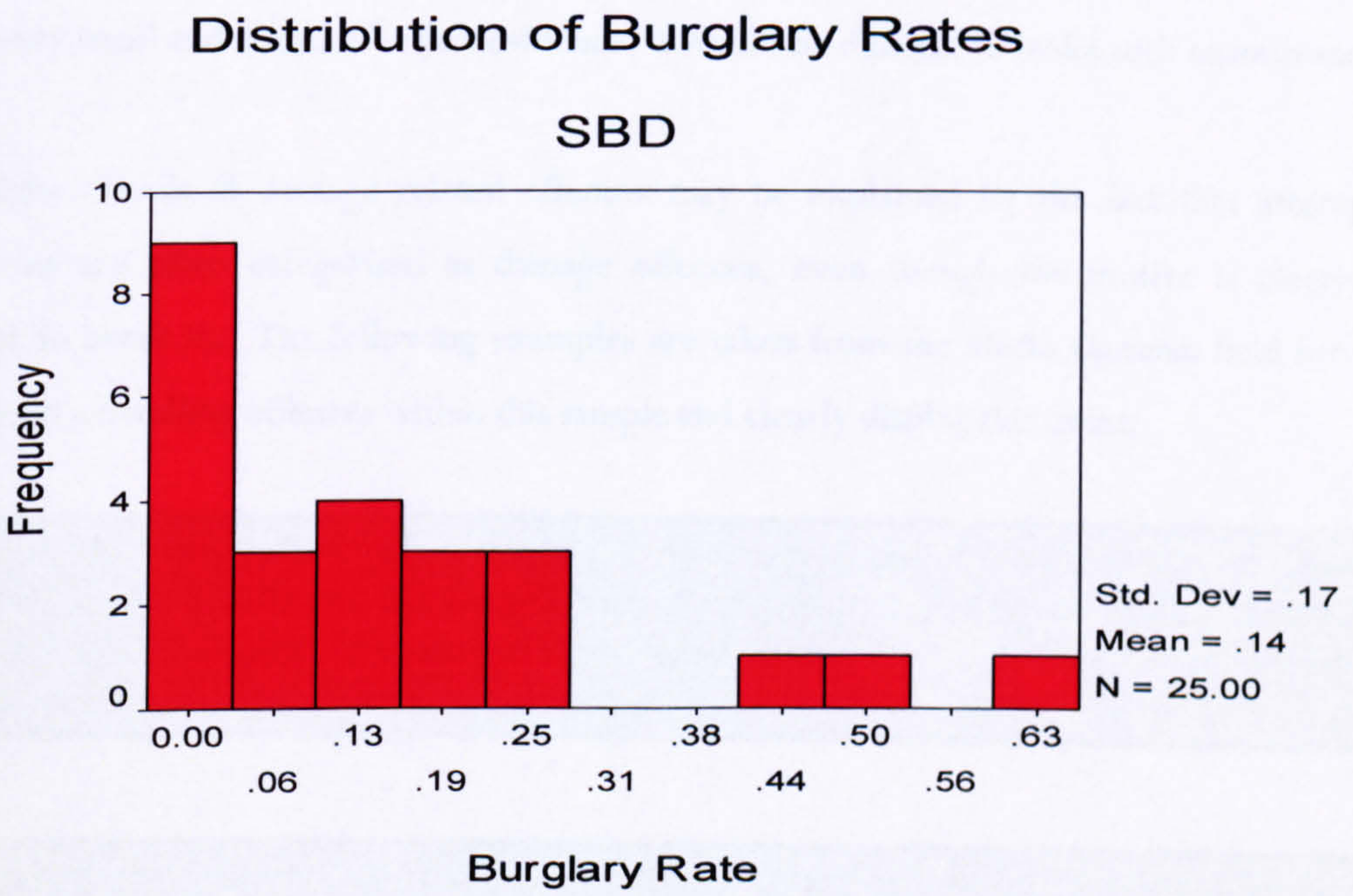


Figure 8: Distribution of Burglary Rates within the SBD Sample



As both samples differed significantly from the norm, the non-parametric Wilcoxon test was selected to analyse the difference between the means. The results revealed that the difference between the burglary rate on SBD and Non-SBD estates was not significant at the level of 0.05 (one-tailed).

Table 10: Summary of Burglary Data

SBD Status	Mean Burglary Rate
SBD	0.17
Non-SBD	0.29
Shapiro-Wilk (test for normality of distribution)	0.001 (SBD) & 0.000 (Non-SBD)
Wilcoxon	0.16

When comparing other crimes experienced within the SBD and Non-SBD samples, the results revealed that SBD estates also appear to offer crime reduction benefits in relation to crimes other than burglary. Vehicle crime was lower within the SBD sample, (see table 11 below) suggesting that although there are no specific vehicle crime reduction measures within SBD estates, the design and layout of SBD estates, with car parking within the curtilage of each dwelling and within the view of each owner's property, may act to deter potential offenders. Offences which were higher within the SBD sample include violent crime such as ABH and GBH as well as damage related offences. One explanation for increased levels of violence within higher security dwellings is that offenders - determined to commit an offence, will use violence if restricted by increased security measures. However, the levels of these offences were very small and without further evidence, it would be difficult to make such assumptions.

The higher levels of damage related offences may be explained by the fact that attempted burglaries are often categorised as damage offences, even though the motive is clearly an attempt to break in. The following examples are taken from the *Modus Operandi* field for two damage to a dwelling offences within this sample and clearly display this point.

"..During hours of darkness person(s) unknown approach wooden rear door of premises and by believed kicking damage bottom panel of door which is actually kicked right through. Person(s) then make good escape. Possibly after being disturbed as no entry gained to premises".

"Person(s) unknown approach garden fence at rear of semi-detached house...With spade or similar instrument dig up approximately 5 panels to fencing 4ft x 4ft. Lay them on ground and trample on them breaking panels".

It is clear that the first example is an attempt to break into the property, whereas the motive behind the second lays more with damaging the property.

Table 11: Crime Rates within the Two Samples

Crime Category	SBD Rate (per household)	Non-SBD Rate (per household)
Theft from Motor Vehicle	0.042	**0.065**
Theft of Motor Vehicle	0.027	**0.036**
TWOC	0.026	**0.054**
Damage to Property – Non Specific	0.017	**0.013**
Damage to Dwelling	0.142	**0.121**
Damage to Building Other than Dwelling	0.005	**0.004**
ABH	0.047	**0.040**
GBH	**0.011**	**0.004**

The analysis has thus far focused upon the incidence of crime - the number of crime events per dwelling/population. The analysis will now turn to the prevalence of crime within the sample - the proportion of dwellings which were offended against at least once. The results reveal that as with incidence, the mean prevalence rate of total crime was lower within the SBD sample (0.37) as compared to the Non-SBD sample (0.44). This suggests that there are fewer crime victims within the SBD sample. Tests for normality of distribution (Shapiro-Wilk) revealed data which did not differ statistically from the mean, therefore the Paired Comparison T-Test was selected to test the statistical significance of these data.

Figure 9: Distribution of Crime Rates (Prevalence) within the Non SBD Sample

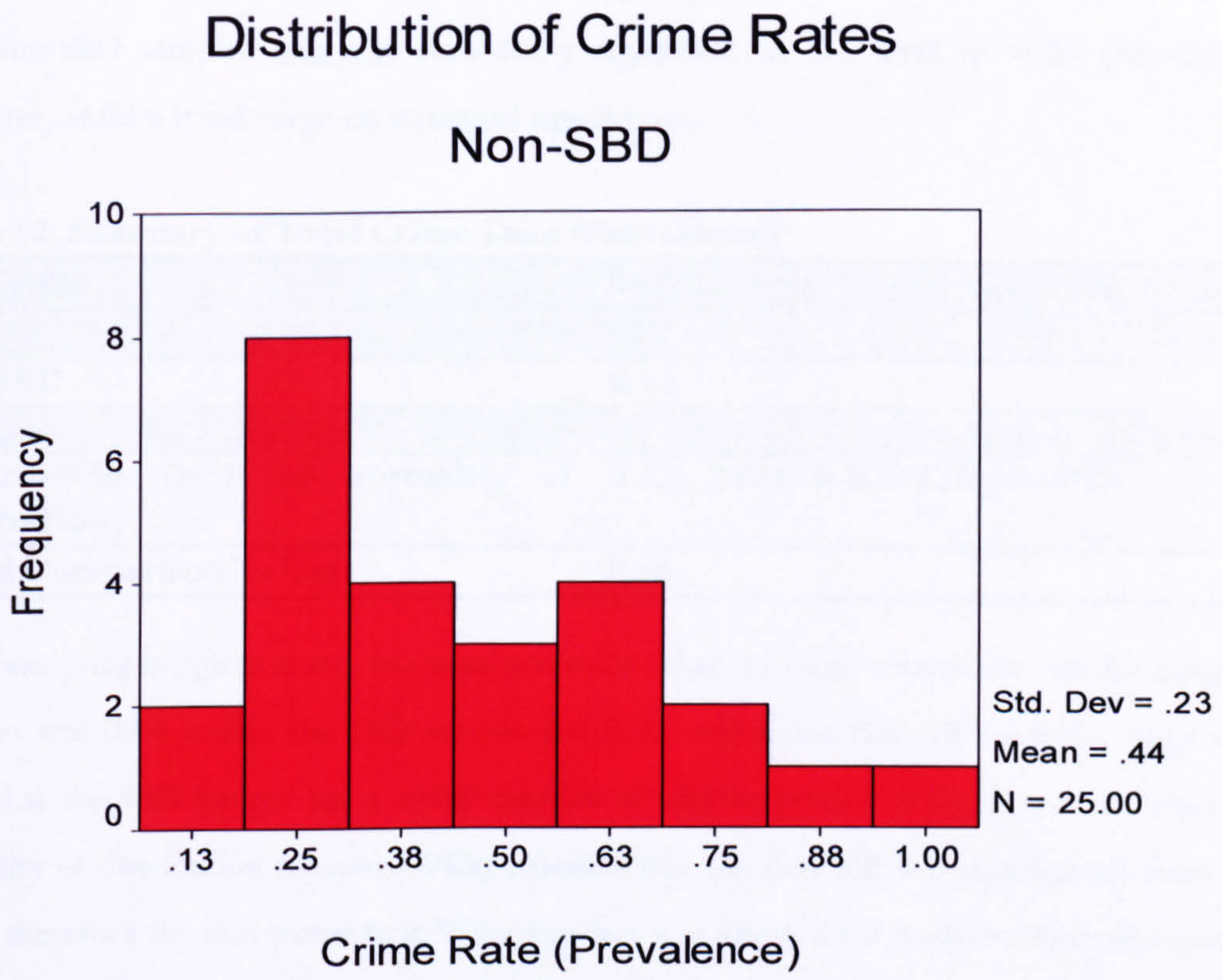
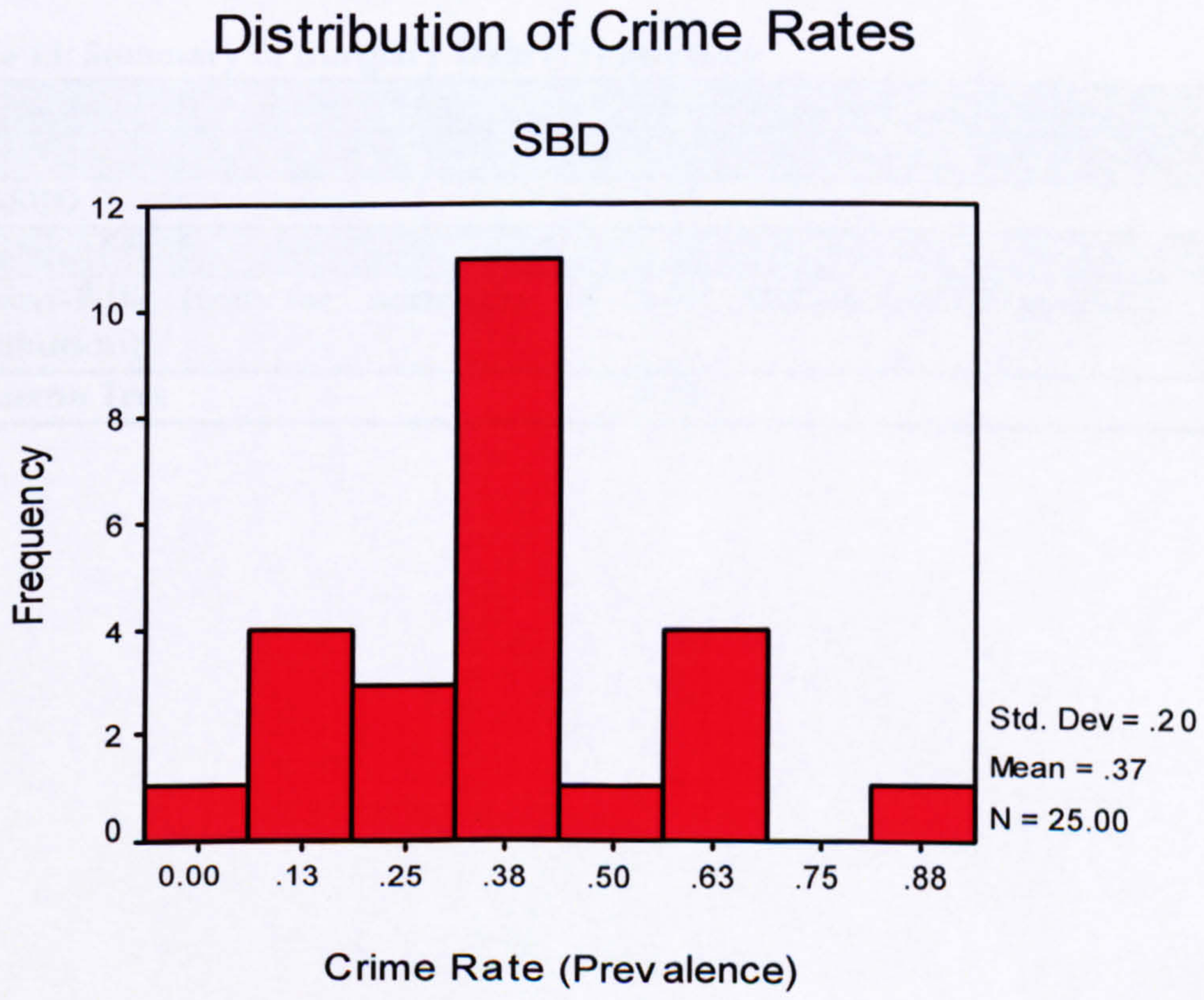


Figure 10: Distribution of Crime Rates (Prevalence) within the SBD Sample



Analysis revealed that the difference between the prevalence rate for total crime within the SBD and Non-SBD samples was not statistically significant at the level of 0.05 (one-tailed). However, at 0.06 it did verge on statistical significance.

Table 12: Summary of Total Crime Data (Prevalence)

SBD Status	Total Crime – Prevalence Rate
SBD	0.37
Non-SBD	0.44
Shapiro-Wilk (test for normality of distribution)	0.326 (SBD) & 0.357 (Non-SBD)
Paired Comparison T-Test	0.06

When analysing burglary alone, the results revealed that the mean prevalence rate for burglary offences was 0.09 within the SBD sample and 0.16 within the Non-SBD sample, suggesting again that the SBD sample has a lower number of victims as well as crime events. Tests for normality of distribution (Shapiro-Wilk) revealed that the data differed significantly from the norm, therefore the non-parametric Wilcoxon test was selected for analysis. Analysis revealed that the difference between the burglary rate (prevalence) within the two samples was not statistically significant at the level of 0.05 (one-tailed).

Table 13: Summary of Burglary Data (Prevalence)

SBD Status	Burglary – Prevalence Rate
SBD	0.09
Non-SBD	0.16
Shapiro-Wilk (test for normality of distribution)	0.001 (SBD) & 0.000 (Non-SBD)
Wilcoxon Test	0.12

Figure 11: Distribution of Burglary Rates (Prevalence) within the Non SBD Sample

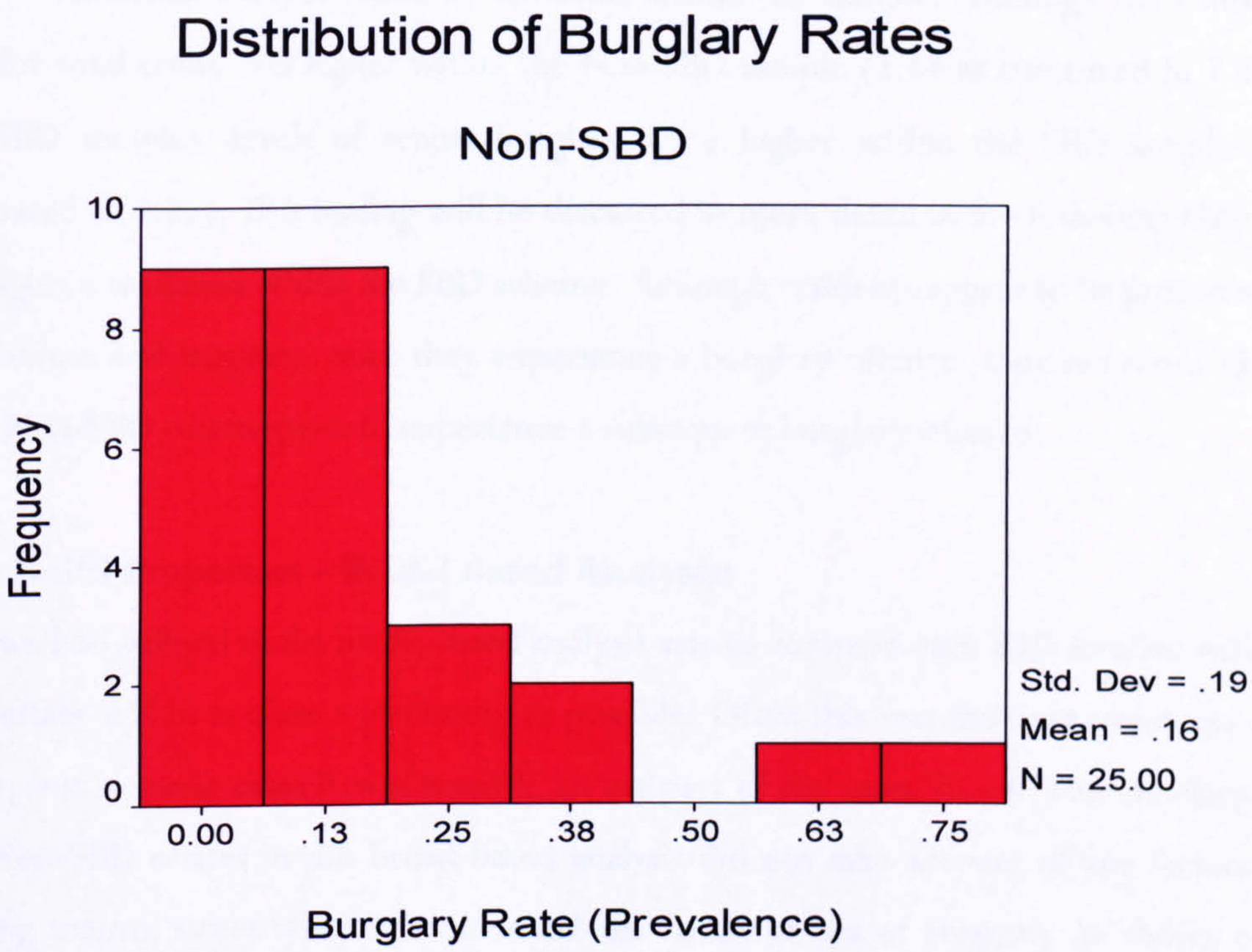
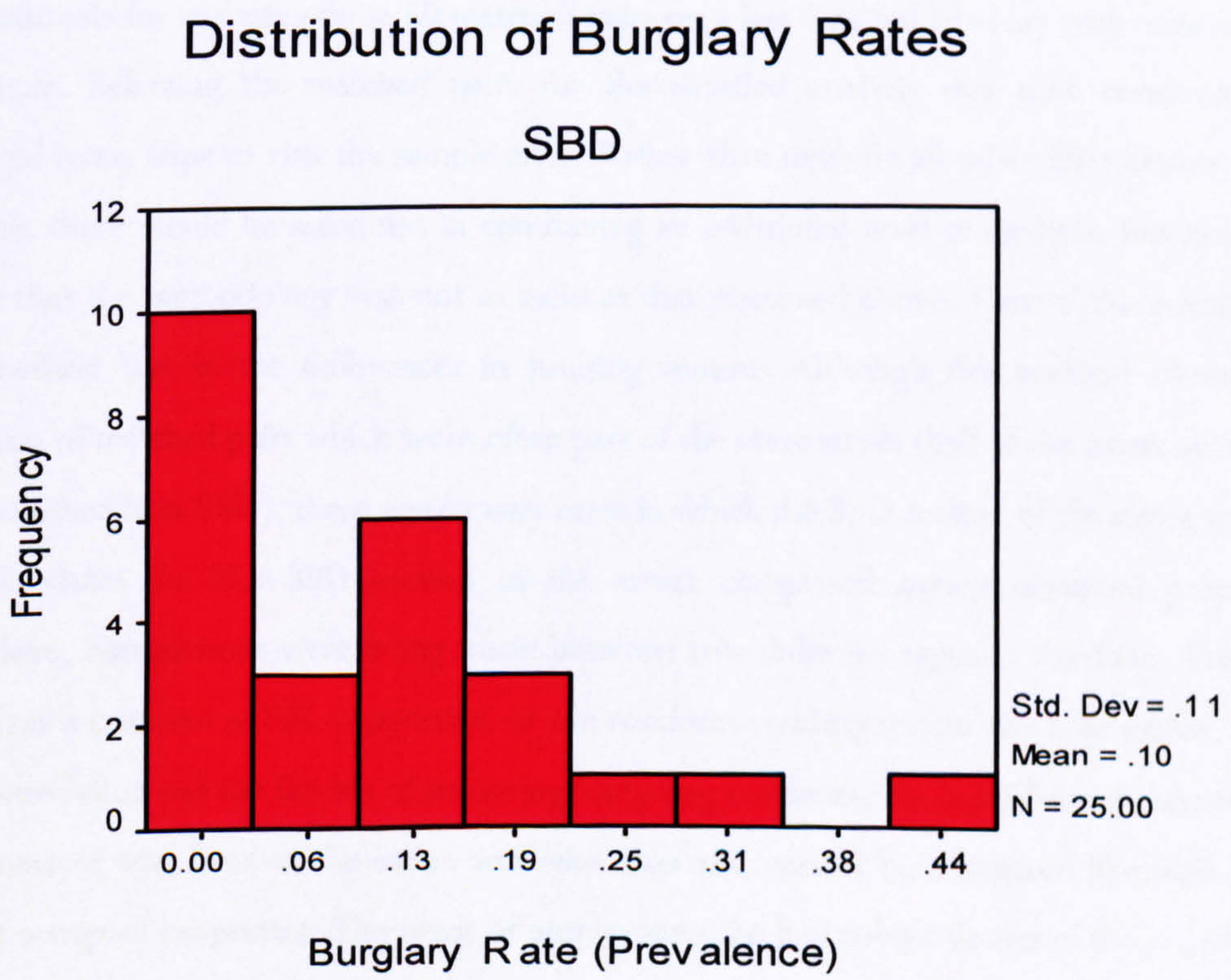


Figure 12: Distribution of Burglary Rates (Prevalence) within the SBD Sample



Analysis of concentration rates of both burglary and total crime revealed mixed findings. Concentration is measured by dividing incidence by prevalence and measures the levels of repeat victimisation experienced by residents within the sample. Although the concentration rate for total crime was higher within the Non-SBD sample (2.14 as compared to 1.89 within the SBD sample), levels of repeat burglary were higher within the SBD sample (1.89 as compared to 1.81). This finding will be discussed in more detail in the following chapters as it highlights a weakness within the SBD scheme. Although residents appear to be protected against total crime and burglary, once they experience a burglary offence, they are more likely than their Non-SBD counterparts to experience a subsequent burglary offence.

New Build Properties – Broad Based Analysis:

The method utilised in the broad-based analysis was to compare each SBD scheme with a Non-SBD estate within as close a proximity as possible. Often this was the next street, *cul de sac* or estate, but in many cases it was possible to use part of the same street. The matching of SBD and Non-SBD estates in this broad-based analysis did not take account of any factors such as housing tenure, street type, environmental risk factor or age of property (as shown earlier in the detailed analysis). The analysis included 50 SBD estates (1558 dwellings) and 50 Non-SBD estates (1453 dwellings).

The rationale for analysing these 50 matched pairs on a less detailed level lay with constraints in resources. Selecting the matched pairs for the detailed analysis was time consuming and required many trips to visit the sample sites. Rather than exclude all other SBD estates, it was felt that there would be some use in conducting an additional level of analysis, but remaining aware that the methodology was not as valid as that discussed above. One of the criticisms of this method lays in the differences in housing tenure. Although this method allowed the selection of matched pairs which were often part of the same street (half of the street being SBD and the other Non-SBD), there were many cases in which the SBD section of the street was RSL owned whilst the Non-SBD section of the street comprised owner occupied properties. Therefore, comparisons were being made between two different types of dwelling. This is by no means a criticism of RSL properties, or the residents residing within them, however, rented accommodation and the fluidity of incoming/outgoing residents, the lack of social cohesion and awareness of who lives on the estate and who does not, cannot be compared like with like to owner occupied properties. The point of emphasising the less robust design of the broad-based

analysis is to anticipate that, in the event of divergent results, more weight should be placed on the detailed analysis. As with the detailed level of analysis, the period of time for which data were included varied between each pair. The start date was always the date at which the newest estate was built, the end date was always the 1st March 2000. The mean rate of total crime within the SBD sample was 0.76 compared to a rate of 0.70 within the Non-SBD sample, this suggests that total crime is slightly higher within the SBD sample. Tests for normality of distribution revealed that the data differed significantly from the normal (using the Shapiro-Wilk for the sample size of 50). Therefore, the Wilcoxon Test was used to analyse the data. The results revealed that the difference between the total crime rate experienced by the two samples was not statistically significant at the level of 0.05 (one-tailed).

The results were very similar when the analysis included burglary alone. The mean rate of burglary within the SBD sample was 0.23, this is compared to a Non-SBD rate of 0.21. This suggests that burglary levels were slightly higher within the SBD sample. As the distribution of data differed significantly from the norm, the Wilcoxon test was used as the method of analysis. The results revealed that the difference between the burglary rate experienced by the SBD sample and that experienced by the Non-SBD sample was not statistically significant at the level of 0.05 (one-tailed).

Table 14: Broad Based Analysis – Summary of Total Crime Data

SBD Status	Mean Total Crime Rate
SBD	0.76
Non SBD	0.70
Shapiro-Wilk (test for normality of distribution for sample size of 50)	SBD (0.000) & Non-SBD (0.000)
Wilcoxon Test	0.43

Table 15: Broad Based Analysis – Summary of Burglary Data

SBD Status	Mean Burglary Rate
SBD	0.23
Non SBD	0.21
Shapiro-Wilk (test for normality of	Non-SBD (0.000) & SBD (0.000)

distribution for sample size of 50)	
Wilcoxon Test	**0.21**

When the prevalence rates for both total crime and burglary were analysed, the results revealed that estates within the SBD sample were experiencing slightly higher rates of victimisation. The prevalence rate of total crime within the SBD sample was 0.39, this is compared to 0.37 within the Non-SBD sample. The prevalence rate for burglary within the SBD sample was 0.19, this is compared to a rate of 0.16 within the Non-SBD sample. The Shapiro-Wilk test was used to measure the normality of distribution of the total crime and burglary data. The total crime data did not differ significantly from the norm, therefore, the Paired Comparison T-Test was used to analyse the data. The burglary data did differ significantly from the norm, therefore, the Wilcoxon test was used to analyse these data. Statistical analysis revealed that the difference between the prevalence rate of total crime and burglary experienced by the SBD sample did not differ significantly from that experienced by the Non-SBD sample at the 0.05 level (one-tailed).

Table 16: Broad Based Analysis – Summary of Total Crime Prevalence

SBD Status	Total Crime Prevalence Rate
SBD	**0.39**
Non SBD	**0.37**
Shapiro-Wilk (test for normality of distribution for sample size of 50)	**SBD (0.388) & Non-SBD (0.489)**
Paired Comparison T-Test	**0.21**

Table 17: Broad Based Analysis – Summary of Burglary Prevalence

SBD Status	Burglary Prevalence Rate
SBD	**0.19**
Non SBD	**0.16**
Shapiro-Wilk (test for normality of distribution for sample size of 50)	**SBD (0.005) & Non-SBD (0.003)**
Wilcoxon Test	**0.12**

Analysis of the concentration rates within this broad-based sample again revealed mixed findings. Concentration rates of total crime were higher within the SBD sample (1.95 as

compared to 1.90). However, concentration rates of burglary offences were slightly higher within the Non-SBD sample (1.3 as compared to 1.2).

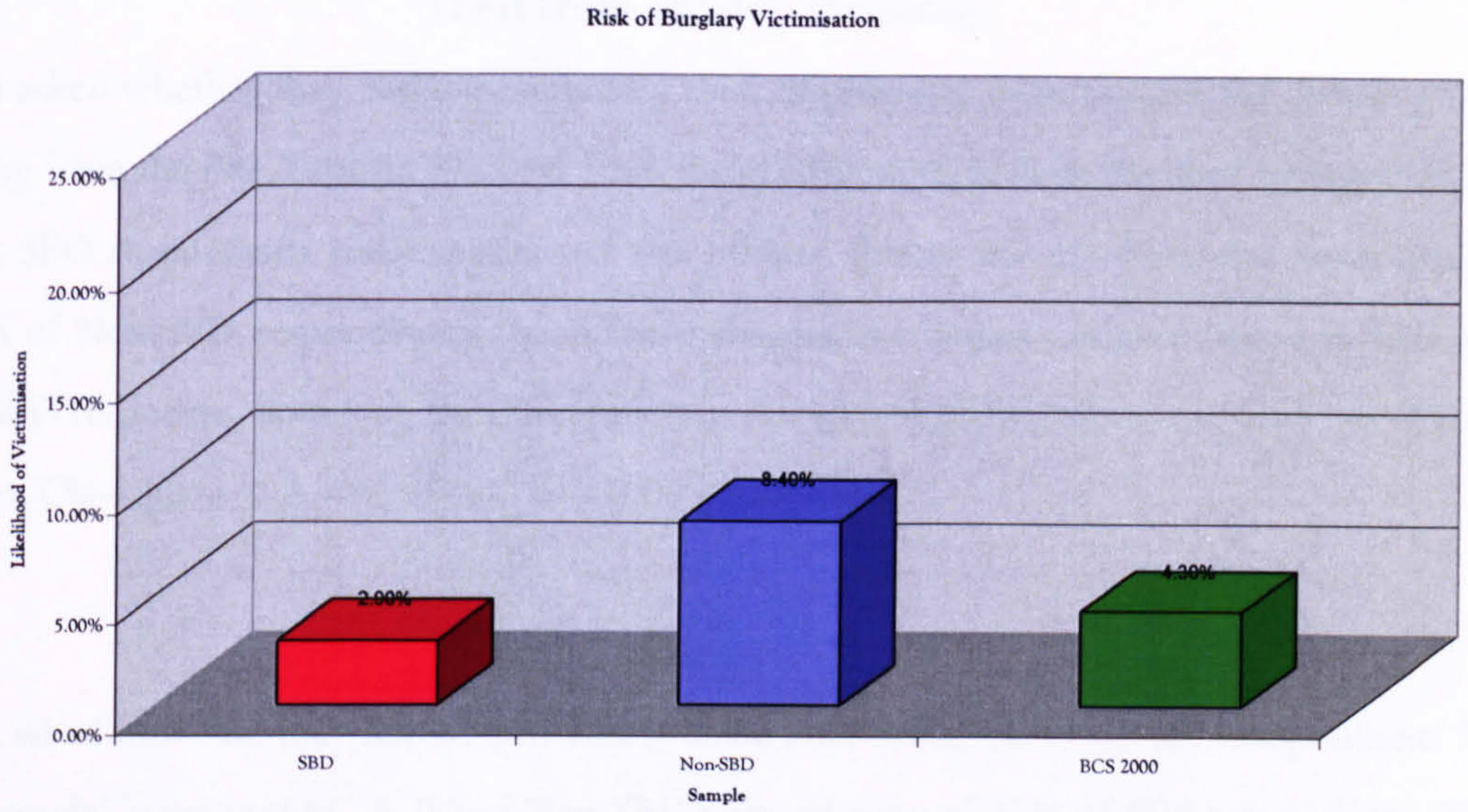
Residents' Survey:

The residents' survey was designed to ascertain residents' actual experiences of crime as well as their fears, perceptions and concerns regarding crime and disorder within their neighbourhood. The questions were based upon those utilised in the British Crime Survey to ensure that as well as comparisons between SBD and Non-SBD respondents, the findings could also be related to those of the general population. 250 SBD and 250 Non-SBD addresses were visited as part of the residents' survey. The response rate was 47%, 45% of these were SBD residents and 55% were Non-SBD residents, giving a balanced representation. The residents' survey took place in 1999, for this reason, the findings from the 2000 British Crime Survey (which measures experiences within 1999) were used as the national comparison.

Burglary:

The results revealed that 2.9% of SBD respondents had been burgled within the previous year, this is compared to 8.4% of Non-SBD respondents and 4.3% of BCS respondents. Statistical analysis revealed that the difference in levels of victimisation experienced by residents living within SBD and Non-SBD properties was not significant at the level of 0.05, but did verge on statistical significance - Pearson Chi-Square = 3.205, df = 1, p = 0.06 (one-tailed). Of those who had experienced a burglary within the previous year 1.9% of SBD respondents and 1.5% of Non-SBD respondents had been burgled more than once. This suggests that although burglary is lower within the SBD sample, residents are more vulnerable to repeat burglary. This finding supports those presented within the detailed analysis (above) which revealed that although burglary rates were lower within the SBD sample, levels of repeat burglary (concentration) were higher.

Figure 13: Percentage of Sample Experiencing Burglary



Vehicle Offences:

Findings from the residents' survey revealed that 4.8% of the SBD respondents and 6.1% of the Non-SBD respondents had experienced a Theft of Vehicle offence within the previous year. Statistical analysis revealed that this difference was not statistically significant - Pearson Chi-Square = 0.203, df = 1, p = 0.44 (one-tailed). 0% of the SBD respondents had experienced this offence on more than one occasion during the previous year compared to 1.6% of the Non-SBD sample.

In direct contrast to this finding, 7.6% of SBD respondents and only 6.1% of Non-SBD respondents had experienced a Theft from Vehicle offence within the previous year. This difference was not statistically significant at the level of 0.05 - Pearson Chi-Square = 0.211, df = 1, p = 0.42 (one-tailed).

A lower number of SBD respondents (5.7%) than Non-SBD residents (7.6%) reported having experienced damage to their vehicle during the previous year. Again, this difference was not statistically significant at the level of 0.05 - Pearson Chi-Square = 0.005, df = 1, p = 0.54 one-tailed)

Theft of pedal cycles were higher among SBD respondents (9.5%) than Non-SBD respondents (6.9%), however, this difference was not statistically significant - Pearson Chi-Square = 0.554, df = 1, p = 0.31 (one-tailed).

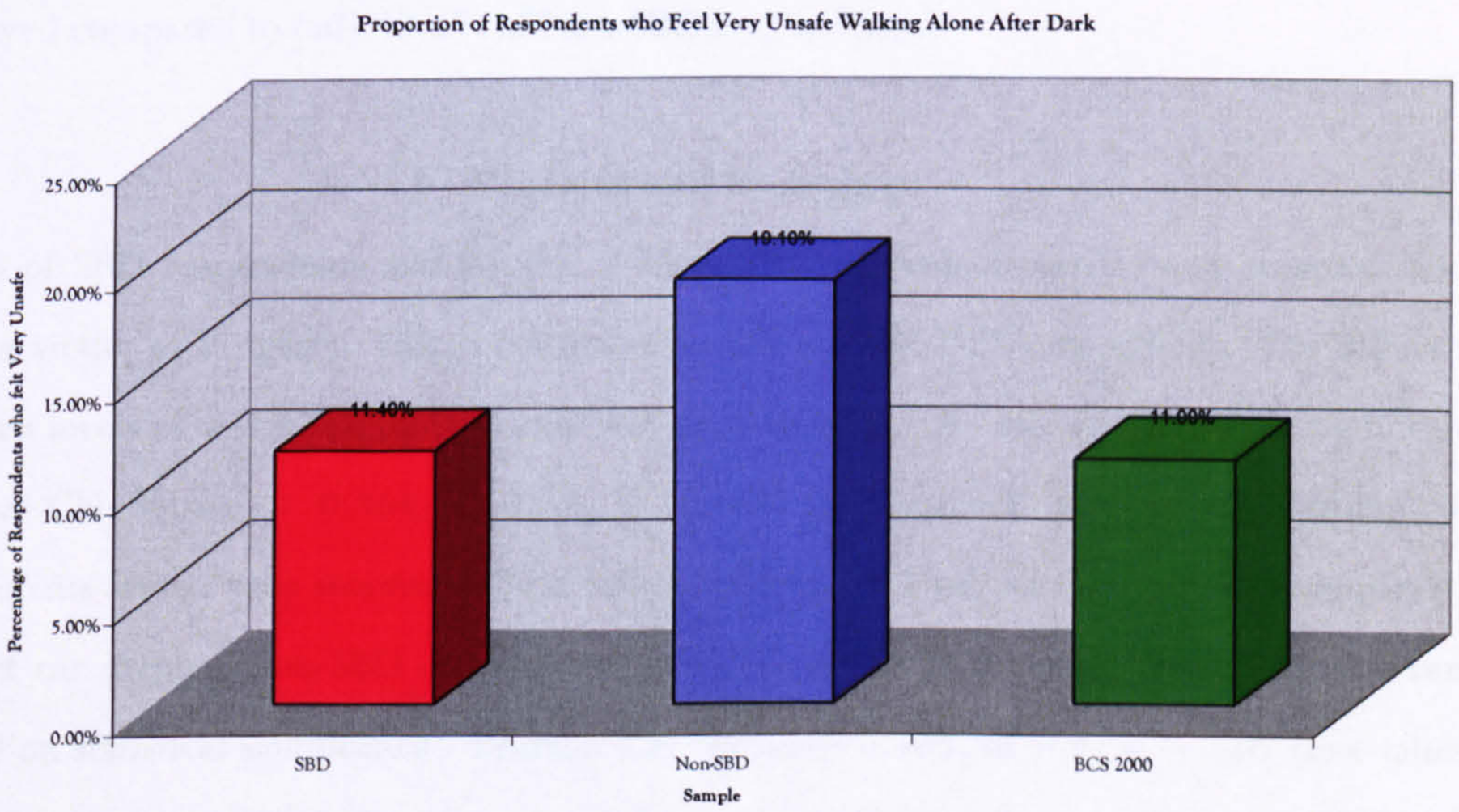
Theft from outside dwelling:

When asked whether they had experienced a theft of property from outside the dwelling (i.e. washing from the line, furniture or toys from the garden or tools from the shed/garage) 16.2% of the SBD respondents had experienced this offence during the previous year compared to 24.4% of Non-SBD respondents. This offence showed the largest variance between SBD and Non-SBD responses, however, the difference was not statistically significant at the level of 0.0 - Pearson Chi-Square = 2.404, df = 1, p = 0.08 (one-tailed).

Safety:

When asked how safe they felt when walking alone after dark, 11.4% of SBD respondents felt 'very unsafe' compared to 19.1% of Non-SBD respondents and 11% of BCS respondents. This difference is statistically significant at the level of 0.05 - Pearson Chi-Square = 6.111, df = 3, p = 0.05 (one-tailed). A further 43.8% of SBD respondents felt 'very unsafe or a bit unsafe' compared to 45.1% of Non-SBD respondents and 33% of the BCS respondents.

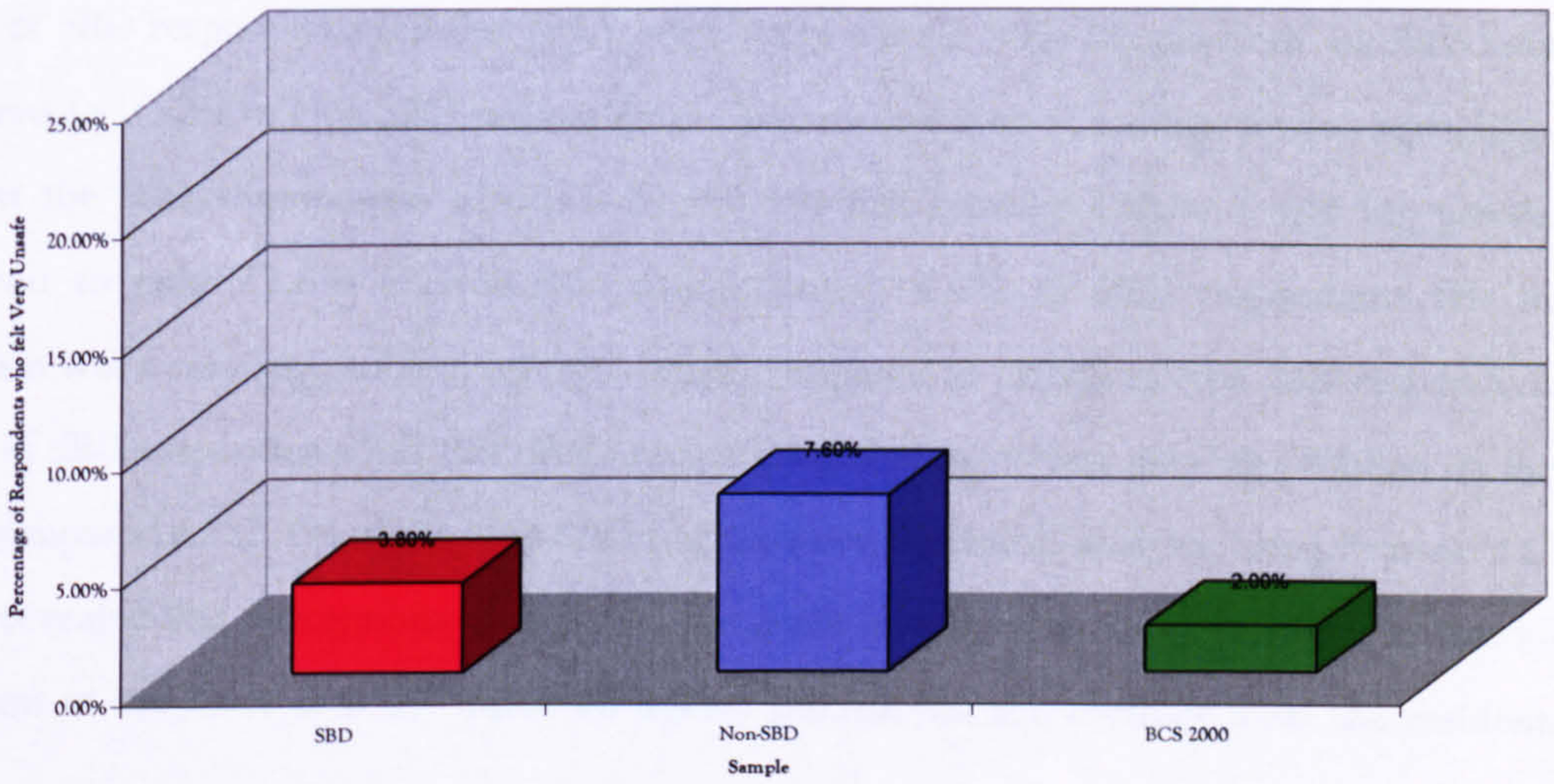
Figure 14: Percentage of Sample who Feel Very Unsafe Walking Alone After Dark



3.8% of SBD respondents felt very unsafe at home alone at night compared to 7.6% of Non-SBD respondents and 2% of BCS respondents. This difference was not statistically significant - Pearson Chi Square = 3.307, df = 3, p = 0.18 (one-tailed). 20% of the SBD respondents felt

very or a bit unsafe in their home at night compared to 29.7% of the Non-SBD respondents and only 9% of BCS respondents.

Figure 15: Percentage of Sample who Feel Very Unsafe at Home Alone at Night.



57.1% of SBD respondents felt safer in their present home than the previous house in which they lived compared to only 49.6% of Non-SBD respondents.

Worries and Concerns:

24.8% of SBD respondents and 26.7% of Non-SBD respondents were 'very worried' about being a victim of burglary. This is compared to 19% of the BCS respondents. The difference between levels of worry felt by SBD and Non-SBD respondents was not statistically significant - Pearson Chi Square = 0.364, df = 3, p = 0.47 (one-tailed). 25% of car owning SBD respondents were 'very worried' about being a victim of Theft of their vehicle compared to 27% of car owning Non-SBD respondents and 21% of the BCS respondents. This difference verged on statistical significance - Pearson Chi Square = 6.163, df = 4, p = 0.09 (one-tailed). 23% of car owning SBD respondents were 'very worried' about being a victim of Theft From their vehicle compared to 26% of car owning Non-SBD respondents and only 16% of BCS respondents. This difference was statistically significant - Pearson Chi Square = 8.419, df = 4, p = 0.04 (one-tailed). 20% of SBD respondents were 'very worried' about being a victim of mugging, this figure was higher than Non-SBD respondents of which only 17.6% were 'very worried'. (The BCS figure was 17%). This difference is not statistically significant - Pearson Chi

Square = 0.878, df = 3, p = 0.42 (one-tailed). Another concern which was greater amongst SBD residents was racially motivated incidents. 11.4% of SBD respondents were very worried compared to 9.2% of Non-SBD respondents. This difference was not statistically significant - Pearson Chi-Square = 4.374, df = 3, p = 0.11 (one-tailed).

Perceptions of Crime and Disorder:

12.4% of SBD respondents felt that noisy neighbours were a 'very big problem' on their estate compared to 10.7% of Non-SBD respondents. Concerns relating to teenagers were again higher amongst the SBD respondents of which 23.8% felt that teenagers were a very big problem compared to only 17.6% of Non-SBD respondents. 18.1% of SBD respondents felt that vandalism was a very big problem on their estate compared to 19.8% of Non-SBD respondents. 15.2% of SBD respondents felt that drug use and drug dealing were a very big problem on their estate compared to 22.1% of the Non-SBD respondents. Statistical analysis, using Pearson's Chi Square revealed that perceptions of each of these crime and disorder issues were not statistically significant at the level of 0.05. Table 18 below summarises the findings from the residents' survey.

Table 18: Summary of Survey Responses

Crime/Disorder	SBD Response	Non-SBD Response
Burglary*	2.9%	**8.4%**
Theft of Vehicle	4.8%	**6.1%**
Theft from Vehicle	7.6%	**6.1%**
Damage to Motor Vehicle	5.7%	**7.6%**
Theft of Pedal Cycle	9.5%	**6.9%**
Theft from Outside Dwelling*	16.2%	**24.4%**
Very Unsafe Alone on Streets**	11.4%	**19.1%**
Very Unsafe at Home Alone	3.8%	**7.6%**
Very Worried about Burglary	24.8%	**26.7%**
Very Worried about Theft of Vehicle*	25%	**27%**
Very Worried about	23%	**26%**

Theft from Vehicle**		
Very Worried about Mugging	20%	**17.6%**
Very Worried about Racially Motivated Attacks*	11.4%	**9.2%**
Noisy Neighbours are a Very Big Problem	12.4%	**10.7%**
Teenagers are a Very Big Problem	23.8%	**17.6%**
Vandalism is a Very Big Problem	18.1%	**19.8%**
Drug Use is a Very Big Problem	**15.2%**	**22.1%**

** denotes statistical significance at the level of 0.1 (one-tailed).*

*** denotes statistical significance at the level of 0.05 (one-tailed).*

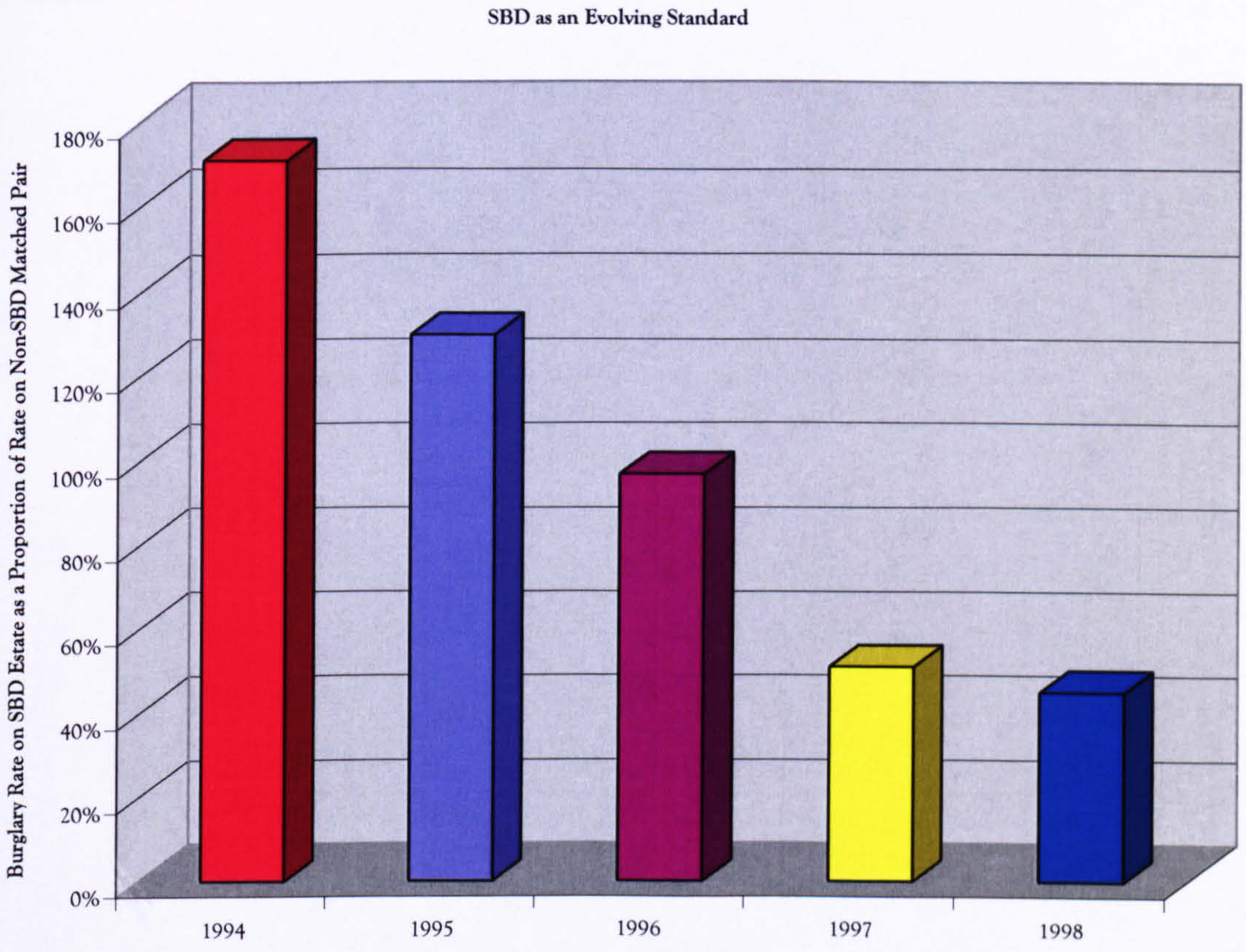
Awareness of SBD:

Finally, only 5% of the SBD respondents were aware that their neighbourhood had been given an award entitled the 'SBD' award because it had been designed and built to reduce opportunities for crime and disorder. This finding is extremely important and suggests that any feelings of enhanced security and safety are genuine emotions rather than the responses which respondents felt obliged to provide, given that they were residing in an estate designed to reduce crime.

SBD as an Evolving Standard:

In an attempt to establish whether the performance of SBD is improving as lessons are learned and new standards are introduced, the burglary rates of SBD estates built in 1994 through to 1998 were compared with their Non-SBD matched pair. The estates used as part of this analysis were the 25 matched pairs utilised for the detailed analysis discussed above. The burglary rate of each SBD pair was expressed as a percentage of its Non-SBD matched pair. These percentages were then aggregated according to the year in which the SBD estate was built, giving a mean percentage for each year – this being the percentage of burglary within the SBD as compared to the Non-SBD sample.

Figure 16: Burglary Rate on SBD Estates as a Proportion of Non-SBD Matched Pairs.



The results revealed a year on year improvement in SBD's performance. The mean burglary rate for SBD estates built in 1994 was 171% of the burglary rate for Non-SBD estates built in 1994 – a disappointing comparison and one which suggests that SBD estates were not achieving any crime reduction benefits. The mean burglary rate for SBD estates built in 1995 was 130% of the burglary rate for Non-SBD estates built in 1995. For estates built in 1996, the figure was 97%, for 1997 the figure was 51% and for SBD estates built in 1998, the mean burglary rate was 45% of the burglary rate for the Non-SBD matched pairs. These results suggest that until 1996, the SBD estates were actually experiencing more burglary that their matched pairs - in the case of estates built in 1994, almost twice as much! Although one would expect an improvement in the performance of the SBD scheme, the extent to which its crime reduction potential has improved is extremely surprising.

Many of the existing standards used in the SBD scheme such as the physical security standards for doors and windows (BS7950 and PAS – 24) were introduced in 1999. It is suggested that had the sample of estates utilised for this thesis been selected at a later date, thus excluding

some of the earlier estates and instead including estates built to a higher specification, the results would have shown a greater difference between crime experienced on SBD and Non-SBD estates.

Chapter Three – Part Four

Discussion

The results discussed within part three of this chapter are mixed, yet overall they reveal a positive picture for the SBD scheme. The analysis of police recorded statistics included three levels – estates which had been refurbished to SBD standard, newly built estates compared with matched pairs which were as similar as possible in terms of age, housing tenure, location and environmental features, and newly built estates which were simply compared with the nearest Non-SBD estate.

The two estates which had been refurbished to SBD saw reductions in the total crime levels of 55%. The crime pattern on the Cherry Court complex appeared straightforward, with immediate reductions in crime following certification to the SBD standard. However, this was not the case for Appleton Gardens/Saville Court. Although the crime rate on this estate fell at the same rate as Cherry Court, the drop in crime levels was not immediate. Crime rates fell in the period immediately following certification, however, they began to increase throughout the following year, before falling to a level much lower than that seen pre-certification, and remaining at this consistently low level for the next five years. Explanations for this pattern may lie with a delay in the crime reduction effects of certain measures introduced by the SBD scheme. Although the physical security improvements would reduce crime immediately, measures such as improved natural surveillance may require time for neighbours to become familiar with the community surrounding them. Others explanations for this pattern may be an increased police presence on the estate, thus an increase in the number of offences actually being detected; an increased willingness to report crime to the police due to rejuvenated levels of pride or increased feelings of confidence in the Criminal Justice System. Each of these suggestions would imply that the level of crimes reported to the police rose following certification to SBD standard, rather than the actual number of crimes being committed.

The refurbished estates involved a simple comparison of pre and post certification crime rates. However, this was not possible for the majority of SBD estates which were newly built to the SBD standard. The analysis of police recorded statistics on newly built SBD estates took place on two levels – detailed and broad based. The detailed level of analysis involved a detailed matching process of 25 SBD and Non-SBD pairs to ensure that as far as possible, the only difference between the pair was that one was SBD and the other was Non-SBD. This detailed

matching process was designed to ensure that any difference in the crime rates could be attributed to the SBD status, as opposed to any extraneous variables such as the age of the properties or the tenure of the residents. The results of this analysis revealed that the incidence rates (number of crime events divided by the number of properties) of both total crime and burglary alone were lower within the SBD sample. The total crime rate was 34% higher within the Non-SBD sample and the burglary rate was 71% higher within the Non-SBD sample. Although the differences between the rates within the two samples were not statistically significant at the level of 0.05, they did verge on statistical significance (0.1 for total crime and 0.16 for burglary) and were virtually all in the same direction, and would thus have reached statistical reliability on a sign test.

The findings were very similar when an analysis of incidence was replaced with prevalence (the proportion of dwellings which were offended against at least once). The results revealed that both total crime and burglary rates were higher within the Non-SBD sample. The total crime rate was 19% higher within the Non-SBD sample, and the burglary rate was 78% higher within the Non-SBD sample. Although these results again did not reveal a statistically significant difference at the level of 0.05, the difference did verge upon statistical significance (0.06 for total crime and 0.12 for burglary).

The analysis of levels of repeat victimisation will be discussed in more detail in Chapter four; however, initial analysis revealed that SBD did not perform as well at preventing repeat crimes once the first crime had been committed. Although repeat victimisation was higher within the Non-SBD sample, repeat burglary was higher within the SBD sample. This finding suggests that although SBD is more likely to prevent crime taking place, once the offender has found a weakness, either within the design of a property or the resident residing within that property, they are exploiting that weakness and committing repeat burglaries at a rate higher than that experienced by the Non-SBD matched pairs.

In contrast to the detailed level of analysis, the broad-based level of analysis simply compared 50 SBD estates with the nearest 50 Non-SBD estates irrespective of intervening variables such as housing tenure or age of property. The less robust design of the broad-based research means that it was recognised in advance that, in the event of divergence of results, more confidence would be invested in the detailed analyses. The results were much less positive for the SBD scheme and revealed very little difference between crime rates within the SBD and Non-SBD

sample. Incidence rates for total crime and burglary were very slightly higher within the SBD sample. However, these differences were not statistically significant (probabilities of 0.43 for total crime and 0.21 for burglary). Prevalence rates showed a very similar pattern, with both total crime and burglary rates slightly higher within the SBD sample. Again these differences did not show statistical significance (0.21 for total crime and 0.12 for burglary). The levels of repeat victimisation were higher within the SBD sample for total crime, but unlike the detailed level of analysis, the repeat victimisation rate for burglary was lower within the SBD sample.

Although the results of the detailed analysis (the level of analysis with the most rigorous methodology) were positive, it was felt that the results were not as positive as might be expected. Further analysis of the burglary rates, paying particular attention to the year in which the SBD estates were built, revealed a year on year improvement in the performance of SBD as a crime reduction measure. The SBD estates built in 1994 and 1995 were experiencing much higher levels of burglary than their Non-SBD matched pairs. Yet, the estates built in 1997 and 1998 were experiencing less than half of the burglaries of the Non-SBD sample. As the standards of physical security required within SBD dwellings was upgraded in 1999, it is suggested that an analysis of estates built in more recent years would have revealed even more positive results, and such research is recommended.

The analysis of refurbished and newly built estates had thus far focused only upon police recorded statistics. Kershaw *et al* (2000) estimated that only 41% of offences are actually reported to the police, and of those offences which are reported, only 57.2% are recorded as police statistics. For this reason, the analysis included a self-reporting questionnaire designed to ascertain experiences, fears and perceptions of crime and disorder within the sample of 25 SBD and 25 Non-SBD estates which had been included in the detailed analysis. The results supported the findings of the detailed analysis and revealed that burglary, theft of vehicle, damage to motor vehicle and theft from outside the dwelling were higher within the Non-SBD sample. The only differences verging on statistical significance were burglary (0.06) and theft from outside the dwelling (0.08). The crime categories theft from vehicle and theft of pedal cycle were higher within the SBD sample, but these differences were not statistically significant. As well as measuring crimes experienced by residents, the survey asked questions relating to fears and concerns about crime and disorder issues. The results revealed that SBD residents feel safer than their Non-SBD counterparts whilst walking alone on the streets as well as at home alone at night. The difference between levels of fear experienced by SBD and Non-SBD residents whilst

walking alone on the streets at night was statistically significant (0.05), whilst the differences in levels of fear whilst home alone at night was not (0.18).

SBD residents were less worried about becoming a victim of burglary or vehicle crime than their Non-SBD counterparts. However, they were more worried than their Non-SBD counterparts about becoming a victim of mugging or racially motivated attacks. SBD residents were more likely than Non-SBD residents to feel that both noisy neighbours and teenagers hanging around were a very big problem. However, SBD residents were less likely than their Non-SBD counterparts to feel that vandalism or drug use were very big problems on their estate. The findings from the residents' survey revealed that SBD residents experienced lower levels of burglary, theft of vehicle, damage to vehicle and theft from outside the dwelling – supporting the findings of the detailed analysis. However, SBD residents report experiencing higher levels of theft from vehicle and theft of pedal cycle than their Non-SBD counterparts. These two offences were lower within the analysis of police recorded statistics, suggesting either a level of under reporting to the police, or over reporting as part of the survey. As well as experiencing lower levels of crime, SBD residents appear to feel safer in their home and on the streets surrounding their home than Non-SBD residents. SBD residents also appear to worry less about becoming a victim of property crimes such as burglary and vehicle crime, yet more about personal crimes such as mugging and racially motivated attacks – a result which supports the police recorded statistics, which showed higher levels of violent crimes such as ABH and GBH within the SBD sample.

A less positive finding from the residents' survey was that of perceptions relating to disorder and anti-social behaviour. A higher number of SBD respondents felt that noisy neighbours and teenagers hanging around were a 'very big problem' on their estate than Non-SBD respondents. However, lower numbers of SBD respondents felt that drug use/dealing and vandalism were a 'very big problem' than Non-SBD respondents. One explanation for this finding may be related to a displacement of concerns or priorities among the SBD residents. A lower level of crime within these estates may have led to disorder issues becoming their main priority for concern (perhaps a positive result of the reduction in crime on SBD estates). Overall, the findings from the residents' survey are positive and support the recorded statistics in their presentation of SBD estates.

This aim of this chapter of the thesis was to establish whether SBD is an effective crime reduction measure. The results are positive, yet not straightforward. Overall, the findings suggest that SBD is probably and with qualifications an effective crime reduction measure when compared with houses which are similar in terms of tenure, age and environmental factors. Rates of burglary and total crime are lower, and residents appear to feel safer and less concerned about property crime. Although the findings suggest that SBD estates experience lower levels of crime than their similar Non-SBD counterparts, the results were far from positive when SBD estates were simply compared with the nearest estate irrespective of intervening variables. It is suggested that the variables age and housing tenure have more impact upon crime, albeit negatively, than the introduction of the SBD scheme. Although these factors have not been disentangled, it is suggested that housing tenure is likely to have the greatest impact upon these findings. The estates were not matched for age, yet the majority were of a similar age. However, within this level of analysis, all SBD dwellings were RSL owned and therefore rented to their tenants. In contrast, the majority of Non-SBD properties were owner occupied. Although the actual levels of social cohesion have not been measured for this study, it is suggested that the increased levels of resident turnover within the rented accommodation, would render those properties more vulnerable to crime. Neighbours are less likely to know who are residents and who are strangers, a factor which would increase the appeal of those properties to potential offenders (Brown and Altman, 1983; Brown and Bentley, 1993).

The reader will recall at the outset that the present thesis is intended as in part future-oriented. Thus the evaluation reported to this point will in due course form the basis for a prospectus of possible refinements of SBD, rather than a static statement of how good it is. In many ways, the easier route to a doctoral thesis would have been to analyse the data reported to this point in greater detail. Some of the analyses which could be done include the following:

1. Is the time and day of week profile in SBD homes different from those of Non-SBD homes, i.e. are there different peak times and days?
2. Is there a different gap between the first time an offence occurs and the last, comparing SBD and Non-SBD homes? The shortness of this gap can be used as a proxy for the shortness of the travel to crime distance of the perpetrator.
3. Is there a different proportion of SBD and Non-SBD burglaries which involve garden sheds rather than intra-mural burglary?
4. Are there differences between goods taken in the burglary of SBD and Non-SBD homes?

These and many other interesting questions could have been addressed with the data to hand, and perhaps will be in the future. However the trade-off between evaluation and improvement was made in favour of the latter, which accounts for the direction taken in the next chapter.

Chapter Four
Environmental Factors and the Prediction of Risk

Chapter Four – Part One
Aims

Chapter three focused upon the performance of SBD as a crime reduction measure, comparing crime and the fear of crime between samples of SBD and Non-SBD properties. The results were positive yet mixed. SBD residents appear to experience less crime and fear of crime than their Non-SBD counterparts, yet SBD properties remain vulnerable to repeat victimisation. The standard of SBD estates also appears to be improving year on year. Estates built prior to 1996 were experiencing burglary rates almost twice as high as their Non-SBD counterparts, however, those built in 1998 experienced less than half of the burglary of the Non-SBD sample. The research findings discussed thus far warrant the claim that SBD is an effective crime reduction measure, but to sit back and enjoy this claim without pursuit of improvement would be both naïve and complacent. Complacency is used to describe those who are contented or self satisfied to a fault. To become complacent about the merits of SBD, or any crime prevention measure, would be to ignore the evolving nature of crime and those who take part in it. To ensure that SBD continues to evolve faster than criminals' abilities to overcome it, research with an improvement orientation is essential. With this in mind, Chapters four and five aim to investigate the current weaknesses within the SBD scheme and to suggest ways in which its use as a crime reduction tool can be maximised. Chapter four focuses upon the specific environmental factors which increase a property's vulnerability to first and repeat victimisation. The rationale for this investigation is twofold – the first relates to clarification, the second to improvement.

The first rationale for investigating which individual environmental factors increase a property's vulnerability to crime was to clarify some of the confusion surrounding the issue of permeability and through movement. Although the research presented within this thesis investigates an abundance of factors other than pedestrian and vehicular movement (including the presence of litter/vandalism, signs of desertion and traces of residence), the analysis of environmental factors such as the positioning of footpaths, road layout surrounding properties and pedestrian and vehicular through movement is designed to help clarify a position which has become confusing and contradictory for the practitioners tasked with the role of designing residential housing estates. The second rationale is improvement oriented. As was discussed in earlier paragraphs, initial investigations suggest that SBD is an effective crime reduction measure.

However, previous research suggests that many crime reduction initiatives follow a finite life cycle (Berry and Carter, 1992) with the positive effects susceptible to fade unless managed closely. This pattern has been displayed within many CCTV initiatives, for example, Webb and Laycock (1992), Tilley (1993), Brown (1995) and Armitage *et al* (1999). It is hoped that in investigating the influence of particular environmental factors upon crime risk, the SBD standards can be re-assessed and improved as necessary.

Chapter Four – Part Two
Risk Factors as a means of Prediction

The importance of predicting the risks associated with the introduction of new products, systems, processes, buildings and even legislation was discussed in Chapter two. Consideration of the unintended consequences of development and innovation are essential. In 1999 the UK government projected a need for some 4.1 million additional homes by 2021. Consider the impact, which this development could have upon crime and disorder should planners and developers a) know which factors make a property vulnerable to crime and b) care enough to avoid these. Chapter two discussed work already carried out by authors such as Winchester and Jackson (1982), Coleman (1986) and Groff and LaVigne (2001) who produced risk assessment tools for residential housing. The Winchester and Jackson Environmental Risk Index provided a good, empirically based starting point and was used as a means of minimising intervening variables within the selection of samples for the analysis contained within Chapter three. However, with the original aims of this thesis in mind, it was felt that a much more comprehensive list of factors was required. The rationale behind the perceived need for a wider range of factors was twofold. Firstly, further analysis of the Winchester and Jackson Environmental Index scores awarded to properties within the original sample (see chapter Three) revealed that there was very little difference between the SBD and Non-SBD samples (even those rejected due to scores which were medium or high). For example, only 1% of the sample was located in the country, 0% were isolated, 0% were set at a distance from the road on which they stood and 0% were in a position with 5 or less houses in sight. This meant that analysis of whether these particular factors predict risk would in all likelihood prove impossible. The second and overriding rationale was to ensure that the findings from the analysis could be used to clarify many of the current debates surrounding SBD and designing out crime. This meant ensuring that data were collected on factors such as through movement, surveillance, maintenance and road layout because these were factors on which variation could reasonably be expected. The factors utilised for this section of the thesis are discussed in more detail within the methodology section below.

Chapter Four – Part Three
Methodology

Chapter four of the thesis focuses upon developing a comprehensive environmental risk index to aid the future development of the SBD scheme and to inform practitioners as to the factors which influence crime and disorder within residential housing. The sample included the 25 SBD and 25 Non-SBD housing estates which had been used in the detailed analysis (see Chapter three) and covered 1058 properties located throughout the West Yorkshire region. The scale of this task will hopefully become clear as the reader continues, however, in case this is not apparent, it is hoped that a brief review will not appear boastful. The collection of data for Chapter four involved conducting an assessment of each of these 1058 houses using the Other Environmental Risk Factors (OERF) checklist developed as part of this thesis (to be discussed below). The checklist is extremely comprehensive and covers factors which relate to the property itself as well as the layout of the surrounding area. Factors such as car parking, property boundary and orientation of the front door could be established relatively easily with a clear view of most properties. However, factors such as the positioning of footpaths were not as straightforward. In this instance the author had to measure the distance from the property to the footpath as well as investigating the destination of the footpath - did it lead to a maze of other paths, shops or another residential areas? Another example includes the factors relating to whether the property was likely to be within the awareness space of potential offenders. Factors included whether the property was in viewing distance of a road junction, the volume of traffic at that junction, whether the property was in viewing distance of traffic lights and what was the volume of traffic at those lights? It is estimated that the completion of one checklist took between 15 and 20 minutes. The sample included 1058 houses, spread throughout Bradford, Huddersfield, Halifax, Wakefield and Bradford. For this reason, the data collection for this section of the thesis alone covered a period of more than three months, and as the photos below highlight, more than one British season!

The OERF checklist was developed using previous indices of risk as well as the literature relating to environmental risk factors which has been discussed in detail in Chapter two. As was referred to within the previous paragraph, this checklist was entitled Other Environmental Risk Factors (OERF) checklist and was split into the seven categories road network, access, property within awareness space of others, surveillance, parking, social climate and traces.

Road Network: Was the property located on a cul-de-sac without a linked pathway, a cul-de-sac with a linked pathway or a through road? Was the property situated on an estate which had a real or symbolic barrier at the entrance to the estate? Was there a change in the texture or colour of the road, a narrowing of the entrance or a physical roadblock?

Access: This section of the table involved assessing how close the property was located to a footpath and where that footpath led. Did it lead to shops, a maze of other footpaths, another residential area or open land? There was also a need to establish whether the footpath ran at the rear of the property, whether there was a gate leading from the footpath into the garden and whether the house was visible from that footpath. The access section also looked at the boundary of the property. Was it bounded by a wall, solid fence, post and rail fence, thorny foliage, a fence/wall topped with trellis or nothing?

Awareness space: This section of the table looked at whether or not the property was within the awareness space of potential offenders. Was it located within viewing distance of a stop sign and if so what was the volume of traffic at that stop sign? Was the property located within viewing distance of traffic lights and again if so what was the volume of traffic at these traffic lights? Was the property located within viewing distance of a road junction? If so, what was the volume of traffic at that junction? Information was also gathered relating to the average speed of traffic in front of the property as well as the volume of both vehicular and pedestrian traffic in front of the property. Finally, this section looked at whether or not there were people hanging around within the vicinity of the residence.

Parking: Were the car parking facilities on the street, within a communal area, on the driveway or within a garage?

Social Climate: Was there evidence of a neighbourhood watch scheme? Was there evidence of litter and graffiti? Were there signs of disrepair, or short/long term desertion?

Traces: The final section looked at traces. Was there evidence of a dog or a burglar alarm? Was there a window open or a door ajar?

The checklist also asked the questions 'Were you observed by a resident?' and 'Were you confronted by a resident?' These were designed to measure the extent of informal social control on the estate where the property was located.

Table 19: Other Environmental Risk Factors Checklist

Address:
Day:
Date:
Time:

Observed by Resident (i.e. twitching curtains etc.): yes/no

Questioned/Confronted by Resident: yes/no

Road Network	Yes	No	Other
1) *Cul de sac* without linked pathway			
2) *Cul de sac* with linked pathway			
3) Through road			
4) Entrance to estate is marked by symbolic/real barrier i.e. change in road colour/texture, pillars, gate etc.			
Access *** footpath is any pedestrian thoroughfare that is NOT a pavement/sidewalk**	**Yes**	**No**	**Other**
5) Number of properties away from footpath*			
a) 0 (i.e. adjacent)			
b) 1-5 (properties)			
c) 6-10 (properties)			
6) Footpath leads to:			
a) Shops			
b) Open land			
c) Maze of other footpaths			
d) Other residential area			
7) Footpath runs at rear of house			
8) Gate leading from footpath into rear garden			
9) Property is visible from footpath			
10) Boundary of property is marked by			
a) Wall			
b) Solid Fence			
c) Post and Rail Fence i.e. see through			
d) Thorny foliage			
e) Fence/wall topped with trellis			
f) Nothing			
Property within 'Awareness Space' of Others?	**Yes**	**No**	**Other**
11) Within viewing distance of 'Stop' sign			
12) Volume of Traffic at 'stop sign'			
a) Light (0-5 vehicles stop within 3 minutes)			
b) Moderate (6-10 vehicles stop within 3 minutes)			
c) Heavy (10+ vehicles stop within 3 minutes)			
13) Within viewing distance of traffic lights			
14) Volume of Traffic at traffic lights			
a) Light (0-5 vehicles stop within 3 minutes)			
b) Moderate (6-10 vehicles stop within 3 minutes)			
c) Heavy (10+ vehicles stop within 3 minutes)			
15) Within viewing distance of road junction			

16) Volume of traffic at road junction a) Light (0-5 vehicles stop within 3 minutes)			
b) Moderate (6-10 vehicles stop within 3 minutes)			
c) Heavy (10+ vehicles stop within 3 minutes)			
17) Average speed of traffic in front of residence			
18) Volume of traffic in front of residence a) Light (0-5 vehicles pass in 3 minutes)			
b) Moderate (6-10 vehicles pass in 3 minutes)			
c) Heavy (10+ vehicles pass in 3 minutes)			
19) Volume of pedestrian traffic in front of residence a) Light (0-5 pedestrians pass in 3 minutes)			
b) Moderate (6-10 pedestrians pass in 3 minutes)			
c) Heavy (10+ pedestrians pass in 3 minutes)			
20) People 'hanging around' within vicinity of property			
Surveillance	**Yes**	**No**	**Other**
21) Front door facing street			
Parking	**Yes**	**No**	**Other**
22) Driveway			
23) Garage			
24) Communal Parking			
25) Street parking			
Social Climate	**Yes**	**No**	**Other**
26) Evidence of Neighbourhood Watch Scheme			
27) Evidence of Litter/Graffiti within vicinity of property a) None			
b) Some			
c) Heavy			
28) General upkeep of Property a) No signs of disrepair			
b) Some sign of disrepair			
c) Many signs of disrepair			
29) Signs of short term desertion: e.g. milk bottles left outside			
30) Signs of long term desertion e.g. untended garden, piles of letters/newspapers, property boarded up			
Traces	**Yes**	**No**	**Other**
31) Evidence of dog			
32) Evidence of burglar alarm			
33) Window open/door ajar			

The final version of the OERF table was produced following several validation exercises to ensure that the statements/questions were not ambiguous or open to misinterpretation. The

criticism to which this methodology is most vulnerable concerns inter-rater reliability. Since it was not possible for the author to be unaware of an estate's SBD status, the rating had to be as objective as possible. Seeking to ensure this involved a small pilot scheme at an estate not utilised within the final analysis. Two individuals scored the same properties without consultation. If there were discrepancies between their findings, these statements/questions were re-worded to improve clarity. The process was repeated until both individuals were reaching the same conclusions for each question/statement. The first fieldworker was the author, the second was a Researcher employed by the Applied Criminology Group at the University of Huddersfield. A second validation exercise involved consultation with several Architectural Liaison Officers (ALOs) to ensure that the questions/statements covered all relevant debates surrounding the scheme – an issue of importance if the findings are to be utilised by practitioners.

Data collection involved certain conventions which should be made explicit. The intention behind the collection of these data was to assess a property's vulnerability to crime as viewed by an outsider i.e. a potential offender. Therefore, when assessing whether there was evidence of factors such as a neighbourhood watch scheme, the objective was not to analyse the intensity of that scheme or even whether it actually existed, but purely to measure evidence of its existence as seen by an outsider. If there was a neighbourhood watch scheme in an area but no overt signs of the scheme it would be categorised as 'no'. On the other hand, if there was no 'working' scheme in an area, but signs of a scheme were present, it would be categorised as 'yes'. On a similar note, evidence of a burglar alarm simply measured whether the fieldworker could see evidence of an alarm, not whether the alarm worked, whether the residents used it, or whether neighbours would respond to it. Following the collection of the OERF data, the fieldwork was concluded with another small pilot exercise whereby two individuals (discussed above) scored the original pilot sample to ensure that there was still consistency between findings. To this end, it is suggested that the scores for each property are as reliable as possible. As a means of supporting the evidence collected, important environmental features from each estate were photographed using a digital camera and filed according to the estate name/house number. Examples are displayed below.

Footpaths:

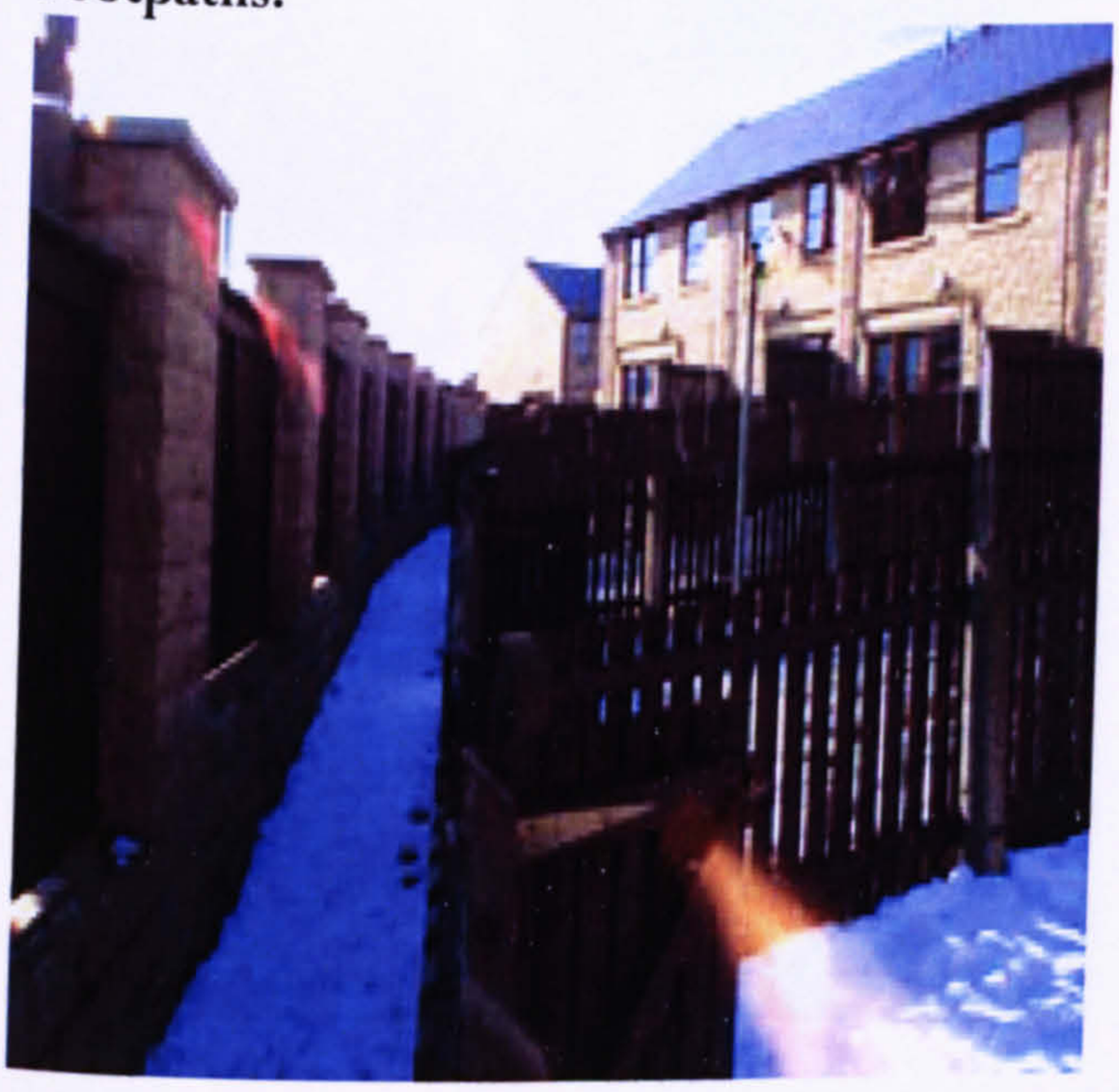


Figure 17: Footpath running at rear of properties. This footpath led to shops and other residential areas.

Figure 18: Footpath running at rear of properties. This footpath led to open land.

Figure 19: Footpath at rear of properties. This footpath led to a maze of other footpaths and to open land.

Management:

Figure 20: Vandalised street sign.

Figure 21: Horses kept in front gardens - A management issue?

Figure 22: Although this estate is well designed and tidy, the below photograph shows the image of its rear.

Figure 23: This photograph shows the rear of Figure 22.

Best Practice:

Figure 24: This estate is tidy, clean and almost crime-free.

The original sample (utilised within the detailed analysis) included two schemes which had resident only entry systems and contained multiple households within one building. For these schemes, environmental factors were not collected for two reasons. First, entry was limited and would have required prior permission and second, many of the environmental factors did not apply to these schemes. Data relating to these 66 properties were therefore excluded from this section of the analysis.

The crime data which was used to establish risk was taken from West Yorkshire Police's CIS. It is police recorded crime data and for that reason does not necessarily include all crime events which occurred at these properties. The analysis of these data, are presented in two distinct formats. The first section identifies which environmental factors are associated with risk of burglary, victimisation (all crime) and repeat burglary/victimisation. Because this section of the thesis is concerned with the association between particular environmental factors which a property possesses and its vulnerability to crime, the analysis utilises Crosstabulation and Chi Square to test this association. It is worth re-iterating at this point that this method of analysis measures association between two variables rather than identifying a causal link. For example, the Crosstabulation table below presents the data relating to the environmental factor: "D*oes the property show signs of litter or graffiti?*" This analysis reveals that a higher proportion of properties showing signs of 'heavy' litter/graffiti had been victimised than properties showing no signs of litter or graffiti. The statistical analysis reveals that there is an association (at the level of 0.05) between the presence of graffiti or litter and a property's (within this sample) vulnerability to victimisation. What this statistical test does not tell us is that the presence of litter or graffiti causes crime.

Table 20: Example of Data Presentation

Evidence of Litter/Graffiti

	Never Victimised	Victimised Once or More	Total
None	512 61.9%	315 38.1%	**827** **100%**
Some	101 49.3%	104 50.7%	**205** **100%**
Heavy	11 42.3%	15 57.7%	**26** **100%**
Total	**624** **59%**	**434** **41%**	**1058** **100%**

Pearson chi-square Value	Significance
13.915	0.0005

The second section of the analysis focuses upon the production of a practitioners' scale for risk assessment – the aim being to produce a simple, transparent and usable tool to enable crime reduction practitioners to direct resources within their local community, a tool whose construction is sufficiently simple for practitioners to revise themselves. Having identified the environmental factors which should feature in any prioritisation of crime reduction effort (because there was a statistically significant association between that variable and the likelihood

that the property would have been victimised), the aim was to produce a practitioners' scale to be used to identify a property's vulnerability to crime. The method of analysis selected for this process was the Burgess Method. This method is described in Simon (1971) and an application in a criminological context is described in Nuttall *et al* (1977), who commend it as robust and simple. It does not address the problems of multicollinearity as more sophisticated models do, but has the crucial advantage of transparency of rationale and construction. Essentially, a score is derived from the difference between the mean rate of crime suffered generally, and the rate of crime suffered by homes with a particular characteristic. The process of applying this method of analysis to this study involved the following steps:

a) The analysis detailed within the first section was utilised to identify the environmental factors which showed a statistically significant association with crime risk;
b) For each of those factors, the average risk of burglary for the whole sample was subtracted from the percentage risk associated with that variable;
c) A score was awarded to each environmental factor. This score was the figure derived from this calculation;
d) Each property *within* the sample was awarded a total score based upon the environmental factors which it possessed;
e) All properties *within* the sample were banded into risk deciles. The mean incidence and prevalence of crime for each decile was established to ensure that the lowest decile (that which had the lowest score) did experience the lowest level of crime, and that the highest decile (that with the highest environmental risk score) had the highest levels of crime.

In the simplest case, if the rate of victimisation of homes in an area is 10%, the rate for homes with window locks is 5% and for homes without window locks is 15%, then the 'window locks' factor is scored thus: +5 = no window locks, -5 = window locks fitted. The process described is repeated for all the attributes which attained statistical significance in the exploratory stage described above. Each home thus receives a total Burgess score. These scores are meaningless until converted into the rate of crime suffered by groups of homes sharing a Burgess score. To do this, as noted above, homes were divided into the 10% with highest Burgess scores, the 10% with next highest and so on down to the 10% with the lowest scores. The rate of crime suffered by each such band was then calculated. These properties were then

banded into percentiles of 10. The mean incidence and prevalence of crime for each percentile was established to ensure that the lowest decile experienced the lowest level of crime, and the highest decile experienced the highest levels of crime.

The scale which emerges is capable of immediate use by practitioners. However, one caveat must be entered. Any predictive scale is almost more powerful as a predictor of the sample on which it was constructed than of any other sample. This is known as shrinkage. This is one of the reasons why the use of this scale by practitioners would need to involve development over the long-term, taking account of local information, rather than simple application of the scale presented. This is not a weakness in the methodology, rather a selection of a method which is simple and transparent which is likely to be utilised by the practitioners it is designed to serve. Any necessity to collate further local information relating to the area in which the analysis was to be applied would require co-operation from a variety of partner agencies, therefore acting as an additional enabler for multi-agency crime reduction practices.

Chapter Four – Part Four
Results

Selecting the Environmental Factors which are associated with crime:

As was detailed within the methodology section, the first stage of this analysis was to establish which environmental factors from the OERFs table, were associated with risk of victimisation. Once these factors had been identified, the second level of analysis - the production of a practitioners' checklist, could take place.

Which Environmental Factors are Associated with Risk of Burglary?

The analysis of the environmental factors which are associated with burglary prone homes was based upon data from 1058 properties, spread throughout the West Yorkshire area. These homes were selected from the detailed analysis sample which was described within Chapter three of this thesis. As this section of the thesis aims to identify the environmental factors which predict risk of burglary of dwellings generally, the variable SBD/Non-SBD was excluded from the analysis. Chapter three focused upon the analysis of SBD against Non-SBD properties, this section of thesis simply looks at what makes a property vulnerable to crime, regardless of its SBD status. Therefore, the sample of 1058 homes includes both SBD and Non-SBD properties.

The first stage of the analysis involved identifying those environmental factors which were associated at a statistically significant level with the likelihood that a property had been burgled. Cross tabulation was used to compare 'Never Burgled' against 'Burgled Once or More' for each of the environmental factors on the OERF table. The environmental factors which were associated with burglary prone homes at or beyond a statistically significant criterion of 0.1 are detailed below. This criterion is more relaxed than the conventional level, but has the advantage of yielding enough criteria from which a checklist can emerge.

Table 21: Burglary - Is the Property Adjacent to Open Space?

	Never Burgled	Burgled at least Once	Total
Yes	160 80.8%	38 19.2%	**198** **100%**
No	728 84.7%	132 15.3%	**860** **100%**
Total	**888** **83.9%**	**170** **16.1%**	**1058** **100%**

19.2% of the properties which were located next to open land had been burgled at least once. Only 15.3% of those which were not located next to open land had been burgled at least once. These figures suggest that the association between being located next to open space and the likelihood of burglary victimisation is statistically significant - Pearson Chi Square = 1.489, df = 1, p = 0.10 (one-tailed).

Table 22: Burglary - What is the Road Network Surrounding the Property?

	Never Burgled	Burgled at least Once	Total
Cul de sac without linked pathway	481 85.9%	79 14.1%	560 100%
Cul de sac with linked pathway	301 81.6%	68 18.4%	369 100%
Through Road	106 82.2%	23 17.8%	129 100%
Total	888 83.9%	170 16.1%	1058 100%

14.1% of the properties which were situated on a cul-de-sac without a linked pathway had been burgled at least once. 18.4% of properties situated on a cul-de-sac with a linked pathway (leaky cul-de-sac) had been burgled at least once, and 17.8% of properties situated on a through road had been burgled at least once. This suggests that properties located on *culs-de-sac* are least likely to experience a burglary, those located on through roads are more vulnerable than true *culs-de-sac*, but less vulnerable than leaky *culs-de-sac,* and *culs-de-sac* which have a linked pathway (leaky) are the most vulnerable to burglary. The association between being located on a *cul-de-sac* with a linked pathway and the likelihood of burglary victimisation was statistically significant – Pearson Chi-Square = 3.418, df = 2, p = 0.09 (one-tailed).

Table 23: Burglary - Is the Property Located on an Estate which has a Real/Symbolic Barrier?

	Never Burgled	Burgled at least Once	Total
Yes	435 86%	71 14%	506 100%
No	453 82.1%	99 17.9%	552 100%
Total	888 83.9%	170 16.1%	1058 100%

14% of the properties which were situated on an estate with a real or symbolic barrier had experienced at least one burglary. In contrast, 17.9% of properties which were situated on an estate without a real or symbolic barrier had experienced at least one burglary. The association between being located on an estate without a real or symbolic barrier at the entrance to that estate and the likelihood of becoming a victim of burglary was statistically significant – Pearson Chi Square = 2.982, df = 1, p = 0.05 (one-tailed).

Table 24: Burglary - Is the Property Located on an Estate which has a Footpath Linking it to Local Shops?

	Never Burgled	Burgled at least Once	Total
Yes	42 73.7%	15 26.3%	57 100%
No	846 84.5%	155 15.5%	1001 100%
Total	888 83.9%	170 16.1%	1058 100%

26.3% of the properties which were located on estates with footpaths leading from the estate to local shops had experienced at least one burglary. However, only 15.5% of properties which were situated on estates without footpaths linking them to local shops had experienced at least one burglary. The association between being located on an estate which has a footpath leading from the estate to the local shops and the likelihood of becoming a victim of burglary was statistically significant – Pearson Chi-Square = 3.923, df = 1, p = 0.02 (one-tailed).

Table 25: Burglary - Is the Property Located on an Estate which has a Footpath Linking the Estate to a Maze of Other Footpaths?

	Never Burgled	Burgled at least Once	Total
Yes	100 73.5%	36 26.5%	136 100%
No	788 85.5%	134 14.5%	922 100%
Total	888 83.9%	170 16.1%	1058 100%

26.5% of properties which were situated on estates with footpaths leading from the estate to a maze of other footpaths had experienced at least one burglary. In direct contrast, only 14.5% of houses situated on estates without footpaths linking them to a maze of other footpaths had experienced at least one burglary. The association between being located on an estate which has a footpath linking that estate to a maze of other footpaths and the likelihood of becoming a victim of burglary was statistically significant - Pearson Chi-Square = 11.653, df = 1, p = 0.0005 (one-tailed).

Table 26: Burglary - Is the Property Located on an Estate which has a Footpath Linking the Estate to Another Residential Area?

	Never Burgled	Burgled at least Once	Total
Yes	352 82.1%	77 17.9%	429 100%
No	536 85.2%	93 14.8%	629 100%
Total	888 83.9%	170 16.1%	1058 100%

17.9% of properties which were situated on estates with footpaths leading from the estate to another residential area had experienced at least one burglary. In contrast, only 14.8% of houses situated on estates without footpaths linking them to another residential area had experienced at least one burglary. The association between being located on an estate which has a footpath linking that estate to another residential area and the likelihood of becoming a victim of burglary was statistically significant – Pearson Chi-Square = 1.665, df = 1, p = 0.10 (one-tailed).

Table 27: Burglary - What is the Volume of Traffic at the Nearest Road Junction?

	Never Burgled	Burgled at least Once	Total
Light	343 87.7%	48 12.3%	391 100%
Moderate	102 76.7%	31 23.3%	133 100%
Heavy	41 77.4%	12 22.6%	53 100%
Total	486 84.2%	91 15.8%	577 100%

12.3% of the properties situated on estates within viewing distance of a road junction with light traffic had experienced at least one burglary. In direct contrast, 23.3% of houses situated on estates within viewing distance of a road junction with 'moderate' traffic had experienced at least one burglary, and 22.6% of houses situated on estates within viewing distance of a road junction with heavy traffic had experienced at least one burglary. The association between being located on an estate which is in viewing distance of a road junction which has more than five vehicles passing within three minutes and the likelihood that you will be a victim of burglary was statistically significant – Pearson Chi-Square = 11.166, df = 2, p =0.002 (one-tailed).

Table 28: Burglary - How Heavy is the Volume of Pedestrian Traffic in Front of the Property?

	Never Burgled	Burgled at least Once	Total
Light	856 84.3%	159 15.7%	1015 100%
Moderate	32 74.4%	11 25.6%	43 100%
Total	888 83.9%	170 16.1%	1058 100%

15.7% of the properties which were situated on estates with light pedestrian traffic had experienced at least one burglary. In contrast to this, 25.6% of properties which were situated on estates with 'moderate' pedestrian traffic had experienced at least one burglary. This finding suggests that the association between having more than five pedestrians passing in front of a property within a period of five minutes and the likelihood that the property will be burgled was statistically significant - Pearson Chi-Square = 2.318, df = 2, p = 0.04 (one-tailed).

Table 29: Burglary - Are there Signs that the Property is within a Neighbourhood Watch Scheme area?

	Never Burgled	Burgled at least Once	Total
Yes	160 88.9%	20 11.1%	180 100%
No	728 82.9%	150 17.1%	878 100%
Total	888 83.9%	170 16.1%	1058 100%

11.1% of the properties which were located on estates which showed evidence of a neighbourhood watch scheme had been burgled at least once. In contrast, 17.1% of properties which were located on estates which did not show any evidence of a neighbourhood watch scheme had experienced at least one burglary. These findings suggest that there is a statistically significant association between not being located within a Neighbourhood Watch area and the likelihood of burglary victimisation – Pearson Chi-Square = 3.521, df = 1, p = 0.03 (one-tailed).

Table 30: Burglary - Is there Evidence that the Property has a Burglar Alarm?

	Never Burgled	Burgled at least Once	Total
Yes	311 77.4%	91 22.6%	402 100%
No	577 88%	79 12%	656 100%
Total	888 83.9%	170 16.1%	1058 100%

22.6% of properties which showed evidence of a burglar alarm had been burgled at least once. In contrast, 12% of those without a burglar alarm had been burgled at least once. This finding suggests that there is an association between having a burglar alarm and the likelihood that the property will be burgled – Pearson Chi-Square = 19.966, df = 1, p = <0.0005 (one-tailed). However, caution should be taken regarding this (and other factors such as presence of a dog) due to the retrospective nature of the crime data collected. Using the data available, it is not possible to ascertain with any certainty whether the presence of a burglar alarm preceded the offence, or whether the residents purchased the alarm as a result of the burglary.

Table 31: Burglary - Is there a Gate Leading from a Rear Path into the Property's Rear Garden?

	Never Burgled	Burgled at least Once	Total
Yes	9 64.3%	5 35.7%	14 100%
No	879 84.2%	165 15.8%	1044 100%
Total	888 83.9%	170 16.1%	1058 100%

35.7% of the properties which had a gate leading from a rear path into the rear garden had been burgled at least once. This is compared to only 15.8% of houses without a gate leading into the rear garden. This finding suggests that there is a statistically significant association between having a gate leading from a rear footpath into a property's rear garden, and the likelihood that the property will be burgled – Pearson Chi Square = 2.718, df = 1, p = 0.06 (one-tailed).

Table 32: Burglary - Are there Signs that the Property has been Deserted on a Brief Basis?

	Never Burgled	Burgled at least Once	Total
Yes	7 58.3%	5 41.7%	12 100%
No	881 84.2%	165 15.8%	1046 100%
Total	888 83.9%	170 16.1%	1058 100%

41.7% of the properties which showed signs of brief desertion had been burgled at least once. This is compared to only 15.8% of properties which did not show signs of brief desertion. This finding suggests that there is an association between a property showing signs of brief desertion and the likelihood that it will have been a victim of burglary. This association is statistically significant – Pearson Chi-Square = 4.134, df = 1, p = 0.03 (one-tailed).

Table 33: Burglary - Are there Signs that the Property has been Deserted on a Long-Term Basis?

	Never Burgled	Burgled at least Once	Total
Yes	6 54.5%	5 45.5%	11 100%
No	882 84.2%	165 15.8%	1047 100%
Total	888 83.9%	170 16.1%	1058 100%

45.5% of the properties which showed signs of lengthy desertion had been burgled at least once. This is compared to a figure of just 15.8% for houses without signs of lengthy desertion. There is a statistically significant association between properties showing signs of lengthy

desertion and burglary victimisation – Pearson Chi-Square = 5.086, df = 1, p = 0.02 (one-tailed).

The table below presents, only for those variables which exhibited a statistically reliable association with burglary victimisation at the 0.1 level, the odds-ratios of burglary or victimisation probability of the named attribute of a home relative to the absence of that attribute. Thus, for example, heavy traffic is associated with 1.84 times the burglary risk of homes passed by only light traffic.

Table 34: Environmental Factors Associated with Burglary Risks (n = 1058)

Environmental Factor	Odds-Ratio
Footpath to other residential area	1.21
Adjacency to open space	1.25
Absence of real/symbolic barrier	1.28
Through road (vs closed cul-de-sac)	1.30
No evidence of neighbourhood watch Scheme	1.54
Footpath to local shops	1.70
Footpath to other footpaths	1.83
Heavy traffic (vs light)	1.84
Evidence of burglar alarm	1.88
Moderate traffic (vs light)	1.89
Gate from rear path into garden	2.26
Signs of brief desertion	2.64
Signs of lengthy desertion	2.88

The analysis of this sample of 1058 properties suggests that there is no statistically significant association between the remaining environmental factors (from the OERF table) and the likelihood that the property will be burgled.

Which Environmental Factors are Associated with Risk of Victimisation from All Crime Categories?

Having focused upon burglary alone, the next stage of the analysis looked at which environmental factors are associated with the risk of victimisation from all crime categories (as opposed to just burglary). This gives practitioners the choice of how to proceed in risk assessment. Clearly the mechanisms which drive crime will be more complex and more various the wider the category of crimes is set, and the interpretation of risk scores and what to do to lower them more contentious, but that is a choice which practitioners should discuss, trading ease of interpretation off against generality of risk . The properties included within this analysis

were the same as those included within the burglary analysis, as were the environmental factors. Rather than cross tabulating each factor with the property's experience of prior burglary victimisation, the analysis looked at any crimes experienced at that property. The environmental factors which were associated with crime risk at a statistically significant level of 0.1 are detailed below.

Table 35: All Crime - What is the Road Network Surrounding the Property?

	Never Victimised	Victimised Once or More	Total
Cul de sac without linked pathway	352 62.9%	208 37.1%	560 100%
Cul de sac with linked pathway	204 55.3%	165 44.7%	369 100%
Through Road	68 52.7%	61 47.3%	129 100%
Total	624 59%	434 41%	1058 100%

The analysis of all crime categories revealed that true *culs-de-sacs* were the least vulnerable to victimisation, followed by leaky *culs-de-sac,* with through roads being the most vulnerable to victimisation. 47.3% of properties located on through roads had been victimised compared to 44.7% on *culs-de–sac* with linked pathways and only 37.1% on *culs-de-sac* without linked pathways. The association between being located on a through road and the likelihood that the property will be victimised was statistically significant – Pearson Chi Square = 7.656, df = 2, p = 0.01 (one-tailed).

Table 36: All Crime - How Close is the Property Located to a Footpath?

	Never Victimised	Victimised Once or More	Total
None	76 52.8%	68 47.2%	144 100%
1-5	150 60.7%	97 39.3%	247 100%
6-10	57 49.6%	58 50.4%	115 100%
More than 10	341 61.8%	211 38.2%	552 100%
Total	624 59%	434 41%	1058 100%

The pattern for proximity to a footpath is not straightforward. Properties which were most vulnerable to victimisation were those located 6-10 houses away from a footpath (50.4% of these properties had been victimised). The next most vulnerable were properties which were located directly adjacent to a footpath (47.2% of properties located next to a footpath had been victimised). Properties which were least vulnerable to victimisation were those located furthest away from a footpath (10 or more properties away). The association between proximity to a footpath and risk of victimisation was statistically significant – Pearson Chi-Square = 8.598, df = 3, p = 0.02 (one-tailed).

Table 37: All Crime - Is the Property Located on an Estate which has a Footpath Leading from the Estate to Local Shops?

	Never Victimised	Victimised Once or More	Total
Yes	27 47.4%	30 52.6%	57 100%
No	597 59.6%	404 40.4%	1001 100%
Total	624 59%	434 41%	1058 100%

As with burglary, this analysis revealed that properties located on estates which had footpaths leading from the estate to local shops, were more vulnerable to victimisation. 52.6% of properties located on an estate with a footpath linking the estate to shops had been victimised. This is compared to 40.4% of properties on estates without footpaths linking them to shops. The association between being located on an estate with a footpath linking that estate to local shops and the likelihood that the property will be victimised was statistically significant – Pearson Chi-Square = 2.869, df = 1, p = 0.05 (one-tailed).

Table 38: All Crime - Is the Property Located on an Estate with a Footpath Linking that Estate to a Maze of Other Footpaths?

	Never Victimised	Victimised Once or More	Total
Yes	64 47.1%	72 52.9%	136 100%
No	560 60.7%	362 39.3%	922 100%
Total	624 59%	434 41%	1058 100%

Again, the analysis suggests that properties located on estates which have a footpath linking that estate to a maze of other footpaths are more vulnerable to victimisation. 52.9% of properties located on estates with footpaths linking the estate to a maze of other footpaths had been victimised. This is compared to only 39.3% of properties on estates without footpaths linking them to a maze of other footpaths. The association between being located on an estate with a footpath linking the estate to a maze of other footpaths, and the likelihood that the property will be victimised was statistically significant – Pearson Chi-Square = 8.609, df = 1, p = 0.002 (one tailed).

Table 39: All Crime - Does the Property Have a Gate Leading from a Rear Path into the Rear Garden?

	Never Victimised	Victimised Once or More	Total
Yes	1 7.1%	13 92.9%	14 100%
No	623 59.7%	421 40.3%	1044 100%
Total	624 59%	434 41%	1058 100%

92.9% of the properties which had a gate leading from a rear footpath into the rear garden had been victimised. This is compared to only 40.3% of properties without gates leading from a rear footpath into the rear garden. The association between having a gate leading from a rear path into the rear garden and the likelihood that the property will be victimised is strongly statistically significant – Pearson Chi-Square = 13.661, df = 1, p = <0.0005 (one-tailed).

Table 40: All Crime - Is the Property Visible from a Nearby Footpath?

	Never Victimised	Victimised Once or More	Total
Yes	78 52.7%	70 47.3%	148 100%
No	546 60%	364 40%	910 100%
Total	624 59%	434 41%	1058 100%

Properties which are visible from a nearby footpath are more vulnerable to victimisation than those which are not. 47.3% of properties which were visible from a nearby footpath had been victimised. This is compared to 40% of properties which were not visible from a nearby footpath. The association between a property being visible from a nearby footpath and the likelihood that it will be victimised was statistically significant – Pearson Chi-Square = 2.508, df = 1, p = 0.06 (one-tailed).

Table 41: All Crime - How heavy is the Volume of Traffic at the Nearest Road Junction?

	Never Victimised	Victimised Once or More	Total
Light	247 63.2%	144 36.8%	391 100%
Moderate	63 47.4%	70 52.6%	133 100%
Heavy	24 45.3%	29 54.7%	53 100%
Total	334 57.9%	243 42.1%	577 100%

Properties which are within sight of busy road junctions are more vulnerable to victimisation than those which are not. Where traffic at the nearby road junction was heavy, 54.7% of the properties had been victimised, this is compared to only 36.8% of properties which were within sight of a road junction with light traffic. The association between being within sight of a road junction which has more than ten vehicles passing within a period of three minutes, and the likelihood that the property will be victimised was strongly statistically significant – Pearson Chi-Square = 13.969, df = 2, p = 0.0005 (one-tailed).

Table 42: All Crime - How Heavy is the Volume of Pedestrian Traffic in Front of the Property?

	Never Victimised	Victimised Once or More	Total
Light	608 59.9%	407 40.1%	1015 100%
Moderate	16 37.2%	27 62.8%	43 100%
Total	624 59%	434 41%	1058 100%

62.8% of properties which were located on estates containing moderate levels of pedestrian traffic had been victimised. This is compared to only 40.1% of properties on estates with 'light' levels of pedestrian traffic. The association between the presence of moderate pedestrian traffic (6-10 people passed within the period of three minutes) in front of a property and its vulnerability to victimisation was statistically significant – Pearson Chi-Square = 7.867, df = 1, p = 0.003 (one-tailed).

Table 43: All Crime - Does the Property have Signs of Litter/Graffiti?

	Never Victimised	Victimised Once or More	Total
None	512 61.9%	315 38.1%	827 100%
Some	101 49.3%	104 50.7%	205 100%
Heavy	11 42.3%	15 57.7%	26 100%
Total	624 59%	434 41%	1058 100%

The analysis revealed that properties showing signs of heavy litter or graffiti were more likely to have been victims of crime. 57.7% of properties showing evidence of heavy litter/graffiti had been victimised compared to only 38.1% of properties which had no evidence of litter/graffiti. The association between levels of litter or graffiti and likelihood of victimisation was strongly statistically significant - Pearson Chi-Square = 13.915, df = 2, p = 0.0005 (one-tailed).

Table 44: All Crime - Does the Property show Signs of Disrepair?

	Never Victimised	Victimised Once or More	Total
No signs of Disrepair	577 60.2%	382 39.8%	959 100%
Some signs of Disrepair	43 50%	43 50%	86 100%
Many signs of Disrepair	4 30.8%	9 69.2%	13 100%
Total	624 59%	434 41%	1058 100%

The analysis revealed that properties with many signs of disrepair were more vulnerable to crime than those with some or no signs of disrepair. 69.2% of properties with many signs of disrepair had been victimised. This is compared to only 39.8% of properties with no signs of disrepair. The association between levels of disrepair and likelihood of victimisation was statistically significant – Pearson Chi-Square = 7.701, df = 2, p = 0.01 (one-tailed).

Table 45: All Crime - Were there Signs that a Dog was Present at the Property?

	Never Victimised	Victimised Once or More	Total
Yes	5 33.3%	10 66.7%	15 100%
No	619 59.3%	424 40.7%	1043 100%
Total	624 59%	434 41%	1058 100%

Properties which showed evidence of a dog were more likely to have been victimised than those which did not. 66.7% of properties with evidence of a dog had been previously victimised compared to only 40.7% of properties with no evidence of a dog. The association between evidence of a dog and the likelihood that a property has been a victim of crime was statistically significant – Pearson Chi-Square = 3.131, df = 1, p = 0.04 (one-tailed). Due to the retrospective nature of this analysis (i.e. looking at crimes which had occurred in the past) it would be very difficult to ascertain whether the residents purchased a dog following the crime event, suggesting that the dog had not been present when the offence occurred, or whether the crime had taken place whilst the dog resided at the property – suggesting that it was ineffective in deterring potential offenders.

Table 46: All Crime - Does the Property have a Burglar Alarm?

	Never Victimised	Victimised Once or More	Total
Yes	190 47.3%	212 52.7%	402 100%
No	434 66.2%	222 33.8%	656 100%
Total	624 59%	434 41%	1058 100%

As with the presence of a dog, properties with burglar alarms appear to be more likely to have been victims of crime. 52.7% of properties with evidence of a burglar alarm had been victimised. This is compared to 33.8% of properties without a burglar alarm. The association between presence of a burglar alarm and prior victimisation was strongly statistically significant – Pearson Chi-Square = 36.005, df = 1, p = <0.0005 (one-tailed). As this study analyses crimes which have already occurred, it is difficult to show whether the burglar alarm was installed following the crime event, or whether the burglar alarm was ineffective in protecting that property against victimisation.

Table 47: All Crime - Did the Property have a Window Open/Door Ajar?

	Never Victimised	Victimised Once or More	Total
Yes	96 54.2%	81 45.8%	177 100%
No	528 59.9%	353 40.1%	881 100%
Total	624 59%	434 41%	1058 100%

Properties which had a window open or a door ajar were more likely to have been victims of crime. 45.8% of properties that had a window open or door ajar had been victimised compared to 40.1% of those without a window open or door ajar. The association between a property having a window open or door ajar and its experience of prior victimisation was statistically significant – Pearson Chi-Square = 1.747, df = 1, p = 0.09 (one-tailed).

Table 48: All Crime - Is the Property Located on the Nearest Main Road?

	Never Victimised	Victimised Once or More	Total
Yes	8 40%	12 60%	20 100%
No	616 59.3%	422 40.7%	1038 100%
Total	624 59%	434 41%	1058 100%

60% of properties that were located on a main road had been victimised compared to 40.7% of those which were not. The association between being located a main road and the likelihood of

victimisation was statistically significant – Pearson Chi-Square = 2.288, df = 1, p = 0.07 one-tailed).

Table 49: All Crime - The House is Not Overlooked at Front?

	Never Victimised	Victimised Once or More	Total
Yes	128 53.3%	112 46.7%	240 100%
No	496 60.6%	322 39.4%	818 100%
Total	624 59%	434 41%	1058 100%

Houses which were overlooked at the front were less vulnerable to crime. 46.7% of properties which were not overlooked at the front had been victimised compared to 39.4% of those which were overlooked at the front. The association between not being overlooked at the front and prior risk of victimisation was statistically significant – Pearson Chi-Square = 3.794, df = 1, p = 0.03 (one-tailed).

Table 50: All Crime - Is the Property within Viewing Distance of Traffic Lights?

	Never Victimised	Victimised Once or More	Total
Yes	1 12.5%	7 87.5%	8 100%
No	623 59.3%	427 40.7%	1050 100%
Total	624 59%	434 41%	1058 100%

Properties which were within viewing distance of traffic lights were more vulnerable to crime than those which are not. 87.5% of properties which were located within viewing distance of traffic lights had been victimised compared to only 40.7% of properties which were not. The association between being located within viewing distance of traffic lights and prior victimisation was statistically significant – Pearson Chi-Square = 5.392, df = 1, p = 0.01 (one-tailed).

Table 51: All Crime - Does the Property show Signs of Brief Desertion?

	Never Victimised	Victimised Once or More	Total
Yes	3 25%	9 75%	12 100%
No	621 59.4%	425 40.6%	1046 100%
Total	624 59%	434 41%	1058 100%

Properties which show signs of brief desertion such as milk bottles on the doorstep, uncut grass or newspapers through the letterbox, were more vulnerable to crime than those which do not. 75% of properties with signs of brief desertion had been victimised, this is compared to 40.6% of properties without signs of brief desertion. The association between a property showing signs of desertion and the likelihood that it will have experienced prior victimisation was statistically significant - Pearson Chi-Square = 4.459, df = 1, p = 0.02 (one-tailed).

Table 52: All Crime - Does the Property show Signs of Lengthy Desertion?

	Never Victimised	Victimised Once or More	Total
Yes	2 18.2%	9 81.8%	11 100%
No	622 59.4%	425 40.6%	1047 100%
Total	624 59%	434 41%	1058 100%

Properties which showed signs of lengthy desertion (such as boarded up windows) were more likely to have experienced past victimisation. 81.8% of properties showing signs of lengthy desertion had been victimised compared to only 40.6% of properties without signs of lengthy desertion. The association between a property showing signs of lengthy desertion and the likelihood that it will be victimised was statistically significant – Pearson Chi-Square = 6.038, df = 1, p = 0.007 (one-tailed).

As with the burglary analysis, the table below presents, only for the variables which exhibited a statistically reliable association with victimisation at the level of 0.1, the odds-ratio of

victimisation risk. This presents each environmental factor and the risk which its presence produces. For example, being located on a through road is linked to a risk of victimisation 1.2 times that of living on a leaky cul-de-sac and 1.27 times that of living on a 'true' cul-de-sac. A property which shows signs of much disrepair is 1.74 times more likely to be victimised than a property which shows no signs of disrepair.

Table 53: Environmental Factors Associated with All Crime Risks (n=1058)

Environmental Factors	Odds-Ratio
Window open/ajar	1.14
Property visible from footpath	1.18
Not overlooked at front	1.19
Through road (vs 'leaky' cul-de-sac)	1.20
Adjacent to footpath (vs 10+ doors away)	1.24
Some disrepair (vs none)	1.26
Through road (vs closed cul-de-sac)	1.27
Footpath to local shops	1.30
Some graffiti (vs none)	1.33
Footpath to other footpaths	1.35
Moderate traffic (vs light)	1.43
Located on main road	1.47
Heavy traffic (vs light)	1.49
Heavy graffiti/litter (vs none)	1.51
Evidence of burglar alarm	1.56
Moderate pedestrian traffic (vs light)	1.57
Evidence of dog	1.64
Much disrepair (vs none)	1.74
Signs of brief desertion	1.85
Signs of lengthy desertion	2.01
Visible from traffic lights	2.15
Gate from rear path into garden	2.31

The remaining environmental factors did not show a statistically significant association with prior crime risk.

Which Environmental Factors are associated with the risk of Repeat Burglary?

The next stage of the analysis included comparing houses which had been burgled once with houses which had been burgled twice or more. Do the same factors predict repeat burglaries as predict an initial burglary? Environmental factors which showed a statistically significant association at the level of 0.1 are presented below.

Table 54: Repeat Burglary - What is the Road Network Surrounding the Property?

	Burgled Once	Burgled Twice or More	*Total*
Cul de sac without linked pathway	47 59.5%	32 40.5%	79 100%
Cul de sac with linked pathway	52 75.5%	16 23.5%	68 100%
Through Road	19 82.6%	4 17.4%	23 100%
Total	118 69.4%	52 30.6%	170 100%

Unlike the analysis of first victimisation, the results reveal that properties located on true *culs-de-sac* are most vulnerable to repeat burglary, followed by properties on leaky *culs-de-sac,* with properties located on through roads experiencing the lowest levels of repeat burglary. The association between being located on a 'true' *cul-de-sac* and a property's risk of repeat burglary was statistically significant – Pearson Chi-Square = 7.143, df = 1, p = 0.01 (one-tailed). It is worth reiterating that the direction of this relationship is very different to that presented in the analysis of first burglary or first victimisation, whereby true *culs-de-sac* experienced the lowest levels of crime. There is a plausible post-hoc interpretation of the finding, in that once having crossed the threshold (literally and metaphorically) of a home on a true *cul de sac*, the quietness and lack of incidental surveillance may invite repetition.

Table 55: Repeat Burglary - How close is the Property Located to a Footpath?

	Burgled Once	Burgled Twice or More	Total
None	18 75%	6 25%	24 100%
1-5	33 82.5%	7 17.5%	40 100%
6-10	16 69.6%	7 30.4%	23 100%
More than 10	51 61.4%	32 38.6%	83 100%
Total	118 69.4%	52 30.6%	170 100%

Again, the direction of the relationship appears to differ from that presented within the analysis of first burglary. The analysis of proximity to a footpath and experience of repeat burglary suggests that properties located nearest to a footpath are the least likely to experience repeat victimisation, with those located furthest away from the footpath most vulnerable to repeat burglary. 25% of houses situated 0 properties away from a footpath were repeat victims of burglary. 17.5% of houses situated 1-5 properties away from a footpath were repeat victims of burglary. 30.4% of houses situated 6-10 properties away from a footpath were repeat victims of burglary and 38.6% of houses situated more than 10 properties away from a footpath were repeat victims of burglary. The association between proximity to a footpath and repeat burglary was statistically significant – Pearson Chi-Square = 6.061, df = 3, p = 0.05 (one-tailed). Again, it should be highlighted that although this association is statistically significant, the pattern is very different from that revealed in the analysis of first burglary or first crime victimisation whereby properties closest to the footpath were the most vulnerable to crime. The same post hoc explanation as was offered in relation to *culs de sac* is relevant here.

Table 56: Repeat Burglary - Is the Property Located on an Estate which has a Footpath Linking that Estate to Open Land?

	Burgled Once	Burgled Twice or More	Total
Yes	33 84.6%	6 15.4%	39 100%
No	85 64.9%	46 35.1%	131 100%
Total	118 69.4%	52 30.6%	170 100%

Again, the direction of the relationship between a property being located on an estate which contains a footpath linking the estate to open land is very different to that revealed in the analysis of first victimisation. 15.4% of houses situated on an estate with a footpath leading to open land were repeat victims of burglary, compared to 35.1% of houses situated on estates without footpaths leading to open land. The association between being located on an estate without a footpath linking that estate to open land, and the likelihood that the property will be a repeat victim of burglary was statistically significant – Pearson Chi-Square = 4.620, df = 1, p = 0.02 (one-tailed).

Table 57: Repeat Burglary - Is the Property Located on an Estate which has a Footpath Linking the Estate to Another Residential Area?

	Burgled Once	Burgled Twice or More	Total
Yes	61 79.2%	16 20.8%	77 100%
No	57 61.3%	36 38.7%	93 100%
Total	118 69.4%	52 30.6%	170 100%

Properties situated on estates with footpaths linking the estate to another residential area were less likely to be repeat victims of burglary than those which were not located on these leaky estates. 20.8% of houses situated on an estate with a footpath leading to another residential area were repeat victims of burglary, compared to 38.7% of houses situated on estates without footpaths leading to other residential areas. The association between being located on an estate which does not have a footpath linking it to another residential area was statistically significant – Pearson Chi-Square = 5.562, df = 1, p = 0.009 (one-tailed).

Table 58: Repeat Burglary - Is there Evidence of a Neighbourhood Watch Scheme?

	Burgled Once	Burgled Twice or More	Total
Yes	17 85%	3 15%	20 100%
No	101 67.3%	49 32.7%	150 100%
Total	118 69.4%	52 30.6%	170 100%

Properties within Neighbourhood Watch areas were less likely to be victims of repeat burglary. 15% of properties which had been repeatedly burgled were located within an area showing evidence of a Neighbourhood Watch scheme compared to 32.7% of properties in areas without evidence of Neighbourhood Watch. The association between being located in an area which is not covered by a Neighbourhood Watch Scheme and the likelihood that a property will be the victim of repeat burglary was statistically significant – Pearson Chi-Square = 1.829, df = 1, p = 0.09 (one-tailed). The presence of Neighbourhood Watch is the only statistically significant

factor which shows the same direction as the variables analysed within the first burglary/victimisation section.

Which Environmental Factors are associated with the risk of repeat victimisation?

When analysing the association between environmental factors and a property's likelihood of becoming a victim of repeat victimisation for all crime categories, the pattern is again complex. The environmental factors which are associated with risk at a statistically significant level of 0.1 are presented below.

Table 59: Repeat Victimisation - Is there Evidence of Litter/Graffiti Surrounding the Property?

	Victimised Once	Victimised Twice or More	Total
None	183 58.1%	132 41.9%	315 100%
Some	44 42.3%	60 57.7%	104 100%
Heavy	6 40%	9 60%	15 100%
Total	233 53.7%	201 46.3%	434 100%

60% of properties with evidence of heavy litter/graffiti had been repeatedly victimised compared to 41.9% of properties with no evidence of litter/graffiti. The association between the presence of heavy litter or graffiti and a property's vulnerability to repeat victimisation was statistically significant – Pearson Chi-Square = 9.008, df = 2, p = 0.006 (one-tailed). This pattern supports that revealed within the analysis of first victimisation.

Table 60: Repeat Victimisation - The Property is Not Overlooked at the Front?

	Victimised Once	Victimised Twice or More	Total
Yes	73 65.2%	39 34.8%	112 100%
No	160 49.7%	162 50.3%	322 100%
Total	233 53.7%	20 46.3%	434 100%

50.3% of properties which were overlooked at the front had been repeatedly victimised compared to 34.8% of properties which were not overlooked at the front. This relationship is the reverse of that displayed in the analysis of first victimisation, whereby properties which were overlooked at the front were less vulnerable to crime. The association between being overlooked at the front and repeat victimisation was statistically significant – Pearson Chi-Square = 7.407, df = 2, p = 0.003 (one-tailed).

Table 61: Repeat Victimisation - Is there Access at Both Sides of the Property?

	Victimised Once	Victimised Twice or More	Total
Yes	0 0%	10 100%	10 100%
No	233 55%	191 45%	424 100%
Total	233 53.7%	201 46.3%	434 100%

100% of properties which had access at both sides had been repeatedly victimised compared to 45% of properties which did not have access at both sides. The association between a property having access at both sides and the likelihood that it will be a victim of repeat crime is highly statistically significant - Pearson Chi-Square = 9.758, df = 1, p = <0.0005 (one-tailed).

The odds-ratios for the relatively few variables which reliably distinguished one-off and repeat burglaries are presented below.

Table 62a: Odds-Ratios of Repeated Burglary Risk by Environmental Factor

Environmental Factors	Odds-ratio
Closed cul-de-sac (vs through road)	2.32
Open cul-de-sac (vs through road)	1.58
10+ properties from footpath	1.54
No footpath to open land	1.98
No footpath to other residential areas	1.86
No evidence of neighbourhood watch	1.86

The findings from this analysis suggest that the factors which influence one-off victimisation are different to those which influence subsequent victimisation. For example, there is a statistically

significant relationship between a property being victimised and it NOT being overlooked at the front. When multiple victimisation is analysed, the results reveal that there is a statistically significant relationship between victimisation and BEING overlooked at the front. At first glance, this appears contradictory. What makes a property vulnerable to victimisation does not make it vulnerable to repeat victimisation. However, this makes both intuitive sense and has practical implications. For example, distance from through routes is more likely to protect from burglary because such homes are less likely to be scanned en passant by burglary target seekers. However, once the first offence has safely been committed, the same factors cease to apply, and distance from scrutiny is converted into an advantage. Put simply, an offender chooses to offend against a property because it has easy access and escape via a footpath running at the rear of the property, which leads to open fields. Their decision is based upon perception of the ease in which they can gain entry to that property as well as the ease in which they can escape unnoticed. Whether the offender chooses to re-offend against that property involves more factors than simply external perception. For example, they burgled the property because it was easy to get into. Once inside the property they found that it contained an abundance of cash, a top of the range hi-fi system as well as a rare collection of valuable silver cutlery. The offender, chose to burgle the property because it was easy to enter, they choose to return because of the lifestyle factors they found once they entered the property. The resident has a lot of money, likes to listen to music on a top of the range stereo and owns valuable cutlery, all of which are likely to be replaced when insurance money is awarded.

Summary:

The findings from the analysis of environmental factors are complex. Those environmental factors which are associated with likelihood of burglary also appear to be associated with risk of all crimes. However, the relationship between these factors and a property's vulnerability to repeat victimisation is not straightforward. The factors which are associated with burglary, all crime and repeat victimisation are summarised below. The findings of this analysis suggest that burgled homes are more likely to:

1) Be located next to open land;

Figure 25: Be located next to open land.

2) Be located on a cul-de-sac with a linked pathway or a through road;

Figure 26: Be located on a cul-de-sac with a linked pathway or a through road.

3) Be located on an estate without a real/symbolic barrier;

4) Be located on an estate containing a footpath which links it to shops;

5) Be located on an estate containing a footpath which links it to a maze of other footpaths;

Figure 27: Be located on an estate which links it to a maze of other footpaths.

6) Be located on an estate containing a footpath which links it to another residential area;

Figure 28: Be located on an estate which links it to another residential area.

7) Be situated within viewing distance of a road junction which has moderate or heavy traffic;

8) Be Located on an estate with a moderate flow of pedestrian traffic;

9) Be located on an estate without evidence of a Neighbourhood Watch scheme;

10) Have evidence of a burglar alarm.

11) Have a gate leading from a rear path into the rear garden;

12) Show signs of brief desertion;

13) Show signs of lengthy desertion.

The data suggest that repeatedly burgled homes (in this sample) are more likely to:

1) Be located 6 or more properties away from a footpath;

2) Not be located on an estate containing a footpath which links it open land;

3) Not be located on an estate containing a footpath which links it to another residential area;

4) Be located in an area without evidence of a Neighbourhood Watch Scheme;

5) Be located on a cul-de-sac without a linked pathway.

The data suggest that victimised (all crimes) homes are more likely to:

1) Be located on a through road or a cul-de-sac with a linked pathway;

2) Be located 0 or 6-10 properties away from footpath;

3) Be located on an estate with a footpath linking the estate to shops;

Figure 29: Be located on an estate with a footpath linking the estate to local shops.

4) Be located on an estate with a footpath linking the estate to a maze of other footpaths;

5) Have a gate leading from a rear path into the rear garden;

6) Be visible from a nearby footpath;

7) Be located within viewing distance of a road junction with heavy or moderate traffic flow;

Figure 30: Be located within viewing distance of a road junction with 'heavy' or 'moderate' traffic flow.

8) Be located on an estate with a moderate flow of pedestrian traffic;

9) Show evidence of heavy litter/graffiti;

Figure 31: Show evidence of heavy litter/graffiti.

10) Have many signs of disrepair;

11) Have evidence of a dog;

12) Have evidence of a burglar alarm;

13) Have a window open/door ajar;

14) Be located on the nearest main road;

15) House is not overlooked at the front;

16) Be located within viewing distance of traffic lights;

Figure 32: Be located within viewing distance of traffic lights.

17) Show signs of brief desertion;

18) Show signs of lengthy desertion.

Figure 33: Show signs of lengthy desertion.

The data suggest that the following factors increase a property's vulnerability to repeat victimisation:

1) Showing signs of heavy litter or graffiti;

2) Being overlooked at the front;

3) Having access to the property at both sides.

Designing a Practitioners' Checklist – The Burgess Method:

Having established the environmental variables which should feature in any prioritisation of crime reduction effort, the next step was to turn these into a simple, usable scale for risk assessment. The method to give effect to this was selected on the grounds of simplicity and robustness rather than statistical sophistication. This was so that the exercise could be repeated by local police or crime reduction partnerships to identify factors more precisely tailored to local circumstances. This seemed particularly important in that the Winchester and Jackson factors were found to be not well suited to the housing stock of West Yorkshire. With very few of the properties scoring any points on their scale, this made analysis using only the Winchester and Jackson method, almost impossible.

The analysis was conducted for burglary as a separate crime type as well as all crime. The results displayed in the tables below show the scores for each environmental factor. For example, being located next to open land scores 3.1, being situated on a through road scores 1.7. The higher the score, the greater the chance of being victimised.

Table 62b: Burgled versus Not Burgled - Environmental Factors and Burgess Score

Environmental Factor	Burgess Score
Located next to open land	3.1
Not located next to open land	-0.8
Situated on a cul-de-sac without a linked pathway	-2
Situated on a cul-de-sac with a linked pathway	2.3
Situated on a through road	1.7
Situated on an estate with a real or symbolic barrier	-2.1
Situated on an estate without a real or symbolic barrier	1.8
Situated on an estate with a footpath leading from the estate to local shops	10.2
Situated on an estate without a footpath leading from the estate to local shops	-0.6
Situated on an estate with a footpath leading	10.4

from the estate to a maze of other footpaths	
Situated on an estate without a footpath leading from the estate to a maze of other footpaths	-1.6
Situated on an estate with a footpath leading from the estate to another residential area	1.8
Situated on an estate without a footpath leading from the estate to another residential area	-1.3
'Light' pedestrian traffic	-0.4
'Moderate' pedestrian traffic,	9.5
Situated on an estate without evidence of a neighbourhood watch scheme	1
Situated on an estate with evidence of a neighbourhood watch scheme	-5
A gate leading from a rear path into the rear garden	19.6
No gate leading from a rear path into the rear garden	-0.3
Showing signs of Brief desertion	25.6
No signs of Brief desertion	-0.3
Showing signs of Lengthy desertion	29.4
No signs of Lengthy desertion	-0.3

It should be noted that although evidence of a burglar alarm was associated with the risk of burglary at a statistically significant level, and would have scored 6.5 for present and -4.1 for not present, a decision was made to remove this factor from the checklist. As was highlighted following table 30, the fact that the crime data were collected retrospectively leaves the author unable to ascertain with any certainty whether the presence of the burglar alarm preceded the burglary, or (a more likely scenario) whether it was installed as a result of the offence. For this reason, it was felt appropriate to remove this factor from the checklist.

The graph below displays each Burgess decile against its mean incidence of burglary. The results reveal that the relationship is close, with a coefficient determination of +0.6418, such that moving up one decile is associated with a 6% increase in victimisation.

Figure 34: Burgess Decile against Burglary Incidence

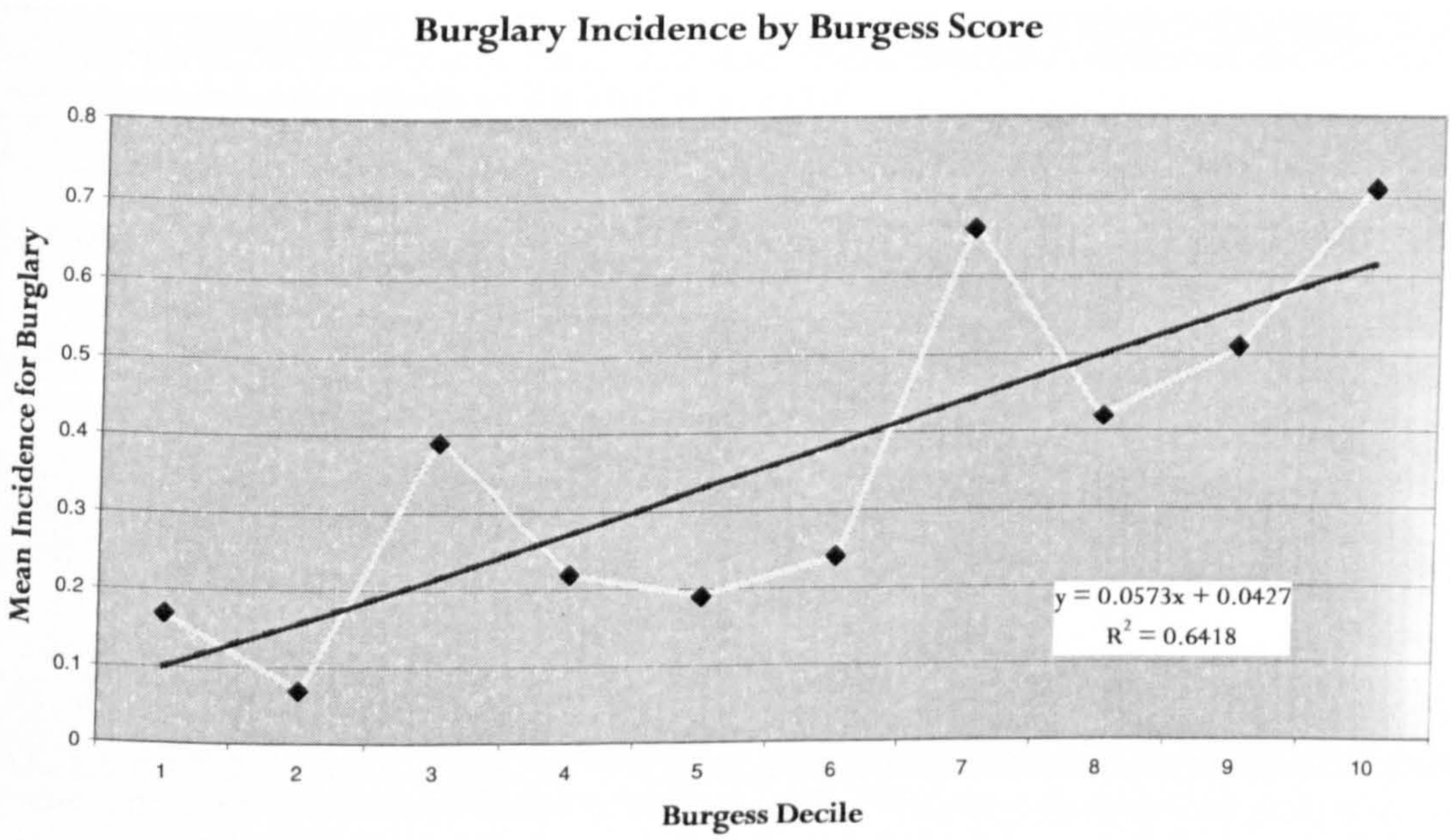
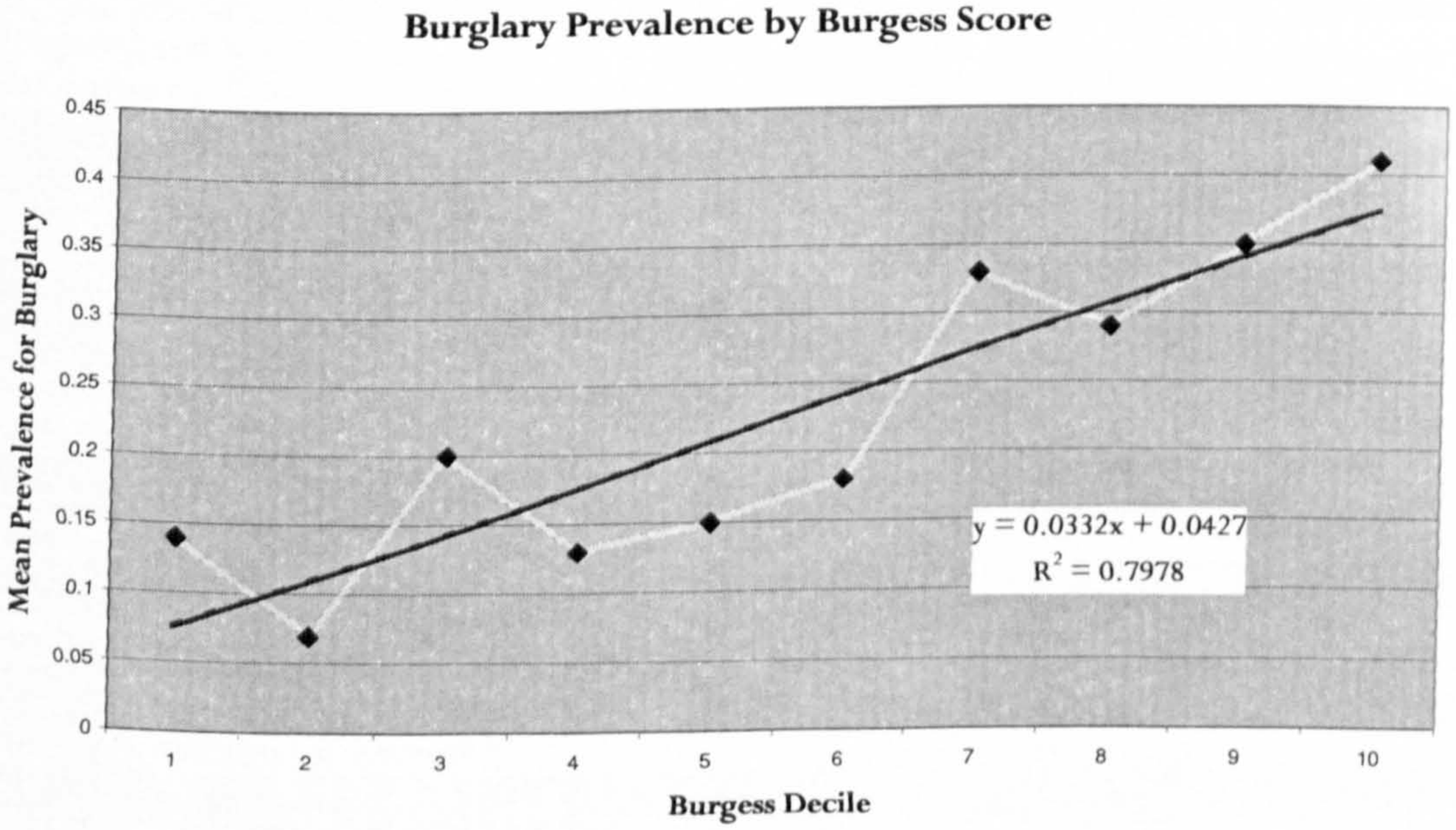


Figure 35: Burgess Decile against Burglary Prevalence



The link between Burgess Score and crime prevalence (i.e. the proportion of homes victimised rather than the total number of victimisations) is even closer, with a coefficient of determination of +0.7978, with an increase of 3% in victimisation prevalence for every Burgess decile.

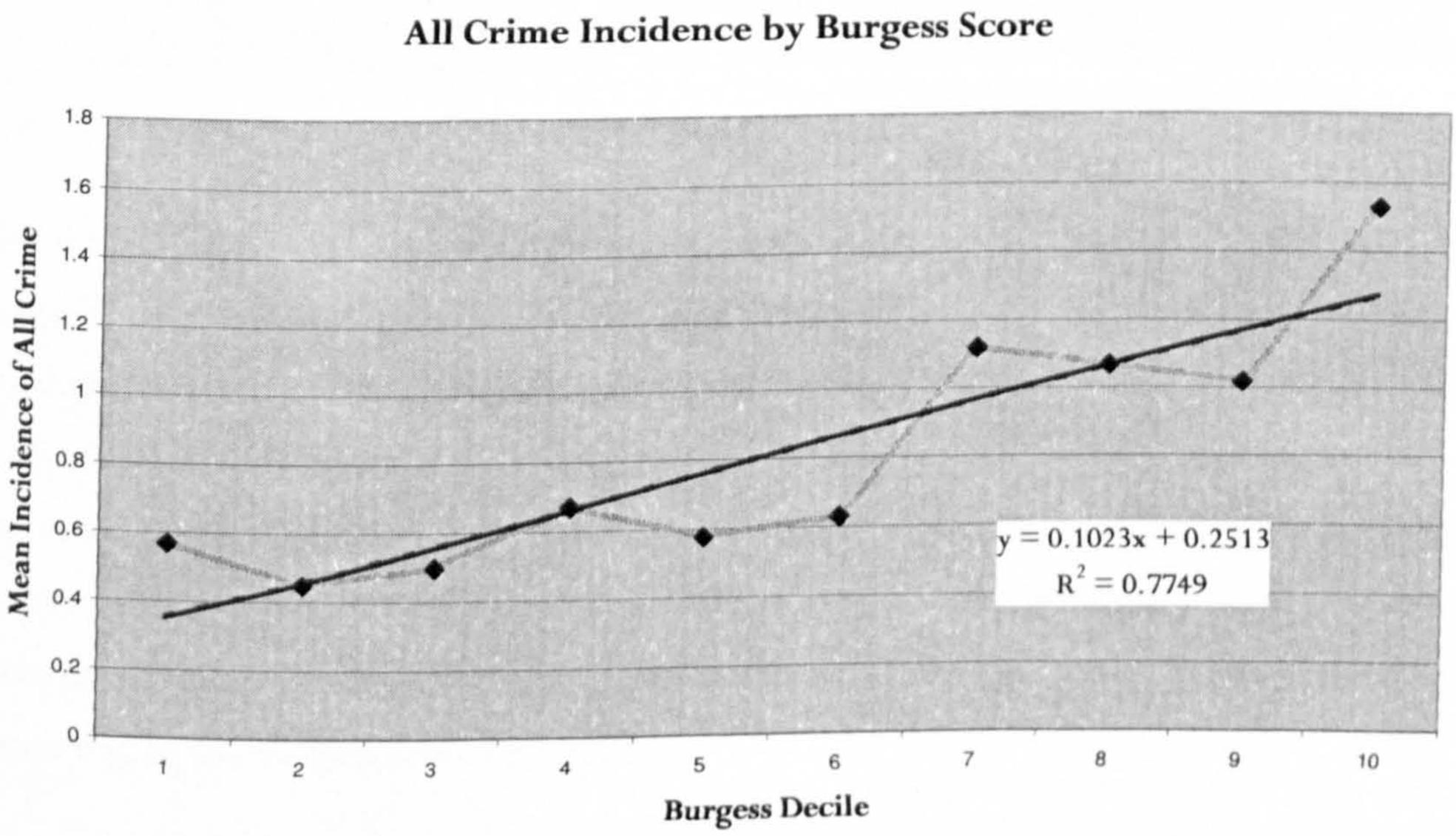
Table 63: All Crimes - Victimised versus Not Victimised, Environmental Factors and Burgess Score

Environmental Factor	Burgess Score
Situated on a *cul de sac* without a linked pathway	-3.9
Situated on a *cul de sac* with a linked pathway	3.7
Situated on a though road	6.3
Situated no properties away from a footpath,	6.2
Situated 1-5 properties away from a footpath,	-1.7
Situated 6-10 properties away from a footpath,	9.4
Situated more than 10 properties away from a footpath	-2.8
Situated on an estate with a footpath leading to shops	11.6
Situated on an estate without a footpath leading to shops	-0.6
Situated on an estate with a footpath leading to a maze of other footpaths	11.9
Situated on an estate without a footpath leading to a maze of other footpaths	-1.7
Gate from a rear footpath leading into the rear garden	51.9
No gate from a rear footpath leading into the rear garden	-0.7
Visible from the footpath	6.3
Not visible from footpath	-1
Situated on an estate with 'light' pedestrian traffic flow	-0.9
Situated on an estate with 'moderate' pedestrian traffic flow	21.8
Showing signs of 'no' litter/graffiti	-2.9
Showing signs of 'some' litter/graffiti,	9.7
Showing signs of 'heavy' litter/graffiti	16.7
Showing 'no signs of disrepair'	-1.2
Showing 'some signs of disrepair'	9
Showing 'many signs of disrepair'	28.2
Window open or door ajar	4.8
Window not open or ajar	-0.9
Located on the nearest main road	19
Not located on nearest main road	-0.3
Not overlooked at the front	5.7
Overlooked at front	-1.6
Situated within viewing distance of traffic lights	46.5
Not situated within viewing distance of traffic lights	-0.3
Showing signs of brief desertion	34
No signs of brief desertion	-0.4

Showing signs of lengthy desertion	40.8
No signs of lengthy desertion	-0.4

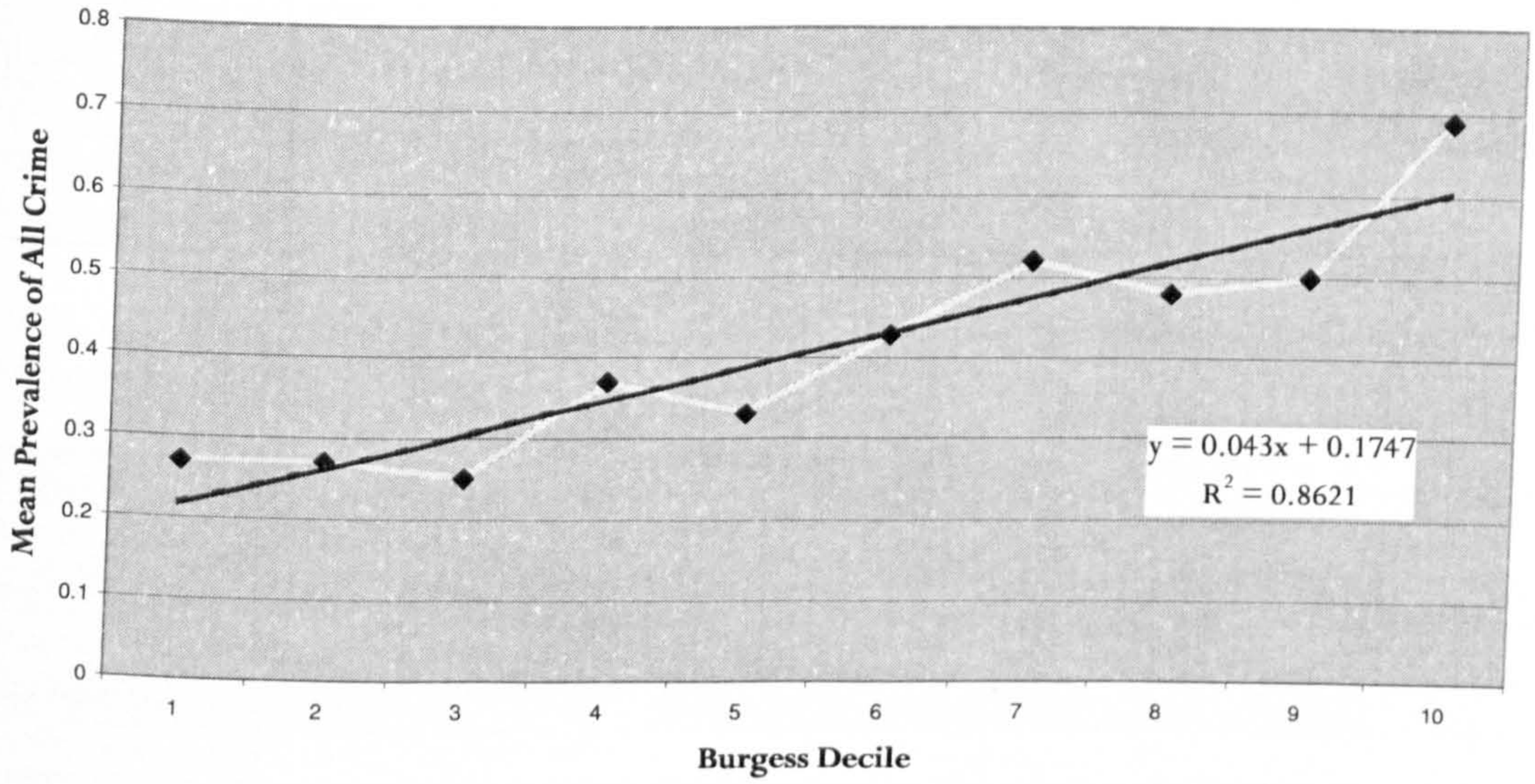
As with the checklist for burglary, a decision was made to remove both presence/absence of a burglar alarm and presence/absence of a dog from the Burgess checklist for all crimes. Evidence of a dog would have added 28.2 to a property's score (absence of a dog subtracting 0.3). In a similar vein, presence of a burglar alarm would have added 11.7 to a property's Burgess score (absence subtracting 7.2). Due to the inability (using the present data alone) to ascertain whether these factors preceded or were installed as a result of the offence, it was felt that they should not be included in the checklist.

Figure 36: Burgess Decile against Crime Incidence



The relationship between Burgess Score and crime incidence was a close one, with a coefficient determination of +0.7749, suggesting that an increase of one decile would be associated with a 10% increase in victimisation. The relationship between Burgess Score and crime prevalence was even stronger, with a coefficient determination of +0.8621.

Figure 37: Burgess Decile against Crime Prevalence



The Burgess scores for repeat victimisation are displayed below. Because the link between Burgess Score and prevalence was closer than between that score and incidence, it seemed worthwhile to see how closely the Burgess Score was linked with concentration of victimisation (incidence/prevalence – the average number of victimisations per victim). As might be expected, given the repeat victimisation results discussed in the exploratory phase of this chapter (as well as the results discussed in Chapter three), there is only a meagre association between crime concentration and Burgess Score (+0.1504) and between burglary concentration and Burgess Score (+0.0208).

Table 64: Burgled Once versus Twice or More – Environmental Factors and Burgess Score

Environmental Factor	Burgess Score
Situated on a cul-de-sac without a linked pathway	9.9
Situated on a cul-de-sac with a linked pathway	-7.1
Situated on a Through Road	-13.2
Located 10 or more properties away from a footpath	8
Located next to a footpath	-5.6
Located 1-5 properties away from a footpath	-13.1
Located 6-10 properties away from a footpath	-0.2
Situated on an estate without a footpath leading to open land	4.5
Situated on an estate with a footpath leading to	-15.2

open land	
Situated on an estate without a footpath leading to another residential area	8.1
Situated on an estate with a footpath leading to another residential area	-9.8
Situated on an estate with evidence of a Neighbourhood Watch Scheme	-15.6
Situated on an estate without evidence of a Neighbourhood Watch Scheme	2.1

Table 65: Victimised Once versus Victimised Twice or More – Environmental Factors and Burgess Score

Environmental Factor	Burgess Score
Situated on an estate with no litter	-4.4
Situated on an estate with some litter	11.4
Situated on an estate with heavy litter	13.7
Not overlooked at the front	-11.5
Overlooked at the front	4
Access at both sides of the property	53.7
No access at both sides of property	-1.3

What does this analysis show us? The exploratory phase set out at the opening to this chapter identified the particular environmental factors (from the EORF table) which were associated with the risk of victimisation. These are the factors which, when present, increase a property's vulnerability to victimisation. The Burgess method of analysis involved converting these factors into scores, allowing each environmental factor to be awarded a number which represents its influence upon crime (the higher the number, the greater the risk of crime when that factor is present). Finally, this process was validated by awarding a total Burgess Score to each of the 1058 properties based upon the environmental factors which they possessed, and then testing the relationship between the Burgess Score and the crime incidence, prevalence and concentration experienced by properties to ensure that those with the highest scores experienced the highest levels of crime, and those with the lowest scores experienced the lowest levels of crime. The results were positive, suggesting that this method would be a valid tool for identifying risk amongst residential properties.

The next question is how this scale, original or modified, is most profitably used. The logic is as follows. Within an area (whether SBD or other) the identified environmental cues are associated with victimisation risk. Protection to houses within an area should be commensurate with that risk, therefore, a practitioner can identify the homes in need of additional security

measures or other special attention. As was discussed above, environmental factors are only one kind of risk factor, and the same enterprise is desirable on the basis of demographic factors, recent home removal, prior victimisation and the like. The advantage of environmental factors are that they tend to persist across the identity of the householder. Further, the information can be gathered easily and without the restrictions of data protection protocol.

Chapter Four – Part Five
Discussion

Chapter three of this thesis focused upon the effectiveness of SBD as a crime reduction measure, comparing the crime rates on SBD estates against Non-SBD estates. Chapter four has been improvement oriented with the aims of identifying which environmental factors are associated with crime prone homes and translating these findings into a risk-assessment tool for practitioners to assess the vulnerability of residential housing. As was discussed within Chapter two (as well as the introduction to Chapter four), several risk-assessment tools have already been produced (Winchester and Jackson, 1982; Coleman, 1986 and Groff and LaVigne, 2001) which aim to identify which environmental factors are associated with crime risk amongst residential housing. In light of the existence of these tools, what justification is there for another risk-assessment measure?

The first justification lies with the language of existing tools which is often unnecessarily complex. Take for example Winchester and Jackson's environmental risk factors which are displayed as statements, with yes answers producing a score of 1, whilst no answers are awarded a score of 0. Several of these statements are confusing and unclear. Examples include: "Housing Plot Not Adjacent to the Gardens of Other Houses", or "Not Overlooked at the Front by Other Houses". Other statements are open to misinterpretation amongst fieldworkers, for example: "Isolated" – what is isolated? "Located in the Country" – What constitutes the country? The second justification concerns the applicability of existing checklists to alternative samples. Groff and LaVigne's tool is produced using USA data, Winchester and Jackson's did not prove useful in the West Yorkshire sample, with the majority of houses scoring 0, making useful distinctions between properties almost impossible. The third justification concerns the ease of usage. Groff and LaVigne's tool requires data relating to offender residence and levels of nuisance complaints. Although these data are useful, they simply add complication for practitioners wishing to assess their built environment. Data protection issues often cause delays in the provision of data between agencies, and although CDRPs are designed to ensure that these complications are easily overcome, a simple and usable tool should avoid placing obstacles in the paths of practitioners. The final justification for the production of a new risk-assessment tool was the desire to include additional variables which had not been covered in existing checklists, namely those relating to through movement, permeability and being located within the awareness space of others. The resulting practitioners' checklist presented within this thesis

is thus clear, transparent and user friendly. It is designed to be used as a proactive crime reduction tool, allowing practitioners to direct preventative resources towards vulnerable properties before they become victims of crime.

Having re-iterated the justification for this tool, the methods through which it was produced should also be summarised. Each of the 1058 properties which were selected for inclusion in the detailed analysis (Chapter three) were assessed using the OERF table. Crime data were collected for each of these properties, allowing the presence or absence of each environmental factor to be cross-tabulated with crime risk. The results revealed that 13 environmental factors were associated with the risk of burglary (at the statistical significance level of 0.1). These are detailed below:

Table 66: Environmental Factors Associated with Burglary

Environmental Factors	Percentage of Sample Victims of Burglary			Average Burglary Risk for sample of 1058 properties	Statistical Significance
Is the property adjacent to open space?	Yes = 19.2%	No = 15.3%	-	16.1%	**0.10**
Road Network	True Cul-de-Sac = 14.1%	Leaky Cul-de-Sac = 18.4%	Through Road = 17.8%	16.1%	**0.09**
Presence of Real/Symbolic Barrier	Yes = 14%	No = 17.9%	-	16.1%	**0.05**
Does Estate have a footpath leading to local shops?	Yes = 26.3%	No = 15.5%	-	16.1%	**0.02**
Does Estate have a footpath leading to a maze of other footpaths?	Yes = 26.5%	No = 14.5%	-	16.1%	**0.0005**
Does Estate have a footpath leading to another residential	Yes = 17.9%	No = 14.8%	-	16.1%	**0.10**

area?					
Volume of Traffic at Nearby Road Junction	Light = 12.3%	Moderate = 23.3%	Heavy = 22.6%	16.1%	**0.002**
Volume of Pedestrian Traffic in Front of Property	Light = 15.7%	Moderate = 25.6%	-	16.1%	**0.04**
Signs of Neighbourhood Watch Scheme?	Yes = 11.1%	No = 17.1%	-	16.1%	**0.03**
Evidence that Property has a Burglar Alarm?	Yes = 22.6%	No = 12%	-	16.1%	**<0.0005**
Is there a Gate leading from footpath into rear garden?	Yes = 35.7%	No = 15.8%	-	16.1%	**0.06**
Are there signs of brief desertion?	Yes = 41.7%	No = 15.8%	-	16.1%	**0.03**
Are there signs of long-term desertion?	**45.5%**	**15.8%**	-	**16.1%**	**0.02**

17 environmental factors were associated with the risk of victimisation (all crime) at the statistical significance level of 0.1. These are detailed below:

Table 67: Environmental Factors Associated with Victimisation

Environmental Factors	Percentage of Sample Victims of Crime				Average Crime Risk for sample of 1058 properties	Statistical Significance
Road Network	True Cul-de-Sac = 37.1%	Leaky Cul-de-Sac = 44.7%	Through Road = 47.3%	-	41%	**0.01**
How Close is the Property Located to a Footpath	0 houses away from footpath	1-5 = 39.3%	6-10 = 50.4%	More than 10 = 38.2%	41%	**0.02**

	= 47.2%					
Does Estate have a footpath leading to local shops?	Yes = 52.6%	No = 40.4%	-	-	41%	**0.05**
Does Estate have a footpath leading to a maze of other footpaths?	Yes = 52.9%	No = 39.3%	-	-	41%	**0.002**
Is there a Gate leading from footpath into rear garden?	Yes = 92.9%	No = 40.3%	-	-	41%	**<0.0005**
Is the Property Visible from a Nearby Footpath?	Yes = 47.3%	No = 40%	-	-	41%	**0.06**
How Heavy is the Volume of Traffic at the Nearest Road Junction	Light = 36.8%	Moderate = 52.6%	Heavy = 54.7%	-	41%	**0.0005**
How Heavy is the Flow of Pedestrian Traffic in Front of Property	Light = 40.1%	Moderate = 62.8%	-	-	41%	**0.003**
Does the Property have signs of Litter/Graffiti?	None = 38.1%	Some = 50.7%	Heavy = 57.7%	-	41%	**0.0005**
Does the Property show signs of Disrepair?	No signs = 39.8%	Some signs = 50%	Many signs = 69.2%	-	41%	**0.01**
Signs of Dog	Yes = 66.7%	No = 40.7%	-	-	41%	**0.04**

Signs of a Burglar Alarm	Yes = 52.7%	No = 33.8%	-	-	41%	**<0.0005**
Does Property have a Window Open/Door Ajar?	Yes = 45.8%	No = 40.1%	-	-	41%	**0.09**
Is Property located on the nearest Main Road	Yes = 60%	No = 40.7%	-	-	41%	**0.07**
The House is Not Overlooked at the Front	Yes = 46.7%	No = 39.4%	-	-	41%	**0.03**
Are there signs of brief desertion?	Yes = 75%	No = 40.6%	-	-	41%	**0.02**
Are there signs of long-term desertion?	**81.8%**	**40.6%**	**-**	**-**	**41%**	**0.007**

The findings relating to repeat victimisation were not straightforward. Factors which were associated with single victimisation were either absent when analysing repeat victimisation, or they were statistically significant yet the relationship was in a different direction. For example, there was a statistically significant relationship between a property being victimised and it NOT being overlooked at the front. When multiple victimisation was analysed, the results revealed that there was a statistically significant relationship between victimisation and BEING overlooked at the front.

Table 68: Environmental Factors Associated with Repeat Burglary

Environmental Factors	Percentage of Sample Victims of Repeat Burglary				Average Repeat Burglary Risk for sample of 1058 properties	Statistical Significance
Road Network	True Cul-de-Sac = 40.5%	Leaky Cul-de-Sac = 23.5%	Through Road = 17.4%	-	30.6%	**0.01**
How Close is	0 houses	1-5 =	6-10 =	More than	30.6%	**0.05**

the Property Located to a Footpath	away from footpath = 25%	17.5%	30.4%	10 = 38.6%		
Does Estate have a footpath leading to open land?	Yes = 15.4%	No = 35.1%	-	-	30.6%	**0.02**
Does Estate have a footpath leading to another residential area?	Yes = 20.8%	No = 38.7%	-	-	30.6%	**0.009**
Evidence of a Neighbourhood Watch Scheme?	**Yes = 15%**	**No = 32.7%**	-	-	**30.6%**	**0.09**

Table 69: Environmental Factors Associated with Repeat Victimisation

Environmental Factors	**Percentage of Sample Victims of Repeat Victimisation**				**Average Repeat Victimisation Risk for sample of 1058 properties**	**Statistical Significance**
Evidence of Litter/Graffiti	None = 41.9%	Some = 57.7%	Heavy = 60%	-	46.3%	**0.006**
The Property is Not Overlooked at the Front	Yes = 34.8%	No = 50.3%	-	-	46.3%	**0.003**
Is there access at both sides of the Property	**Yes = 100%**	**No = 45%**	-	-	**46.3%**	**<0.0005**

At first glance these findings appear contradictory; however, these findings are supported by other criminological research (Ellingworth *et al,* 1997; Ashton *et al,* 1998). Offenders often select a target based upon external cues such as the proximity of the property to a nearby footpath – 'how easily can I escape unnoticed from this target?' Whether the offender chooses

to re-offend against that property involves more factors than simply external perception, these are likely to relate to internal cues relating to the residents' lifestyle and wealth. The factors associated with repeat victimisation are different to those associated with single victimisation. An offender makes choices about initial victimisation based upon the cues available to them. Unless they know the resident, these have to be assumptions based upon what they perceive from the outside of the property. Once the offender has victimised the property, they can base their decision to re-offend on internal cues such as lifestyle and wealth. It is for this reason that the environmental factors relating to single victimisation are not present when multiple victimisation is analysed.

Having established which environmental factors were associated with crime risk, the aim of this thesis was to translate this into a usable scale for risk-assessment. The method used to produce this scale was the Burgess Method whereby a score is produced for each environmental factor. This score represents the difference between the mean rate of crime suffered by the general sample and the mean rate of crime for properties possessing that feature. The two resulting checklists for burglary and all crime were validated to ensure that properties with the highest Burgess Scores actually experienced the highest incidence and prevalence of crime, and the properties with the lowest Burgess Scores experienced the lowest levels of crime. This validation proved successful, with positive correlations between Burgess Score and crime experienced.

Table 70: Correlation between Burgess Score and Victimisation

Relationship	Correlation Coefficient
Burgess Score and All Crime Incidence	+0.7749
Burgess Score and All Crime Prevalence	+0.8621
Burgess Score and Burglary Incidence	+0.6418
Burgess Score and Burglary Prevalence	+0.7978

Part five of this Chapter opened with a discussion of the justification for developing this risk-assessment measure, these fell largely into the following categories:

a) Existing risk-assessment measures contained confusing language which is open to misinterpretation;

b) Existing risk-assessment measures were not applicable to housing within the West Yorkshire. It was assumed that this lack of transferability may be consistent across other geographical areas;

c) Existing risk-assessment measures required the collection of data relating to offender residence and levels of noise nuisance complaints. There was a need to design a checklist which could be completed without the need to collect additional data;

d) Research relating to issues such as through-movement and permeability remains conflicting. There currently exists a debate surrounding these issues which has been unhelpful to the progression of designing out crime. It was hoped that the inclusion of these factors would help to clarify this debate.

The first three justifications have been addressed in the production of the practitioners checklist presented in this chapter. The final justification, relating to the current debate surrounding sustainability and permeability should also have been clarified by the data presented within this thesis. These data are summarised below, alongside a brief return to the explanation for its inclusion.

Permeability:

The permeability debate covers the three OERF table categories of road network, access and awareness space. Road network relates to the issue of cul-de-sac versus through road, a debate which has dominated much of the discussion surrounding SBD over the last decade (Fairs, 1998; Stungo, 1998; Summerskill, 2000). The issue of access is closely related to this and expands upon the subject of footpaths, where they are positioned, where they lead to and whether there is access from that footpath directly into the boundary of the property. Awareness space relates to the positioning of the property within the surrounding neighbourhood - are potential offenders likely to notice the property en-route to school, work or leisure activities? The permeability debate centres around the benefits of facilitating movement within an area weighed against the risks of potentially criminogenic design. Those who argue in favour of permeable housing (through roads or leaky *culs-de-sac*) believe that residential areas should encourage movement and thus allow passers by to create an informal surveillance or act as guardians for that area. Previous research which supports the positioning of residential housing within permeable neighbourhoods includes Rudlin and Falk (1995); Department of the

Environment, Transport and the Regions (1998); Hillier and Chi-Feng Shu (1998); Department of the Environment, Transport and the Regions (1999) and Chi-Feng Shu (2000). In contrast, there exists an abundance of criminological research which suggests that crime is higher along major vehicular or pedestrian pathways as opposed to within closed estates such as *culs-de-sac* which limit through movement (Brantingham and Brantingham, 1975, 1993, 2000; Bevis and Nutter, 1977; Brantingham *et al,* 1977; Brown and Altman, 1983; Newlands, 1983; Greenberg and Rohe, 1984; Cromwell *et al,* 1991; Mirlees-Black *et al*, 1998).

The research findings presented within this thesis largely support the premise that properties positioned within permeable estates are more vulnerable to victimisation. The environmental factors which emerge as associated with elevated crime (and burglary) levels suggest that higher levels of movement past the home are generally associated with higher levels of risk. Thus in the somewhat heated debate about the role of permeability in enabling crime, the general thrust of the data suggests that high permeability (as proxied by the property's proximity to a footpath, whether that footpath leads to shops/other residential areas/a maze of other footpaths and the level of pedestrian and vehicular movement through the estate) is indeed associated with higher levels of crime. In fact, 8 of the 13 environmental factors which were associated with risk of burglary at a statistically significant level of 0.1, and 10 of the 17 factors which were associated with total crime at a statistically significant level of 0.1 were related to permeability and access.

Surveillance

Previous research suggests that the likelihood that offenders will be noticed by neighbours is crucial in their decision making process. Reppetto (1974) found that over a fifth of his sample of 97 convicted burglars stated that the possibility of neighbours watching them deterred them from selecting a property. Brown and Altman (1983) also found that burgled properties had less visual access to immediately neighbouring properties than non-burgled properties. The research findings presented within this thesis which relate to surveillance are mixed.

- Houses which are not overlooked at the front are more vulnerable to total crime than those which are overlooked. The association between not being overlooked at the front and prior risk of victimisation was statistically significant (0.03);

- Does the front door face the street? - When burglary alone is analysed, the findings do not support those revealed within existing research. Of the properties which had a front door facing the street, 16.1% had been burgled. Of those which had a front door which did not face onto the street, 16.2% had been burgled. However, when all crime categories were analysed, the results were similar to those revealed by Reppetto (1974) and Brown and Altman (1983). Of the properties which had a front door facing the street, 40.6% had been victimised. Of those which had a front door which was not facing onto the street, 47.1% had been victimised. This association, however, was not statistically significant (0.18).

Social Climate

The issue of management and maintenance was included in the OERFs table in recognition of previous research which highlights that crime and anti-social behaviour can act as a catalyst for increased crime and disorder, higher levels of fear of crime and a reluctance by residents to engage in informal crime prevention activities (Zimbardo, 1970; Finnie, 1973; Wilson and Kelling, 1982; Skogan, 1990) as well as portraying the impression to offenders that residents living within the neighbourhood are less likely to apprehend them or report their actions to the police (Taylor and Gottfredson, 1987). Management and maintenance emerged as one of the most significant environmental factors, with properties showing signs of brief and lengthy desertion being more vulnerable to burglary and total crime at a statistically significant level than those which did not. Properties showing signs of heavy litter/graffiti were also more vulnerable to total crime than those with no litter/graffiti as were those showing many signs of disrepair (all were associated with total crime at a statistically significant level).

The findings revealed within Chapter three of this thesis suggested that SBD properties experience less crime and fear of crime than their Non-SBD counterparts. Chapter four has built upon these findings, identifying the particular environmental factors which influence crime risk and translating these findings into a tool to allow practitioners to direct crime reduction resources. Continuing the improvement theme, Chapter five aims firstly to identify whether the environmental factors discussed within this chapter have a different impact upon SBD and Non-SBD properties. Is it the presence or absence of the environmental factors identified within Chapter four which affords SBD the crime reduction potential revealed within Chapter three? Finally, Chapter five presents the findings of an analysis of the *modus operandi* used by offenders when offending against SBD and Non-SBD properties. It is hoped that these findings

will allow the identification of particular weaknesses within the scheme (thus allowing these weaknesses to be addressed) as well as revealing something about the relationship between the offender and the built environment within both SBD and Non-SBD areas.

Chapter Five
An Improvement Perspective

Chapter Five – Part One
Environmental Factors and the SBD scheme

The findings from the previous chapter allow practitioners to identify which environmental factors are likely to increase a property's vulnerability to crime, thus allowing resources to be directed towards those at risk of victimisation. As was discussed within Chapter two, the SBD scheme takes as its basis many of the principles of environmental criminology, CPTED and the New Opportunity Theories. With this in mind, one might presume that the environmental factors found to influence crime (such as permeability, vandalism and disrepair) are less likely to be present within SBD schemes. The findings discussed within Chapter four revealed that victimised properties have a higher Burgess Score than non-victimised properties. It did not address the question of whether SBD properties possess less of those environmental features associated with crime victimisation (as one might expect) or whether the crime reduction benefits of SBD are based upon alternative factors. This is an important consideration. Insofar as factors associated with low risk are not more common in SBD areas, the scope of environmental improvement by refining SBD is greater. Thus, paradoxically, it would be preferable for SBD status not to be statistically associated with risk scores.

Chapter Five – Part Two
Methodology

As was discussed within Chapter four, each property within the sample (n=1058) was awarded a Burgess Score based upon the environmental factors which it possessed. These data were analysed using two way ANOVA with the Burgess Score representing the dependent variable, and whether the house was SBD or not and whether it had been victimised or not, representing the independent variables (0 represents a property which has not been victimised, 1 represents a property which has been victimised at least once). In this way, it was possible to see whether SBD was associated with environmental risk scores, either alone or in interaction with prior victimisation. This analysis was carried out separately for total crime and burglary alone.

Chapter Five – Part Three
Results

The findings from this analysis can be summarised as follows. The same pattern applies to both burglary alone and total crime.

1. SBD homes have higher Burgess scores at both levels of victimisation (victimised and non-victimised).
2. Non-victimised homes have lower levels of Burgess scores, for both SBD and Non-SBD homes.

SBD properties which have not been burgled have a mean Burgess Score of +1.6, SBD properties which have been burgled have a Burgess Score of +8.6. Non-SBD properties which have never been burgled have a mean Burgess Score of -6.1, Non-SBD properties which have been burgled have a mean Burgess Score of -1. The average Burgess Score for non-burgled properties was -1.9, whilst the average Burgess Score for burgled properties was +4.3.

Table 71: Mean Burgess Scores for Burgled versus Non-Burgled Properties

	SBD	Non-SBD	Average Risk	Sample
Non-Burgled	1.6	-6.1	-1.9	
Burgled	8.6	-1.0	4.3	
Average Sample Risk	3.3	-4.9		

Victimised properties (whether SBD or not) also have a higher Burgess Score than non-victimised properties. SBD properties which had not been victimised had a Burgess Score of -1.8, SBD properties which had been victimised had a Burgess Score of +14.1. Non-SBD properties which had not been victimised had a mean Burgess Score of -8.8, whilst Non-SBD properties which had been victimised had a mean Burgess Score of +2.1. The average Burgess Score for victimised properties (irrespective of SBD status) was +8.7, the average Burgess Score for non-victimised properties was -5.

Table 72: Mean Burgess Scores for Victimised versus Non-Victimised Properties

	SBD	Non-SBD	Average Risk	Sample
Non-Burgled	-1.8	-8.8	-5.0	
Burgled	14.1	2.1	8.7	

Average Sample Risk	4.8	-4.4

These findings validate those discussed in Chapter four, properties with high Burgess Scores are more likely to have been victimised than those with low Burgess Scores.

As SBD properties experience lower levels of crime and are designed according to CPTED principles, one would expect the SBD sample to have a lower mean Burgess Score than the Non-SBD sample. However, the results revealed that although the SBD properties within this sample experienced lower levels of crime and fear of crime, they were achieving this in spite of the environmental factors which they possessed, not because of the environmental factors they possessed. The results of this analysis revealed that the SBD properties within the sample had a higher Burgess Score than the Non-SBD properties. For all crime categories, the mean Burgess Score for SBD properties was +4.8, for Non-SBD properties it was -4.4. The average Burgess Score for non-victimised properties was -5. Non-victimised SBD properties had a mean Burgess Score of -1.8, whilst non-victimised Non-SBD properties had a Burgess Score of -8.8. The average Burgess Score for victimised properties was +8.7. Non-SBD victimised properties had a Burgess Score of +2.1, whilst SBD victimised properties had a Burgess Score of +14.1. When burglary alone was analysed, the results again revealed that the SBD properties had a higher Burgess Score than the Non-SBD properties within this sample. The average Burgess Score for the SBD sample was +3.3, whilst the average Burgess Score for the Non-SBD sample was -4.9.

Chapter Five – Part Four
How can these findings be used to improve SBD?

The findings presented thus far suggest that although the SBD sample selected for this thesis experienced lower levels of crime and fear of crime, this was achieved in spite of the indexed environmental features which those properties possessed, rather than because of those features. It is suggested that the value of SBD derives from other variables which were not measured by this checklist, these may include good quality security hardware. The environmental factors which were associated with crime victimisation were more likely to be present within the SBD sample than the Non-SBD sample. This suggests that although the SBD scheme was designed with CPTED principles in mind, these have not been fully implemented within the chosen sample. The SBD sample has reduced crime in spite of its design characteristics, suggesting that addressing these design weaknesses could further improve the crime reduction potential of SBD housing estates.

Chapter Five – Part Five
Does SBD Status affect Offender *Modus Operandi?*

The foregoing suggests that a major refinement of SBD could come through having regard to the factors in the environmental risk index in SBD certification. There are others. One such supplementary method for immediately improving the existing SBD scheme would be to ensure that its principles are actually implemented at the design/build stage. Basing a crime reduction scheme upon principles which are proven to have crime reduction benefits is a sound judgement, failing to implement those principles in practice is short sighted. A second means of improving the SBD scheme is to identify particular vulnerabilities within the existing standards through the analysis of offender *Modus Operandi (MO). MO* refers to the characteristic means through which an offender or offenders carry out an offence, for example, what is their point of entry? Do they use a tool? How do they penetrate the target enclosure? The importance of analysing *MO* in relation to this thesis is in identifying the specific design weaknesses of SBD as well as Non-SBD properties. Weaknesses may be specific to the property, for example patio windows or rear doors, or they may be within the wider environment such as houses located next to open fields. The aim is to draw out the finer details of burglaries being committed within SBD and Non-SBD estates and to offer these findings to practitioners faced with managing the SBD scheme.

Chapter Five – Part Six
Methodology

As a means of identifying weaknesses within the SBD standards, as well as investigating the effect which SBD has upon the behaviour of offenders and potential offenders, *MO* information was collected for crimes committed against the 1058 properties within the detailed sample discussed throughout the thesis. Therefore, the sample utilised for this section of the thesis remains the same as that used within the detailed sample (Chapter three) as well as Chapter four. Data were collected for the three offences burglary dwelling, attempted burglary dwelling and damage to a dwelling for the same time period as that utilised within the detailed analysis. The *MO* data were extracted from the police CIS following the same data protection protocols discussed throughout the thesis. Although this section of the thesis is predominantly focused upon the burglaries committed against the SBD and Non-SBD properties, it was important to analyse failed burglaries (attempted burglary and damage to a dwelling) as well as those which were completed. An attempted burglary is a failed burglary, be that failure due to a disturbance by a resident, or a failure to overcome security measures. Damage to a dwelling offences were included due to the large proportion of these offences which appeared to be attempted burglaries. Although there did appear to be damage to a dwelling offences which were just that (see quote two below), a large number were clearly attempts to break into the property (see quote one below). The examples detailed below (extracted from the police CIS for damage to a dwelling offences) demonstrate the variance between what is considered to be a damage to a dwelling offence.

Quote One (taken from the *MO* field of a damage to a dwelling offence):

> "..During hours of darkness person(s) unknown approach wooden rear door of premises and by believed kicking damage bottom panel of door which is actually kicked right through. Person(s) then make good escape. Possibly after being disturbed as no entry gained to premises".

Quote Two (taken from the *MO* field of a damage to a dwelling offence):

> "Person(s) unknown approach garden fence at rear of semi-detached house...With spade or similar instrument dig up approximately 5 panels to fencing 4ft x 4ft. Lay them on ground and trample on them breaking panels".

For the purpose of this analysis, the free text information contained within the *MO* field was categorised according to Ekblom's (2000) Conjunction of Criminal Opportunity, the main focus being the elements of the situation as opposed to the offender. Information was collated according to the following categories:

1. Target enclosure (Premises). Was the property detached, mid-terrace, end-terrace?
2. Target enclosure (Victims). Did the victim's status have relevance to the offence? For example was the victim an ex-partner using an old set of keys to break in?
3. Target enclosure (Implement). Did the offender use a tool or a weapon?
4. Target enclosure (Point of Entry). Where did the offender enter the property?
5. Target enclosure (Point of escape). Where did the offender leave the property?
6. Target enclosure (Method of Entry). How was the entry effected?
7. Target enclosure (Status). How did the offender present themselves?
8. Crime Promoters: Promoters either carelessly or deliberately make crime more likely. These are active roles rather than features of the environment. For example, a property being located next to a main road or communal entrances within housing blocks.
9. Crime preventers: Preventers are active roles making crimes less likely, the absence of preventers may facilitate crime. Examples of crime preventers include burglar alarms, double-glazing or bars/grills on ground floor windows.
10. Wider Environment: The environment surrounding the crime or disorder scene can be logistically favourable to the offender and crime promoters and unfavourable for crime preventers, for example locating a housing estate next to a school playing field.
11. Identification of Offender. Was the victim able to identify the offender?

For attempt burglary offences, the categories 'why did they fail?' and 'did the offender penetrate the target enclosure' were also introduced. For damage to a dwelling offences the categories 'did the offender penetrate the target enclosure?' and 'did the offender gain entry to the property?' were also analysed.

The quality of *MO* information can vary depending on the officer responsible for the case, the training and experience of that officer and the importance given to *MO* by the officer. Although the analysis focused upon the above categories of information specific to the offence, in many cases the relevant information was not contained within the *MO* free text field. Because the information used to compare the *MO* of offences against SBD properties with those against

Non-SBD properties was extracted from the same CIS of the same police force it is suggested that any biases were minimised.

Chapter Five – Part Seven
Results

Burglary:

Table 73 below displays the *MO* for burglary offences against SBD and Non-SBD properties. The results not only identify weak points within the SBD sample, but also reveal a great deal about the impact of the SBD scheme upon offender behaviour. The analysis of tool or implement used in burglary offences showed very little difference between attacks on SBD and Non-SBD properties. The most common implement used in this sample of burglaries was a bladed screwdriver type instrument. This was the most common tool for both SBD offences (31%) as well as Non-SBD offences (31%). The second most common tool for both SBD and Non-SBD offences was the body, either in the form of kicking or forcing the point of entry. The body was used in 12% of offences against both SBD and Non-SBD properties. Other tools which were used to break into SBD properties were: duplicate keys (5%), bricks (4%), garden gnome (1%), piping (1%) crowbar (1%) and electrical tool (1%). Other implements which were used to break into Non-SBD properties were: duplicate keys (4%), bricks (2%), hacksaw (1%) and wire (1%).

The analysis of point of entry revealed very interesting contrasts between the two samples. Although the most common point of entry for both SBD and Non-SBD properties was a rear ground floor window (31% of offences), a much higher proportion of offences against SBD properties involved entry via the rear of the property (rear ground floor window 31%, rear door 28%, rear upstairs window 1%). In direct contrast to this, a large proportion of points of entry against Non-SBD properties were committed via the front of the property (front door 16%, front ground floor window 6%, front upstairs window 2%). The table below displays these findings. The most interesting finding is that 16% of offences against Non-SBD properties were committed via the front door, this is compared to only 9% of offences against SBD properties. In contrast, 28% of offences against the SBD sample were committed via the rear door, compared to only 19% of the offences against the Non-SBD sample.

Table 73: Point of Entry

Category of Analysis	Percentage of Offences (SBD)	Percentage of Offences (Non-SBD)
Rear ground floor window	31	31
Rear Door	28	19
Rear upstairs window	1	2
Front door	9	16
Front ground floor window	5	6
Front upstairs window	0	2

This finding suggests that offenders may perceive social control to be higher amongst residents in SBD areas thus avoiding a conspicuous point of entry such as the front door. On the other hand, offenders choosing their point of entry in Non-SBD estates may feel that residents are unlikely to apprehend them even if they catch them in the act of breaking into a neighbouring property, therefore, they feel comfortable breaking in using the front of the property.

As with the point of entry, the analysis of point of escape revealed very interesting findings. One of the main differences between SBD and Non-SBD properties was that far more offenders escaped from the property via the front when offending against Non-SBD properties. In 17% of offences against Non-SBD properties the point of escape was the front door, this is compared to only 9% of offences against SBD properties. These findings support the suggestion discussed within the previous paragraph, that offenders feel more comfortable exiting the property via the front door in Non-SBD areas. This may relate to the layout of these estates, in which there is less natural surveillance from neighbouring properties, or it may relate to the behaviour of Non-SBD residents who portray the impression that they are unlikely to intervene.

The analysis of method of entry revealed some interesting findings relating to specific weak points within the SBD standard. For both samples, the most common method of entry was to jemmy the lock on the door. However, this was far more likely to occur within the Non-SBD sample (38% of offences compared to just 26%) suggesting that the standard of SBD locks is higher than those found on Non-SBD properties. The second most common method of entry for both SBD and Non-SBD properties was through an insecure door or window. In 23% of offences against SBD properties the offender entered through an insecure window or door. In 20% of offences against Non-SBD properties the offender entered through an insecure door or window. The third most common method of entry for both SBD and Non-SBD properties was

to smash a window or a glass panel in the door. In 16% of offences against SBD properties the method of entry was to smash a window/panel of glass in the door. In 15% of offences against Non-SBD properties the method of entry was to smash a window/panel of glass in the door.

Removing the Beading from around the windows was much more common in offences against SBD properties. 6% of offences against SBD properties involved removing the beading. Only 1% of offences against Non-SBD properties involved this method of entry. Other common methods of entry used in offending against SBD properties were: Kicking open the door (7%), using duplicate keys (5%), bodily pressure to the door panel (4%), taking out a pane of glass (2%), fully removing the window and frame surround (1%) and pulling open the door using bodily force (1%). In only 1% of offences against SBD properties was threat of violence used. In 3% of offences against Non-SBD properties there was a threat of violence. There was no use of violence in burglary offences against SBD properties. In 1% of offences against Non-SBD properties there was some use of violence. The use of distraction was used in 1% of burglary offences against Non-SBD properties and 0% of SBD properties. The use of false pretences was used on 1% of burglary offences against Non-SBD properties and 0% of SBD properties.

Table 74: *Modus Operandi* for Burglary Offences against Sample of SBD and Non-SBD Properties (n=212)

Category of Analysis	Percentage of Offences (SBD)	Percentage of Offences (Non-SBD)
Implement		
Bladed screwdriver type instrument	31	31
Kicking or forcing the point of entry using body	12	12
Duplicate keys	5	4
Bricks	4	2
Garden gnome	1	0
Piping	1	0
Crowbar	1	0
Electrical tool	1	0
Wire	0	1
Hacksaw	0	1
No evidence of tool used or Tool not specified	*45*	*50*
Point of Entry		
Rear ground floor window	31	31
Rear door	28	19
Front door	9	16
Front ground floor window	5	6
Patio	3	3
Side door	3	4

Rear upstairs window	1	2
Already in premises	1	0
Side window	0	2
Front upstairs window	0	2
Not Specified	*20*	*18*
Point of Escape		
Rear door	30	26
Rear ground floor window	19	19
Front door	9	17
Patio	4	3
Side door	3	3
Front ground floor window	2	4
Rear upstairs window	0	1
Side window	0	1
Found in house	0	1
Not specified	*34*	*26*
Method of entry		
Lock jemmied	26	38
Through insecure window/door	23	20
Smash window/glass door panel	16	15
Kicking open the door	7	6
Removing the beading	6	1
Using duplicate keys	5	4
Bodily pressure to the door panel	4	6
Taking out a pane of glass	2	0
Removing boarding	1	3
Fully remove window and frame surround	1	1
Brace and bit to push internal arm of window	1	0
Pull open door using force	1	0
Invited in as a friend	1	0
Completely remove the lock	1	0
Fishing keys through letterbox	0	1
Distraction methods	0	1
Take out letterbox	0	1
Operate lock using unknown means	0	1
Saw through window bars	0	1
Method not specified	*6*	*3*

Attempted Burglary:

The table below displays the *MO* for attempted burglary offences against the two samples. The results revealed a similar pattern to those discussed within the burglary section. There was very little variation between the implement used to attempt to break into the properties. The most common implement used in attempt burglary offences was a 'bladed screwdriver type implement'. 79% of attempt burglary offences against SBD properties included this type of implement compared to 50% of attempt burglary offences against Non-SBD properties. The

second most common implement was the body (either to kick or force the point of entry). The body was used in 7% of offences against SBD properties and 11% of Non-SBD properties.

The most common attempted points of entry for offences against SBD properties were either a rear ground floor window or the rear door (each accounting for 29% of the offences). The most common attempted point of entry for offences against Non-SBD properties was a rear ground floor window (39%). However, as with burglary offences, offenders were much more likely to attempt to break into Non-SBD properties via the front door. 22% of offences against Non-SBD properties involved an attempt to break in via the front door. This was compared to only 14% of offences against SBD properties.

The most common attempted method of entry against SBD properties was to jemmy the lock (64% of offences). Far less Non-SBD properties experienced this attempted method of entry (33%). The most common methods of attempted entry against Non-SBD properties were removing the beading around the window (33%) and jemmying the lock (33%). Other attempted methods of entry used against SBD properties were: removing the beading (14%), smashing the window/glass panel in the door (7%) and kicking open the door (7%). Other attempted methods of entry used against Non-SBD properties were: smashing the window/glass panel in the door (11%), bodily pressure to the door panels (11%), taking out the pane of glass (6%) and drilling the lock (6%).

In 71% of attempted burglaries against SBD properties the burglary failed due to the offender being unable to overcome security measures. This was compared to 56% of offences against Non-SBD properties. In 29% of offences against SBD properties, the offender failed due to a disturbance, this was the case in 39% of offences against Non-SBD properties. This finding is supported by the fact that offenders were much less likely to actually penetrate the target enclosure when offending against SBD properties. In 14% of attempted burglary offences against SBD properties the target enclosure was penetrated (even though the offence was still classed as an attempt). This was the case for a much higher percentage of Non-SBD properties (28%). These findings are extremely important and suggest that offenders attempting to burgle SBD properties are more likely to fail to enter the property - a positive finding for the SBD scheme. In addition, offenders attempting to burgle SBD properties are more likely to be unsuccessful because of the security measures which they face, rather than being disturbed in

the process. Again, this is an extremely positive finding and suggests that the scheme is succeeding in preventing offenders from successfully entering SBD properties.

Table 75: *Modus Operandi* for Attempted Burglary Offences against Sample of SBD and Non-SBD Properties (n=32)

Category of Analysis	Percentage of Offences (SBD)	Percentage of Offences (Non-SBD)
Implement		
Bladed screwdriver type instrument	79	50
Kicking or forcing the point of entry using body	7	11
Electrical tool	0	6
No evidence of tool used or Tool not specified	*14*	*33*
Point of Attempted Entry		
Rear ground floor window	29	39
Rear door	29	11
Front door	14	22
Front ground floor window	7	6
Patio	0	11
Side window	0	11
Not Specified	*21*	*0*
Method of Attempted entry		
Lock jemmied	64	33
Removing the beading	14	33
Smash window/glass door panel	7	11
Kicking open the door	7	0
Bodily pressure to the door panel	0	11
Taking out a pane of glass	0	6
Drill the lock	0	6
Method not specified	*7*	*0*

Damage to a Dwelling:

The table below displays the findings from the analysis of damage to a dwelling offences committed against the sample of 1058 SBD and Non-SBD properties. The most common tool used in damage to a dwelling offences against SBD properties was the body (20%), followed by stone (17%) and then brick (6%). The most common tool used in damage to a dwelling offences against Non-SBD properties was stone (27%) followed by the body (13%) and then brick (10%). Unlike the two offences burglary and attempt burglary, this offence was more likely to take place at the front of the property within the SBD sample. 27% of the offences committed against the SBD sample took place against the front door; this was compared to only 19% of the offences against Non-SBD properties. In contrast, a higher proportion of offences

against the Non-SBD sample took place against the rear door (13%) compared to the SBD sample (8%).

The most common method of damage against SBD and Non-SBD properties was to smash the window or glass door panel (47% and 40% respectively). In 56% of damage to a dwelling offences against SBD properties the target enclosure was penetrated. This was compared to 52% of offences against Non-SBD properties. The high levels of penetration of the target enclosures of both SBD and Non-SBD properties suggest that a proportion of these offences were attempted burglaries. As was discussed in the opening to this section, there is a vast difference between the offence categorised as damage to a dwelling, with some clearly an attempt to break in, whilst others are vandalism against the property or its surroundings.

Table 76: *Modus Operandi* for Damage to a Dwelling offences against Sample of SBD and Non-SBD Properties (n=142)

Category of Analysis	Percentage of Offences (SBD)	Percentage of Offences (Non-SBD)
Implement		
Kicking or forcing the point of entry using body	20	13
Stone	17	27
Brick	6	10
Bladed screwdriver type instrument	2	0
Spade	1	0
Crowbar	1	2
Ballard	1	0
Metal Clothes prop	1	0
Vehicle	1	0
Air pellet	1	0
Superglue	1	0
Golf ball	0	2
Roof slate	0	2
Baseball bat	0	5
No evidence of tool used or Tool not specified	*47*	*40*
Point of Damage		
Front door	27	19
Rear ground floor window	13	8
Already in premises	10	8
Rear door	8	13
Front ground floor window	6	8
Fence	6	0
Side window	3	0
Side door	1	0
Rear upstairs window	1	0
Front upstairs window	1	7
Electrical box	1	3

Telephone wire	1	2
Satellite dish	1	0
Roof	1	0
Patio	0	2
Not Specified	*19*	*30*
Method of Damage		
Smash window/glass door panel	47	40
Damage object other than boundary	19	13
Crack glass by means unknown	15	30
Kicking open the door	11	2
Bodily pressure to the door panel	3	8
Vandalism	3	0
Lock jemmied	1	0
Insecure	0	2
Method not specified	*1*	*5*

Do offenders' *MO* vary between single and repeatedly victimised properties?

Unlike the analysis of SBD versus Non-SBD, the comparison between offenders' *MO* in single burglary offences against repeat burglary offences showed very little variation. The most common implement used was a bladed screwdriver, which accounted for 31% of single and repeat burglary offences. The most common point of entry for both single and repeat offences was the rear ground floor window (31% of repeat offences and 30% of single offences). The only slight discrepancy between the two offence types was that only 19% of repeat offences took place via the rear door whilst 21% of single offences took place through this point of entry. This finding was supported in the analysis of point of escape, whereby a higher proportion of single offences took place via the rear door (32%) than repeat offences (24%). Again, there was very little variation between the method of entry for single and repeat offences. The most common method in both samples was to jemmy the lock (33% of repeats and 31% of single offences). Bodily pressure to the door panels was used more often in repeat offences, however the difference was only marginal (7% of repeat offences involved bodily pressure compared to 3% of single offences).

Table 77: *MO* for Repeat Burglary Victims as Compared to Single Burglary Victims

Category of Analysis*	Percentage of Repeat Burglary Offences	Percentage of Single Burglary Offences
Implement		
Bladed Screwdriver Type Instrument	31	31
Bodily Force	13	10
Duplicate Key	6	3
Brick	1	5
No implement specified/not known	*46*	*50*

Point of Entry		
Rear ground floor window	31	30
Rear door	19	27
Front door	12	12
Front ground floor window	5	6
Rear upstairs window	3	0
Patio	3	3
Side window	2	0
Side door	2	5
Not specified	*21*	*17*
Point of Escape		
Rear ground floor window	24	15
Rear door	24	32
Front door	11	15
Front ground floor window	3	3
Patio	3	4
Side door	2	4
Not specified	*31*	*28*
Method of Entry		
Jemmy lock	33	31
Insecure	21	22
Smash window/glass in door	15	16
Bodily pressure to door panels	7	3
Duplicate key	6	3
Kick open door	5	8
Remove beading	2	5
Remove boarding	2	2
Fully remove window and frame surround	0	2
Not specified/not known	*3*	*5*

*Categories with 1% or less are excluded from the table.

The analysis of attempted burglary offences revealed much greater discrepancies between single and repeat offences. Although the most common instrument used in this sample of properties was a bladed screwdriver, a much higher proportion of single offences took place using this instrument. 64% of single attempt burglary offences involved the use of a screwdriver, in contrast only 50% of repeat offences utilised this tool. The use of bodily force was also more common in single offences (11%) than repeat offences (0%).

The point of attempted entry also showed variations. 75% of repeat offences took place via a rear ground floor window, this is compared to only 29% of single offences. The front door was a much more common point of entry for single offences (21%) than repeat offences (0%). This suggests that the selection of the front door as a point of entry may be related to one-off/chance offences whereby an offender notices the opportunity to enter via this point, but chooses not to re-offend through this risky method. The rear window may be more common in repeat offences due to its positioning away from the surveillance of neighbouring properties.

The method of attempted entry also showed variations between single and repeat victims. 75% of repeat victimisations involved removing the window beading, this was compared to only 18% of single victims. In contrast, 54% of single victims involved jemmying the lock, whilst 0% of repeat victims involved this method of entry.

Table 78: *MO* for Repeat Attempt Burglary Victims as Compared to Single Attempt Burglary Victims

Category of Analysis*	Percentage of Repeat Burglary Offences	Percentage of Single Burglary Offences
Implement		
Bladed Screwdriver Type Instrument	50	64
Bodily Force	0	11
Electrical tool	0	4
No implement specified/not known	*50*	*21*
Point of Attempted Entry		
Rear ground floor window	75	29
Rear door	25	18
Front door	0	21
Front ground floor window	0	7
Patio	0	7
Side window	0	7
Not specified	*0*	*11*
Method of Attempted Entry		
Remove beading	75	18
Smash window/glass in door	25	7
Bodily pressure to door panels	0	7
Kick open door	0	4
Jemmy lock	0	54
Drill Lock	0	4
Take out pane of glass	0	4
Not specified/not known	*0*	*4*

*Categories with 1% or less are excluded from the table.

Analysis of damage to a dwelling offences also revealed some interesting findings. Although there were very little differences between the instruments used to carry out this offence, the point of damage and the method of damage showed variations. Whilst the front door was the most common point of damage for repeat and single victims, this point of damage was much more likely to be used in single damage offences (26% as compared to 17%). This finding supports that revealed in the analysis of attempt burglary offences and suggests that the use of the front door may relate to opportunistic or chance offences which do not result in a further offence. The rear door was also more commonly used in single offences (14%) than repeat

offences (4%). However, the front ground floor window was a much more common point of damage for repeat offences (12%) than single offences (5%).

The most common method of damage for both single and repeat victims was to smash the glass in the window/door, this method accounted for 60% of repeat offences and 36% of single offences.

Table 79: *MO* for Repeat Damage to a Dwelling Victims as Compared to Single Damage to a Dwelling Victims

Category of Analysis*	Percentage of Repeat Burglary Offences	Percentage of Single Burglary Offences
Implement		
Stone	17	23
Brick	14	5
Bodily Force	12	21
Crowbar	4	0
Baseball bat	4	1
Vehicle	2	0
Bladed Screwdriver Type Instrument	0	1
No implement specified/not known	*48*	*41*
Point of Damage		
Rear ground floor window	15	8
Rear door	4	14
Front door	17	26
Front ground floor window	12	5
Side window	4	0
Already in premises	8	10
Electrical Box	2	2
Fence	6	2
Telephone wire	2	1
Satellite dish	2	0
Roof	2	0
Not specified	*27*	*22*
Method of Damage		
Smash window/glass in door	60	36
Damage to object other than boundary	19	15
Crack/Damage glass by means unknown	14	26
Bodily pressure to door panels	2	7
Vandalism	2	1
Kick open door	2	10
Not specified/not known	*4*	*2*

*Categories with 1% or less are excluded from the table.

Chapter Five – Part Eight
Discussion

Findings from the analysis of offenders' *MO* support the premise that SBD encourages informal social control amongst its residents. The front door was a far more common point of entry and escape for offences against Non-SBD properties, suggesting that offenders are less fearful of being noticed or apprehended. Jemmying the lock was a far more common method of entry against Non-SBD properties, yet too many offenders are still using this method to break into SBD properties. There were a much higher proportion of attempt burglary offences which involved a failure to break-in due to the inability to overcome security measures within the SBD sample, suggesting an increased effort required to succeed in offending against SBD properties.

Although 23% of the offences against SBD properties were committed through an insecure entrance, this proportion was only slightly higher than the Non-SBD sample and the majority of burglary offences took place by overcoming the security measures (as opposed to sneaking in). Overcoming the security measures within this sample did not appear to involve a high degree of sophistication or difficulty and in many cases the target enclosure was penetrated with tools which would be available on the roadside such as stones, garden gnomes and bricks. A worrying finding from this analysis is the ability of offenders to break into the sample properties (both SBD and Non-SBD) without the aid of a tool, for example, kicking in the door, or applying pressure to the panels.

There are a number of features of this trawl which could alert practitioners to the points at which it may prove most profitable to refine SBD. First, and in general, the fact that most methods are roughly similar between SBD and non-SBD dwellings suggests that there is no obvious SBD weak point. The closest to such weak points concern the rear door and window beading, both of which were involved more in burglaries of SBD homes than of other homes. Whilst attention should be given to any identified weak points, it should be noted that many of the properties included within this analysis were built prior to the introduction of the current standards for windows (PAS 24) and doors (BS7950), therefore, methods used against properties built post 1999 may require more sophistication. A reassuring finding is that burglaries of SBD homes are not more often achieved by violence. The argument is often

advanced that improvements in security have as a cost their substitution by violence (as vehicle security begets carjacking). It is therefore important to note that violence is even rarer during the burglary of SBD homes than of other homes. Finally, it seems to be the case that SBD works more through target hardening than increased surveillance, given the distribution of reasons for non-completion of attempted burglaries. This being the case, consideration of surrogate signs of occupancy (e.g. by timers) might strengthen the whole package.

Chapter Six
Improving and Selling the SBD Product

Chapter Six – Part One
Aims

The final chapter of this thesis focuses upon the future of SBD. The findings from the previous three chapters revealed that SBD is, with qualifications, a useful crime reduction measure and discussed the means by which the scheme can continue to improve. The incentive of reduced crime and fear of crime may be appealing for SBD residents, but how do policy makers convince those who build and let these properties that the problem of crime, and the benefits of reduced crime, are theirs as well as their residents?

The legislative requirements to consider the crime and disorder implications of decision making were discussed within Chapter two. These include Section 17 of the Crime and Disorder Act (1998) and the Human Rights Act (1998). However, the process of selling crime reduction to developers and purchasers must involve both carrot and stick techniques (particularly for those within the private sector). For public bodies who own and manage social housing, legal action may be enough to influence development decisions. For private developers, a decision to build housing to a higher standard of security will involve additional factors such as costs and the property's appeal to future house buyers. In attempting to increase the proportion of properties which are built to the SBD standard, the agencies and individuals involved in the decision making process must be considered. For social housing the owner/manager is usually a RSL or a Local Authority and the customer is an individual or family who contribute towards the management of the property through the payment of rent. For new build private housing the property will be designed and developed according to the developer's standards. In the majority of cases, the customer will purchase a property once design decisions have been made. Their decision to either purchase or rent a private property will be based upon personal factors which may or may not include security.

Selling the SBD scheme to decision makers must take account of these needs. In social housing the decision makers include RSLs, Local Authorities and individuals whose decision it is to accept or reject a property. Although not exclusive to high crime areas, social housing is more common in urban and inner city areas and these are in turn more vulnerable to crime (Dodd *et al*, 2004). Selling the scheme to social housing residents on the basis of its crime reduction potential should be straightforward. For the owners/managers of that housing, additional

factors will include costs, planning permission and customer appeal. For private developers and house buyers the appeal is not as obvious. For developers, there is a risk that the mention of high security may portray the impression to house buyers that the area is not safe. The other primary factor will be costs. Developers who are selling the property (as opposed to living in it) will be concerned to maximise their profits, any additional costs relating to security must be recouped within the sale price. This chapter will investigate the levers which can be used to increase the proportion of housing which is built to SBD standard from the perspective of the social housing provider as well as private developers.

Chapter Six – Part Two
Social Housing Providers

Methodology:

In an attempt to establish what particular incentives and disincentives currently exist for social housing providers to build their properties to the SBD standard, interviews were conducted with both RSLs and the Housing Corporation. RSLs because the decision to build these houses to SBD is theirs, and the Housing Corporation because they make national decisions regarding standards and funding which will ultimately influence the local housing providers. The sample of properties used throughout this thesis were owned and managed by fifteen RSLs and one Local Authority. Each of these fifteen RSLs and the one Local Authority were invited to take part in a face-to-face interview to discuss their view on the existing incentives and disincentives to build to the SBD standard. They were selected because they owned and managed the SBD housing estates utilised within this thesis, for this reason, they were all based within the West Yorkshire region. Of the fifteen RSLs and one Local Authority included within the sample, only six RSLs were willing to take part in the interview. Although the findings are extensive, they should be treated with some caution as they represent the views of less than half of the RSLs from the West Yorkshire region. The interviews were semi-structured with questions relating to company policy regarding SBD, views on the existing incentives and disincentives to build to SBD, as well as the costs of building to SBD. (Appendix 3 contains the interview schedule for RSLs).

In an attempt to expand upon the role of the Housing Corporation in influencing design policy for RSLs, an interview took place with the Housing Corporation's Head of Housing Procurement – Practice and Development. This respondent was selected through a process of contacting the Housing Corporation at a national level and requesting their advice on possible interviewees. It was the opinion of The Housing Corporation that the Head of Housing Procurement – Practice and Development, would have the most extensive knowledge on policy issues such as the Scheme Development Standards (SDS). The interview took place at the Housing Corporation Headquarters in London and was semi-structured in nature. The content of the interview focused upon the issues raised within the interviews conducted with RSLs. These issues related to the Housing Corporation's SDS, funding, the costs of building to SBD

and any future policy changes. (Appendix 6 contains the interview schedule for the Housing Corporation).

Results:

Of the six RSLs who took part in the interview, two stated that all new homes MUST be built to the SBD standard, whilst four stated that they only SEEK to achieve the SBD standard (one respondent did not respond to this question). The incentives of building to SBD discussed by respondents fell largely into three categories. These were customer satisfaction, funding from the Housing Corporation and the value of expert advice from ALOs. Of the six respondents only five were willing to provide an answer to this question. Two respondents focused solely upon customer satisfaction, quotations from these respondents include:

> "Our customers welcome the improved levels of security that they feel as a result of SBD" (Yorkshire Metropolitan).

> "To provide a safe environment for residents" (Headrow).

A further two respondents focused upon the requirements of the Housing Corporation, whereby RSLs receive additional funding if their housing is built to the SBD standard. Quotations from respondents include:

> "RSLs must develop to SBD standards as it a requirement of the Housing Corporation's Scheme Development Standards. Failure to comply would be picked up at the audit stage by the Housing Corporation which would be a serious breach of the Scheme Development Standards and could jeopardise development funding to the RSL in the future" (Jephson).

> "The incentive for RSLs to build to SBD is the requirement for safety and security in the Housing Corporation Scheme Development Standards" (Ridings).

One respondent felt that the advice received from the police ALO when building (or attempting to build) housing to the SBD standard was a benefit and an incentive.

> "The audit process of having to liaise with an ALO is very useful as we value their advice and expertise on design issues" (Headrow).

Only two of the six respondents felt that they could highlight any disincentives or constraints in building to the SBD scheme. These fell into three categories: 1) Costs, 2) Design constraints and 3) Difficulties with inconsistent demands by ALOs. Two respondents expressed concern

about costs. One respondent expressed concern about ALO inconsistency and one respondent expressed concern about design compromises. Examples of quotations from respondents are set out below:

> "If the Housing Corporation's Scheme Development Standards were taken away, we would not build to SBD standard....financially we are squeezed from both ends and if we can find places to cut costs we will... Without public subsidy it is difficult to meet the Scheme Development Standards" (Headrow).

> "We sometimes feel that there is an inconsistency between ALO demands. For example, we were developing an estate which had phase one and phase two. Phase two was simply meant to follow on from phase one, with no re-designing of the estate layout. However, the ALO demands had changed from phase one to phase two....this made putting together a design brief very difficult" (Headrow).

Complete interviews are available at appendix 4; the following table contains a summary of the information provided by respondents.

Table 80: Summary of Company Policy, Incentives and Disincentives

	Company Policy	Incentives	Disincentives
Yorkshire Metropolitan	We seek to achieve certification on new build schemes.	Our customers welcome the improved levels of safety and security that they feel as a result of SBD.	None are obvious at this time.
Headrow	Not specified	To provide a safe environment for residents.	If the Housing Corporation's Scheme Development Standards (SDS) were taken away, we would not build to SBD standard.
		The audit process of having to liaise with an ALO is very useful as we value their advice and expertise on design issues	
		To help the development of a sustainable community where people want to stay.	
			Financially we are squeezed from both ends and if we can find places to cut costs we will.
			We sometimes feel that there is

			an inconsistency between ALO demands. Without public subsidy it is difficult to meet SDS standards.
Jephson	SBD certification must be obtained for all schemes.	RSLs must develop to SBD standards, as it is a requirement of the Housing Corporation's SDS. Failure to comply would be picked up at audit stage by the Housing Corporation which would be a serious break of SDS and could jeopardise development funding to a RSL in the future.	None specified
Places for People	All schemes should seek SBD certification; however, we recognise that in some circumstances, full SBD is not possible or practicable.	Going through the process ensures that the designers take full account of the security aspects of the design – this is as important as getting the accreditation.	There may be some extra cost involved, or an insistence on full compliance may lead to consequential design compromises. If we build a scheme which fits all SDS requirements, we will be in deficit for about 10 years.
Ridings	Meeting the SBD standards is a requirement in our company's design brief and it is a specification for all new build houses.	The incentive for RSLs to build to SBD is the requirement for safety and security in the Housing Corporation SDS.	None specified.
Sadeh Lok	Security provision for our tenants is of prime importance when considering the design of our new build schemes and we aim to achieve SBD certification.	None specified.	None specified.

The interview conducted with the Housing Corporation (the complete interview can be seen at appendix 7) revealed that they offer several funding related incentives for RSLs to build their properties to the SBD standard. These are Social Housing Grants and a Supplementary Multiplier for Sustainability. The Housing Corporation's SDS document (Housing Corporation, 2003) sets out the requirements and recommendations for all housing projects which receive Social Housing Grants (SHG). Items set out in the document fall into two categories, these are essential and recommended. RSLs which build schemes to a standard over and above the essential criteria to incorporate recommended items will achieve enhanced quality assessments. Enhanced quality assessments are reflected in the RSL's compliance audit results which can in turn influence the level of future funding from the Housing Corporation. Section 1.4 of the SDS document sets out both essential and recommended safety and security criteria.

Table 81: Housing Corporation Scheme Development Standards

1.4.2	Security provision for internal and external environments should be appropriate for scheme location and building types and should reflect advice obtained from local police Architectural Liaison Officers/Crime Prevention Design Advisors prior to detailed planning stage
	In assessing the extent to which this standard has been met the Corporation will: • Liaise with Police authorities to ascertain the extent of liaison undertaken by RSLs and their partners; • Have regard to the extent that the guidance in the relevant "Secured by Design" Guide has been incorporated. See the Further information section of SDS for contacts of the company set up to operate Secured by Design nationally.
1.4.2.1	*Tests of Compliance – essential items:* Scheme specific advice obtained from local police design advisers prior to detailed planning?
1.4.2.2	Secure side/rear fencing provided, any side or rear gates lockable and to full fencing height?
1.4.2.3	Layout avoids unnecessary through routes and minimises hiding places?
1.4.2.4	Site layout maximises natural surveillance?
1.4.2.5	Ground floor and other easily accessible windows tested to BS 7950: 1997 – enhanced security?

1.4.2.6	Key operated locks or laminated 6.4mm glass to ground floor or easily accessible windows?
1.4.2.7	Not used
1.4.2.8	External doors/frames/fixing/locking meet Secured by Design standards?
Prompt	Housing Quality Indicators (HQI) assessments carried out and data submitted to www.hqiuk.com
	Tests of compliance – recommended items:
1.4.2.9	Fused spur for security alarm provided?
1.4.2.10	'Secured by Design' certification obtained?

RSLs who require SHG funding to build housing schemes need to fulfil all essential criteria. Although these houses will not be SBD, they will have high levels of security. If RSLs wish to be looked upon favourably in terms of future funding from the Housing Corporation, they must build their housing schemes to a standard over and above the essential items, thus incorporating recommended items and hence building to SBD standard.

The second Housing Corporation incentive relates to the multiplier for sustainable properties. The Housing Corporation's Total Cost Indicators, Grant Rates, Value Limits and Discount Amounts, Rent Caps and Administration Allowances for 2001/2002 (Housing Corporation, 2000) came into force from the 1st April 2001. The changes from the 2000/2001 Total Cost Indicators (TCIs) include a new supplementary multiplier which has been introduced in order to encourage greater sustainability. Supplementary multipliers can be applied to new build and rehabilitation units when the accommodation is designed to meet the relevant standards set out in the Housing Corporation's SDS. In order to qualify for the Sustainability multiplier, two separate elements must be achieved. Firstly; Greening – In pursuit of the government's stated policy of increasing energy efficiency and reducing levels of CO2 in the atmosphere, an EcoHome rating of Good (second level) must be certified. Secondly, Security. In order to achieve this, SBD certification must be obtained (both Greening and Security must be present for the multiplier to apply). Depending upon the location throughout England (cost groups A, B, C, D or E), a RSL can achieve either an additional enhancement of Total Cost Indices of either 1.01 or 1.02. This equates to a 1% enhancement.

The interview with the Housing Corporation's Head of Housing Procurement also revealed that the Housing Corporation views SBD as an important factor in improving the quality of life of social housing residents. Although building to SBD is, at present, only a recommended criterion, it was stated that within a couple of years this will be a requirement of all social housing funded by the Housing Corporation.

> "SBD will be a requirement within a couple of years" (Housing Corporation).

It was suggested that there are no technical reasons why SBD is not an essential criterion. The indication was that the requirement to build to SBD is being introduced on a gradual basis to allow the treasury to account for the additional costs.

> "Before the supplementary multiplier, if we stated that SBD was essential, the Treasury's costs would go from a very small percentage of RSLs building to SBD to 100% - this would be a massive increase in costs. The way we have done it, it should go from a very small percentage to say 70% before it jumps to 100%. If in future I make it a requirement, it will seem to cost the Treasury a very small amount" (Housing Corporation).

Summary:

The incentives of building housing to SBD standard are largely associated with the funding provided by the Housing Corporation. RSLs who receive funding from the Housing Corporation must fulfil certain criteria (set out in the SDS) when building residential housing. Gaining SBD certification is not essential, it is only a recommended item on the SDS. However, RSLs who build over and above essential criteria to include recommended criteria, will be looked upon favourably in terms of future funding from the Housing Corporation. This is referred to as 'enhanced quality assessments'. From the 1st April 2001 the Housing Corporation introduced a second incentive for RSLs to build to SBD standard – the Supplementary Multiplier for Sustainability. This allows RSLs who build to SBD standard to achieve a 1% enhancement. RSLs taking part in the interviews also felt that customer satisfaction and the benefits of receiving assistance and advice from ALOs when applying for the SBD scheme were incentives in attempting to achieve the SBD standard. Whilst there have been extensive moves towards increasing the incentives for RSLs to build to SBD standard, it should be borne in mind that a) not all housing built by RSLs is funded by the Housing Corporation, and b) not all housing is owned or built by RSLs. As a means of illustration, one RSL stated that only one third of their housing stock is funded by the Housing Corporation and that any housing which is

not funded by public subsidy would not be built to SBD standard. Whilst the incentives offered by the Housing Corporation should be applauded, incentives for the private sector must not be forgotten.

Chapter Six – Part Three
The Private Sector

The only potential incentives for private developers to build their housing to the SBD standard are an increase in buyer appeal and an increase in profits following the sale of the property. As a means of establishing whether these incentives could be used to 'sell' the scheme to private developers two hypotheses had to be tested. First, that the crime reduction benefits of SBD outweigh the additional costs of building to this standard. Second, that house buyers are attracted to homes which offer enhanced security and are willing to pay an additional cost for these benefits.

Do the crime reduction benefits of SBD outweigh the additional costs of building to this standard?

Methodology:

In an attempt to establish whether building to SBD standard produces benefits over and above the additional costs, a cost-benefit analysis was undertaken. The additional costs of building to SBD were difficult to establish. An initial trawl of the fifteen RSLs and one local authority who owned the properties included within this thesis resulted in responses from five RSLs, two architects, one quantity surveyor and one local authority. A follow up survey produced responses from an additional RSL, more detailed information from the original quantity surveyor, one architect and an additional local authority. Therefore, the additional costs of building to SBD standard are based upon the data provided by six RSLs, one quantity surveyor, three architects and two local authorities. (The cost information provided by respondents is available at appendices 4 and 5).

The costs of crime figures utilised for this study were those published by Brand and Price (2000). These include the costs incurred in anticipation of victimisation (i.e. expenditure on security measures), as a consequence of victimisation (i.e. goods stolen, emotional costs, physical costs and costs to the health service) and the costs incurred by society in responding to a crime (criminal justice system). Brand and Price (2000) estimate the average cost of a burglary in a dwelling offence to be £2,300. Other cost estimates include:

- Common assault £540
- Robbery/mugging £4,700

- Theft £600
- Theft (not vehicle) £340
- Vehicle Theft £890
- Criminal Damage £510

The costs of crime per household were calculated by multiplying the number of crimes experienced within a one year period (1st January 1999 to 31st December 1999) by the estimated cost for that crime and dividing this by the number of households within the sample area. The rationale for selecting a one year period relates to the different life-spans of each matched pair. As was discussed within earlier chapters, although each matched pair of SBD and Non-SBD properties covered the same period of time, the whole sample of 25 pairs, covered different lengths of time. For this reason, crimes taking place within this one year period were selected.

Results:

Information gathered from RSLs, quantity surveyors, architects and local authorities revealed that the mean additional cost of building to SBD standard was £1000, with a median cost of £795. However, this one off investment includes costs for a variety of measures such as road layout, fencing and foliage as well as the more obvious locks and bolts which although paid for at the development stage, will continue to reduce crime for a number a years. To transform this cost into an annual estimate involved dividing the one off additional cost by the number of years for which that property would continue to protect against crime. The difficulty with calculating this figure being that although the layout of the estate may prevent crime for decades, features such as doors and windows have a shorter crime prevention life span before upgrading is required. Taking a crude estimate of 20 years, if the total additional cost (£1000 mean or £795 median) is divided by 20 to produce a yearly additional cost for a SBD house, this figure would be £39.75 (median) or £49.97 (mean). It is estimated using these calculations that the saving achieved through prevented burglaries in building to the SBD standard would be £27.44 per year. In subtracting the yearly cost of building to SBD from this saving, the resulting figure is a negative (-£12.31 or -£22.53) suggesting that in this instance (using burglary alone) the benefits of reduced levels of crime do not outweigh the additional costs of building to the SBD standard. The same result is achieved when considering the prevention of vehicle theft (-£28.22 or -£38.44). However, using total crime as opposed to single crime categories revealed that building to SBD would save £5.97 per year (using the median cost

quoted above), but would not break even if the mean additional costs were used in this calculation (-£4.27 per year). Table 82 below displays the costs for burglary, vehicle theft and total crime within the sample.

Table 82: Annual costs of Crime per Household

Offence Category	Cost of crime for each SBD home	Cost of crime for each Non-SBD Home	Difference between costs
Burglary	£87.12	£114.56	£27.44
Vehicle Theft	£24.27	£35.80	£11.53
All crime	£375.75	£421.45	£45.70

Summary:

Several complexities of cost-benefit analyses lead the author to urge caution regarding these figures. Firstly, economists would suggest that the additional costs of building to SBD have not taken account of discounting. Treasury guidelines (HM Treasury, 2003) state that costs should be discounted to account for social time preference and risk, at a rate of 3.5% a year. This means that spending £1000 today costs 3.5% more to society than spending £1000 in a year's time. However, if the analysis is to take account of the changing costs of building to SBD, it must take account of the changing costs of crime. As evermore expensive technological devices become commonplace in the household, the average cost of a burglary is likely to rise dramatically over the next two decades. A short trawl of British Crime Survey data reveal that the mean cost of items stolen in burglary offences did increase from £1,181 in 1996 to £1,416 in 1998. However, this figure fell to £1,273 in 2000, suggesting that projecting the average cost of a burglary over the next 20 years may not be a straightforward task. Furthermore, findings discussed within Chapter three revealed that the crime reduction performance of SBD is increasing year on year when compared with matched Non-SBD estates. For this reason, the savings gained by building to SBD in terms of reduced levels of crime are likely to increase greatly over the next 20 years. For a more comprehensive cost-benefit analysis these and other factors would need to be taken into account.The most prudent conclusion is that, currently, SBD costs are finely balanced with the anticipated costs of crime prevented. However, enhancements in the scheme's crime reduction benefits as well advancements in security measures should improve this position in the future.

Are house buyers attracted to properties which offer enhanced security? If so, are they willing to pay an additional cost for these benefits?

Aims:

The data collection phase of this thesis involved many discussions with police ALOs and Crime Prevention Officers whose task it is to sell the SBD scheme to the public. Anecdotal evidence collected throughout this period suggested that the lack of enthusiasm for the SBD within the private sector was due to the views of many private developers who felt that a) house buyers would equate the mention of high security with high crime areas and thus be 'turned off' purchasing a SBD property and b) house buyers would be unwilling to pay an additional premium for properties with higher levels of security, therefore any additional costs would impact directly upon the developer's profit margins. Without evidence to support the contrary, there was little that crime reduction practitioners could do to convince them otherwise.

Methodology:

As a means of testing the hypothesis that house buyers are attracted to secure homes and are willing to pay for these benefits, a national survey of house buyers was conducted. This phase of the thesis involved collaboration between two national estate agencies (Halifax Property Services and Royal and Sun Alliance Property Services) and West Yorkshire Police and took place in 2001. West Yorkshire Police contributed towards the printing costs of the questionnaire and the two major national estate agents agreed to distribute the questionnaire throughout their branches. The questionnaires were distributed throughout England and Wales to the local estate agency offices and were completed by customers who were in the process of purchasing properties from the agency, at the agency premises. The questionnaire was designed with self-completion in mind, therefore the majority of questions were closed-ended and the numbers of questions were limited to enhance its appeal. The aim of the questionnaire was to establish whether enhanced security would appeal to house buyers as well as ascertaining whether they were willing to pay an additional premium for these benefits, or whether such features were expected to be included within the original purchase cost. (A copy of the questionnaire can be found at appendix 8).

In identifying which particular features of a property were important to house buyers, the two estate agents were asked to select six features (excluding security) which they felt impacted upon a home purchase decision. These were: fitted carpets, turf to front and rear gardens, built-in kitchen appliances, a garage, a separate downstairs toilet and en-suite facilities in the

master bedroom. To these six features was added the additional feature a 'secure environment'. A 'secure environment' was not defined in the questionnaire for a number of reasons:

1. It is a contextual concept and, like the criteria for the SBD award scheme, is site specific.
2. A definition that was applicable to every situation would either be extremely complex or banal and little different to the lay interpretation of 'secure environment'.
3. It was always intended that the questionnaire would be relatively simple to complete, neither time-consuming nor overly complex.

The utilisation of the term 'secure environment' was an attempt to broaden the focus of security from bolts and bars to something approximating the SBD scheme features. The author accepts that the use of 'secure environment' as opposed to a more explicit term has trade-offs and may have resulted in a difference in interpretation amongst respondents. It is recognised that a secure environment to one respondent may translate to the presence of a burglar alarm, security lighting and low levels of crime, whilst another may view a secure environment as the sight of families playing together. Whilst recognising this weakness, the author consulted extensively with both West Yorkshire Police and the estate agents involved, who both felt that this term was appropriate.

In an attempt to avoid influencing respondents' decision making process, the document was designed to appear as a University of Huddersfield research document, with no mention of West Yorkshire Police and their role in the survey. Any mention of police involvement may have influenced respondents towards the security related responses. Respondents were asked a number of questions relating to their socio-demographic and house buying status. These included; whether they were first-time buyers, whether they were considering buying a newly built property, their current postal address area and the postal address area where they wished to live, gender, age and the composition of the family group moving into the new home. Respondents were asked to rank the seven features, previously described, in order of preference, one being the most important and seven the least in terms of the house purchase decision. They were then asked to select which of those seven features they would expect to be included in the purchase price of their home at no additional cost. Finally, respondents were asked if a house was described as having 'high standards of security' would this a) influence them to buy the house, b) influence them not to buy it, or c) neither.

Results:

Respondents:

Despite the commitment of the two national estate agencies, the number of completed questionnaires (n=233) was much lower than anticipated, a response rate of 9% of those distributed to the agencies. However, the response was still sufficient for most of the prospective analyses. Although the questionnaires were distributed on a national basis the responses were markedly skewed geographically. The level of response from the East Midlands, West Midlands, North West England and North East England were much higher than in the rest of the UK. The gender of respondents was fairly evenly distributed between males and females. 41% of respondents were male and 56% female (3% of respondents failed to answer this particular question). The responses were reasonably well distributed across the age groups. The group with the greatest number of responses were those aged 25-34 years (37%) and the group with the least number were those aged 45 –55 years (7%). The vast majority of respondents were moving to a new home in which two adults would be living (69%). 25% of respondents were moving into a home in which just one adult would be residing. 54% of respondents were moving into a home in which one or more children would be residing.

When Purchasing a New Home which Features are most important to you?

Respondents were asked to rank the seven features (fitted carpets, turf to the front and rear gardens, built-in kitchen appliances, a garage, a separate downstairs toilet, en-suite facilities in the master bedroom and a secure environment) according to their importance in influencing their decision to purchase a home (one being the most important and seven the least). The responses to this question were analysed in two separate ways. Firstly, in terms of first preferences which is a measure of their outright attractiveness to respondents. Thus, if a particular feature had 53 respondents giving it a first preference the score for that feature would be 53. The highest score indicating the feature most attractive to the respondents. Additionally, they were examined in terms of their overall attractiveness to the respondents by analysing the sum of all their preferences. Given that the rating for the most preferred feature was one and the least preferred was seven, the total score for a particular feature was the sum of the scores across all respondents. Thus, given *n* respondents, if all rated a particular feature as 3 the score for that feature would be 3*n*. The lowest overall score would indicate the feature with the greatest overall attractiveness to respondents.

The sub-categories with the least number of respondents and therefore where the results are, arguably, less persuasive are: the age group 45-54 years, the sub-categories moving into and out of high crime areas, the single gender sub-categories and the single gender with children sub-categories. Table 83 displays the results of the analysis in respect of first preferences indicated by the respondents. The most attractive feature for each category of respondent is highlighted. It can be seen that a secure environment is the most favoured option in almost all sub-categories – the exceptions being 45-54 years, moving from a high crime area, single females with children, single males with children and single males.

Table 83: Respondents' First Preference

Category of Respondent	Fitted Carpets	Turf to the front and rear	Secure Environment	Built-in kitchen appliances	Garage	Separate downstairs toilet	En-suite to master bedroom
Overall	59	28	**85***	32	39	11	15
Male	27	10	**31***	15	10	4	5
Female	31	18	**51***	22	22	7	10
First-time buyer	19	9	**32***	12	13	4	2
Not-first time buyer	40	19	**53***	20	26	6	13
Consider new build	20	10	**31***	11	7	2	6
Not consider new build	38	18	**53***	21	30	8	9
Under 25 years	8	5	**17***	6	5	2	2
25-34 years	21	11	**34***	11	18	4	4
35-44 years	8	2	**11**	5	4	8	3
45-54 years	6	2	5	3	**10**	1	1
55 + years	16	8	**18**	7	11	4	5
Moving to high crime area	4	0	**6**	0	0	2	3
Moving from high	**6**	5	5	2	1	1	1

crime area							
All with children	38	14	**42***	13	22	8	8
Single females + children	4	2	2	3	1	1	2
Single females	8	4	**9**	6	3	2	2
Single males + children	1	1	1	0	0	0	0
Single males	7	6	**7**	2	5	1	6

* Denotes statistical significance at the level of 0.05 (using Chi-Square).
Bold Type indicates highest score.

Table 84 displays the results of the analysis in respect of overall scores indicated by the respondents. Again the most attractive feature for each category is highlighted and it can be seen that secure environment is the most favoured option in most sub-categories. The exceptions being moving from a high crime area, single females with children, single females, single males with children and single males.

Table 84: Respondents' Overall Preference

Category of Respondent	Fitted Carpets	Turf to the front and rear	Secure Environment	Built-in kitchen appliances	Garage	Separate downstairs toilet	En-suite to master bedroom
Overall	784	981	**636***	743	782	1056	1090
Male	319	413	**270***	333	330	452	447
Female	448	540	**352***	399	434	582	612
First-time buyer	269	325	**213***	239	275	365	399
Not-first time buyer	508	651	**427***	502	501	690	688
Consider new build	253	315	**189***	242	242	339	327
Not consider new build	508	646	**433***	486	524	691	737
Under 25 years	132	169	**97***	121	144	204	198
25-34	287	351	**226***	275	279	390	388

years							
35-44 years	80	118	**68**	82	95	114	116
45-54 years	52	79	**48**	60	67	81	83
55 + years	229	258	**195**	210	196	262	298
Moving to high crime area	52	44	**21**	31	40	50	52
Moving from high crime area	**55**	75	63	71	83	96	81
All with children	410	535	**371***	419	426	558	596
Single females + children	**28**	52	49	31	51	58	65
Single females	**73**	110	83	81	105	137	149
Single males + children	11	13	14	**8**	20	19	23
Single males	**81**	100	**81**	91	86	119	118

* Denotes statistical significance at the level of 0.05 (using Chi-Square).
Bold Type indicates lowest (and therefore most preferable) score.

Overall, 37% of the sample placed secure environment as their top priority, followed by fitted carpets (25%) and having a garage (17%). The features least likely to be considered a top priority were downstairs toilet (5%), en-suite facilities to the master bedroom (6%) and turf on front and rear gardens (12%). The following analysis compares the importance of secure environment between the socio-demographic variables of respondents.

Gender:

There were very few gender differences in choice of top priority. Male respondents placed secure environment as their top priority (33%) as did female respondents (39%).

Age Group:

The analysis of age groups revealed that for all but the 45-54 year old age group, secure environment was the top priority when buying a new home. 43% of under-25s felt that it was

the most important feature when considering the purchase of a new property, as did 40% of 25-34 year olds and 38% of 35-44 year olds. Respondents in the 45-54 age group felt that fitted carpets (35%) were more important than a secure environment (29%). Secure environment was the most important feature for those in the 55+ age group with 30% selecting this feature as their top priority (however, this was only 3% more than those were who placed fitted carpets as the top priority).

First Time Buyers:

Both first time buyers and non-first time buyers placed secure environment as their top priority. 40% of first time buyers felt that it was the most important feature when considering the purchase of a new home and 35% of non-first time buyers felt it the most important feature. First time buyers appear to place a higher priority upon security than respondents who have owned properties before.

Purchasers of Newly-Built Homes:

Both those who would consider buying a new build house and those who would not were most likely to place secure environment as their top priority. 44% of those who would consider a new build felt that secure environment was the most important feature when buying a new home. 34% of those who would not consider a new home felt that it was the most important feature.

High Crime Areas:

When the movement to and from high crime areas was analysed a similar pattern emerged. Those moving to a high crime area placed secure environment as their top priority, however, those moving from a high crime area placed fitted carpets as their top priority. It should, however, be stressed that the numbers of respondents included in this analysis was very small.

Do House Buyers expect these features to be included within the purchase price of their home?

When asked whether they expected certain features to be included in the purchase price of a new home at no extra cost, the following results were revealed:

- 51% expected fitted carpets to be included at no extra cost;
- 49% expected built in kitchen appliances to be included at no extra cost;

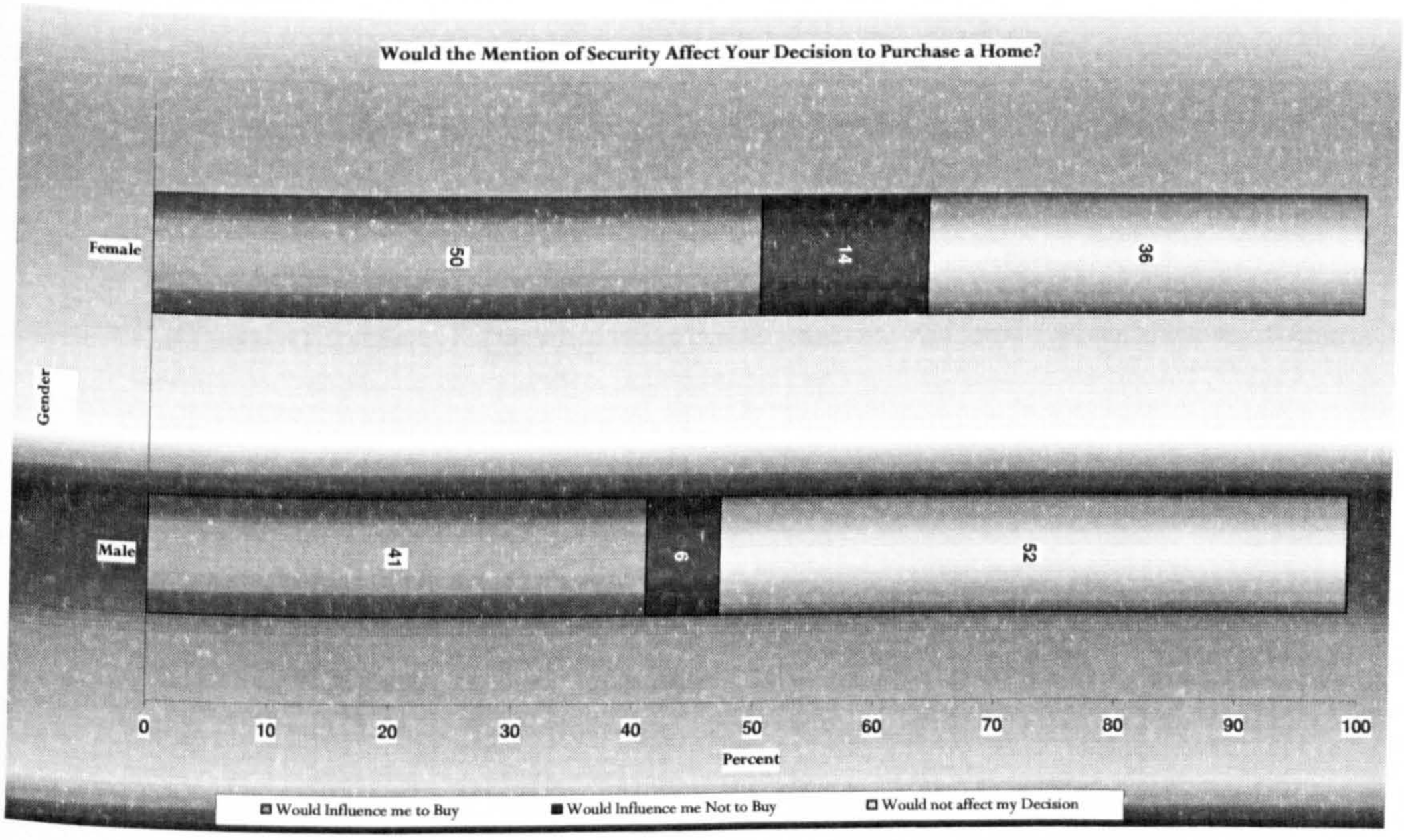
- 45% expected turf to the front and rear gardens to be included at no extra cost;
- 42% expected a garage to be included at no extra cost;
- **37% expected a secure environment to be included at no extra cost;**
- 25% expected a downstairs toilet to be included at no extra cost;
- 21% expected an en-suite to the master bedroom to be included at no extra cost.

Although having a secure environment is considered to be the most important factor when buying a new home, a low percentage (as compared to other features) **expect** it to be included in their purchase at no extra cost. Of all features listed in the survey, the provision of a secure environment at no extra cost was the only feature to show a gender difference; only 28% of male respondents expected this compared to 43% of females. Those in the under-25 age category were most likely to expect a secure environment at no extra cost (45%); those in the 25-34 age group (40%) and 35-44 age group (41%) were also likely to expect a secure environment. Those in the older age categories were least likely to expect a secure environment for no extra cost when purchasing a new home. Only 29% of 45-54 year olds had such an expectation, and only 27% of those 55+. There appeared to be very little difference between those buying their first home (39%) and those who are not (36%) in terms of whether they expect a secure environment for no extra cost. This suggests that first time buyers have a slightly higher expectation of security in their home than purchasers who have owned a home before. Those considering buying a new build property are less likely to expect a secure environment (34%) than those looking at older homes (38%). The data suggest that those looking at older homes are more likely to expect all features at no extra cost (with the exception of en-suite facilities in the master bedroom). This may relate more to a general expectation of facilities in older homes as opposed to a relationship specific to security.

Does Enhanced Security influence a purchaser's decision to buy?

Respondents were asked whether a house being described as 'having high standards of security' would affect their decision when thinking about buying it. 47% said that it would influence them to buy, 10% said that it would influence them not to buy and 42% said that it would not affect their decision. Figure 38 displays the male/female differences in responses. 50% of female and 41% of male respondents felt that the mention of security would influence them to buy a house. Interestingly, a higher proportion of females than males also felt that the mention of security would influence them not to buy a home.

Figure 38: Would the Mention of Security affect your Decision to Purchase a Property?



These data suggest that for females, security has a strong influence upon their perception of a home, whether this creates a negative or positive opinion appears to vary. However, for the vast majority, this is a positive influence. For male respondents, security does not appear to have as strong an influence. 52% of males suggested that security would not affect their decision. Only 36% of females felt this way. The mention of security would have a positive affect on the decision of all age groups with the exception of those aged 55+ for whom the largest proportion felt that this would not affect their decision. For first time buyers, the mention of security would be most likely to influence them to purchase a home (49%). This finding was also evident for non-first time buyers with 46% suggesting that the mention of security would influence them to buy a home. There was very little difference in the findings between those who are buying a first home and those who have owned a home before. Those considering a new build home were most likely to feel that the mention of security would have a positive affect upon their decision (49%). The finding was the same for those not considering new build homes (46%). Although a positive finding, the results also suggest that a larger proportion of those looking at new build properties would find that the mention of security influenced them not to buy the house (14%), than those looking at older homes (9%).

Summary:

Although the number of respondents was limited, this research challenges the view that there is no demand for enhanced security and that homes advertised as such will not attract buyers. The findings from this research suggest that a secure environment is the most important factor (excluding location) in determining whether a person will purchase a particular property. In addition to this finding, a secure environment was also one of the factors least expected to be provided at no extra cost, suggesting that house-buyers are willing to pay an additional premium for enhanced security. It is hoped that these findings have proved the hypotheses that house buyers are not only attracted to secure homes, but are also willing to pay for these additional benefits, thus supporting crime reduction practitioners in attempting to increase the security demanded amongst privately owned homes.

Chapter Seven
Conclusions

Chapter Seven – Part One
Summary of Findings

The last two decades have seen increasing recognition of the contribution which the design of products and services can make to crime reduction. This has nowhere been more true than in the design of buildings and the spaces between them. From the initial work of Jacobs (1961) and Newman (1973, 1995) in the USA, and Poyner alone (1983, 1988) and with Webb (1991) in the UK has grown a clearer understanding of the crime-reductive design of homes. Its most significant practical manifestation in the UK has been the SBD award scheme which seeks to encourage developers to design out crime at the planning stage. Set within a current climate in which agencies previously excluded from the crime reduction agenda, as well as those traditionally considered to be responsible for its management, have been tasked with demonstrating their ability to work together to reduce crime and disorder, the SBD scheme has the potential to flourish. It not only approaches the crime problem from a holistic perspective, removing suitable targets, introducing capable guardians and removing likely offenders, it also requires the commitment and the co-operation of a variety of multi-agency partners.

At the commencement of this thesis, the SBD scheme was being offered as a tool for crime reduction partnerships, yet no independent evidence existed to support its claims. Whilst focusing upon addressing this deficit and identifying to what extent the scheme actually reduced crime, disorder and the fear of crime, this thesis was concerned with more than simple evaluation of a crime reduction measure. Its primary focus lies in the production of practical findings which will assist crime reduction practitioners in their task of reducing the impact of crime and the fear of crime. The thesis aims to offer means through which the SBD scheme can be improved, enhanced and subsequently promoted to a wider audience.

The findings revealed throughout this thesis suggest that SBD is currently acting as an effective crime reduction measure, yet there exist weaknesses within its design and application. As well as evaluating SBD in its current position, the thesis offers what is hoped will be an enhancement to the existing scheme. A simple, usable risk assessment checklist to be used by practitioners in identifying properties which will become vulnerable to crime if built (therefore allowing them to challenge planning applications) or in the case of properties already developed, allowing resources to be directed towards those at most risk of future victimisation. Like risk assessment measures designed to predict an individual's vulnerability to future involvement in crime (for

example, Identification, Referral and Tracking), it is hoped that the Burgess checklist will allow early intervention in identifying risk within the built environment.

Whilst it is accepted that conflicting research will always exist, the current debate surrounding the criminogenic features of permeable design has not only diverted practitioner and policy makers' attention from the immediate task of reducing crime, the lack of standardisation for measuring the elusive permeability has meant that claims that a proposed development is 'too permeable' can neither be measured nor tested. The time invested in the collection of local data to establish a development's risk can be reaped in preventing the consumption of practitioner hours expended in debating the indefinable, as well as the prevention of future crime associated with the production of criminogenic housing. Having identified what it is hoped will be the future implementation of the Burgess checklist, the author will reconsider the methods through which it was developed, as well as additional findings revealed throughout this thesis which fall largely into the categories of evaluating, improving and selling the SBD scheme.

Evaluating the Effectiveness of SBD:

Chapter three focused upon the current performance of the SBD scheme and revealed mixed, yet on balance, positive findings. The analysis of police recorded statistics included three levels – estates which had been refurbished to the SBD standard, newly built estates compared with matched pairs which were as similar as possible in terms of age, housing tenure, location and environmental features, and newly built estates which were simply compared with the nearest Non-SBD estate.

The two estates which had been refurbished to SBD saw reductions in the total crime levels of 55%. The crime pattern on the Cherry Court complex appeared straightforward, with immediate reductions in crime following certification to the SBD standard. However, this was not the case for Appleton Gardens/Saville Court where an immediate reduction in the crime rate was followed by a rise in crime to levels higher than those seen prior to the introduction of the scheme. This rise in crime in the year following certification to SBD standard was not maintained, and crime soon fell to (and remained at) levels lower than those revealed pre-certification. Explanations offered for this pattern include a delay in the crime reduction effects of certain measures introduced by the SBD scheme, an increased police presence on the estate (thus an increase in the number of offences actually being detected) and an increased willingness

to report crime to the police due to rejuvenated levels of pride or increased feelings of confidence in the Criminal Justice System.

The refurbished estates involved a simple comparison of pre and post certification crime rates. However, this was not possible for the majority of SBD estates which were newly built to the SBD standard. The analysis of police recorded statistics on newly built SBD estates took place on two levels – detailed and broad based. The detailed level of analysis involved a detailed matching process of 25 SBD and Non-SBD pairs to ensure that as far as possible, the only difference between the pair was that one was SBD and the other was Non-SBD. This detailed matching process was designed to ensure that any difference in the crime rates could be attributed to the SBD status, as opposed to any extraneous variables such as the age of the properties or the tenure of the residents. The results of this analysis revealed that the incidence rates (number of crime events divided by the number of properties) of both total crime and burglary alone were lower within the SBD sample. The total crime rate was 34% higher within the Non-SBD sample and the burglary rate was 71% higher within the Non-SBD sample. Although the differences between the rates within the two samples were not statistically significant at the level of 0.05, they did verge on statistical significance (probabilities of 0.1 for total crime and 0.16 for burglary). The findings were very similar when the analysis of incidence was replaced with prevalence (the proportion of dwellings which were offended against at least once). The results revealed that both total crime and burglary rates were higher within the Non-SBD sample. The total crime rate was 19% higher within the Non-SBD sample, and the burglary rate was 78% higher within the Non-SBD sample. Although these results again did not reveal a statistically significant difference, the difference did verge upon statistical significance (probabilities of 0.06 for total crime and 0.1 for burglary).

In contrast to the detailed level of analysis, the broad-based level of analysis simply compared 50 SBD estates with the nearest 50 Non-SBD estates irrespective of intervening variables such as housing tenure or age of property. The results were much less positive for the SBD scheme and revealed very little difference between crime rates within the SBD and Non-SBD sample. Incidence rates for total crime and burglary were very slightly higher within the SBD sample, however, these differences were not statistically significant (probabilities of 0.43 for total crime and 0.21 for burglary). Prevalence rates showed a very similar pattern, with both total crime and burglary rates slightly higher within the SBD sample. Again these differences were not statistically reliable (0.21 for total crime and 0.12 for burglary).

Although the results of the detailed analysis (the level of analysis with the most rigorous methodology) were positive, overall findings were not as substantial as might have been expected. Further analysis of the burglary rates, paying particular attention to the year in which the SBD estates were built, revealed that SBD estates built prior to 1996 were experiencing much higher levels of burglary than their Non-SBD matched pairs. Yet, the estates built in 1997 and 1998 were experiencing less than half of the burglaries of the Non-SBD sample. As many of the standards of physical security required within SBD dwellings were upgraded in 1999, it is likely that a sample selected from a more recent time period would have revealed much more positive findings than those presented within this thesis.

In an attempt to avoid a focus upon police recorded statistics, a victimisation survey was conducted with a sample of 250 SBD and 250 Non-SBD residents selected from the estates utilised within the detailed analysis. The results supported the findings of the detailed analysis and revealed that burglary, theft of vehicle, damage to motor vehicle and theft from outside the dwelling were higher within the Non-SBD sample. The only differences verging on statistical significance were burglary (0.06) and theft from outside the dwelling (0.08). The crime categories theft from vehicle and theft of pedal cycle were higher within the SBD sample, but these differences were not statically significant. As well as measuring crimes experienced by residents, the survey asked questions relating to fears and concerns about crime and disorder issues. The results revealed that SBD residents felt safer than their Non-SBD counterparts whilst walking alone on the streets as well as at home alone at night. The difference between levels of fear experienced by SBD and Non-SBD residents whilst walking alone on the streets at night was statistically significant (0.05), whilst the differences in levels of fear whilst home alone at night was not (0.18). SBD residents were less worried about becoming a victim of burglary or vehicle crime than their Non-SBD counterparts. However, they were more worried than their Non-SBD counterparts about becoming a victim of mugging or racially motivated attacks. SBD residents were more likely than Non-SBD residents to feel that both noisy neighbours and teenagers hanging around were a very big problem. However, SBD residents were less likely than their Non-SBD counterparts to feel that vandalism or drug use were very big problems on their estate.

The findings from the residents' survey revealed that SBD residents experience lower levels of burglary, theft of vehicle, damage to vehicle and theft from outside the dwelling – supporting

the findings of the detailed analysis. As well as experiencing lower levels of crime, SBD residents appear to feel safer in their home and on the streets surrounding their home than Non-SBD residents and worry less about becoming a victim of property crimes such as burglary and vehicle crime.

Improving the SBD scheme:

Alive to the dangers of luxuriating in the success of a crime reduction measure without seeking to maximise understanding and consequent improvement of performance (and even maintenance of current performance in the face of changing crime threats and opportunities), the thesis proposed to identify current weaknesses within the scheme and to develop its value as a crime reduction tool.

The perceived need to identify the current weaknesses within the SBD scheme, and to offer tools for improving its current status, evolved throughout the thesis and whilst the original aims may have remained the same, the methodology of painstakingly recording the environmental attributes of 1058 homes provided the author with the insight to offer a simpler, more user friendly system for practitioners who would be assessing this number of properties on a regular basis. That is not to say that the final product compromises on quality, rather it is designed with more understanding of the practical issues at stake.

Several immediate methods for improving the scheme were identified. The first lay in the identification that although the SBD scheme was designed with CPTED principles in mind, these had not been exhaustively implemented within the sample selected for this analysis. Analysis of the sample of 1058 SBD and Non-SBD homes revealed that although they experienced lower levels of crime and disorder, they were achieving this in spite of, rather than because of the environmental factors measured in the OERF checklist. When the Burgess Scores which were awarded to each property, based upon the criminogenic environmental factors which it possessed, were aggregated to the level of SBD status, the results revealed that the SBD sample had consistently higher Burgess Scores than the Non-SBD sample. For all crime categories, the mean Burgess Score for the SBD sample was +4.8, for the Non-SBD sample it was -4.4. When burglary alone was analysed, the results revealed again that the SBD sample had a higher Burgess Score (+3.3) than the Non-SBD sample (-4.9). As analysis had validated the Burgess Score as a method for identifying likelihood of victimisation, this finding suggests that the SBD scheme has been swimming against the tide – reducing crime whilst estates

possess a greater presence of the environmental factors which are associated with the risk of victimisation. A more rigorous implementation of its own principles would act to further reduce the crime levels amongst SBD estates. The question of why SBD works is beyond the scope of this thesis, but in the writer's view, the results suggest that high quality security features are implicated.

A second point upon which the scheme could be improved relates to the findings of the *MO* trawl. Whilst SBD clearly reduces opportunities for crime, offenders are still succeeding in offending against SBD properties. Analysis of offenders' *MO* revealed that the same proportion of SBD as Non-SBD properties were broken into through an insecure door or window. Therefore, the issue of improvement is not necessarily to increase crime prevention advice and education. Window and door locks were being jemmied, ground floor windows were being smashed with unsophisticated tools such as bricks, stones and even garden gnomes! Should this be possible? Those who certify products to the standards required by SBD suggest that rigorous testing ensures that doors and windows should not be easily overcome. Are offenders' methods so very different from those employed by the testers? If so, should they seek advice from offender accounts? Are landlords failing to replace broken windows and doors with those of the required standard? Are they failing to install them in the first place? Or are *MO* accounts inaccurate, with residents reluctant to admit that they left the door open for fear of nullifying insurance claims, thus stating that the offender broke in rather than sneaked in? At present, a housing estate awarded SBD status by the local ALO becomes a statistic (one more SBD development) but no longer warrants concern. Although resources are limited, measures should be introduced to allow spot-checks upon SBD developments to ensure that standards are being maintained (if they were implemented in the first place). Without the threat that the award can be revoked, standards, and therefore the overall performance of the scheme, may fade.

A final suggestion for improvement relates to the ability of the SBD scheme to prevent and therefore reduce repeat victimisation. The findings from this thesis suggest that whilst SBD works to modestly reduce rates of initial victimisation, once that crime has occurred SBD properties become more vulnerable than their Non-SBD counterparts. The detailed analysis of 25 SBD and 25 Non-SBD estates revealed that repeat burglary (but not repeat total crime) was higher within the SBD sample. The findings from the Broad-Based analysis revealed higher levels of total crime concentration within the SBD sample (but not repeat burglary). These

findings were further supported (and explained) through the analysis of environmental risk factors which preceded the development of the Burgess Checklist. 1058 properties were assessed using the OERF table to establish which features were present. Environmental factors were cross tabulated with prior victimisation to establish which features were associated with crime prone homes. Although the findings from the analysis of first burglary and first victimisation were comparable, the analysis of repeat victimisation revealed complex findings. The results revealed that 13 environmental factors were associated with the risk of burglary (at the statistical significance level of 0.1) and 17 environmental factors were associated with the risk of victimisation (all crime). These included being located adjacent to open space, being located on a leaky *cul-de-sac* or a through road, being located on an estate with high levels of litter and graffiti and being located within the awareness space of others. However, the findings relating to repeat victimisation were not straightforward. Factors which were associated with single victimisation were either absent when analysing repeat victimisation, or they were statistically significant yet the relationship was in a different direction. For example, there was a statistically significant relationship between a property being victimised and it NOT being overlooked at the front. When multiple victimisation was analysed, the results revealed that there was a statistically significant relationship between victimisation and BEING overlooked at the front.

At first glance these findings appear contradictory; however, once considered in more detail, they make intuitive sense and are supported by other criminological research (Ellingworth *et al,* 1997, Ashton *et al,* 1998). Offenders often select a target based upon external cues such as the proximity of the property to a nearby footpath – 'how easily can I escape unnoticed from this target?' This explains the presence of environmental factors relating to access, occupation and surveillance in the list of significant features associated with first burglary and first victimisation. However, once the offender has burgled the property, they can base their decision to re-offend upon internal cues such as lifestyle and wealth, explaining the absence of external cues within the list of significant features associated with repeatedly victimised homes. These findings have practical implications. The principles of environmental criminology upon which SBD is based appear to be restricted to preventing initial and not repeat victimisation. If SBD is to provide a complete crime reduction package, it must address this deficit by introducing measures to reduce repeat victimisation which extend being the limits of design of the environment. Police forces currently implement measures to prevent repeat victimisation, ensuring that SBD estates

are prioritised in the delivery of repeat victimisation packages would address this weakness within the scheme.

Whilst recognising the effectiveness of the SBD scheme and the potential for improvements upon its current crime reduction performance. The thesis aimed to enhance its value amongst crime reduction practitioners through developing a simple, transparent risk-assessment checklist to identify properties which are vulnerable to victimisation. Although there exists an abundance of literature and practical tools for identifying the risk of offending and victimisation, such tools are relatively scarce when concerned with the vulnerability of the built environment. Although risk-assessment tools do exist within the field of designing out crime, it was felt that sufficient justification existed for the development of an additional measure. The Burgess Checklist was based upon the Burgess method of data analysis. This process was described in Simon (1971) and an application in a criminological context was described in Nuttall *et al.* (1977). Essentially, the score is derived from the difference between the mean rate of crime suffered generally, and the rate of crime suffered by homes with a particular characteristic.

The analysis involved selecting the environmental risk factors which showed statistical significance, subtracting the average risk from the percentage risk associated with each feature, awarding a Burgess Score to each environmental factor and then validating this method by ensuring that the properties with the highest Burgess Scores actually experienced the highest incidence and prevalence of crime. The resulting checklist, presented within this thesis will allow practitioners to score proposed properties and make decisions regarding their suitability, or to score existing houses and offer advice to residents, landlords and ultimately the police regarding the most effective means of directing crime reduction resources.

Selling the SBD scheme:

The benefits of the SBD scheme may appear obvious to those who are tasked with reducing and preventing crime, but for those whose primary concerns are not crime reduction (profits/buyer appeal/aesthetics), how can policy makers increase the appeal of this scheme? Analysis of current incentives to build properties which are designed to reduce crime revealed that social housing providers are currently offered financial incentives by the Housing Corporation. These include Enhanced Quality Assessments as well as the Supplementary Multiplier for Sustainability. Further investigations revealed that for those whose properties are funded through the Housing Corporation, building to SBD is likely to become an essential criterion.

Whilst there have been extensive moves towards increasing the incentives for RSLs to build to the SBD standard, those developing housing for the private sector appear to have been forgotten. Potential incentives for private developers include buyer appeal and increased profits.

In relation to the cost-effectiveness of this crime reduction initiative, the most prudent conclusion is that, currently, SBD costs are finely balanced with the anticipated costs of crime prevented. The reader is, however, reminded that the body of this thesis is based upon the notion of the significant improvability of SBD performance. That being so, any progress has the potential to make the initiative cost-effective, providing capital costs do not increase significantly. As SBD practice becomes more refined, economies will become possible. As new security technologies become more widespread and cheaper, they can reasonably be incorporated into SBD specifications while remaining ahead of the game in cost terms.

Whilst these findings may render it difficult to sell the scheme to private developers on the premise that additional costs will be reaped, the analysis of buyer appeal revealed extremely positive findings. House buyers were asked to rank the seven features: fitted carpets, turf to the front and back gardens, built-in kitchen appliances, en-suite facilities in the master bedroom, a separate downstairs toilet and a secure environment according to their importance in influencing their decision to purchase a property. They were also asked whether or not they would expect these features to be included in the purchase price. The results revealed that not only is secure environment the most important feature when purchasing a property, but house buyers do not expect this benefit to be included at no additional cost. The suggestion that a mention of increased security may be equated in a house buyer's mind with a high crime area, was refuted with the finding that for 47% of respondents, the mention of high levels of security would actually influence them to buy the property - a further 42% stating that it would not affect their decision. These findings suggest that far from being dissuaded by the mention of high security, house buyers view a secure environment as the most important feature when purchasing a property, are content to pay an additional premium for this benefit and would be influenced to buy a property following the mention of enhanced levels of security.

Chapter Eight
Lessons Learned

Chapter Eight – Part One
Implications of Findings

Research presented within this thesis suggests that houses built to SBD standards are less vulnerable to crime. There is however, a need to avoid complacency and to ensure that SBD standards continue to evolve and improve. This thesis was improvement oriented. The desired result being an improved clarity regarding the environmental factors which predict victimisation, a clearer understanding of the enablers and constraints involved in building to the SBD standard and a focus upon ways in which existing standards can be improved.

For those whose job it is to make decisions about planning applications regarding the design and layout of residential housing, there still remains a conflict in both advice and demands. Whilst criminological research warns of the dangers involved in increasing access and permeability, design guidance encourages the walkable neighbourhood (Department of the Environment, Transport and the Regions, 1998). In many instances communication and discussion between planners and ALO/CPDAs has led to a sensible compromise, taking into account both sustainability and the need to encourage pedestrian movement whilst at the same time avoiding unnecessary victimisation risks. What appears to be an initial conflict can result in agencies realising that they are singing from the same hymn sheet and that their ultimate aim is the same. In other instances the contradictory guidance has led to conflict. Section 17 requires CDRPs to "exercise their functions with due regard to...the need to do all that they reasonably can to reduce crime and disorder within their area" (Great Britain, 1998a). Criminological research suggests reducing unnecessary footpaths, minimising access and egress and limiting permeability. Planners are advised to ensure that neighbourhoods are permeable and encourage through movement from pedestrians. Being stuck between a rock and a hard place will not aid the reduction of crime and only wastes the precious time of crime reduction practitioners.

It is hoped that the findings of this thesis will not only clarify the position regarding environmental factors and crime risk, but that they will assist in the future enhancement of the SBD scheme as well as identifying the levers through which to encourage its use. Issues to be addressed include ensuring that SBD standards are implemented in the field, incorporating repeat victimisation packages into its standards and considering the threat to revoke the scheme for developments found failing to maintain the SBD standards. Levers to be used to encourage

its use include its effectiveness as a crime reduction measure as well as its appeal to potential house buyers. Finally, it is hoped that the introduction of the Burgess Checklist as a risk-assessment tool, will allow crime reduction practitioners to standardise the measurement of risk, as well as directing resources towards properties most vulnerable to crime.

Chapter Eight – Part Two
Contributions to the field

Smith (2000) highlighted the appeal of SCP interventions over long-term, resource intensive offender based interventions in the persuasive statement that "It is easy to see that happy families tend not to produce criminals. It is hard to see how public policy can decree that family relationships be constructive and positive" (p.149). It is hoped that this thesis has identified the risk factors associated with crime-prone homes, but more importantly, offered practitioners a tool to address these. Although much has been written on the subject of designing out crime, many studies still fail to inform practitioners of what actually works. As Laycock (2001) highlights, many academics "simply refuse to say what works" (p.21). I sincerely hope that this thesis has avoided this weakness and has provided a clear message as to what has been tested, what has been found and how this can be applied in practice. Although such conjecture leaves itself open to refutation, hiding behind what Laycock (2001) refers to as "impenetrable text" (p.6) is neither valuable nor helpful, and as Popper (1963) suggested, we learn the most from our mistakes.

Chapter Eight – Part Three
Methodological Reflections

One of the frustrations of conducting a piece of work over a five year period is looking back and wishing that you had known then what you know now. I have evolved with this thesis and although I believe that the methodology is sound, there are several areas which could have been improved. Although these have been highlighted at the relevant points throughout the text, they are repeated as a summary below.

The housing estates included within this sample were selected almost five years ago. To ensure that sufficient crime data existed post-development, they were, even at that stage, at least two years old. SBD standards have improved throughout this ensuing period and so too has the experience of ALO/CPDAs, many of who would refuse an estate in 2004 which had been granted SBD status in 1999. For this reason, it is suggested that future research should bring this evaluation up to date, covering SBD properties built between 1998 and 2004.

Another criticism of this thesis may be that it has spread itself too thinly and rather than conducting a more detailed evaluation of the SBD scheme, it has focused upon whether the scheme works, how it can be improved and how it can be marketed to a wider audience. The trade-off between evaluation and improvement was a difficult decision to make and as the thesis progressed so did its aims. Following months of visiting over a thousand residential properties it soon became clear that a simple 'yes it works', or 'no it does not work', would be a wasted opportunity. It became clear that practitioners (who spend almost every day carrying out the tasks which I conducted over a few months) needed a tool to help predict and avoid risk, and that for this tool to be used it must be simple, clear and transparent.

Other methodological weaknesses include the use of the term "secure environment" within the house buyers' survey, which could be open to misinterpretation from different respondents. The restriction of variables in matching the 25 pairs to housing tenure, environment risk factors, age and location, rather than including socio-demographic variables or RSL housing allocation policies also leaves the positive findings open to the criticism that alternative variables may have influenced the differences in crime rates.

Finally, a larger sample would have been preferable for the analysis of recorded crime data as well as the residents' survey. Several environmental factors showed a statistically significant association with victimisation, yet the sample of properties containing those variables were too small to warrant a valid analysis. Again, the limit to 25 SBD and 25 Non-SBD estates for the majority of the research involved a trade-off between quality and quantity. The time taken to conduct individual assessments of over one thousand properties would not have been possible with a larger sample.

Chapter Eight – Part Four
Suggestions for Further Research

As has been referred to, additional research would compliment the findings of this thesis. Suggestions for further research include updating the sample to include houses built post-1998, conducting a more thorough analysis of the crimes committed against SBD homes (as compared to Non-SBD homes) covering temporal differences, an in-depth analysis of the property stolen from SBD and Non-SBD properties, carrying out a more comprehensive cost-effective analysis and developing a standard measure of permeability. The findings revealed within this thesis also indicate that further research into the influence of SBD upon offender decision making, particularly in relation to the influence this has upon selected point of entry and escape, would be beneficial.

Chapter Eight – Part Five
A final word

It feels appropriate to conclude this thesis with a note on what I have learned both personally and professionally from this journey. When I began this thesis almost five years ago, I was a recent graduate working as a Research Assistant at the University of Huddersfield. My youth gave me the passion and enthusiasm for the subject area, as well as the determination to produce a thesis which would be practical, as opposed to a tome gathering dust on a shelf, or worse still – a doorstop in somebody's office (it has been known!). Working alongside esteemed criminologists provided the inspiration and the practical advice needed at the onset of such a task, and most importantly, this period allowed me the time required to conduct the majority of the fieldwork. By Chapter four, I was no longer a recent graduate (three years to write three chapters!) and working as a Senior Consultant for a crime reduction charity, providing training and consultancy support for multi-agency partnerships. This provided an insight into criminology in practice and gave me an understanding of what practitioners want, and more importantly, what they do not want. By Chapter five, I had become a mum. This gave me perspective and was a period in which I re-captured the passion I had felt when I began. I could see why I had started this task and what the implications could be for society. Finally, as I was completing Chapter eight I developed a mystery illness (initial indications suggest Guillan Barre Syndrome). This taught me that my timing has always been lousy! Above all, I have learned that conducting a PhD is an honour and a privilege. The ability to spend five years perfecting one research project, of being solely responsible for every element from knocking on doors and stuffing envelopes, to analysing results and developing conclusions is surely a luxury unlikely to be repeated (I hope!).

Appendix 1
Current SBD Standards

DOORS & LOCKS

BS: PAS 23-1: 1999: General performance requirements for door assemblies. Part 1, single leaf, external door assemblies (presently excluding annexes). An environmental performance standard for door sets, which certifies that a particular door set, is fit for purpose. The security element is basic and not sufficient for police and insurers purposes. The environmental protection element is relevant to the police requirement for PAS 24.

BS: EN 1303: 1998: Building Hardware Cylinder for locks requirements & specified test methods. The minimum standard for lock cylinders for multi-point locking on external or entrance doors to be acceptable to the Association of British Insurers (ABI) and the police service. The effectiveness of the lock depends on the quality of the door, frame and other hardware not covered or tested by this standard and which may fail before the cylinder.

BS 3621: 1998: Specification for thief resistant locks. The minimum standard for locks on external or entrance doors acceptable to the Association of British Insurers (ABI) and the police service. The effectiveness of the lock depends on the quality of the door, frame and other hardware not covered or tested by this standard and which may fail before the lock.

BS: PAS 24-1: 1999: Enhanced security performance requirements for door assemblies. Part 1 single leaf, external door assemblies. An attack test standard for door sets which certifies that a particular door, frame, lock and hardware set has withstood a series of physical tests based on common methods of burglary using defined sets of tools and attack time. This is the minimum police requirement for SBD homes.

LPS 1175: Issue 4, 1998: Specification for testing and classifying the burglary resistance of building components, strong-points and security enclosures. This includes doors for commercial premises and higher risk domestic premises and is acceptable to the ABI and the Police. The standard has categories 1 -6; Cat.1 being simple attack tests and Cat.6 relevant to extreme attack risk. See note under General Security.

WINDOWS

BS:7950: Specification for enhanced security performance of casements, tilt/turn windows for domestic applications. This is the standard required for all SBD windows to meet the security specifications for domestic premises.
The following BS references are fit for purpose standards required to support BS:7950 certification for relevant SBD windows.

BS 4873:1986: Specification for aluminium windows.

BS 7412:1991: Specification for plastic windows made from PVC-U extruded hollow profiles.

BS 644-1:1989: Wood windows. Specification for factory assembled windows - various types.

BWF:TWAS: Timber window accreditation scheme.

BS 6510: 1984: Specification for steel windows, sills, window boards & doors.

LPS 1175: Issue 4, 1998: Specification for testing and classifying the burglary resistance of building components, strong-points and security enclosures. This includes window security for higher risk premises. See under General Security.

GENERAL SECURITY

COMPUTERS: LPS 1214: Issue 2: 1996: Specification for testing and classifying physical protection devices for personal computers and similar equipment.

DATABASE REGISTRATION: LPS 1224: Issue 2, 1999: Requirements for secure database registers. Specifications to ensure the viability and effectiveness of database registers for the recording of property and its owner. It ensures the database is available 24 hours a day and that data is held securely and in accordance with the Data Protection Act.

PROPERTY MARKING: LPS 1225: Issue 3, 1999: Specification for testing and classifying asset marking systems. Specifies requirement for the composition and performance such that, when used according to manufacturers instructions the system may: Enable the marked asset to

be traced to the legal owner via a secure database register linked to the system employed and act as a deterrent by virtue of its existence.

SECURITY OF BUILDINGS: LPS 1175: Issue 4, 1998: Specification for testing and classifying the burglary resistance of building components, strong-points and security enclosures. Caters for any product or system designed to prevent unlawful access to buildings by mechanical means. The standard has categories 1-6, Cat.1 being simple forms of attack and Cat.6 relevant to extreme risks. The attack time and type of tools used increase with the category rating. The criteria were developed to satisfy the security needs of Insurers, police, government or other specifiers.

SMOKE GENERATING DEVICES: BS 7939:1999: Smoke Security Devices - Manufacture, installation & maintenance. Devices which, on intrusion to premises, generate non-toxic smoke to disorientate intruders and prevent or reduce loss.

VEHICLE SECURITY

STOLEN VEHICLE TRACKING: THATCHAM Q Report: An evaluation and test confirming that a stolen vehicle tracking system is accurate, effective, fit for purpose and meets criteria to gain a police response to recover the vehicle following theft.

Note: BS refers to British Standards, LPS refers to Loss Prevention Certification Board Standards. BWF:TWAS refers to the British Woodworking Federation TWA Standards, and Thatcham refers to the Motor Insurance Repair Research Centre

Appendix 2
Questionnaire Utilised in Residents' Survey

"This questionnaire is part of a research project designed to ascertain YOUR opinions on the levels of crime and disorder in this area.

Please could you spare 5 minutes to tell me about YOUR experiences of crime and disorder in this area and YOUR feelings of safety in this house and neighbourhood.

The information that you give me will be treated as completely confidential and will be extremely valuable as part of a project which covers the whole of West Yorkshire.

I hope you will find the time to take part in this survey and would like to thank you In advance for your help and co-operation"

Rachel Armitage (Researcher, University of Huddersfield)

Questionnaire Number _ _ _ _

THE FOLLOWING QUESTIONS RELATE TO HOUSEHOLD DETAILS

Question 1

How many years have you lived at this address ?
(please tick relevant box)

- Less than 1 year ☐
- 1 but less than 2 years ☐
- 2 but less than 5 years ☐
- 5 but less than 10 years ☐
- 10 years or more ☐

Question 2

How many male adults live in this household ?
(16 or over) ☐

Question 3

How many female adults live in this household ?
(16 or over) ☐

Question 4

How many children under 18 live in this household ☐

The following questions concern things that may have happened over the 13-14 month period since March 1998 in which you may have been the victim of a crime or offence

Question 5

During the last 13-14 months, have you or anyone else in your household had their car, van, motorcycle, or other motor vehicle stolen or driven away without permission ?

Yes ☐
No ☐

Question 6

(If Yes) How many times has it happened ? ☐

Question 7

During this time period, has anyone ever made an attempt to steal a motor vehicle belonging to you or anyone else in your household ?

Yes ☐
No ☐

Question 8

(If Yes) How many times has this happened ☐

Question 9

During the last 13-14 months have you or anyone else in your household had anything stolen off their vehicle or out of it(e.g. parts of the vehicle, personal possessions) ?

Yes ☐
No ☐

Question 10

(If yes) How many times has this happened ☐

Question 11

During this time period, has anyone ever made an attempt to steal from a motor vehicle belonging to you or anyone else in your household ?

Yes ☐
No ☐

Question 12

(If Yes) How many times has this happened ☐

Question 13

During the last 13-14 months have you or anyone else in your household had their vehicle tampered with or damaged by vandals or people out to steal ?

Yes ☐
No ☐

Question 14

(If Yes) How many times has this happened ? ☐

Question 15

During this time period, has anyone made an attempt to damage or tamper with a vehicle belonging to you or anyone else in your household ?

Yes ☐
No ☐

Question 16

(If Yes) How many times has this happened ? ☐

Question 17

During the last 13-14 months have you or anyone else in your household had a bicycle stolen ?

Yes ☐
No ☐

Question 18

(If Yes) How many times has this happened ?

Question 19

During this time period, has anyone made an attempt to steal a bicycle that belonged to you or somebody else in your household ?

Yes ☐

No ☐

Question 20

(If Yes) How many times has this happened ?

Question 21

During the last 13-14 months has anyone broken into your house/flat without permission and stolen, or tried to steal anything ?

Yes ☐

No ☐

Question 22

(If Yes) How many times has this happened ?

Question 23

During the same time period, has anyone made an attempt to break into your house/flat

Yes ☐

No ☐

Question 24

(If Yes) How many times has this happened ?

Question 25

During the last 13-14 months has anything that belonged to someone in your household been stolen from OUTSIDE the house/flat e.g. from garage, shed or garden ?
Do *not include milk bottle theft*

Yes ☐
No ☐

Question 26

(If Yes) How many times has this happened ? ☐

Question 27

During the same time period, has anyone made an attempt to steal something from OUTSIDE your house/flat ?

Yes ☐
No ☐

Question 28

(If Yes) How many times has this happened ? ☐

THE FOLLOWING QUESTIONS RELATE TO YOUR FEAR OF CRIME

Question 29

How safe do you feel walking in this area after dark ?

(please tick relevant box)

Very safe ☐
Fairly safe ☐
A bit unsafe ☐
Very unsafe ☐

Question 30

How safe do you feel when you are alone in your home at night ?
(please tick relevant box)

- Very safe ☐
- Fairly safe ☐
- A bit unsafe ☐
- Very unsafe ☐

Most of us worry at some time or other about being a victim of crime. Using one of the following phrases, could you let me know how worried you are about certain crimes

Question 31

How worried are you about having your home broken into and something stolen ?

(please tick relevant box)

- Very worried ☐
- Fairly worried ☐
- Not very worried ☐
- Not at all worried ☐

Question 32

How worried are you about having your car stolen ?

(please tick relevant box)

- Very worried ☐
- Fairly worried ☐
- Not very worried ☐
- Not at all worried ☐
- (Not applicable) ☐

Question 33

How worried are you about having things stolen from your car ?

(please tick relevant box)

- Very worried ☐
- Fairly worried ☐
- Not very worried ☐
- Not at all worried ☐
- (Not applicable) ☐

Question 34

How worried are you about being mugged or robbed ?

(please tick relevant box)

- Very worried ☐
- Fairly worried ☐
- Not very worried ☐
- Not at all worried ☐

Question 35

How worried are you about being subject to physical attack because of your skin colour ethnic origin or religion ?

(please tick relevant box)

- Very worried ☐
- Fairly worried ☐
- Not very worried ☐
- Not at all worried ☐

THE FOLLOWING QUESTIONS RELATE TO YOUR PERCEPTIONS OF CRIME AND DISORDER WITHIN THIS AREA

How much of a problem do you feel that the following crimes are in this area?

Question 36

How much of a problem are noisy neighbours or loud parties ?

(please tick relevant box)

- Very big problem ☐
- Fairly big problem ☐
- Not a very big problem ☐
- Not a problem at all ☐

Question 37

How much of a problem are teenagers hanging around the street ?

(please tick relevant box)

- Very big problem ☐
- Fairly big problem ☐
- Not a very big problem ☐
- Not a problem at all ☐

Question 38

How much of a problem is vandalism, graffiti and deliberate damage to property ?

(please tick relevant box)

- Very big problem ☐
- Fairly big problem ☐
- Not a very big problem ☐
- Not a problem at all ☐

Question 39

How much of a problem are racially motivated attacks ?

(please tick relevant box)

- Very big problem ☐
- Fairly big problem ☐
- Not a very big problem ☐
- Not a problem at all ☐

Question 40

How much of a problem are people using or dealing in drugs ?

(please tick relevant box)

- Very big problem ☐
- Fairly big problem ☐
- Not a very big problem ☐
- Not a problem at all ☐

THE FOLLOWING QUESTIONS RELATE TO YOUR FEELINGS OF SAFETY IN THIS HOUSE AND NEIGHBOURHOOD

Question 41

Do you feel safer in the <u>house</u> in which you are now living, compared to the previous Household in which you lived ?

- Yes ☐
- No ☐
- The Same ☐

Question 42

Do you feel safer in the <u>neighbourhood</u> in which you are now living, compared to the previous neighbourhood in which you lived ?
(e.g. walking to and from the shops,

- Yes ☐
- No ☐
- ☐

Appendix 3
RSL Interview Schedule

Name:

Company:

Position:

Qu. 1: What is your company's policy regarding SBD housing?

Qu. 2: What would you consider to be the incentives of building residential housing to the SBD standard?

Qu. 3: What would you consider to be the disincentives of building residential housing to the SBD standard?

Qu. 4: Have you experienced any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

If so, could you please describe.

Qu. 5: What are the additional costs of building residential housing to the SBD standard?

Appendix 4
Interviews with RSLs

Company:

Yorkshire Metropolitan Housing association

Position:

Development Manager

Qu. 1: What is your company's policy regarding SBD housing?

In general terms we have adopted SBD specification and sought to achieve certification on new build schemes. We support the scheme and note the changing requirements of the housing corporation.

Qu. 2: What would you consider to be the incentives of building residential housing to the SBD standard?

Our customers welcome the improved levels of safety and security that they feel as a result of SBD – external layout, secure gardens/play areas for children and home security.

Qu. 3: What would you consider to be the disincentives of building residential housing to SBD standard?

There are none obvious at this time.

Qu. 4: Have you experienced any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

Yes

If so, could you please describe?

The NHBC specification is far lower than the Housing Corporation's SDS. Private developers appear less aware of the requirements and can prove inflexible or require additional costs.

Qu. 5: What are the additional costs of building residential housing to the SBD?

It is very difficult to quantify this but the extra staff and liaison time is significant. On the specificational side many SBD requirements are now with the Housing Corporation's SDS so it could be argued that they are not "additional". At a push these could vary between £500 - £2,000 per home – depending on existing specification for doors, windows, fencing, locks and alarms.

Company:

Headrow Housing association

Qu. 1: What is your company's policy regarding SBD housing?

No answer provided.

Qu. 2: What would you consider to be the incentives of building residential housing to the SBD standard?

1) To provide a safe environment for residents.
2) The audit process of having to liase with an ALO is very useful as we value their advice/expertise on design issues.
3) Help development of a sustainable community where people want to stay.

Qu. 3: What would you consider to be the disincentives of building residential housing to the SBD standard?

These are not really disincentives, more like negative issues.

1) I do not think that our clients are aware of what SBD is, therefore they make no demands on us in relation to what they require in terms of the property that they want to live in. The residents tend to go on word of mouth as to whether an area is good to live in. If the area is bad, building to SBD would not make these people change their minds and move in.
2) We do not market SBD.
3) Costs: If SDS standards were taken away, we would not build to SBD standard.
4) We have financial pressures from both ends. The housing corporation have reduced their grants (especially in the north), they are also limiting the level of rent that we can charge (from next year it will be in line with local earnings etc.). This means that we are squeezed from both ends and if we can find places to cut costs we will.
5) We sometimes feel that there is an inconsistency between ALO demands. For example, we were developing an estate which had phase 1 and phase 2. Phase 2 was simply meant to follow on from phase 1, with no re-designing. However, the ALO demands had changed from phase 1 to phase 2, and for phase 2 they were demanding windows in gable ends etc. This makes putting together a design brief very difficult.
6) This year, 2 thirds of our properties will be Non-Housing Corporation funded and 1 third Housing corporation funded. The non-Housing Corporation housing will not be up to SDS standards. Without public subsidy it is difficult to meet SDS standards.
7) We feel that there is a north/south divide. Grants are higher in the south, and they are not as badly affected by the rent re-structuring.
8) Housing corporation subsidies have been reduced. If we build a scheme which fits all SDS requirements, we will be in deficit for about 10 years.

Qu. 4: Have you experienced any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

We have not experienced any problems

If so, could you please describe?

Examples might be refurbishments where the existing layout places constraints on what you can achieve.

Brownfield sites may also place constraints on what you can do in terms of design.

Qu. 5 What are the additional costs of building residential housing to the SBD standard?

What is required of SBD has become part of what we do i.e. our design brief would aim for SBD. We cannot, therefore breakdown the costs

Company:

Jephson Housing association

Position:

Development and Property Asset Manager

Qu. 1: What is your company's policy regarding SBD?

Housing environments should be safe and secure and the need for privacy must also be recognised as an important element in layout design.

Security provision for internal and external environments should be appropriate for scheme location and building types, and should reflect advice obtained from local police ALOs.

In particular, the following items should receive attention:

a) Gates to the rear should be lockable and anti-climb fencing provided.
b) Layouts should avoid through routes and hiding places.
c) Layouts should maximise natural surveillance.
d) Secure opening window lights should be provided.
e) Mortice deadlocks to solid core external doors should be provided.

The need for privacy must be recognised as a most important factor in layout design.

On the public side of the dwelling, no footpath should pass within 4 metres of a living room window without screening in the form of a wall, structure or landscaping. Particular reference should be made to The BRE Housing Handbook and SBD.

SBD certification must be obtained for all schemes. – Early consultation with the Local Crime Prevention Officer is advisable, prior to planning permission being obtained.

Qu. 2: What would you consider to be the incentives of building residential housing to the SBD standard?

RSLs must develop to SBD standards, as it is a requirement of the Housing Corporation's SDS. Failure to comply would be picked up at audit stage by the Housing Corporation which would be a serious break of SDS and could jeopardise development funding to a RSL in the future. Whilst small schemes do not qualify for SBD certificates, RSLs must still develop to the principles within it.

Qu. 3: What would you consider to be the disincentives of building residential housing to the SBD standard?

No answer

Qu. 4: Have you experienced any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

No answer

If so, could you please describe?

Qu. 5: What are the additional costs of building residential housing to SBD standard?

I detail below the extra over costs involved in SBD compliance.

The costs are based upon extra over sums anticipated from general private specification housing, for a dwelling with a net internal floor area of 85 metres square. It also assumes a plot size of 22m x 9m (3-bedroom house).

1. Upgrade 2 No. external doors to PAS 24 standard	£294
2. Increased glazing to ground floor windows to laminated glass	£ 76
3. To provide a spur for future alarm and 2 No. external security lights	£140
4. Increased specification and height to rear fencing	£285
	£795

The above costs are specific to Cemetery Lane, where there has been no requirement for car parking areas to be enclosed.

It should be highlighted that the extra over cost for any scheme is site specific and can only be verified once the comments of the Police ALO have been received.

Company:

PfP Developments Ltd (part of Places for People Group)

Position:

Strategy and Support Manager

Qu. 1: What is your company's policy regarding SBD housing?

We specify that all our developments should be designed with advice from police ALOs and/or Crime Prevention Officers. All schemes should seek SBD certification.

However, we recognise that in some circumstances, full SBD is not possible or practicable, therefore what we say is that even if we cannot get SBD certification on a particular point, all other features required to comply must be provided. For example, there may be over-riding design requirements that mean that access to rear gardens might not be SBD compliant.

This is backed up by particular requirements on (e.g.) entrance doors specifying level of security, as well as general advice on natural surveillance and self-policing layouts.

North British/Places for People Building Standards:

- Site Layout:

All open spaces to be well lit with vandal resistant lighting.
Avoid pedestrian through routes.
Designed to encourage natural surveillance and self-policing.
Create secure private areas around individual dwellings.
Paths generally to follow vehicular access routes.
Avoid hiding places created by dense, tall planting, high walls and hedges, dark corners and recesses.

- Windows:

All glazing below 800mm shall be laminated glass double glazing.

- Doors:

All external doors to be SBD standard to BS1 PAS 24-1: 1999, with all security and performance testing undertaken by a UK Accreditation service test house.
Doors to be minimum 44mm thick and door frames to be metal cramp fixed to structure at minimum 600mm centres.
Hang external doors on 1 ½ pairs of butts with secured pins.
Entrance or front door to be fitted with automatic deadlocking rim lock fitted 1/3 from top of door, and a mortice deadlock and boxed keep kitemarked BS 3621: 1998, fitted 1/3 from bottom of door.
All lock cylinders to BSEN 1303 Grade 3 incorporating anti-drill and pick resistance.
180 degrees security peephole in main entrance door, together with letter plate with internal screen and security chain.
Rear entrance doors to have mortice sash lock and boxed keep to BS 3621: 1998 with key operation to both sides and 2 key operated mortice bolts top and bottom, avoiding construction joints.

- All schemes should be designed to seek SBD certification. Notwithstanding a technical failure to achieve certification, all those other features required by certification shall be provided.
- Fencing shall be equivalent to BS 1722 Part 5, or Part 6, with concrete posts.

- Front gardens to houses and bungalows shall be enclosed with walls or railings and with metal gates.

Qu. 2: What would you consider to be the incentives of building residential housing to the SBD standard?

Going through the process ensures that the designers take full account of the security aspects of the design – this is as important as getting the accreditation. Also, SBD accreditation may be helpful in marketing a site.

Qu. 3: What would you consider to be the disincentives of building residential housing to the SBD standard?

There MAY be some extra cost involved, or an insistence on full compliance may lead to consequential design compromises.

Qu. 4: Have you experienced any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

No

If so, could you please describe?

Qu. 5: What are the additional costs of building residential housing to the SBD standard?

Difficult to be specific, as we specify compliant fittings (windows, doors, locks) anyway. There must be some design cost but I think it is insignificant.

Company:

The Ridings Housing association

Position:

Business Development

Qu. 1: What is your company's policy regarding SBD housing?

Meeting the SBD standards is a requirement in our company's design brief and it is a specification for all new build houses.

Qu. 2: What would you consider to be the incentives of building residential housing to the SBD standard?

The incentive for RSLs to build to SBD is the requirement for safety and security in the Housing Corporation SDS. To obtain grant funding RSLs have to comply with SDS. An essential requirement in SDS is for external doors, frames, fixings and locking to meet SBD standards and a recommended item is for SBD certification to be obtained.

Qu. 3: What would you consider to be the disincentives of building residential housing to the SBD by Design standard?

-

Qu. 4: Have you experienced any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

-

If so, could you please describe?

Qu. 5: What are the additional costs of building residential housing to the SBD standard?

The additional costs in building to SBD standards on average is £750 per property, depending on the floor area.

Company:

Sadeh Lok Housing association

Position:

Development Officer

Qu. 1: What is your company's policy regarding SBD housing?

Security provision for our tenants is of prime importance when considering the design of our new build schemes and we aim to achieve SBD certification.

We confirm to the Housing Corporation when bidding for a grant that our new build schemes will achieve SBD certification at which point it becomes auditable.

Qu. 2: What would you consider to be the incentives of building residential housing to the SBD standard?

-

Qu. 3: What would you consider to be the disincentives of building residential housing to the SBD standard?

-

Qu. 4: Have you experienced any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

-

If so, could you please describe?

Qu. 5: What are the additional costs of building residential housing to the SBD standard?

Additional costs are estimated as being around £600.00

Appendix 5
Cost Information Provided by Architects and Quantity Surveyors

Company:

Brewster Bye Architects

Qu. 1: What are the additional costs of building residential housing to the SBD standard?

In terms of the general layout, SBD would not influence our costs. We would go about it in the same way as a £70,000 3 bedroom private property.

The additional costs would include:

1) Fencing (1800 mm on the boundary but not on the intermediate fencing);
2) PAS 23/34 doors. These cost about £4-500. Non-SBD doors would cost half this price;
3) Windows on ground floor would be laminate, these would cost about 50% more than standard glazing;
4) Gates (with padlocks);
5) Trellising;
6) Natural Surveillance/layout of the estate is no extra cost. We know at the start that we have to fit 116 4 bedroom properties in and there is no question over that, so we just make sure that we design with natural surveillance in mind right from the start;
7) Change in the road colour/texture (no extra cost);
8) I would estimate that it costs approximately £1,000 - £1,500 extra per dwelling.

In terms of our personnel costs, it would be almost no extra cost now that we have been doing it for 5/6 years. A few years ago, when we first started, it might have been something like an extra 2 hours (£50 an hour) for researching what was required etc.

We do not add any money on to the fees for doing a SBD estate.

Company:

Webb, Seeger, Moorhouse Architects

Qu. 1: What are the additional costs of building residential housing to the SBD standard?

The additional cost of building to SBD standard is approximately £2,500 - £3,000.

- Walls & Railings for in-curtilage parking.
- Car parking space.
- 1800mm fencing at rear.
- Alarm.
- Lighting.
- Windows/Doors.

You do not lose out in terms of house density.

Company:

Bradford Metropolitan Borough Council

Qu. 1: What are the additional costs of building residential housing to the SBD standard?

The Interviewee is responsible for the external development of SBD and Non-SBD housing estates, therefore the information is limited to costs such as lighting, parking, landscaping and fencing.

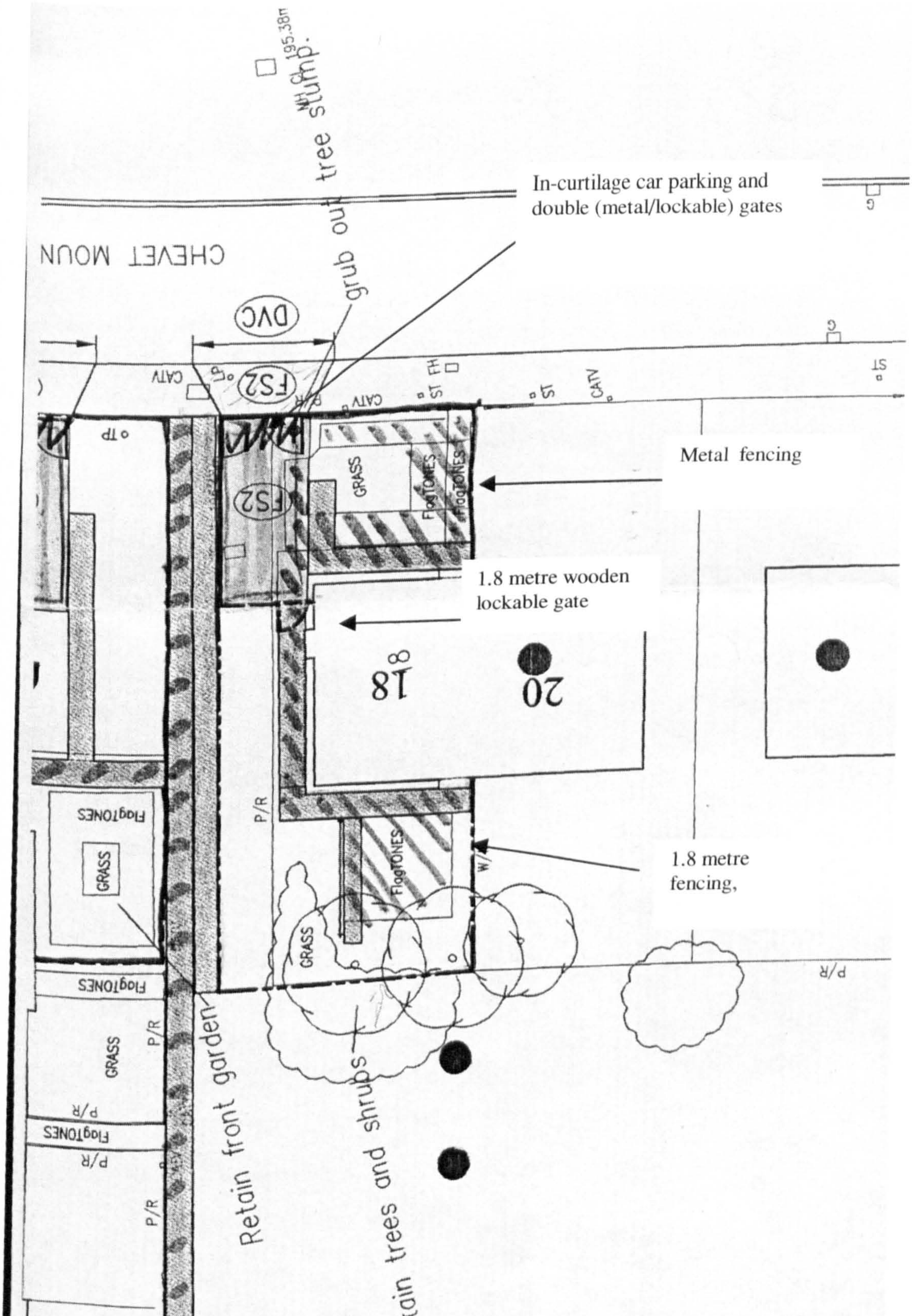
All information relates to the below example of a semi-detached property on a regeneration scheme within Bradford (plot 18).

- 1.8 metre wooden fencing surrounds the rear boundary of the property. 25milimetre gaps between each paling, this has 2 functions, 1) To allow wind through, 2) To allow visibility both in and out, i.e. to avoid the problem of intruders getting in and feeling that they are then free to carry on unobserved. The palings are on the outside to remove the step ladder effect of the horizontal wooden strips. 1.0m fencing (non-SBD option) would cost £26.40 per m2 (this includes 25% & 11% on-costs i.e. this is the total cost including labour etc.). The total cost of 1.8m fencing (SBD option) is £33.38 per m2, **the difference being £6.98 per m2.**
- The 1.8m lockable gate would cost **£53.32 each** (inc. on costs), there would be no gate on a non-SBD property. So this total is an enhanced cost.
- All street lighting would be upgraded on adopted highways. This would include the post and the lantern. This is a difficult cost to attribute solely to SBD, for example, if the Local Authority were upgrading lighting as part of their maintenance program, this is the standard they would upgrade to. However, in this case there were no foreseeable plans to upgrade so the costs were attributable to SBD. The cost per lamppost including column, 150-watt lamp and Yorkshire electricity supply/maintenance would be **£1000 per lamppost**. 1 lamppost is required for every 30 metres of road.
- In-curtilage parking costs approximately £1200 per house. The double gates to the driveway would cost **£228.75**
- Front fencing. This would be metal fencing (durability) and is not strictly a SBD necessity. This would cost **£68.45 (inc. on costs) per m2.**
- The legal costs of closing a footpath on a refurbishment estate is approximately **£1000 per footpath.**
- No extra costs for change in road colour.

A typical property length would be:

- Wooden fencing (1.8m) = 32 metres.
- 1 gate.
- 1 pair of metal gates.
- 19 metres of metal fencing at front.

There are no extra personnel costs involved in building to SBD standard.
There are no reductions in cost involved in building to SBD standard (excluding the benefits of reduced crime etc.)


In-curtilage car parking and double (metal/lockable) gates
Metal fencing
1.8 metre wooden lockable gate
1.8 metre fencing,
Retain front garden
Retain trees and shrubs
CHEVET MOUN
tree stump
grub
DVC
FS2
CATV
ST
FH
TP
GRASS
FLAGSTONES
P/R
W/
18
20

Costings provided by Faithful and Gould Quantity Surveys

Secured by Design Cost Appraisal

(Carried out for The Applied Criminology Group of The University of Huddersfield)

Basis of Appraisal - Phase 3 of Royds Community Association's Refurbishment Programme (Commenced June 1999)

Typical 3 Bed Semi-Detached Property (Type 17)

Secured by Design Elements	Bill Ref.	Notes	Bill Rate	Add Prelims	Sub-Total	Increased Costs	Total Elemental Cost	Estimated Cost of Element if not complying with Secured by Design
External Doors	4/11/A	*Front*	456.47	69.52	525.99	35.35	561.34	300.00
	4/11/A	*Rear*	456.47	69.52	525.99	35.35	561.34	300.00
Upvc Windows	4/7/H		1,427.02	217.34	1,644.36	110.50	1,754.86	1,754.86
PAS 11 Upgrade	4/8/K1		105.17	16.02	121.19	8.14	129.33	-
Sash Jammers	*Fitted to side and rear window opening lights at ground floor*						25.00	-
Burglar Alarm	4/30/A		447.33	68.13	515.46	34.64	550.10	-
Additional PIR Sensor	4/30/B	*Lounge*	30.00	4.57	34.57	2.32	36.89	-
External Lighting	4/29/D	*Front*	41.61	6.34	47.95	3.22	51.17	-
	4/29/D	*Rear*	41.61	6.34	47.95	3.22	51.17	-
					Total		**£ 3,721.19**	**£ 2,354.86**

Typical 3 bed house on Bishopdale Holme, Buttershaw Bradford

General Works Costs		11,825.80
Add: Contract Preliminaries	*15.23%*	1,801.07

Extra-over to comply with Secured by Design **£ 1,366.33**

		13,626.87			**% of Total Costs**				**9.39%**
Add: Increased Costs @ 6.72%	**6.72%**	915.73							
Add: Typical variations		1,376.76							
Total Costs		**£ 15,919.35**							
Notes:									

1) The Scheme included the refurbishment of 393 properties in Buttershaw and Woodside, Bradford. Property types ranged from 1 and 2 Bed Flats to 2, 3 and 4 Bedroom houses either terraced or semi-detached.

2) The above figures exclude any external works.

3) Meter moves have not been included, as the majority of tenants were on token meters. For budget purposes you could include approx. £350 to move an electric or gas meter to the outside of a property.

4) The above costs are based on the 2nd Quarter of 1999 (i.e. June), to bring costs up to current day would suggest adding 3% year on year.

5) As the scheme includes 393 properties (e.g. over 730 external doors were fitted) it will attract a certain amount of bulk discount, this must be considered if dealing with bespoke schemes.

Appendix 6
Interview Schedule – Housing Corporation

Date:

Name:

Company:

Position:

Can you explain the process of applying for Housing Corporation funding?

At present SBD is only a recommended item on your SDS. What are the reasons for it being excluded from the list of Essential Criteria?

Can you give any examples of where achieving the SDS would not be possible?

Are you aware of any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

If so, could you please describe.

Can you explain the decision to alter the SDS?

Are there any plans to change the SDS in the near future?

Would it be feasible for the Housing Corporation to withdraw funding/demand action if RSLs did not maintain standards? (For example, I have seen extremely badly managed estates which are still labelled SBD, who should be responsible for this?)

Several RSLs have mentioned 'financial pressures from both ends' i.e. reduction of grants (especially in the North), plus limits to the level of rent that they can charge. The phrase 'squeezed from both ends' has been used. What is your opinion of this?

Another RSL stated that due to reductions in Housing Corporation funding, when they build a scheme to SDS, this leaves them in deficit for 10 years. What is your view of this comment?

Can you explain the TCI Multiplier?

What, in your view, are the additional costs of building to the SBD standard?

Any other comments:

Appendix 7
Interview with Housing Corporation

Date:

April 2001

Company:

Housing Corporation

Position:

Head of Housing Procurement, Practice and Development – Housing Corporation

At present, SBD is only a recommended item on your SDS. What are the reasons for it being excluded from the list of Essential Criteria?

There are no reasons why SBD cannot be an essential criterion. We have been waiting for SBD to get a good press. For example, some people are very positive, others are very negative. Those managing the scheme will look at a checklist and say 'you've only done 95% of the things on this list so you cannot be awarded SBD' and you get nothing. This is a frustration for many RSLs.

With the emergence of ACPO CPI Ltd., I feel more confident that if a client has a complaint about being turned down for SBD they have someone to appeal to. I feel that SBD is very different now to the position it was in 10 years ago. 10 years ago SBD did not deal with customer satisfaction; ACPO CPI ltd. has gone some way towards this.

One thing ACPO CPI Ltd. have not listened to is my suggestion to introduce a gold, silver and bronze standard where if people do not quite achieve SBD they still achieve something. The problem with having the system whereby you get SBD or nothing is that people who are refused may feel that their hard work has been for nothing and will not try again. The attitude should be: Is this RSL doing as much as they reasonably can? If they are, they should be given some recognition.

Before we make SBD an essential item, there needs to be improvements in things such as a database of SBD houses. What percentage are social? What percentage are private? ACPO CPI Ltd. need to get this information up to date before I can make it an essential criterion. There are no other technical reasons why we cannot make it an essential criterion.

Before the TCI Supplementary multiplier was introduced, if we simply stated that SBD was essential, the treasury's cost would have gone from a very small percentage building to SBD to 100%. This would be a massive increase in costs. The way we have done it i.e. phasing it in with the multiplier, it should go from a very small percentage to say 70%, before it jumps to 100%. If in future I make it a requirement it will seem to cost the treasury a very small amount.

SBD will be a requirement within a couple of years.

Can you give any examples of where achieving the SDS would not be possible?

No

Are you aware of any problems with clashes between different specificational requirements of the Housing Corporation's SDS, the NHBC and the requirements of SBD?

Any reasons given to you by RSLs are excuses not reasons.

One conflict is the fire regulations; these are statutory so if there are any conflicts they will apply.

Would it be feasible for the Housing Corporation to withdraw funding/demand action if RSLs did not maintain standards? (For example, I have seen extremely badly managed estates which are still labelled SBD, who should be responsible for this?)

One problem with this is that everything is done on an impersonal basis these days, for example, rent is paid by giro, therefore, RSLs do not have to go to the estates to collect money and they do not see most of these problems.

Our grant is based upon providing dwellings to live in. If estates are badly managed it will reflect badly upon each RSL in the future. However, SBD isn't meant to cure all of these problems. Management is a subsidiary issue; we cannot do anything about this.

Several RSLs have mentioned 'financial pressures from both ends' i.e. reduction of grants (especially in the North), plus limits to the level of rent that they can charge. The phrase 'squeezed from both ends' has been used. What is your opinion of this?

I have absolutely no sympathy whatsoever. We are talking about providing housing for their tenants who are generally in fear of crime. It needn't cost them anything extra.

Another RSL stated that due to reductions in Housing Corporation funding, when they build a scheme to SDS they are in deficit for 10 years. What is your view of this comment?

Surely a more important issue is the quality of service for their client.

Can you explain the TCI Multiplier?

We introduced a supplementary multiplier under the heading of sustainability. Each RSL could get an extra 1% if they achieve this.

What, in your view, are the additional costs of building to the SBD Standard?

If RSLs bring SBD into the thought process at the beginning, achieving SBD need not cost them anything extra. By investing a little at the start they are saving in the long run. There is a perception that it is going to cost them more money, this may not be the case.

The costs of doors and windows are moving anyway as people demand more quality. 10 years ago the standard was wood, now a client would not be happy unless their windows were UPVC. At year 1 the cost of SBD may be more, but by year 3 the expectations have moved.

Other Comments:

We are auditing (compliance audit) RSLs on their compliance with our SDS. We inform the police as to which RSLs are going to be building in the near future, we then want feedback from the police as to how co-operative each has been and whether or not they have actually contacted them for their advice.

Another failing of some RSLs is that they try to shirk responsibility so in their specifications they say 'will get SBD' and then do nothing to progress this. For example, they ask the contractor to build to SBD, and as the contractor thinks that no one will check, they build the development without consultation from the police ALO. Then when they are asked for certification they go to the police to ask for a certificate and the police say 'no way'. The RSL then moan about how much it costs them to rectify this and to bring the scheme up to the required standards. RSLs have to take responsibility for checking their developments throughout the process. They need to state before plans are finalised that they will be thoroughly checked for SBD compatibility.

We need to be careful that RSLs do not have bad experiences with ALOs. What you do not want is for RSLs to start complaining to each other about their experiences of the SBD process.

Appendix 8
Questionnaire Utilised in House Buyers' Survey

Please complete this questionnaire by placing a tick in the appropriate boxes to reflect your preferences

University of HUDDERSFIELD

Q1 Are you a first time buyer? Yes ☐ No ☐

Q2 Are you considering buying a newly-built house? Yes ☐ No ☐

Q3 Please give your current postal area e.g. LS26. (not full post code) ☐☐☐☐

Q4 Please give the favoured postal area of your new home e.g. LS18 (if known). ☐☐☐☐

Q5 When purchasing your next home, which of the following features would be most important to you? Please rank your preferences by placing a number into each of the boxes below. 1 being the **most** important and 7 being the **least** important.

Fitted carpets ☐
Turf to the front and rear gardens ☐
Secure environment ☐
Built-in appliances in kitchen ☐
Garage ☐
Separate downstairs W.C. ☐
En-suite facilities to the master bedroom ☐

Q6 Which of those features would you expect to be included in the purchase price of your home at no extra cost? Please tick **any** that apply.

Fitted carpets ☐
Turf to front and rear gardens ☐
Secure environment ☐
Built-in appliances in the kitchen ☐
Garage ☐
Separate downstairs W.C. ☐
En-suite facilities to master bedroom ☐

Q7 What would be your initial reaction to a house described as having **'high standards of security'**? E.g. quality door and window security.

.....

Q8 Would a high standard of security influence your decision to buy?

Yes ☐ No ☐ Would influence you not to buy ☐

Q9 The person completing this questionnaire is: Male ☐ Female ☐

Q10 The age group of the person completing this questionnaire is:

Under 25 ☐ 25 - 35 ☐ 35 - 44 ☐ 45 - 54 ☐ 55 and over ☐

Q11 The size of 'family group' living in the new home is:
Please tick the appropriate boxes.

	1	2	3	4 or more
Number of adults	☐	☐	☐	☐
Number of children	☐	☐	☐	☐

Thank you for taking the time to complete this questionnaire

Survey : 2

Page : 1

References

Allatt,P. (1984) Residential Security: Containment and Displacement of Burglary. *Howard Journal of Criminal Justice,* 23, 99-116.

Angel, S. (1968) Discouraging Crime through City Planning. *Working Paper Number 75, Center for Planning and Development Research,* Berkeley, University of California.

Aquarium Entertainments Limited versus Brighton and Hove Council. Appeal Ref: T/APP/Q1445/A/99/1025514/P2, 15-18 and 22 February 2000.

Armitage, R. *et al.* (1999) Burnley CCTV Evaluation. *In:* K. Painter and N. Tilley (eds.) *Surveillance of Public Space: CCTV, Street Lighting and Crime Prevention.* Monsey New York, Criminal Justice Press. p. 225-249.

Ashton, J. *et al.* (1998) Repeat Victimisation: Offender Accounts. *International Journal of Risk, Security and Crime Prevention,* 3 (4), 269-279.

Barclay, G.C. and Tavares, C. (eds.) (1999) *Information on the Criminal Justice System in England and Wales – Digest 4.* London, Home Office.

Barr, R. and Pease, K. (1990) Crime Placement, Displacement and Deflection. *In:* M. Tonry and N. Morris (eds.) *Crime and Justice: A Review of Research, Volume 12.* Chicago IL, University of Chicago Press. p. 277-318.

Barr, R. and Pease, K. (1992) A Place for Every Crime and Every Crime in its Place: An Alternative Perspective on Crime Displacement. *In:* D.J.Evans *et al.* (eds.) *Crime, Policing and Place.* London, Routledge. p.196-216

Beavon, D.J.K. (1984) *Crime and the Environmental Opportunity Structure: The Influence of Street Networks on the Patterning of Property Offences.* Unpublished M.A. Thesis, Simon Fraser University, Burnaby, British Columbia.

Beavon, D.J.K. *et al.* (1994) The Influence of Street Networks on the Patterning of Property Offences. *In:* R.V.Clarke (ed.) *Crime Prevention Studies, Volume 2.* Monsey NY, Criminal Justice Press. p. 115-148.

Bennett, T. and Wright, W. (1984) *Burglars on Burglary: Prevention and the Offender.* Aldershot, Gower.

Berry, G. and Carter, M. (1992) *Assessing Crime Prevention Initiatives: The First Steps, Crime Prevention Unit Paper No 31.* London, Home Office.

Bevis, C. and Nutter, J.B. (1997) *Changing Street Layouts to Reduce Residential Burglary: Paper presented to the American Society of Criminology.* Atlanta.

Bottoms, A.E. (1974) Book Review of Defensible Space. *The British Journal of Criminology, 14,* 203-206.

Bottoms, A.E. *et al.* (1992) Housing Markets and Residential Community Crime Careers: A Case Study from Sheffield. *In:* D.J. Evans *et al.* (eds.) *Crime, Policing and Place.* P. 118- 144.

Brand, S. and Price, R. (2000) *The Economic and Social Costs of Crime, Home Office Research Study 217.* London, Home Office

Brantingham, P.L. and Brantingham, P.J. (1975) Residential Burglary and Urban Form. *Urban Studies,* 12, 273-284.

Brantingham, P.L. and Brantingham, P.J. (1981) *Environmental Criminology.* Beverley Hills, Sage.

Brantingham, P.L. and Brantingham, P.J. (1984) Burglar Mobility and Preventive Planning. *In:* R.V. Clarke and T. Hope (eds.) *Coping with Burglary: Research Perspectives on Policy.* Boston, Kluwer-Nijhoff. P. 77-96.

Brantingham, P.L and Brantingham, P.J (1993) Environmental Routine and Situation: Towards a Pattern Theory of Crime. *Advances in Criminological Theory,* 5, 259-294.

Brantingham, P.L and Brantingham, P.J. (2000) *A Conceptual Model for Anticipating Crime Displacement: Paper presented at the American Society of Criminology Conference.* San Francisco.

Brantingham *et al,* (1977) Perceptions of Crime in a Dreadful Enclosure. *Ohio Journal of Science,* 77, 256-261.

Brennan, P, *et al.* (1991) Congenital Determinants of Violent and Property Offending, *In:* D. Pepler & K. Rubin (eds.) *The Development and Treatment of Aggression.* Hillsdale, New Jersey, Erlbaum.

Brown, B. (1995) *CCTV in Town Centres: Three Case Studies, Crime Detection and Prevention Series Paper 68.* London, Home Office.

Brown, B.B. and Altman, I. (1983) Territoriality, Defensible Space and Residential Burglary: An Environmental Analysis. *Journal of Environmental Psychology,* 3, 203-220.

Brown, B. and Bentley, D. (1993) Residential Burglars Judge Risk: The Role of Territoriality. *Journal of Environmental Psychology,* 13, 51-61.

Bullock, K. and Tilley, N. (eds.) (2003) *Crime Reduction and Problem-Oriented Policing.* Cullompton, Willan.

Bullock, K. *et al.* (2000) *Anticipating the Impact of Section 17 of the 1998 Crime and Disorder Act, Briefing Note 11/00.* London, Home Office.

Burgess, E. W. (1916) Juvenile Delinquency in a Small City. *Journal of the American Institute of Criminal Law and Criminology,* 6, 724-728.

Byrne, S. and Pease, K. (2003) Crime Reduction and Community Safety. *In:* T. Newburn (ed.) *Handbook of Policing.* Cullompton, Willan. p.286-310.

Caspi, A. and Moffit, T.E. (1995) The Continuity of Maladaptive Behaviour. From Description to Explanation in the Study of Antisocial Behaviour. *In:* D. Cicchetti and D. Cohen (eds.) *Developmental Psychopathology – Volume 2.* New York, Wiley. P. 472-511

Chaiken, J.J. *et al.* (1974) *Impact of Police Activity on the New York Subway System (Report No. R-1424-NYC).* Santa Monica, California, Rand Corporation.

Chi-Feng Shu, S. (2000) Housing Layout and Crime Vulnerability. *Urban Design International, 5, 177-188.*

Clarke, R.V. (1992) Introduction. *In:* R.V. Clarke (ed.) *Situational Crime Prevention – Successful Case Studies.* New York, Harrow and Heston. p. 3-36.

Clarke, R.V. (1999) *Hot Products: Understanding, Anticipating and Reducing Demand for Stolen Goods – Police Research Series Paper 112.* London, Home Office.

Clarke, R. V. (2000) Situational Prevention, Criminology and Social Values. *In:* A. von Hirsch *et al.* (eds.) *Ethical and Social Perspectives on Situational Crime Prevention.* Portland, Oregon, Hart Publishing. p.97-112.

Clarke, R.V.G. and Mayhew, P. (1988) The British Gas Suicide Story and its Criminological Implications. *In:* M. Tonry and N. Morris (eds.) *Crime and Justice, Volume 10.* Chicago, IL, Uni of Chicago Press.

Clarke, R.V. and Newman, G. (2002) *Secured Goods by Design – A Plan for Security Coding of Electronic Products,* London, Department of Trade and Industry.

Clunis v Camden and Islington Health Authority (1997).

Cohen. L.E. and Felson.M. (1979) Social Change and Crime Rate Trends: A Routine Activity Approach. *American Sociological Review,* 44, 588-608.

Coleman, A. (1986) *Utopia on Trail: Vision and Reality in Planned Housing.* London, Hilary Shipman.

Cozens, P. *et al.* (2001) Crime and the Design of Residential Property – Exploring the Theoretical Background. *Property Management,* 19 (2), 136-164.

Cromwell, P.F. *et al.* (1991) *Breaking and Entering: An Ethnographic Analysis of Burglary.* Newbury Park, California, Sage.

Decker, J.F. (1972) Curbside Deterrence: An Analysis of the Effect of a Slug Rejectory Devise, Coin View Window and Warning Labels on Slug Usage in New York City Parking Meters. *Criminology,* August, 127-142.

Department of the Environment (1994) *Planning out Crime – Circular No. 5.* London, Department of the Environment.

Department of Environment, Transport and the Region (1998) *Places, Streets and Movement – A Companion Guide to Design Bulletin 32 Residential Roads and Footpaths.* London, Department of Environment, Transport and the Regions.

Department of Environment, Transport and the Regions (1999) *Towards an Urban Renaissance – Final Report of the Urban Task Force.* London, Department of Environment, Transport and the Regions.

Department of Trade and Industry (2000) *Turning the Corner.* London, Department of Trade and Industry.

Dodd, T. *et al.* (2004) *Crime in England and Wales 2003/2004.* London, Home Office.

Duff, R.A. and Marshall, S.E. (2000) Benefits, Burdens and Responsibilities: Some Ethical Dimensions of Situational Crime Prevention. *In:* A. von Hirsch *et al* (eds.) *Ethical and Social Perspectives on Situational Crime Prevention.* Portland, Oregon, Hart Publishing. p. 17-35.

Ekblom, P. (1997) Gearing Up Against Crime: A Dynamic Framework to Help Designers Keep Up with the Adaptive Criminal in a Changing World. *International Journal of Risk, Security and Crime Prevention,* 2 (4), 249-265.

Ekblom, P. (2000) The Conjunction of Criminal Opportunity – A Tool for Clear, Joined-Up Thinking about Community Safety and Crime Reduction'. In S.Ballintyne *et al.* (eds.) *Secure Foundations: Issues in Crime Prevention, Crime Reduction and Community Safety.* London, IPPR. p. 30-66.

Ekblom, P. (2002) Future Imperfect: Preparing for the Crimes to Come. *Criminal Justice Matters,* 46, 38-40.

Ellin, N. (ed.) (1997) *Architecture of Fear.* New York, Princeton Architectural Press.

Ellingworth, D. *et al.* (1997) Prior Victimisation and Crime Risk. *International Journal of Risk, Security and Crime Prevention,* 2 (3), 201-214.

F2-19/00 Total Cost Indicators, Grant rates, Value Limits and Discount Amounts, Rent Caps and Administration Allowances for 2001/2002 (2000) [online]. Available at: <URL:http://www.housingcorplibrary.org.uk/HousingCorp.nsf/AllDocuments/4FD60925757ABAB580256AB9003D8212> [Accessed 19 September 2004]

Fairs, M. (1998) End of Road for Cul-de-Sac. *Building Design,* 1373,1.

Feeney, F. (1986) Robbers as Decision Makers. *In:* D. Cornish and R. Clarke (eds.) *The Reasoning Criminal.* New York, Springer-Verlag. p. 53-71.

Felson, M. (1998) *Crime and Everyday Life, Second Edition.* California, Pine-Forge Press.

Felson, M. and Clarke, R.V. (1998) *Opportunity Makes the Thief: Practical Theory for Crime Prevention, Police Research Paper 98.* London, Home Office.

Fielding, H. (1988) An Enquiry into the Causes of the Late Increase of Robbers. *In:* M.R. Zirker (ed.) *Henry Fielding: An Enquiry into the Causes of the Late Increase of Robbers and Related Writings.* Oxford, Clarendon Press. p. 61-172.

Finnie, W.C. (1973) Field Experiments in Litter Control. *Environment and Behaviour,* 5, 123-144.

Forrester, D. *et al.* (1988) *The Kirkholt Burglary Prevention Project, Rochdale, Crime Prevention Unit: Paper 13.* London, Home Office.

Foucault, M. (1991) *Discipline and Punish: The Birth of the Prison.* London, Penguin Books.

Gabor, T. *et al.* (1987) *Armed Robbery: Cops, Robbers, and Victims.* Springfield, IL, Charles C. Thomas.

Gabor, T. and Gottheil, E, (1984) Offender Characteristics and Spatial Mobility: An Empirical Study and Some Policy Implications. *Canadian Journal of Criminology,* 26, 267-281.

Garland, D. (1996) Limits of the Sovereign State: Strategies of Crime Control in Contemporary Societies. *British Journal of Criminology,* 36, 445-471.

Garland, D. (2000) The New Criminologies of Everyday Life: Routine Activity Theory in Historical and Social Context. *In:* A. von Hirsch *et al.* (eds.) *Ethical and Social Perspectives on Situational Crime Prevention.* Portland, Oregon, Hart Publishing. p. 215-224.

Gelfand, D.M. *et al.* (1973) Who Reports Shoplifting? A Field-Experimental Study. *Journal of Personality and Social Psychology,* 23, 276-285.

Graef, R. (1989) *Talking Blues.* London, Collins.

Great Britain (1998a) *Crime and Disorder Act 1998. Chapter 37.* London, HMSO.

Great Britain (1998b) *Human Rights Act 1998. Chapter 42.* London, HMSO.

Great Britain (2000) *Countryside and Rights of Way Act 2000. Chapter 37.* London, HMSO.

Great Britain (2002) *Police Reform Act 2002. Chapter 30.* London, HMSO.

Greenberg, S. and Rohe, W. (1984) Neighbourhood Design and Crime: A Tale of Two Perspectives. *Journal of American Planning Association,* 50 (1), 48-61.

Groff, E.R. and LaVigne, N.G. (2001) Mapping an Opportunity Surface of Residential Burglary. *Journal of Research in Crime and Delinquency,* 38 (3), 257-278.

Heck, S. (1987) Oscar Newman Revisited. *Architect's Journal,* 14 (1), 30-32.

Hillier, B. and Chi-Feng-Shu, S. (1998) *Crime and Urban Layout: The Need for Evidence: Home Office Crime Prevention College.* Easingwold.

HM Treasury (2003) *The Green Book: Appraisal and Evaluation in Central Government.* London, HM Treasury.

Home Office (1965) *Report of the Committee on the Prevention and Detection of Crime (Cornish Committee).* London, Home Office.

Home Office (1991) *Safer Communities: The Local Delivery of Crime Prevention through the Partnership Approach. Standing Conference on Crime Prevention (The Morgan Report).* London, Home Office.

Housing Corporation (2000) *Total Cost Indicators, Grant Rates, Rent Caps and Administrative Allowances 2001/2002.* London, Housing Corporation

Housing Corporation (2003) *Scheme Development Standards, 5th Edition.* London, Housing Corporation.

Hughes, G. (1998) *Understanding Crime Prevention: Social Control, Risk and Late Modernity.* Buckingham, Open University Press.

Jacobs, J. (1961) *The Death and Life of Great American Cities.* New York, Random House.

Jeffery, C. R. (1971) *Crime Prevention Through Environmental Design.* Beverly Hills, California, Sage.

Kelling, G.L. and Coles, C.M. (1997) *Fixing Broken Windows: Restoring Order and Reducing Crime in Our Communities.* New York, NY, Touchstone.

Kershaw, C. *et al.* (2000) *The 2000 British Crime Survey – England and Wales.* London, Home Office.

Klinteberg, B. A. *et al.* (1993) Hyperactive Behaviour in Childhood as Related to Subsequent Alcohol Problems and Violent Offending: A Longitudinal Study of Male Subjects. *Personality and Individual Differences*, 15, 381-388.

Kodz, J. and Pease, K. (2004) *Reducing Burglary Initiative: Early Findings on Burglary Reduction.* London, Home Office.

Kolvin, I. *et al. (1990) Continuities of Deprivation?* Aldershot: Avebury.

Latane, B. and Darley, J.M. (1970) *The Unresponsive Bystander: Why Doesn't He Help?* New York, Appleton-Century-Crofts.

Laycock, G. (2001) *Scientists or Politicians – Who has the Answer to Crime? Inaugural Lecture, April 26.* University College London.

Laycock, G. (2003) *Launching Crime Science – Crime Science: Short Report Series.* [online]. Jill Dando Institute, University College London. Available at: <URL:http://www.jdi.ac.uk/downlaods/crime_science_series/pdf/LAUNCHING_CS_FINAL.pdf> [Accessed 25 August 2004]

Leigh, A. *et al.* (1996) *Problem-Oriented Policing: Brit Pop, Crime Detection and Prevention Series Paper 75.* London, Home Office.

Leppa, S. (1999) *Anticipating Instead of Preventing: Using the Potential of Crime Risk Assessment in Order to Minimize the Risks of Organized and Other Types of Crime - HEUNI Paper 11.* Helsinki, HEUNI.

Letkemann, P. (1973) *Crime as Work.* Englewood Cliffs, NJ: Prentice-Hall.

Levi, M. and Maguire, M. (2004) Reducing and Preventing Organised Crime: An Evidence-Based Critique. *Crime, Law and Social Change,* 41 (5), 397-469.

Maguire, M. and Bennett, T. (1982) *Burglary in a Dwelling.* London, Heinemann.

Mawby, R.I. (1977) Defensible Space: A Theoretical and Empirical Appraisal. *Urban Studies,* 14, 169-179.

Mayhew, P. (1979) Defensible Space: The Current Status of a Crime Prevention Theory. *Howard Journal,* 18, 150-159.

Mayhew, P. *et al.* (1976) *Crime as Opportunity, Home Office Research Study No. 34.* London, Home Office.

Mayhew, P. *et al.* (1979) *Crime in Public View, Home Office Research Study No 49.* London, Home Office.

McGee, R *et al.* (1984) Perinatal, Neurological, Environmental and Developmental Characteristics of Seven year old Children with Stable Behaviour Problems. *Journal of Child Psychology and Psychiatry,* 25, pp. 573-586.

McKinnon, A. and Tallam, D. (2002) *New Threats from E-Tailing in the Home Delivery Channel.* London, Department of Trade and Industry.

Merry, S.E. (1981) Defensible Space Undefended: Social Factors in Crime Control through Environmental Design. *Urban Affairs Quarterly,* 16, 397-422.

Michaud, L.J. *et al.* (1993) Traumatic Brain Injury as a Risk Factor for Disorders in Children. *Archives of Physical and medical Rehabilitation,* 74, 368-375.

Mirlees-Black, C. *et al.* (1998) *The 1998 British Crime Survey – England and Wales.* London, Home Office.

Moffit, T.E. (1990) Juvenile Delinquency and Attention-Deficit Disorder: Developmental Trajectories from Age Three to Fifteen. *Child Development,* 61, 893-919.

Moffit, T.E. (1993) "Life-Course-Persistent" and "Adolescence-Limited" Antisocial Behaviour: A Developmental Taxonomy. *Psychological Review,* 100, 674-701.

Moffit, T.E. (1994) Natural Histories of Delinquency. *In:* E. Weitekamp and H.J. Kerner (eds.) *Cross-National Longitudinal Research on Human Development and Criminal Behaviour.* Dordrecht. The Netherlands, Kluwer Academic Press. p. 3-61.

Moffit, T.E. (1997) Adolescence-Limited and Life-Course-Persistent Offending: A Complementary Pair of Developmental Theories. *In:* T. Thornberry (ed.) *Advances in Criminological Theory: Developmental Theories of Crime and Delinquency.* London, Transaction Press. p. 11-54.

Moffit, T.E. (2003) Life-Course-Persistent and Adolescence-Limited Antisocial Behaviour – A 10-Year Research Review and a Research Agenda. *In:* B.B. Lahey *et al.* (eds.) *Causes of Conduct Disorder and Juvenile Delinquency. New York, Guilford Press. p. 49-75.*

Moss, K. (2001) Crime Prevention v Planning: Section 17 of the Crime and Disorder Act 1998. Is it a Material Consideration? *Crime Prevention and Community Safety: An International Journal,* 3 (2), 43-48.

Moss, K. and Pease, K. (1999) Crime and Disorder Act 1998: Section 17 A Wolf in Sheep's Clothing? *Crime Prevention and Community Safety: An International Journal,* 1 (4), 15-19.

Moughtin, J.C. and Gardner, A.R.T. (1990) Towards an Improved and Protected Environment. *The Planner,* 8 June, 9-12.

Newlands, M. (1983) *Residential Burglary Patterns in a Vancouver Neighbourhood.* Unpublished honors thesis, Simon Fraser University.

Newman, O. (1973) *Defensible Space: People and Design in the Violent City.* London, Architectural Press.

Newman, O. (1975) Community of Interest – Design for Community Control. *In: Architecture, Planning and Urban Crime: Report of N.A.C.R.O Conference 6 December 1974.* London, War on Want.

Newman, O. (1976) *Design Guidelines for Creating Defensible Space.* National Institute of Law Enforcement and Criminal Justice. Washington, U.S. Government Printing Office.

Newman, O. (1995) Defensible Space: A New Physical Planning Tool for Urban Revitalization. *American Planning Association Journal,* 61 (2), 149-155.

Nuttall, C. *et al.* (1977) *Parole in England and Wales, Home Office Research Study No. 38.* London, Home Office.

Office of the Deputy Prime Minister (2000) *Our Towns and Cities: The Future.* London, HMSO.

Office of the Deputy Prime Minister (2004) *Safer Places – The Planning System and Crime Prevention*, HMSO.

Park, R.E. *et al.* (1925) *The City.* Chicago, IL, University of Chicago Press.

Pascoe, T. and Topping, P. (1997) Secured by Design: Assessing the Basis of the Scheme. *International Journal of Risk, Security and Crime Prevention,* 2 (3), 161-173.

Pease, K. (1997) Crime Reduction. *In:* M. Maguire *et al* (eds.) *The Oxford Handbook of Criminology: Second Edition.* Oxford, Clarendon Press.

Phillips, P.D. (1980) Characteristics and Typology of the Journey to Crime. *In:* D.E. Georges-Abeyie and K.D. Harries (eds.) *Crime: A Spatial Perspective.* New York, Columbia Univeristy Press.

Popper, K. (1963) *Conjectures and Refutations.* London, Routledge and Kegan Paul.

Poyner, B. (1983) *Design Against Crime: Beyond Defensible Space.* London, Butterworth.

Poyner, B. (1988) Video Cameras and Bus Vandalism. *Security Administration,* 11, 44-51.

Poyner, B. (1992) Situation Crime Prevention in Two Parking Facilities. *In:* R.V. Clarke (ed.) *Situational Crime Prevention: Successful Case Studies.* Albany, NY, Harrow and Heston. p. 174-184.

Poyner, B. and Webb, B. (1987) *Successful Crime Prevention: Case Studies.* London, The Tavistock Institute of Human Relations.

Poyner, B. and Webb, B. (1991) *Crime Free Housing.* Oxford, Butterworth.

Pyle, G. (1974) The Spatial Dynamics of Crime. *Department of Geography Research Paper 159,* Chicago, University of Chicago Press.

Rengert, G.F. and Wasilchick, J. (2000) *Suburban Burglary: A Tale of Two Suburbs – Second Edition.* Springfield, Illinois, Charles C. Thomas Publishers.

Reppetto, T.A. (1974) *Residential Crime.* Cambridge,MA, Ballinger.

Rhodes, W.M. and Conly, C.C. (1981) *In:* P.J. Brantingham and P.L. Brantingham (eds.) *Environmental Criminology.* Beverley Hills, Sage.

Rogerson, M. *et al.* (2000) Crime Reduction and the Benefit of Foresight. In: K. Pease and V.McLaren (eds.) *Secure Foundations: Key Issues in Crime Prevention and Community Safety.* London, IPPR. p.265-275.

Rosenthal, A. (1964) *Thirty-Eight Witnesses.* New York, McGraw-Hill.

Rubenstein, H. *et al. (*1980) *The Link Between Crime and the Built Environment. The Current State of Knowledge.* Washington, DC, National Institute of Justice.

Rudlin, D. and Falk, N. (1995) *21st Century Homes: Building to Last.* URBED, London.

Satterfield, J.H. and Schell, A. (1997) A Prospective Study of Hyperactive Boys with Conduct Problems and Normal Boys: Adolescent and Adult Criminality. *Journal of the American Academy of Child and Adolescent Psychiatry,* 36, 1726-1735.

Scherdin, M.J. (1986) The Halo Effect: Psychological Deterrence of Electronic Security Systems. *Information Technology and Libraries,* 5, 232-235.

Schneider, R.H. and Kitchen, T. (2002) *Planning for Crime Prevention – A Transatlantic Perspective.* London, Routledge.

Secured by Design Principles (2004) [online]. Available at: <URL:http://www.securedbydesign.com/guides/principles.asp> [Accessed 19 September 2004].

Simon, F.H. (1971) *Prediction Methods in Criminology – Including a Prediction Study of Young Men on Probation, Home Office Research Study* 7. London, Home Office.

Skogan, W.G. (1990) *Disorder and Decline: Crime and the Spiral of Decay in American Neighbourhoods.* California, University of California Press.

Smith, D.J. (2000) Changing Situations and Changing People. *In:* A. von Hirsch (eds.) *Ethical and Social Perspectives on Situational Crime Prevention.* Portland, Oregon, Hart Publishing. p. 147-174.

Standards and Testing (2004) [online]. Available at: <URL:http://www.securedbydesign.com/standards/index.asp> [Accessed 19 September 2004]

Stungo, N. (1998) Culs-de-sac hit the Skids. *Building Design,* 1377, 2.

Summerskill, B. (2000) How Brookside Boom Helped the Burglars. *Observer,* Sunday July 16, p. 16.

Suttles, G.D. (1968) *The Social Order of the Slum.* Chicago, IL, University of Chicago Press.

Taylor, R. and Gottredson, S.D. (1987) Environmental Design, Crime and Prevention: An Examination of Community Dynamics. *Crime and Justice: An Annual Review of the Research,* 8, 387-416.

Taylor, M. and Nee, C. (1988) The Role of Cues in Simulated Residential Burglary. *British Journal of Criminology,* 238, 396-401.

Tilley, N. (1993) *Understanding Car Parks, Crime and CCTV: Evaluation Lessons from Safer Cities, Crime Prevention Series Paper 42.* London, Home Office.

Tilley, N. and Laycock, G. (2002) *Working Out What to Do: Evidence Based Crime Reduction.* London, Home Office.

United Nations Conference on Environment and Development, *(*1992) *Agenda 21.* Rio De Janeiro, Brazil.

Weatheritt, M. (1986) *Innovations in Policing.* London, Croom Helm.

Webb, B. and Laycock, G. (1992) *Reducing crime on the London Underground.* London, Home Office.

White, R.C. (1932) The Relations of Felonies to Environmental Factors in Indianapolis. *Social Forces,* 10, 498-509.

Wiles, P. and Costello, A. (2000) *The 'Road to Nowhere': The Evidence for Travelling Criminals, Home Office Research Study 207.* London, Home Office.

Wilson, J.Q. and Kelling, G.L. (1982) The Police and Neighbourhood Safety. *The Atlantic,* March 1982, 29-38.

Wilson, S. (1978) *Tackling Vandalism, Home Office Research Study No 47.* London, Home Office.

Winchester, S. and Jackson, H. (1982) *Residential Burglary: The Limits of Prevention, Home Office Research Study Number 74.* London, Home Office.

Wong, K. (2003) *Rethinking Prevention – A Child-Focused Approach to using Protective and Risk Factors in Youth Crime Prevention,* London, Nacro.

Youth Justice Board (2001) *Risk and Protective Factors Associated with Youth Crime and Effective Interventions to Prevent it, Research Note 5.* London, Youth Justice Board.

Zimbardo, P.G. (1970) The Human Choice: Individuation, Reason, and Order Versus Deindividuation, Impulse and Chaos. *In:* W. Arnold and D. Levine (eds.) *Nebraska Symposium on Motivation 1969.* Lincoln, NB, University of Nebraska Press. p. 237-307.