STREET LIGHTING AND CRIME:

the Cardiff Project

by

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ACKNOWLEDGEMENTS

This project was funded jointly by South Glamorgan County Council and Urbis Lighting Limited and this sponsorship is greatly appreciated. The elected members and officers of South Glamorgan County Council who were actively involved at all stages of the project, including the key stage of new lighting installation, did a great deal to ensure its success. Also members of South Wales Police who provided advice and data and Beaufort Research Limited who conducted the surveys ensured a truly collaborative exercise. Our thanks also to Ken Woolmer, who acted as representative of the British Parliamentary Lighting Group for his enthusiasm and involvement and to Kate Painter who helped guide the overall strategy for the project. This Cardiff project was part of a United Kingdom initiative and our exchanges of ideas with colleagues elsewhere proved invaluable. With one exception, the questionnaire used in the surveys took the same form in all project areas. Our thanks also to Lynn Muir for all her work in the preparation of the report and to Tom Burden who undertook responsibility for final desk-top publishing.

David Herbert
Laurence Moore

September 1991

EXECUTIVE SUMMARY

Objectives

The focus of the study is street lighting and its influence on community safety and the quality of the local environment.

The key factor is the way in which local residents perceive their local quality of life and the impact of improved lighting.

Method of study

Surveys were taken of residents before and after the installation of new lighting and were augmented by pedestrian counts and statistical analyses. A market research company, Beaufort Research Limited, undertook the main data collection.

The research was organized on a multi-agency basis and was paralleled by similar projects in other parts of the United Kingdom.

The Cardiff project centred on a part of the Tremorfa estate which satisfied the main criteria of a council estate with poor lighting and known social problems.

In the pre-Iighting survey a sample of 154 respondents WAS achieved (November 19th to December 3rd, 1991). A total of 152 respondents were interviewed in the post-lighting survey.

Problems on the estate

Perceived problems in Tremorfa were categorized into incivilities, crime, feelings of insecurity and attitudes towards local services. All of these figured prominently in residents' minds as detracting from their quality of life.

The major change after the installation of new lighting was the diminution in levels of problems. Lighting itself showed a very marked decrease as a perceived problem but many other indicators moved in the same direction.

Some problems increased post-lighting and included broken pavings, which may have become more visible, and dissatisfaction with some services.

Fear of **crime**

Fear of crime is a reality in the Tremorfa estate and covers a range of events from burglary to vandalism and car theft.

These fears remain but had diminished post lighting, especially in terms of fear of attacks against the person.

Much of the anecdotal evidence showed that awareness of problems and fear of crime arose from personal or near-personal experience.

Fear of crime and for personal safety had direct effects upon people's behaviour which was constrained in time and place.

Safety on the street

Before the installation of new lighting, risks after dark were thought to be high, particularly among women and the elderly. Lighting improvement created greater ease of mind for the majority of respondents, and particularly for these two 'vulnerable' groups.

Most people reacted to the perceived problems by taking precautionary measures, and generally continued to do so post lighting.

Tremorfa emerged from victimisation experience as a relatively high crime rate area; 48% of households had experienced at least one incident over the previous twelve months.

Gender and age differences

Women and older people were rather over represented in the sample, as they are in Tremorfa as a whole. These two groups tend to feel more vulnerable and to be more appreciative of improved lighting.

Post lighting there were significant reductions in levels of worry women have about crime.

Again the installation of new lighting had a greater effect on respondents over the age of sixty-five than any other age group. Older people tended to have higher levels of anxiety and to experience greater relief after lighting change.

Some effects of lighting change

Post lighting questions on the incidence of problems over the previous two years showed general reductions.

There is a clear 'halo' effect in the sense that although only one element of the local environment has been modified, residents perceive more general effects.

The post lighting survey was six weeks after installation of new lights but residents were prepared to modify their assessment of the previous two years.

Prior to lighting there was a negative image of the Tremorfa environment, this negative image remained post lighting, but there was a positive shift in attitudes.

Local awareness of problems

The growing dissatisfaction with the quality of life in Tremorfa was related to social rather than to design problems. Types of people moving into the area and the activities of gangs of youths on the streets figured prominently as perceived problems.

Residents saw solutions in terms of increasing police presence, harsher sentences and better community facilities. Street lighting had helped but the need for social policies remained.

The 'halo' effect of improved street lighting was also evident in attitudes towards services.

Improvements in street lighting have had many positive effects in the short-term and the extent of improvement is disproportionate to the actual amount of change.

Tremorfa is a residential area with deteriorating confidence for its older residents, any positive sign of improvement is welcomed *and* the reactions to better lighting are symptomatic.

Preferred strategies for change

Design improvements are important but improvement of local social control may be the eventual priority. Police, welfare services and facility provision all have vital roles.

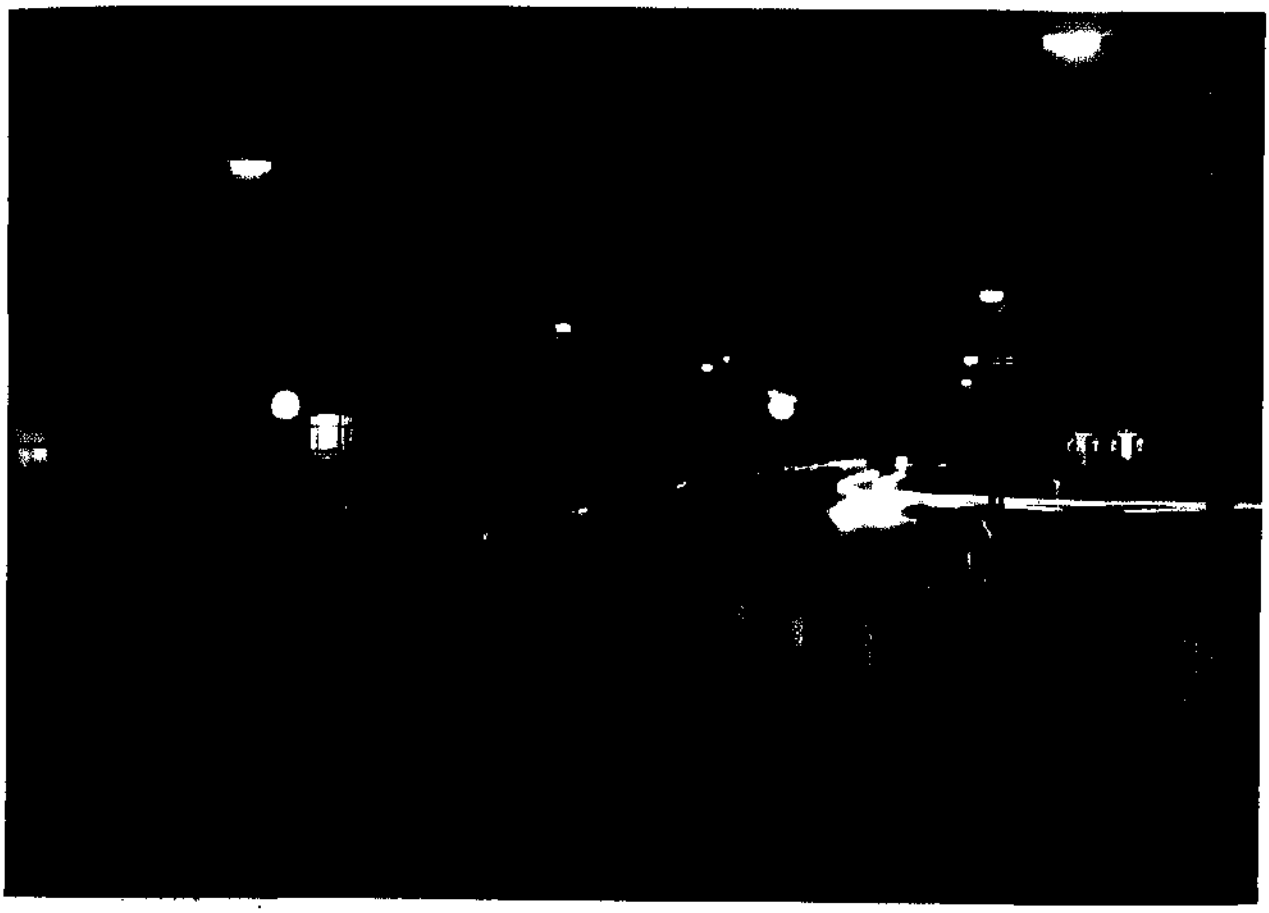
Strategies for local community improvement need to be sustained if short-term gains are not to be lost.

INTRODUCTION

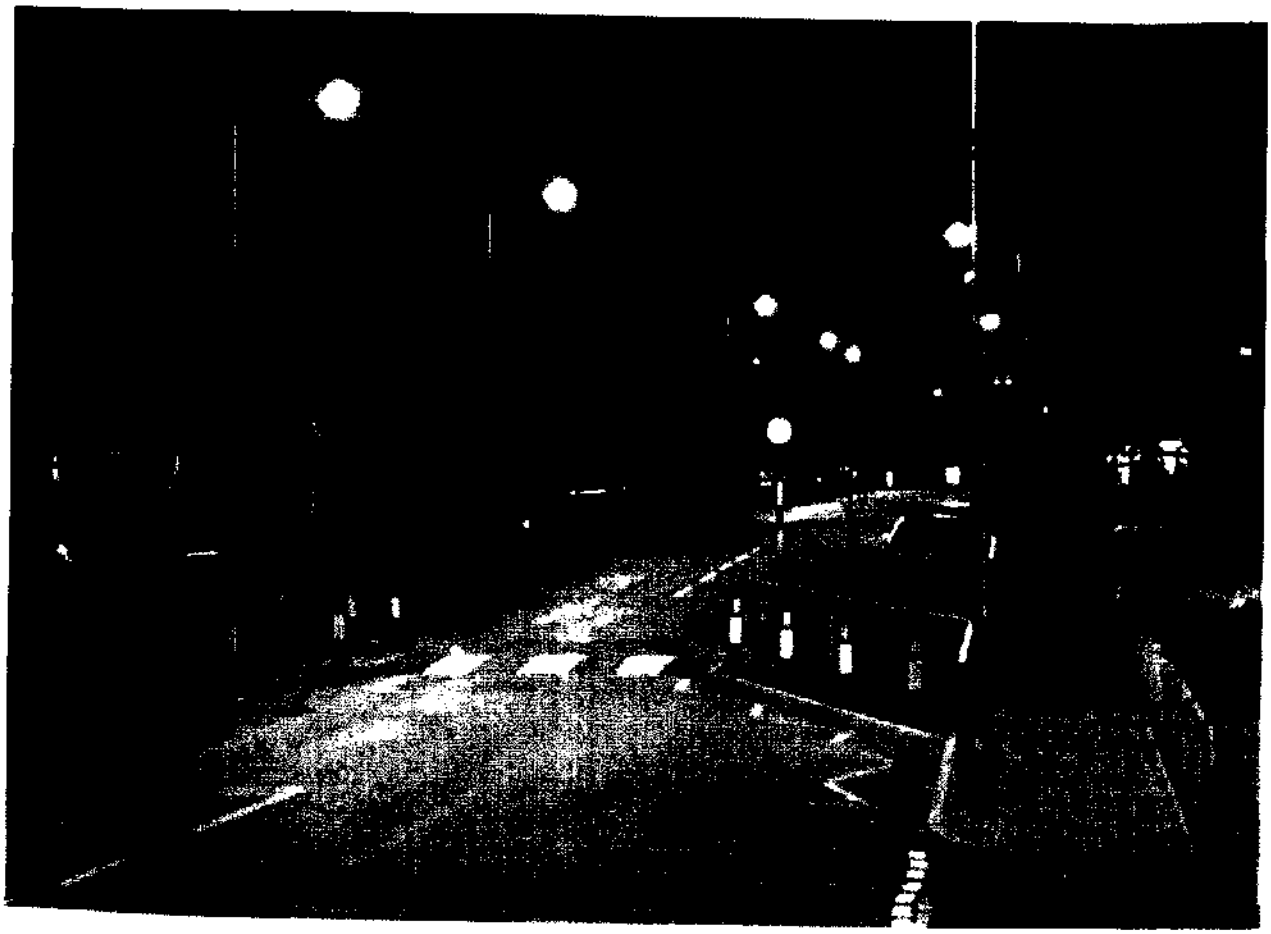
Crime is widely and reasonably accurately perceived as a major and growing issue for those charged with the maintenance of law and order. Crime is also a major concern for ordinary people and one of the most striking confirmations arising from the British National Crime Surveys of the 1980s and from other surveys is that people's experience of crime is far greater than that suggested by official statistics. As Susan Smith (1989) recently suggested some areas are getting meaner and the experience of crime falls disproportionately on those people who occupy them. These recent surveys suggest that victimisation experience is far in excess of official crime rates; they also show that fear of crime and feelings of lack of community safety are widely prevalent. Such fear is often unfounded but nonetheless has a stark reality for all of those who experience it. As with all social problems, experience and fear of crime does not fall evenly on all sections of the population or on all places. Some people **are** more vulnerable, others **feel** themselves to be more vulnerable. The life-style of youths in some inner city areas puts them more at risk for example, the frailty of old people gives them feelings of insecurity. It is the wealthy who have the means of protection and middle-class suburbs often emerge as relatively safe areas in any geography of crime.

Crime is not **one** thing but covers a range of forms of behaviour which society has labelled as being illegal. These 'definitions' vary from one society to another and although there is a good deal of conformity the fit is by no means perfect. There are many forms of crime and there are also many different ways of studying crime and of attempting to find ways of ameliorating its effects. As an academic study, this particular project can best be described as an approach based upon the concepts of environmental criminology. This approach focuses attention on the localities in which crimes occur. Within these localities it is concerned with the detailed elements of the environment which may contribute to *An* understanding of the incidence of crime. The 'environment' in this sense involves both the physical features of the design, quality and content of the 'built' environment but also the 'social' environment created by the residents which makes it the kind of **place** it is.

A great deal of recent and relevant research has used this environmental criminology approach. Oscar Newman (1972) is perhaps the best known of those researchers who tried to bring together in a 'model' a set of conditions which would pre-dispose a locality towards the incidence of crime. His concept of 'defensible space' suggested design features which would strengthen local social control and reduce vulnerability to crime.



Before Re-lighting . . . . .



Jane Jacobs (1961) was an earlier though less specific advocate of this type of approach but Newman gave it coherence and proved the main catalyst for more detailed studies. Within the United Kingdom, Alice Coleman (1985; 1989) has applied these principles in her detailed studies of inner London boroughs. Using a range of measures of design and quality features she developed an Index of Disadvantage which expressed the total number of defective design features present in residential blocks. The higher the scores on this Index, the more vulnerable a block would be to crime. The Home Office (Hope and Hough, 1985) has expressed interest in the measurement of incivilities in the local environment. These are indictors of neglect such as broken windows and litter, or of defacement such as vandalism and graffiti, which suggest an absence of good social control. One suggestion is that the incidence of incivilities is a good indicator of the incidence of crime. Recent reports have suggested that control should focus to some extent on local conditions. The Grade Report (1989) emphasised environmental change as one means of reducing fear of crime; Gottfredson and Hirschi (1990) recommended more studies of localities to understand patterns of victimisation and fear.

Street lighting is a single example of the kind of local environmental feature contained in studies of environmental criminology. It is implicit rather than explicit in studies of defensible space; the theory is centrally concerned with levels of visibility, surveillance and observability even if it does not specify street lighting as a critical indicator. Poor or badly maintained street lighting would constitute an incivility which in association with other environmental 'defects' could increase an area's vulnerability to crime.

In this project the strategy was to improve street lighting in a specific area and to monitor the impact of this single change in the quality of the local environment. In contrast with Coleman's work with the Index of Disadvantage it is a single-stranded approach rather than a 'package' of environmental improvements. This kind of environmental change is intended to reduce the vulnerability *oi* an area to crime *L\i\d* also. perhaps more realistically, to reduce tear of crime. The project in common with others supported by the British Parliamentary Lighting Group has the general aim of promoting community safety ^*nd* of improving the quality of life within localities. The research will examine the extent to which people have been victims of crime *and* the fears they hold for themselves *And* their families in terms of crime and anti-social behaviour.

Improved street lighting is the focus of this project and offers a new approach with relatively few precedents. Kate Painter (1989) studied the effect of improved street lighting and commented that 'it is now generally accepted that improved lighting makes people feel safer' (p.107). She extended this analysis to the context of women's fear of crime and argued that good public lighting will not eradicate the causes of sexual violence towards women, nor will it necessarily reduce the incidence of such attacks. However, by affecting the offender's fear of being seen and challenged in well-lit environments, some progress can be made in preventing or reducing crime and fear of crime among women (Painter, 1992). There is some established research therefore which supports the effectiveness of improved street lighting as an environmental control. The findings of this project in Cardiff and its associated projects in other British cities are intended to build up a substantive body of research evidence in this area.

BACKGROUND TO THE STUDY

The initiative from the **British Parliamentary Lighting Group** encompassed a number of study areas with the United Kingdom. The Cardiff project was dependent upon the co-operation of several agencies, though principally the **South Glamorgan County Council,** and also upon additional funding support from **Urbis Lighting Limited.** All of these essential forms of co-operation and support were forthcoming. In addition to both elected members and officers from South Glamorgan County Council, there was active involvement from the police in Cardiff. Taking into account the roles of academic researchers and the market research company who conducted the surveys, this was a multi-agency approach and the round-table meetings involving all of these agencies had positive roles in the progress of the research project.

South Glamorgan County Council was prepared to manage its programme for the improvement of street lighting so that a residential district could be surveyed before and after the implementation of *AI* improvement scheme. The initial task, which proved difficult, was to identify a suitable area. There were a number of constraints on the choice of site:

O it had ideally to be within the proposed programme of street lighting renewal established by the local authority

O it would be a compact and recognizable residential area of uniform characteristics

O the quality of street lighting should be consistent throughout the area

O there should be around 250 households on the streets to be included within the survey

O the area should be one with recognised social problems, particularly relating to crime.

The site eventually chosen to match these criteria was within the Tremorfa district of Cardiff (see Figure 1) and contained five roads which were scheduled for replacement and upgrading of existing street lighting. The roads, identified on Figure 1, are Tweedsmuir Road, Storrar Road, Pengam Road, Whitaker Road and Cairnmuir Road. As is evident, Tweedsmuir and Storrar form one main routeway through the estate joining at right angles with Pengam and Whitaker. Cairnmuir Road is a cul-de-sac leading off Tweedsmuir Road. Within this set of roads are 289 dwelling units which form part of the compact Tremorfa estate, built as local authority rented accommodation in the late 1920s. From 1981 Census small area statistics and 1986 estimates by wards it is possible to profile the Tremorfa estate and some key indicators are included in Tables 1 and 2. These tables reveal some interesting

features and trends. In comparison with Cardiff as a whole, Tremorfa has a larger number of people of retirement age and this has increased progressively since 1971. The number of households which include at least one pensioner is now over half the total in the ward. Tremorfa has a lesser number of immigrants than the Cardiff average but on key indicators of deprivation such as unemployment and lack of cars, it scores poorly. As is common in many cities, immigrants tend to be concentrated in specific areas and in Cardiff the dockland communities are the traditional clusters. Over time unemployment has increased sharply in Tremorfa from 7.2% for men in 1971 to 36.2% in 1986. There is a decline in family (3 to 5 person) households and an increase in single-person households which reflects demographic change and an increase in owner-occupancy which is counter-balanced by the downward trend in housing rented from the local authority.

Figure 1 The Cardiff Project Area

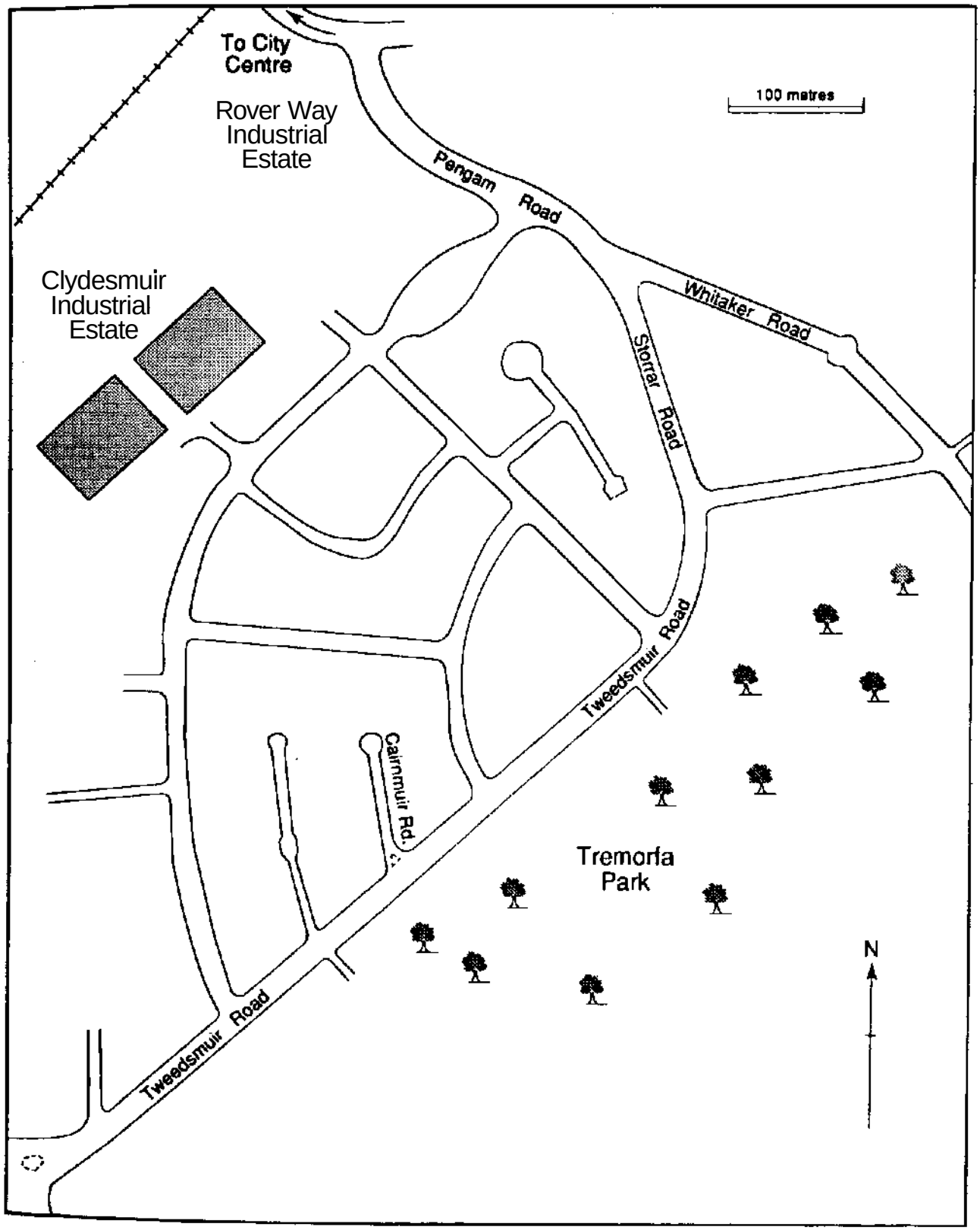


Table 1: Demographic Profile: Tremorfa and Cardiff, 1986

	Tremorfa	Cardiff
Population of retirement age	33.2	21.6
Resident born outside U.K.	2.1	4.6
Private-rented households	1.8	6.3
Single-parent households	5.8	3.7
Male unemployment	36.2	18.3
Female unemploymeat	26.8	12.1
Households with no cars	70.4	43.5

Tremorfa county electoral division. All figures are percentages.
Source: 1986 Cardiff Social Survey (SGCC).

Table 2: Area Profile: Tremorfa, 1971-86

	1971	1981	1986
Population of retirement age	26.2	29.3	33.2
Unemployed males	7.2	27.1	36.2
Public sector housing	72.8	65.8	60.7
Owner-occupied housing	24.4	31.5	37.5
1 or more pensioner households	26.8	35.0	50.5
1 person households	15.3	27.1	35.1
3-5 persoi' households	41.0	33.3	24.5
Households with no car	70.5	69.8	70.4

Tremorfa county electoral division. All figures are percentages.
Sources: 1971 and 1981 Censuses (OPCS), 1986 Cardiff Social Survey (SGCC).

The area profiles contained in Tables 1 and 2 suggest an area with an above-average (in comparison with Cardiff as a whole) incidence of social problems and also an ageing resident population. Key indicators such as numbers of single-parent households, level of unemployment and pensioner-households are all typified by high or increasing scores. Additional evidence emerged from the household surveys which confirmed these characteristics. There were large numbers of elderly people in the Tremorfa estate, many of whom had been resident there for a long time. Qualitatively, there was evidence of a strong sense of local community feeling though this may be under threat at this point in time. Although there is local crime, general statistics indicate that the Trernorfa estate does not rank with the worst problem estates in Cardiff

a fact which was confirmed by local community police officers. There is a general point about the study area which is worth emphasis. That is that whereas it has problems and shows signs of deprivation and disadvantage, it is not generally regarded as a 'problem estate'. Its problems, though not trivial, are far less than some of the worst areas in the City of Cardiff.

RESEARCH METHODS

Research aims

The project was specifically concerned with the relationship between street lighting and a number of specified local conditions. The strategy of improving the street lighting allowed the impact of a specific change upon these conditions to be examined in a detailed and controlled way. The main local conditions examined were:

- incidence of crime
- fear of crime
- residential area satisfaction or well-being

Research methodology

Three main data sources were used to assess the impact of improved street lighting in the area:

a) The major focus was on the comparison of data collected in pre- and post-lighting household surveys. The questionnaires used for this part of the study have been developed and extensively piloted in previous studies undertaken by Painter. The questionnaires comprehensively cover respondents' crime victimisation histories, their perception of and satisfaction with the physical and social environment in the Tremorfa area, their main worries and concerns, and their adoption and perception of various crime prevention strategies. Respondents were not told the purpose of the survey, and questions were worded so that the main focus of the survey (lighting and crime) did not appear obvious.

b) Additional primary data were collected in the pre- and post-lighting periods regarding the volume of pedestrian traffic in the study area after dark. These data indicate whether changes in street lighting affect the degree to which people are happy to be out on the streets after dark. Pedestrians observed in the study period were recorded according to their sex, approximate age, and the size of group they were in. These data were collected by observation rather than interview.

c) Secondary data in the form of recorded police crime statistics were used to monitor any impact on actual recorded crime in the area that is coincident with the improvement in street lighting. This was achieved with the co-operation of South Wales Constabulary, and particularly with the help of the Rumney Crime Statistics Collator. Detailed crime data for the study area were collected for the two six-week periods 12th November, 1990 to 23rd December, 1990 (pre-lighting) and 14th January, 1991 to 24th February, 1991 (post-lighting). Comparison of the data for

the two periods also refers to the wider area of the Tremorfa 'beat', for which crime data are routinely collected.

Research schedules

The scheduling of the various stages of the research was of central importance for the successful completion of the project. Critical factors in this scheduling were South Glamorgan County Council who had to install the new lighting within a relatively narrow time-band and **Beaufort Research Limited** who were engaged to conduct the surveys. These surveys had to be timed and completed to give a set of attitudes and opinions under the old lighting conditions and then had to be repeated after the new lighting had been installed to assess the impact. In fact all these scheduled activities fell into place extremely well. The pre-lighting survey was completed during the period 19th November, 1990 to 3rd December, 1990. The pedestrian traffic count was undertaken on the nights 27th November, 1990 to 1st December 1990. Lighting installation work by South Glamorgan County Council contractors commenced on 3rd December, 1990 and was completed when the lights were brought into use on 21st December, 1990. The details of the lighting installation programme are given in Appendix One. The post-lighting survey was undertaken in the two-week period commencing 22nd February, 1991, with the pedestrian traffic count taking place 26th February to 2nd March, 1991.

The rationale underlying the research design is that any differences of questionnaire responses, pedestrian traffic and recorded crime in the pre- and post-lighting survey periods may be related to the installation of new street lighting in the intervening period. Every attempt was made to minimise possible confounding factors. For example, identical survey methods were used in all three areas of data collection in the pre- and post- lighting periods. Many of the questions in the household questionnaires were identically worded in the two surveys. It was also fortunate that weather conditions in the two survey periods were very similar (cold and dry), as markedly different conditions (particularly rain or snow) may have affected some questionnaire responses, and would certainly have affected pedestrian activity. The construction *oi* a sheltered housing scheme and small community centre in Tweedsmuir Road continued throughout both survey periods; if this had been completed or been near completion between the survey periods, responses to some of the attitudinal questions may have been affected. Other significant confounding factors were not detected.

Response rates and basic sample characteristics

The sample frame for the pre-Iighting survey consisted of 262 households. No contact was made with 25 of these households. At the remaining 237 (90% of selected sample), an initial respondent was asked to list all household members aged 17 or over. From this list, one individual was then randomly selected as target respondent, using a respondent selection grid issued to all interviewers. The sex and age breakdown of selected respondents is given in Table 3, and as they are randomly drawn from 90% of households in sample are therefore highly representative of the sample population. Fifty-one of these target respondents refused to be interviewed, whilst others could not be contacted or were unable to give an interview. The final sample of completed responses achieved was 154 *(65%* of selected respondents), an overall response rate of *58.8%,* Comparison by age and sex of respondents with target respondents indicates that there was no strong bias in response rates, although there was a slight over-representation of females over 60 years of age and under representation of males aged 36-59 (see Table 3).

Table 3: Pre-lighting Survey: Sample by Age and Sex

	SELECTED RESPONDENTS				COMPLETED INTERVIEWS		
AGE	**Male No.**	**Fem. No.**	**Total %**	**AGE**	**Male No.**	**Fem. No.**	**Total %**
17-35	**30**	**39**	**29%**	17-35	**16**	28	29%
36-59	**31**	**32**	**27%**	36-59	15	22	24%
>60	**41**	**64**	**44%**	>60	28	45	47%
Total %	**43%**	**57%**	N=237	Total %	38%	62%	N=154

The aim of the post-lighting survey was to re-interview the same 154 respondents as far as possible. The advantage of this is that it will enable direct comparison of results from pre- and post-lighting surveys without having to take account of significant confounding of comparisons due to possible differences between the samples in the two surveys. Of the original 154 respondents, 125 (81%) were re-contacted and completed a post-lighting interview. This is a higher than expected level of re-recruitment and will strengthen the significance of any differences found between pre- and post-lighting in the data analysis.

Of the remaining 29 respondents, 13 refused, 4 Were ill, 4 had moved and 5 were not contacted after 4 calls. Another 3 interviews were undertaken with different individuals in households previously surveyed. A further 24 interviews were completed with respondents from 32 households *(75%)* in the study area that were not approached in the

pre-lighting survey. A final sample of 152 was obtained. Table 4 shows the composition of the sample by age and sex. In comparison with the completed interviews pre-lighting, the post-lighting survey sample has marginally fewer males under 60, yet more males over 60, resulting in a slight shift towards an over-representation of the eldest group, yet no change in overall sample composition by sex.

Table 4: Post-lighting Survey: Sample by Age and Sex

AGE	COMPLETED INTERVIEWS Male No.	Female No.	Total %
17-35	11	27	25%
36-59	14	24	25%
>60	33	43	50%
Total %	38%	62%	N=152

54% of households in the pre-lighting survey did not have access to a car or van, a lower figure than indicated by the 1986 Social Survey (70.4%), which in itself seems unusually low (lower than 1981 Census data despite the general rise in car ownership levels throughout the last decade). 51% of post lighting survey households did not own a car or van.

THE NEIGHBOURHOOD

Neighbourhood stability

It has already been suggested that there was some subjective evidence to indicate that the Tremorfa estate was a stable and well-integrated community. Some of the evidence which emerged from the pre-lighting survey did offer confirmation for this view. 93% of those interviewed had lived in Cardiff for over twenty years and 51% had lived at their present address for over 20 years. Although these figures seem unusually high, the sample representativeness has been demonstrated above, while further support is indicated by the 1981 Census which shows that 91% of Tremorfa's population was at that time born in Wales (compared to 81% for Cardiff district). Social integration was high with 55.8% claiming that they knew 'all' of their neighbours and 70% that they had relatives or close friends living nearby, within a twenty minute walk (see Tables 5 and 6). This profile of a stable and well-integrated community has to be qualified on two counts. Firstly, as already noted, if there is a problem arising from the low response rate it is that these older, longer-term residents are over-represented. Secondly, there was a significant amount of anecdotal evidence which will be detailed later in

this report, which suggested that the estate was experiencing social change. Many respondents referred to new 'types' of people moving in with the implication that these were disruptive and tended to 'lower the tone' of the community.

Table 5: Length of residence (in years)

	1-4	5-9	10-19	20+
How long lived at this address	22.0	12.3	14.3	51.3
How long lived in Cardiff	2.6	-	3.9	93.5

All figures are percentages.

Table 6: Social interaction in Tremorfa

	All	Most	Few	None
How many neighbours known	55.8	21.4	20.1	2.6
		Yes	No	
Relative/friends live close by		69.5	30.5	

All figures are percentages.

Problems in Tremorfa

The main thrust of the questionnaire was to direct residents' attention towards feelings of safety in the estate and experience of crime or crime related activities. Respondents to the pre-lighting survey were asked whether there were any serious problems associated with living in the area. Over 20% said there were serious problems. Of the examples of serious problems which were cited, half were related to local traffic conditions.

> Too much traffic using this road"
> "The youths screeching around the roundabout".
> "It's like a racing track with all the cars and motorbikes"

Other serious problems referred to other residents often in flats:

> "Trouble with people in the flats - drunks"

and the persistent mention of youths:

> "A gang in Tweedsmuir Road and a gang outside the Chinese shop".

both surveys, respondents were asked about different things which might see as a problem in the Tremorfa area. These can be divided the four main categories of incivilities, crime, insecurity and equate services (Table 7). Street lighting was included in this list was not emphasised in any way as there was a need to avoid sing any special awareness of a lighting issue in advance of the iting enhancement scheme and the second survey.

Some indication of the significance of incivilities has already been given it some further clarification on these and on the typology used in Table 7 may be used. The typology is a set of broad categories into which the various types of problems identified by residents may be placed. Incivilities are taken as those indicators of neglect within the local environment. They are signs of deterioration and lowering Standards and are linked with lower levels of social control. Some studies of incivilities (Hope and Hough, 1985) suggest that they can, if measured properly, act as a good indicator for the incidence of crime. Smith (1989) argued that fear of crime was linked to perceived levels of incivility within local environments:

> "It seems that a variety of neighbourhood 'incivilities' including litter, graffiti, damaged property, loitering vagrants or youths, and so on, tended to be interpreted as evidence of criminality. These can alert people to the **prospect** of deviance and may so heighten their sense of fear" (Smith, 1989: 197).

One category therefore can be termed incivilities. The crime category contains specific offences or criminal acts which are judged to be problems in Tremorfa and include offences against both property and person. The 'insecurity' set of problems does have potential overlap with the incivilities but is restricted to behavioural experiences, whilst the services category includes complaints about local services and social conditions. Table 7 shows the four categories of problems:

Table 7: A typology of problems

Incivilities	Crime	Insecurity	Services
broken paving	vandalism	atraid to go out	public transport
rubbish/ litter	burglary	after dark	refuse collection
youths	robbery	car-parking	employment
noise	theft of/from cars	being pestered	leisure facilities
dogs	racial attacks		
poor lighting			

Chart 1: Things perceived as a problem (%)

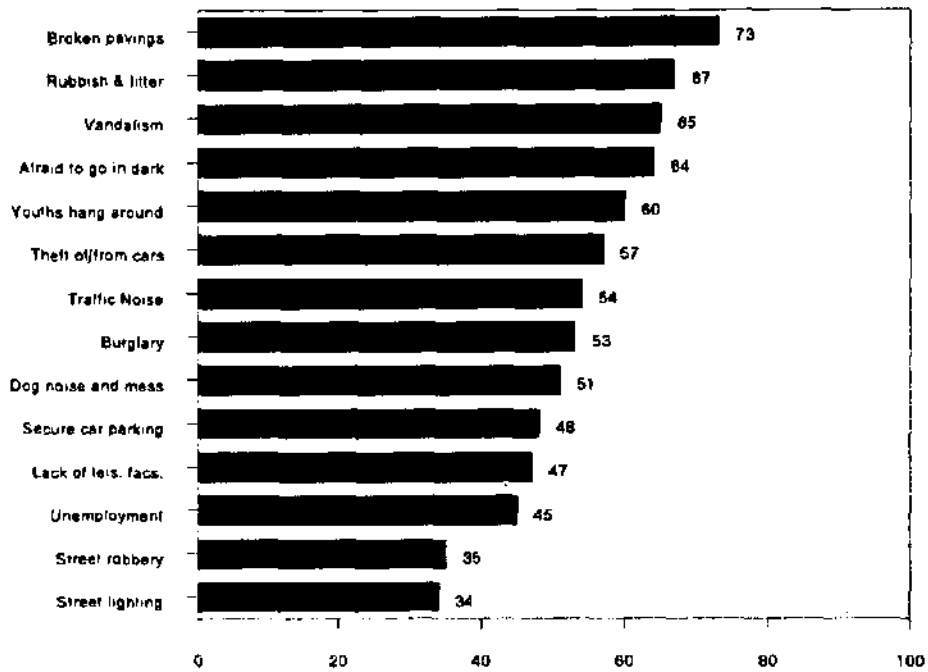


Table 8: Perceived problems (pre-lighting)

	Percentage stating item to be a problem (BIG problem in brackets)
Broken pavings	**73% (44%)**
Rubbish & litter	**67% (32%)**
Vandalism	**65% (33%)**
Afraid to go out after dark	**64% (34%)**
Youths hanging around	**60% (33%)**
Theft of/from cars	**57% (29%)**
Traffic Noise	**54% (28%)**
Burglary	**53% (15%)**
Dog noise and mess	**51% (23%)**
Secure car parking	**48% (22%)**
Lack of leisure facilities	**47% (24%)**
Unemployment	**45% (21%)**
Street robbery	**35% (8%)**
Street lighting	**34% (10%)**

Table 9: Perceived problems, changes pre- and post-lighting

	PRE		POST	
	Percentage stating item to be a problem (BIG problem in brackets)			
Broken pavings	*73%*	**(44%)**	*76%*	(47%)
Rubbish & litter	*67%*	(32%)	**59%**	(25%)
Vandalism	*65%*	**(33%)**	**54%**	**(16%)**
Afraid to go out after dark	**64%**	**(34%)**	**69%**	**(14%)**
Youths hanging around	**60%**	**(33%)**	**56%**	(20%)
Theft of/from cars	**57%**	**(29%)**	**51%**	**(16%)**
Traffic Noise	**54%**	(28%)	**40%**	**(13%)**
Burglary	**53%**	**(15%)**	**42%**	**(10%)**
Dog noise and mess	**51%**	**(23%)**	**70%**	**(45%)**
Secure car parking	**48%**	**(22%)**	**51%**	**(18%)**
Lack of leisure facils.	**47%**	**(24%)**	**59%**	**(26%)**
Unemployment	**45%**	**(21%)**	**61%**	**(30%)**
Street robbery	**35%**	**(8%)**	**24%**	**(4%)**
Street lighting	**34%**	**(10%)**	**6%**	**(3%)**

Tables 8 and 9 and Chart 1 show the extent to which respondents recognized these problems in their residential area before and after the lighting improvement scheme and the kinds of changes in attitude which occurred. There is **a** high level of perceived incivilities. Almost three-quarters of respondents in the pre-lighting survey (Table 8) thought that broken pavings or bad pavement surfaces were a problem; over two-thirds recognized a litter problem. The 60% who cited youths on the streets as a problem was significant as this figured prominently **as** a complaint in the anecdotal evidence. Within the incivilities set street lighting did not figure prominently as a recognized problem, but did concern one-third of respondents. It should be remembered that in the pre-lighting survey, care was taken not to emphasise lighting as a specific issue. Among the crime variables, vandalism and thefts of or from cars were the most commonly cited problems. A point to emphasise here is that in recognizing problems, respondents are not necessarily relating their views to the particular streets in which they live, nor indeed to their direct experience. The main expectation is that responses will be generalised to the Tremorfa estate as a whole, but attitudes are of course affected by what people read about in newspapers or see reported on television. So awareness of car theft is high although levels of car ownership are low; about one-third thought robbery was a problem although there has not been an officially recorded robbery in the survey area for some years. It is the perception of problems which is being recorded rather than the actuality.

Under the heading of insecurity, the large group (64%) stating that they were afraid to go out after dark, is of interest. Here is a clear indicator of a sense of fear and insecurity which has a direct impact upon normal behaviour. Similarly, the 48% who felt there was no secure parking for cars was indicative of this feeling of insecurity. The last category of 'services' is incidental to the main thrust of a study of the relationship between lighting and crime. It is included because many respondents cited poor services as problems which they faced; it became of interest because attitudes towards even these kinds of problems seemed to change.

Table 9 shows the general shifts in attitude between pre- and post-lighting surveys and Column 1 in Table 10 expresses these as a percentage change. Generally the results after lighting improvement are in the direction of desired change with some increase in positive attitudes towards the local environment. There are exceptions which can be explained but the trend of change is extremely encouraging. Under the category of incivilities there is a dramatic improvement in assessment of the quality of street lighting with 70% fewer people believing it to be a big problem. There are shifts of opinion in the same direction for perceived problems of noise (54%), youths (39%) and litter (22%). For two of the commonly mentioned incivilities, broken pavings and dog-mess, perceptions of problems actually increased. This can be partly at least attributable to the fact that these problems become more visible, though this argument does not seem to account for the reduced perception of litter. Under the category of crime indicators, there are very significant gains in terms of improved attitudes. All of the crime indicators show sharply reduced levels of perceived problems in the post-lighting survey and these trends are very encouraging. Again, it is important to stress that these are changes in residents' attitudes. There is no clear collaborative evidence on reduced crime rates but to reduce people's feelings of insecurity because they believe crime to be less prevalent is in itself a major gain.

Under the heading of insecurity, the 49% reduction in those believing that being afraid to go out after dark is a big problem is a major finding. It shows that reduced perception of crime leads to reduced fear of crime and that this in turn affects behaviour. The only explicit change between the two surveys has been the improved street lighting but its impacts have been clear and widespread. Under the services category, there should be no direct relationship with the lighting change and indeed the main issues of unemployment and lack of leisure facilities for the young are seen as increasing problems.

This section has examined residents' perceptions of problems in the Tremorfa area and has recorded the ways in which these perceptions have changed between the pre- and post-lighting surveys. The general trends of change are encouraging and are strongly supportive of the value of improved street lighting as a means of improving community safety and attitudes towards the local quality of life. Further evidence of these 'positive' changes will be presented later in the report. It is important however to keep a sense of perspective. The problems of Tremorfa have not gone away. People have 'better' attitudes and clearly welcome the change but at the same time they remain aware of the deficiencies of their local environments. It is an improvement wliich is being recognized not a solution. Again, the 'time-lapse' issue has to be relevant. With the new street lighting still a novelty, attitudes may improve sharply; as the novelty wears off there may be further change in less promising directions. This latter possibility remains to be tested.

Table 10: Percentage Change in Items Being Big Problem By Sex

	All	Females	Males
Street lighting	- 70%	- 83%	- 50%
Traffic noise	- 54%	- 52%	- 60%
Vandalism	- 52%	- 39%	***- 73%***
Street robbery	- 50%	- 50%	**- 50%**
Afraid to go out after dark	- 49%	- 43%	**-61%**
Theft of/from cars	- 45%	- 34%	***- 63%***
Youths hanging around	- 39%	- 42%	- 30%
Burglary	- 33%	- 45%	+ 2S%
Rubbish & litter	- 22%	- 38%	+ 18%
Secure car parking	- 19%	-	- 39%
Broken pavings	+ 7%	+ 4%	+ 14%
Lack of leisure facilities	+ S%	+ 23%	+ 9%
Unemployment	+ 43%	+ 67%	+ 11%
Dog noise and mess	+ 96%	+ 72%	+ 100%

Table 10 breaks down the perception of problems by sex. Although the percentage drop in the number of respondents who see the above items as a big problem is similar for both sexes, in many cases, and particularly with crime and insecurity problems, women were more worried about these issues than men prior to lighting, <*md* have shown a much larger absolute reduction in citing them as big problems. For example, prior to lighting, 42% females (18% males) were afraid to *go* out after dark, but after lighting installation , this had fallen by nearly half (43%) to 18% (by 61% to 9% for men). Similarly, prior to lighting, a third of women stated that youths and vandalism were big problems, but both fell by about 40% in the post lighting survey. Chart 2 gives a

graphical depiction of the extent and direction of change following re-lighting.

Chart 2: Extent of **changes in items perceived to be a problem after the re-lighting(%)**

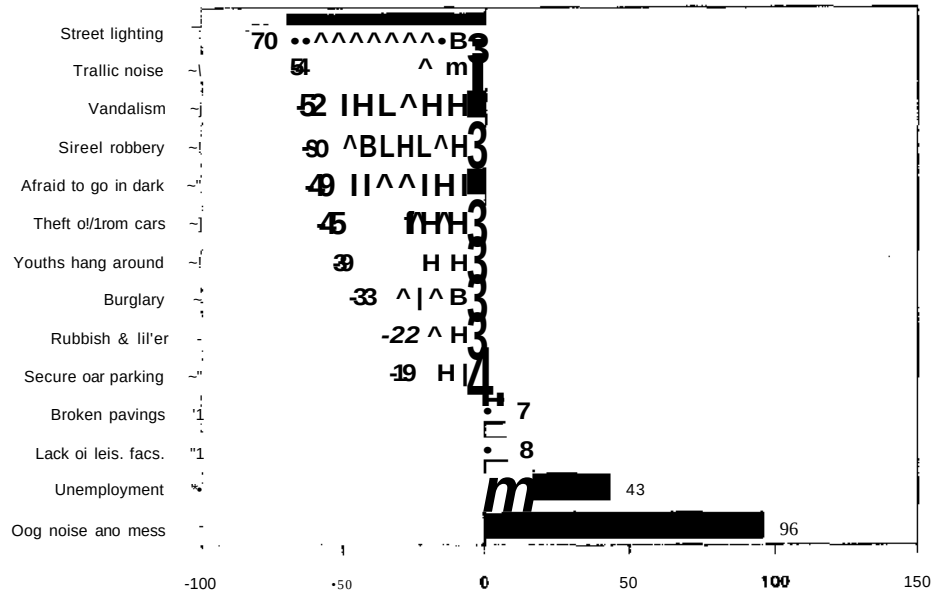


Table 11 disaggregates perceptions of big problems by age group. It is immediately clear that the lighting installation has had most effect on respondents aged over 65. Prior to lighting, 49% of elderly respondents stated that going out after dark was a big problem for them, twice as many as in the younger age groups. However, after lighting installation only 15% of over 65-year olds felt this was still a big problem, a drop of 69%.Street lighting, traffic noise, vandalism, street robbery and burglary are all items that experienced reductions of 70% or more in the proportion of over 65-year olds finding them to be a big problem. This indicates significant success in relieving the insecurities and fear of crime experienced by the elderly residents of Tremorfa.

Table 11: Percentage Change in Items Being Big Problem By Age

	All	17-35	36-64	65+
Street lighting	-70%	**-79%**	-73%	-71%
Traffic Noise	-54%	-33%	-48%	*-71%*
Vandalism	-52%	-38%	-50%	-73%
Street robbery	-50%	-43%	-25%	-78%
Afraid to go out after dark	-49%	-38%	-52%	-69%
Theft of/from cars	-45%	-49%	-31%	-65%
Youths hanging around	-39%	-38%	-39%	-38%
Burglary	-33%	+91%	-47%	-78%
Rubbish & litter	-22%	+4%	-38%	-21%
Secure car parking	-19%	-25%	+5%	-40%
Broken pavings	+7%	+5%	+31%	-10%
Lack of leisure facils.	+8%	+31%	-	+44%
Unemployment	+43%	+100%	-	+50%
Dog noise and mess	+96%	+114%	+27%	+10S%

FEAR OF CRIME

Fear of crime has become a major issue in criminological studies as people react to reported rising crime rates and the evidence (Smith, 1989: 271) that "The streets of Britain are getting meaner". The **1982 British Crime Survey** showed that 34% of the population of England and Wales felt unsafe walking alone in their residential area after dark. In the **Islington Crime Survey** (Jones, McLean and Young, 19S6) it was revealed that over half the women avoided going out after dark and 25% never went out alone at any time. Respondents in Tremorfa were asked about eight specific possible tilings which might happen to them and were asked if these were sources *oi* concern or worry. Table 12 summarises the results.

The levels of worry are the first point of interest. For the pre-lighting responses, half of the respondents had either a lot or quite a bit of worry about their homes being broken into. Almost half were worried about their homes being vandalised, just under 40% about their car being stolen and about one-third feared being robbed or attacked in the street. One-third of the women respondents had some worry about sexual assault or rape.

Table 12: Percentage of Respondents Worried About Crime

WORRY(%)		A LOT	QUITE ABIT	NOT MUCH	NOT AT ALL
Home being broken into	Pre-	24	26	34	16
	Post-	20	25	31	24
Being robbed in street	Pre-	12	18	33	38
	Post-	11	18	34	40
Being attacked in street	Pre-	14	20	27	39
	Post-	9	16	34	40
Insulted/ in Pestered street	Pre-	7	19	27	47
	Post-	7	11	40	43
Home vandalised	Pre-	20	27	26	27
	Post-	16	34	30	21
Car stolen / Damaged	Pre-	19	18	13	50
	Post-	15	19	14	53
Violence/ threats from known person	Pre-	5	10	23	63
	Post-	3	5	24	68
WOMEN ONLY assault / rape	Pre-	13	20	24	43
	Post-	8	11	40	41

After the new lighting had been installed the generalisation is that worries were allayed to some extent. If the proportions who said they worried not much or not at all are considered, these increased for all responses except worry about homes being vandalised. The proportions who worried a lot about this set of offences, all decreased with the exception of 'being pestered in the street' where it remained the same. Taking the two categories 'worry a lot' and 'worry quite a bit' together^ again worry about home being vandalised was the only exception and! all the other indicators showed lower values. Women's worry aboU sexual assault or rape decreased from 33% to 19% and general worri<= about violence went down from 15% to 8%.

Table 13 disaggregates worries about crime by sex, and indicates th percentage of each sex that said they 'worried a lot' about each crii From Table 13 we can see that prior to lighting, women were m< worried than men about all crime types. Post-lighting, there have *hi* significant reductions in the level of worry women have for all cri types, and particularly burglary, being attacked in the street, vandali of home, auto crime and sexual assault. These results suggest that

new street lighting has dramatically alleviated the worries of women. In Contrast, male worries have changed little, and for some crimes (notably burglary and being robbed in the street) there have been unexpected increases in level of worry.

Table 13: Percentage of Respondents Worried A Lot About Crime By Sex

	WORRY A LOT (%)					
	Males			Females		
	PRE	POST	% Change	PRE	POST	% Change
Home being broken into	12	16	+25	32	23	-28
Being robbed in street	8	11	+37	14	11	-21
Being attacked in street	10	11	+10	17	8	-53
Insulted/ in Pestered street	5	4	-20	9	8	-11
Home vandalised	12	12	-	26	18	-31
Car stolen / Damaged	17	16	-6	20	14	-30
Violence/ threats from known person	2	4	+100	6	3	-100
WOMEN ONLY assault/rape	-'	-	-	13	8	-39

Table 14 presents the same variables, disaggregated by age group. A similar pattern emerges, with this time respondents in the more elderly group tending to exhibit higher levels of anxiety prior to lighting, and also experiencing the greater relief of anxiety during the period immediately following light installation. Respondents aged over 36 were particularly anxious about the safety of their home (burglary and vandalism of home), and appeared less worried about these threats post lighting. Middle-aged women were most worried about sexual assault or rape prior to lighting, and were significantly less anxious about this after lighting. Curiously, the younger age group indicated higher levels of anxiety after light installation.

Table 14: Percentage of Respondents Worried A Lot About Crime By Age

	WORRY A LOT (%)					
	17-35		36-64		65+	
	PRE	POST	PRE	POST	PRE	POST
Home being broken into	**11**	**24**	**27**	22	31	**17**
Being robbed in street	**9**	**11**	11	10	15	**11**
Being attacked in street	**7**	**8**	18	12	16	**7**
Insulted/ in Pestered street	**2**	**8**	9	7	**9**	**6**
Home vandalised	**16**	**16**	24	20	**20**	**11**
Car stolen / Damaged	**16**	**24**	31	17	**9**	**6**
Violence/ threats from known person	5	**8**	7	3	**2**	**0**
WOMEN ONLY assault / rape	**7**	**11**	24	8	**6**	**6**

Considering the short time period over which these changes took place, these results are encouraging. As with perception of problems, the change of lighting has stimulated marked reductions in levels of anxiety about the above crimes.

FEELINGS OF SAFETY

Feelings of safety in the home

The question of safety at home and in the streets has become of increasing importance. Tremorfa is an area with a relatively high incidence of crime and this in turn has created an atmosphere of concern. A question on feelings of safety in people's homes was asked only in the pre-lighting survey but did show that just over 20% of respondents felt some level of concern.

Table 15: Feel unsafe in own home

	Number	Percentage
Yes	25	16.2
Sometimes	7	4.5
No	122	79.2

Further, some 27% said that they had some experience which made them feel unsafe and 13% said that they very often felt this way.

Typical comments were:

"I have experienced and witnessed crime by youths. Mainly outside my house"

"Since I was mugged"

"Kids come up the gully and throw stones at the van next door. They have broken the fence along the gully and dump things there".

Table 16 : Reasons for feeling unsafe in home

	Percentage
Violent crime	8
Property damage	19
Noise, disorder	17
Youths, gangs	16
Experience of burglary	25
Others	15

When asked why they felt unsafe, there were 59 reasons cited (see Table 16). Comments linked to property damage accounted for 1^(7 o\ the mentions, noise and disorder for 17% and experience or fear of burglary for 25%. In the post-lighting survey, 19^ women and 10T- men said that they felt safer in their own home in the six weeks following lighting installation. It was particularly the older respondents that felt safer in their own homes. This is supported by the reduced worry of burglary and vandalism in the home reported above.

Feelings of safety on the streets

Table 17 presents responses to a number of questions asked in both surveys relating to perception of risks, fear and safety on the streets. On the question of how they felt on the streets after dark, \$^r'r men and 38% women said they felt unsafe in the pre-Iighting survey, which had fallen to 16% and 34% respectively after lighting. This pattern of Perception of safety was reflected in behavioural outcome, with many more men than women stating that they regularly walked outside after

dark. However, despite the trend towards feeling slightly safer on the streets, there was no significant change in behaviour indicated in the post-lighting survey.

Table 17: Feelings of safety on the streets

	Male		Female	
	PRE	POST	PRE	POST
Unsafe streets around home	18%	16%	38%	34%
Regularly walk streets at day & night	**73%**	**72%**	42%	41%
Risks for women after dark	**75%**	**58%**	71%	64%
Risks for old after dark	**73%**	61%	74%	73%
Groups or gangs of youths after dark	**53%**	39%	54%	51%

About three-quarters of both men and women felt there were risks for women and older people on the streets after dark, but there was a significant reduction in this perception in the post-lighting survey. This reinforces the responses to the questions on anxiety about crimes discussed earlier. There were 155 mentions of reasons why women felt they were at risk in the pre-lighting survey. 48% of these could be categorised as fear of mugging or physical assault. Fear of sexual assault, including rape, accounted for 12% of the mentions; abuse or harassment for 23%. In the post-lighting survey, there were 140 mentions of reasons why women felt at risk. 49% were fear of mugging or physical assault; 9% were fear of sexual assault, including rape; 18% comprised abuse or harassment. There were some significant shifts in the perception with, for example, 28% fewer mentions of sexual assault, 44% fewer mentions of bag-snatching and *55%* of the problem of youths. In the post-lighting survey there were fewer examples mentioned of risks for women (a reduction of the order of 30%) but the general form of risk -muggings, abuse and sexual assault was similar.

In the analysis of perceived problems (Tables 8-11) we saw the reduction in mentions of youths as a big problem in Tremorfa, and this is further reflected (Table 17) in a question asking respondents whether there are groups of youths hanging around the streets after dark. Prior to lighting, 54% said there were such gangs, but post lighting there were fewer gangs noticed, particularly by male respondents.

Respondents to both surveys were asked how often they used the streets outside after dark (Table 18). There was no clear pattern in comparison of pre- and post-lighting responses. 12% of men (16% post) and 35% women (37% post) stated that they never went out after dark. These respondents also tended to be from the older age group. Although changes are marginal and thus of limited significance, there is some evidence that older women are unlikely to go out after dark and this has not changed since the new lighting scheme was introduced.

Table 18: How many times use street outside after dark per week, by sex, age

18a: SEX

	Male		Female	
	PRE	POST	**PRE**	**POST**
Never	**12**	**16**	**32**	**37**
lor 2	**30**	**32**	**23**	**30**
3 or more	**58**	53	**45**	**34**

18b: AGE

	17-35		**36-64**		**65+**	
	PRE	**POST**	**PRE**	**POST**	PRE	**POST**
Never	**11**	**18**	**27**	**27**	**31**	**39**
1 or 2	**41**	**38**	**36**	**27**	**40**	**30**
3 or more	**48**	**45**	**36**	**47**	**29**	**32**

All figures are percentages.

Knowledge of crime

The question of how people become aware of crime and related problems has become a research theme in its own right (see Smith, 1985). Possible routes are personal experience, word of mouth *and* the role of the media. All of these were represented in the Tremorfa sample.

There was a high proportion of respondents who were aware of problems through some form of personal experience. If the various categories - happened to respondent or household member, witnessed by respondent, happened to close friend or family, personal experience and observation - are added together, these amount to about 80% of mentions. The media have a much lesser role but are still significant sources of information but 'gossip' as an informal 'news-channel' is more important. The picture which emerges is one of a strong awareness of problems drawn from the experience of living on the estate. Local gossip and informal exchanges of information all re-inforce

the feeling that 'problems[7] are prevalent and there is a local sub-culture of shared views on the nature of local conditions.

Table 19: Why aware of problems?

Reason	Percentage
Happened to household member	23
Witnessed by respondent	14
Happened to close friend	15
Personal experience/media	21
Newspapers/TV	13
Gossip/common knowledge	25
Observations	10

"The road sweeper told me this was the worse area to clean"
"People talking"
"I can see for myself"

Precautions against crime

Respondents were asked about the precautions they took to counter any fears for personal safety and feeling that they were at risk. Table 20 shows that quite large numbers of people habitually take some precautionary measures. 45%, for example, said that at least sometimes they would walk near other people, 14% in the pre-lighting survey said that they would always do so. About half the respondents said that they would go out with someone else as a precaution; over 40% that they would take taxis for the same reason. By and large these precautionary measures were still in place after the street lighting improvements bu| there were some small changes. Fewer people, for example, alwayf avoided some streets (43% less) and 30% fewer people always avoide(f being alone.

Table 20: Adoption of precautionary measures

	ALWAYS		OFTEN		SOMETIMES		NEVER		N/A	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Avoid brinj*, out after dark	Id	13	*H*	5	12	15	62	59	7	H
Walk near penple	14	12	10	12	21	21	46	44	8	11
5tav off some streets	1H	11	X	10	12	17	53	52	H	II
Co with someone	*2H*	21)	9	16	12	16	44	41	7	7
Avoid buses	7	5	3	3	3	3	73	74	14	16
Take taxis	21	IK	10	11	11	16	51	47	7	8

All figures are percentages.

CRIME VICTIMISATION

Respondents were asked in the pre-lighting survey whether they or another member of their household had been victim of a crime in the last 12 months. 48% households had experienced at least one incident. Table 21 indicates that the most common incident type was tampering or damage to vehicles, which was reported by 21 respondents, many of whom had experienced this on a number of occasions, such that there was a total of 52 incidents of this type in the year before the pre-lighting survey. These figures reveal a level of victimisation experience over the twelve-month period prior to the pre-lighting survey which was well in excess of officially recorded crime. In terms of individual criminal events there were 156 incidents experienced among the sample of 154 respondents though as stated many people had experienced more than one incident. 17% of respondents had experienced theft of an item of property from outside their dwelling and 14% had experienced damage to a vehicle.

Table 21: Victimisation experience: 12 months prior to lighting

Incident Type	**Frequency of occurrence**	**Number *(%)* victims**
Burglary	**8**	**7 (5%)**
Attempted burglary	**4**	**4 (3%)**
Something stolen from outside	**34**	**25 (17%)**
Vehicle tampered with /damaged	**52**	**21 (14%)**
Vehicle stolen	**5**	**4 (3%)**
Theft from vehicle	**12**	**7 (5%)**
Damage to home	**16**	**11 *(7%)***
Theft from person	**2**	**1 (1%)**
Respondent threatened/insulted	**15**	**13 *($%)***
Racial attack	**0**	**0**
Rape/ sexual assault	**0**	**0**
Assault	**8**	**7 (5%)**

Table 22: Victimisation experience: 6-week periods pre- and post-lighting

Incident Type	Number of victims	
	PRE	POST
Burglary	0	0
Attempted burglary	1	3
Something stolen from outside	3	3
Vehicle tampered with/damaged	2	8
Vehicle stolen	1	1
Theft from vehicle	1	4
Damage to home	4	4
Theft from person	1	0
Respondent threatened/insulted	2	6
Racial attack	0	0
Rape/ sexual assault	0	0
Assault	2	1

Police data were available for the project area for two short periods of time which covered the pre- and post-lighting situations. The number of criminal incidents was small but Figures 2 and 3 show their locations with Tweedsmuir Road and Whitaker Road containing most of the occurrences.

Figure 2 The Cardiff Project Area : Criminal Events 12/11/90 to 23/12/90

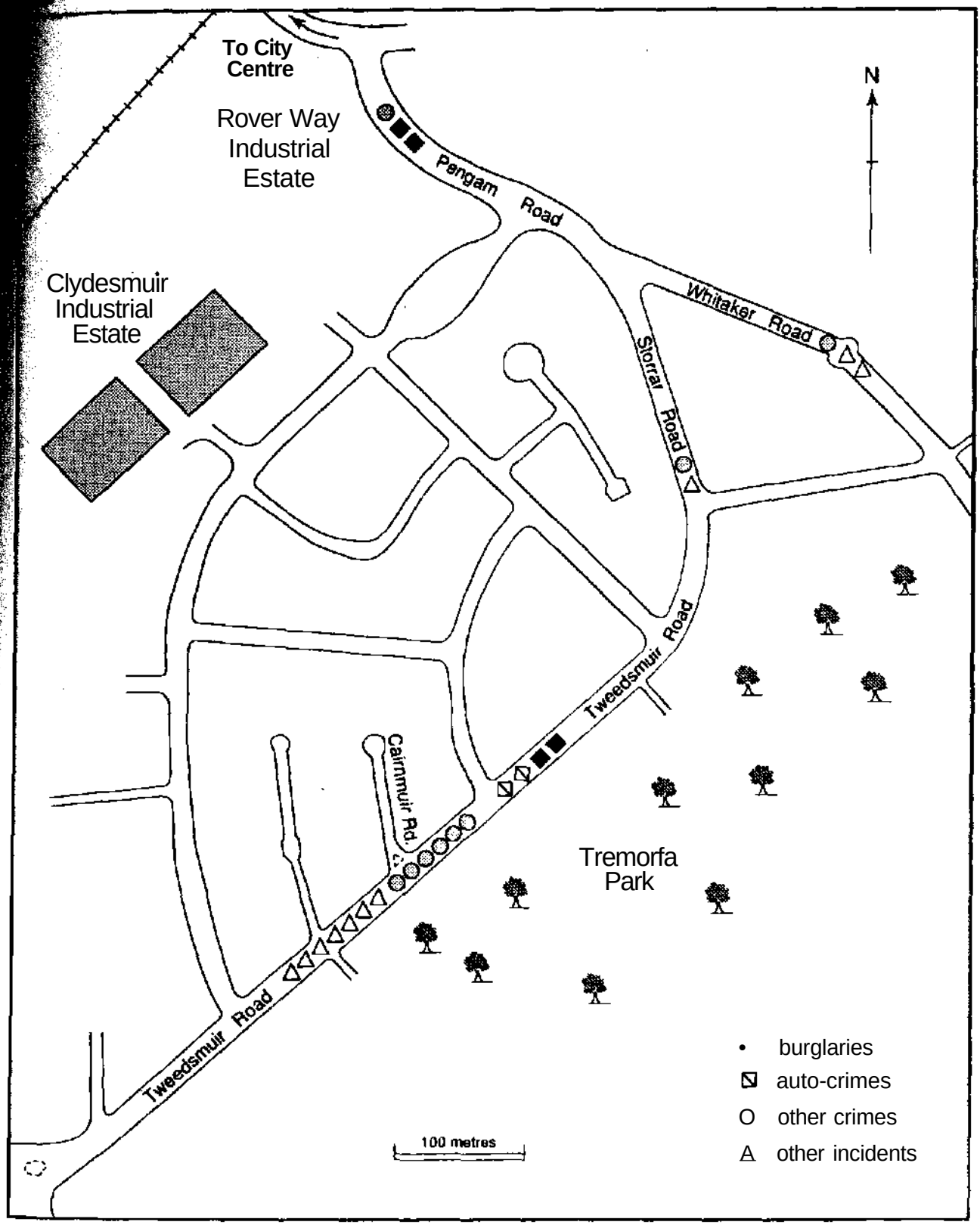
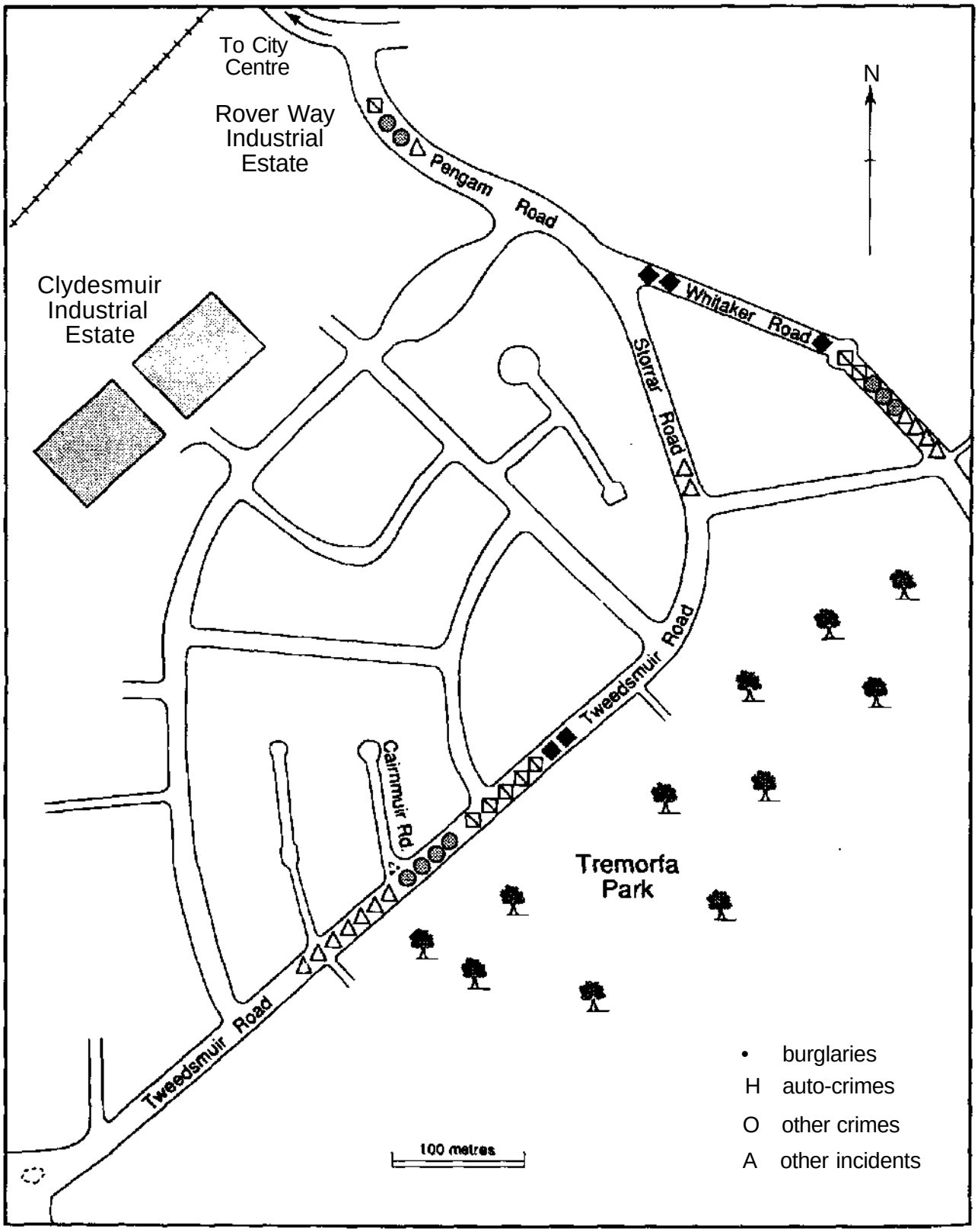


Figure 3 The Cardiff Project Area : Criminal Events 14/1/91 to 24/2/91



CHANGES OVER THE PREVIOUS TWO YEARS

Residents are often aware in a general way of change within their neighbourhood. Individually they will identify what these changes are and will make judgements on whether they are, in terms of the effect upon their quality of life, changes for the better or for the worse. Although these are individual assessments, they will be strongly influenced by exchanges of views and become for people who share other characteristics, such as the older residents of the estate, a commonly-held set of opinions. Some of this awareness arises from personal experiences but is more likely to be the product of a variety of 'cues' or sources of information. The media feature strongly in this set of information. For crime and crime-related activities in particular there is a good deal of media-coverage on television and in newspapers which ensure that public awareness remains high. For this part of the survey, questions were asked at both pre-lighting and post-lighting parts of the survey, on the kinds of changes thought io be occurring over the past two years. As this period is much longer than that covering the changed circumstances brought about by improved lighting, views should not have changed substantially but it was interesting to examine the extent to which a specific and very obvious change 'coloured' views of the longer time period. The tables which follow take a similar form to those used earlier but the important point to remember is that people are now-being asked to reflect on change over the previous two years.

Table 23 shows responses to the range of local problems which were, in the earlier stages of analysis/ classified into incivilities, crime and feelings of insecurity.

Table 23: Crime and its occurrence

	MORE COMMON		LESS COMMON		THE SAME	
	Prel	**Post**	**Pre**	**Post**	Prel	Post
Burglary	47	26	**6**	**14**	34	**43**
Auto-crime	52	34	**3**	**3**	25	**40**
Vandalism	44	23	**3**	**9**	38	51
Rubbish/litter	35	35	7	**11**	51	**48**
Noise/nuisances	25	14	**7**	**7**	**61**	**73**
Poor street lighting	**20**	**4**	**10**	**84**	**64**	**7**
Afraid to go out after dark	61	28	**1**	**10**	**25**	49
Youths hanging around	49	20	**4**	**10**	**37**	**60**
Racial attacks	3	2	**3**	**2**	**58**	**46**
Rape/sexual assault	3	2	3	5	***57***	**40**
Robbery (mugging)	29	13	3	**6**	49	**40**
Drunks	16	7	5	7	**64**	69
Being pestered in streets	12	9	3	**6**	**58**	51

All figures are percentages.

Figures from the pre-lighting survey show high scores on many of the indicators cited. 61% thought that being afraid to go out after dark was more common, 52% that crimes involving vehicles were more common and 47% that burglary was more common. Very few people thought that problems of this kind were less common than two years ago. The 10% believing that poor street lighting was less of a problem was in fact the only instance where the percentage crept into double figures.

There were significant and general shifts in attitude following the installation of new lighting. All forms of crime - burglary, auto-crime, vandalism and robbery - had lesser numbers of people believing that they had become more common over the previous two years. For burglary, for example, only 26% in the post-lighting survey thought it had become more common compared with 47% in the pre-lighting survey. 14% now thought burglary had become less common. Annoying the incivilities, perceived problems with youths hanging around the streets, had decreased markedly. 61% thought these had become more common in the pre-lighting survey but this was down to 28% in the post-lighting survey. Attitudes towards street lighting improved dramatically with 84% believing after the new lighting had been installed

...eet lighting was less of a problem than it had been two years ...reviously.

...ible 24: **Percentage reduction in respondents** believing **that** problems had ...come more common over the **previous two** years

Problem	Percentage reduction
burglary	46
vehicle offences	35
vandalism	40
litter	2
noise	46
lighting	81
fear of dark	54
youths	59
racial attacks	25
sex attacks	25
robbery	57
nuisance/drunks	60
pestered	26

NB: These figures are calculated against the actual numbers stating a problem in pre- and post-lighting surveys, i.e. the difference as a percentage of the pre-lighting total.

Table 24 throws the shifts of opinion between pre- and post-lighting surveys into sharper focus. The change shown is of those believing that the problem had become more common over the previous two years. The range is from *2%* fewer believing that litter had become a more common problem to an 81% reduction in those believing that street lighting had become a more common problem. The latter is in line with the work undertaken on lighting, the former may be an indication that litter is more visible with improved lighting. As street cleaning is normally a morning activity, the accumulation of litter may be more obvious in the night-time. Fear of the dark or being afraid to go out after dark showed a welcome sharp decrease as did many forms of criminal offence such as burglary, robbery, vehicle offences and vandalism.

Several points emerge from this table:

There is a 'halo' effect.

1 > Although only one element of the local environment has been modified, respondents are prepared to recognize a much more general effect.

The short-term impact of change is translated into a retrospective view.

=> Although the post-lighting survey was only six weeks after the installation of new lights, respondents were prepared to modify their assessment of the previous two years.

Even problems which are almost irrelevant to the survey area are perceived as having become less of a problem.

This set of information on perceived views over two years has interesting implications. The specific step of improving street lighting has indeed had the effect of 'colouring' residents' perceptions of the longer time period. It is positive in the sense that they are now prepared to see neighbourhood change in more favourable terms. Again this is a relative shift of attitude as the general worries about neighbourhood change are still there but the environmental improvement has served a more general purpose.

The former is in line with the work undertaken on lighting, the latter may be an indication that litter is more visible with improved lighting. As street cleaning is normally a morning activity, the accumulation of litter may be more obvious in the night-time. Fear of the dark or being afraid to go out after dark showed a welcome sharp decrease as did main forms of criminal offence such as burglary, robbery, vehicle offences and vandalism.

TREMORFA ENVIRONMENT

The other questions on longer-term change relate to the general environment of Tremorfa and respondents were asked whether there had been changes over the previous three years. Table 25 records the results in terms of improvement or otherwise:

Table 25: Has the **local environment improved?**

	pre-	**post-**	**% change**
Improved	7.8	10.5	+ 25
Worsened	42.9	34.9	-20
Same	42.2	47.4	**+ 11**
Don't know	7.1	7.2	_

At the pre-lighting stage there was a strong negative image of the Tremorfa environment with only 7.8% thinking that there had been improvement and 42.9% believing that it had worsened. This negative image remained in the post-lighting survey but there had been a noticeable positive shift. The percentage change column of Table 25 perhaps shows this most clearly with an increase in 25% of those

believing that there had been some improvement and a decrease of 20% of those seeing a worsening situation.

When those who had recognized some improvement in the pre-lighting survey were asked to specify which improvements had occurred, some twenty citations were obtained. 4% of the whole sample mentioned road humps, designed to slow down the flow of traffic and this was the single most frequently mentioned positive change (30%). Other positive changes mentioned included nicer type of people, less youths hanging around and more facilities, this other improvement group amounted to *9%* (see Table 26) of the overall sample.

Table 26: Environmental change

IMPROVEMENTS:	PRE	POST
Road humps	4%	5%
Others	***9%***	***8%***
Lighting	—	***5%***
No youths		***5%***
NEGATIVE:		
Vandalism	***7%***	***6%.***
More youths/ children	19%	14%
More noise	***5%***	6%
Worse people in area	***7%***	13%
Unsafe at night	4%	***0%***
Car thefts	4%	***3%***
Others	21%	15%

There was a far larger number of negative changes mentioned by respondents, 103 in total. Of these the largest single category was the higher number of youths and children on the streets (29% of mentions) whilst increased vandalism, more noise and worse type of people all formed about 10% of the mentions.

The strongest sentiments expressed were about the gangs of youths and the different types of people moving into the area. These were largely replicated, as shown below, in the post-lighting survey. On new type of people:

> 'Too many problem families at Stenhousemuir Estate and they cause the problems"

> "A lot of one-parent families, not enough facilities for them, nowhere for the youngsters to go. Bringing down the tone of the area. Children of eight years and up playing football in other people's gardens. Lack of discipline with children and youths hanging around. At one time Tremorfa was **the** place to live, problems from Stenhousemuir children gangs".

And on social change:

"People are not so nice, best people are gone"
"New tenants are problem families".

There was also evidence of awareness of crime and fear of its **consequences:**

"Robberies"
"Car thefts"
"Break-ins"
"Not safe to go out or leave cars, they get vandalised"
"Abuse of people and property"
"Stolen cars are being driven up the road at night - early hours of the morning"
"Car chases, car damage, walls being knocked down".

The image which emerges from this set of anecdotal evidence in the pre-lighting survey is one of a problem area where the quality of life is deteriorating. This is not a universally expressed view but with 103 mentioned negative trends over the past three years, it does have a claim to generality.

Not only therefore were there many more respondents who felt that environmental conditions and the general quality of life had worsened, but they had many more specific instances to explain their feelings. As we have seen, the post-lighting survey showed some general shift in attitude in a positive direction though still only 10% of respondents thought that the general quality of life had improved. Amongst the cited improvements, street lighting now appeared, being mentioned by 5% of respondents. On the negative side, those respondents still recognizing worsening conditions, fewer mentioned vandalism, more youths or car-theft and no-one mentioned lack of safety at night. Again overall there is evidence of a positive change in attitude following the installation of new street lighting.

If one examines the items mentioned as improvements in the post-lighting survey, lighting itself now accounts for about one-third of these. Better conditions for traffic and some reduction in the numbers of youths on the streets both account for just under one-quarter of the mentions. There were 68 mentions of worsening conditions over the past three years in the post-lighting survey. Most of these relate to social change in the estate and pick out the main continuing concerns for longer-term residents which were evident in the pre-lighting survey. There is still a strong feeling that the more recent movers into the area are a different type of people who are 'lowering the tone' of the estate. Typical quotes are shown below:

"The people. They put problem families and one-parent families into a decent estate. It spoils it for the decent people who live here."

'The type of people who come to live here - rough and ready type."

"A different type of people live here now, and it's spoiling it for the people who have always lived here."

Similar sentiments were expressed about the youths on the streets:

The kids get more vicious, more vandalism, more aggressive".

"Since November Ok. Terrible gangs of boys outside before then, street noise directly outside, daughter (4 1/2 years) frightened to sleep in own room at front of house."

"Gangs of youths that hang around the shops cause trouble".

Whereas there is some evidence of an improvement in numbers of youths on the street since the new lighting was installed, the longer-term view of an estate on a downward spiral continues. Again it is important to give this kind of interpretation a proper perspective. The views being expressed are generally those of older residents who have lived in Tremorfa for many years. With recollections of better days and a closer community, they are predisposed to believe that generally things are changing for the worse. Older residents are ensnared not only by more local problems but in a general change in societal attitudes, particularly among the young, which may be at odds with their commonly held values. When they see youths on the streets who ignore authority and seem to have little or no respect for adults, their judgements are heavily influenced by this negative experience. Again, Tremorfa is experiencing some decline but no more than many other public housing estates and a lot less than the real 'problem areas'. For Tremorfa residents what matters is what they experience in their homes and their neighbourhood; perspectives are important but their reality is what they see around themselves and wliich with increasing age they feel less competent to cope with.

POLICIES TO REDUCE CRIME

Respondents were asked to say which of the following policy options would do most to reduce crime:

Table 27 : Policies to reduce crime

	PRE-UGHTING	POST-LIGHTING
More Neighbourhood Watch	36%	44%
Stronger locks	26%	34%
Improve street lighting	33%	9%
Harsher sentences	49%	57%
More Police on foot patrol	90%	90%
More facilities for young	42%	42%

The interest in this table is less with change than with the types of policies which respondents thought to be important. The single significant change is in policies for improved street lighting with a reduction from 33% to 9% believing this to be a desired policy. Most of the preferred policies relate to social control and the prevention of crime. Reliance upon the police is evident at a very high level. 90% of respondents wanted more police on foot patrol and underline the extent to which populations of this kind rely upon the police to safeguard their quality of life. This emphasis of the importance of the Police is supported by the finding that 48% of respondents felt that the Police understood the problems faced by local people either well or very well, a higher rating than other officials such as Members of Parliament, Local Authority officials and local Councillors. There is a recognized need for various forms of crime prevention from neighbourhood watch which involves both police and residents, to the provision of stronger locks for doors and windows. One way of dealing with the mainly young offenders is to punish them and over half were in favour of harsher sentences. Another is to divert them to more constructive uses of their time and 42% favoured the provision of more facilities. The important message here is that Tremorfa residents welcomed the improved street lighting and its positive contribution to the quality of life in their locality. They also recognize however that the problems remain and require social as well as environmental changes. Social welfare programmes must underpin any services strategy to improve the quality of life in disadvantaged areas.

In the pre-lighting survey, respondents were also asked which policies they believed would do most to increase the safety of women in the area:

Table 28: Policies to improve safety for women

	PRE-LIGHTING
More Neighbourhood Watch	29%
Self Defence Classes	44%
Improve street lighting	44%
Harsher sentences	6%
More Police on foot patrol	*78%*
Women to stay indoors	*62%*

This provided an interesting range of responses (Table 28) with improved street lighting as a strong, unprompted suggestion from 44% of respondents. Again over three-quarters looked to the police and 62% adopted the fatalistic solution of advising women to stay indoors.

Council services

Respondents were asked about the efficiency of the council in the provision of a range of services which included street lighting. The results again gave evidence of this 'halo-effect' whereby the single act of improving lighting appeared to have 'coloured' opinions on other unaffected council services. One interpretation is that new* street lighting is an obvious, very visible improvement, its installation is seen as an act of faith in the neighbourhood, a willingness to invest in improvement. Residents have increased confidence in the council as the authority with a range of responsibilities which bear directly upon the prevention of crime. Many of the perceived 'incivilities' are in the maintenance responsibility of the council *and* improvements in this context are welcomed with open arms.

Table 29: Efficiency of Council services

	PRE-LICHTINC	POST-LIGHTING	% Change
Rubbish collection	91%	91%	-
Street cleaning	60%	70%	17
Street lighting	*57%*	84%	47
Repairs of vandalised public property	20%	31%	55
Road maintenance	34%	41%	21
Footpath maintenance	20%	26%	30

The extent of satisfaction did vary considerably with the service being considered. Level of satisfaction with rubbish collection for example was very high (91%) but in repairs and maintenance the council was generally thought to have a less efficient record.

Table 29 also shows the changes in assessments of efficiency with the advent of improved street lighting. There is a 47% shift in opinion on

street lighting and 84% now believe it to be efficient. Again in services where there was room for improvement, the 'halo effect' already referred to is in evidence. Although there has been no known change in repairs policy towards vandalised public property, there is a *55%* shift in opinion and about one-third view this aspect of council policy favourably. On other aspects of repairs and street cleaning there are clear, positive shifts in public opinion.

STREET LIGHTING

A number of questions addressed directly the question of the adequacy of street lighting. In the pre-lighting survey the aim was not to focus on lighting but some questions on quality of lighting were asked.

Table 30: Perception of the quality of lighting before change

	Yes	No	Don't know
Too dull	51	47	2
Too bright	1	96	3
Unevenly spaced	41	55	4
Well maintained	*57*	42	2
Badly maintained	34	62	3
Satisfactory	62	36	3
	Prefer orange	**Prefer white**	**No preference**
Preference of type	**8**	**33**	**59**

AH figures are percentages

Table 30 summarises responses to relatively straight forward questions on people's attitudes to the existing street lighting in the area. About half thought it was too dull and virtually no-one thought it was too bright. Questions on maintenance and general satisfaction with the street lighting showed a majority of positive views. Most people preferred white lighting to orange but the majority (almost 60%) expressed no preference. This last question on type of lighting was the only one replicated in the post-lighting survey and there was an increase of 37% in the numbers expressing a preference for white lighting and a decrease of 30% in those expressing no preference.

In the pre-lighting survey, respondents were also asked what the impacts of better street lighting might be. Whereas a small minority (4%) thought that it was not in need of improvement and a further 7% thought that there would be no effect, **many respondents did anticipate positive outcomes.** 44% for example believed that they would feel safer with improvements to the lighting and a small number did mention specific crimes that would be reduced such as auto-crimes, muggings,

burglaries and vandalism. The comments **here** covered most elements of **the community for whom** beneficial effects are seen:

"Safe for ladies to go out"
"The elderly may go out"
"Safer for pedestrians, you can see where you are going"
"It would help people who walk along the street at night"
"Would alleviate anxiety, people are always wondering if they are going
to be attacked".

Other comments refer to the problem groups and the form of problem behaviour which might, at least to some extent, be deterred:
"Prevent people vandalising cars"
"Stop people getting mugged"
"Stop gangs hanging around, breaking in shops"
"Better effect, not so much peeing down lanes and in streets".
Local residents often refer to the problems associated with back lanes and gullies:
"Have lights in the gullies, children use them to hide".

Effects of improved street lighting

In the post-lighting survey, 93% of respondents had noticed that the street lighting had been changed. These respondents were then asked to comment on the changes (see Table 31). On the main impacts there was a very positive attitude towards change. 99% of those asked thought that the street lighting was brighter, that it improved the look of the area and that it was now easier to recognise people. Almost 90% were of the view that lighting was now better maintained. Although these are positive indicators there were less obvious impacts on actual behaviour as only 4% said that they were more likely to go out after dark since the lighting had been improved.

Respondents were asked whether they felt safer on the streets 'during the last six weeks' (this being the period since lighting installation, but this question was asked early in the questionnaire, before any questions relating specifically to lighting). 26% said that they did feel safer, with 71% stating that there was no change or that they had not been out at night. However, when prompted about the changes made to the street lighting, 67% stated that the new lights made them **feel safer in the streets** around their homes. A similar pattern was found with feelings of safety in the home, with 16% stating that they felt safer in the last six weeks (81% about as safe as before), but **42% saying they now felt safer in their homes,** when specifically asked about the impact of the new

Table 31: Perceptions of lighting change

Lighting brighter	99%
Lighting better maintained	89%
Easier to recognise people	95%
Improved the look of the area	90%
Feel safer in streets (last 6 weeks)	26%
Feel safer in own home (last 6 weeks)	16%
Feel safer in streets (since lighting)	67%
Feel safer in own home (since lighting)	42%

Of the reasons given by people who said they felt safer in the streets around their home at night, virtually all referred to the advent of new street lighting:

> "Because of the new street lighting."
> "Because the streets are much tighter and feel safe."
> "Since new lighting can see more of the lanes now".

When asked specifically about the changes in safety brought about by the new lighting, 91 different items were mentioned. 51 (56%) of these were direct comments on the brightness or lightness:

> "It's much brighter and lighter and you feel safer."
> "It's like daylight waiting for the bus."

16 replies (18%) linked the brightness to safety, and 19 (21%) to an ability to see people around you more clearly and to recognize faces. A minority (6%) thought there would be a direct impact on crime:

> "Stops people prowling around, no need to worry now."
> "The place is better lit, must stop crime."

There was a small minority who still felt unsafe, or even less safe:

> "Lots of kids hanging around alleys and lanes."
> "Gangs of youths swearing. The light is duller now so you can't see them properly."

Responses on changes in safety in the home were typically very favourable:

> "The light is so bright, it lights up the front of the house."
> "I feel less people would try to break in, as it's clear to see them."
> "You feel safer because it lights up the house."
> "If anything happens on the street, you can see what is happening."
> "Because of the lighting. It lights the front of the house up. Makes me feel safer because you can see better."
> "Because it's so well lit I don't think anyone would break in. Because they would be seen."

Prior to lighting installation/ more people preferred white lighting than orange (see Table 32), but the majority (almost 60 per cent) expressed no preference. After the installation of high-pressure sodium (white) lighting, there was an increase of 45 per cent in the numbers expressing a preference for white lighting and a decrease of 27 per cent in those expressing no preference:

Table 32: Preferences for lighting type

	Prefer orange	Prefer white	No preference
Pre-lighting	**8%**	**33%**	**59%**
Post-lighting	**9%**	**48%**	**43%**

In the post-lighting survey, respondents were asked about the ways they believed changes had occurred since the installation of new lighting. The first three statements in Table 33 all show positive increases in the form of response. The numbers of people using the streets at night, expressing confidence in going out at night and feeling safe on the roads, have all increased. The other statements all show 'good' signs of decreasing problems with a range from 8% for noise to 23% for risks to the elderly after dark stating that these things are less of a problem now than they had been before the lighting was improved.

Again, this is good and welcome evidence of positive changes brought about directly as s result of improved street lighting. It has, as always to be kept in perspectives as majorities in all cases see no real change. # the categories of 'same' and 'don't know' in Table 33 are combined, for example, *78%* see no difference in numbers of people using the street at night, 81% no difference in numbers of youths hanging around in the area and 75% see no change in the risks to women using the streets after dark. The improved lighting has achieved some desired level of chang[e] but it has not in itself solved all the problems of the area; it is [a] significant contribution but not a complete answer.

There are decreases in actual crime, fear of crime, and perceived risks to women and the elderly. Given the short time period which had elapsed since the installation of new lights, the evidence of this **table** is extremely encouraging. When asked what further improvements were needed, there were mentions for better lighting in gullies, or back allies, in other streets or roads where the lighting had not been changed and on local landmarks such as Pengam Bridge.

Table 33: Perceived changes

	Up	Down	Same	DK
The number of people using the street at night	21	1	55	23
Vandalism to cars/property	4	13	40	43
Noise from those using the street at night	4	8	75	13
Groups of youths hanging around in the area	6	13	65	16
Your confidence to go out at night	24	1	72	3
General community safety or fear of crime in the area	9	13	53	26
Your personal fear of crime or threatening behaviour	11	17	66	6
Burglary in the area	4	10	45	42
Risks of crime to women using the streets after dark	4	22	44	31
Risks of crime to elderly using the streets after dark	4	23	48	25
Risks of crime to Black or Asian people using the street	1	3	43	54
Road safety	45	11	28	16

The final set of questions on the post-lighting survey tested perceptions of change over a number of key statements which included the improved street lighting. Some statements were related specifically to lighting, others examined the extent to which ideas of longer-term change were prevalent. 39% thought that the Tremorfa environment had improved since Christmas (Table 34), which would cover the period of lighting change, and 42% that it had improved over the previous two years. These are promising and significant levels of optimism.

Table 34: Some indicators of change

	AGREE STRONGLY	AGREE	NO STRONG FEELINGS	DISAGREE	DISAGREE STRONGLY
The environment in Tremorfa has improved over the last two years	1	41	29	26	3
The environment in Tremorfa has improved since Christmas	1	38	35	24	2
There are more youths/children hanging around the streets ompared to two years ago	8	41	26	24	1
There are more youths/children hanging around the streets ompared to before Christmas	3	14	39	43	1
There is more traffic noise in Tremorfa than two years ago	15	40	16	26	1
The road humps have been a major improvement	43	41	9	8	0
The new street lights have been a major improvement	70	23	3	4	1

All figures are percentages.

The responses on numbers of youths and children hanging around the streets was interesting as this was consistently an issue of great significance for many Tremorfa residents. Whereas 49% agreed or strongly agreed with the statement that there were more youths and children on the streets compared with two years ago, this fell to 17% when the period was started to 'before Christmas'. If new lighting has brought about this change it is a very real contribution to the quality of many people's lives. Traffic is a local problem which is well recognized but the use of 'road humps' or 'sleeping policemen' is generally believed to be a great improvement. Finally there was massive support (93%) for the statement that the new street lights had been a major improvement.

PEDESTRIAN TRAFFIC FLOW SURVEY

While the questionnaire survey indicated changes in respondents' perception of problems, risks and safety, the pedestrian traffic survey was undertaken to assess whether the improved street lighting had any immediate impact of behaviour. This report has shown that after lighting installation, respondents stated that being out after dark was less of a problem than it had been before, and worries about crime, including being attacked in the street were less acute than in the pre-lighting survey. These trends were particularly clear in female respondents, and in those aged 65 or over. Table 35 indicates the average number of pedestrians recorded by the fieldworker on each of the five nights of the pre- and post-lighting study periods, disaggregated by sex.

The table indicates that there has been a slight increase in street activity, but contrary to the questionnaire findings, the increases has been greatest among males. However, many of these pedestrians were in groups of two or more, and Table 36 shows that if only single pedestrians* are considered, there has been an increase in pedestrian activity of 26%, with the increase greatest among single females, of whom there are much fewer than males.

Table 35: Average pedestrian flow per night (7pm-midnight):

	All pedestrians by sex		
	PRE-LIGHTING	POST-LIGHTING	% change
Males	84.0	95.0	+13.1%
Females	51.4	51.8	+ 0.8%
All pedestrians	135.4	146.8	+ 8.4%

Table 36: Average pedestrian How per night (7pm-midnight):

	Single pedestrians by sex		
	PRE-LIGHTING	POST-LIGHTING	% change
Males	45.6	56.0	+22.8%
Females	12.4	17.2	+38.7%
All pedestrians	58.0	73.2	+26.2%

Table 37 includes only pedestrians recorded before 9pm, and surprisingly shows a decrease in activity after lighting. However, Table 38 also covers the early evening period, and shows increased activity by pedestrians walking alone.

Table 37: Average pedestrian flow pet *&*VP??V±

All pedestrian ^ sex

	PRE-LIGHTING	POST-LIGHTING	% change
Males	50.4	46-2	- 8.3%
Females	33.2	30-8	- 7.2%
ALL pedestrians	83.6	77.0	- 7.9%

Table 38: Average pedestijan flow perflight (7pm-9pm):

Single pedestrians by sex

	PRF liSniNG	POST-LICHTING	* change
Males	26.2	30-2	+15.3%
Females	8.4	10.0	+19.1%
All pedestrians	34.6	40.2	+16.2%

The pavements are busier at this time than later on, and it is likely that many pedestrians at this time are undertaking routine, rather than discretionary, trips. The greatest expected impact of improved lighting will be on activity later in the evening, when people do not have to go out (for journeys to work, shopping etc), and if they have a fear of crime will stay at home. It is therefore not unexpected that Table 39 shows an increase of 35% in the number of pedestrians recorded after 9pm. Furthermore, Table 40 shows an even higher percentage increase in the number of pedestrians on their own.

Prior to lighting, there were many more male pedestrians than female, particularly after 9pm, and there has been a greater increase in activity in males than females. There are clearly still barriers to females, as the greater extent of change in worries and fear of crime found in the questionnaire survey amongst females are not repeated in observed behaviour.

Table 41 indicates that for the elderly, there is increased street activity post lighting, but there are still very few people aged over 65 out after 7pm.

Table 39: Average pedestrian flow per night (9pm-midnight):

	All pedestrians by sex		
	PRE-LIGHTING	POST-LIGHTING	% change
Males	33.6	48.8	+45.2%
Females	18.2	21.0	+15.4%
All pedestrians	51.8	69.8	+34.7%

Table 40: Average pedestrian flow per night (9pm-midnight):

	Single pedestrians by sex		
	PRE-LIGHTING	POST-LIGHTING	% change
Males	19.4	25.8	+33.0%
Females	4.0	7.2	+80.0%
All pedestrians	23.4	33.0	+41.0%

Table 41: Average pedestrian flow per night (7pm-midnight):

	Pedestrians recorded as aged over 60, by sex		
	PRE-LIGHTING	POST-LIGHTING	% change
Males over 6Oyrs	7.6	9.8	+28.9%
Females over 60yrs	3.8	4.8	+26.3%
AH pedestrians (all ages)	135.4	146.8	+ 8.4%

CONCLUSIONS

Tremorfa estate displays many of the indicators of a deprived public sector housing project with an ageing low-income population. Long-term residents, who have strong memories of the estate as an integral and socially-cohesive balanced community, see new kinds of people moving into the estate with different sets of attitudes, and see these as

threat to former sets of values. Whether these values are conjectural and idealised is a moot point and it seems clear that Tremorfa is now a very different kind of local environment to that which many of its inhabitants would like. One theory of estate change is that residential areas of this kind may enter a 'cycle' of deterioration and there are indicators which suggest that Tremorfa is on the way down this scale. The problem is one of reversing perceived trends, of reducing disadvantages and of establishing a stronger feeling of local social control which may give confidence to committed residents in the area. Again, it can be stressed that Tremorfa is not being labelled as a 'problem estate' -there are worse-off areas - rather that many of its residents display some growing sense of concern and that signs of disadvantage are becoming more common,

Tremorfa's perceived problems are clear indicators of a public sector housing estate in decline. There are therefore relatively high rates of criminal events, and a record of victimisation which shows that official crime statistics greatly underestimate the actual risk of crime which residents encounter. Much of this crime is 'minor' and classed as non-serious but it has a negative impact of far greater consequence for women and the elderly in particular. Awareness of incidents and experience of victimisation has bred high levels of fears of crime. The inner-city syndrome of crime-fear is synonymous with the public estate syndrome, in many ways it is on these estates with their deteriorating fabric and low quality of services that the quality of life has declined most. Incivilities, from uncontrolled dogs to broken pavings to unruly youths, are as much the symptoms of social disorder as are high crime rates. Tremorfa clearly suffers from many of these. Of all the perceived hazards it is the gangs of youths and their activities which pose the greater threat to a comfortable way of life. To the elderly and women they are a threat who may taunt, pester, harass and generally make life a misery. Alley ways and other specific locations are avoided because of the presence of youths. To others they have more of a nuisance value with associated noise and damage. The car theft, car damage and 'joy-riding' phenomenon is a real hazard here as elsewhere and constitutes a modern danger to life in this kind of residential area.

People adapt their lives to an awareness of these problems. Places are avoided, people are ignored, the social network of mutual trust and interdependence upon which the concept of 'neighbourhood' stands is threatened. People, especially the old, are afraid to go out after dark, they do not feel safe even within their own homes. They find fault with everything from the state of the pavements to the lack of jobs and of facilities for the young. They take precautionary measures to accommo-

date the risks under which they feel placed.

Street lighting is one small part of the environment of the estate. The outcome of this project **which in many ways is astonishing** is of the impact which improvement of this single facet has upon the **general** attitudes of residents. There are specific areas of improvement - feelings of safety, less youths around, better visibility - which are clear and tangible benefits. But residents seemed willing to go beyond the obvious and to recognise a general upward movement in their quality of life. There may be two parts to this awareness of positive change. Firstly, **improved** street **lighting** is **highly visible and obvious.** Within its specific and important role of illumination it can achieve unmistakeable and obvious effects. Favourable comparisons can be made both with former lighting and with other parts of the estate where the older, less efficient lighting is still in existence. Secondly, **the installation of new lighting acts** as **an investment in the future of the estate;** it is a gesture which counteracts any feeling of neglect.

Reactions in the post lighting survey serve to justify the experiment. All the trends are of a positive nature, and although the difference between short-term euphoria and long-term benefit cannot be distinguished in this survey the portents are favourable. It would be foolish to imagine that the problems of Tremorfa have been solved. There was a lifting of the spirits but also a realism about the risks, fears and hazards. Significantly, it was to social change that residents looked for a longer-term scenario of improvement. Facilities to occupy the youths, stronger roles for police and social workers, these were the priorities. There is a responsibility both towards the oppressed and the oppressors on these estates. Labelled as mindless thugs, the youths who cause so much misery have some call on resources whether these be to occupy them, entertain them, control them or even to incarcerate them. Environmental improvements will last as long as local elements allow them and social control will be the priority. **Better lighting is one element of better control. It needs to be bolstered and sustained by people. A multi-agency, people-intensive approach which involves the whole of the community is the ultimate goal. Improved street lighting is a relatively cheap, focused ameliorative, to give it lasting effect it must be part of a strategy for change which will cost a good deal more but will be justified if it improves the quality of life and reduces a burden upon society.**

The mechanisms for achieving change are already largely in place. There are crime prevention initiatives, there are victim support schemes, there are policing and council services policies **to** deal with problematic

areas. **The lighting project is an excellent example of ways in which the responsibilities for local authorities for maintenance and improvement of the fabric of the local community can be coordinated with those of the police.** Better lighting, road safety, paved alleys, litter-free streets, dog-control are all roles which the local authority can carry out towards the end of improving the environment. Police and social services have the heavier responsibility of controlling youths and the criminal element but they are all part of the same strategy. **Community safety is now a planning and policy priority.** It will have been achieved when people feel safe within their neighbourhoods and can exercise choice in when and how often they move within their residential areas.

There are relatively high levels of fear of crime and of risk and evidence that these fears inhibit use of the neighbourhood. Experience of victimisation shows that although serious crimes are neither frequent nor common, there is a sufficiently high preponderance of minor crime to justify worries, especially among women and the elderly. Improved lighting does have a positive impact upon the quality of life in an estate of this kind in both direct and indirect ways. Despite the short time period between installation of the new lights and completion of the second survey, awareness of the positive advantages of the new lighting is evident over a wide range of indicators.

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TECHNICAL APPENDIX

Background

South Glamorgan County Council has for many years been aware of the relationship between lighting and crime and the fear created by poor lighting.

In order to improve the lighting network within South Glamorgan, the County Council has spent in excess of £3.5 m over the last five years and has an ongoing re-lighting programme. Included in this programme was the Tremorfa experimental site carried out in conjunction with the **British Parliamentary Lighting Group.**

The experimental area consists of five roads, Tweedsmuir, Storrar, Pengam, Whitaker and Cairnmuir Road (see Figures 4, 5 and 6). Using the data from these roads in conjunction with **BS5489** it was determined that:

a) Tweedsmuir, Storrar and Pengam Road with an effective width of 15.5 meters was categorised into British Standards 3/2 with a minimum illuminance of 2.5 Lux.

b) Whitaker Road with an effective width of 9.9 meters and Cairnmuir Road with an effective width of 7.7 meters was categorised into British Standards 3/3 with a minimum illuminance of 1 Lux.

From the data accumulated on site, the recommendations from BS5489, vehicular and pedestrian traffic, crime records and the general environment of the area a new scheme was designed.

The details of the scheme are:

a) A staggered column arrangement.

b) The light source by calculation was determined to be 70 Watt and 150 Watt SON.

c) The lighting unit consisted of a galvanised steel column with Urbis ZX 12 semi-cut off lanterns with SON-T lamps to provide good colour rendering.

The lantern and column not only complemented each other but became an efficient lighting unit.

d) The photocells were SELC thermal, one piece P.C. cells with a 1:1.5 ratio.

Areas that required special attention were road humps, pedestrian crossings, shops, public houses, a church hall and a school.

Figure 4 Old and new street lighting specifications

Street Name	New Lighting Units			Existing Lighting to be removed				
	•	(•)	A	0	<	A		0
Pengam Road	**11**	**1**	**0**	1	**7**	**0**	**1**	**0**
Tweedsmuir Road	**29**	**0**	**0**	**3**	**21**	**2**	**0**	**0**
Storrar Road	**6**	**0**	**0**	**1**	**6**	**0**	0	0
Whitaker Road	**0**	**1**	**10**	**0**	**10**	**0**	**0**	**0**
Cairnmuir Road	0	**0**	**5**	**0**	**0**	**0**	0	4
Total	**63**			**56**				

New

● 8m. galvanised Petit Jean Mk 3 to B.S.739 (min 85microns) URBIS lantern 150w SON-T

◉ 6m. galvanised Concrete Utilities, min 85 microns, URBIS lantern, 70w. SON

▲ 5m. galvanised Concrete Utilities, min 85 microns, URBIS lantern, 70w. SON

Old

(Y\ 5m.$_t$ steel, 55w Sox Lantern

⊕ 15 feet, concrete, 35w Sox Lantern

/\ 6m., concrete, 55w Sox Lantern

/\ 25 feet, concrete, 90w Sox Lantern

○ 15 feet, concrete, 80w MBF/U Lamp, Post-top Lantern

Figure 5 Old Street Lighting

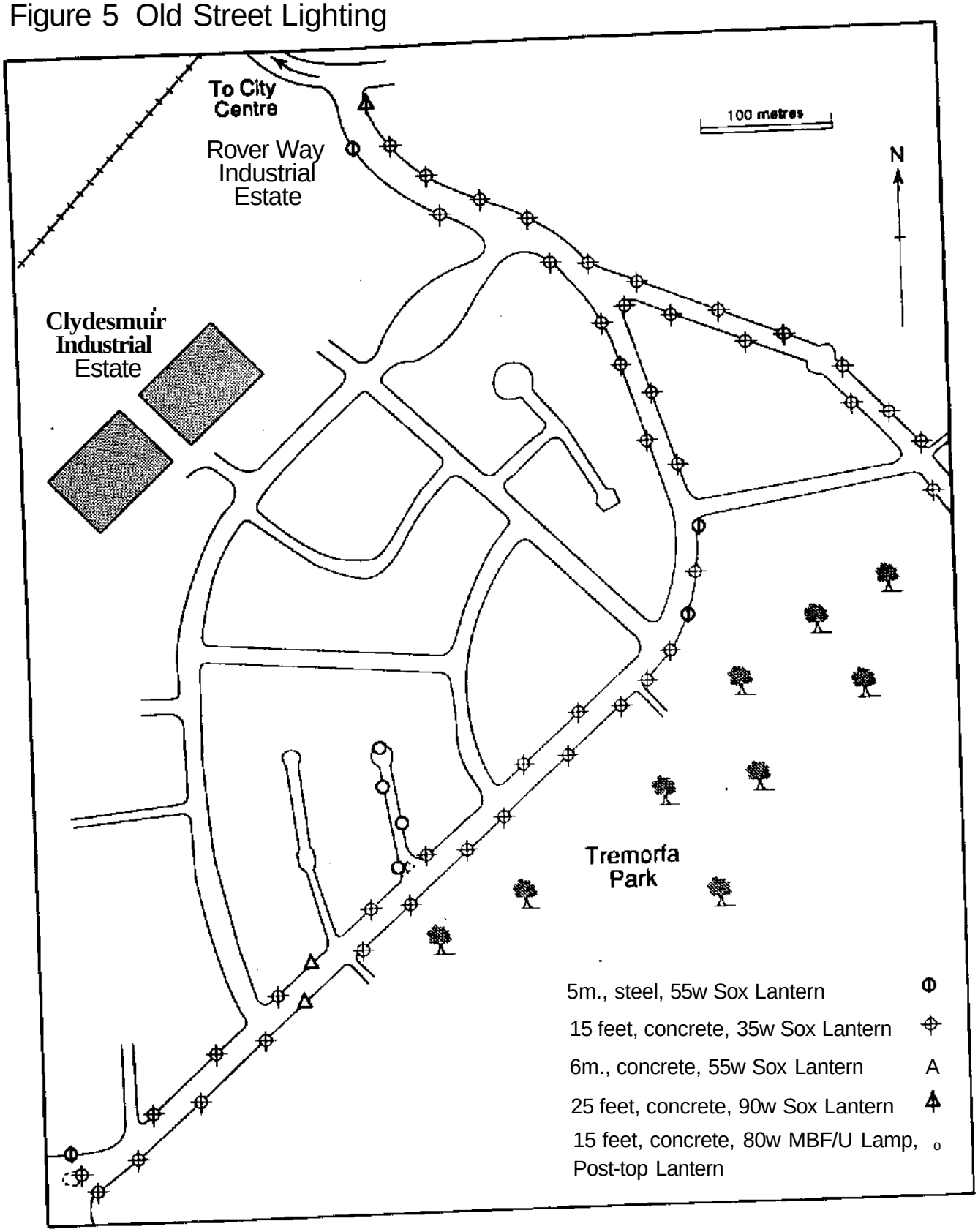
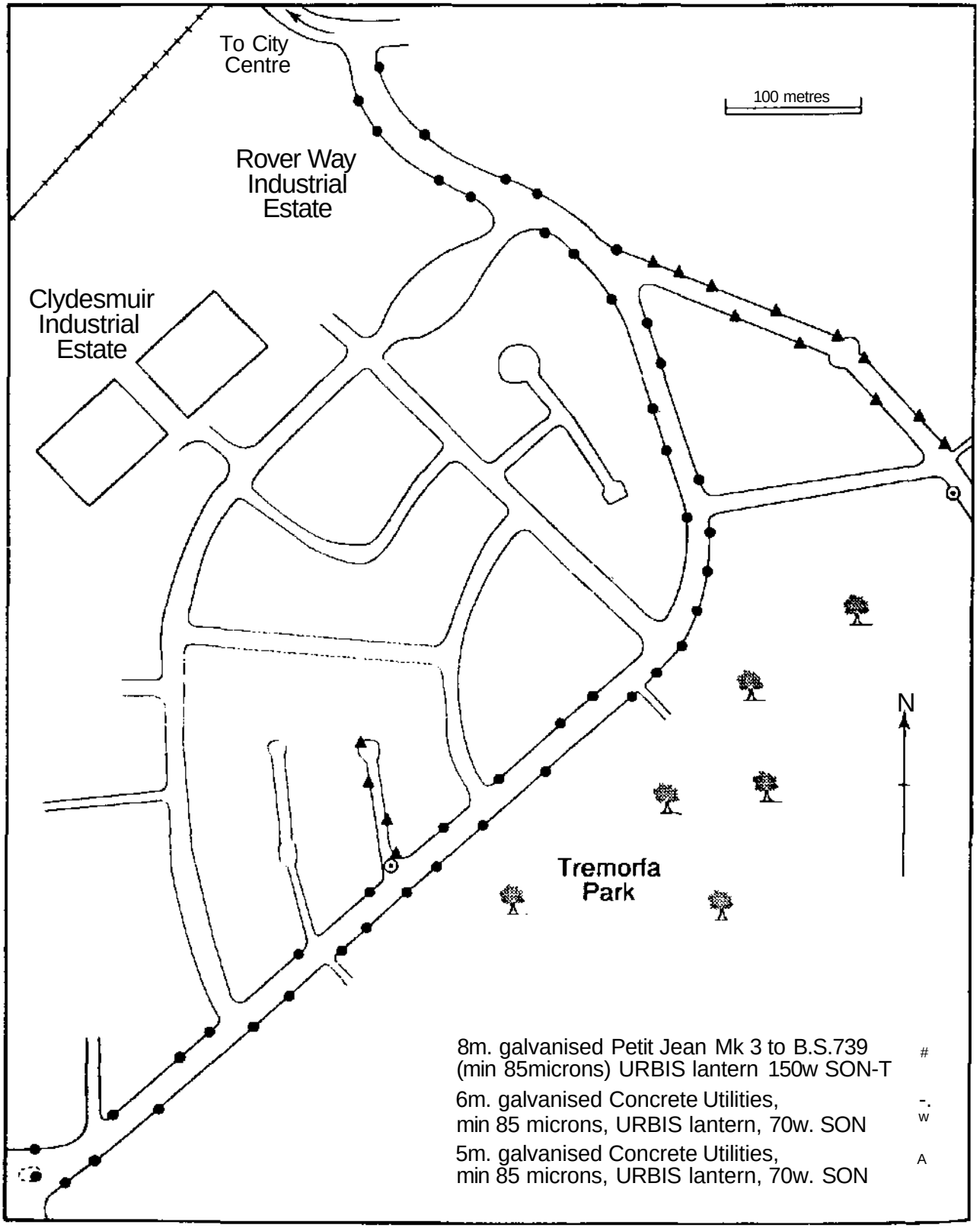


Figure 6 New Street Lighting



FINANCIAL IMPLICATIONS

a) Capital costs

The cost of the lighting scheme was £47,410 which includes the removal of the old lighting equipment, installation of the new equipment, electrical services and reinstatement of the footways.

Analysis of the costs per lighting unit, street and house are as detailed below:

lighting Unit cost: £752.54

Typical Street cost: £11,152 (Whitaker Road)

Typical House cost: £94.51 (Whitaker Road)

b) Running costs

Analysis of the costs per lighting unit, street and house before and after relighting are as detailed below:

i) Lighting Unit Cost	Before (£)	After (£)
Energy	18.28	21.24
Maintenance	12.93	13.24
Total	**31.21**	34.48

ii) Typical Street Cost	Before (£	**After** (£)
Energy	274.08	.339.84
Maintenance	193.90	211.84
Total	467.98	551.68

iii) **Typical House Cost**	Before (£)	After (£)
Energy	2.33	2.88
Maintenance	1.65	1.80
Total	3.98	4.68

CONCLUSION

Comparative costs of the Before and After lighting schemes would indicate a marginal increase in the annual running costs.

This is due to an increase in the electrical energy consumption and general maintenance.

The improved lighting of these roads has reduced the risk of road accidents.

In addition to this, burglary, mugging and rape have been made more difficult by increasing the chance of recognition of the offender.

It has also induced more confidence in the residents to walk out at night and enhanced the area not only by providing more light, but also by highlighting colours to give a better night time scene.