The Association of Chief Police Officers Project and Design Group

EVALUATION OF THE "SECURED BY DESIGN" INITIATIVE: PILOT STUDY,

Bv

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

SUMMARY

There is a widespread support for the view that much crime is opportunistic and more specifically that certain common cnmes like domestic burglary can be reduced by careful housing design. This prompted the "Secured by Design" (SBD) police initiative to encourage the housebuilding industry to adopt good practice crime prevention measures in home and estate design.

A system has been devised and implemented which involves submission of designs and their assessment according to British Standards and other cntena for approval for SBD status, but the initiative has yet to receive a proper evaluation. The Association of Chief Police Officers Project and Design Group accordingly commissioned a pilot study to examine Secured By Design on the ground and develop an appropriate methodology for wider application.

Differences in reported crime, expressed as a ratio per dwelling, between a Secured By Design estate and a comparator area were examined after devising a two stage procedure combining statistical and contextual analysis. In the sample areas examined the statistical tests undertaken for burglary incidence alone did not show a statistically significant difference, but those for all crimes considered, i.e. domestic burglary, theft of cars and theft from cars. did. However in a larger exercise crime incidence can be expected to be greater and facilitate statistical testing.

The comparison gives encouragement to the Secured By Design concept, especially as the population composition of the SBD development indicated that it would be more rather than less at risk to the specified crimes than the comparator area.

The next step should be to apply the methodology to a larger sample of SBD estates to determine the effectiveness of the scheme. A more extensive application could involve either multiple compansons along the same lines as this pilot or possibly aggregation *of* SBD samples and comparison with appropriate control areas.

As a by-product of the research some serious practical issues emerged concerning the operation of the scheme from the standpoint of developers. These issues, which should also be addressed in a subsequent more comprehensive study, are discussed briefly in an annex to the report.

1 INTRODUCTION

1.1 Research background

An important recent initiative to reduce crime is the police's "Secured by Design" (SBD) scheme, aimed at reducing crime by encouraging builders to meet certain specified design criteria in both house security and estate layout. The scheme was launched by the police at the Guildhall, London in 1989, with the backing of the Association of Chief Police Officers (ACPO) and the Home Office Crime Prevention Unit, as well as Ministers of State at the Home Office, Department of Environment and Welsh Office. The onginal sponsors were the South East Regional Crime Prevention Officers Committee (SERCPOC) but following extension of the scheme to most pans of Britain, subsequent responsibility for the national application of SBD has been taken on by the ACPO Project and Design Group.

Although this initiative has been running for more than three years and has been taken up all over Britain - with 408 builders and 665 estates approved for "Secured by Design" at the time of the study - there has been no evaluation of its effectiveness. The ACPO Project and Design Group consider that this is urgently required. This has been underlined officially with the recent issue by the Department of the Environment of advice on planning and crime prevention[1] promulgating the principles of SBD through the planning and development process.

SBD applications have increased to include design guidelines for car parking, dwelling refurbishment and commercial property, but the proposed subject of examination is estate design, where development consists of more than four houses.

The ramifications of proven effectiveness of SBD are considerable. Apart from the social benefits of reduced burglary etc. there are additional opportunities for builders to market SBD. Longer term SBD can contribute to more intelligent overall design for development, in which energy and transport efficiency, security and other desirable features are integrated.

However, apart from the fact that a comprehensive study would be a major undertaking, it is prudent to examine the problems of appraisal of a diverse range of developments and test methodologies before devoting substantial resources on research. Thus it was agreed that the ACPO Project and Design Group would support a pilot exercise to define and assess evaluation methodology to provide the basis for a more detailed study. The area chosen for the test was the Hertfordshire Constabulary area (Herts Police District), which is coterminous with Herts County area bar part of the Borough of Broxbourne and the whole of the District of Hertsmere.

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[1] Planning Out Crime, Department of the Environment Circular 5/94. HMSO. February 1994.

1.2 Scope **and** objectives

The proposed approach to the pilot study was to undertake a comparative analysis of crime figures for two housing developments, one an "SBD approved" estate the other an adjacent or nearby area not subject to this design process. The intention was to concentrate on domestic burglary, for which the SBD initiative has a particular relevance, although other crime could also be examined.

The study sought specifically to do two things:

i develop a useable methodological approach;
ii identify data collection issues;

However although not strictly part of the study it was thought useful, time permitting, if it could provide information on three other aspects;

iii the SBD developer's views on the scheme;
iv potential costs and benefits;
v the time and resource effort required to prepare data, particularly the extraction of data from police records.

The main body of this report deals with items (i)-(ii) above. Discussion of (iii)-(v) is set out in Annexes A-C. A supplementary note on crime trends analysis is found in Annex D.

An investigation of this nature has to tackle the issue of comparability, such as the population mix of different areas, which can influence the incidence of crime. These are considered in the report but they are also factors which can only be fully addressed in a more comprehensive study. Nor was it possible within the limits of this exercise to carry out any general prior examination of local crime patterns. The extent to which the chosen study area and context area might be atypical in terms of their crime patterns or in respect of other parameters was not of primary relevance to the exercise.

2 SCHEME SELECTION

The Consultant visited the Hertfordshire police headquarters Crime Management Department to identify candidate SBD developments. The main criteria were establishment for a reasonable period of time, to allow the estate to settle down, and size. Too small a development could mean no crimes recorded at all. which would not facilitate analysis.

After a review of schemes in the county with the Architectural Liaison Officer, two developments were selected for closer inspection. These were located in St Albans and Watford Districts and had about 80 and 120 dwellings respectively.

After driving out to see the developments it was clear that both composed similar small modern houses. However, adjacent to the Watford estate was a large area of public housing, indicating a different social mix. The St Albans estate was therefore chosen as the preferred SBD appraisal scheme. The location of the development (see Figure 1) is at London Colney, a small suburb south of St Albans. Figure 2 shows a part of the scheme from the architect's drawings.

The estate was certificated for SBD in September 1990. The development was completed in the latter part of 1991, the first homes being sold in September. By the middle of 1992 most dwellings were sold and occupied.

Figure 1 London Colney Location

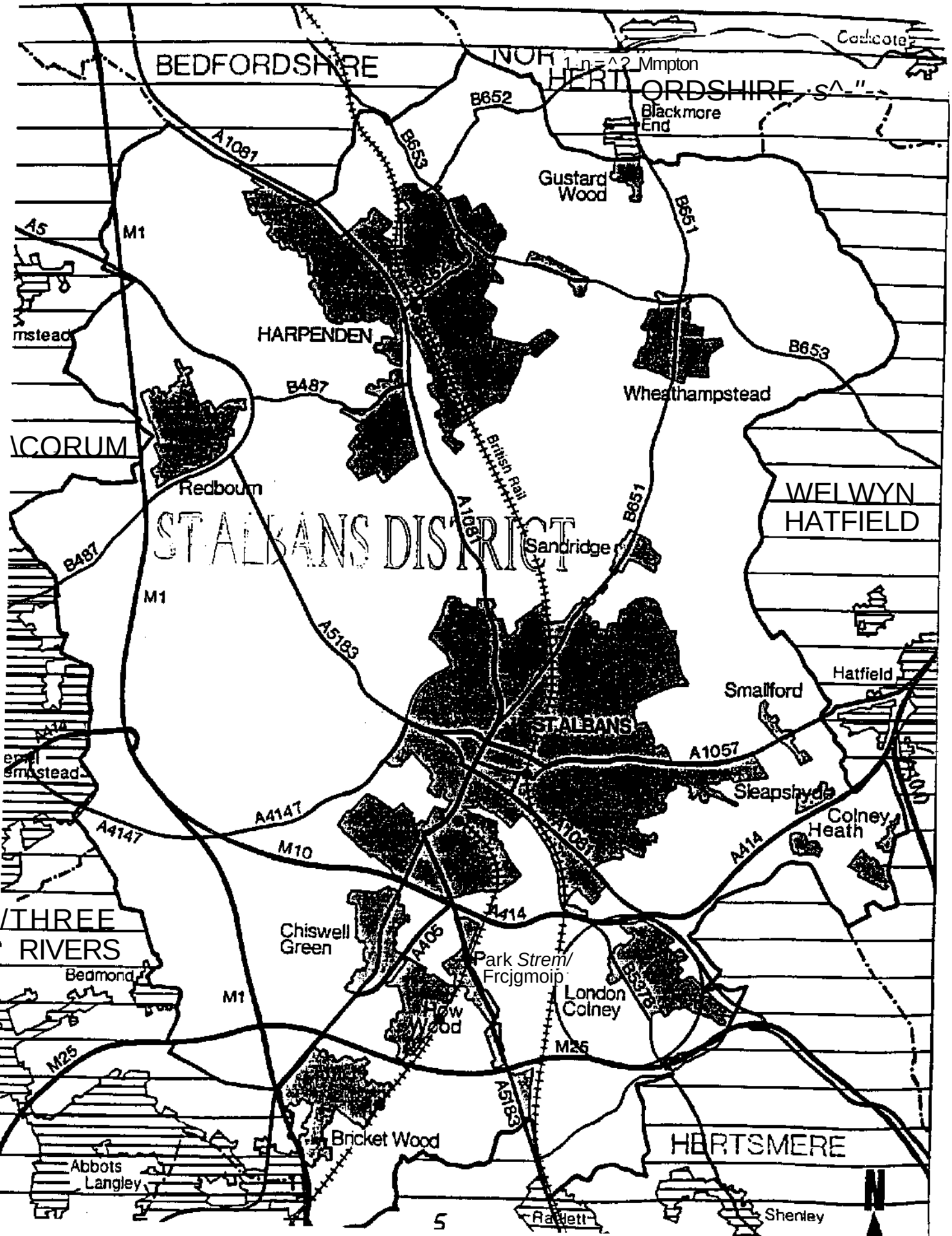
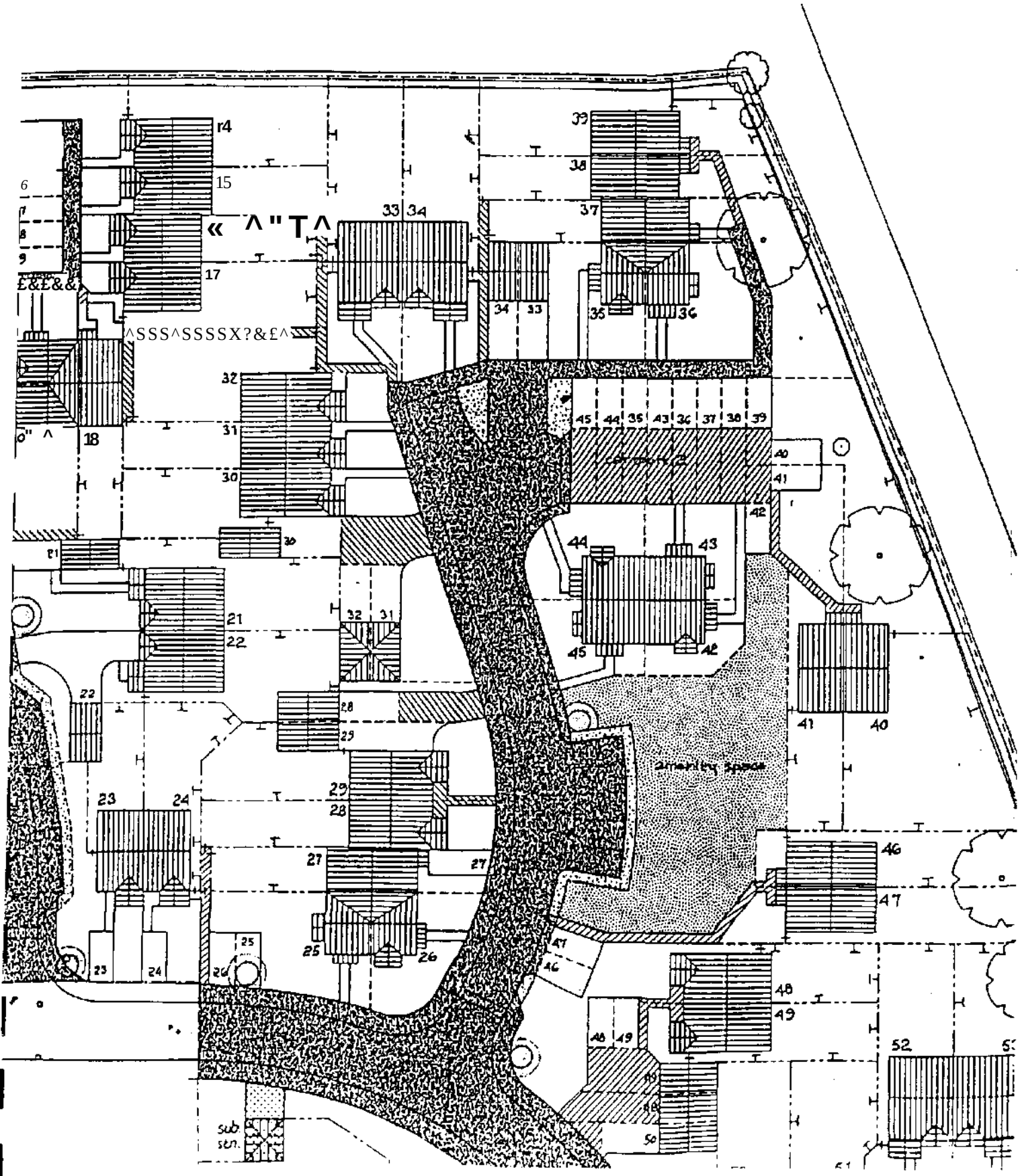


Figure 2 SBD Estate (part) - Architect's Drawings



3 EVALUATION METHOD

3.1 Analysis steps

The approach to the appraisal is summarised in the following sequence of tasks:

i define geographic comparison areas;
ii define crime types;
iii define crime period;
iv extract data for (i) x (ii) x (iii) from police records;
v set up analysis/test procedure;
vi carry out tests.

The process of specifying these tasks is described below.

3.2 Specification of geographic areas, crime types and crime period

Geographic comparison areas

It was decided to base the evaluation on crime incidence in the two areas of:

i the Secured By Design estate;
ii **a** surrounding/adjacent area, without SBD status (the "comparator area").

How should the comparator area be chosen? Proximity is a natural criterion, as this will increase the likelihood of similarity of the development type and population with the SBD estate. Further, if the comparator area is located a considerable distance from the SBD area the possibilities of identifying displacement will be much diminished, if not lost.

For the appraisal to make use of available statistics it is desirable to base comparators on a census area, the smallest one for which data is available being the enumeration district (ED). These typically include some 150 households, much larger than the normal SBD development which can be as few as 4 dwellings. A moment's reflection will be sufficient to appreciate that a typical SBD scheme is very likely to be tucked inside existing residential development in an ED. Thus if use is to be made of ED data, the comparator area will usually select itself as the ED to which the SBD development belongs.

Following discussion with the planning department of St Albans District the relevant ED was identified, with standard Small Area Statistics (SAS) available from the 1991 Census. Data collection is described in Section 4.

It was not considered essential for this exercise to assemble and analyse a wide variety of contextual data outside the bounds of the sample study areas, as for example undertaken

for larger crime analysis studies-[1]. Nevertheless, some appreciation of the wider context for local crime incidence is helpful and the larger numbers point to the opportunities for further investigation, e.g. of crime trends and seasonality, for which time series analysis is required. Data was therefore also collected for the larger areas of:

iii the St Albans Police Division (corresponding to St Albans District);
iv Herts Police District (the County Constabulary area).

Crime types

The focus of the analysis was domestic burglary, but the opportunity was taken to extract data for car crime, notably the two offences of theft of a vehicle and theft from a vehicle. The main justification for including these, if time permitted, was that Secured By Design encompasses a good standard of protection (natural surveillance) for parked vehicles, and hence the expectation of car theft may be reduced just as with burglary.

Crime period

Comparisons of crime incidence could be made for any areas over a common timespan. but since many SBD developments are recent it is often impossible to get extended time series data. An elapsed time period is obviously beneficial to reduce the effect of chance differences in crime incidence.

Information on the crime incidence in the different areas was sought for the period January 1991-March 1994 inclusive. The monthly crime figures thus extended over 13 quarters. In the case of the SBD development, not occupied until late 1991. the first crime reported (domestic burglary) was in June 1992.

3.3 Selection of test procedure

The main comparison to be made was between the incidence of crime on the sample SBD and comparator areas. This was undertaken for both burglary and car crime. The most suitable statistical approach appeared to be a null hypothesis, in which the proposition is that occurrence of the event in the SBD estate can be expected to arise from chance alone. If the null hypothesis is disproved, i.e. there is a significant difference from the assumption that this is a chance outcome, the Secured By Design development would indeed be associated with a difference in crime incidence.

For the purpose of this exercise - concerned with SBD housing - crime incidence is defined as a ratio of recorded crime events to total number of dwellings. It may be noted that this is different to other definitions such as crime prevalence as well as crime incidence in the technical sense used in the British Crime Survey of crime events per head.

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[2] See "Assessing Crime Prevention Initiatives: The First Steps". Geoff Berry and Mike Carter, Crime Prevention Unit Paper 31, Home Office, 1992.

Statistical testing was augmented by identification and review of otlier factors which might affect crime prevalence in either area. These include location, dwelling type. household type and existence of any special security protection. While a larger study probably justifies a more detailed analysis of these factors an attempt was made to check their potential effects, as pan of the effort to develop a suitable overall methodology.

4 DATA COLLECTION

4.1 Crime statistics

The source of reported crime incidence was the Crime Information System (CIS) a computerised information database which holds data referenced by street and house number, beat code and grid reference. From this database time series data was extracted on domestic burglary, theft of and theft from cars, for the SBD area, comparator area and two wider context areas (St Albans Division and Herts Police District area) by the Hens Police Crime Analyst.

For the relevant period of consideration (March 1992 - April 1994 inclusive) totals for these areas are shown in Table 1.

Table 1 Selected crime incidence in SBD and non-SBD areas and Herts County March 1992-April 1994

Area	Dwellings	Burglaries (Dw)	Car thefts	All crimes	Burglaries per dwell.	Car thefts per dwell.	All crimes per dwell.
SBD estate	90	1	-	1	0.011	-	0.011
Rest of Enum. District	74	3	8	11	0.041	0.108	0.149
St Albans	49,000	1.897	8.810	10.707	0.039	0.180	0.219
Herts County	342.000 approx	11.039	39.017	50.056	0.032	0.114	0.146

Source: Hertfordshire Constabulary.

The most obvious feature of both the SBD and rest of the ED or comparator area crime figures is their paucity; with only a single burglary and only a handful of car thefts recorded on the SBD estate, and not many crimes reponed in the comparator area. This paucity rules out any time series analysis, although that was not envisaged for the main exercise.

4.2 Street and population data

The planning department of St Albans District provided 1:10.000 and 1:1250 scale map extracts of the London Colney area. The former shows ward and enumeration district boundaries, from which the outline of the sample ED (27KHF105). in which the SBD

development was located, could be established; street names could also be picked out. It is necessary to refer to the larger scale 1:1250 map to identify house numbers, however.

Having identified the relevant ED the planning department was able to extract for the Consultant a number of tables from the 1991 census SAS. For the purpose of this study table specifications selected covered:

- Dwelling type and occupancy (Table 59)
- Household space type; household composition (Table 61)
- Occupancy and tenure of dwellings (Table 62E)
- Households with dependent children (Table 46E>
- Household composition and housing (Table 42E)
- Lone parents (Table 40)
- Social class of households (Table 90, 10% sample)

Although no spatial breakdown of the SAS data is possible, inspection can confirm homogeneity or otherwise of the ED, In this ED for example the great bulk of dwellings are houses, with very few flats. Similarly, the great preponderance of tenure is owner occupation.

Below the ED level there is little information available other than the electoral register, listing the number of adults registered at each address. Although fairly minimal, it points to certain population characteristics as well as the probability of empty dwellings. The register covering the SBD and comparator area. London Colney East Ward. Polling District CBA, was obtained from St Albans Council. The qualifying date for the register of electors was October 1993.

4.3 **Contextual indicators**

For the purpose of crime prevention initiatives in existing areas it may be appropnate to collect and analyse contextual indicators such as total crime rates in the area, crime incidence for the same crimes at national level, etc, to help place the area in a wider context. As noted above this was not considered relevant in this exercise, in which very localised comparisons were being made. Nevertheless, some time series data on domestic burglary for St Albans and Herts county was collected, and this is presented in Annex D.

4.4 **SBD** scheme costs **and** benefits

A limited exercise was undertaken to look at potential costs and benefits, for illustrative purposes. There was not time to assemble original data, nor would the small numbers of crimes recorded provide a good base for reliable evaluation. The balance sheet places on one side the additional physical and other costs of building the SBD estate, and on the other side defines benefits as the costs of crimes that would otherwise have been expected. This, needless to say. is a calculation taking only monetary costs into account. The figures are presented in Annex B.

5 CALCULATIONS AND FINDINGS

5.1 Crime rates in SBD and non-SBD estates

The formulation adopted for null hypothesis was a ratio, i.e. of crimes per dwelling. In view of the fact that the SBD estate was mostly unoccupied in 1991. only crime incidence from March 1992 onwards was considered (both estates reported crimes after March 1992). The occurrences during the period 1.3.92 to 31.3.94 were:

	SBD area	Comparator area
No of dwellings	90	74
Burglaries	1	3
Burgl./dwelling	0.011	0.041
Theft of cars	-	4
Theft of c./1000 dwells	-	0.054
Theft from cars	-	7
Theft fromc/1000 dwells	-	0.095
All car thefts	-	1 *y*
All car theft/1000 dw.	-	0.149
All crimes	1	14
All crimes/dwelling	0.011	0.189

The null hypothesis assumed from the above is that 0.041 burglaries per dwelling (i.e. p - 0.041) could be expected in normal circumstances, and that the occurrence ratio in the population (0.011), i.e. the SBD estate, would be likely to arise from chance alone.

The one tail test of hypothesis is set up such that:

HO:TT= 0.041
Ha:7r> 0.041

A significance level of 5% <of=0.05) is chosen as a normal level of probability.
The critical value of p is set at:

$$\pi - 1.64\sqrt{\{\frac{\pi(1-\pi)}{n}\}}$$

(1) Region of rejection for 1-tail test

Giving a value for p of:

$$0.041 - 1.6\sqrt{(\hat{I}\hat{9}/74)} = 0.003$$

The observed rate of burglaries in the SBD estate (one) was in fact a ratio of 0.011 per dwelling. The null hypothesis is not disproved, and hence we are unable to accept within 95% limits of confidence that the occurrence of burglary on the SBD estate is significantly different to the comparator area. However, as discussed above, with such small numbers of events this finding should not be invested with too much importance. To indicate the importance of larger numbers a similar null hypothesis was formulated using a two tailed test, generating ratios below or over which population values are unlikely to arise by chance. This could be utilised for example to see whether the Herts County burglary ratio shown in Table 1 (0.032) fell inside or outside these boundaries. This test produces a range for p = -0.004 to +0.086. i.e. the actual Herts ratio falls within these limits.

Other null hypotheses tests which can be applied are. respectively, that the incidence of car thefts and of all three crimes in the comparator area is no greater than in the SBD area, giving values for p of:

$$0.149 - 1.64\sqrt{\left(\frac{0.149 \times 0.851}{74}\right)} = 0.081$$

and

$$0.189 - 1.64\sqrt{\left(\frac{0.189 \times 0.811}{74}\right)} = 0.114$$

In each of these cases the null hypothesis is disproved, i.e. the occurrence of car thefts and of all crime on the SBD estate is significantly less than expected. In this case the numbers of crimes recorded are larger and the hypothesis is more realistic, although more occurrences in both areas would, statistically speaking, be desirable.

5.2 Susceptibility to crime: other factors

A key issue in evaluation is the degree to which non-design factors could affect crime incidence. In particular one is looking at differences between the sample and comparison or control areas which could explain crime incidence differentials. A number of these may be identified with varying significance to the comparator areas. These include:

(1) General location
(2) Dwelling type
(3) Household composition/occupancy
(4) Non-SBD security protection
(5) Police presence

These factors have demonstrated impacts on burglary incidence, as shown in British Crime Survey (BCS) analysis[3], but arguably have much less significance for other crime incidence in the comparison areas, e.g. car crime. These factors are considered in turn, although in the context of this small study it is not feasible to mount an in-depth investigation.

General location

Burglary is strongly correlated with location, with proximity to the residence of offenders an unsurprising determinant of nsk. Thïs would not be applïcable to the study areas which are in the same location.

Dwelling type

Flats and maisonettes face a higher nsk of burglary than houses, wherever located, most probably the consequence of communal rather than private access and entrances. The small area census statistics for the relevant ED show that 28 of the total 123 dwellings in 1991 were flats, nearly 30%. However only 5 could be clearly identified from the map which formed the basis for extracting crime statistics, situated in the non-SBD area. This small number was not considered likely to affect crime comparison.

Household composition/Occupancy

Domestic burglary incidence is higher with single adult households, although not necessarily among similar types of accommodation. It is also higher for manual than for non-manual households, for renters rather than owner occupiers and for households more frequently away from home in the evenings, according to the BCS. The census SAS data is too large to distinguish the SBD area (even if it had been built by the time of the census) and. short of survey, a judgement about the population characteristics of the SBD and comparator area has to be made on the basis of a combination of:

- inferences from the census ED statistics
- visual inspection of the house types
- information or inferences from the electoral register
- data on purchasers obtained from the housebuilder (if avaílable)

Visual inspection showed the predominance of similar house types - small, modern semi-detached houses and detached houses in the SBD estate with similar housing augmented by a sprinkling of terraced houses and flats in the non-SBD area of the ED. In 1991 - before the SBD estate was completed and sold - the character of the area is indicated by the following census statistics:

[3] The 1992 British Cnme Survey. P.Mayhew. N.Aye Maung. C.Mirrlees-Black. Home Office Research Study No. 132, HMSO. 1993.

Salient characteristics of the Enumeration District (London Colney)

Dwellings: 123 - detached 8; semi-detached 62; terraced 25; flats 28
Tenure: 87% owner occupied: 13% rented
Households: 114 - without dependent children 84; with dependent children 30. Single parent households 4.
Social Class: A.B.C1 88%; CII. D.E 12%
Car ownership: 2 or more. 39%; 1 car 45%; no car 16%.

Source: 1991 Census SAS tor Herts. ED K05. Tables 40. 42E. 46E. 61. 62E. 90.

The area had few people of pensionable age and relatively few inactive households. The **SBD** development may have accentuated this pattern, a review of electoral register data for the SBD and identified comparator area housing showing:

	Registered Households			
	All	**1 person**	**2 persons**	**3-i- persons**
SBD area	83	19(23%)	64(77%)*	-(0%)
Comparator Area	85	23 (27%)	48 (56%)**	14 (21 %)

Source: Register of Electors. London Colney.

* 'unmarried* 15
**"unmarried' 13

The high proportion of couples likely to be unmarried, i.e. couples self registered with different names, can be identified. These are a particularly high proportion of household among the SBD dwellings.

Taking account of the type of new build housing in the SBD area, and the above data, it is concluded that SBD occupants are typically working couples likely to be away from the home during the day, and to have fewer residents at home than the comparator area. Police research has confirmed that unoccupied dwellings are much more susceptible to burglary, such that these dwellings should be more rather than less at risk than those in the comparator area (and given reduced surveillance, any cars left at home more at nsk from theft) than those in the comparator area. Put another way. the occupancy characteristics of the SBD area are not such as to reduce crime incidence likelihood there.

Non-SBD security protection

Crime incidence could be influenced by a localised installation of burglar alarms in one of the comparison areas, e.g. following the targeting of the area by a private security company. Inquiries made indicated that this had not occurred.

Police presence

Other factors which could influence the incidence include the deployment, for any reason, of larger numbers of officers patrolling the comparison areas. Additional police presence in the SBD areas might reduce crime incidence there; conversely, a normally higher crime incidence in the non-SBD areas could be temporarily reduced by greater police

there. Either circumstance could obscure an otherwise observable effect of SBD.

In the small case study area such possibilities are unlikely. A proper evaluation should nevertheless pay attention to such external influence. The Consultant checked with the police department to see whether any events such as these were known to have taken place in the area during the period under consideration. No such special occurrences were identified.

It was concluded from an initial assessment of all these factors that there was no a priori reason to suspect that they might influence the incidence of the cnme under consideration in the sample areas.

5.3 Conclusions

Differences in reported crime, expressed as a ratio per dwelling, between a Secured By Design estate and a comparator area were examined after devising a two stage procedure combining statistical and contextual analysis. For the chosen statistical technique, a null hypothesis, the characteristics of the developments and availability of crime incident data were shown to be adequate to undertake the exercise, which should be replicable on a larger scale.

In the sample areas examined crime incidence was too low to demonstrate the efficacy or otherwise of Secured By Design from a statistical standpoint. As it happens the statistical tests undertaken for burglary incidence alone did not show a statistically significant difference, but those for all crimes considered, i.e. domestic burglary, theft *of* cars and theft from cars, did. A distinction is drawn between statistical testing and the crude data. observed crime incidence being considerably lower in the SBD estate than the comparator area.

The comparison gives encouragement to the Secured By Design concept, even though statistical testing may not have been conclusive. This stems in part from the social/occupancy comparison which suggests that, cetens paribus. the susceptibility of the SBD development to the specified crimes should be higher than that of the comparator area.

Wider application of methodology

The approach adopted needs to be applied to a larger sample of SBD estates to determine the effectiveness of the scheme. A more extensive application could involve either multiple comparisons along the same lines as this pilot or possibly aggregation of SBD samples and comparison with appropriate control areas.

The apparent low incidence of burglaries and car thefts in these areas may be a tribute to Secured By Design, but raises difficulties where the statistical analysis is more comfortable with larger numbers of occurrences. There are two implications for further research, first that the larger the SBD areas are the better, for analysis purposes; and second, that as long a time period as possible is used. This can also be expected to throw up larger numbers.

A more extensive evaluation would not necessarily be sufficient to establish how particular features of SBD affect crime incidence, for example, the efficacy of layout standards vs. improved individual house security precautions. However there is no way that such questions can be considered without having a much larger sample of SBD areas.

Other considerations

Administrative and operational issues relating to Secured By Design have not been addressed in this study but some senous practical issues related to the SBD qualification and criteria, and to publicity emerged from discussions with the developer. These are discussed in Annex A.

ANNEX A

SECURED BY DESIGN AND THE DEVELOPER

As a by-product of the main study, a discussion held with the developer of the sample SBD scheme raised important issues for Secured By Design practice. The most critical was the statement made by the Chief Executive that the company was no longer participating in Secured By Design because one of its schemes had not been accepted for SBD status. The complaint made was that the SBD criteria were too rigid, such that in one case where a footpath could not be re-routed, the whole scheme could not qualify for SBD status. This was, it was claimed, in spite of proposals to introduce other security features, e.g. floodlighting, high walls, that would effectively compensate for the footpath problem.

This developer had been a strong supporter of Secured By Design, the promotion tor Ins developments advertising SBD as an important feature. However it was important for him to be able to say that all his schemes were SBD. hence if one tailed the point of the concept was lost (he felt).

The Consultant was not in a position to pursue this issue, but it is clearly important to gain the full co-operation of developers. It would be worth considering whether the SBD procedure can be given a degree of flexibility. For instance, could a points system be devised that provides a total "SBD pass" level with a combination of security elements, allowing some substitution between them? Alternatively, could two levels of SBD be recognised, such as a minimum and full SBD status? Whatever the drawbacks of these options there is undoubtedly a problem to be resolved.

Further problems raised by the developer were the attitudes of planners (e.g. trying to get the position of garages accepted), and level of support and publicity on the police side. The former is perhaps a matter of more extensive consultation and education. The latter question is for the police. In practical terms there was. it was claimed, very little back up or publicity for SBD. A contrast was made with Neighbourhood Watch, with its follow up and support system, development of logos to put on lamp posts etc.

ANNEX B

ILLUSTRATIVE COSTS AND BENEFITS

Cosr.s

From cnscussion with the developer, most costs incurred arose from house strengthening measures (stronger doors and windows, better locks etc), rather than from increased costs *of* land *or* infrastructure. Other costs were incurred with setting up the scheme, inducing discussions with planners and the police. Assuming costs are defined as expenditure rliat would not otherwise have been incurred, total scheme costs for the 90 dwellings are provisionally estimated as:

Additional house-related costs <g) £450 per dwelling	£40,500
Developers discussions with planners, police etc say 3 days @ £500/day	£1.500
Architects' drawings, additional time, say 5 days *C0* £400 day	£2.000
TOTAL	£44.000

These costs are reflected in the house selling price, hence being borne in practice by the house purchasers.

Bcnefirs

Considering direct and indirect monetary benefits only, primary benefits are calculated as the savings in losses of property and damage from reduced burglaries and car crime. Secondary benefits are estimated from the impact of reduced crime upon the criminal justice system, although there is much debate about the savings realisable in practice from this.

Some notional crime incident reductions must be assumed for the SBD development. For the purpose of this exercise simplifying assumptions are made, that:

- the SBD and comparator areas are the same size;
- the observed reduced burglary incidence in the SBD area is directly attributable to its SBD character;
- car crime rates in the SBD area occur, in the long run, at the same reduced proportion (1/3) of the non-SBD area as does burglary;
- recorded crimes are assumed to be the only crimes.

From mese assumptions the numbers of crimes recorded during over the two "obsened" years and an extrapolated 10 year period are as follows:

	SBD area		Non-SBD area		Difference
	2 years	10 years	2 years	10 years	in 10 .u·ars
Domes .burglaries	1	5	3	15	10
Thefts of cars	(-)	7	4	20	13
Thefts ;rom cars	(-)	12	7	35	23

What are the costs of the crimes, in the last column above, prevented? It is reasonable to take gross costs for burglary and theft losses since the balance between the net and gross, met through the insurance system, is still a real cost. The 1992 British Crime Survey (op cit) indicates that the average cost of these is:

Cost area	£ costs/losses
Domestic burglary	Gross loss: Property: £650; Damage £190; Total £840
Theft of car	Net loss: Average per car £740 *
	Double figure for gross loss - Total £1480 **
Theft from vehicle	Net loss: Average per car £140
	Double figure for gross loss and to include cost of theft attempts (£70) - Total £280
Criminal Justice Costs	say, about £700 per crime ***

* (a) net loss of £560 per car recovered, N = 151
(b) net loss of £1530 per car unrecovered. N = 35
(cj average loss per car theft. £742.50. say £740

** approximate estimate based on BCS study

*** based on 15% of main Criminal Justice System costs (c.£1870m) divided by approximate estimate of number of these crimes (2.544m)

These costs are nominally summed to:

Domestic burglaries:	10 x £840 =	£8,400
Theft of cars:	20 x £1480 =	£29,600
Theft from cars:	5 x £280 =	£1,400
Justice costs:	35 x £700 =	£24,500
Total costs (savings)		£63,900

Assuming these events would occur evenly over the ten year period, discounting at a social preference discount rate for households of about *5-6%* will reduce this benefit shown above to a sum approximately equal to the estimated cost. Hence, since the social and psychological costs of crime are in any case excluded from the calculation, the SBD initiative on this basis would appear well worth while.

ANNEX C

DATA COLLECTION AND RESOURCE ISSUES

Data collection issues

A wider sample of schemes raises other questions of data collection. Apart from assembly of information on the SBD areas it is necessary to collect data on comparator areas. For this purpose the 1991 Census provides useful information at the Enumeration District level but has limitations where the SBD scheme has been constructed or occupied since the date of the Census, and of course is likely to contain a much larger number of dwellings. Some limited information can be obtained from the electoral register, but investigation of socio-economic charactenstics in more depth may require direct interview survey, at least on a sample basis.

An important source of information is of course the developer. Only he will know the completion date when properties are legally handed over (with the keys) and. in almost all cases, immediately occupied. This is important to mark the start date when burglary risk commences and start date for crime comparison. Unless this information is obtained it is difficult to conduct an evaluation of SBD.

Crime data requires extraction from police records. For Herts the computerised Criminal Information System (CIS) provides quick access to small area and street based crime incident data, and crime can be related to single dwellings although this takes longer. However since different forces use different computer systems there may be difficulties in preparing standardised datasets. In London there is not full computerisation of crime records, and manual extraction would be much more time consuming.

For spatial referencing the CIS has the useful attribute of grid references, although above street level there is only a beat and town spatial aggregation, but no ED or ward^ aggregation, so it cannot be linked directly to these Census units.

Data collection time

For the police in Hertfordshire it took only 5 minutes to generate initial data and a further 20 minutes to pnnt the reports. The "High Street" search took longer - 20 minutes to research before any printing - because each offence had to be inspected to find the street numbers required. Total time taken for compilation of the original data was approximately 8 hours, with several further hours expended preparing follow-up data requested by the Consultant.

The main potential problem with data extraction is simply the availability of staff to do the work. In Herts a researcher was able to put the data together, but he was only available part time. The Crime Analyst was full time but inevitably busy carrvin* out many other tasks. Preparing information for the pilot study therefore took considerable elapsed time, i.e. weeks rather than days. Hence although a more extensive appraisal should present no data extraction difficulties in principle (so long as there is computerised CIS), the whole exercise would be quite slow unless special assistance were provided.

A larger study would naturally involve preparatory work visiting, sifting and selecting the sample of developments to be studied, but this would be no different to practice in any comparable research study.

For the local authority, following an initial meeting, the time involved in extracting small area Census data and 1:1250/1:10,000 scale prints for the study areas was about a morning. In the event of a county wide or multiple district evaluation it may be quicker to obtain such data from the county.

ANNEX D

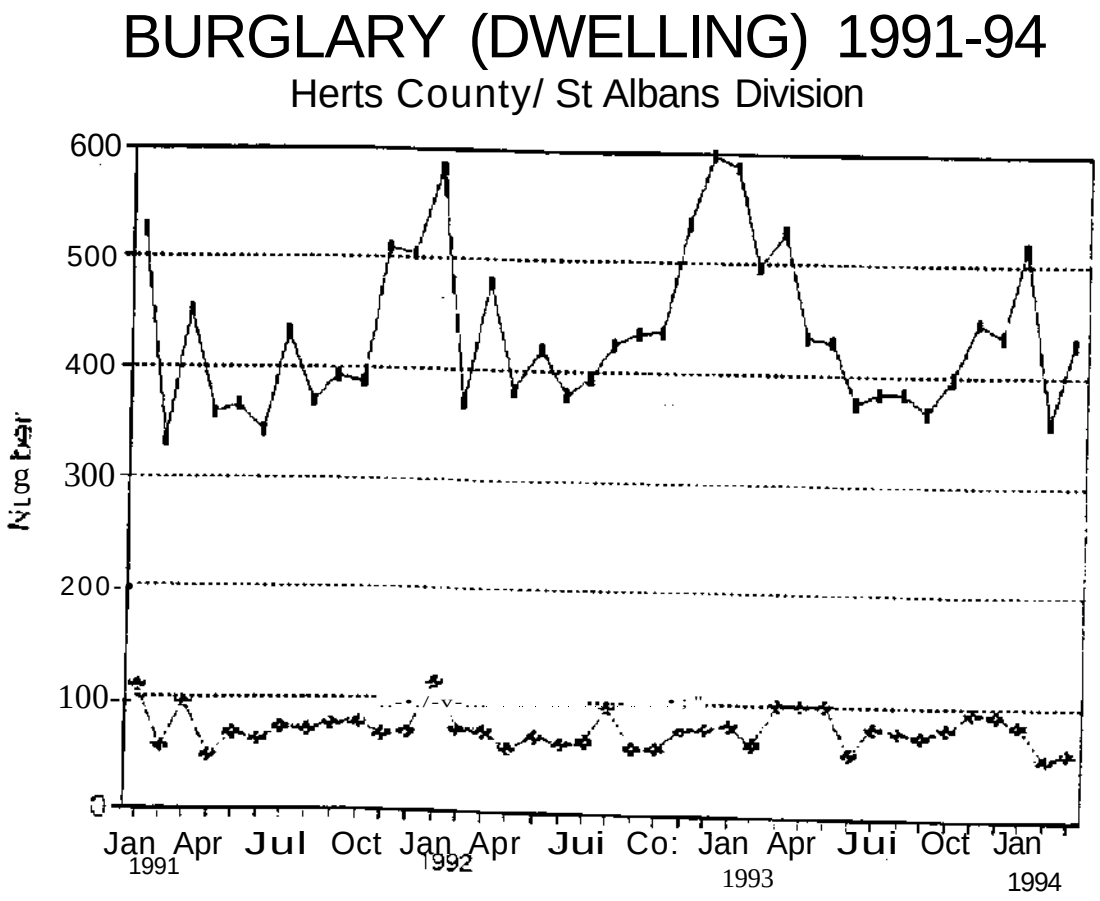
MORE DETAILED ANALYSIS OF CRIME TRENDS

More detailed study of crime context, and certainly before and after study of crime prevention initiatives in existing developments, are likely to require time senes analysis. Frequent seasonal variation between different types of crime can mask other cnme trends.

In this case it is necessary for these distorting effects to be smoothed, typically to decompose the series to a trend component, seasonal component, possibly cyclical or economic component, and a residual or random component. The pilot study was not geared to carry out extensive time series testing, but it is desirable that exercises of this nature assemble a time series for cnme data for at least three years. From a practical standpoint this is likely to be the minimum time period for use in a seasonal adjustment program which adjusts for monthly variations. A longer period is of course preferable.

To supplement the SBD area statistics monthly domestic burglary data was therefore also obtained for the Herts Police District and St Albans Division areas. These statistics (upper graph Herts District, lower graph St Albans Division) are shown in Figure 3.

Figure 3 Domestic Burglary in Herts Police District and St Albans Division



It may be seen that the Police District burglary figures display more marked seasonal variation than the Divisional (St Albans district) figures. There is also likely to be a trend over and above the seasonal pattern. The crime pattern time series may thus be seasonally adjusted and further decomposed to establish the trend, which would normally be the statistic used for the control area in contextual analysis, or before and after studies Although such analysis was not needed for the pilot study, a time series decomposition of the Herts Police District domestic burglary pattern was undertaken for illustrative purposes using the X-11-ARIMA based seasonal adjustment program. This package works out, through successive iterations, the trend-cycle component using a moving average process. With the particular technique deployed the moving average reflects varying periodicity, and is not therefore compatible with (say) a simple 3 or 12 month moving average.

This is shown in Figure 4, which shows clearly the trends of burglary in the County from 1991 to the end of the first quarter of 1994.

Figure 4 Herts Police District Burglary (Dwelling): Seasonally Adjusted and Trend