VANDALISM IN A SOUTH AFRICAN TOWNSHIP: AN EXPLORATORY STUDY OF CRIMINAL DAMAGE TO THE BUILT ENVIRONMENT IN MANENBERG, WESTERN CAPE

By

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By

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ABSTRACT

The overall objective of this study is to identify the spatial distribution of vandalism and the causes of vandalism variance within a specific geographical area. The study concentrates on the impact of the built environment, particularly the design of the built environment as a motive for vandalism and has sought to identify the design elements of the built environment which encourage vandalism. The investigation for this study is limited to Manenberg, a residential township in the Western Cape.

The methodology adopted for the study involves the collecting and interpretation of official police statistics of vandalism over a seven-year period. The statistical data is combined with the 1996 population census for the area. A GIS program is adopted in order to graphically represent the data.

The statistical data is examined and presented in three focus areas: the frequency of vandalism, the nature of vandalism and the area and target of vandalism. Following the initial presentation, the data is compared to factors of the built environment specifically the design of the built environment. The study then presents the association between the design of the built environment and vandalism levels.

DECLARATION

I declare that this research report is my own unaided work.

It is submitted in complete fulfillment of the requirements of the degree of Master of Philosophy, in the Faculty of Engineering and the Built environment, University of Cape Town, South Africa.

It has not been submitted before for any degree or examination in any other tertiary institution.

Signed by candidate

Elizabeth Clare Heron

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DEDICATION

I dedicate this report to my Mother and Father, whose love and encouragement have been constant in my life. Thank you for everything you have done and continue to do for me.

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1.1 Background

Vandalism is considered to be the result of willful or thoughtless behaviour toward the environment, resulting in the destruction and damage of property, or the defacement of parks and recreational areas (Wilson, 1961). The variables influencing the occurrence of vandalism are considered to be psychological, social, genetic and situational (Ward, 1973). Two research theories exist which identify the spatial distribution of offender and offence within geographical areas. The first research theory focuses on the offender rate in relation to spatial distribution. This has resulted in numerous studies relating the presence of offenders to various characteristics of the neighborhood, such as: socio-economic status, family structure, ethnicity, residential mobility and density (Hesseling, 1992, citing Dunn, 1980; Byrne and Sampson, 1986). The second school of thought identifies various environmental and opportunity theories to explain the variations of crime rates (Hesseling, 1992). Furthermore, a number of studies have identified the spatial distribution of crime targets to explain the variation of crime rates in a given situation (Hesseling, 1992).

Newman (1973) identified the impact of specific physical and social factors on the control of crime targets. The situational perspective focuses on the social and physical variables that influence the offender (Harvey, 1982). Since the physical conditions, in terms of opportunity, structure and environmental design, are considered to act as both the trigger to offend and the target of offence, the physical form, in terms of design and material use, will influence the vandalism rate and type.

The purpose of this study is to examine the extent of vandalism in the South African context and for this purpose Manenberg, a suburb on the Cape flats in Cape Town, will be adopted as a case study. Manenberg was developed between 1966 and 1970 by the Cape Town City Council on the sands of the Cape Flats. It was initially designed to contain the largest number of sub-economic multiple dwellings for low-income families of all the Municipal schemes (City Engineers Department, 1981). Initially designed for a maximum of 10 000 people, its primary objective was to re-house 4973 families in terms of the Group Areas Act. In 1996 there were estimated to

be 8963 households units in Manenberg (Population census 1996), with a population density/ km^2 approximately at 13 260.04. The original housing units were designed as largely sub-economic and economic two or three bedroom, double and triple storey flats, and rows of semi-detached houses (City Engineers Department, 1981).

The unit design and form has encouraged and escalated the growth in population and density levels. The last population census undertaken in 1996 estimated the population in Manenberg to be 45 086, of which 15 309 were below 14 years of age. Between 1991 and 1996 the population was estimated to have increased by 12% from 39 798 to 45 086. The ethnic groupings in 1996 were estimated to be: 41 108 Coloured; 1 406 African/Black; 256 Indian/Asian; 36 White and 2 280 unspecified; in addition there were estimated to be 21 137 males and 23 949 females (Population Census, 1996). The escalating density levels have been associated with a number of negative factors, namely: an increase of residential dissatisfaction with the area, an increase in socio-economic problems and, more notably, an increase in poverty and crime (Cape Town City Council, City Planner's Department, 1993). Furthermore, the increase in child density has been identified as a contributing factor to the escalation in crime levels and, more specifically, vandalism. A study undertaken by the City Planners Department, (Cape Town City Council, 1993) attempted to identify the perceptions and opinions of tenants in high-rise and medium rise housing design. The study identified malicious injury to property as one factor that contributed to residential dissatisfaction; moreover, the residents identified vandalism, both unintentional and intentional, undertaken by children as impacting negatively on the area.

Violent acts aimed at property in the Cape Metropolitan Area showed an increase of 2.78% from 13 538 reported cases in 1997 to 13 915 reported cases in 1998. Malicious damage to property contributed to 95.52% of the percentage of property crimes in 1988, of which 4.48% were identified as arson (Cape Metropolitan Council (1999)).

Between 1988 and 1994, the reported cases of vandalism in Manenberg reflected a 65% increase in the crime. In 1988 there were 381 reported cases of malicious injury to property, compared to 628 in 1994. However, more recently the reported incidents

of vandalism have declined. There were 287 reported incidents of vandalism in 1998 and 485 in 1999 (CIAC, 2000). Although there has been a decline in the reported incidents of vandalism in Manenberg, the offence essentially exists and continues to be considered problematic (CIAC, 2000).

Fanaroff *et al.* (2001) conducted a survey for the Unicity Commission, to analyse the SAPS (South African Police Service) statistics on the occurrence of serious crime and more specifically violent crime, in the City of Cape Town from 1996 to 1999. The report indicated that the type of crime, varies with the socio-economic character of an area, and more specifically, that vandalism is associated with poorer communities. Fanaroff *et al.* (2001) compared the crime statistics of nine geographical areas or provinces within Southern Africa. The Western Cape was recognized as having the second highest record of malicious damage to property. Furthermore, within the Western Cape, of the twenty-eight most frequently occurring crimes committed in 1999, malicious damage to property was identified as the sixth most dominant. Of the thirty-seven severe crimes committed in the Western Cape, malicious damage to property was identified as the fifth most frequent.

Fanaroff *et al.* (2001) identified ten areas, termed "*hotspots*", within the Western Cape that were considered a priority for a proposed SAPS (South African Police Services) crackdown to reduce crime. Manenberg was one of the areas identified. The report further identified nineteen of the most serious crimes committed within the area, one of which was malicious injury to property. Four hundred and eighty five reported cases of malicious injury to property took place in Manenberg in 1999. Consequently, Manenberg is classified as the ninth most prominent area for the occurrence of crime. In addition, Manenberg has been identified as the third most dominant area when the crime rates for malicious injury to property are calculated per 100 000 of the population.

This research project will examine the vandalism levels concentrated in specific geographical areas within Manenberg, and it will attempt to identify the environmental design factors, which influence the extent and type of vandalism.

In the following section, the theory of vandalism in Manenberg is presented, the purpose of which is to distinguish explanations for the nature, extent and causes of vandalism and solutions to the problem. A historical portrayal of Manenberg will be presented, specifically the environmental design adopted, from conception and planning through to the creation and development, to the present day. The importance of the environmental design, more specifically the built form, in terms of physical design, will be examined as a contributory factor to vandalism. The purpose of this section is to provide background information to the problem statement, which will be presented later.

1.1.1 Vandalism defined

Environmental crime has been seen as behaviour that results in physical, psychological or social damage to either an individual or group of people, through the willful disturbance of the physical environment. The characteristics of environmental crime are identified as: a few criminals with a large number of victims; problematic in terms of a definition for the crime; having an inconspicuous, invincible criminal; and a disproportion of power between victim and criminal. The crime is localised and therefore specific to the victim, and the crime is identified as white collar (Ward, 1973 citing Hoefnagels Professor of Criminology at the Netherlands Economic University).

Vandalism, a specific form of environmental crime, is defined as the willful damage to property through specific behaviour, as opposed to decay, erosion and change, which the physical environment is subject to over time and through use (Ward, 1973). Furthermore, the act of vandalism is undertaken to property not belonging to the vandal, and the onus for repairing the property lies with the owner.

Reaction toward vandalism is based on the extent, type, rate and situation within which it occurs. Ward (1973) defined the various forms of vandalism as: institutionalised; ideological; and conventional.

Institutionalised vandalism

Institutionalised vandalism is defined as the most acceptable form of vandalism; being considered harmless it is mostly ignored. Institutionalised vandalism is subdivided into several categories, namely:

Ritualism and special events

Ritualism and special events, is where the vandalism undertaken is based on an event or ceremony.

License damage

License damage, where the damage is agreed to in advance through an informal agreement, the damage is not reported, and often undertaken by a protected group in a ritual setting, often under the guise of play.

Industrial damage

Industrial damage is identified as that form of damage that occurs during an industrial dispute.

Routine wear and tear vandalism

Routine wear and tear vandalism occurs in the form of damage to school desks, or the informal development of a footpath and littering. A protected group often performs play vandalism, defined as accidental damage, on a ritual occasion and in a specific setting.

Written off vandalism

Written off vandalism is identified as unreported vandalism, where the offender is not traced. Although offenders are considered deviant in their own right, they are not classified a deviant, with regard to the act and type of vandalism undertaken. This

form of vandalism can take the form of minor property defacement, such as graffiti on walls, both internal and external and is expected under the circumstances, within which it occurs.

Walling in

Ward (1973) identified a further form of innocuous vandalism which was categorised as, "walling in". The crime is confined to a specific environmental setting, the damage is often considered inconsequential, and the punishment of the offender is undertaken within the confines of the offence area. The vandalism is considered unsupportable when the motive for the damage is not of a financial nature, when the damage is highly visible and considered to break certain specific rules, or when it can be considered threatening, senseless and deliberate (Harvey, 1983).

Ideological vandalism

Cohen (1973) identified "ideological vandalism" as that which promotes or condemns a cause. The target is predefined and attacked for the purpose of revenge, attention, or insult.

Conventional vandalism

"Conventional vandalism" is considered to have its motive in ideological vandalism and is believed to be ideologically inspired. It is defined as an act, which, unlike institutionalised vandalism, causes a reaction. Conventional vandalism is identified as that damage primarily undertaken to acquire money or property. The action is deliberate and planned, often revengeful and an expression of hostility, resentment and malevolence. Cohen (1973) identified five areas within conventional vandalism namely: acquisitive vandalism; tactical vandalism; vindictive vandalism, play vandalism and malicious vandalism.

1.1.2 Causes of vandalism

In order to conceptualise vandalism a number of issues need to be considered, namely the psychological factors, sociological factors and the physical factors. Ward (1973), citing Leather and Matthew (1973), contended that the physical factors that create the environment can be conducive to vandalism and that the damage is a result of a reaction toward the environment.

Harvey (1982) citing Wilson (1980) stated that the design of the built environment did affect the type of vandalism. To date, inadequate research exists on the reaction, in the form of vandalism, toward part of or the entire environment. More specifically, insufficient research has taken place with regard to the spatial distribution of vandalism and the identification of specific design variables which may influence the extent and type of vandalism in specific localities. Although there is evidence of research pertaining to related aspects of environmental design (e.g. Shaw and McKay, 1969; Newman, 1972 ; Ward, 1973; Hesseling, 1986 ; Tygart, 1989) it is primarily directed toward material choice, appropriate finishes, components and detail.

Harvey (1982) identified child density as an important factor in the variation rates of vandalism among diverse building forms. Tygart (1989) identified the vandal as those youths in lower grades at school, irrespective of the crime being school or non-school vandalism.

1.1.3 The effects of vandalism

Cohen (1971) contended that the effects of vandalism are inconvenient, irritating and, in extreme examples, life threatening. The psychological effects on the victim occur when the victim's predisposition toward their territorial boundary is betrayed and disregarded through the destruction of the aesthetic or physical form of the environment, the apathy of the residents increases and pride decreases. Tygart (1989) identified vandalism as a behaviour that may result from youth having to remain in a

hostile environment. Furthermore, the youths' negative perception of their treatment, by the residential community, contributes to the levels and types of vandalism. Tygart (1989) conceptualized vandalism in terms of property defacement which was identified as: writing, painting and drawing pictures on buildings and property; and property damage, which was classified in terms of breaking windows, damaging other parts of buildings and damaging equipment. Ward (1973) suggested that the act of vandalism visually demonstrates the vandals' hostility and resentment toward the environment.

1.1.4 Research into vandalism and the measurement of vandalism

Vandalism is not identified as simply a sociological or psychological product of delinquent behaviour. Behaviour cannot be assessed in isolation from the situational context within which it takes place, as many of the acts are situationally specific (O'Donnell, 1980, citing Mischel, 1968). A study was undertaken by the Cape Town City Council (1993) to identify the perceptions and opinions of residents of high density and medium rise housing in specific areas in the Western Cape, namely: Albow Gardens; Bo-kaap; Hanover Park; Woodlands; Uitsig; Lotus River and Langa. The study suggested that the social and physical environments are inextricably linked, and that it is not practical to separate the direct effects of the physical environment from the social environment. From that study it can be concluded that a large proportion of the dissatisfaction of the residents in terms of the social environment emanated as a direct result of the physical environment.

O'Donnell and Lydgate (1980) proposed that among the variety of approaches for environmental assessment, dimensions of the physical environment should be identified. Ittleson *et al.* (1970) stated that the behaviour observed must be categorised on the basis of its physical location. The most influential environmental assessment research yet undertaken for examining patterns of crime within cities developed within the Chicago School of Sociology. Shaw *et al.* (1929) analysed delinquency rates in relation to geographical factors, initially identifying the delinquency rates and distance from the city center. The conclusion of the study was that certain people are

more prone to undertake certain types of crime than others and that criminal activity, specifically property crime, does not often occur in the area within which the offender lives (identified as the offender area).

Contrary to this theory, Cohen and Felson (1979) developed the Routine Activities Theory (RAT) in order to explain the occurrence of crime. The theory focused on the characteristics of the criminal event (the crime) rather than the motivations and the characteristics of offenders (criminality). The theory states that criminal offences are related to the nature of everyday patterns of social interaction. According to Cohen and Felson (1979) three factors must exist for a crime to take place namely: an offender, a target and the absence of a capable guardian. A capable guardian is identified as a person or thing which discourages a crime from taking place. Routine activities, or routine patterns of behaviour, which are defined as those activities that are carried out in order for basic needs to be met, affect the merging of the three elements. Furthermore, the frequency of their union is dependant on certain ecological factors such as the timing of the criminal and the timing of the victim or target.

According to the RAT theory developed by Cohen and Felson (1979), the suitability of a target depends on its value, inertia, visibility and access. Offenders will only concentrate on targets that have value. The value of a target is dependant on its monetary value or on the offender's perception of the value of the target. The inertia is the size or weight of the target; the visibility refers to the target's exposure and the visibility of the offender; the access refers to the target's accessibility. In order for a crime to occur, an offender will locate a suitable unguarded target. This suggests that with an increase of targets without guardians crime will increase without an increase in offenders. Given that an offender will commit a crime within their Routine Activity Area, the routine activity of a community can determine its exposure to the offenders. Furthermore, targets that are located within the offender's activity area will be at greater risk of assault, particularly if the target is accessible, has reduced visibility and is unguarded.

The Routine Activities Theory developed by Cohen and Felson (1979) has been instrumental in promoting situational crime prevention techniques, where the *situation*

is defined as the immediate setting in which the behaviour occurs and where *situational analysis* sets out to identify the regularities or patterns in the relationships between settings such as neighborhoods, recreational facilities, schools and parks, and behaviours such as crime.

O'Donnell (1980) stated that the methodology for research into vandalism should assess both the physical resources of an area and the characteristics and actions of the population within the given area. A study undertaken by O'Donnell and Lydgate (1980) attempted to assess the physical resources within specifically defined geographical areas. A land coding system was adopted. Data offences, which were reported to the police during a four-year period, were correlated with the physical resources in the area. The study identified the relationship between the frequency of specific offences and the physical resources contained within a geographical area. The research identified a number of crime-resources patterns, including vandalism. It was concluded that permanent residences continually appeared to be associated with vandalism and that a variation of crime is related to the distribution of physical resources within the geographical area. The findings suggest that it is possible to assess the opportunities for crime through the coding of physical resources. Furthermore, it is appropriate for research into the nature and extent of vandalism to focus on specific situations associated with the occurrence of a particular crime, rather than the social conditions within which the offenders are raised, or the social characteristics of residents in areas of high crime.

A survey of vandalism in park and recreational facilities undertaken in the United States of America by Wilson (1961) is considered the seminal study of vandalism in the field. The objective for the study was to identify effective practices employed to reduce vandalism in park and recreational facilities. The research was undertaken in 87 cities having a minimum population of 50 000. Two hundred and twenty one vandalism observations were submitted by one hundred and twenty six observers, of which 66.8% of reported incidents resulted in property damage and 63.6% occurred outdoors. Through the research, Wilson (1961) identified the circumstances for vandalism to occur, the specific practices employed in vandalism, and the results rating of the practices employed to reduce vandalism. The research indicated that

vandalism could be minimised through effective planning and design of the environment.

It is apparent from the available literature that there exists no precise tool for measuring vandalism and that very limited information is available with regard to a specific reason for the evolution of vandalism. However, it is widely contended that it is the designer's duty to ensure the built environment is less inclined to assault and damage, and that it does not promote the spread of vandalism. Ward (1973) stated that the environmental factors which influence vandalism levels have, to date been descriptive in terms of quantity and quality. Furthermore, Ward (1973) identified vandalism as a reaction to whole or part of the environment and promoted the importance of future research, specifically with regard to design, to identify the causes of the reaction.

1.2 Problem statement

Design factors within the built environment elicit a reaction on the part of the vandal, which is expressed in the form of damage and physical attack. Environmental design has been identified as an influential factor of environmental abuse and damage, and more specifically, vandalism. The reaction, specifically in the form of vandalism, is directed toward the built environment. Certain elements of urban design, therefore, cause a reaction to take place and are the target of the reaction. It is the designer's responsibility to the eventual users of the built environment to employ design factors that discourage vandalism. Failure to consider the design variables that motivate vandalism will result in attack and damage. Vandalism results in a deleterious environment; it questions the aesthetic values, emotional qualities and the territoriality of the environmental users. Vandalism is contended to be costly, both financially and emotionally; furthermore it is considered dangerous, and in extreme situations, life threatening.

Therefore the problem to be addressed in the research project may be stated as:

The act of vandalism is encouraged and promoted through design variables of the built environment specifically within low-income residential dwellings.

1.3 Objectives of the research

The objectives of the research project may be identified as being:

- Establish a theoretical framework for the analysis of vandalism.
- Establish the frequency of vandalism within Manenberg and identify frequency patterns within specific areas in Manenberg.
- Establish the nature of vandalism that exists in Manenberg in terms of the methods of destruction and the instruments adopted.
- Relate the levels of vandalism within specific areas to design factors of the environment, specifically environmental layout, housing types and density of the area investigated
- Identify and compare additional variables that may impact on vandalism levels, specifically the population statistics, in terms of density, unemployment and dwelling size.

1.4 Research Methodology

The objectives of the research project will be attained using the following research methods:

1. Undertake a literature review on the subject of vandalism
2. Identify, through police records, the nature, frequency and areas of vandalism within Manenberg
3. Establish a pattern for the spatial distribution of vandalism in Manenberg in terms of the nature, frequency and vandalism area.
4. Identify the relationship of vandalism with environmental design factors specifically in terms of the nature, frequency and areas of vandalism.
5. Provide an analysis of the findings and relate the findings to the literature review.
6. Draw conclusions and make recommendations

1.5 Limitations

The incidence of malicious injury to property will be limited to those cases that have been reported, and as such, under-representation of the problem is likely. The crime records of malicious injury to property may be inaccurate or incomplete.

It is widely observed that generally the vandal is male and between the ages of 16-25 (O'Donnell and Lydgate (1980)). Research has shown that in South Africa specifically on the Cape Flats, delinquent behaviour is initially undertaken from the age of 4. The research may be situationally specific and unique to the South African context.

1.6 Structure of the thesis

Having presented in Chapter One the background to the problem, the research objectives and the methodology, the remainder of this dissertation is presented in a number of chapters, namely:

Chapter 2 will present the concept of vandalism. More specifically, the development of vandalism, and the extent, causes and effects of vandalism will be identified.

Chapter 3 will identify the research methodologies that have been employed for research in environmental psychology/criminology and provide justification for the method employed in this research.

Chapter 4 will identify the findings of the police statistics for vandalism in Manenberg; the findings will be examined and presented in order to portray all the aspects of vandalism identified in the statistics. The information will be presented by the application of a GIS (Geographic Information System) survey.

Chapter 5 will present and analyse the findings.

Chapter 6 will present the conclusions emanating from the research and offer proposals for the reduction of vandalism through design variables in the built environment.

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Chapter 2: Literature review

2.1 Introduction

The Chapter commences with a historical and theoretical overview of vandalism, which will define the subject area and examine the extent and importance of vandalism, specifically in the South African context. Furthermore, the various methods adopted for the control and prevention of vandalism are reviewed.

2.2 Vandalism – a historical overview and definition.

The term *vandalism* as it is known today is derived from a Germanic tribe named the "Vandals". The tribe existed between AD 100-534 and is known to have originated from Jutland, the area which is now recognized as Denmark. During the second and third centuries the tribe inhabited areas along the Danube River region. The Vandals were threatened by the Huns and other tribes from the East during that time and by the late A.D.300's had moved West. In 406 the Vandals invaded and destroyed parts of Gaul and by 409 had crossed the Pyrenees and overpowered Spain. The Vandals reached the height of their power between 428-477 under the control of the Vandal King Genseric. In 429 the Vandals invaded North Africa where they overtook many Roman provinces and where their persecutions of members of the Catholic Church were fierce. During 534 the Vandal Kingdom was destroyed by an army from the Byzantine Empire, and from that date the Vandals did not contribute significantly to history. (World Book Encyclopedia, 1997: 310; Cavendish, 1996: 1028; Encyclopedia Brittanica, 1988).

Cohen (1973) noted that the significance of the Vandals, in terms of the modern theory of "vandalism", was that the Vandals were known to be great destroyers of valuable aesthetic items. More specifically, according to Coffield (1991), it was during the period AD 1700's that the vandals became associated with lack of culture, barbarous behaviour and the destruction of anything beautiful. Although the Vandals were not any more significant than other tribes for destructive and barbaric behaviour,

the word *vandal* continues to be associated with a destroyer of valuable things (World Book Encyclopedia, 1997).

According to Coffield (1991), Schama (1989) proposed that the first modern use of the term vandalism was devised in the 1700's by Henri Gregoire, the Bishop of Bloise, to describe extreme destruction, and Coffield (1991) argues that from the initial use of the word the meaning was the similar to Cohen's (1973) use of the word to describe deliberate ideological vandalism.

According to Coffield (1991) many countries define vandalism under the legal definition of other crimes, such as, theft or burglary and this can distort comparative studies. In addition, vandalism is often considered to be a crime that is undertaken by juveniles and vandalism undertaken by adults is often disregarded as vandalism.

Snyman (1989) noted that the crime of malicious injury to property, as vandalism is referred to in South Africa, was not known in Roman or Roman Dutch Law; it was based on English Law and Common Law during the nineteenth century. In Roman law only specific forms of the crime were punishable, for example, damaging property on a boat during a fire and damaging trees and vines. Furthermore, that the crime was originally identified in the case R *v* Mashanga 1924 AD 11 12, where the crime was recognized as: *"An intentional wrongful injury to the property of another"*.

Snyman (1989) further stated that the crime of vandalism is committed either when property owned by another person, is damaged either intentionally or unintentionally, or when the owner of insured property damages the property for the purpose of an insurance claim. Mayhew *et al* (1989) identified vandalism as anything ranging between "*arson to graffiti*", whereas Clarke (1978) suggested that vandalism was deliberate or malicious damage and Hunt (1970:778) defined malicious injury to property to be *unlawfully damaging property with the intent to injure another*. Wilson (1980) identified vandalism as damage caused by: an accident, a direct attack, misuse or play.

2.3 A typology of vandalism

Existing literature indicates that there is not a single definition for vandalism, the definition of the damage depending largely upon, and varying according to, the conditions within which the damage is undertaken and the situation within which it becomes acceptable.

Martin (1961) proposed the first typology of vandalism that he described as, predatory, vindictive, and wanton. Since this first attempt to classify vandalism the most widely accepted and adopted classification was determined by Cohen (1973) and for this research, Cohen's theory will be examined.

Cohen (1973) noted that in order for society to survive vandalism, it has developed a level of endurance toward it and has classified vandalism in terms of *acceptable* vandalism, such as graffiti and property damage, and *unacceptable* vandalism, which is regarded by society as problematic and potentially dangerous. Furthermore, he identified the conditions for acceptance as; ritualism; protection; play; writing-off; walling-in and licensing. The conditions were identified in order to illustrate the variable conditions under which property damage is not classified as vandalism.

Cohen (1973) ascertained that the term *vandalism* evokes an image, and the image dispels any motive or meaning behind the actual destruction, particularly if the destruction is not connected to economic attainment. Tygart (1988, 1989), while sharing this theory, added that vandalism is a response to frustration that cannot be avoided and the damage is directed toward the source of the frustration, for example, the vandal's environment. According to Wilson (1979), vandalism is a component of a wider range of behaviour, which can begin with simple lack of consideration, such as litter dropping, and extends to more deliberate destructive behaviour. Cohen (1973) further asserted that to describe certain property destruction as senseless or ignorant, such as that vandalism which is undertaken for a definite ideology such as politics or religion, dismisses the understanding of the motive.

Cohen (1973) describes ideological vandalism as being either damage which is undertaken as a means to a theoretical end, and/or damage which occurs although the

reason is unclear and the rule for which the demonstration takes place is not challenged. In addition, it was noted that all property destruction is used as a method of drawing attention to a specific cause and although forms of property damage may be dismissed as vandalism, all vandalism contains an element of ideology. From this theory it may be presumed that all forms of property damage are ideologically inspired and motivated, and not motiveless, as generally perceived, and therefore in order to understand and reduce vandalism the motive which inspires the act must be analyzed. He further noted that if this theory were accepted, society's attitude toward the act and the method of dealing with it would alter according to the type of act and the circumstances within which it takes place.

Cohen (1973) dispelled two theories regarding vandalism. Firstly that there exists a homogeneous vandal responsible for vandalism and, secondly, that the destruction is meaningless or without motive. In order to prove these theories he suggested that patterns were identified in terms of the type of damage that is undertaken and the motive for the various damage recognized. From these theories, Cohen (1973) developed a typology of vandalism (see Table 2.1).

Table 2.1 Cohen's typology of vandalism

Source: (Cohen, 1973)

Type of Vandalism	Motive
Acquisitive	In order to obtain money or property, e.g., looting, collecting, and junking.
Tactical	A conscious tactic, in order to obtain some other end rather than money. Does not involve aggression. The property destruction is deliberate and planned in order to obtain attention. E.g., slogan painting and other property defacement.
Vindictive	Property destruction as a form of revenge. Large part of vandalism – appears meaningless. Emotionally satisfying and safe – detection unlikely.
Play vandalism	Form of rule breaking therefore institutionalised. Little malicious element and the motives are curiosity, spirit of competition and skill.
Malicious vandalism	Expression of anger, aggression and animosity. The action is directed and responsive.
Ideological	Undertaken in order to obtain attention for a cause.

The typology developed by Cohen (1973) evaluated the types of "conventional vandalism" and the motive for vandalism. "Conventional vandalism" was identified as that vandalism which is considered problematic and treated as a criminal offence. The classification Cohen gave for conventional vandalism was grouped as; acquisitive; tactical; vindictive, play, malicious and ideological.

Using the typology, it was also suggested that vandalism was not homogeneous, although, it was suggested that certain types of vandalism could be identified with specific groups of people. For example, in a study conducted in the United Kingdom

Cohen (1973), identified that two thirds of telephone vandals were identified as adults while most railway vandalism is undertaken by children between the ages of ten and twelve. Coffield (1991), through an assessment of police records on vandalism in England in 1989, noted that 50% of those convicted or cautioned for vandalism offences were under the age of 21, and of those criminals convicted the majority were male (8 700 males compared to 700 females in 1989). Tygart (1989), while sharing this theory, distinguishes the vandal with the following criteria: juvenile offense record; age; gender; parental social class; youth approval/disapproval of vandalism; youth perceptions of the extent that youth can identify the vandals; treatment by officials and treatment by community. Furthermore, Harvey (1982) contented that due to the low apprehension rates of offenders, the characteristic of the offender is not possible to develop.

Many researchers have since adapted Cohen's typology for vandalism in order to understand vandalism. Although researchers such as Baker and Waddon (1989), have since altered Cohen's typology and replaced *tactical vandalism* with *graffiti* and *vindictive vandalism* for *problem expression* the original typology remains the most widely accepted classification for the crime. Barker and Bridgeman (1994) confirmed this and noted that although Cohen's work has been adapted into more recent research the original work has not been improved upon. In addition, Barker and Bridgeman (1994) argued that it is questionable to combine the motivational characteristics of vandalism into an overall definition of vandalism as the act may not be related to the damage, for example, accidental damage. Although Barker and Bridgeman (1994) did agree that in order to effectively prevent vandalism a definition of the problem, the circumstances of the damage and the possible motives of the vandal must be considered.

2.4 Vandalism - the problem.

Schonteich and Louw (2001) indicate in their report "Crime in South Africa: a country and cities profile", that levels of recorded crime began to increase from 1980 until 1990 when it had risen significantly. Furthermore, that although the levels of recorded crime stabilised between 1995 and 1996, crime in general has steadily increased since 1999. In addition, the report indicated that although crime levels have

steadily increased, the overall number of reported crimes was greater during 1999 than in any year after 1994, and that the crime trends in all the major cities within South Africa have displayed a similar pattern since 1994. Johannesburg was identified as having the highest volume of serious crimes, followed by Pretoria, Cape Town and Durban. Furthermore, apart from Johannesburg, all the identified cities suffered an increase in overall crime between 1994 and 1999.

Fanaroff *et al.* (2001) stated that according to the 1996 census, the Western Cape had a total population of 3.9 million. According to the crime statistics from the SAPS Crime Information Analysis Centre (CIAC) (2000), the Western Cape suffered the highest crime rate in South Africa per 100 000 of the population. Of the crimes identified, housebreaking; theft; murder, common assault and shoplifting were identified as the most problematic in terms of number of incidents, followed by fraud, rape, common assault, aggravated assault, mugging and malicious injury to property.

Fanaroff *et al.* (2001) further identified the number of crimes committed per province between 1994-1999. Overall the Western Cape was shown to have suffered between 20 000-25 000 incidents of malicious damage to property with a steady increase of 5 000 reported incidents between 1994-1999. Furthermore, the Western Cape was identified as having the second highest incidence of malicious injury to property in South Africa superseded by Johannesburg which recorded between 30 000-35 000 incidents of the crime.

Schonteich and Louw (2001) noted seven factors which contribute to the high crime rate in South Africa, namely; period of transition; culture of violence; proliferation of illegal firearms; organised crime; youthful population; rapid urbanisation; and a weak criminal justice system. Moreover, that the victims of crime are influenced by their age, income, company and, most significantly place of residence.

While the level of malicious injury to property continues to increase, Schonteich and Louw (2001) noted that not all crimes are reported and official statistics undercount the total number of crimes that are committed. Furthermore, that reports from victims highlight between 60-70% additional crimes to those reported in the official statistics. The Safety and Crime Prevention Report (2001) agrees with the theory suggested by

Schonteich and Louw (2001) and identified murder, car theft and housebreaking as the most reported crimes while rape and common assault are the least reported crimes. Significantly, the report stated that malicious injury to property was commonly associated with poorer communities.

2.5 The cost of vandalism

Herbert (1990) acknowledged the cost of vandalism firstly in terms of financial cost such as court costs, police costs, social services and repair and secondly in terms of the social costs which were identified as psychological distress and apathy. In terms of social costs, Cohen (1973) stated that vandalism was a challenge or threat to society's ethics.

In terms of financial cost, according to the Housing Support Services of the Cape Town Administration Department the costs incurred by vandalism in Manenberg for the financial year 1999/2000 was a total of R 12 037, 84 and for the year 2000/2001 R759, 967.

2.6 Factors which influence vandalism

Although all people do not share the same opinion as to when and how vandalism becomes problematic, researchers agree that it is extreme in nature from being irritating and inconvenient to being dangerous and life threatening (Cohen, 1973).

Through research undertaken in Britain, Wilson (1979) argued that vandalism is the result of a wider spectrum of behaviour that can be initiated through carelessness, in the form of litter dropping to deliberate and extreme forms of vandalism that are malicious in their form. Moreover, researchers agree that vandalism threatens aesthetic values, for example, the defacement of war monuments or religious statues and it questions ethics and the symbolic value with regard to possession of property specifically after assault (Cohen,1973). Through research undertaken in the USA Wilson and Kelling (1982) argued that vandalism reduces the levels of mutual regard and obligations of people toward an area and it instills the image that "*no one cares*".

Barker and Bridgeman (1994) argued that in the British context, vandalism is linked to wider social problems and that the act promotes the fear of crime within a community. The fear of crime was influenced by the appearance of an area and not the actual crime levels; if the area suffered from disorganization and incivility the fear of crime was higher. Furthermore, vandalism will eventually lead to the breakdown of community controls and ultimately urban decay (Wilson and Kelling, 1982)

Coffield (1991) presented four explanations for vandalism namely: financial gain, peer pressure, pleasure and finally manufactured malice and excitement as a solution. Coffield (1991) citing Gladstone (1978) and Gillier (1998) stated that often vandalism is economically motivated, for example the destruction of telephone boxes may be carried out to steal money from the telephone box.

Secondly vandalism as peer pressure is seen as a *game* that is inevitably going to be successful, undertaken for acceptance into a group. Coffield (1991) cites the results of a survey undertaken by Pollard in 1988 which sought the opinions of a number of 13-16 year olds on the reasons for vandalism; the second most frequent comment for the occurrence of vandalism was to *prove something to friends*.

Coffield (1991) citing Allen (1984) described vandalism as an aesthetic experience or a pleasurable act to undertake and cited Ellerby (1966) who questioned why vandalism can not be seen as creation in its own right. Cohen (1973) identified vandalism as a solution to the problems associated with certain class groups in England. Cohen (1973) argues that the Government system has, in the eyes of society, created the class they live in and vandalism is a method of retaliating and venting their anger.

Sykes (1979) contended that neglect of an area in the form of damage left un-repaired will encourage further damage and areas, which are left un-repaired, will suffer from low esteem that will in turn make them more vulnerable.

Newman (1972) noted from his research undertaken in the USA that the highest crime rates are found in those areas occupied by poorer communities, particularly housing areas which are surrounded by similar social and economic environments and the

crimes undertaken are those requiring limited skill without an element of specialty. Coffield (1991) suggested that sociologists promote the theory that criminal damage is more likely to be committed by groups rather than individuals and that according to a theory, termed the *sub-culture theory,* certain types of behaviour are more likely to be found in working-class neighborhoods where some types of minor delinquent behaviour become acceptable. In the British context, Barker and Bridgeman (1994), confirmed this theory and added that poverty escalated the problem as the residents are unable to afford to repair the damaged property. Wilson and Kelling (1982) noted, through their research in the USA, that a broken window which is left damaged will act as a signal that the environment is not cared for, furthermore it triggers a signal to the window breakers that breaking more windows costs very little.

Through research undertaken in Britain, Wilson (1979) noted that vandalism was triggered and based on the feelings of ownership the vandal had towards the abused property. Wilson (1979) stated that the feeling of ownership related to the responsibility levels and that in order to reduce the levels of vandalism the levels of responsibility must be increased. Ward (1973) identified a number of similar characteristics that existed in housing projects that suffered high degrees of vandalism; one of the characteristics was that the property is more likely to be publicly rather than privately owned. Wilson (1979) stated that public housing projects have a social stigma attached to them, and often they are too large to be controlled effectively by the residents.

The capacity of design to influence the perception toward a housing project was first developed by American architect and planner Newman who in 1973 promoted the theory that crime could be prevented through architectural design. Newman (1973) stated that design could influence the built environment to encourage or discourage crime through four principles, namely:

- The design of the environment should encourage levels of ownership, defined as territoriality.
- The capacity of an area to encourage surveillance in order to increase security.
- The image of the environment in terms of perceptions of the area.

- The functionality of an area should be consistent with its raison d'être.

According to Coffield (1991) Newman's work was tested and a number of environmental psychologists questioned the three main hypotheses being addressed namely: psychological, sociological, and the architectural. It was decided that they failed to address specific issues relating to vandalism, and a fourth approach was developed namely the socio-environmental hypothesis. This theory questions such areas as: why particular building types are continually vandalised while others are not and why the appearance of vandalism increases the further occurrence of vandalism.

It was contended by Newman (1973) that government housing projects were designed in a unique manner; they are easily identifiable as the living area of poorer communities and this relates a poor image that creates the stigma that the community is a target for crime. Sykes (1979) further suggests that any area that could represent neglect by a housing authority, for example damages left un-repaired, will encourage further neglect by the residents.

2.6.1 Density

Ward (1973) identified the targets of vandalism as those with low surveillance and property which is derelict, incomplete or poorly maintained, but more significantly, council housing which has a higher proportion of flats than houses and therefore a higher population density. Wilson (1979) concurred with Ward (1973) and a survey undertaken in Britain by Wilson (1986) identified that child density adversely affected the level of vandalism. She further stated that high density increased the levels of vandalism particularly where the density levels reflected an increase in the number of children, and more specifically, where the number of children increased above five for every twelve dwellings or where the total number of children exceeded more than 20 per block of flats. Williamson (1981) and Tygart (1983) also identified the importance of age and density of children as critical factors. Williamson (1981) stated that the environment has less of an impact on older children and, citing Zinn (1975) and Piaget and Inhelder (1971), proposed that the effects of the environment on a child are critical up to the age of 12.

Newman (1972) stated that much of the vandalism which exists in housing projects in the United States is the direct result of children and furthermore that the overall performance of a low-income family can be attributed to the physical environment. From a study undertaken in Philadelphia on a 1022 unit public housing development, Newman (1972) identified the problems of children of low-income families who occupy high-rise developments. A set of guidelines for high-rise housing resulted, the most significant being that children from low-income families should only be housed in buildings not higher than three storeys and that the building should be designed to restrict entry and exit, therefore reducing density. Van Vliet (1983) stated that there are fragmented guidelines which define a *high rise,* although generally high rise buildings are those whose height exceeds access by the use of a safety ladder or those buildings higher than 50 or 75 feet, or higher than 4, 6 or 8 storeys.

Van Vliet (1983) reiterated the detrimental effect of high-rise living on children specifically in terms of disturbed behaviour and the increased probability of the older children becoming engaged in vandalism. Their theory was based on various research studies investigating the negative aspects of children living in apartments. The bases of the findings were that children living in apartments are more aggressive due to the distance between the ground and the home. Tygart (1989) contended, through research undertaken by Agnew (1985), that children who are forced to remain in an adverse condition, such as school, are more likely to become aggressive and vandalism is a display of the aggression.

2.6.2 Residential satisfaction

Extensive research has highlighted the importance of residential satisfaction and its effect on housing projects that suffer high levels of crime. Ahlbrandt and Brophy (1976) identified residential satisfaction in terms of social relationships, the physical structure, security and estate management. The City Planner's Department of Cape Town City Council (1993) published a report entitled *High density medium rise housing: perceptions and opinions of tenants* in order to highlight the perceptions and opinions of tenants living in high density medium rise housing within the Cape Town metropolitan area. The report stated that the social and physical character of an area combined with amenities and the proximity of the area directly influenced the

satisfaction levels. The report stated that, of the residents questioned, 82% chose a *friendly* neighbourhood as opposed to an attractive area within which to live, indicating that a friendly neighbourhood increased the residents' perception of safety. According to Greenberg (1997) residential satisfaction is associated with the floor on which one lives in addition to density and anticipated duration of residence. The Cape Town City Council report (*High density medium rise housing: perceptions and opinions of tenants*, 1993) identified overcrowding as a primary cause of dissatisfaction, although significantly, the residents identified that living above the ground floor increased the feeling of safety.

In the Cape Town City Council report (*High density medium rise housing: perceptions and opinions of tenants*, 1993) undesirable neighbourhoods were those identified as having residents who were of lower economic standing and poorer education. The report highlighted that the majority of the respondents preferred free standing houses as opposed to flat developments specifically in terms of privacy and noise levels, the residents also expressed dissatisfaction with regard to the maintenance of the flats and communal spaces between the blocks of flats. The report indicated that the residents living in poorly maintained areas feel mistreated and that the lack of maintenance reflects the lack of concern of management and the inability of management to control the residents' problems.

Sarkissan (1984) argued that although vandalism is a product of over-use, neglect and deliberate destruction, it is equally a product of inadequate maintenance and that damage, which is left un-repaired, will encourage further destruction, escalating residential dissatisfaction. In a report undertaken for the New South Wales Housing Commission, Sarkissian (1984) sought to identify security through environmental design. A number of policies were developed through the report to minimize vandalism namely: avoidance of the high density of children; provision of recreational facilities for youths; and the implementation of vandal-proof material on target areas, in addition to a speedy repair of damage and efficient management policies.

Clarke and Mayhew (1977 and 1980) developed a framework to identify the reasons for vandalism. The framework stemmed from various theories emanating from biology, psychology and sociology. The model concentrates on situation factors that

influence the act of vandalism and promotes the theory that vandalism may be reduced through the reduction for opportunities of crime.

Figure 2.1 presents Clarke and Mayhew's (1980) framework for the rational of vandalism.

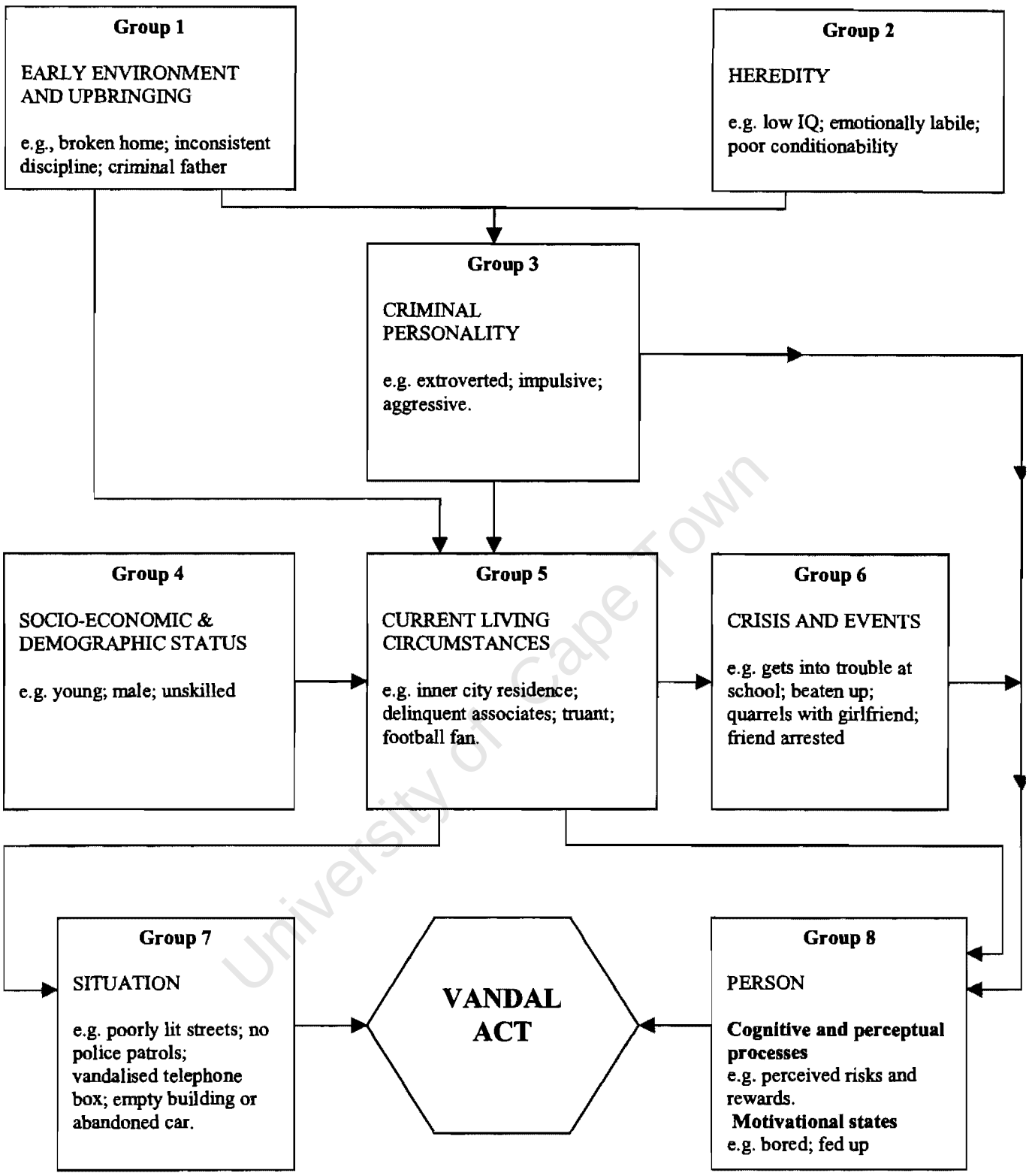

Figure 2.1 Clarke and Mayhew's Explanations of Vandalism

Source: (Clarke and Mayhew, 1980)

The following table (Table 2.2) provides an interpretation for Figure 2.1

Table 2.2 an interpretation for Clarke and Mayhew's explanation of vandalism
Source: (Clarke and Mayhew, 1980)

Group number	Explanation for vandalism
1	Explanation of psychologists – stressing child rearing and personality of offender
2	Explanation of biologists – heredity
3	Explanation of psychologists – stressing child rearing and personality of offender
4	Explanation of Sociologists – emphasizing social status and environmental factors
5	Explanation of Sociologists – emphasizing social status and environmental factors
6	Explanation of criminologists – situational factors
7	Explanation of criminologists – situational factors

2.7 Vandalism and the built environment

Newman (1973) undertook a study in the USA of the design elements within the built environment, which contribute toward criminal behaviour. The publication that was produced from the study was "defensible space", it comprised of four main areas namely: territoriality, surveillance levels, image and surroundings. The study claimed that design could encourage or discourage crime to take place within the built environment through the four areas identified. The study also stated that that crime rates where greater in high-rise buildings than in low rise.

The most significant and recognised theory developed by Newman (1973) was *territoriality*, which related directly to the levels to which certain groups of people, specifically residents are able to secure the public spaces between and around their dwelling units. In the single story house, fences or walls, windows and lighting, usually define the buffer of separation. With regard to rows of houses, walk-up flats and high-rise apartments, the degree of clarity with regard to ownership becomes more problematic. The residents do not take responsibility for the area outside their immediate dwelling and consequently control is lost. Newman (1973) further stated that through effective planning and design, it is possible to subdivide the high-density living area in order to encourage the occupants to perceive the area to be under the control of specific groups. The subdivision of the public areas would consequently define control and ownership, which Newman (1973) argued would substantially reduce crime levels. The mechanisms employed for zoning of specific areas in order to improve territoriality considered site design, street design, the zoning of cluster or apartment units, and the density of buildings and occupants needs.

The second significant theory developed by Newman (1973) stated that improved design specifically with regard to *surveillance* levels of a building, for the residents and onlookers, will enable the levels of visibility of the building to be manipulated, and therefore reduce the opportunity for crime to be committed. Thirdly, Newman (1973) noted the importance of the *image* of a building and identified how the image can create perceptions of isolation or vulnerability, which can increase crime levels, specifically toward the building, in the form of vandalism. Newman's final theory encourages geographical juxtaposition to be considered in the design of buildings.

The geographical juxtaposition encourages safety to be a factor for design through the geographical location of a building.

Ward (1973) identified the targets of vandalism to be those buildings with low surveillance and property which may be perceived as derelict, incomplete or poorly maintained, more significantly, council housing projects which have a higher proportion of flats than houses.

Coleman (1985) revived Newman's works, and particularly in Britain, the Government funded several experimental modifications to take place on a number of existing housing estates, particularly high-rise flat developments and deck-access flats (Cozens, 1999). In order to undertake the experiments the levels of vandalism and abuse were plotted against specific design variables in the housing projects, the results of which were found to support Newman's work.

One such research project undertaken in Britain was by Wilson (1980) who undertook to examine the relationship between defensible space and vandalism rates in 285 blocks of residential dwellings on 38 public housing estates in inner London. Wilson (1980) found that through incorporating Newman's principles on design vandalism rates could be reduced

Cozens (1999) noted that although Newman's work has been criticized specifically with regard to the potential for the theories to be adopted into existing housing projects, the potential for the results of the study to be implemented in future housing projects, may prove to be effective. Furthermore Cozens (1999) argued that although recognised, Newman's work remains largely untested particularly the theories pertaining to *image* and *geographical juxtaposition*, and in newly built housing projects the two theories may prove to be vital in the reduction of crime.

Although existing research regarding the preventative methods for vandalism has focussed specifically on the reduction of vandalism through the targets of vandalism within the built environment, Newman (1973) identified environmental design as a contributory factor and due to this it is significant to consider his research for this study. The design of external factors such as the design, lighting and surveillance of

entrances to buildings, the shape of access paths and the orientation of a building, in addition to internal factors, such as the design of the lobby, lifts or external stairwells were identified as vital to consider for crime reduction. Specific design variables of internal areas of high-rise buildings that he considered to influence crime were the following: lobbies, elevators, hallways and internal stairwells. Furthermore Newman (1973) argued that the orientation of buildings does not allow for individuality and the natural flow from street to home is uncontrolled, consequently, the street becomes the home and responsibility is lost.

According to Wise (1982), vandalism is a response to poorly designed features of the built environment and that, in order to reduce it vandal resistant materials and specific design features must be incorporated into housing projects. Furthermore, that vandalism is opportunistic and the environment must be designed as un-opportunistic. Wise (1982) contended that a study of vandalism must firstly identify the vandalised area, in terms of use and damage, and design the environment specifically to that area in an unobtrusive manner thus reducing the appeal for vandalism and improving the aesthetics of the environment.

Barker and Bridgeman (1994) identified four approaches toward the control of vandalism namely: education; social programs; the criminal justice system; and opportunity reduction. Within opportunity reduction they identified a situational approach that concentrated on altering the environment in order to make the offence more difficult to commit rather than identifying the causes why the offender is motivated to offend. More significantly, the purpose of the study was to identify two factors: firstly, the targets most vandalised and to propose measures which would result in those targets being more resistant to abuse; and secondly, to identify environmental factors which create social awareness and control.

According to Sykes (1979), the targets of vandalism and graffiti may be reduced with a number of prevention methods. Murals should be incorporated in to housing projects, particularly to large bare wall surfaces; exposed concrete and mortar should be protected with cladding which is durable in nature for example steel sheeting, and mortar which is removed from brickwork should be replaced as soon as possible. Low level glazing particularly on staircases should be avoided and glazing which is

constantly damaged should be toughened. White (1979) identified that glazing was the most frequently reported damage, particularly at low-level entrances to buildings and stairways and specifically in buildings in which there was a high percentage of children.

2.8 Preventative methods

The following table (Table 2.3) presents several methods which may be adopted to reduce vandalism.

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Chapter 3: A research methodology for the assessment of the impact of environmental design on vandalism.

3.1 Introduction

This chapter identifies the methods and problems associated with the selection of a research instrument for use with criminological research. In order to establish a suitable research instrument for this study of environmental assessment, the existing documented research methodologies on environmental behaviour will be reviewed. The review will highlight various research methods used for the investigation of behavioural settings and identify their strengths and weaknesses. Furthermore, a review of the major research methods and a summary of the various approaches will be presented. The research method adopted for this study will then be described and justified.

3.2 The development of criminological research

Research in criminology, as it is known today, has been strongly influenced by *positivism*, which developed in the mid-nineteenth century (Jupp, 1989). Central to positivism are two themes, namely: the search for the factors which cause crime and, secondly, the treatment of the offender (Jupp, 1989, citing Phillipson, 1974). *Positivism* developed as a challenge to *classical thinking,* which saw crime as a product of a voluntary action undertaken through logical calculation. Crime was viewed as an action, which an individual undertook when the benefits of the crime outweighed the penalty of the crime (Jupp, 1989). *Positivism,* on the other hand, identified crime as an action, which an individual was encouraged to undertake due to factors beyond their control; the theory promoted an investigation of the variables on which the crime was dependant (Jupp, 1989).

According to Viano (1975), the influence of positivism can be traced from Cesare Lombroso's work in 1911 which identified various physical and mental types that represented a deterministic explanation of crime. In order to promote the theory that criminals were *born,* Lombroso (1911) attempted to correlate specific physical

features of a criminal's skull to criminal behaviour, and identified facial characteristics which could be attributed to all criminals. Although the research undertaken by Lombroso has been discredited, *positivism* still continues to influence researchers who remain deterministic in their approach toward the research of crime (Jupp, 1989).

Various themes have developed from the early research and theory of criminological positivism most notably, *psychological positivism* and *sociological positivism*. *Psychological positivism* is concerned with personality, learning capacity, socialisation and upbringing (Jupp, 1989), whereas *sociological positivism* concentrates on social disorganisation and anomie.

Hagan (1982) recognised that there are two philosophical traditions on which the research methods adopted for a social scientific study of crime are based. The first tradition is *qualitative* and considers the social world as demonstrating a historical, insightful and observational area for research. Furthermore, the researcher should appreciate the *reality* of the setting under investigation since qualitative behaviour provides a more accurate portrait of the real world (Jupp, 1989). The second tradition is *quantitative* and is concerned with measurement; furthermore it sometimes encompasses positivism (Hagan, 1982).

Positivist forms of analysis, particularly experimental research, have had a great impact in social research particularly if the research is quantitative. It has greatly influenced the various theoretical critiques that influence criminological research and the suitability of social research methods. Furthermore, criminological research is not dependent upon one tradition or approach and has developed through a combination of theoretical and data collection research (Jupp, 1989).

Several areas are considered significant in the study of criminology. Firstly, there should be a *unit of analysis,* which may be the group, person, or social structure, and secondly, the degree of determinism awarded to the research which is based on *causality* (Jupp, 1989; Hagan, 1982). In order to solve the causality of a crime the

relationship between the variables, the time sequence and rival causal factors have to be identified (Hagan, 1982).

Johnson (1981) agreed with Hagan (1982), stating firstly that the causal factors must be quantitatively or empirically related, before the effects can be measured. Secondly, that the relationship which exists between the variables must not have an effect that could be attributed to additional factors; and thirdly, that a logical sequence of events must be evident.

It is not the purpose of this research to claim that the design of the built environment is the cause of vandalism, rather that it may influence vandalism to take place. In order to identify whether vandalism is influenced by the design factors of the built environment, the additional factors which are considered to affect crime must be considered. The additional factors which will be considered in this research directly impact on the social status of the population and, more importantly, on the perpetrators of the crime namely the demographics of the population. The demographics will be examined within specific geographical areas in order to identify any differences which could contribute to vandalism, allowing the built environment to be examined in isolation.

3.3 A review of environmental assessment research methodology

Although widely agreed that researchers, such as Quetelet and Guerry, led the exploratory work in the field of social ecology in the early 19th century, Shaw *et al.* undertook the most influential research between 1920 and 1930 (Byrne and Sampson, 1986). Shaw and McKay pioneered environmental assessment and the methodology for examining patterns of crime within cities through ecological studies undertaken at the University of Chicago between 1920 and 1930. Shaw *et al.* (1929) demonstrated variations of delinquency rates within a major city (Chicago) and identified that increasing delinquency rates could be correlated with distance to a city centre; the rates of delinquency increased closer to the city centre. Shaw and McKay (1942) concluded from the study that delinquency rates and delinquent behaviour were

associated with the growth process of the city. Following their original work in 1929, Shaw and McKay (1942) identified that delinquent behaviour and crime patterns developed in areas with social disorganisation and increased poverty. Although the research was a study of the characteristics of offenders and not a study of the behaviour-environment relationship, the methodology implied that a number of people are more likely to commit specific crimes than others. Furthermore, the research implied that a study of the residential areas in which the criminals live would reveal the physical conditions that encourage criminal behaviour (Shaw and McKay, 1942).

O'Donnell and Lydgate (1980) documented several discrepancies in the research undertaken by Shaw *et al.* (1929). Firstly, O'Donnell and Lydgate (1980) argued that Shaw *et al.* (1929) studied the characteristics of individual offenders and not the behaviour-environment relationship. Shaw *et al.* (1929) suggested that certain people are more likely to commit crime acts than others and in order to identify the environmental conditions that foster criminality, a study of the criminal residence areas should be undertaken. Research by Boggs (1964) and Newman (1973) has since concluded that crimes, particularly property crimes, do not occur in the area in which the offender lives or works (*offender area*), but rather where there is increased *opportunity* for crime with less chance of detection (*offence area*) and that research which investigates the offence rates based primarily on the offender's characteristics is inadequate since behaviour cannot be assessed in isolation from its situational context. Furthermore, an adequate enquiry in the future would be a direct study of the environment within which the behaviour takes place (O'Donnell and Lydgate, 1980).

Deviance includes behaviour which is illegal and *abnormal,* and what is considered deviant behaviour alters over time and area. There are several theories which attempt to identify the cause of deviance. The positivist theory of deviance attempts to identify the causes in terms of biological, psychological and social theories (Harvey and MacDonald, 1993). While Shaw and McKay (1942) developed the social ecological theory of deviance, sociological researchers such as Merton (1938) proposed that distinct forms of deviance, specifically in America, could be attributed to a *strain* that existed between the cultural system and social structure (Pearson,

1994). The *strain theory* was based on the premise that America promoted an open society where individual development was encouraged, while, contrary to this belief, the social structure of America limited development possibilities to specific ethnic groups of people. The *goals,* or outcome, did not correlate with the *means,* or opportunities, and Merton (1938) argued that deviance developed through an attempt to reach the goals. Furthermore, crimes such as theft were *innovative* and a method for achieving the *ends* (Pearson, 1994).

O'Donnell and Lydgate (1980) recognised the interest generated toward the environmental context of behaviour and identified Barker (1968) as having developed the most influential methodology for the assessment of behavioural settings. Barker endorsed the theory of *ecological psychology*, which suggests that the study of behaviour is undertaken most effectively in the natural environment.

Barker (1968) explored the influence of situational settings or behavioural settings on people and attempted to classify environments. Each of the environments became the context for a social setting which supported a specific behaviour. Barker (1968) identified the essential features of a behavioural setting as follows: the setting must be the immediate environment of human behaviour and must provide moment-to-moment input of people; the setting must be real and tangible; and the parts of the setting must have a synomorphic relationship with one another (i.e., the actions and the objects must fit compatibly together). Furthermore, the suitability of the persons within the setting must be considered and there must be a minimum number of persons within the setting. To summarise, a behavioural setting is a bounded, self-regulated and ordered system, composed of human and non-human replaceable components which interact in a synchronised manner, in order to carry out an ordered sequence of events, termed the setting program.

Research undertaken by Barker (1968) over a twenty-four year period observed the life of a community in Oskaloosa, Kansas. The research sought to identify the interdependent relationship between the actions of people, which were goal-directed, and the behaviour settings in which the actions took place. Behavioural settings were categorised as business, church, government, voluntary associations, schools and

Adapted effectively, behavioural mapping is able to provide information regarding the distribution of behaviours throughout a given space, compare behaviour types, and provide data in order to develop general principles for the use of space within a number of settings. Furthermore, behavioural mapping can help to anticipate behaviour within specific environments, enabling more effective design principles to be implemented (Ittleson, 1974).

Previous environmental assessment research has investigated the frequency of aggressive behaviour or offence rate. In order to effectively calculate the offence rate, the frequency of offence is divided by the population density in a specific geographical area (O'Donnell and Lydgate, 1980).

O'Donnell and Lydgate (1980), citing Harries (1974), stated that for the investigation of the crimes committed against permanent residences, the assessment of resident population is an appropriate base for the calculation of rates, although, with the exception of residential burglary and rape, the majority of crimes take place outside the residential area. O'Donnell and Lydgate (1980) argued that the purpose of computing the offences per capita is to control and identify the total number of persons involved or affected by the criminal activity. Although considered an effective measure of crime per capita, the method will not identify the composition of the population, and in order for two geographical areas to be compared effectively, the demographic composition of the population within the respective areas must be analysed (O'Donnell and Lydgate, 1980).

O'Donnell and Lydgate (1980) undertook an environmental assessment for the investigation of property crime within 75 motorized police controlled areas in the Metropolitan area of Honolulu. The assessment took place over an 11-month period, from October 1975 to August 1976. In order to effectively assess the frequency of specific property crime, the *physical resources* in the area were coded and correlated to police statistics of reported criminal offences. In order to code the *physical resources,* the land use was initially identified and grouped according to its function notably, residential, manufacturing, and recreation. Subdivisions of these

classifications were then introduced and coded. For instance, *residential* land use was divided into permanent and transient, and *trade* was divided into retail, eating places and alcohol consumption. The physical resources were then compared to the police statistics and examined in terms of their relationship to crimes.

From their research O'Donnell and Lydgate (1980) identified a number of factors relating to property crime, most notably that vandalism depicted a positive relationship with the density of permanent residences. It was found that as the number of residential units in an area increased, the number of youths grew and as youths were considered to be the perpetrators of vandalism, the levels of vandalism would rise.

The study also suggested that a spatial variation in crime is associated with the distribution of physical resources within specific geographical areas and that it would be possible to assess the opportunities for crime directly through the coding of appropriate physical resources. O'Donnell and Lydgate (1980) recognised the importance of future research which focussed on specific situations associated with the occurrence of crime, rather than the living conditions of the criminal, or characteristics of the populace in high crime areas. Furthermore, they asserted that investigations of the environmental factors which influence crime, combined with a physical resource inventory in addition to demographic and behavioural characteristics of the population, would extend the findings.

The present study will attempt to employ O'Donnell and Lydgate's theories and develop a methodology for the assessment of residential unit design within a number of geographically defined areas within Manenberg and then compare the physical design to the frequency and types of vandalism undertaken within the areas.

The physical resources and physical design of residential units within existing geographically defined residential areas in Manenberg will be examined and compared to police records of vandalism compiled over a seven-year period (1992-1999). In addition to the *area* within which the offence took place, the street, time, day of week, type of offence, method of damage and instrument used will be assessed.

The information will be compared to the physical attributes of the area and the relationship between the frequency and type of vandalism and the design of the built or physical environment will be identified.

3.4 Criminological field research methods

The main methods for criminological research are dependent on how the crime is to be visualised and explained. Existing theories promote specific methods of research as more suitable than others depending on the type of data collection undertaken and the type of information required from data analysis. Furthermore, all forms of research must be considered in order to appreciate the methods adopted for empirical investigation and more significantly to have a basis from which to validate criminological findings (Jupp, 1989).

A good research design should address the following: the nature of the variables under investigation, the most prolific methods for studying the behaviour and the provision of additional information regarding the behaviour (Ittleson *et al.*, 1974).

There are two main sources of data adopted for the purposes of research, namely primary and secondary data. Primary data are collected directly by the researcher for the research through observation, surveys, interviews and experiments. Secondary data comprise information which has been already collected, usually for another purpose. The researcher will have to analyse the data and interpret it in order for it to be applicable to the research. An example of secondary data is crime statistics (Harvey and MacDonald, 1993).

Traditionally, several research methods have been adopted for the purpose of environmental assessment, most notably; *survey research, experimental research, interviews, holistic research and field research.* For the purposes of criminological research, the methodologies are comparable to those used for environmental assessment with the addition of official statistics.

3.4.1 Survey research

Although in this research survey research has been identified as qualitative in its approach, the analysis of social surveys have received a great deal of input from developments by statisticians who have introduced statistical modelling and probability theories into the survey analysis. This has given rise to social surveys being considered quantitative (Jupp, 1989).

Hagan (1982) noted that a survey would record attitudes or opinions on behaviour and not the behaviour itself. They are quantitative methods of research and identify the causality of the research problem. There are two significant methods of sampling namely, probability sampling and non-probability samples. Probability samples involve an equal probability of selection method of a small group of the population, and promote that what is accurate of the sample is true for a larger group of the population. Non-probability sampling, such as systematic samples, quota samples, accidental samples, purposive samples and snowballing samples, do not consider equal probability of selection. For both of these methods, sampling enables the researcher to assess a small group of the population, and from the results, identify a similar pattern for a larger percentage of the population (Hagan, 1982). According to Johnson (1981), ideal results from the survey may not emerge and because the researcher will be basing the results on the opinions of people, there will be an element of error. Compounding this, as the results will be interpreted by a person, accuracy in the question type and format is vital. The researcher has little or no control over the variables and although survey research methods are considered neither holistic nor experimental, where the variables are known and controllable, the survey can be semi-experimental (Ittleson *et al.*, 1974). The final outcome of the results of a survey may indicate external factors that initially were not considered by the researcher; for instance, a survey may indicate personal preferences and customer satisfaction levels (Johnson, 1981).

Survey research can involve a number of techniques for data gathering such as questionnaires, field interviews, telephone surveys and mail questionnaires. These techniques require the researcher to identify the factors that are to be measured and to

ensure the technique is suitable for obtaining the required results, in terms of suitable language, non leading questions and an unbiased approach (Hagan, 1982).

Although a survey of the perpetrators of vandalism may prove extremely rewarding, it is considered an impractical and inappropriate research tool for this research project. This research is not an enquiry requiring descriptive data based on opinions, it is rather an investigation of specific known variables and the possible effect of one on another.

3.4.2 Experimental research

Traditionally, experimental research is the application of a scientific test to examine human behaviour. It is considered to be the study of the behaviour and the psychological meaning beneath it (Jupp,1989).

According to Farrington *et al.* (1986), an experiment is an attempt to test a causal hypothesis on the effects of dissimilarity between variables. The effectiveness of the method is in the control of the variables. There are generally two types of variables namely: the independent variable which is assumed to cause changes on another variable known as the dependant variable. There are two basic requirements for an experiment; firstly, that the variables can be manipulated and, secondly, that the other factors can be controlled (Harvey and MacDonald, 1993). Hagan (1982) noted that experimental research is the most suitable method to eliminate rival causal factors and two methods that allow the researcher to undertake experimental research of groups of people fall under randomisation or matching. Randomisation involves randomly assigning subjects from a similar population into groups resulting in equal opportunity for experiment selection. Matching assures that specific characteristics are similar for the groups being researched. The groups are divided into experimental groups. This is determined by the groups which are to be treated (control groups) and those which are not (Hagan, 1982).

The experimental method may be undertaken in a laboratory or in a field setting although they are more generally adopted in the laboratory. It is widely

acknowledged that the laboratory setting reduces realism and attempts are often made at simulating the environment through the use of models and photographs. In addition, the experiments are conducted over a short time frame and this is considered inadequate as difficulties in real life situations manifest themselves over longer periods of time (Viljoen *et al.*, 1987).

3.4.3 Interviews

Interviews as a research methodology fall within the domain of survey research. Interviews explore the attitudes of people rather than their actual behaviour and it is the job of the interviewer to ask questions and record the answers as accurately as possible. Johnson (1981) identified three types of interview, namely: personal interview, telephonic interview, and the mail-out. The quality of the questionnaire will determine the quality of the obtained data. This can be determined by several factors, more notably the respondents' education level, dialect, race, gender and class. Hagan (1982) argued that, although interviews are manageable, inexpensive and quick, they might encourage artificiality in the required response. Furthermore, a poor response may be experienced and identifying suitable subjects in order to control the variables under investigation may prove problematic. According to Harvey and MacDonald (1993), there are a number of problems the interviewer can experience, more notably: the interview effect, the hired-hand effect and interview bias. The interview effect is where the respondent provides only partial information and is reluctant to reveal additional information. The hired-hand effect can occur when interviewers are employed and consider the results to be insignificant. Interview bias can take place when the opinions of the interviewer are contrary to those of the respondent.

For research reported here it must be noted that interviews may have proved useful in determining the opinions of residents on the causes of vandalism. An existing survey regarding residential satisfaction and perception was assessed (Chapter 2) and although not specific to vandalism it did address several issues pertaining to living in Manenberg such as living in high rise apartments, high density living and living with high crime levels. There were perceived to be many problems associated with

interviewing both residents and perpetrators for this research, most significant of which was access into Manenberg and access to the perpetrators and residents. It is proposed that telephonic interviews will be conducted with members of the SAPS in Manenberg, community workers and housing officials.

3.4.4 Participant observation

As with interviews, participant observation may have proved beneficial for this research. Participant observation is where the researcher observes an environment without influencing the activities and becomes a part of the group or situation being studied. It is often undertaken in addition to informal interviews and personally recorded data (Harvey and MacDonald, 1993). For the study of criminology or criminal activities participant observation poses several problems, most notably safety related problems and time constraints, and was considered to be unsuitable for this project.

3.4.5 The use of official statistics

Official crime statistics are considered to be the most significant sources of secondary data for the research of crime since they provide information regarding the criminal activity and the number of people involved with the activity. Crime statistics are considered appropriate to investigate the extent of crime, the social and ecological arrangement of crime, and the sociological component of these (Jupp, 1989).

Viano (1975) identified several advantages of official statistics as a research tool, most notably: that the crime statistics are inexpensive and readily available; they reflect the crime over a long period of time and the time series can be identified; they adequately reflect the problem identifying the crime patterns and fluctuations and can be used for research.

For this research the analysis of official crime statistics for vandalism in Manenberg is seen as the most appropriate tool. The statistics provide the most reliable and consistent source of data on the recorded incidents of vandalism. In addition to the

levels of vandalism, the statistics provide information regarding the method, area and frequency of vandalism. The statistics can be interpreted to provide information regarding the spatial distribution of the crime and, once assessed, any relationship between the crime and building type in terms of design can be identified.

In addition to the official police statistics on vandalism, Manenberg's demographic details will be drawn from the 1996 population census. The purpose of a demographical study will be to ensure that differences in the population structure within the geographical areas are identified. There are demographic factors which are considered to impact on crime levels, notably, residential density and unemployment. These may vary in the geographical areas and in order to concentrate primarily on design as an influence on vandalism these demographic factors must be distinguished from the physical environmental factors.

Conclusion

This chapter has identified the research methods that exist for criminological research specifically relating to environmental assessment. The various research methodologies applicable to criminology and environmental assessment have been identified and considered in terms of this research. Several research techniques have been identified and their suitability for this research discussed. A number of methods, notably interviews and surveys, would have been suitable for this type of research and would have been adopted, except that the area that forms the case study for this research, namely Manenberg, is considered a very dangerous area and access to the area, perpetrators and residents was impractical. Although telephonic interviews will be conducted with the Manenberg police, community workers and housing officials. Statistical analysis of official police records is considered a reliable and suitable source of information and although some of the data are expected to be inaccurate the inaccuracies will be addressed in the analysis.

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Chapter 4: Data interpretation

4.1 Introduction

This chapter presents the data obtained for the assessment of vandalism in Manenberg over a seven-year period (1992-1999). The crime data will be interpreted and the findings presented. The findings will be presented using a Geographical Information System package (GIS) and histograms and the geographical area presented through aerial photographs.

4.2 The geographical area selection: Manenberg.

Manenberg was primarily selected for its reputation and image as a highly dysfunctional and disorderly area, suffering high crime levels and gang violence. An investigation of crime statistics for the Western Cape, and specifically for Manenberg, confirmed the preconceptions of the public and statistically Manenberg was identified as being the ninth most prominent area suffering from vandalism and the third most dominant area when the crime rates for malicious injury to property are calculated per 100 000 of the population.

4.3 Data Coding

The current recording of crime data was initiated in November 1992. During 1993, in an attempt to control crime, Manenberg was divided into several police blocks, the area and boundaries of which were determined by access roads. Each identified block was allocated a police code. From that time all crime data was recorded according to the police block within which the crime took place. The recording of crime data continues to relate to the police blocks and this research has adopted the police blocks and the system of recording crime as the crime data reference grid for analysis. See Appendix 1, which details the police blocks in Manenberg.

The recording of crime in Manenberg is undertaken by breaking down the information of the reported incident into several categories, these then being coded

and recorded. Crime data is categorized as the following: The time of crime, day of week, month of year, type of damage, instrument used, method of destruction, physical address, description of property and geographical code (Appendix 2). With the exception of the months of the year, method adopted, instrument used and street names, codes have been allocated and used to record the data. The codes analyzed for this research and used for the police statistics are clarified in Table 4.1 below.

Table 4.1

The categories and category codes adopted in the recording of crime data.

Recorded category	Category code	Category definition/description used
Geographical code	3289 – 3304 (Excluding area codes: 3296, 3299 and 3302)	Geographical block code
Time of day	T 01 T 02 T 03 T 04	6am to 12 pm 12pm to 6pm 6pm to 12am 12am to 6am
Description of property	001 002 003 004 005	All residential premises Private vehicles Business manufacturing Government property All other property
Day of week	Mon Tues Wed Thur Fri Sat Sun	Monday Tuesday Wednesday Thursday Friday Saturday Sunday
Month of year	Months of year inclusive	Months of year inclusive
Description of method	No code adopted	Broken off, burnt, cut, damaged, force, open door of vehicle, force open door of premises, hacked with axe or panga, kicked, not applicable, physical force, remove roof tiles, set alight, shot with firearm, smashed, stabbed with knife, struck with object, threw stones, unknown, vehicle driven, window broken
Instrument used	No code adopted	Brick, feet, hammer, hands, iron pipe, knife, matches, motor vehicle, petrol bomb, revolver, spade, sticks, stone/brick, unknown.
Street names	No code adopted	All streets in Manenberg

Of the 18 police blocks located in Manenberg three blocks extend into other geographical areas and were eliminated from the study. Of the remaining 15 blocks, two presented incomplete data over the seven-year period, presenting only two years

of statistics. Thus, for this research 13 police blocks were assessed. The assessment of vandalism was undertaken entirely through police records of vandalism between 1992-1999, which were obtained through the Crime Administration System (CAS) of the South African Police Service (SAPS). The CAS obtained the recorded incidents of vandalism from Manenberg Police Station. Further analysis of the raw data was undertaken using a SAS Version 8.2 Statistical Analysis package and all graphical images in this research were created using a Geographical Information Systems (GIS) package. The GIS system was adopted in order to graphically present the crime data and although the GIS program adopted for this study demonstrates the data effectively, the overlapping technique possible with GIS has not been fully exploited. The graphical information which may have been presented through overlapping the data has been explained in the text.

From the 13 identified police blocks assessed in this study several blocks were identified as having either the highest or lowest incident rate throughout the years assessed. These areas were compared and factors relating to building design examined. In the examination of the relationship between building design and vandalism, several additional variables that were assumed to impact on vandalism were considered, the most significant of which was demography which will be presented separately in this chapter.

In order to present the crime data for the police blocks this research will focus on three areas, namely: the frequency of vandalism, the nature of vandalism and the area and target of vandalism.

4.4 The frequency of vandalism

The police data for the frequency of vandalism presents the following:

- The overall number of incidents in Manenberg per police block and a pattern of vandalism for the seven years in review (1992-1999).
- The pattern of vandalism for the months of the year.
- Frequency in terms of days of week and, more significantly, a pattern for the days of the week in which vandalism is more prominent.

- The findings regarding time of day for vandalism.

4.4.1 The pattern of vandalism.

Appendix 1 shows the number of incidents of vandalism in Manenberg per police block over the seven-year period assessed and shows the total number of incidents per year. Police blocks 3291 and 3293 display the highest numbers of incidents having 310 (16%) and 280 (15%) of the recorded incidents respectively. These blocks are followed by police blocks 3297 and 3298 which had 248 (13%) and 263 (14%) recorded incidents of vandalism. Police blocks 3288, 3294, 3295 and 3304 display the lowest levels of vandalism. Furthermore, police block 3291 displayed the most prominent levels of vandalism for five of the seven years assessed and, in addition to the block presenting the highest number of reported incidents for the seven years overall, police block 3291 was found to be the dominant area for vandalism in Manenberg.

Overall 1994 is recorded as having the highest incidence of vandalism (364 incidents) and 1992 the lowest (79 incidents). The low number of recorded crime during 1992 can be attributed to the computer system being implemented only during November 1992. The recording of the crime for 1992 was undertaken after the implementation of the computer system. During telephonic interviews with members of Manenberg Police Station it was established that 1993 and 1994 showed a markedly higher crime rate in all types of crime due to increased gang activity, in fighting for territory. All of the police blocks, with the exception of 3303, show a marked variation of vandalism levels in each of the years. Police block 3303 presents less of a variation and a more even spread of vandalism levels. While 1993 and 1994 demonstrate the highest levels of vandalism, each police block exhibits a variation of the vandalism levels for each of the seven years assessed.

Examination of the overall number of incidents (Appendix 1) indicates that the geographical areas suffering the highest levels of vandalism (namely: 3291, 3293, 3297 and 3298) are geographically located in the *heart* of Manenberg and that the areas which demonstrate the lowest levels of vandalism (namely 3304, 3294, 3295 and 3288) are located on the boundary edges of Manenberg. In addition, the two

areas with the highest levels of vandalism (namely 3291 and 3293) are separated by area 3292, which is physically the smallest police block in Manenberg. Although police block 3292 is surrounded by those police blocks with the highest levels of vandalism (3291 and 3293), the block has experienced a gradual decline in the total number of incidents since 1993 (see Appendix 3). More significantly, Police block 3292 contains the highest percentage of flats in Manenberg and, although it displays less vandalism than the surrounding blocks (3291 and 3292), it contains similar population and density levels (see Appendix 15).

4.4.2 The months of year

In order to determine a pattern for the levels of vandalism per month of the year, the total number of recorded incidents of vandalism, between 1992 and 1999, were combined and assessed per police block (Appendix 4).

Overall December presents the highest levels of vandalism with 238 recorded incidents (13%). November follows with 207 incidents (11%) and January with 195 (10%). August (116), September (124) and July (128) present the lowest levels of vandalism. With the exception of police blocks 3288, 3294, 3303, 3297, 3304 and 3295, all the blocks demonstrate a consistent increase in vandalism either in November, December or January. More significantly, those that do not show an increase of vandalism in November, December or January (3288, 3294, 3303, 3297, 3304, and 3295) are those blocks on the outskirts of Manenberg and it is only the more *central* police blocks which demonstrate consistent levels of vandalism with regard to months of year. Police block 3291 displayed the most consistently high levels of vandalism during the overall period assessed. Furthermore, with the exception of June, January and August, area 3291 presented consistently high levels of vandalism for all the months in the year.

The range of vandalism levels per month can be attributed to holiday periods and seasonal weather conditions. The overall levels of vandalism rise during school holidays particularly in the summer months and show a decline during school time and the winter months.

4.4.3 The day of week

Appendix 5 shows the distribution of vandalism in terms of the day of week. Overall, Saturday experienced the highest percentage of vandalism with 462 incidents (24%) followed by Friday with 337 incidents (18%), Sunday with 323 incidents (17%) and Thursday with 216 incidents (11%). Wednesday presents the lowest levels of vandalism (9%). All the police blocks, with the exception of 3303, 3304 and 3294, present Saturday as the day of the week with the highest levels of vandalism. There appears to be a steady growth in the levels of vandalism toward the weekend (from Thursday) and a gradual decline after Saturday. From telephonic conversations with Inspector White of Manenberg Police Station (2002), youths and adults undertake the majority of vandalism in Manenberg and vandalism is a gang related activity. Furthermore, in his opinion the majority of the residents in Manenberg are paid on Friday evenings and the money is spent on Saturdays, mostly on drugs and/or alcohol and it is this factor that contributes to the increase in the incidents of damage to property. In addition, he suggested that most of the children are left unattended on Saturdays and out of boredom they undertake damage to property. Inspector White further stated that, although children are thought to contribute to the overall levels of vandalism, adults undertake the majority of vandalism, and vandalism is considered to be a by-product of gang violence.

4.4.4 The time of day

The recorded crime statistics for vandalism in Manenberg do not indicate whether the time of day refers to the time the crime took place, the time the crime was reported or the time the crime was recorded. For the purposes of this research, and on the advice of Manenberg Police Station, it will be assumed that the time of day refers to the approximate time the vandalism occurred.

Appendix 6 shows that, overall, 40% of the vandalism in Manenberg is undertaken between 18h00 and 24h00 (T03), followed by 26% taking place between 12h00 and 18h00 (T02). Eighteen percent of the vandalism in Manenberg occurs between 6h00 and 12h00 (T01) and 15% between 12h00 and 6h00 (T04). Although generally the

individual police blocks are consistent with this pattern, police blocks 3301 and 3304 reveal that the highest levels of vandalism occur between 12h00 and 18h00 (T02).

The time of the crime indicates that 40% of the vandalism in Manenberg takes place at night (T03). This factor may be associated with people going out at night, children being left alone and the influence of alcohol and/or drugs. In addition, Inspector White of Manenberg Police Station stated that gang activity is increased at night as darkness reduces the likelihood of detection.

The police blocks within the *centre* of Manenberg represent those areas with the highest levels of vandalism and a greater variety of time frames within which the vandalism takes place, while the areas on the boundary display reduced levels and more consistent time frames. Police block 3293 experiences the highest overall levels of vandalism for all the time frames with the exception of T03 and an investigation of police block 3291 shows that the levels of vandalism are consistently high between 18h00 and 6h00.

4.5 The nature of vandalism

The police statistics for the nature of vandalism present the following:

- The method of destruction.
- The instrument adopted for the destruction.

4.5.1 The method of destruction

Table 4.1 presents the technique adopted for the method of destruction and Appendix 7 presents the data per police block. Across all the methods adopted *damaged* was the most dominant method of destruction (499 incidents). This suggests that at the time of recording the data, the method of destruction was unknown. The second most dominant method of destruction was the breaking of windows (339 incidents or 18%), followed by throwing stones (225 incidents or 12%).

According to Inspector White of Manenberg Police Station, vandalism often occurs as a result of another crime, for example, windows being damaged through shooting. One method of destruction identified was *shot with firearm* which, although it causes actual damage to property, may have transpired from gang activity and the use of firearms. The damage caused is therefore not deliberate vandalism or targeted vandalism. More significantly, the reported incidents of vandalism, which may be the result of firearm activity, indicate the levels of shooting in Manenberg that would otherwise go unreported. In addition, it was noted that in the case of burglary, windows might be broken in order to gain entry to a property. If theft does not take place the crime is reported as vandalism.

This issue gives rise to the question of the levels of deliberate vandalism that take place in Manenberg compared to that vandalism which is a by-product of another crime (consequential vandalism). It seems from the data regarding method of destruction that the destruction is often undertaken for some other gain, for example, breaking windows to gain entry to property. This assumption is encouraged by the notable lack of reported and recorded incidents of mild forms of vandalism such as graffiti and damage to public property such as the smashing of street-lights and damage to public stairwells. Furthermore, it questions whether vandalism is only reported when undertaken on an individual's property and reported in order to obtain a case number which would be used for insurance claims.

4.5.2 The instrument adopted

Appendix 8 shows the instruments adopted for vandalism in Manenberg over the seven years assessed. Appendix 8 presents the data as the data was recorded in the official police statistics. The statistics display inaccuracies, most notably that the instruments are recorded in both English and Afrikaans, and there are several spelling mistakes in the recording. In order to reflect an accurate account of the recorded instruments the original data has been maintained and presented in Appendix 8. In 791 (41%) of the recorded incidents the instruments were unknown. Of the known instruments bricks, and/or stones dominated with 575 (30%) incidents, followed by a fist or hand (224 reported incidents or 12% of all vandalism). For all of the police blocks, *unknown*, stones and/or bricks and fist/hand were recorded as being the most

prominent instruments adopted. With the exception of police blocks 3294 and 3295, *unknown* dominated. Police block 3301 presented the least variation of instruments adopted with only four instruments identified, one of which was *unknown*. Police blocks 3291, 3293 and 3300 presented the highest variation of instruments adopted with 18 instruments being identified.

There is a relationship between the method of destruction and the instrument used. For example, there were 55 incidents of shooting recorded as the method of destruction and there were 54 revolvers reported as instruments used. More significantly, the police blocks with the highest incidence of vandalism adopting revolvers were 3291, 3292 and 3293. This suggests high gang activity and may indicate a high percentage of the vandalism being caused by that activity rather than being targeted vandalism.

For the reporting of the instrument adopted, unless the reporter of the crime is certain about the instrument used to undertake the vandalism, the instrument must be assumed or recorded as unknown; this accounts for the large number of instruments that were recorded as unknown.

4.6 The area for vandalism

The police statistics identify the street in which the malicious injury to property took place.

4.6.1 The streets

Appendix 9 shows a street map of Manenberg and Appendix 9a shows the streets in each police block in which the malicious injury to property occurred. The street names presented in Appendix 2 are presented as they were recorded in the police statistics; the incorrect spelling of several street names as recorded by the police were not altered in the data presentation. The data regarding the streets differs from other data presented in this project, in as much as the street data cannot be merged and displayed using the GIS program due to the total number of streets in each police block and the impracticality of colour coding them. Where the police blocks reflect

data regarding the same street name, the street or road is often a main road and as a result passes through several police blocks, for example, Manenberg avenue. Where this occurs, the street often reflects a high number of incidents overall, whereas when the incidents are categorised into the police blocks within which they occur they are comparative.

A number of streets in Manenberg have been classified in terms of the *type* of street. Street descriptions such as lane, street, avenue, walkway and way were adopted in the recording of the crime data, although, in some cases the classifications refer to one street. Given the number of street types adopted, it can be assumed that the descriptions are often allocated incorrectly in the recording of the data. This has been considered as a possible inaccuracy. In order to provide a more accurate account of the vandalism levels per street, the original data was modified and several street types were merged providing a more concise account of the vandalism levels. Combining the street types named avenue, laan, weg and road together and combining the street types walk and looppad together formed the basis of the data being merged. The original data and the modified data were both considered in the street analysis for this research.

Although the original data have been modified to provide a more accurate account of the street location of the crime, it was found that several of the streets identified in the original crime data do not correspond with the allocated police block code. This inaccuracy was recognized by Manenberg Police Station and confusion of police block codes was provided as an explanation. Although this inaccuracy has been recognised in this research the data have not been modified.

With regard to the original data and the modified data, the street that presented the highest levels of vandalism overall was *Manenberglaan* (158 incidents) which was recorded as either: *Manenberglaan, Manenberg avenue* or *Manenberg road*. Although Manenberglaan displayed the highest number of incidents overall, further examination of the number of incidents which occurred per police block did not present *Manenberglaan* as a dominant street for vandalism in any of the police blocks.

The highest recorded levels of vandalism on *Manenberglaan* were in police block 3297 with 34 reported incidents. Thames avenue presented 56 incidents of malicious injury to property, 29 of which were accounted for in police block 3293 and 22 incidents in police block 3292. Jordaanstraat accounted for 50 incidents and Duinefontein 48 incidents. The streets identified with the highest levels of malicious injury to property (Manenberglaan, Thames avenue, Jordaanstraat and Duinefontein road) are roads that pass through several police blocks and form the boundary roads that separate the blocks. The streets are not particular to one police block, and experience several building designs as they pass through the various police blocks. In addition, as the streets are boundary roads they can border 2 police blocks. Identifying the building design that is specific to the street may prove problematic. For this research the main roads that pass through several police blocks and form boundary roads will not be analysed.

The official police statistics identified Sonderentweg (38 incidents) as the street with the 5th highest levels of vandalism. Sonderentweg represents the street with the highest levels of vandalism that is contained within one police block (3293). The street separates two primary schools and a high school from several rows of one and two bedroom terraced cottages (see Appendix 10 which details an Aerial photograph of Manenberg). Although the cottages possess a garden and back yard, which commonly contain shacks, the density levels of the police block (3291) are between 1746 and 7345 people per km^2, the lowest in Manenberg. Manenberg Police Station identified the area to be the *territory* of the American gang which is one of the most violent gangs in Manenberg

4.6.2 Vandalism and flats

The recording of vandalism that took place on the residential flats in Manenberg, identified as *courts* or *Hof*, was recorded either according to the name of the flats that suffered the damage or the street address of the flats. In order to assess the method adopted in the recording of vandalism to flats, the data were interpreted in conjunction with a detailed map of the area. Where the street name was recorded, as opposed to the flat name, analysis and comparisons confirmed the building type to be residential flats.

A total of 247 incidents of malicious injury to property took place specifically on the residential flats, of which 13 incidents occurred at Colleenhof and Ericahof. Ericahof is situated in police block 3293 and Colleenhof in police block 3297. Both police blocks present the highest overall levels of vandalism in Manenberg.

Telephonic conversations with members of Manenberg Police Station suggested that although the recorded incidents of vandalism on flats are not extreme, more serious crimes, particularly gang related crimes such as: murder, rape and drug related offences, were considered to occur more frequently in the areas which contained flats. Furthermore, according to Manenberg Police Station, the relatively low incidence of vandalism can be attributed to the lack of reporting by the flat residents.

4.6.3 The modified data

A detailed examination of the street names, specifically the street type, confirmed that a variety of street *types* had been employed when recording data for the same street name. Correlating the street type recorded in the crime data with the street names in Manenberg confirmed that the variety of street types applied in the data recording, such as avenue, lane, way, walk and road, applied to one street. An analysis of the original crime data would result in an inaccurate frequency analysis. With continued assistance from Manenberg Police Station, the street names recorded in the crime data were modified to provide a more accurate representation of the streets in Manenberg where the crime may have occurred. The modifications that were made grouped street types, avenue, laan, weg and road together, and walk and looppad together.

The modified data relating to the occurrence of vandalism per street suggests that Sonderentweg located in police block 3293 presents the highest incidence of vandalism with 51 incidents. This was followed by Manenberg avenue which had 47 incidents (police block 3297), Irvine Street with 37 incidents (police block 3298) and Manenberg avenue with 33 incidents (police block 3289).

Sonderentweg is situated in police block 3293 (Appendix 11). The street borders two primary schools and a high school. According to Manenberg Police Station, the

recording of vandalism which takes place on school grounds or to school buildings, is recorded as taking place on the road that provides the entrance to the school and not as taking place to the school itself. This suggests a large proportion of the vandalism may have taken place to school property. Manenberg Police Station confirmed this suggestion.

The vandalism recorded in Manenberg avenue (police block 3297) suggests that the vandalism took place either to the flats in the area or to the playing fields. Closer inspection of the playing fields confirms only one building being present. The building was identified as the caretaker's office. Manenberg avenue (3297) contains a large proportion of flats (Appendix 11), of which Colleenhof was identified as having the highest levels of vandalism. More significantly, the flats border Manenberg Primary School. The density levels in police block 3297, particularly those areas which contains flats, are identified as being the highest in Manenberg (Appendix 15)

Irvine Street in police block 3298 (Appendix 12) was identified as having the 3rd highest levels of vandalism throughout the Manenberg area. Appendix 10 identifies the position of Irvine Street in relation to Manenberg and Appendix 12 shows further detail of Irvine Street. Irvine Street surrounds a large expanse of open space utilized as soccer fields. One and two bedroom cottages that have gardens and yards border the street. The rows of cottages are back to back.

The street identified as the fourth most vandalized was Manenberg avenue in police block 3289. Appendix 13 presents the portion of Manenberg avenue in police block 3289. The street borders police block 3289 which comprises of flats only. The flats border Manenberg Primary School and Manenberg High School. The density levels of police block 3297 were identified as the highest in Manenberg (Appendix 15). From this it can postulated that an area containing a high number of flats, occupying or bordering a school, with a high density increases the likelihood of vandalism taking place.

4.7 The demographics

In the examination of the relationship between the design of the built environment and vandalism, several additional variables were considered that were assumed to impact on vandalism, the most significant of which was demography.

The demographic data for this research were obtained through the 1996 population census. The census areas for Manenberg are identified in Appendix 14, 14a and 14b. The population census for Manenberg presents an overview and summary of the population with regard to several specific variables.

A number of population variables are considered to impact on crime, the most notable of which are considered to be density levels and income levels. In addition, factors such as economic status, household profile in terms of size, education and marital status have been considered.

Data from the population census were compared to the police blocks in order to identify the profile of the residents in each block. A comparison of the data enabled differences in the population to be identified and collated.

Appendix 14a and 14b presents several variables obtained from the 1996 population census. The variables were considered to impact on crime levels and as a result considered appropriate for assessment in this research. The variables identified in this research were the following:

- The overall number, type and size of households specifically the number of persons per household, in addition to property ownership types.
- The density levels and population size.
- The income and unemployment levels.
- The ethnicity, education levels and martial status.

Appendix 14 presents the census area for Manenberg. The boundaries for the census blocks were identified in terms of an approximate population size. The population size for each *block* of the census areas was estimated to be 200. Each block was allocated a census code for the purposes of assessment (Appendix 14). Appendix 14a presents the census data relating to the police blocks compared to the building types found in Manenberg.

When the population census data are compared to the police blocks with the highest levels of vandalism (3291, 3293, 3297 and 3298) and then compared with the streets with the highest levels of vandalism, a comparison between the population demographics, the vandalism levels and the streets can be made.

The greatest number of households are found in police blocks 3300, 3295 and in sections of police blocks 3293, 3292 and 3291. Police blocks 3298, 3293, 3292, 3297 and 3291 contain the largest number of households not on separate stands and police blocks 3289, 3300, 3291, 3292, 3293 and 3297 experience the greatest concentration of flats. More significantly, the police blocks, particularly the streets, which were identified as having the highest levels of vandalism, can be associated to the presence of flats particularly in police blocks 3289, 3291 and 3297. The greatest number of town or cluster houses is situated in the region of Irvine Street that was identified as the third most vandalized street in Manenberg.

Appendix 14b presents the housing size specifically in terms of the number of rooms per dwelling. Police blocks 3291, 3292, 3293, 3297 and 3289 portray the greatest variety of household size, the largest household having 5 rooms. Police blocks 3288 and 3298 (Irvine Street) are identified as containing the largest households in Manenberg, each dwelling containing 6-10 rooms (Appendix 12). Furthermore, police blocks 3291, 3292, 3293 and 3297 contain the largest percentage of houses that are not owned by the residents.

The overall population density of Manenberg is identified in Appendix 15. The density levels are considered to be a major contributing factor to crime levels (Newman, 1973). According to the 1996 population census, the police blocks with the highest density levels are police blocks 3289, 3291, 3293 and 3297, in addition to

a portion of police block 3293. Comparing the density levels with the vandalism statistics, with particular reference to the street, indicates that an association can be made in police blocks 3289, and 3297. *Manenberglaan* in police blocks 3289 and 3297 experiences high vandalism levels in the presence of flats. The flats in police block 3289 and 3297 are identified as having the highest density levels in Manenberg (Appendix 14b and 15). The section of police block 3292 that has been identified as high-density is an area in 3292 with a high proportion of flats (Appendix 11, 14b and 15). More significantly, running adjacent to the high-density flats situated in police block 3292 is *Sonderentweg,* which was identified as the street with the highest incidence of vandalism (Appendix 11). Given that there is a relationship between flats, density and vandalism, it can be assumed that the vandalism levels in police block 3293, and specifically in *Sonderentweg*, can be associated with the presence of the high density flats in police block 3292 (see Appendix 11). Furthermore, the density levels can be compared to the number of people per household. Appendix 14b shows that the number of persons per household in Manenberg is between 5-6 irrespective of the size of the dwelling, which is mostly between 0-5 rooms. This indicates that the area accommodates considerably more people than it was originally designed to accommodate the result of which is overcrowding, high density and an over use of the facilities.

The annual income levels of the residents in Manenberg were grouped into several categories. The range of income levels was R1800-R360000 per year. Police blocks 3291, 3292, 3293, 3289 and 3297 presented the greatest range of income levels, particularly in the lower income bracket. Furthermore, a section of police block 3291 was identified as the police block that contained the highest levels of unemployment, although, the area presented the highest income levels.

The education levels of the residents varied from no schooling to postgraduate level. The greatest percentage of people who did not attend school was found in police block 3300, 3288, 3291 and 3292 (the flats). The majority of the residents in Manenberg attended school, although, completion of matric is not determined.

Appendix 14b identifies the marital status of the residents. There appears to be a higher proportion of people who have never been married in police blocks 3291, 3292, 3293 and 3297.

4.8 Conclusion

This Chapter has presented the data obtained for the assessment of vandalism in Manenberg over a seven-year period (1992-1999). The data were obtained though the Crime Administration System (CAS) and the 1996 population census. Many of the findings might have been predicted and were documented during telephonic interviews with housing officials and members of Manenberg Police Station.

The findings have brought to light many factors which are specific to the South African context of crime particularly with regard to vandalism. Most notably, the findings identified the difference and levels of pure vandalism and consequential vandalism which reflects the levels and types of other often more serious crimes.

Chapter 5: Data analysis

5.1 Introduction

This chapter presents the analysis of the crime statistics collected for the period 1992-1999. More specifically, the crime data presented in chapter 4 will be interpreted and the findings discussed. A comparison of the crime statistics and population census, with the design of the built environment, provides the basis for the analysis.

To reiterate, the crime statistics, provided by the Crime Administration System (CAS) of the South African Police Service (SAPS), consist of the crime data for vandalism in Manenberg for a seven-year period (1992-1999). The crime statistics adopted for this study were found to provide the most comprehensive and reliable view of vandalism in Manenberg. The statistics prior to 1992 were not available on the computer system and CAS has not compiled the crime statistics subsequent to 1999.

The crime data for vandalism was presented in three focus areas: the nature of vandalism, the area for vandalism and the targets of vandalism. Each of the three areas will be described for their content and analysed in the examination of vandalism. The information obtained through the analysis will be interpreted to make an assessment of the extent of vandalism undertaken in Manenberg. The data will then be associated with the built environment within which it takes place and the relationship will be analysed and discussed. The chapter will conclude with a summary of the research findings.

5.2 The frequency of vandalism.

The frequency of vandalism refers to:

- The overall number of incidents in Manenberg per police block and a pattern of vandalism for the seven years in review (1992-1999).
- The pattern of vandalism for the months of the year.

- Frequency in terms of days of the week and, more significantly, a pattern for the days of the week in which vandalism is more prominent.
- The findings regarding time of day for vandalism.

5.2.1 The total number of incidents for the seven years in review (1992-1999)

The overall number of recorded incidents for the seven years suggests that in terms of the geographical position, the police blocks with the highest levels are located in the *heart* of Manenberg and those blocks with the lowest levels are situated on the boundary. The police blocks with the highest levels of vandalism (3291 and 3293) are separated by police block 3292. Police block 3292 presents lower levels of vandalism (199 number of incidents).

Police block 3292 is geographically the smallest police block in Manenberg, although it contains the highest number of flats of any police block. The aerial photograph of the area (Appendix 10), suggests that police block 3292 contains the smallest amount of public space compared to the other police blocks in Manenberg, specifically in terms of play areas, parks and playing fields. Police blocks 3291, 3293 and 3297 contain large portions of land designated as sports fields and land for schools. When compared to those street names and types that suffer the highest levels of vandalism, the streets were found to border the large open spaces. The spaces provide large expanses of uncontrolled, unobserved land, where illegal activities can be undertaken un-noticed. The buildings situated on the land are not in permanent use and there is no form of lighting.

Given that there is limited designated land for recreation available in police block 3292, it can be assumed that the residents of police blocks 3292 utilise the land in the surrounding blocks, travelling through the surrounding police blocks to get to the recreational areas. This is specifically the case for school children that need to gain access to the schools located in 3291, 3297 and 3293. This observation supports Hesseling (1992), citing McIver (1981), who suggested that the majority of crime takes place within a mile of the criminals' residence. Furthermore, Hesseling (1992), citing Fiselier (1979), found that 60% of vandalism was committed outside the

offenders' neighbourhood. A *neighbourhood* in Manenberg is recognised by the residents as the designated police blocks within which they live. Kruger (2001) suggests that vacant land, specifically in poorer areas, poses risks with regard to personal safety. The land provides an opportunity to commit crimes such as, rape, robbery and assault and in order to reduce crime the land should be used more effectively, reduced in size, and managed more effectively (Kruger, 2001). In respect of vandalism, the vacant land can provide unobserved space in which to undertake vandalism or an area for the offender to escape subsequent to committing vandalism.

In addition to the assumption that the offenders of vandalism are moving away from their residential area (offender area) to undertake crime (offence area), particularly to the open spaces, the low incidence of vandalism in police block 3292 can be attributed to a lack of reporting by residents. It was noted through informal telephonic interviews with various parties involved in Manenberg (police and community workers) that the lack of recorded incidents could be attributed to the reluctance of residents to report crime. The flats were noted as promoting a stronger sense of community and loyalty than houses and this resulted in the residents' unwillingness to report crimes. Through research undertaken in America, Newman (1972) argued that crime rates were dependant on the height of a building and not the size (density) of the building. Newman (1972) suggested that the greater the height of the building the higher the incidence of crime. If the building was six storeys or less, the density of the area was inconsequential to crime levels. The crime statistics for the police areas that contain flats in Manenberg support Newman's (1972) theory. The flats were built to a maximum height of three storeys and although the police areas that contain the flats present high population density they have fewer numbers of reported crime. The lack of reported crime in the police areas that contain flats suggests the flats promote a greater community spirit. Although Newman (1972) suggests that increased community spirit reduces crime, the reduced levels of reported crime which takes place in the police areas which contain flats may reflect the residents' fear of reporting crime. The offence area is discussed later in this chapter.

The seven-year review of vandalism in Manenberg suggests 1994 as having had the highest levels of vandalism. According to Kruger (2001) there has been a dramatic increase in the overall levels of recorded crime since 1990 and the increase continues.

The first democratic general election in South Africa was held in 1994, when politically, the country was generally considered to be unstable. The instability of the country can be reflected in the recorded incidents of violent crimes, which have steadily increased by 22% since 1994 (Kruger, 2001). It has been suggested through informal telephonic interviews with members of Manenberg police station that the political uncertainty led to increased gang violence, particularly when the gangs were fighting for territory. The increased gang violence may have escalated the amount of vandalism that occurred, specifically consequential vandalism.

5.2.2 The months of the year

An assessment for the months of the year indicates that there is an increase in the levels of vandalism during the summer months and during school holidays, (November, December and January). Vandalism levels decrease during the winter months (July August and September). One suggestion for this is that vandalism is an outdoor activity and during the cold months less activity is undertaken outdoors, particularly children playing outdoors. The summer months (November, December and January) are the longest school holiday period. During informal telephonic interviews with members of Manenberg police station it was suggested that the increase of vandalism during holiday periods is due to the children going to the large open areas for *something to do* and for them to *get out of the way*, and that boredom is one of the main factors which contributes to vandalism being undertaken.

5.2.3 The days of the week

A comparison of vandalism and the days of the week indicates that vandalism increases during the weekend, with a pronounced increase on Saturdays. Given that the majority of people would be at home at weekends, it can be assumed that there are a greater number of people present on the streets, or a greater number of people observing the street activities during the weekend. Establishing that there are higher levels of vandalism during the weekend suggests the following: increased observation does not deter criminal activity taking place; the offenders are known or recognised and "accepted" by the community; the high numbers of crimes that are observed and not intercepted or prevented by the residents suggest that the residents

have a lack of control of their area which is reflected in their inability to alter the action (mostly from fear). According to Newman (1972), improving the *surveillance* of an area, specifically a street, is only effective when the territorial divisions of the street are established as this reflects on ownership and responsibility. The greater the sense of ownership by the residents, the greater the levels of territoriality and responsibility. Furthermore, Newman (1972), hypothesised that increased surveillance, in the number of people using the street and improvement of building surveillance opportunities (windows and doors) is a crime deterrent, and improved surveillance creates the image of a safe environment. Jacobs (1961) proposed that increased surveillance acts as a deterrent for criminal activity. In Manenberg the reverse is occurring. This suggests that the criminals do not fear being detected and they are confident the observers will not interfere. It also suggests that the observers or residents in an area are powerless in reducing criminal activity and the criminals are taking ownership of the geographical areas, which they regard as an easy target.

Increased *use* of the area during the weekends by the residents coincides with the occurrence of the various forms of conventional forms of vandalism, identified by Cohen (1972). This is reflected in the various types of vandalism identified by Cohen (1972), most notably an increase in the occurrence of vandalism caused by *play* vandalism by the residents, and *consequential* vandalism from gang activity.

5.2.4 The time of day

As noted in chapter 4, it is unclear from the official police statistics whether the *time of day* refers to the time the crime was undertaken, reported or recorded. Various members of Manenberg police station confirmed the time of crime referred to the approximate time the crime was thought to take place. Overall the most prominent time for vandalism was between 18h00 and 24h00. This supports the theory of crime taking place during periods of reduced detection or observation (Newman, 1972) although, in an assessment of the days of week the theory is contradicted. Further causes for an increase of vandalism levels were noted in Chapter 4, the most notable of which was children being left alone while parents and adults went out, and increased gang activity. Given that the time for high levels of vandalism is between

18h00 and 24h00, an attempt to reduce vandalism can be made through greater policing of the area during that time.

5.3 The nature of vandalism

The nature of vandalism refers to:

- The method of destruction
- The instrument adopted for the destruction

5.3.1 Method of destruction

The most commonly recorded method of destruction was *damaged*. This indicated that the technique adopted for the vandalism was unknown. Unless the reporter of the vandalism observes the action while it is being carried out, the method must either be assumed from the evidence (bullet holes indicating shooting) or reported as unknown.

Most significantly, it has emerged from this research that the damage recorded as vandalism may be the result of another crime, resulting in a large amount of the vandalism being consequential vandalism. This has emerged through the analysis of data relating to the method of destruction. The intentional act of theft may be reported as malicious injury to property if the initial act involved breaking a window to gain entry to a building. The significance of this is the effect this type of reporting has on the statistics for other crimes. Gang violence and theft may be recorded as vandalism, which reduces the statistics of gang violence and theft and increases the incidents of vandalism. This inaccuracy in recording presents a false account of the gang violence in the area.

An analysis of the method of destruction questions the levels of deliberate vandalism that takes place. The statistics of vandalism analysed for this research do not indicate or differentiate between the levels of deliberate vandalism or the levels of consequential vandalism. Furthermore, the reporting of vandalism is thought to take

place only when there is a gain to be had through the reporting, usually in the form of an insurance claim for the damage. This questions the true levels of deliberate vandalism and the perceptions of the residents on vandalism. An analysis of the recorded incidents has led to the discovery that vandalism, which occurs to public property, is not reported. The noticeable lack of reporting of vandalism and graffiti which occurs to street lights, traffic lights, libraries, schools and clinics, questions the perceptions of residents on vandalism to public property. Informal telephonic interviews with members of Manenberg police station indicate that the vandalism, which takes place to public property, is not recorded unless the City Council lays a charge and reports the crime (the purpose of reporting the crime by the Council was unclear). The police report the vandalism that takes place to public property directly to the City Council when it is noticed. It was remarked that the Council officials are prompt in undertaking the repair. The vandalism which takes place to public buildings (notably: schools, libraries and clinics) is reported directly to the Council by the police or users of the building and the police records do not reflect the levels of vandalism which take place. The failure to report the vandalism that takes place to public property reflects in this study. A future study, examining the maintenance records of public property, might provide a more accurate account of the levels of deliberate and consequential vandalism to public property. Moreover, a future study of the vandalism that takes place on public property might indicate higher levels of deliberate vandalism particularly when analysing the vandalism to streetlights, traffic lights and graffiti.

5.3.2 Instruments adopted

In 41% of the incidents the instrument was identified as unknown. Unless the instrument is known, seen to be used, or is left near the damage, the instrument is classified as unknown.

Of the instruments identified, with the exception of petrol bombs, revolvers and fire-arms, all of the instruments might have been found at the scene of the vandalism. More significantly, it can be assumed that vandalism, which occurred through the use of a firearm or revolver, can be attributed to gang activity. This indicates the levels of consequential vandalism caused by gang activity and, more specifically, shooting.

An assessment of the instrument adopted identified that vandalism involving a firearm was more prominent in police blocks 3291, 3292 and 3293. This suggests a higher degree of gang activity in those police blocks. It further suggests an irregularity in the type of vandalism and the instrument adopted, depending on the geographical area within which it takes place. Further research might seek to identify the causes of increased gang activity within specific geographical areas and the significance of *territory* to the gang.

5.4 The area of vandalism

The area of vandalism was specified as the street in which the vandalism took place. There were a number of problems associated with the assessment of street location and vandalism, in as much as the streets were recorded incorrectly particularly with regard to the type of street. In order to alleviate the problem, the street names recorded were compared to street maps of Manenberg; this identified the street *types* that should have been recorded. In the recording of the streets, a number of streets were allocated different street *types*, which meant the same street types, most notably: lane, avenue, street and way were combined. Having confirmed the street types with members of Manenberg Police station, Manenberglaan was found to display the highest overall levels of vandalism.

Several problems were identified in the examination of the streets in terms of levels of vandalism. Most notable was the allocation of a street to a geographical area when the street travelled through more than one police block. Manenberglaan travels through several police blocks. The number of incidents on Manenberglaan had to be linked to the police block within which they occurred in order to identify the block with the highest number of incidents on the street. Inaccuracies in the recording of the crime data had to be allowed for, mostly with a street being associated to the wrong police block.

From this research the most significant aspect to emerge, through an analysis of the streets, was the irregularity of the levels of vandalism among the streets.

The available crime data did not provide sufficient detail regarding the type of building that suffered vandalism or promoted vandalism and thus an analysis of the targets of vandalism could not be undertaken. The crime data was specific to the street on which the vandalism took place and not the buildings or targets of vandalism. Details regarding the built environment surrounding the identified streets had to be identified through telephonic interviews with various parties involved in Manenberg (police, community workers and housing officials), visits to Manenberg and through aerial photographs.

Given that building details (physical addresses) of where the vandalism took place were not provided in the crime data, comparisons with international theories cannot be made. For example, Newman (1972) suggested that of all crime which takes place on buildings, 79% takes place within the building. Furthermore, specific design elements incorporated into building design encourage crime activities to take place and not the grounds within which the buildings are situated. Although the police statistics adopted in this research identify the location of the crime, in terms of the roads and police blocks, the statistics do not identify the building type or portion of the building where the vandalism takes place. As a result, an investigation and comparison with international theories which have identified specific design elements of the building which are more susceptible to vandalism and the design elements in a building which encourage vandalism is not possible.

Although an investigation of the streets identified Manenberglaan as having the highest levels of vandalism, Manenberglaan travels through several police blocks. Isolating Manenberglaan into the police blocks within which it travelled suggested that two police blocks (3297 and 3289) portrayed high levels of vandalism. Sonderentweg (police block 3293) presented the highest levels of vandalism of all the streets identified in Manenberg (51 incidents). Manenberg Avenue (police block 3297) presented 47 incidents of vandalism. Irvine Street (police block 3298) presented 37 incidents and Manenberg Avenue (police block 3289) presented 33 incidents of vandalism.

Inspection of the streets identified as having the highest levels of vandalism suggests a number of significant characteristics. Firstly, the streets border large open spaces.

The spaces are designated as play grounds, sports fields or school grounds (Sonterentweg, Irvine Street and Manenberglaan 3297 and 3289). Secondly, it was found that the streets travel through, or border, areas that contain a high number of flats (Manenberglaan 3297 and 3289). The presence of large open spaces has been identified as a significant factor that contributes to high crime levels. Newman (1972) argued that the proximity of specific institutions could impair the safety of a neighbourhood, specifically the location of schools and school grounds. Furthermore, those buildings immediately opposite youth recreational facilities have displayed higher crime rates. In order to reduce crime, access to buildings (specifically apartments) should not be from streets that are located directly opposite schools and school grounds.

The street location recorded in the statistics for this research is limited in that the statistics do not identify the specific target of the vandalism. In this research it is assumed that the recorded vandalism indicates that the vandalism took place to buildings. Where vandalism is recorded on open spaces the target is assumed to have taken place on storerooms; benches; children's' play equipment; boundary walls, fences and gates.

The vandalism, which is assumed to take place on the open spaces, is recorded in terms of the street where the entrance to the open space is located. In addition, the vandalism that takes place to any buildings located on the open spaces, most notably, school property and sports field buildings, is recorded in terms of the entrance address.

The theory that open spaces influence high crime levels is reinforced in this research, specifically in the presence of schools and school grounds.

5.5 The demographics

In addition to the design of the built environment, several other factors are considered to impact on crime levels. These factors were examined and are grouped into the following:

- The overall number, type and size of households specifically the number of persons per household, in addition to property ownership types.
- The density levels and population size
- The income and unemployment levels
- The ethnicity, education levels and marital status of the populace.

When comparing the demographic data to the police blocks that suffer the highest levels of vandalism (3291, 3293, 2197, 3298 and 3292), police blocks 3291, 3292, 3293 and 3297 contain the largest number of households, the greatest concentration of flats, and the highest proportion of units not owned by the residents. More significantly, the streets that have been identified as having the highest levels of vandalism are contained within these police blocks.

Although it is contended that crime does not compare with density, Newman (1972), suggested that building height contributes significantly to high crime rates and the higher a building the higher the crime rate. Furthermore, those buildings less than 6 stories high have a lower crime rate than similar density projects designed with greater height. The flats in Manenberg were designed with a maximum height of 3 stories, although the density of the flats is greater than they were originally designed to house. The increase in the population in Manenberg is heightened by the lack of alternative available housing for the residents. Units that were originally designed for a family of four can house 10 or more people. In addition to the growth in population, the number of units has increased. Informal shacks have been erected, mostly in the gardens of houses and adjoining the ground floor flats. The shacks accommodate family members or are sublet to other residents. According to Newman (1972), limiting the number of buildings that comprise a housing project is vital to achieve defensible space and reduce crime. The informal development and escalation in population has resulted in the overpopulation of the area, and although density is not considered to be a factor that contributes significantly to crime (Newman, 1972), in the context of Manenberg, high density and overpopulation must be considered as a contributing factor.

Through several informal telephonic interviews with police and community workers in Manenberg, it was established that the original purpose of housing projects on the Cape Flats (apartheid) is a factor that continues to stigmatise the residents and the image of the housing. The housing projects are distinctive in terms of their design, size, purpose and the life style they symbolize. It is the uniqueness in design and purpose that isolates the projects from other residential housing developments. In addition to the stigma attached to living in the low cost housing schemes, primarily designed for low income "coloured" families during apartheid, there is the stigma of being forced to live in the developments and a resentment attached to the forced removal process. The result of this has been the development of a community that is specific to the Cape Flats. The characteristics of which are presented in language, clothing and behaviour. The most significant aspect to emerge since the development of the *Cape Flats* is the high levels of violent crime particularly through the development and growth of gangs.

5.6 Conclusion

This chapter has interpreted and analysed the crime statistics presented in Chapter 4. The initial purpose of this research was to compare elements of the design of the built environment, specifically low-income residential dwellings and crime, specifically vandalism.

In order to pursue the initial proposal the exact location of the vandalism would have to be identified. The police statistics, which formed the bases of the research, did not indicate the street location of the vandalism. The location of the vandalism was specified in terms of the street name. An analysis of the street, in terms of building type situated on the street, determined the type of building design or environmental features that were located on the street.

The most significant findings to emerge from the analysis of the vandalism statistics was the irregularity in the number of incidents in relation to the time variables assessed (time of day, day of week, month of year and year) and the unevenness of the levels of vandalism in each of the police blocks assessed.

An assessment of the number of incidents and the time frame variables (time of day, day of week, month of year and year) indicated a pattern for the levels and frequency of vandalism; most notably, that vandalism occurs most frequently at night, at weekends, specifically Saturdays and is more frequent during the warmer months specifically during periods of school vacations.

An analysis of the location of vandalism suggested that vandalism is more likely to occur to buildings which border large open spaces of land, particularly school premises. Furthermore, the research indicated that vandalism is more likely to occur in the presence of flats.

The research did not indicate if the perpetrators of vandalism undertook the crime in their own area (offender area) although, the research suggests that the offenders of vandalism travel to the offence area to commit the vandalism.

The research did not lend itself to identify the type of building and design elements that promote vandalism other than vandalism being more likely to occur in proximity to flats and open spaces.

Informal telephonic interviews with parties involved in Manenberg (police, housing official and community workers) suggested that the police statistics did not reflect the true extent of the vandalism. An assessment of the statistics reinforced this with the lack of recorded incidents of vandalism to public property.

An assessment of the findings suggests the uniqueness of vandalism in South Africa. An understanding of the crime must be associated with the South African context within which it takes place and factors, such as, the high levels of gangsterism, the excessive forms of extreme violence and the legacy of apartheid, and the stigma attached to it, must be considered in any crime research undertaken in Southern Africa.

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Chapter 6: Conclusions and recommendations

6.1 Overview of research

This study is concerned with the spatial distribution of vandalism and the causes of vandalism variance focusing on the influence of environmental factors, particularly environmental design. In specific terms, the study has identified the types and levels of vandalism that have taken place within a specific geographic location (Manenberg) and has identified and rationalized the variation in terms of environmental design.

In order to effectively undertake the research several objectives were established (chapter 1). The research methodology provided a guide for the data collection, analysis and the data interpretation which was then linked to the set objectives.

The vandalism data for the study was obtained through police records of vandalism in Manenberg over a seven-year period. As recommended by Viano (1975), official crime statistics and police records can provide an accurate historical overview of crime within a specific geographical area. The vandalism statistics for a seven-year period in Manenberg were presented in chapter 4 through the application of a Geographical Information System; the data was then analysed in chapter 5.

The findings of the research will be presented in terms of the research objectives and more specifically how the research objectives were met.

6.2 Research Findings

6.2.1 Research findings on the establishment of a theoretical framework for the analysis of vandalism

Having identified the geographical area to be examined in terms of vandalism the first objective of this study was *to establish a theoretical framework for the analysis of vandalism* (chapter 1). The purpose of the objective was to identify a suitable research tool in which to accurately gather vandalism data.

The vandalism data that was required for an accurate assessment of vandalism variance had to reflect the vandalism levels over a long period of time. The data had to be accurate, reliable and easily interpreted for fluctuations. An analysis was made of the suitable data gathering methods available for this study and the application of official police statistics were considered the most appropriate (chapter 3).

6.2.2 Research findings on the frequency of vandalism within Manenberg, identifying the frequency patterns within specific areas in Manenberg.

The second objective of this study was to identify the frequency of vandalism in Manenberg. The *frequency of vandalism* was identified as: the overall number of incidents per police block per year, the number of incidents of vandalism per month of year, day of week and time of day.

The police crime statistics for Manenberg were recorded in terms of encoded police blocks that divided Manenberg into specific areas. The areas were allocated a numerical code. The vandalism statistics presented each incident of vandalism in terms of the police block within which it occurred.

The aim of this objective was to firstly establish a pattern for the vandalism levels within Manenberg thus identifying areas that consistently presented high and low levels of vandalism for the seven-year period under review. The second purpose for achieving the objective was to establish a pattern for the total number of incidents per year thus identifying any significant pattern for the years under review.

Results show that there is a significant disparity in the levels of vandalism for the police blocks assessed and that vandalism levels are not uniformly distributed within the geographical area. The results suggest that the police blocks located within the centre of Manenberg present the highest levels of vandalism and those police blocks located on the periphery display the lowest levels of vandalism.

The frequency of vandalism addresses the months of the year, the days of the week and the time of day. An assessment of the variables indicate that there is a pattern for the levels and occurrence of vandalism in terms of month, time and day. The

significance of these finding is in terms of policing. The results suggest that in order to reduce vandalism policing in Manenberg can be increased during the months of December, November and January in addition to the days of the weeks which presented high levels of vandalism, most notably, on Fridays, Saturdays, and Sundays. In terms of time of day it is suggested that surveillance be increased between 18H00 and 24H00. An assessment for the frequency of vandalism suggests that holiday periods, weekends and the time after school is closed displays the highest levels of vandalism. Furthermore, an association can be made between the periods of high levels of vandalism and a high presence of children as the results indicate a time of high levels of vandalism is during the time after school and school holidays. In order to alleviate the number of incidents of vandalism facilities for children during holiday periods should be developed, which would discourage the children from getting bored.

As noted, the results suggest that in terms of the frequency of vandalism a pattern for holiday periods, weekends and night time has emerged, in that, during these times the levels of vandalism increase. In addition, it can be suggested that vandalism is seasonal and increases during warmer weather. The results in this study dispel previous research undertaken by Newman (1972) who suggested that increased surveillance of an area reduces the incidents of crime. The results of this study suggest that the highest levels of vandalism occur during the weekends and holiday periods, when there is a rise in the levels of surveillance due to people being at home and not at work. On the other hand, elements of this study do support Newman's (1972) findings in terms of increased levels of vandalism taking place at night when the observations levels are low.

Through an analysis of the recorded statistics of vandalism the results suggest that a type of vandalism previously unrecognised in previous research has emerged, most notably consequential vandalism. More significantly, the results of this study suggest that consequential vandalism is the result of more extreme forms of violence, namely gunfire. Furthermore, levels of gang violence in an area can be determined through the police statistics that have recorded specific types of vandalism that have occurred as a consequence of firearms.

The results of this study suggest that there is a variance in the levels of gang activity within each of the police blocks assessed and there is a variance in the types of criminal activity that occurs within the blocks and this is reflected in the levels of vandalism. The police blocks located in the centre of Manenberg display a higher degree of gang activity and aggressive behaviour presented in the recording of vandalism that has taken place as a consequence gunshots.

The results suggest a pattern in the streets that present high levels of vandalism. Streets that border large open spaces of land, areas with a high proportion of flats and/or areas that contain schools present higher levels of vandalism. Moreover, larger geographical areas do not necessarily present increased vandalism levels, the levels of vandalism reflect what is contained within the areas the density levels and how the areas are positioned in respect of other areas and facilities

The results propose that the police blocks, which have to be travelled through in order to reach a specific facility, present an opportunity for increased levels of vandalism. This further supports the theory by McIver (1981) who suggested that the offender area and the offence area differ. Furthermore the results of the research imply that the offender sees the surrounding police blocks as a different environment to his own and present an opportunity to undertake vandalism undetected.

6.2.3 Research findings on the nature of vandalism that exists in Manenberg in terms of the methods of destruction and the instruments adopted.

The third objective of this study required the nature of vandalism in Manenberg to be identified, specifically in terms of the method of destruction and the instruments adopted.

The aim of this objective was to identify the type of vandalism that takes place in Manenberg in relation to the police blocks within which they occur. This would indicate whether specific police blocks present more violent types of vandalism and others more accidental vandalism.

The results of the study suggest that there is a variance in the distribution in the method of destruction within the police blocks assessed. The most commonly reported method of destruction was *damaged* which suggests that the method was unknown. More significantly, the results for the method of destruction indicate that vandalism can be the result of another crime and, although recorded as vandalism, is not deliberate vandalism or *pure* vandalism. This suggests that more violent crimes are being recorded though the damage they have consequently caused and not necessarily for the crime itself.

The results of this study identify the instruments adopted for vandalism. An assessment of the instruments adopted suggests that there is a disparity in the instruments used among the police blocks. Moreover, specific police blocks present more of a variation in the type of instruments used and that more violent instruments are used more frequently in particular police blocks than others. Furthermore, the results suggest that in those police blocks with high levels of vandalism there is an increase in the number of more violent instruments adopted, most notably, guns. The implication of this is that vandalism is recorded as vandalism when it is the result of a more serious crime; the results further reveal that several police blocks have a higher percentage of activity involving guns than others, possibly as a result of gang activity.

6.2.4 Research findings on the relationship between vandalism levels within specific areas and design factors of the environment, specifically environmental layout, housing type and population density.

The fourth objective of this study was to establish levels of vandalism within specific areas, most notably, to identify the variance of vandalism among the police blocks and the vandalism levels among the streets. Achieving this objective identifies any disparity of the vandalism levels in the police blocks and streets and further indicates the police blocks and the streets with the highest and lowest levels of vandalism. Isolating and examining the vandalism levels per street allows for a more accurate assessment of the environmental factors that may influence the vandalism levels on the street.

Results suggest that there is an irregularity in the number of incidents of vandalism among the police blocks and the streets. The research suggests that the streets with high levels of vandalism present several common characteristics, most notably, they border large open spaces of vacant land and they are in close proximity to areas of flats and/or schools. The official police statistics adopted for this study did not contain information regarding the targets of vandalism, particularly in terms of building type. Further study could be made regarding the targets of vandalism, which would indicate the type of building that suffers from increased levels of vandalism and which building may influence or encourage vandalism to take place.

6.2.5 Research findings on the identification and comparison of additional variables that may impact on vandalism levels, specifically the population statistics, in terms of density, unemployment and dwelling size.

The fifth objective of this study required an examination of the additional variables that are widely contended to impact on vandalism, most notably density. The aim of the objective was to consider the demographic datum of the area (Manenberg) as a factor which influences vandalism. Making an allowance for the demographic datum to be considered in this study recognised the influence the demographic datum might have on vandalism levels.

The results show that there is a relationship between vandalism levels and density, number of flats and household ownership. The results confirm that high levels of vandalism occur in areas that contain high-density levels, a high number of flats and a large proportion of rented accommodation.

6.2.6 Summary

From the results of this study it can be concluded that the objectives set out in chapter one have been addressed and achieved.

6.3 Benefits of the findings

This study aimed at investigating the spatial distribution of vandalism and examining the causes of vandalism variance, focusing particularly on the influence of environmental factors specifically environmental design.

As stated in the research findings there is a variance in the vandalism levels in Manenberg that can be associated to specific variables in the environmental layout. The results of this study support Ward (1973), who suggested that physical factors that create the environment are conducive to vandalism and that damage is a result of a reaction to the environment (chapter 1). The results suggest that vandalism occurs more often in specific areas at specific times and that elements of the environment layout and design encourage vandalism.

According to Wilson and Kelling (1982) vandalism encourages the feeling of apathy toward an area and creates an image of neglect, more significantly the image that it creates can encourage further crimes to be committed. Creating an environment that discourages vandalism from taking place may have a positive effect on the reduction on the levels of more serious crimes and a further analysis of the vandalism areas, identified in this study, may indicate characteristics within the building design which encourage vandalism. Identifying and rejecting these findings in the design and development of future housing projects may reduce vandalism levels.

Given that the results of this study promote the theory that environmental layout and design impacts on vandalism and there are specific time factors in which vandalism levels significantly increase, the significance of this study lends itself to future research in respect of crime analysis and methods for crime reduction.

Given that this research identifies the areas of vandalism it is suggested that further research is undertaken examining the targets of vandalism, specifically the buildings which are the most likely targets for vandalism and, furthermore, the building design and materials which encourage the levels of vandalism to increase.

Further research should be conducted to examine the impact of vandalism on more serious crimes and to investigate highly vandalised areas and levels of more serious crimes.

This study is considered a preliminary study into vandalism in South Africa. The results identify the levels, type and times of vandalism. It is hoped that this study will encourage further research into the impact of vandalism on crime and specific building design which influences vandalism. Furthermore more, it is envisaged that the results from this study will encourage measures to be taken to reduce vandalism in the areas and times identified, thus reducing vandalism and improving the image and aesthetics of Manenberg.

6.4 Recommendations

Supporting the results and conclusions of this study, the following recommendations are presented as an effective method of reducing vandalism levels in Manenberg. The recommendations are rationalized in terms of the following: Environmental design and restoration; improved surveillance and policing; and crime statistics

1. Environmental design and restoration

- Designers, planners and architects should consider the positioning of housing projects in terms of their proximity to open spaces and schools. Moreover, further consideration should be given to the development and distribution of flats amongst housing projects.

- Damage caused by vandalism should be promptly repaired. The timely repair of damage caused by vandalism would improve the aesthetics of the area and may increase the residents' sense of responsibility to the area. The image of the area would improve and an impression that the area is cared for would begin to develop.

- The open spaces should be fenced. Research by Newman (1972) suggested that open spaces which are not managed and maintained correctly and are not demarcated by boundaries create an impression that the area is not owned and leaves the area vulnerable to abuse. Fencing the large open spaces in Manenberg would define the space in terms of ownership and discourage misuse. Having fenced the open spaces the entrance to the spaces should be limited and access to the spaces should be monitored at specific times of the day, furthermore, the use of the space should be supervised. In addition, limiting access to the open spaces would encourage the pedestrian traffic to be diverted and not use the open space as a travelling route, this would limit the number of people using the open spaces and increase the number of people using the roads, ultimately improving the surveillance of the roads.

- Where the spaces are *open* and display little purpose other than existing for the purpose of providing open space between housing, a definition of the space should be developed. The spaces should be awarded a specific function and the necessary equipment placed in the areas to portray the purpose, such as a children's playground equipment or a defined sports field.

- Environmental design should be developed to improve the sense of territory. The residential areas should be zoned and demarcated through the incorporation of fences, walls and hedges. Creating an image that specific areas are zoned will encourage residential responsibility for the zoned area, increase the sense of belonging and ownership and encourage the residents to recognise strangers in the area.

2. *Surveillance*

Given that the results of this study suggest that high levels of vandalism take place in specific areas at specific times in terms of time of day, day of week and month of year, measures should be taken to improve surveillance during those times when there

is an increase in the levels of vandalism. The following recommendations are made in connection with improvement to surveillance:

- Street lighting should be improved; this would ultimately enhance the surveillance levels of the residents in the area.

- Increase levels of policing in those areas identified in this research that suffer the greatest levels of vandalism. In addition, the results of this study indicate the times of day, days of week and months of the year in which vandalism levels increase. Improved policing during the times identified would significantly reduce the vandalism levels.

3. Crime statistics

Given that the research tool adopted for this study was the analysis of official police statistics the following recommendations are made regarding the recording and interpretation of the statistics.

- Several methods previously recognized for the collection of crime data were analysed in chapter 3. For the purposes of future research further consideration should be given to a more appropriate choice of data collection other than official police statistic. Several inconsistencies were found in the crime data presented in the official statistics which affect the interpretation of the data and results in assumptions having to being made. Furthermore, the official statistics do not portray an accurate measure of the vandalism levels in Manenberg; the expectation is that the actual levels of vandalism in Manenberg outweigh the representation made in the official statistics. In order to obtain additional information regarding the perceptions of residents and victims of crime, it is suggested that for further studies interviews and observation techniques be adopted as the official police statistics do not reflect the problem in its entirety.

- Given that the reporting of vandalism is not consistent (chapter 5) it can be assumed that the reporting of more serious crimes is also inconsistent, thus, future crime research should adopt more suitable research method for obtaining a more accurate account of the crime under investigation.

- The residents of Manenberg must be encouraged to report crimes more frequently for reasons other than obtaining a case number for insurance claims (chapter 5). Furthermore, an attempt must be made to deter vandalism by means of the penalty for vandalism being increased.

- It is recommended that further research be undertaken to identify the variance of gang violence in the area and more significantly, the effect of gangsterism on other types of crime. Moreover, future research should be conducted that investigates the variance of gang violence in Manenberg and a pattern for the distribution of gang violence presented. Assuming that a variance in the distribution of gang violence will emerge, the factors that encourage the variance, particularly the environmental factors, should be identified.

6.5 Evaluation of the research approach undertaken.

An evaluation of the research approach undertaken in this study is as follows:

The research methods adopted in this study were guided primarily by the demands required for presenting the most accurate method for obtaining crime data. The study adopted the use of official police statistics as the primary source of data collection, interpretation and analysis of vandalism in Manenberg over a seven-year period. Justification for the adoption of the police statistics in this study is based on the recommendation made by several previous crime researchers identified in chapter 3.

Although several inconsistencies have been presented with regard to the recording and interpretation of the crime statistics, it is proposed that the use of crime statistics for the purposes of this study remain the most accurate and safe method of presenting vandalism for the time frame under review.

6.6 Problems experienced undertaking the study

The following problems were experienced while undertaking the study:

- Several problems were experienced during this study associated to the collection and analysis of crime statistics. The crime statistics were mostly recorded in Afrikaans and had to be translated into English. This process was time consuming and costly. The police statistics that were provided by the South African police service were presented in three different styles of recording due to the police testing suitable recording methods. For the purpose of analysis the various recording methods had to be collated and presented in one style. This process was time consuming, as the various collection methods presented a variety of information that had to considered or eliminated for the purpose of consistency. During the analysis of the police data, the statistics proved to be inconsistent as the data reflected on the ability of the parties involved in the original recording.

- Obtaining prompt clarification and interpretation of the recorded police data was problematic. The police responsible for the original recording of vandalism data are located in Manenberg and are very busy; in addition, in comparison to the more serious crimes taking place in Manenberg vandalism is not considered a priority and lengthy discussions regarding the problem of vandalism was not always possible.

- The opinions, of several parties informally interviewed, regarding the vandalism problem were that vandalism is often associated to external factors such as, gansterism, poverty, alcohol abuse, boredom and the legacy of apartheid. Focusing on the international theories of the environmental influence on vandalism and comparing them to the South African context proved to be problematic, as the problem of vandalism in Manenberg emerge as being situationally specific given the previously mentioned factors, most notably apartheid.

- During the course of this study, it became evident from the opinions of police and housing officials, that crime, irrespective of the severity, has become an accepted part of life in Manenberg. As the results of this study have identified the victims of crime do not report a crime unless there is a gain to be made, thus the statistics do not reflect the true levels of vandalism.

- Gaining access to Manenberg for additional information for this study, in terms of interviews and observation was not possible. Several parties, including members of the South African police force, strongly advised against going to Manenberg for research purposes, due to safety constraints. Moreover, obtaining information from the facilities in Manenberg, such as the library, was not always possible due to increased gang activity which forced the facilities to temporarily close. Telephonic interviews were conducted with members of Manenberg police, housing officials and community workers.

6.7 Possibilities for further research

This study promotes further research in the area of vandalism in South Africa. It is considered essential to conduct research that identifies the targets of vandalism and the specific building designs that suffer from vandalism and encourage vandalism to take place. The findings of such a study would indicate specific characteristics within the building design which encourage vandalism. Identifying and rejecting these features in the design and development of future housing projects may reduce vandalism levels.

This study lends itself to be continued through an investigation into the effects of vandalism and the influence vandalism may have on the levels and types of other more serious crimes that take place.

Further study should be conducted on the vandal. In order to alleviate vandalism the perpetrators of vandalism should be identified and their justification for undertaking vandalism considered. Preventative methods based on the findings may be found to differ than those already identified in international research.

This study is considered to be a preliminary study into the problem of vandalism in South Africa. Taking action to reduce vandalism, based on the findings of this study, could prove effective in reducing the overall levels of crime in Manenberg and not simply vandalism. Reducing vandalism would improve the appearance of Manenberg and ultimately change the image that it has developed. Furthermore, reducing vandalism levels would improve the living conditions of the residents and overturn the sense of apathy which has evolved toward the environment.

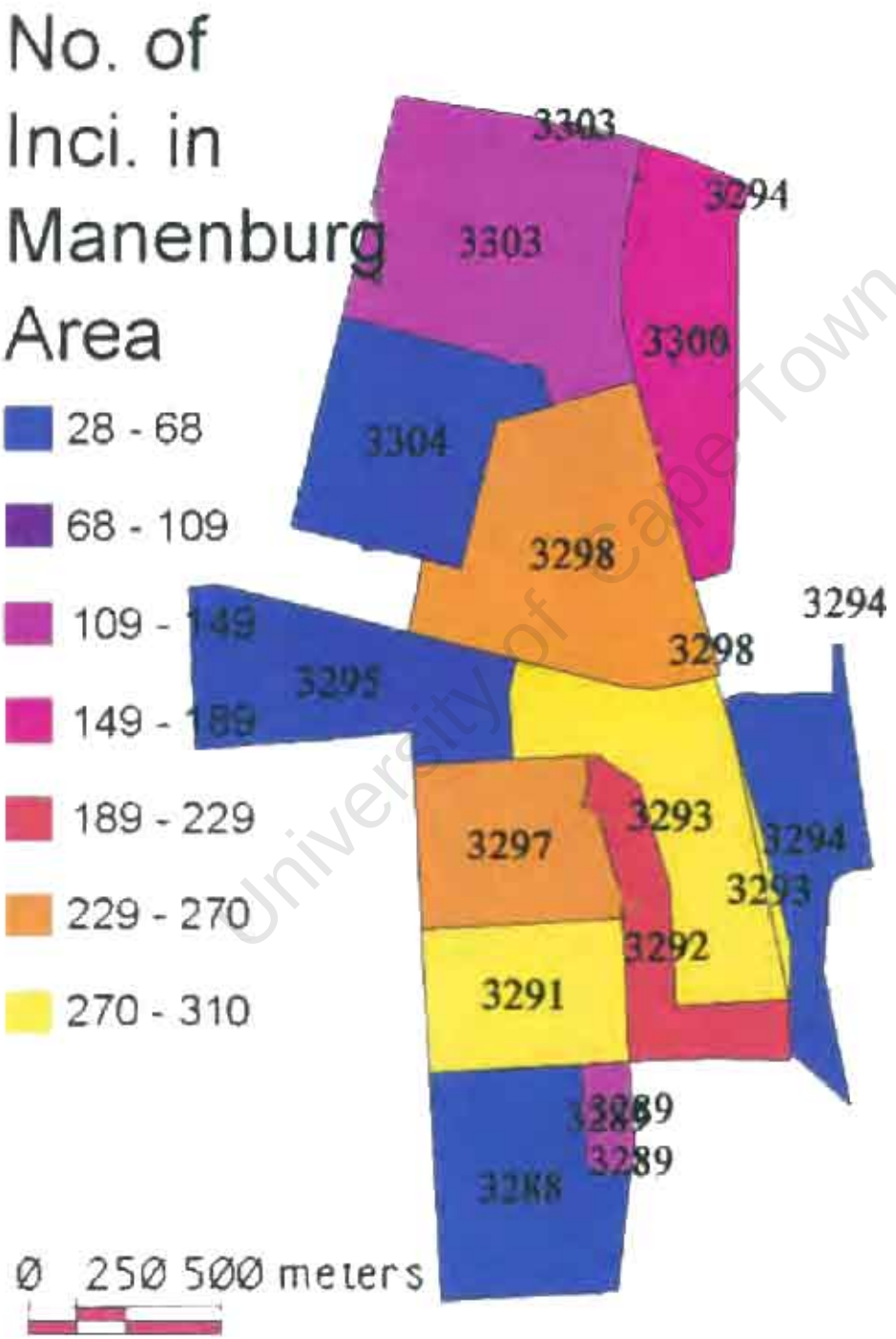
Appendices

Appendices

Appendix 1

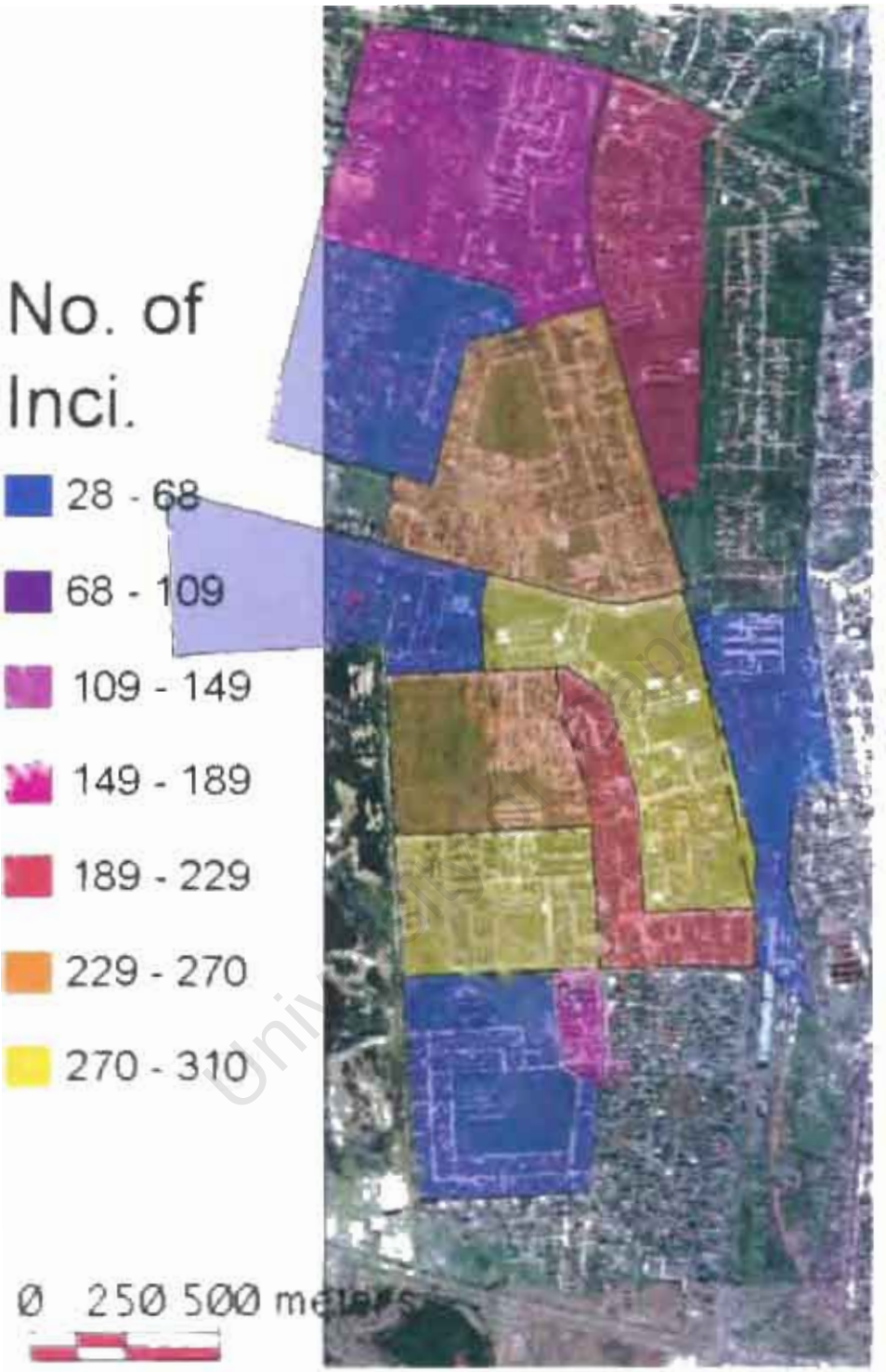
The police blocks in Manenberg and the total number of incidents per police block (1992-1999)

Total number of incidents in Manenburg per police block (1992-1999)



Appendix 1a

Map of police blocks correlating to building type and number of incidents (1992-1999)


No. of Inci.
28 - 68
68 - 109
109 - 149
149 - 189
189 - 229
229 - 270
270 - 310
0 250 500 meters

Appendix 2

Appendix 2 presents, in table form, the overall crime statistics (1992-1999) as interpreted from the official police statistics. The table specifically presents data for the day of week, the year, the time of day, the method of destruction, the instrument adopted and the street name.

Overall crime statistics															
Area #	**3288**	**3289**	**3291**	**3292**	**3293**	**3294**	**3295**	**3297**	**3298**	**3300**	**3301**	**3303**	**3304**		**Totals**
Day of Week															
Monday	7	11	29	26	36	1	3	34	23	18	0	13	4		205
Tuesday	5	18	31	18	27	6	4	23	24	17	4	11	4		192
Wednesday	10	11	29	22	26	2	2	18	34	14	1	13	4		186
Thursday	6	14	32	20	25	4	7	32	30	21	1	17	7		216
Friday	19	24	60	33	47	13	5	37	37	27	4	28	3		337
Saturday	4	34	72	42	78	6	13	55	76	45	6	26	5		462
Sunday	6	22	57	38	41	5	5	49	39	22	3	35	1		323
	57	134	310	199	280	37	39	248	263	164	19	143	28		1921
Month of year															
January	6	20	29	15	32	3	3	19	31	19	0	16	2		195
February	6	6	19	15	19	5	1	21	24	16	0	11	3		146
March	3	10	26	16	23	4	2	37	26	15	4	9	3		178
April	5	6	37	14	18	1	3	17	18	10	3	14	2		148
May	4	11	22	18	28	7	3	20	12	14	0	9	1		149
June	5	7	19	24	16	2	4	16	21	18	1	11	1		145
July	5	5	25	9	11	1	6	20	19	10	1	13	3		128
August	3	6	24	7	10	1	4	13	26	8	0	11	3		116
September	3	10	20	12	15	3	1	14	19	7	1	17	2		124
October	7	20	22	18	21	2	1	15	14	11	2	13	1		147
November	7	12	27	25	44	2	5	24	26	25	1	6	3		207
December	3	21	40	26	43	6	6	32	27	11	6	13	4		238
	57	134	310	199	280	37	39	248	263	164	19	143	28		1921

Year															
1992	4	6	15	11	16	1	0	8	9	3	0	5	1		79
1993	13	22	57	39	63	4	4	61	46	25	0	17	6		357
1994	4	18	55	32	66	8	15	59	50	20	4	25	8		364
1995	4	8	30	26	28	3	1	22	29	19	6	22	1		199
1996	9	24	43	22	37	4	11	24	46	34	2	23	5		284
1997	14	36	18	18	28	3	5	20	22	35	6	26	1		232
1998	3	13	65	30	30	11	3	27	38	19	1	15	5		260
1999	6	7	27	21	12	3	0	27	23	9	0	10	1		146
	57	134	310	199	280	37	39	248	263	164	19	143	28		1921
Time															
6am to 12pm	13	30	58	41	57	9	7	38	34	14	6	25	7		339
12pm to 6pm	13	32	76	56	75	9	9	77	69	50	7	33	9		515
6pm to 12am	24	44	121	74	111	13	17	105	111	80	5	64	8		777
12am to 6am	7	28	55	28	37	6	6	28	49	20	1	21	4		290
	57	134	310	199	280	37	39	248	263	164	19	143	28		1921
Method															
Broken	1	2	3	5	5	0	1	5	14	3	1	4	2		46
Broken window	10	21	51	32	51	7	8	35	44	42	3	31	4		339
Broken window of vehicle	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Burned	0	0	0	0	0	0	0	0	0	0	0	0	1		1
Climbed through roof window	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Cut	1	0	2	0	3	0	0	2	0	1	0	0	1		10
Damaged	19	43	85	51	65	11	9	49	67	53	8	31	8		499

Force	1	2	4	4	6	2	0	4	5	2	1	4	1		36
Force open premises	0	4	8	1	5	1	0	5	6	8	0	0	0		38
Force open door of car	0	0	0	0	1	0	1	1	1	0	0	0	0		4
Gained entrance through telling a lie	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Hacked with axe/panga	0	0	2	1	5	0	0	2	2	0	0	1	0		13
Hit	3	10	8	7	9	1	4	3	7	6	1	4	0		63
Kick	1	4	6	4	8	0	0	5	11	2	1	7	0		49
Not applicable	1	0	7	6	5	0	0	7	4	1	0	2	0		33
Opened gate	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Removed roof tiles	0	0	0	1	4	0	0	0	1	0	0	0	1		7
Removed windows	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Run/bump over by car	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Set alight	0	1	1	0	5	1	0	1	3	2	0	2	1		17
Shot	2	2	9	11	13	1	0	5	5	0	0	5	2		55
Smashed	2	5	26	11	20	1	1	12	21	6	0	7	1		113
Stabbed	1	0	10	4	0	1	0	6	2	2	0	0	1		27
Struck	3	7	34	13	13	2	4	13	12	8	0	9	1		119
Take	0	0	0	0	0	0	0	0	0	0	1	0	0		1
Threw by stones	7	15	31	26	39	4	8	35	28	15	3	13	1		225
Threw by object	0	6	4	1	1	1	0	3	4	5	0	2	0		27
Torn	0	1	0	1	0	0	0	0	0	0	0	0	0		2
Unknown	4	10	19	20	19	4	3	53	26	8	0	20	3		189
Vehicle driven	0	0	0	0	1	0	0	1	0	0	0	0	0		2
	57	134	310	199	280	37	39	248	263	164	19	143	28		1921
Ins. Des.															
Axe	0	1	0	0	0	0	0	1	2	1	0	0	0		5
Bike	0	0	1	0	0	0	0	0	0	0	0	0	0		1

Booted foot	0	2	0	3	4	0	0	1	0	1	0	1	0		12
Bottle (*vottle*)	1	0	0	0	0	1	0	1	0	1	0	0	1		5
Brick/Stone	14	39	88	58	94	15	18	68	77	49	6	44	5		575
Broom stick	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Car	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Cricket bat	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Feet	1	7	14	8	9	1	2	9	10	7	1	9	0		78
Fire arm	1	0	0	1	2	0	0	0	1	0	0	1	2		8
Fist/Hand	3	16	39	19	30	4	4	21	39	23	3	20	3		224
Hammer	1	2	3	0	1	0	0	0	1	1	0	0	0		9
Hit	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Iron pipe	0	3	4	3	2	0	0	3	2	4	0	1	0		22
Fireworks (*klappers*)	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Knife	3	1	12	3	3	1	0	10	3	2	0	3	1		42
Foot (*koevoet*)	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Matches (*vuurhoutjies*)	0	0	2	0	3	1	0	1	0	1	0	0	2		10
Motor vehicle	1	3	3	1	3	0	0	2	1	1	0	0	0		15
Panga	0	1	0	0	1	0	0	0	0	1	0	0	0		3
Petrol bomb	1	0	0	0	0	0	0	0	0	0	0	1	0		2
Pick	0	0	2	0	0	0	0	1	0	1	0	0	0		4
Pipe	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Plank	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Pole	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Revolver	1	2	10	11	13	1	0	7	5	0	0	4	0		54
Shoes	0	0	1	0	0	0	0	1	1	0	0	0	0		3
Scissors	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Screwdriver	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Chair (*shair*)	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Spade	1	1	4	1	4	0	1	1	2	2	0	1	0		18

Stick	3	1	4	5	1	0	0	4	3	2	0	3	0		26
Unknown	25	54	120	85	107	13	14	116	116	65	9	53	14		791
Walking stick	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Whip	0	0	0	0	1	0	0	0	0	0	0	0	0		1
	57	134	310	199	280	37	39	248	263	164	19	143	28		1921
Street															1
'elsieskraalweg	0	0	0	0	0	0	0	0	0	0	0	1	0		
10a	0	0	0	0	1	0	0	0	0	0	0	0	0		1
2 cd avenue	0	0	1	0	0	0	0	0	1	0	0	0	0		2
2 cd street	0	0	0	0	0	0	0	0	1	0	0	0	0		1
4 th avenue	0	1	0	0	1	0	0	1	0	0	0	0	0		3
5 th avenue	0	0	0	0	0	0	0	0	1	0	0	1	0		2
Aletta Looppad	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Aletta Road	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Aletta Walk Road	0	0	0	0	1	0	0	1	0	0	0	0	0		2
Alettahof	0	0	1	0	0	0	0	1	0	0	0	0	0		2
Alettalooppad	0	0	1	0	0	0	0	1	0	0	0	0	0		2
Alphahof	0	0	0	0	0	0	0	1	1	6	0	0	0		8
Amatola Crescent	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Asencion Road	0	0	0	0	0	0	0	0	0	0	1	0	0		1
Audrey Court	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Audrey Hof	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Audreyhof	0	0	0	0	0	0	1	5	0	0	0	0	0		6
Audreyweg	0	0	0	0	0	0	0	2	0	0	0	0	0		2
Baakense Road	0	0	0	0	0	0	0	0	1	0	0	0	0		1
Bailey Close	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Banhoek Road	0	0	0	0	0	0	0	0	0	0	0	1	0		1

Beatrix	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Beatrix Avenue	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Beatrix Court	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Beatrix Hof	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Beatrix Walk Road	0	0	0	0	1	0	0	1	0	0	0	0	0	2	
Beatrixhof	0	0	1	0	0	0	0	8	0	0	0	0	0	9	
Beatrixlaan	0	0	0	0	0	0	0	3	0	0	0	0	0	3	
Beatrixlooppad	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Belinda Court	0	0	0	1	0	0	0	1	0	1	0	0	0	3	
Belinda Walk Road	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Belindahof	0	0	0	0	0	0	0	4	1	0	0	0	0	5	
Belindaloop	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Belindalooppad	0	0	0	0	0	0	0	2	0	0	0	0	0	2	
Belindawalk	0	0	0	1	0	0	0	1	0	0	0	0	0	2	
C/O 4th & 5th Street	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
C/O 4th Avenue & 5th Avenue	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
C/O Duinefontein & Lansdown Road	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
C/O Hexcrescent & Touwsberg Road	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
C/O Sonderend Road And Seine Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
C/P Vygiekraal & R10 Grand Street	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Camstraat	0	0	3	0	0	0	0	0	0	0	0	0	0	3	
Carbon Road	0	1	0	0	0	0	0	0	0	1	0	0	0	2	
Cathleen Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Cockcomb Road	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Cockscomb Road	0	0	0	0	0	0	0	0	0	1	0	0	0	1	

Colesberg Sircel	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Colleen Court	0	0	0	0	0	0	0	2	0	0	0	0	0		2
Colleen Road	1	0	0	0	0	0	0	1	0	0	0	0	0		2
Colleenhof	0	0	0	0	0	0	0	10	1	0	0	0	0		11
Colleenstraat	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Colorado Street	0	0	0	0	0	0	1	0	0	0	0	0	0		1
Coral Court	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Corothy Street	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Corrie Court	0	0	0	0	0	0	0	2	0	0	0	0	0		2
Corriehof	0	0	0	0	0	0	0	5	0	0	0	0	0		5
Corrieweg	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Csheldt Walk Road	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Danubes Street	0	0	0	0	0	0	0	0	0	1	0	0	0		1
De Downes Road	0	0	0	1	0	0	0	0	0	0	0	0	0		1
De Downs	0	0	2	0	0	0	0	0	0	0	0	0	0		2
De Downs Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
De Downslaan	1	0	0	0	0	0	0	0	0	0	0	0	0		1
De Downsweg	0	0	2	4	0	0	0	0	1	0	0	0	0		7
Devilspeak Road	0	1	0	0	0	0	0	0	0	0	0	1	0		2
Dina Court	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Dinah Hof	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Dinahof	0	0	1	1	0	0	0	2	0	0	0	0	0		4
Don Straat	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Duinefontein	0	0	0	0	0	0	0	0	0	0	1	0	0		1
Duinefontein Road	0	5	0	0	0	1	0	1	1	2	1	2	0		13
Duinefontein Weg	0	0	0	0	0	1	0	0	1	0	0	0	0		2
Duinefonteinstraat	0	0	0	0	0	1	0	0	1	1	0	0	0		3
Duinefonteinweg	0	0	0	2	5	25	0	1	2	3	10	0	0		48
Duinefontenweg	0	0	0	0	0	1	0	0	0	0	0	0	0		1

Dwyka Straat	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Dwyka Street	0	1	0	0	0	0	0	0	0	4	0	0	0	5	
Dwykastraat	0	0	0	0	0	0	0	0	0	6	0	0	0	6	
Dwykastreet	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
Easter Peak Primary School	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Easterpeakweg	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Elbe Straat	0	0	0	0	0	0	0	0	0	0	0	3	0	3	
Elbe Street	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Elbestraat	0	0	0	0	1	0	0	0	0	0	0	4	0	5	
Elsiekraal Road	0	0	0	0	0	0	0	1	0	0	0	1	0	2	
Elsieskraal	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Elsieskraal Road	0	1	0	0	0	0	0	0	1	0	0	6	0	8	
Elsieskraalstraat	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
Elsieskraalweg	0	0	0	0	1	0	0	0	2	0	0	11	0	14	
Elsiesrivierweg	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Erica Court	0	0	0	0	1	0	0	0	0	1	0	0	0	2	
Erica Hof	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Erica Singel	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Ericahof	0	0	2	3	4	0	0	0	1	0	0	0	0	10	
Ericasingel	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Ericastraat	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Erikasingel	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Eva Hof	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
Evahof	0	1	0	0	2	0	0	0	0	0	0	0	0	3	
Falcon Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Flat Number	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Flora Court	0	1	0	1	2	0	0	0	0	0	0	0	0	4	
Floracourt	0	0	0	0	1	0	0	0	0	0	0	0	0	1	

H/V Ruimte & Jordaanweg	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
H/V Stormrivier & Thameslaan	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
H/V Vygiekraalweg & Boyneweg	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Heideveld Road	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
Helen Court	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
Helenhof	0	0	0	4	0	0	0	1	0	0	0	0	0	5	
Hex Closed	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Hex Cresent	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Hexcrescent	0	0	0	0	0	0	0	0	1	1	0	0	0	2	
Hexcressent Road	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Hexsingel	0	0	0	0	0	0	0	0	0	12	0	0	0	12	
Hilda Court	0	0	0	2	0	0	0	0	1	1	0	0	0	4	
Hilda Road	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
Hildahof	0	0	0	2	0	0	0	0	0	0	0	0	0	2	
Houwhoek Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Houwhoek Weg	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Houwhoekstraat	0	0	1	0	0	0	0	0	0	0	0	1	0	2	
Humber Street	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Humberg Road	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Inga Court	0	1	0	1	0	0	0	0	0	0	0	0	0	2	
Ingahof	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
Ingastraat	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Irvin Road	0	0	0	1	0	0	0	0	1	0	0	0	0	2	
Irvin Straat	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Irvine	0	0	0	0	0	0	0	0	2	0	0	0	0	2	
Irvine Straat	0	0	0	0	0	0	0	1	1	0	0	0	0	2	
Irvine Street	0	0	0	0	1	1	0	0	6	0	0	0	0	8	
Irvinestraat	0	0	0	0	0	0	0	0	24	0	0	0	0	24	

Irvinestreet	0	0	0	0	0	0	0	0	1	0	0	0	0		1
Irvinstreet	0	0	0	0	0	0	0	0	1	0	0	0	0		1
Irvonstraat	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Isabelhof	0	0	0	4	0	0	0	2	0	0	0	0	0		6
Isabelweg	0	0	0	1	1	0	0	0	0	0	0	0	0		2
Isobelhof	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Jhilda Road	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Johanna Court	0	0	0	0	0	0	1	0	0	0	0	0	0		1
Johanna Road	1	0	0	0	1	0	0	0	0	0	0	0	0		2
Johannahof	0	0	0	3	1	0	0	1	0	0	0	0	0		5
Jonkerhoek Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Jonkershoek Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Jordaan	0	0	0	0	0	0	0	0	1	0	0	0	0		1
Jordaan Looppad	0	0	0	0	0	0	1	0	2	1	0	1	0		5
Jordaan Road	0	1	0	0	0	0	0	0	1	1	0	0	0		3
Jordaan Straat	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Jordaan Street	0	0	0	0	0	0	0	0	1	6	0	1	0		8
Jordaan Walk Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Jordaanlooppad	0	0	1	0	0	0	0	0	1	0	0	0	0		2
Jordaanstraat	0	0	2	0	2	0	0	1	20	15	0	6	4		50
Jordaanwalk	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Jordaanweg	0	0	3	0	0	0	0	1	4	0	0	0	0		8
Jordan Street	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Jordanstraat	0	0	0	0	0	0	0	0	1	1	0	0	0		2
Joyce Court	0	0	0	3	0	1	1	0	0	0	0	0	0		5
Joycehof	0	0	1	3	1	0	0	0	0	0	0	0	0		5
Joyceweg	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Jupiter Road	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Karenhof	0	3	0	0	0	0	0	0	0	0	0	0	0		3

Karinhof	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Karinweg	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Kasouga Road	0	0	0	1	0	0	1	0	1	0	0	1	0	4	
Kasouga Weg	0	0	0	0	0	0	0	0	2	0	0	0	0	2	
Kasougaweg	0	0	0	0	0	0	0	0	7	0	0	0	0	7	
Kasougs Road	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Kathleen Court	0	0	0	1	0	0	1	0	0	0	0	0	0	2	
Kathleenhof	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
Kei Street	0	0	0	0	0	0	0	0	2	0	0	2	0	4	
Keistraat	0	0	0	1	0	0	0	5	12	0	0	1	0	19	
Klipfontein Road	0	0	0	0	0	0	0	0	1	3	0	1	0	5	
Klipfonteinweg	0	0	0	0	0	0	0	0	0	5	1	0	0	6	
Lainsburg Road	0	1	0	0	1	0	0	0	0	0	0	0	0	2	
Lansdowneweg	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Letaba Road	0	1	0	0	0	0	0	0	4	0	0	1	0	6	
Letaba Street	0	0	0	0	0	0	0	0	2	0	1	0	0	3	
Letabaweg	0	2	0	0	0	0	0	0	11	0	0	0	0	13	
Lettie Court	0	1	1	0	0	0	0	0	0	0	0	0	0	2	
Lettiehof	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
Lilian Court	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
Lilian Road	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Lillianhof	0	5	0	0	0	0	0	0	0	0	0	0	0	5	
Longkloof Sircel	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Lyne Street	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Lynneweg	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Madge Court	0	0	1	0	0	0	0	0	1	1	0	0	0	3	
Madge Hof	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Madge Street	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Madgehof	0	3	0	1	0	0	0	0	0	0	0	0	0	4	

Magdahof	0	1	1	0	0	0	0	0	0	0	0	0	0		2
Mamenberglaan	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Manenber Avenue	1	0	0	0	0	1	0	0	0	0	0	0	0		2
Manenberg Avenue	1	6	2	6	3	0	1	12	4	1	0	2	0		38
Manenberg Laan	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Manenberg Road	0	0	1	1	3	0	0	0	2	1	0	0	0		8
Manenberglaan	6	27	12	19	4	0	2	34	4	0	0	0	0		108
Marico Street	0	0	1	0	0	0	2	0	0	0	0	0	0		3
Maricostraat	0	0	0	0	0	0	3	0	0	0	0	0	0		3
Maricoweg	0	0	0	0	0	0	1	0	0	0	0	0	0		1
Mathildahof	0	1	0	0	0	0	0	2	0	0	0	1	0		4
Matilda Court	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Matulda Court	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Moses Street	0	0	0	0	0	0	0	0	1	0	0	1	0		2
Munniks Bus Service	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Mymona Crescent	0	1	0	0	0	0	0	0	0	0	0	0	0		1
N2	0	0	0	0	0	0	0	0	0	2	0	1	0		3
N2 Snelweg	0	0	0	0	0	0	0	1	0	0	0	1	0		2
Naby Bus Terminus	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Nahoon Street	0	0	0	0	0	0	1	0	0	0	0	0	0		1
Nellie Court	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Nelliehof	0	6	0	1	0	0	0	0	0	0	0	0	0		7
Noelle Court	0	0	0	0	1	0	0	0	1	0	0	0	0		2
Noellehof	1	0	0	0	0	0	0	1	0	0	0	0	0		2
Noreen Court	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Nyanga Junction	0	0	0	0	0	0	0	0	0	0	1	0	0		1
Ohiostreet	0	0	0	0	0	0	1	0	0	0	0	0	0		1
Ohioweg	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Olga Court	0	0	0	0	0	0	0	0	1	0	0	0	0		1

Olga Road	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Olga Street	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
Olgahof	0	0	3	0	0	0	0	1	0	0	0	0	0	4	
Olgastraat	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Olgaweg	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Olifant	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Olifant Street	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Oliphants Road	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Olivia Court	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Omega Court	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Omegahof	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
Ondine Court	0	0	1	1	0	0	0	0	0	0	0	0	0	2	
Ondine Hof	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Ondinehof	0	2	0	0	0	0	0	0	0	0	0	0	0	2	
Pam Court	0	1	1	0	0	0	0	0	0	0	0	0	0	2	
Pam Looppad	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Pam Road	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pam Street	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pam Walk Road	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pamhof	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pamslooppad	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pamswalk	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pamsweg	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pamweg	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pavo Road	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Pavoroad	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Pecos Looppad	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
Pecos Road	0	1	1	2	0	0	0	1	0	0	0	0	0	5	
Pecos Walk	0	0	0	0	0	0	0	1	0	0	0	0	0	1	

Pecos Walk Road	0	1	4	0	0	0	0	2	0	0	0	1	0	8	
Pecos Weg	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pecoshof	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Pecosloop Road	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pecoslooppad	0	1	16	0	0	0	0	1	0	0	0	0	0	18	
Pecoswalk	0	0	3	0	0	0	0	1	0	0	0	0	0	4	
Pecosweg	0	0	14	0	0	0	0	2	0	0	0	0	0	16	
People's Centre	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Peta Looproad	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
Petahof	0	0	5	0	0	0	0	2	0	0	0	0	0	7	
Petalooppad	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Petas Walk Road	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Petaswalk	0	0	3	0	0	0	0	1	0	0	0	0	0	4	
Petawalk	0	0	2	0	0	0	0	1	0	0	0	0	0	3	
Petta Walk Road	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pettas Walk Road	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Pettaslooppad	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Pettaswalk	0	0	2	0	0	0	0	1	0	0	0	0	0	3	
Picoswalk	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
Plate Road	0	0	3	0	0	0	0	0	0	0	0	0	0	3	
Plate Street	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Plateweg	0	0	3	0	0	0	0	0	0	0	0	0	0	3	
Pluto Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Postern Road	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Quarius Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
R 10 Grande Road	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
R 10 Grande Walk	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
R 10 Grande Walk Road	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Red River Laan	0	0	1	0	0	0	0	0	0	0	0	0	0	1	

Red River Looppad	0	0	1	0	0	0	0	2	0	0	0	0	0		3
Red River Road	0	0	2	0	0	0	0	0	0	0	0	0	0		2
Red River Straat	0	0	0	0	1	0	0	1	0	0	0	0	0		2
Red River Walk Road	0	0	0	0	0	0	0	3	0	0	0	0	0		3
Red Riverlooppad	0	0	3	0	0	0	0	1	0	0	0	0	0		4
Red Riverstraat	0	0	7	0	1	0	1	4	0	0	0	0	0		13
Red Riverwalk	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Red Riverweg	0	0	1	0	0	0	0	3	0	0	0	0	0		4
Redriver	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Redriver Looppad	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Redriver Primary School	0	0	0	0	0	0	1	0	0	0	0	0	0		1
Redriver Singel	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Redriver Straat	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Redriver Street	0	0	2	0	0	0	0	0	0	0	0	0	0		2
Redriver Walk	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Redriver Walk Road	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Redriverlooppad	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Redriversingel	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Redriverstraat	0	0	4	0	0	0	0	7	1	0	0	0	0		12
Redriverweg	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Redrivier Walk Road	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Renoster Looppad	0	0	4	0	0	0	0	0	0	0	0	0	0		4
Renoster Road	0	0	7	0	0	1	0	1	0	0	0	0	0		9
Renoster Walk Road	0	0	2	1	2	0	0	0	0	0	1	0	0		6
Renosterlooppad	0	0	11	0	0	0	0	1	0	0	0	0	0		12
Renosterstraat	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Renosterwalk	0	0	3	0	0	0	0	0	0	0	0	0	0		3
Renosterweg	0	1	29	0	0	0	1	2	0	0	0	0	0		33
Rhone Looppad	0	0	4	0	0	0	0	0	0	1	0	0	0		5

Rhone Walk	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Rhone Walk Road	0	0	3	0	0	0	1	0	0	0	0	0	0	4	
Rhonelooppad	0	0	2	0	0	0	0	0	1	0	0	0	0	3	
Rhonestraat	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Rhonewalk	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
Rhoneweg	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Rio Grandestraat	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Rio Grande Looppad	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Rio Grande Straat	0	0	3	0	0	0	0	0	0	0	0	0	0	3	
Rio Grandelooppad	0	0	3	0	0	0	0	0	0	0	0	0	0	3	
Rio Grandestraat	0	0	12	0	0	0	0	0	0	0	0	0	0	12	
Rio Grandeweg	0	0	18	0	0	0	0	1	0	0	0	0	0	19	
Rio Grandstraat	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Rio Grandwalk	0	0	1	0	1	0	0	0	0	0	0	0	0	2	
Riogrand Street	0	0	2	0	0	0	0	0	0	0	0	0	0	2	
Riogrand Walk Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Riogrande Street	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Riumteweg	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Ronel Looppad	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Ronellooppad	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Ronoster Walk Road	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
Ruimte Road	0	2	0	1	0	0	0	0	4	1	0	0	1	9	
Ruimtelaan	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Ruimteweg	0	0	0	0	1	0	1	6	14	0	0	0	10	32	
Ruth Court	0	0	1	0	0	0	0	0	2	0	0	0	0	3	
Ruth Hof	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Ruth Weg	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
Ruthhof	0	0	3	1	0	0	0	1	0	0	0	0	0	5	
Ruthweg	0	0	2	0	0	0	0	0	1	0	0	0	0	3	

Saambou Primere School	0	0	0	0	0	0	0	0	0	0	0	0	1		1
Sabie Looppad	0	0	0	3	0	0	0	0	0	1	0	0	0		4
Sabie Road	0	0	0	1	3	0	1	1	0	0	0	0	0		6
Sabiecresent Road	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Sabielloop Road	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Sabielooppad	0	0	0	2	0	0	0	0	0	0	0	0	0		2
Sabiewalk	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Sabieweg	0	2	0	21	0	0	0	1	0	0	0	0	0		24
Scheldt Looppad	0	0	0	1	11	0	0	0	0	0	0	0	0		12
Scheldt Road	0	1	0	2	2	0	0	0	0	0	0	0	0		5
Scheldt Walk Road	0	0	0	0	1	0	1	0	0	0	0	0	0		2
Scheldt Weg	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Scheldtlooppad	0	0	0	0	9	0	0	0	1	0	0	0	0		10
Scheldtwalk	0	0	0	1	1	0	0	0	0	0	0	0	0		2
Scheldtweg	0	0	0	3	16	0	0	1	0	0	0	0	0		20
Schelt Walk Road	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Sein Street	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Seine Looppad	0	0	1	0	3	0	0	0	0	0	0	0	0		4
Seine Weg	0	0	0	0	2	0	0	0	0	0	0	0	0		2
Seinelooppad	0	0	0	0	2	0	0	0	0	0	0	0	0		2
Seinewalk	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Seineweg	0	0	0	0	5	0	0	0	0	0	0	0	0		5
Senator Hof	0	0	0	0	0	0	0	0	1	0	0	0	0		1
Senatorhof	0	1	0	0	0	0	0	0	2	0	0	0	0		3
Silver Stream Primary School	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Silver Streamweg	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Silverstream Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Silverstream Looppad	0	0	0	0	0	0	0	1	0	0	0	0	0		1

Silverstream Road	0	0	0	0	0	0	0	0	0	2	0	0	0		2
Silverstream Weg	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Silverstreamroad	0	0	0	0	0	0	0	0	0	0	0	1	0		1
Silverstreamstraat	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Silverstreamweg	0	0	1	1	0	0	0	1	0	4	0	4	0		11
Silwer Streamstraat	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Sirius Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Sirus Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Slanghoek Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Slanghoekweg	0	0	0	0	0	0	0	0	0	2	0	0	0		2
Sneeubergweg	0	0	0	0	0	0	0	0	0	0	0	0	1		1
Sondered Road	0	1	0	0	0	0	0	0	0	1	0	0	0		2
Sonderend Road	0	1	0	0	8	0	0	0	1	0	0	1	0		11
Sonderendweg	0	0	0	0	7	0	0	1	0	0	0	0	0		8
Sonderentstraat	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Sonderentweg	0	0	0	0	35	0	0	1	2	0	0	0	0		38
Steenbras Road	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Storm Rivier Road	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Stormriver Close	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Stormriver Road	0	0	0	0	0	0	0	0	1	0	0	0	0		1
Stormrivier Avenue	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Stormrivier Looppad	0	0	0	0	0	0	0	1	0	0	0	0	0		1
Stormrivier Road	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Stormrivier Walk Road	2	0	0	0	0	0	0	1	0	0	0	0	0		3
Stormrivierlooppad	0	0	0	0	3	0	0	0	0	0	0	0	0		3
Stormrivierweg	0	0	1	0	10	0	0	0	0	0	0	0	0		11
Storms Riverway	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Storms Rivier Walk	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Stormsribier Road	0	0	0	0	2	0	0	0	0	0	0	0	0		2

Stormsriver Walk	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Stormsriverwalk	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Stormsriverweg	0	0	0	0	0	0	0	0	1	0	0	0	0		1
Stormsrivier Looppad	0	0	2	0	1	0	0	0	0	0	0	0	0		3
Stormsrivier Road	0	0	0	0	2	1	0	0	0	0	0	0	0		3
Stormsrivier Walk Road	0	0	0	0	2	0	0	0	0	0	0	0	0		2
Stormsrivierlooppad	0	0	0	0	2	0	0	2	0	0	0	0	0		4
Stormsrivierweg	0	0	1	1	11	0	0	15	0	0	0	0	0		28
Sugar Loafstraat	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Sugar Loafweg	0	0	0	0	0	0	0	0	0	4	0	0	0		4
Sugarloaf Road	0	0	0	0	1	0	0	0	0	3	0	0	0		4
Sugarloaf Street	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Sugarloaf Weg	0	0	0	0	0	0	0	0	0	2	0	0	0		2
Sugarloafstraat	0	0	0	0	0	0	0	1	0	4	0	0	0		5
Sugarloafweg	0	0	0	0	0	0	0	0	0	4	0	0	0		4
Surius Street	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Swakopstraat	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Swakopweg	0	0	1	2	0	0	0	0	0	0	0	0	0		3
Swartkopweg	2	0	0	0	0	0	0	0	0	0	0	0	0		2
Tagus Close	0	0	0	1	0	0	0	0	0	0	0	0	0		1
Tagus Road	0	0	1	0	0	0	0	0	0	0	0	0	0		1
Tagus Weg	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Taguswalk	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Tagusweg	3	0	0	0	0	0	0	2	0	0	0	0	0		5
Tambo Sqaure	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Tambo Square	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Tees Road	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Teesweg	2	0	0	0	0	0	0	0	0	0	0	0	0		2
Thames Avenue	0	1	0	2	8	0	0	1	1	0	0	1	0		14

Thames Looppad	0	0	0	2	5	0	0	0	0	0	0	0	0	7	
Thames Walk Road	0	1	0	3	5	1	0	0	0	0	0	1	0	11	
Thames Weg	0	0	0	1	0	0	0	0	0	0	0	0	0	1	
Thameslaan	0	1	0	22	29	0	1	2	1	0	0	0	0	56	
Thameslooppad	0	0	0	14	9	1	0	2	1	0	0	0	0	27	
Thameswalk	0	0	0	3	0	0	1	1	0	0	0	0	0	5	
The Downs Road	0	0	0	2	0	0	0	0	0	0	1	0	0	3	
The Downsweg	0	0	1	2	0	0	0	0	0	0	0	0	0	3	
Tiber Street	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Tousberg	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
Tousberg Road	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Tousberg Weg	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
Tousbergweg	0	0	0	0	0	0	0	0	0	5	0	0	0	5	
Touwsberg Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Touwsberg Weg	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Touwsbergweg	0	0	0	0	0	0	0	0	1	2	0	1	0	4	
Towerkop	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
Towerkop Road	0	0	0	0	0	0	0	0	0	0	1	4	0	5	
Towerkopstraat	0	0	0	0	0	0	1	0	0	0	0	7	0	8	
Towerkopweg	0	0	0	0	0	0	0	1	0	0	0	10	0	11	
Tugela Road	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
Tugelaweg	3	0	0	0	0	0	0	0	0	0	0	0	0	3	
Uks Road	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Uskstraat	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Uskweg	1	1	0	0	0	0	0	0	0	0	0	0	0	2	
Vanguard Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Venster Straat	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
Venster Street	0	0	0	0	0	0	0	0	0	1	0	1	0	2	
Vensterstraat	0	0	0	0	0	0	1	4	0	0	0	24	0	29	

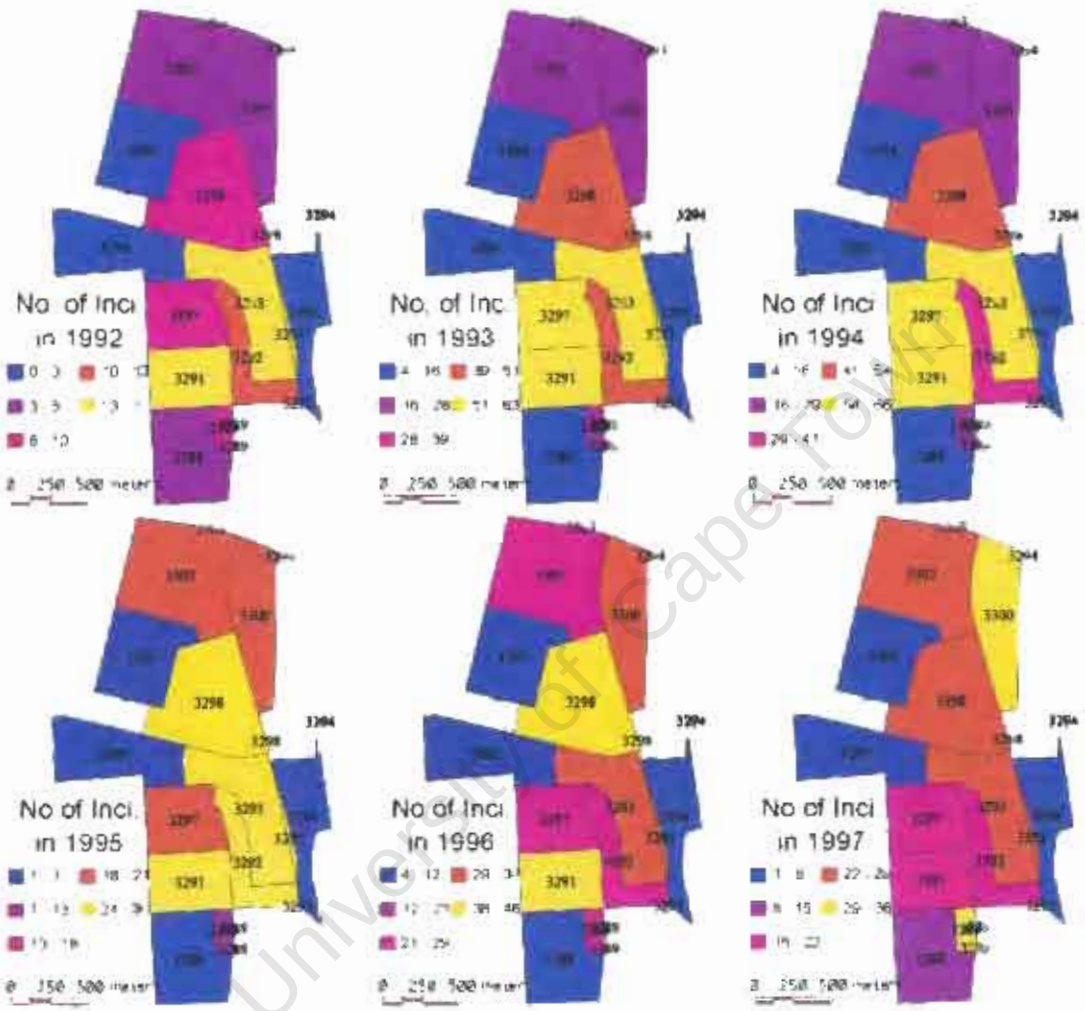
Venter Street	0	0	0	0	0	0	0	1	0	0	0	1	0		2
Vistula Road	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Vistulalaan	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Vistulaweg	11	0	0	0	0	0	1	0	0	0	0	0	0		12
Viva Street	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Vygiekraal Road	3	0	3	0	0	0	0	0	0	0	0	0	0		6
Vygiekraalweg	1	4	2	0	0	0	2	6	1	0	0	0	0		16
Vygieskraalweg	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Waterberg Road	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Wye Road	0	1	0	0	0	0	0	0	0	0	0	0	0		1
Wyne Road	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Zakstraat	0	0	0	0	0	0	0	0	0	1	0	0	0		1
Zuurberg Road	1	1	0	0	0	0	0	0	0	0	0	1	0		3
Zuurberg Street	1	0	0	0	0	0	0	0	0	0	0	0	0		1
Zwartkop Road	0	0	0	0	1	0	0	0	0	0	0	0	0		1
Total	**57**	**134**	**310**	**199**	**280**	**37**	**39**	**248**	**263**	**164**	**19**	**143**	**28**		**1921**

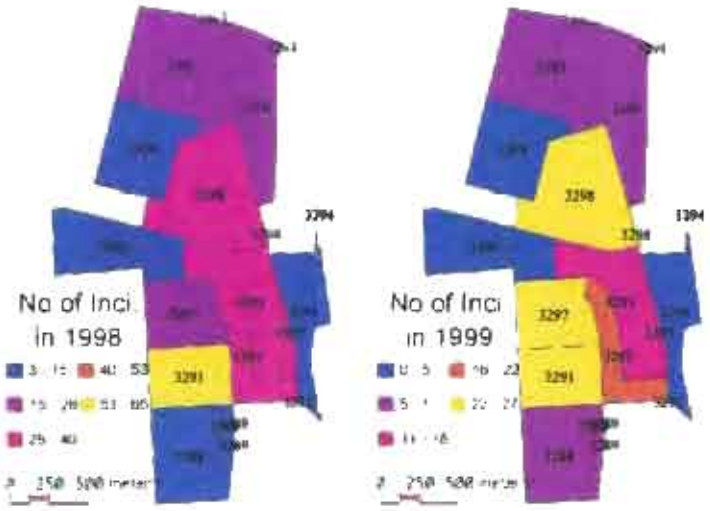
Appendix 3

Incidents per year (1992-1999) by geographical area.

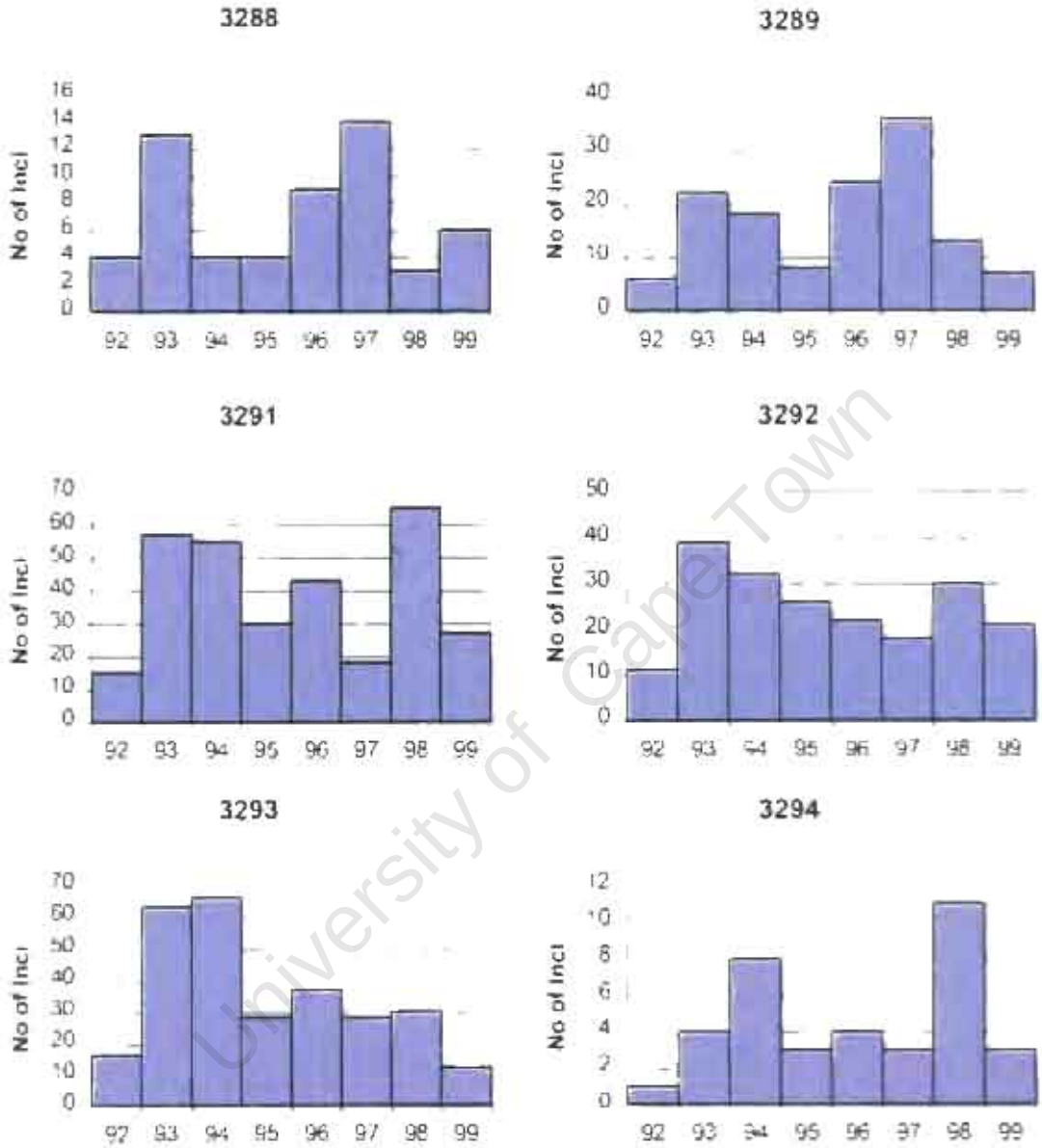
GIS presentation for the number of incidents per year and histogram presentation for the number of incidents per year

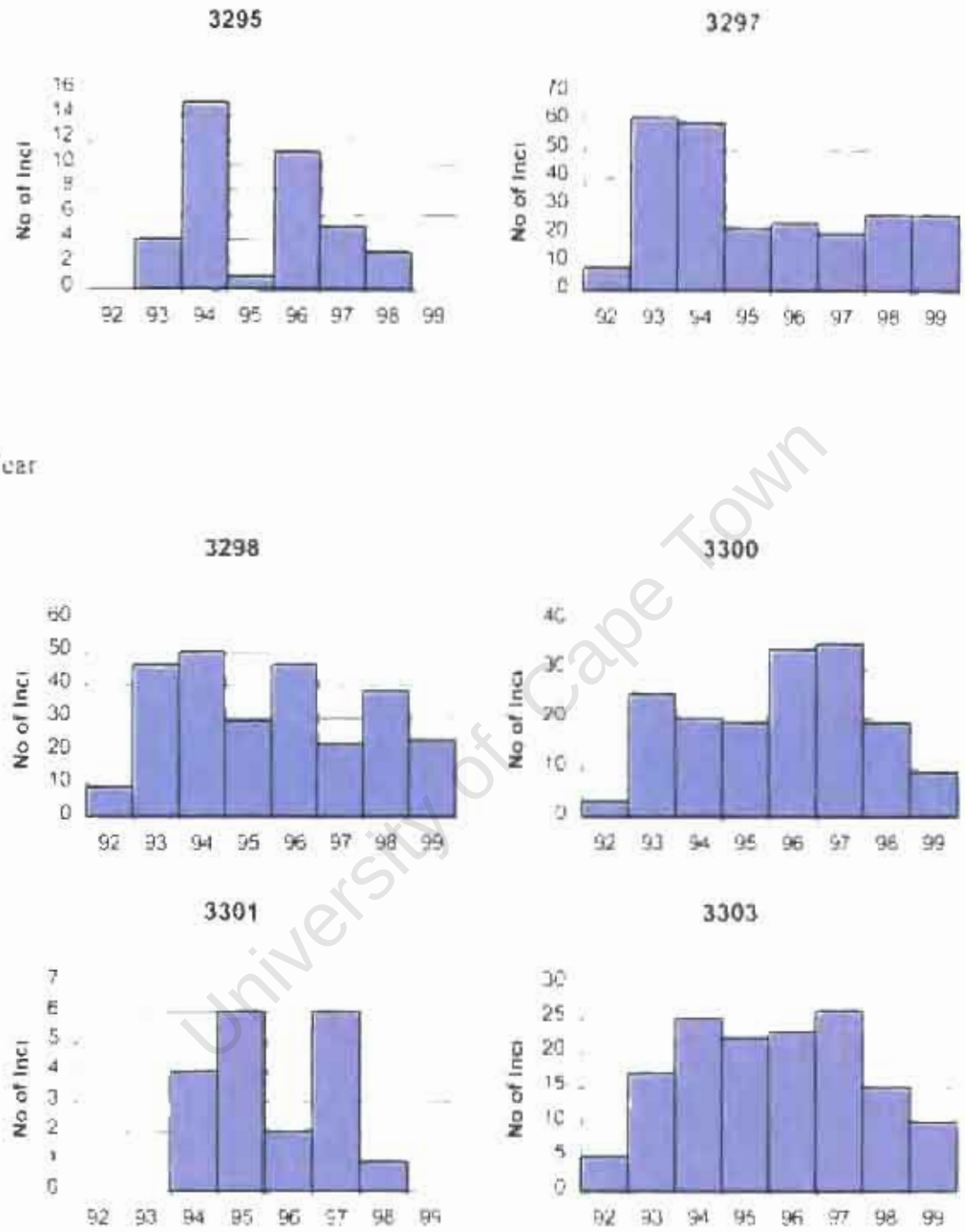
GIS presentation of the number of incidents per year

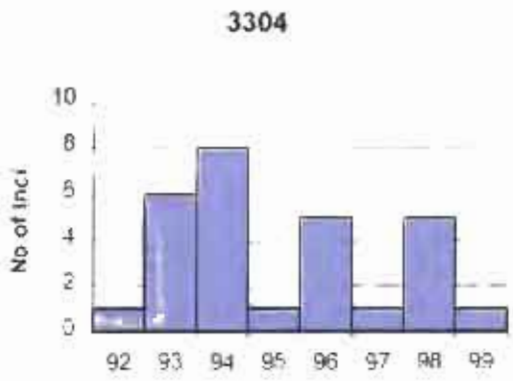


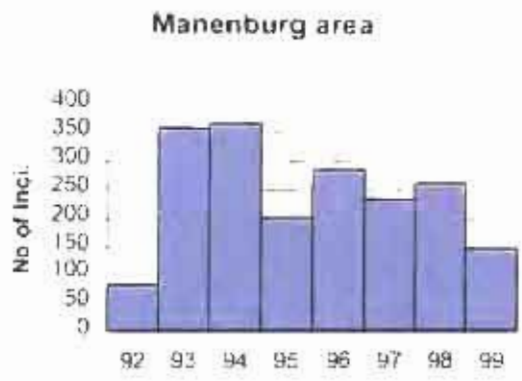


Histogram presentation of the number of incidents per year (1992-1999)





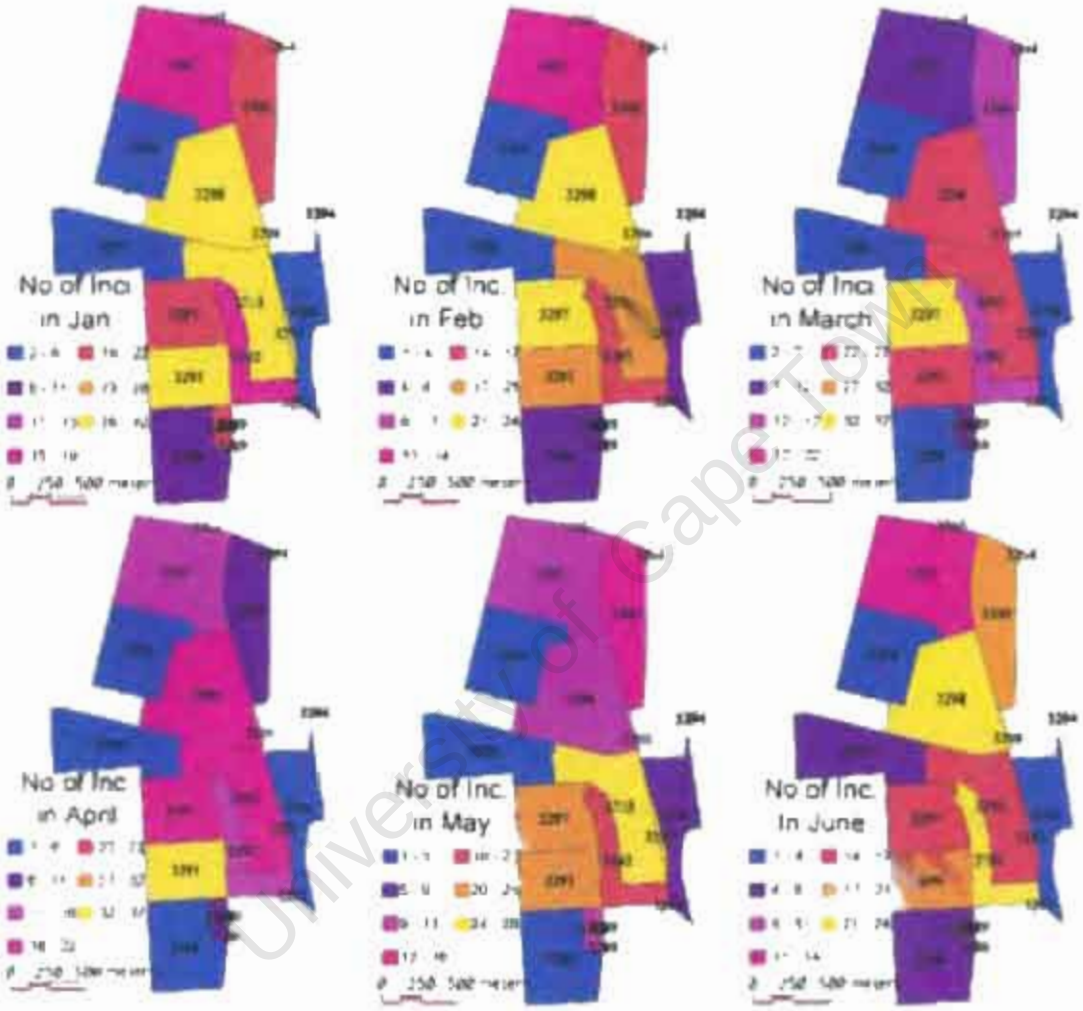


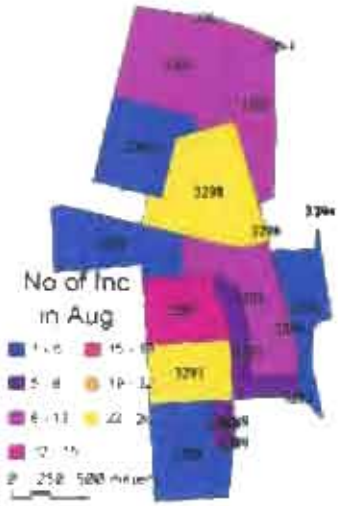


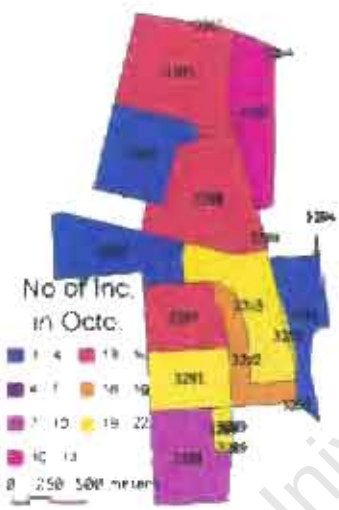
Appendix 4

Incidents per month (1992-1999) by geographical area

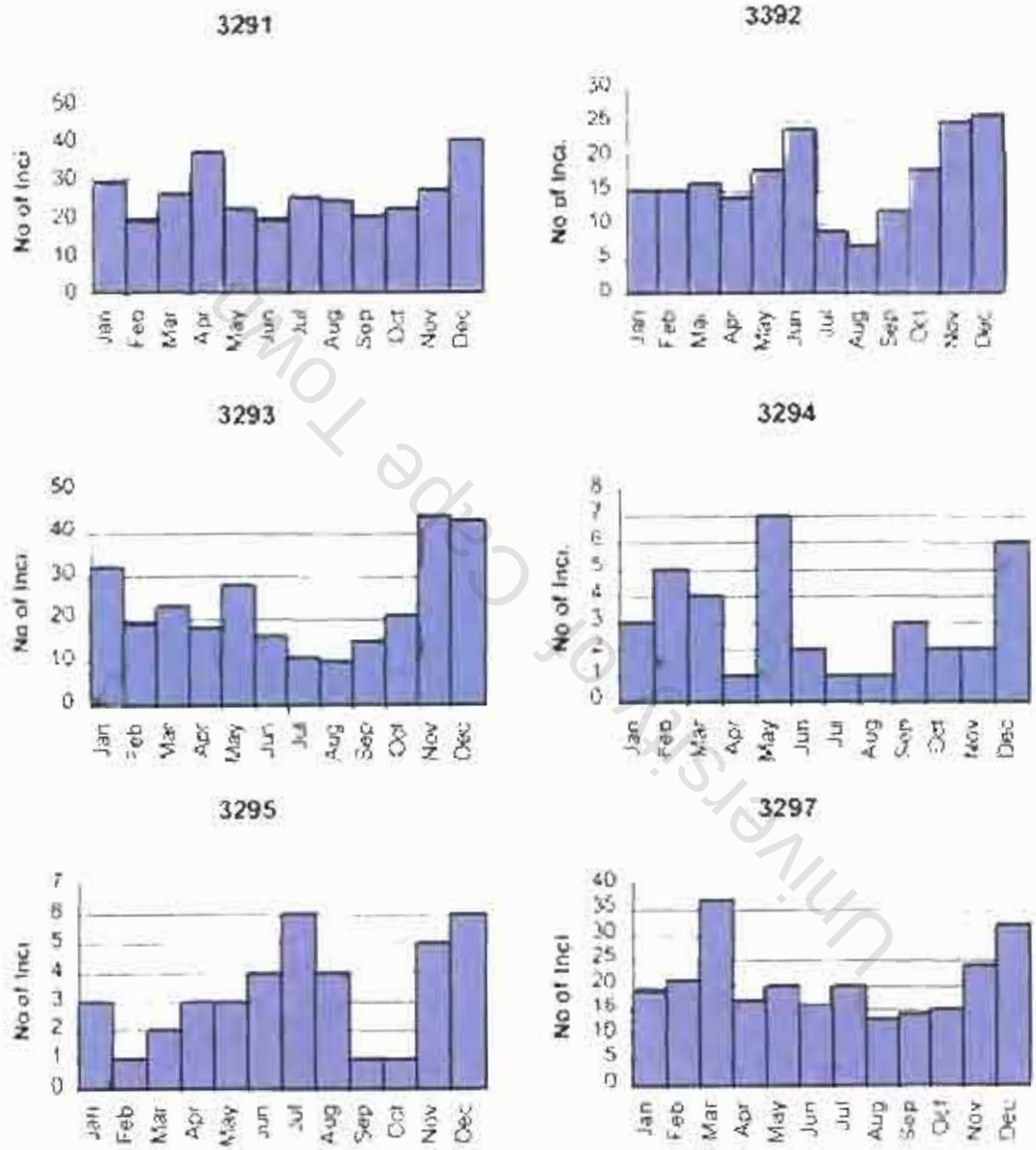
GIS presentation of the number of incidents per month

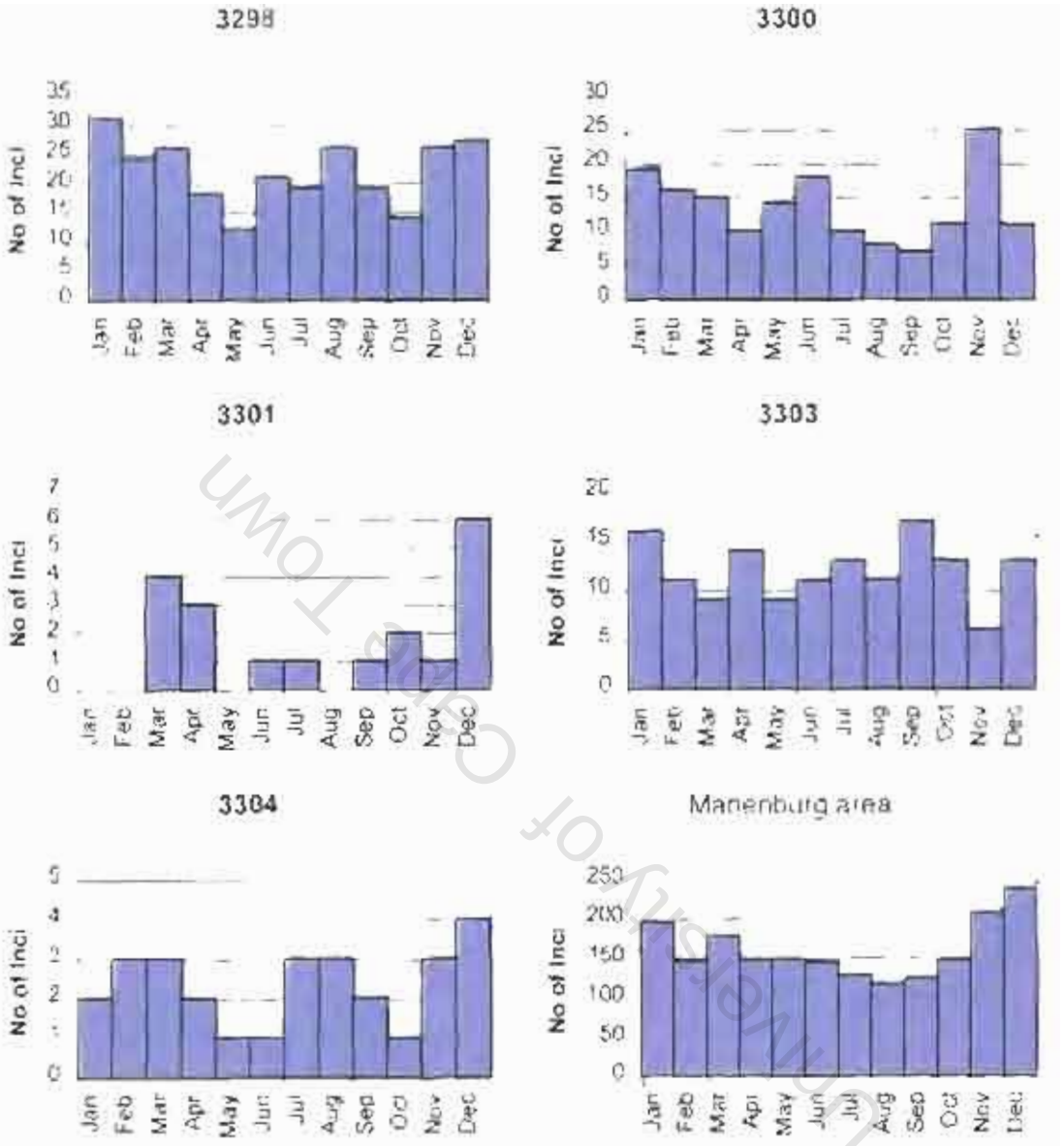






Histogram presentation of the number of incidents per month





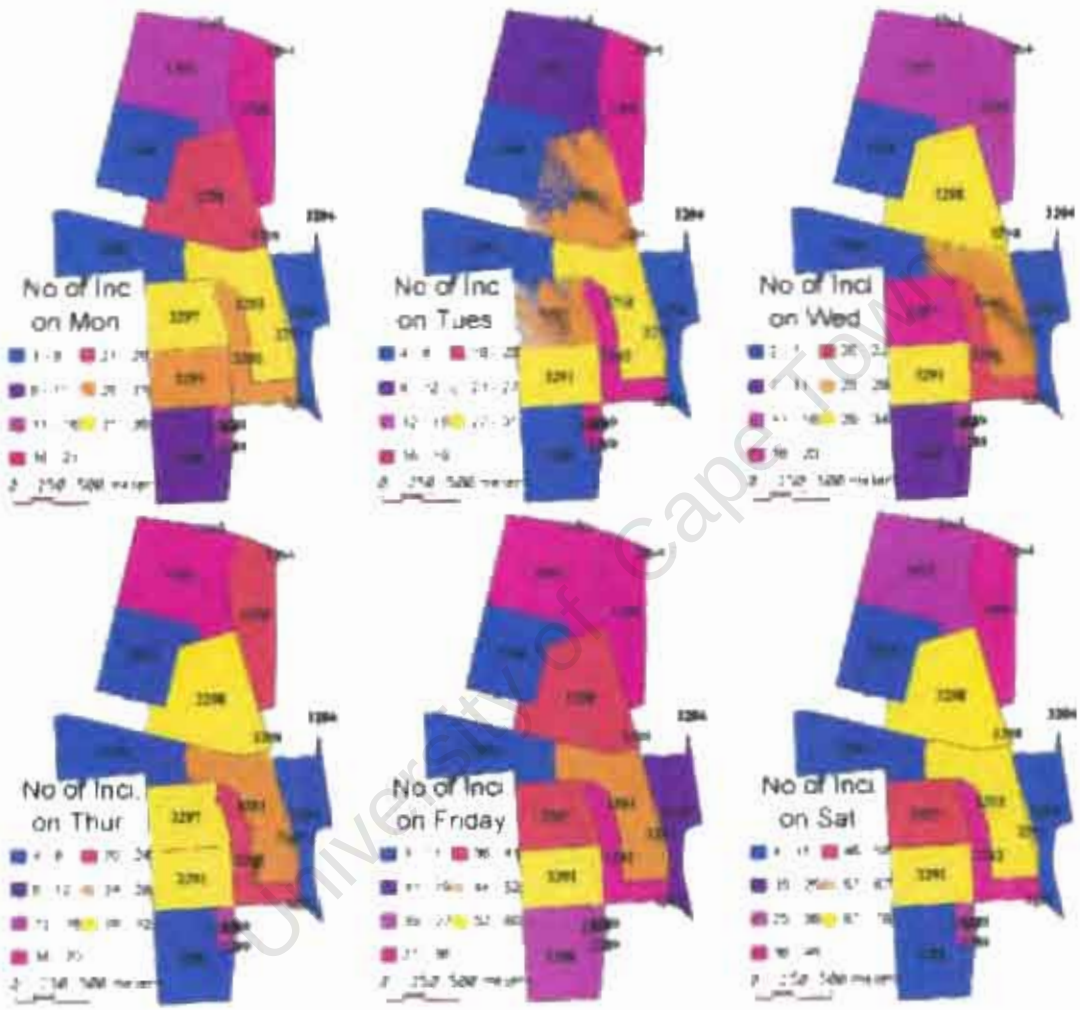
Appendix 5

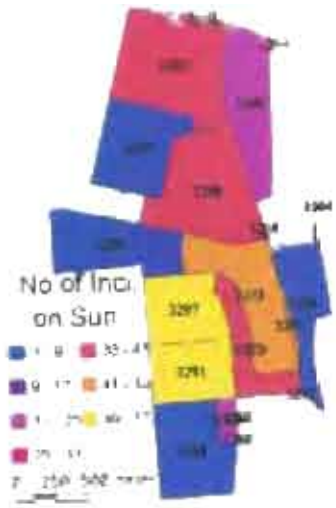
The number of incidents per day of week (1992-1999) by geographical area

GIS presentation for the number of incidents per day of week

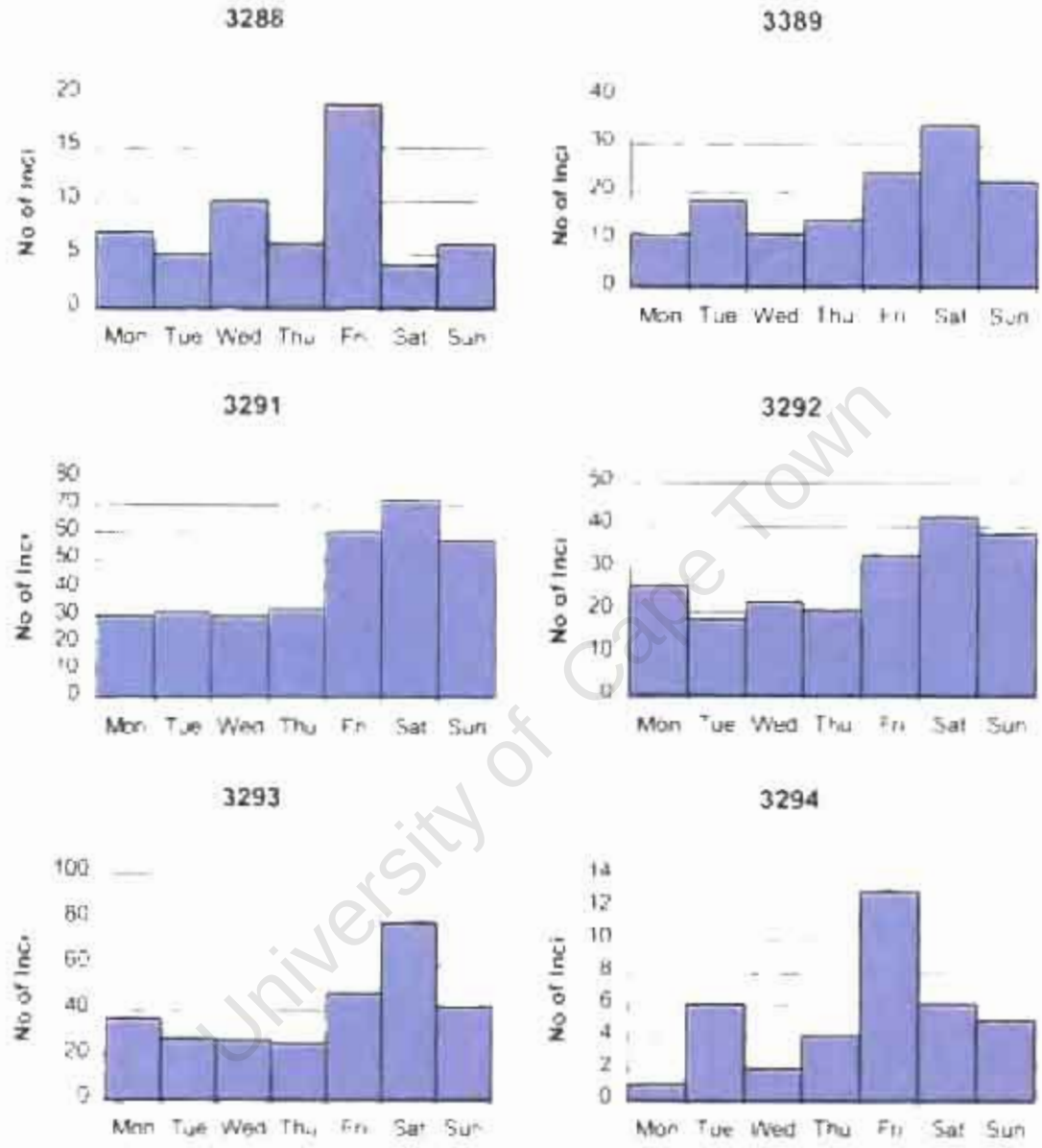
Histogram presentation for the number of incidents per day of week

GIS presentation for the number of incidents per day of week

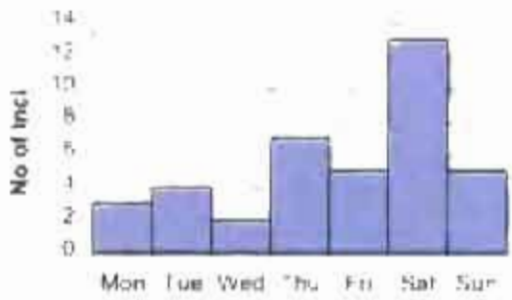




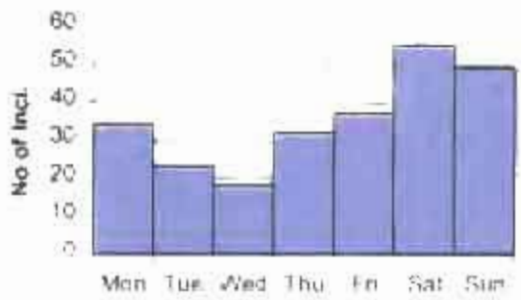
Histogram presentation for the number of incidents in relation to the day of the week



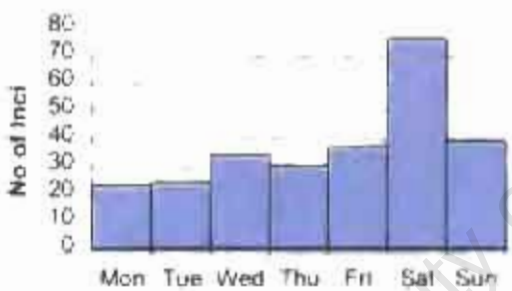
3295



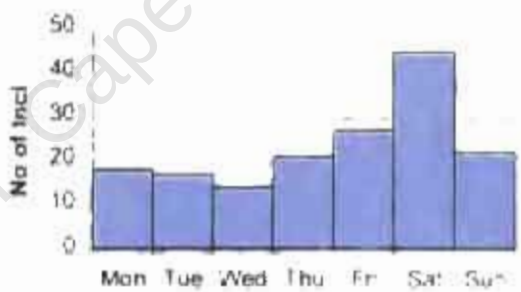
3297



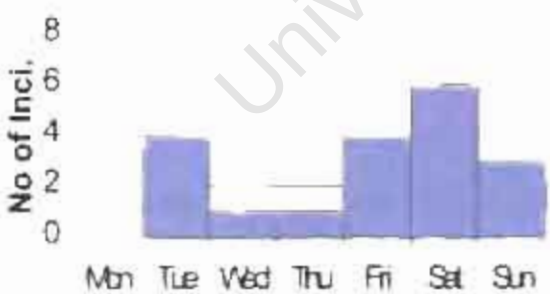
3298



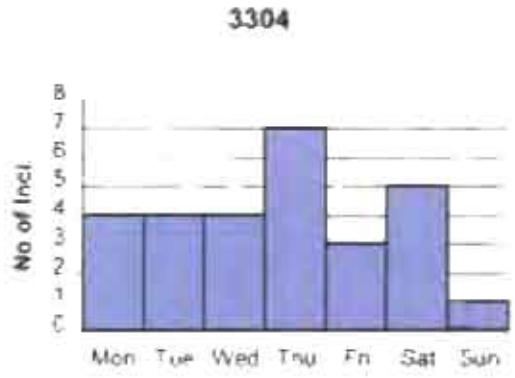
3300

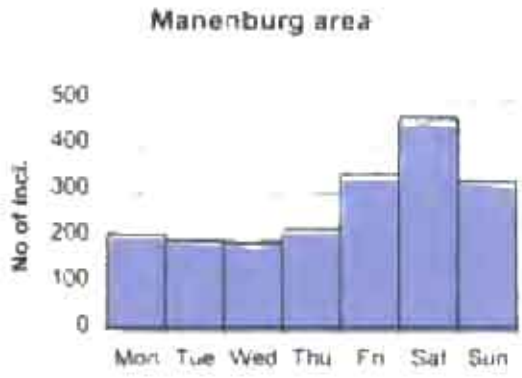


3301



3303





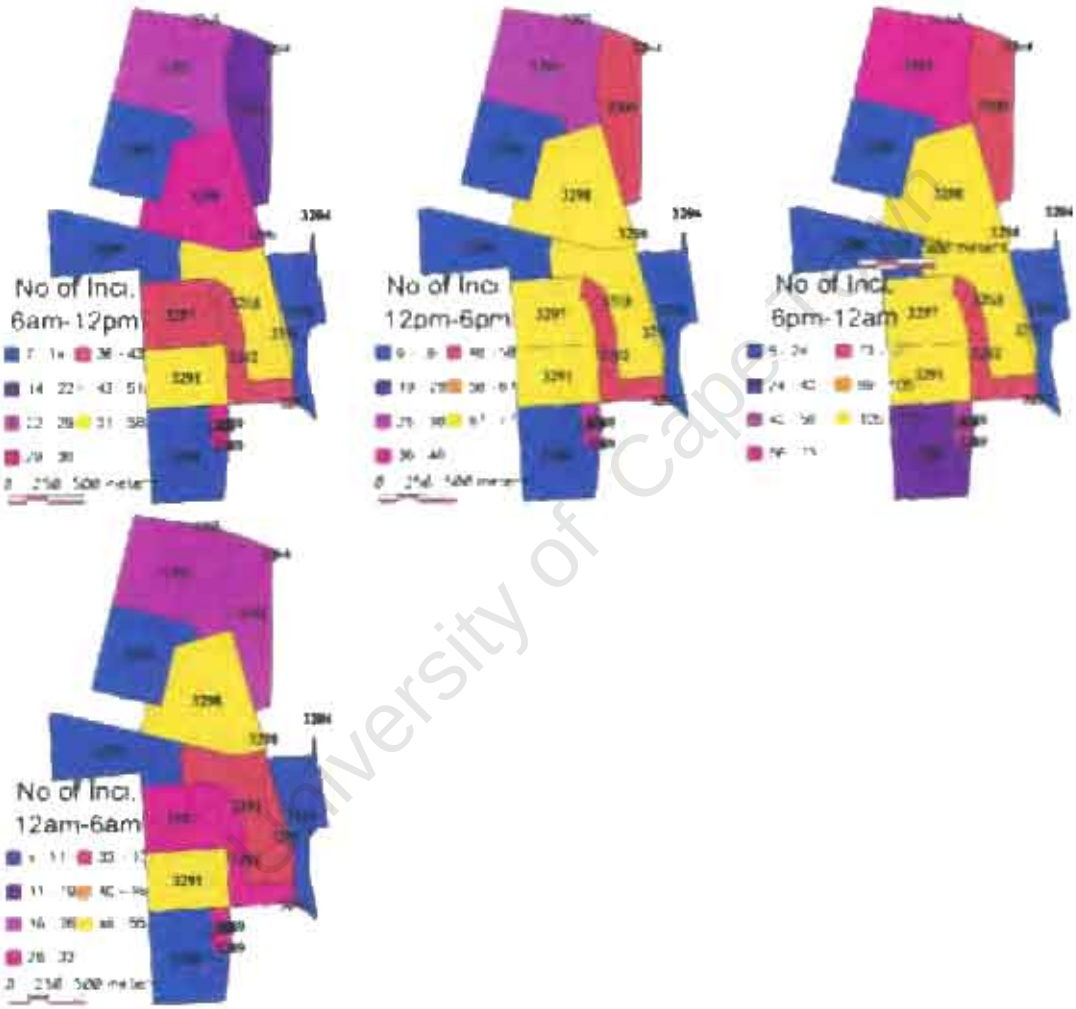
Appendix 6

Incidents for the time of day (1992-1999) by geographical area

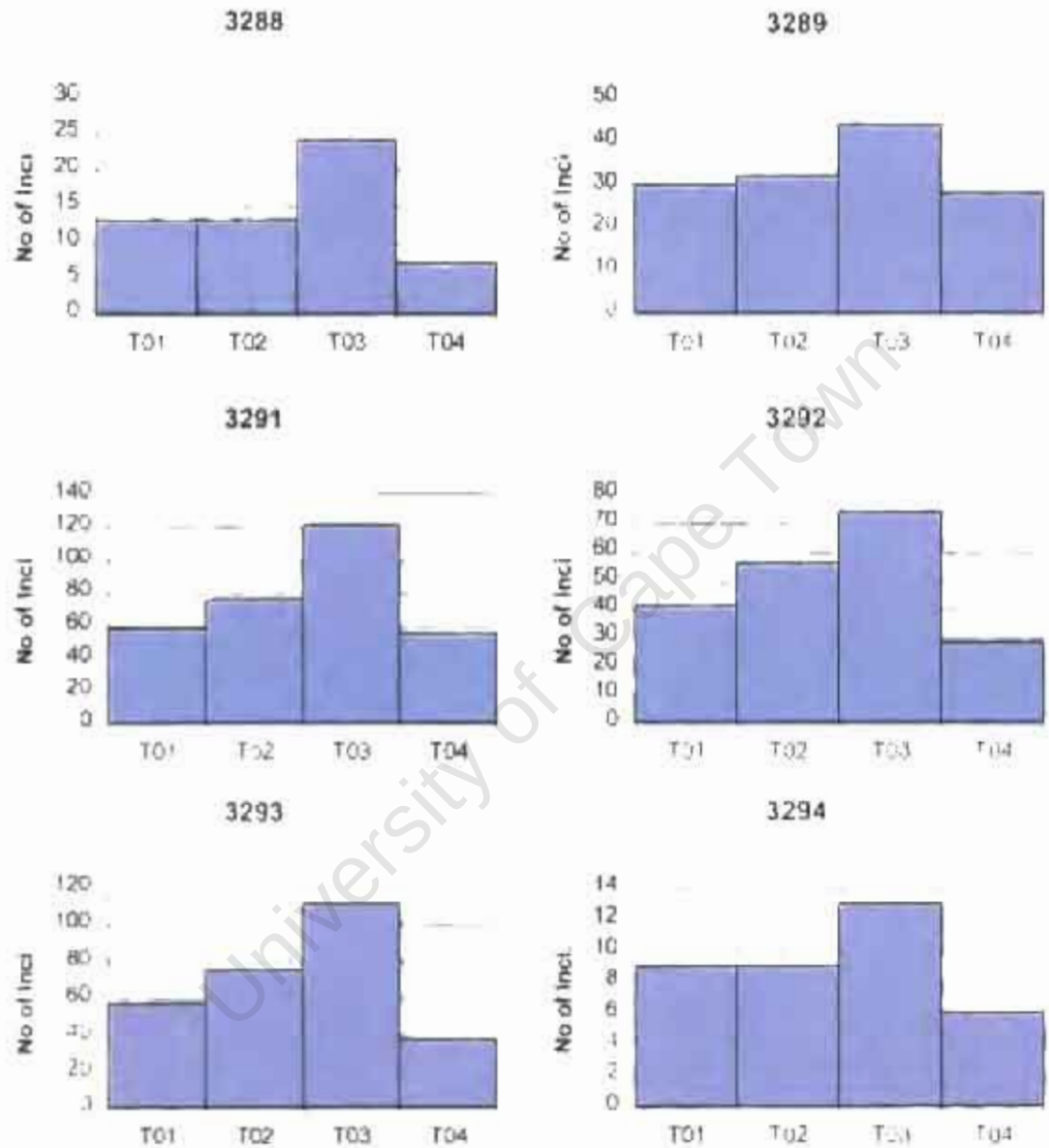
GIS presentation for the time of day

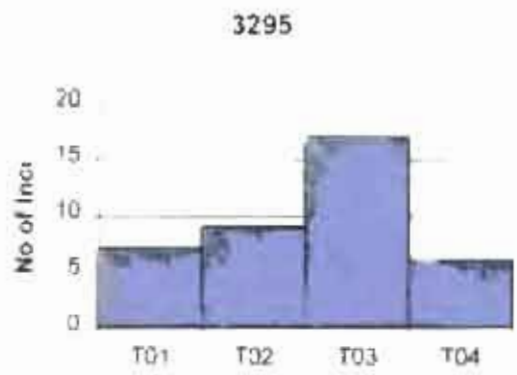
Histogram presentation for the time of day

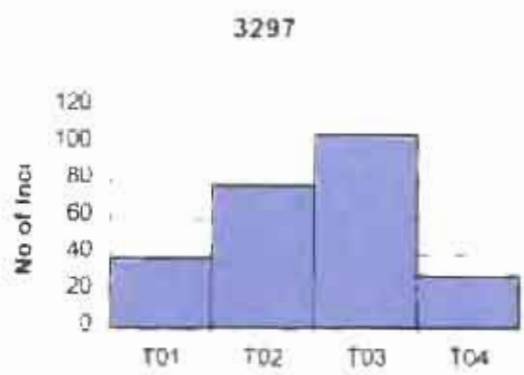
GIS presentation for the number of incidents in relation to the time of day

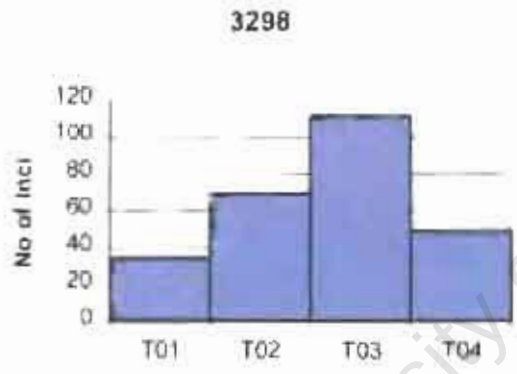


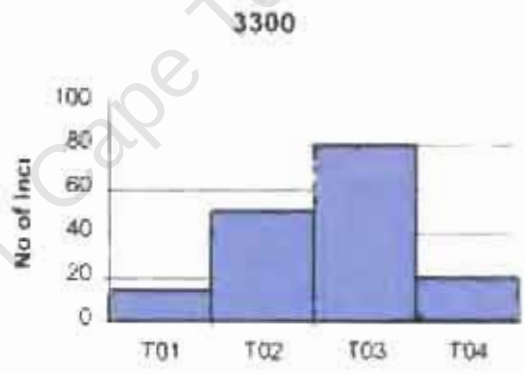
Histogram presentation for the number of incidents in relation to the time of day

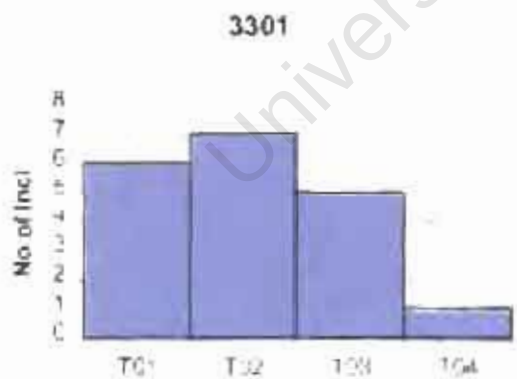


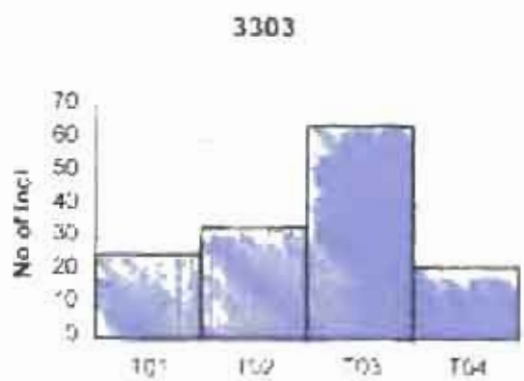












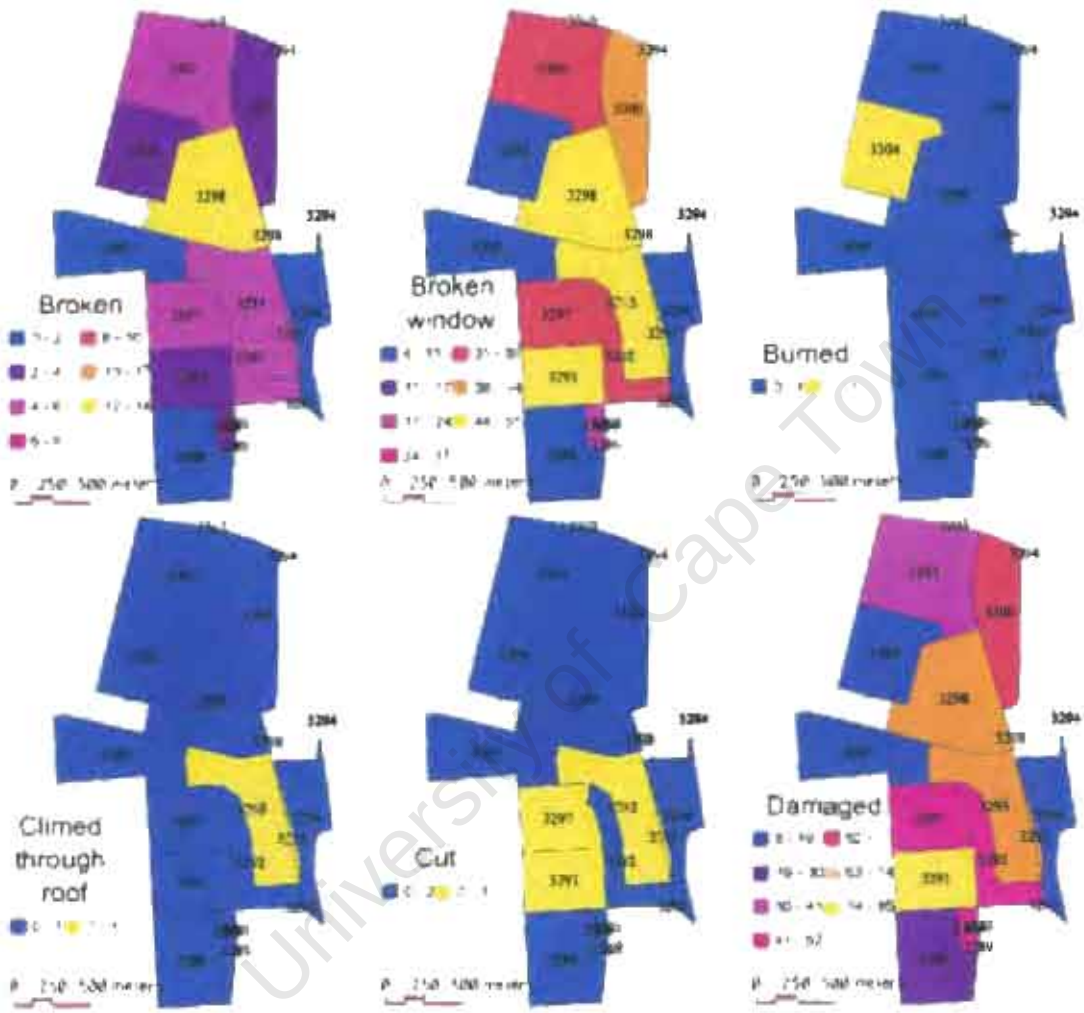
Appendix 7

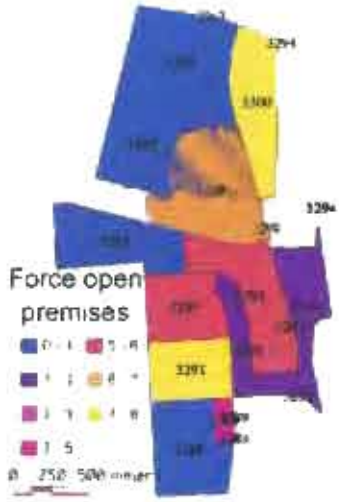
Method of destruction (1992-1999) by geographical area

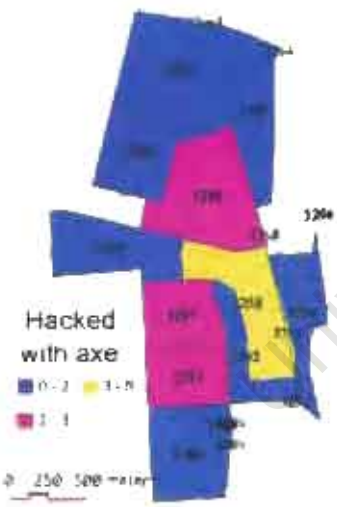
GIS presentation for the method of destruction

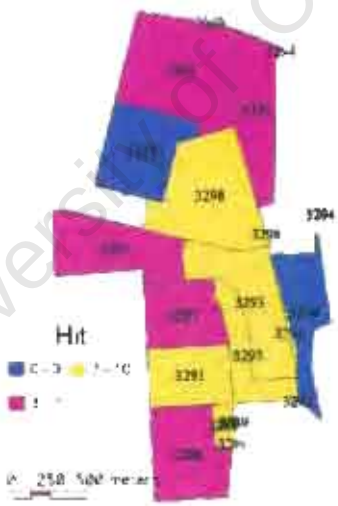
Histogram presentation for the method of destruction

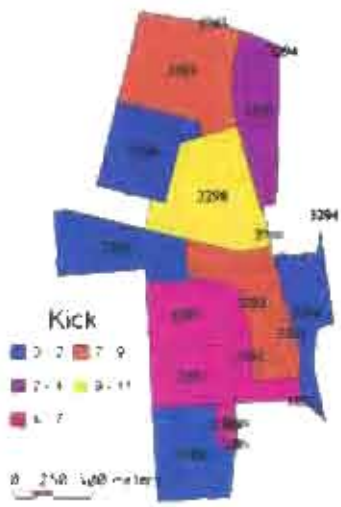
GIS presentation for the method of destruction per police block

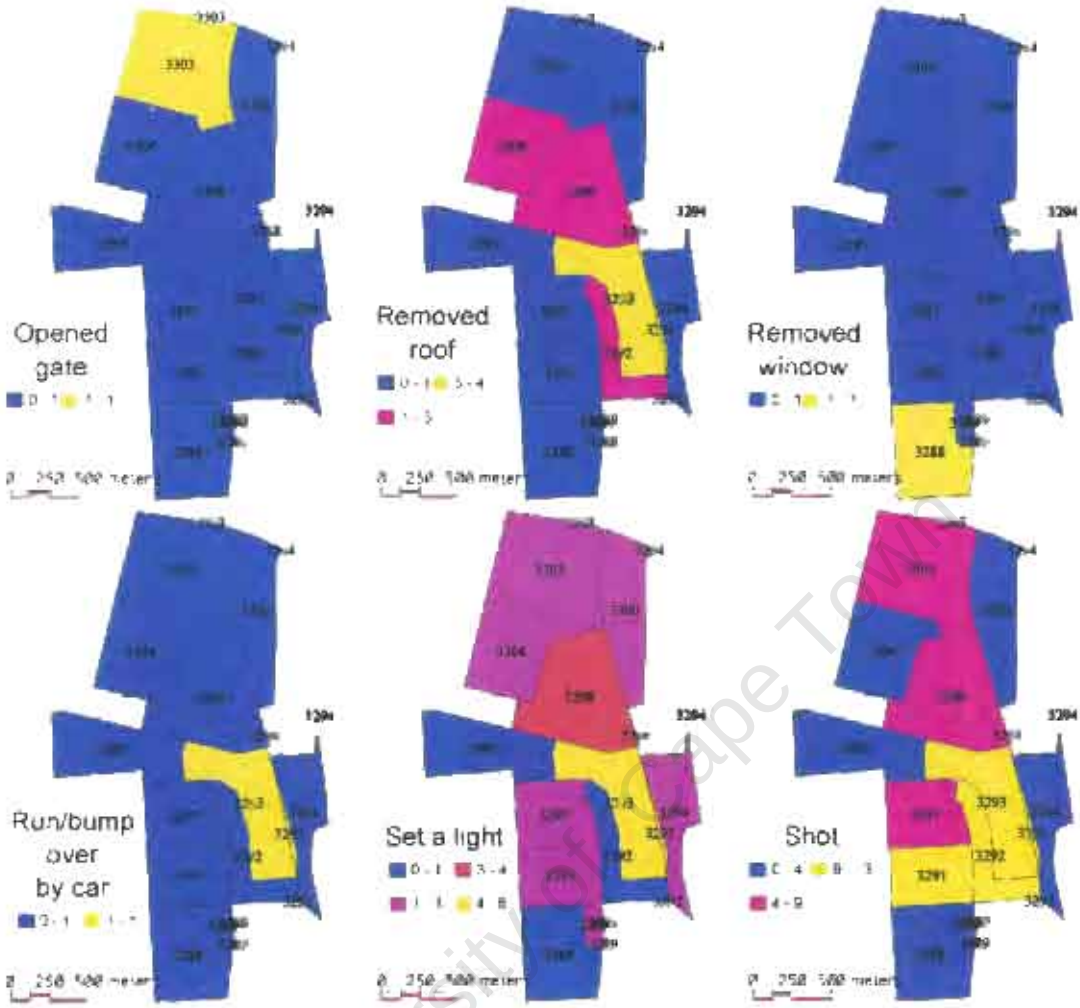


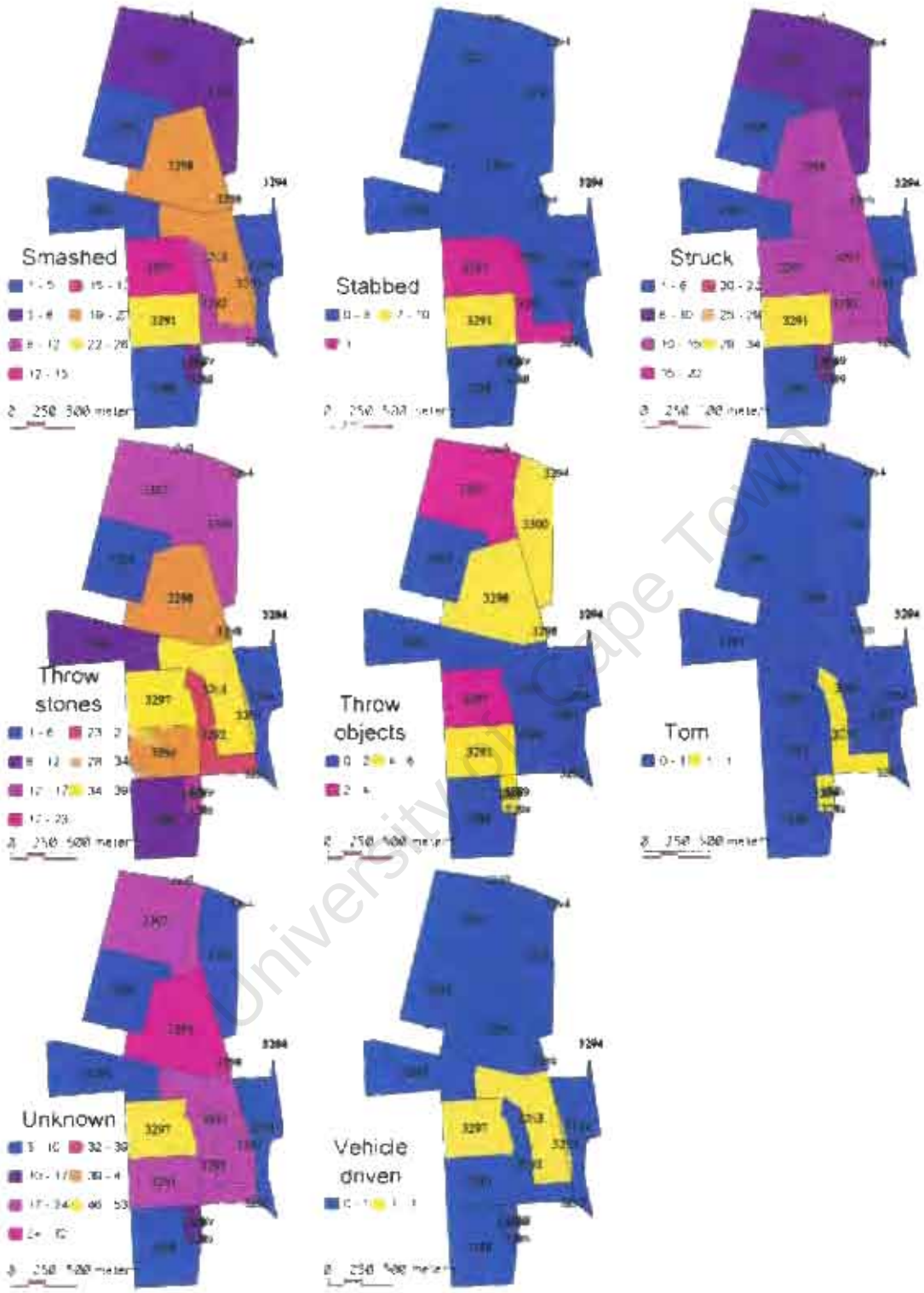








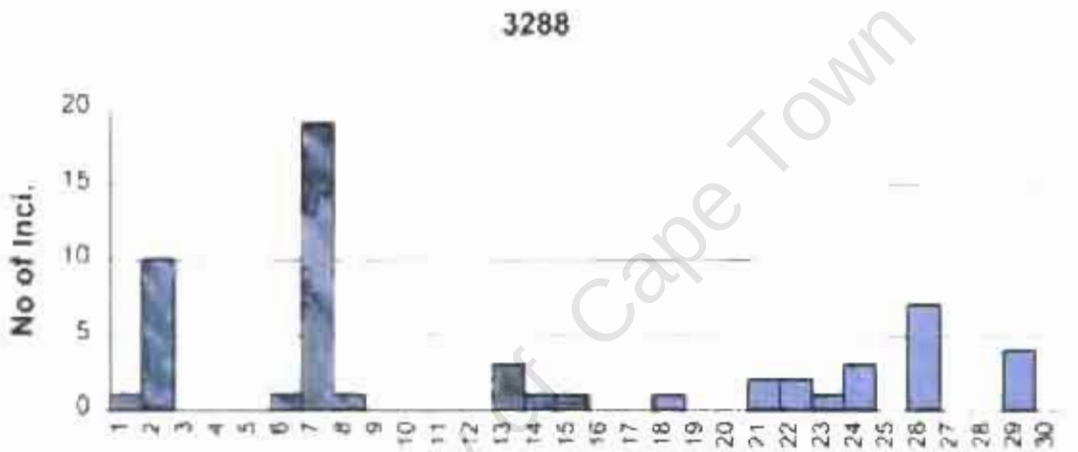


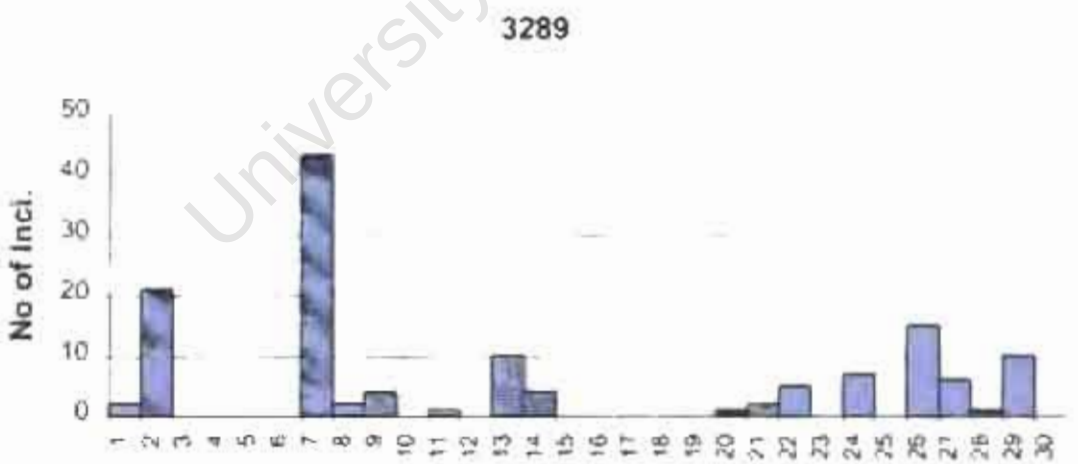


Histogram presentation for the method of destruction per police block.

For the histogram presentation for the method of destruction the following abbreviations were adopted:

1. Broken **2**. Broken window **3**. Broken window of vehicle **4**. Burned **5**. Climbed trough roof window **6**. Cut **7**. Damaged **8**. Force **9**. Force open premises **10**. Force open door of car **11**. Gained entrance through telling a lie **12**. Hacked with axe/panga **13**. Hit **14**. Kick **15**. Not applicable **16**. Opened gate **17**. Removed roof tiles **18**. Removed windows, **19**. Run/bump over by car **20**. Set alight, **21**. Shot, **22**. Smashed, **23**. Stabbed, **24**. Struck **25**. Take **26**. Threw by stones **27**. Throw by objects. **28**. Torn. **29**. Unknown **30**. Vehicle driven.





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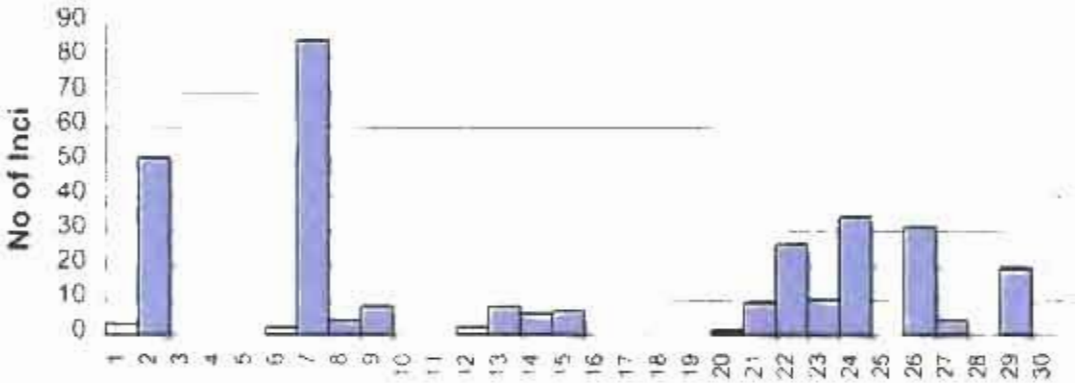

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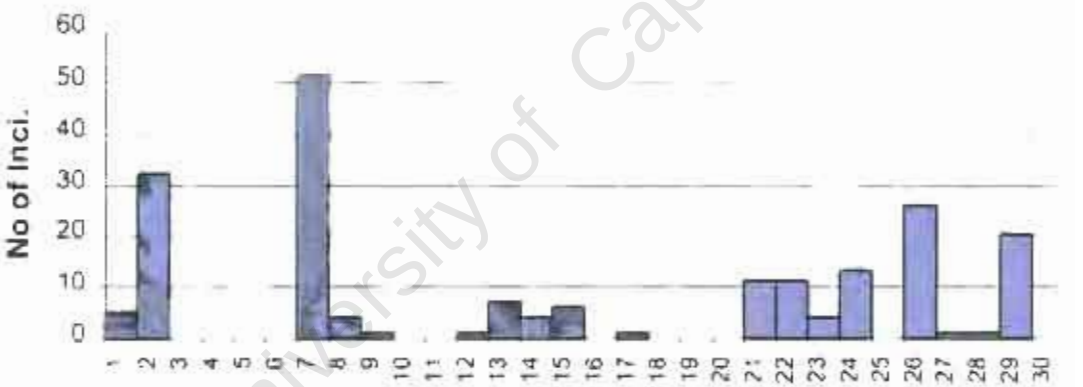

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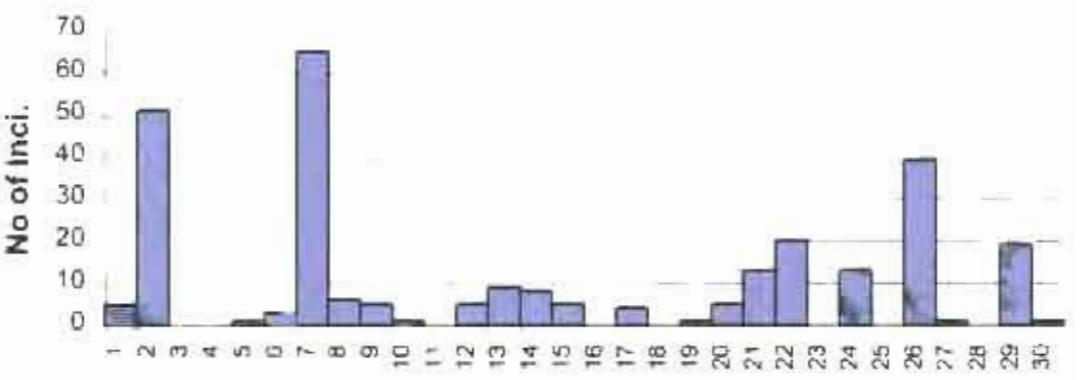

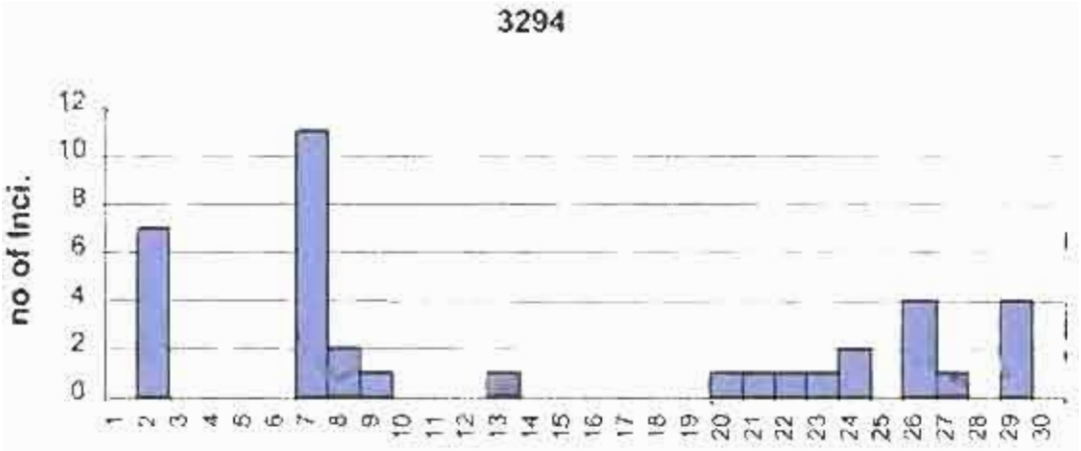

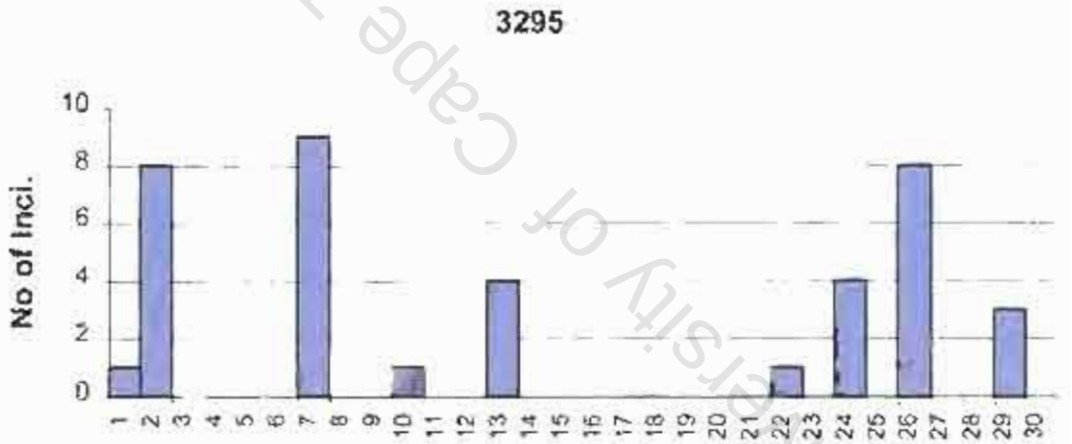

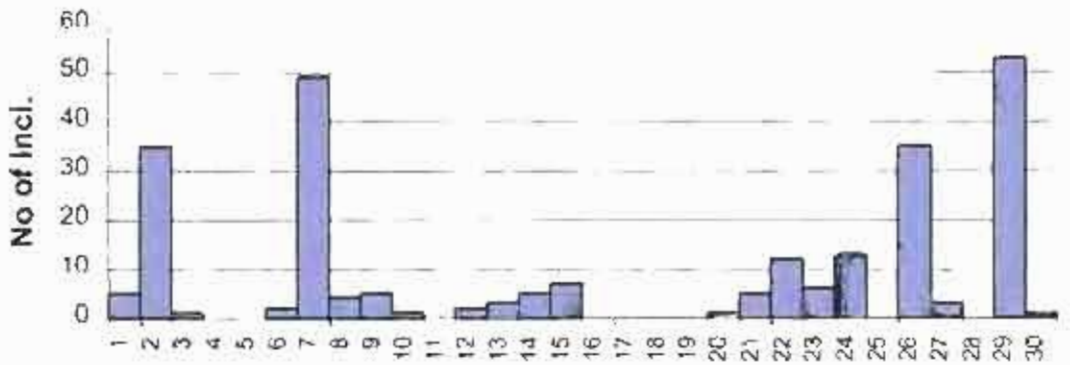

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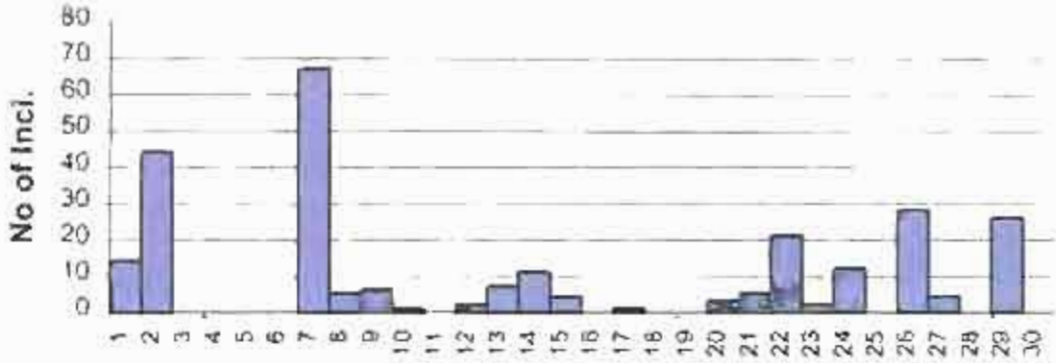

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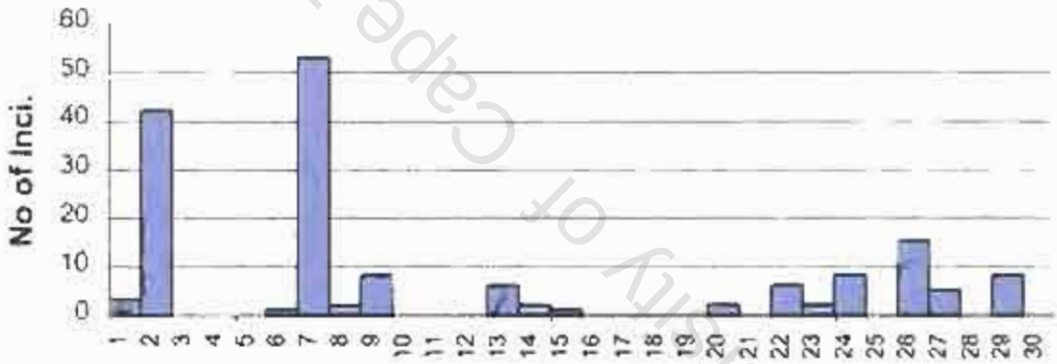

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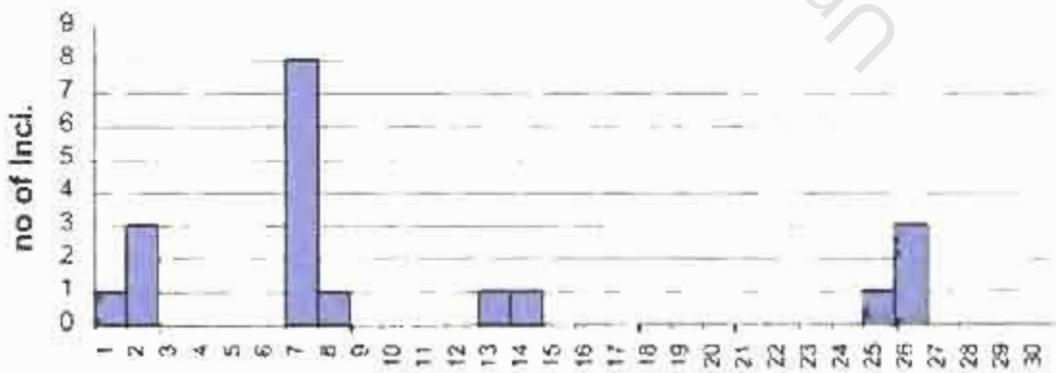


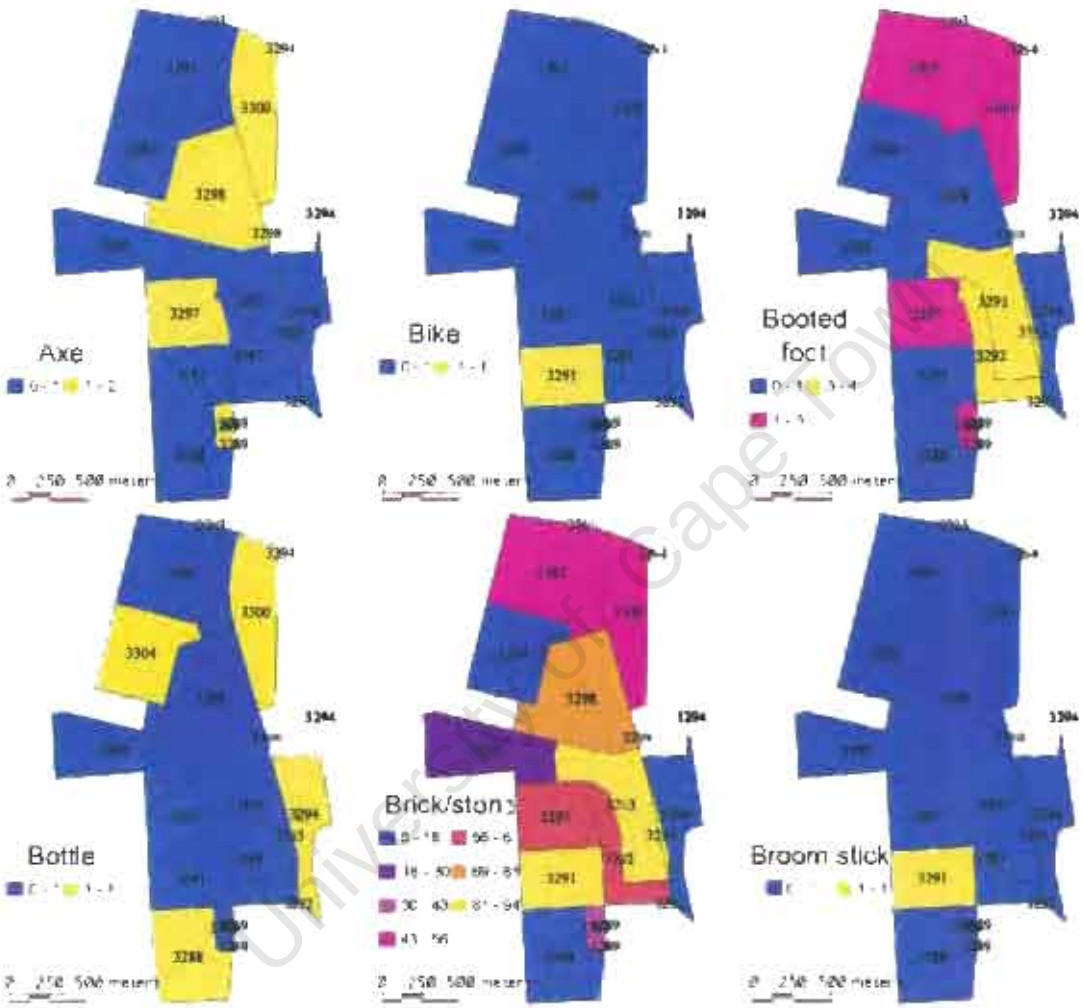
Appendix 8

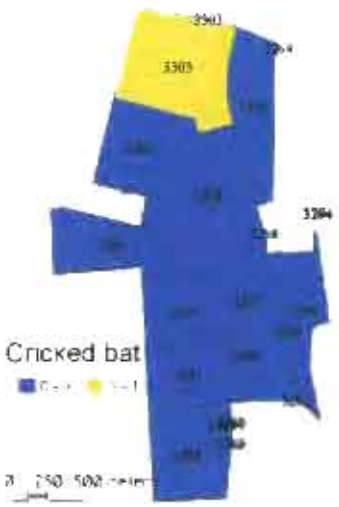
Instruments used (1992-1999) by police block

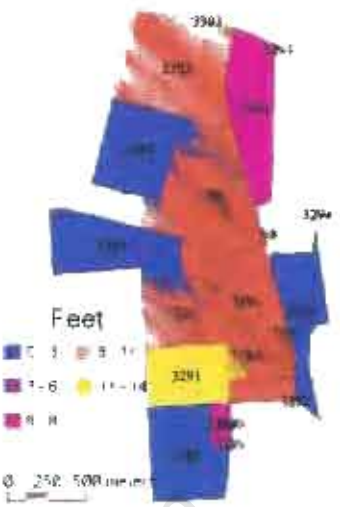
GIS presentation for the instruments adopted

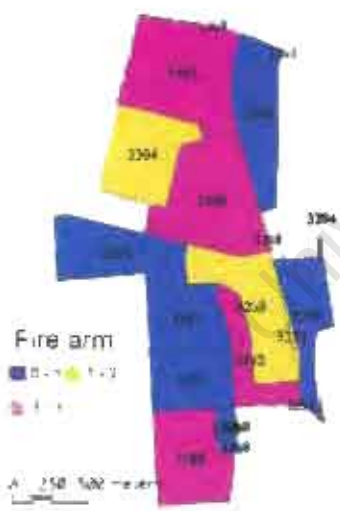
Histogram presentation for the instruments adopted

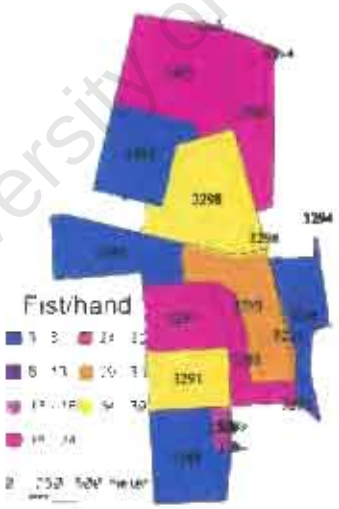
GIS presentation for the instruments adopted per police block

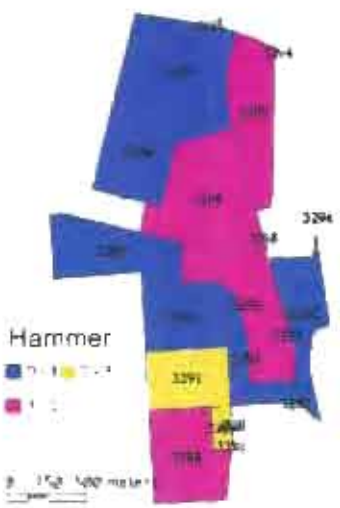


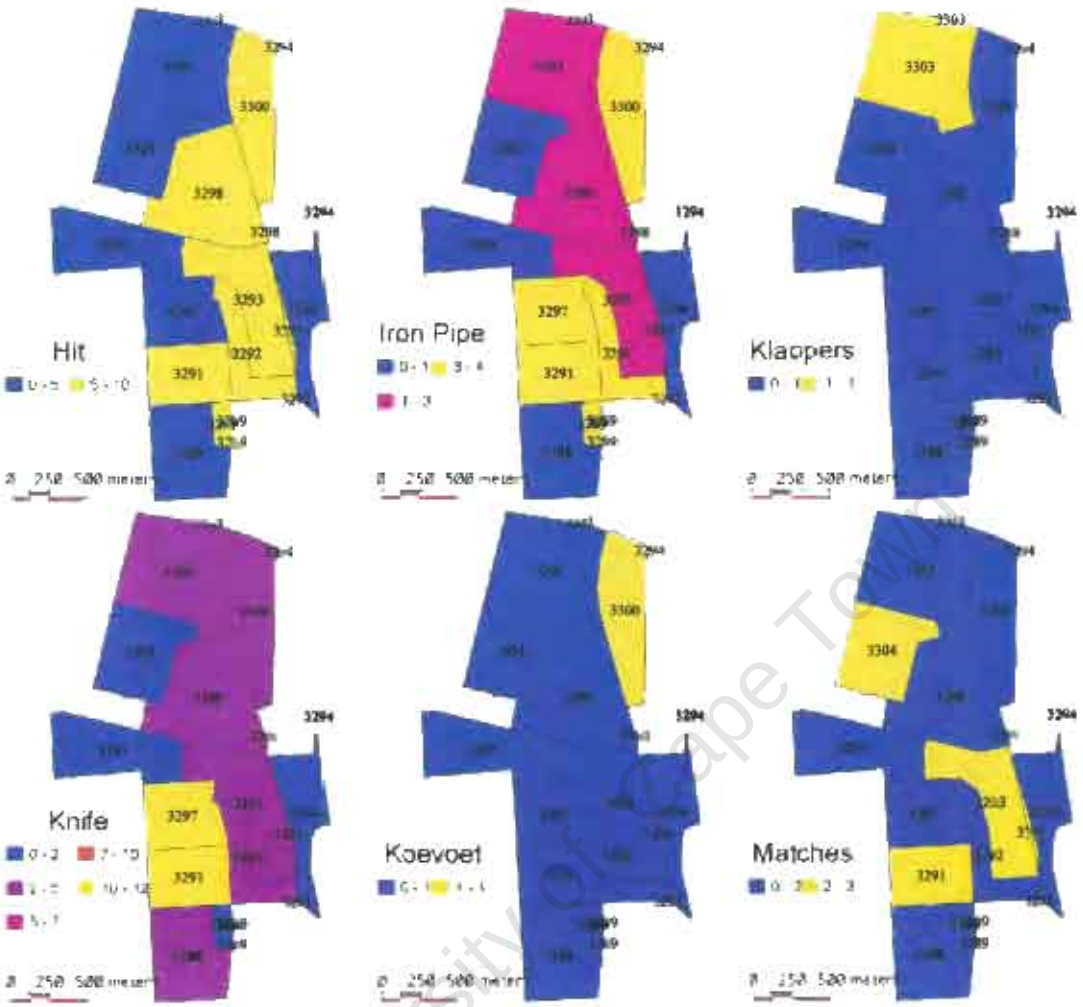


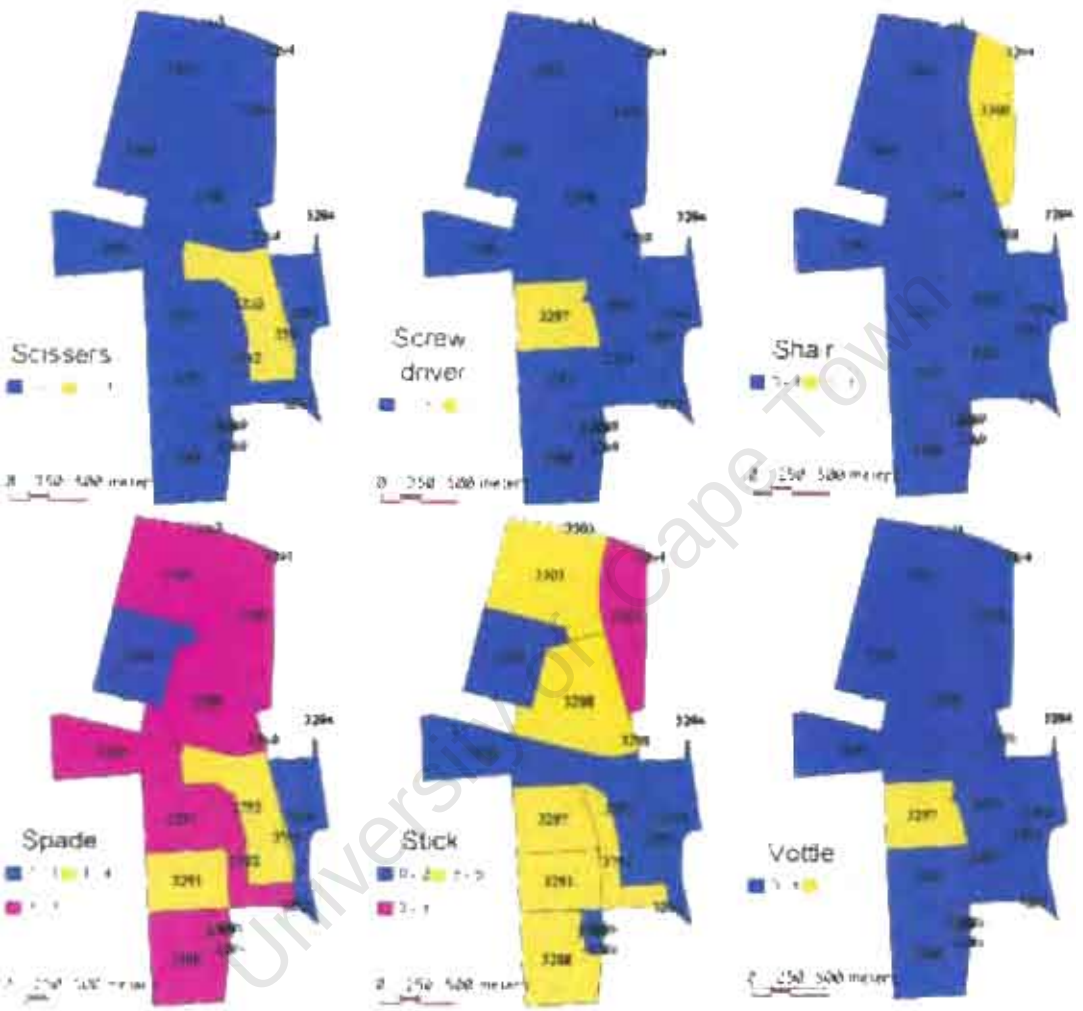


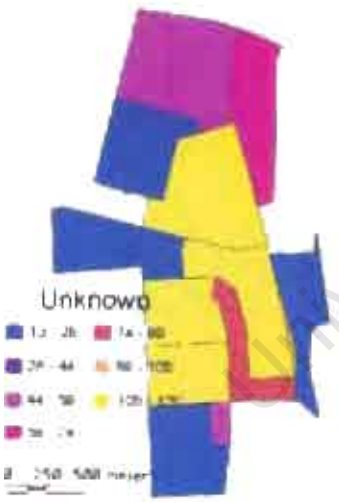




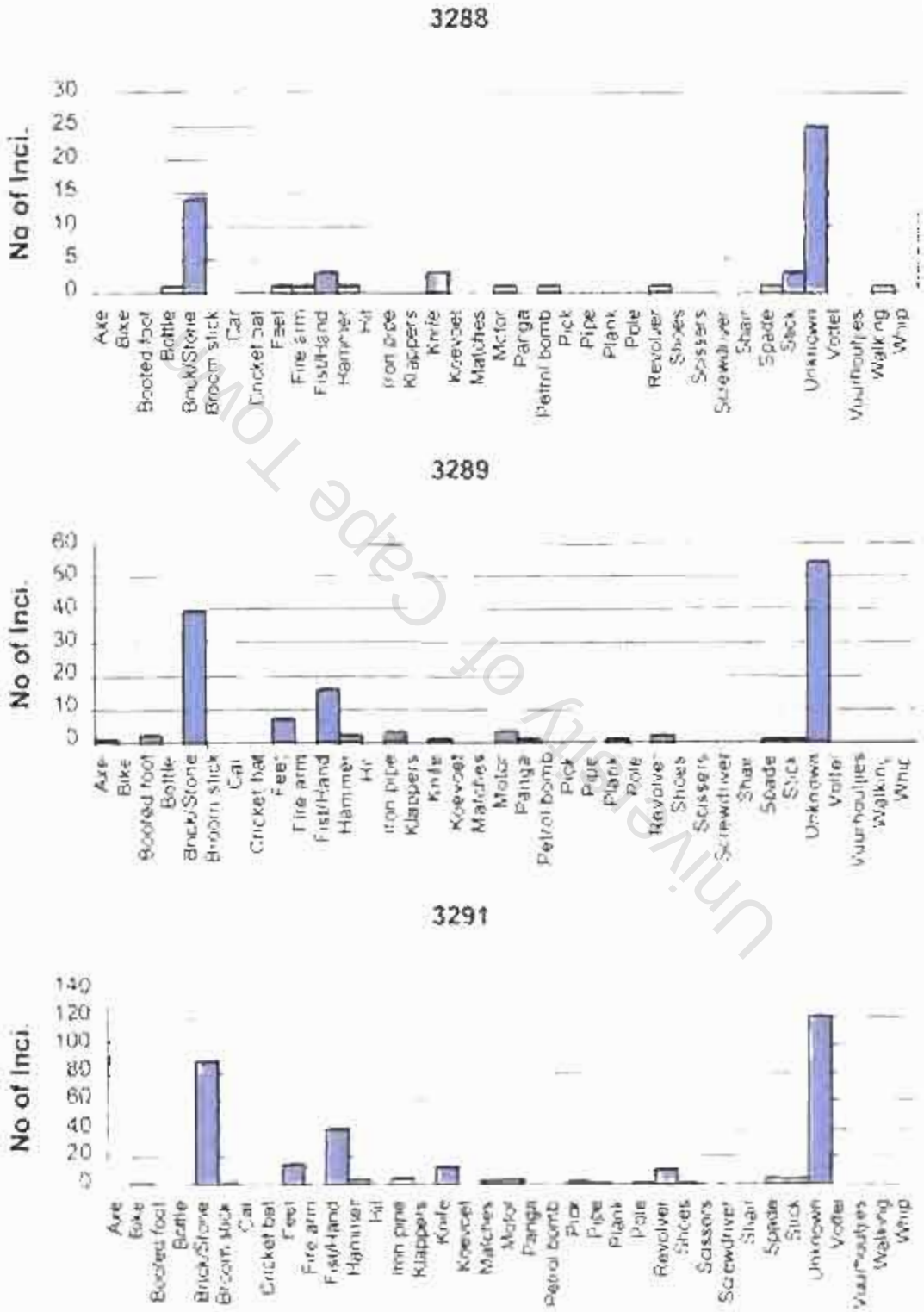








Histogram presentation for the instruments adopted per police block Instrument



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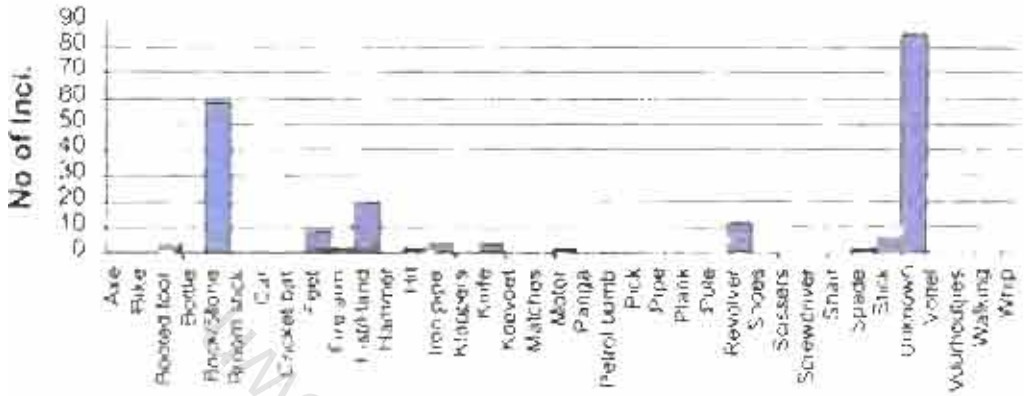

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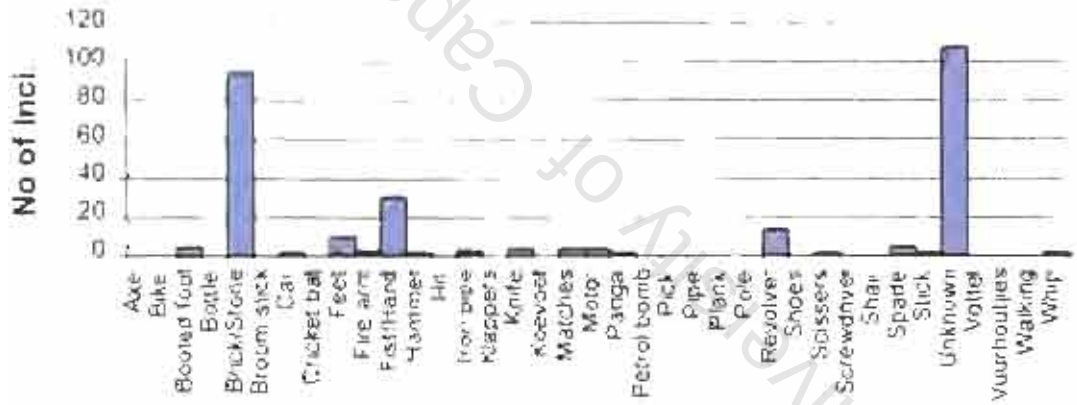

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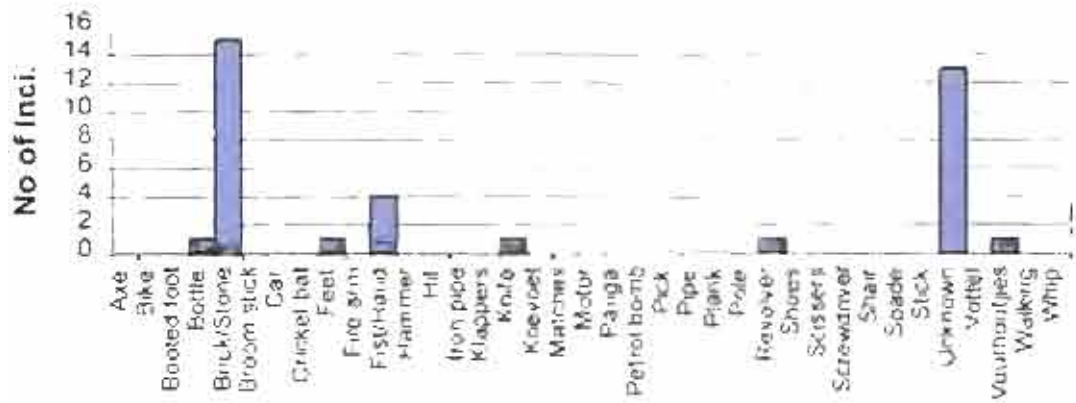

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3297

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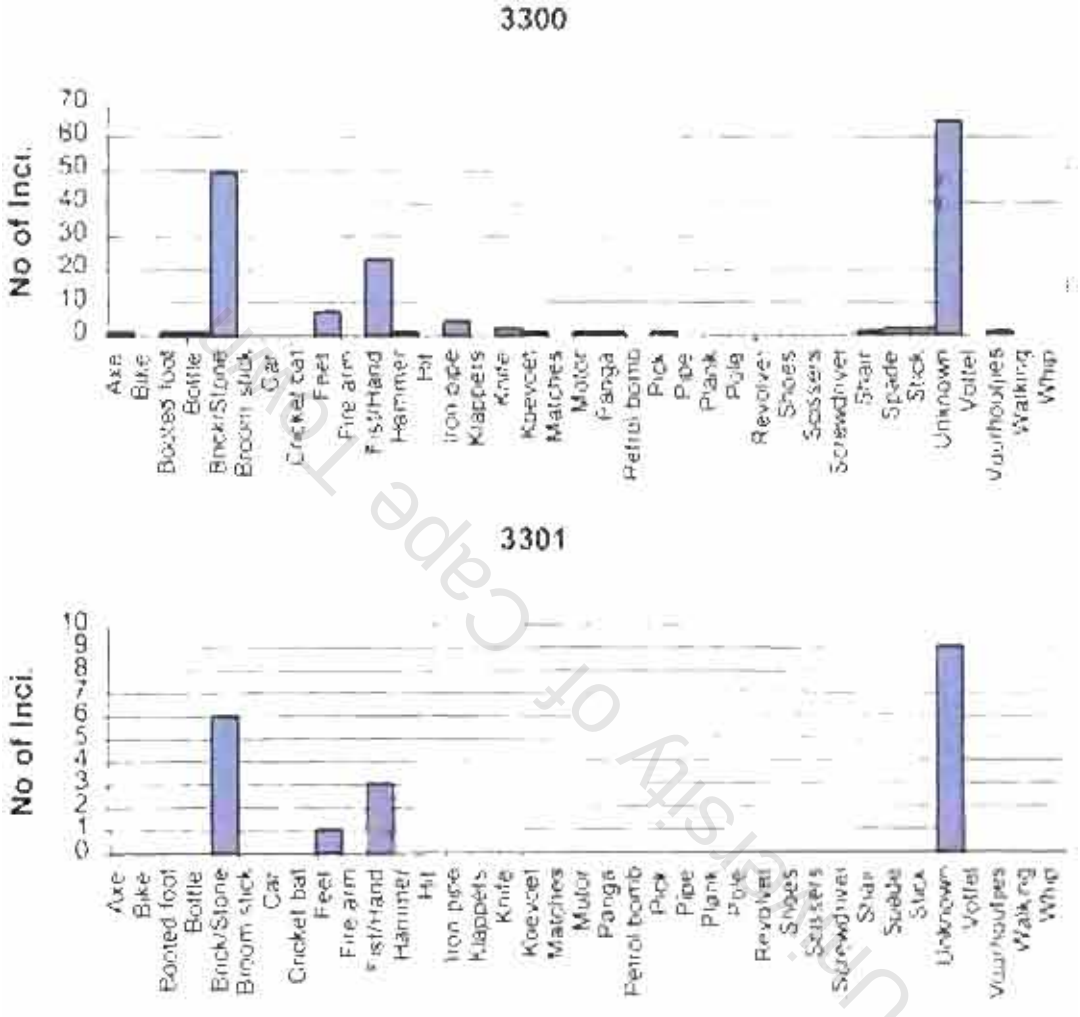
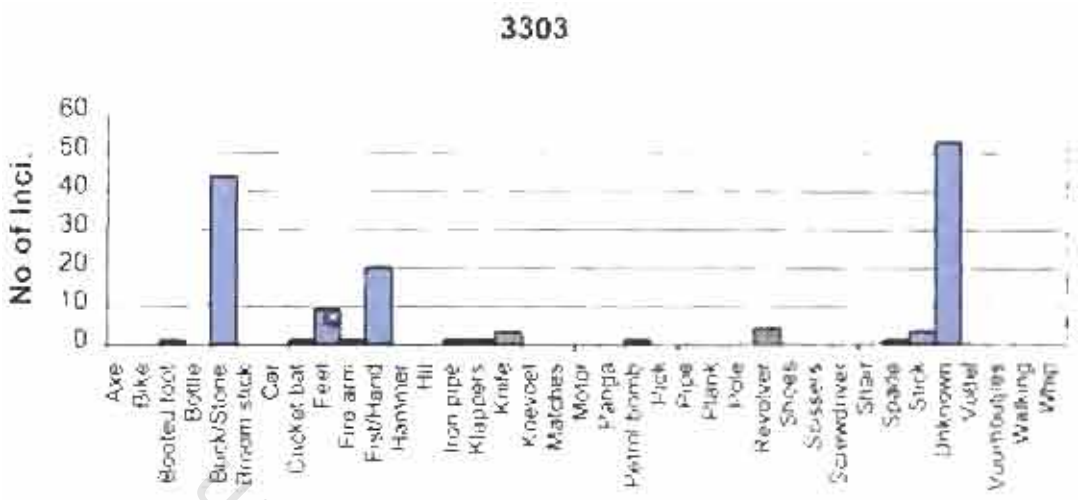
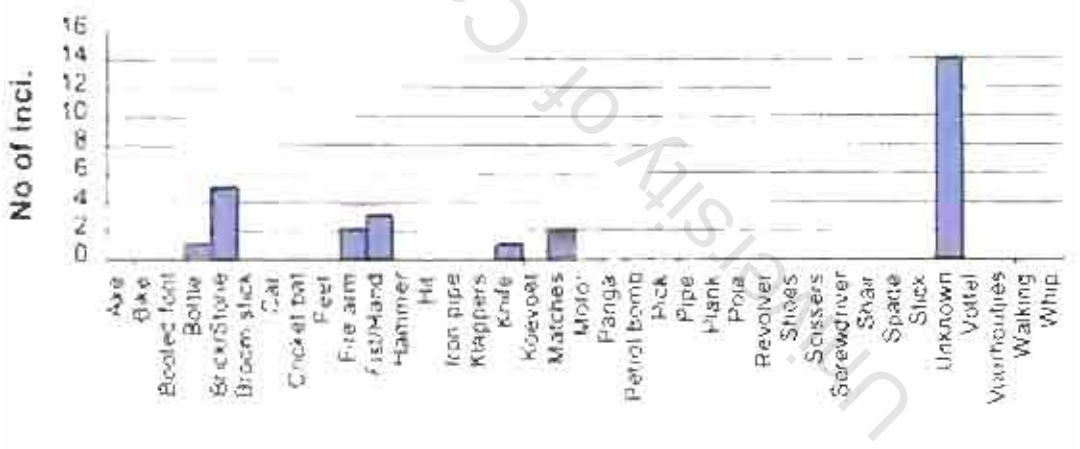






Appendix 9

Street Map of Manenberg

Appendix 9a

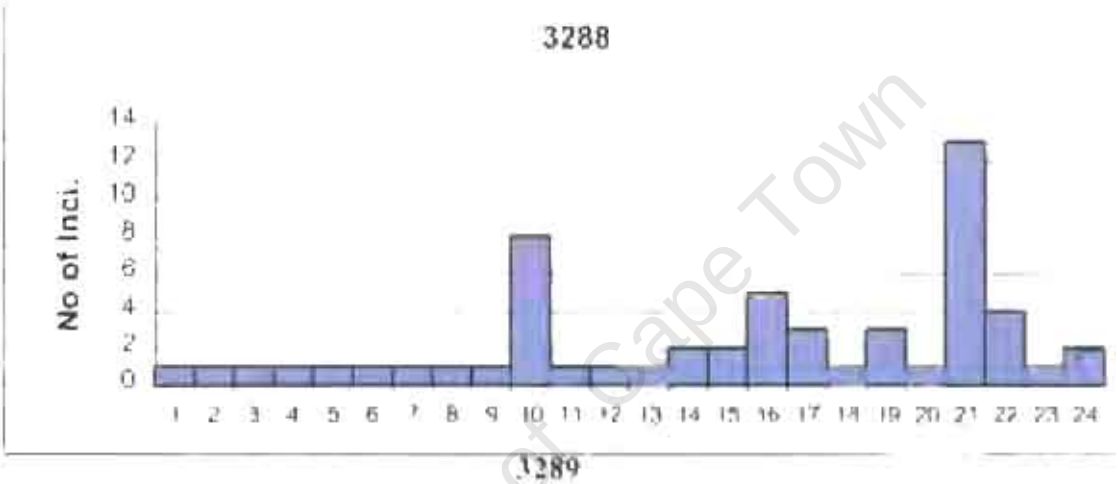
Incidents per street (1992-1999) by geographical area

Histogram presentation for the number of incidents per street

Name of street

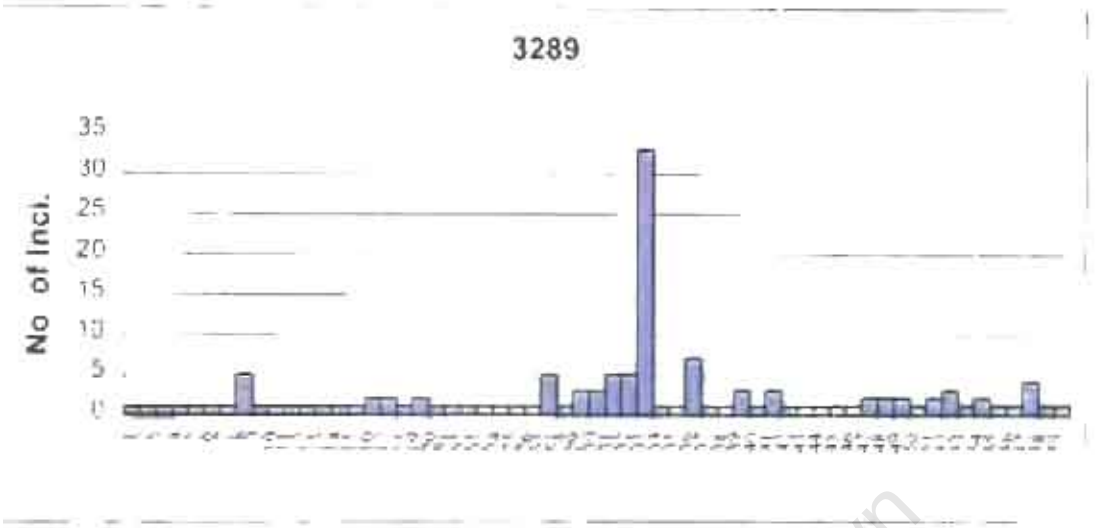
3288

1. AMATOLA CRESCENT 2. COCKCOMB ROAD 3. COLESBERG CIRCLE 4 COLLEEN ROAD 5. DIE DOWNSLAAN 6. GAMKA STREET 7. HEXCRESSENT ROAD 8 HUMBERG ROAD 9. JOHANNA ROAD 10. MANENBER AVENUE 11.NOELLEHOF 12. REDRIVER STRAAT 13. STEENBRAS ROAD 14. STORMRIVIER WALK ROAD 15. SWARTKOPWEG 16. TAGUS WEG 17. TEES ROAD 18. TIBER STREET 19. TUGELAWEG 20. USKWEG 21. VISTULA ROAD 22. VYGIEKRAAL ROAD 23. WYNE ROAD 24. ZUURBERG ROAD



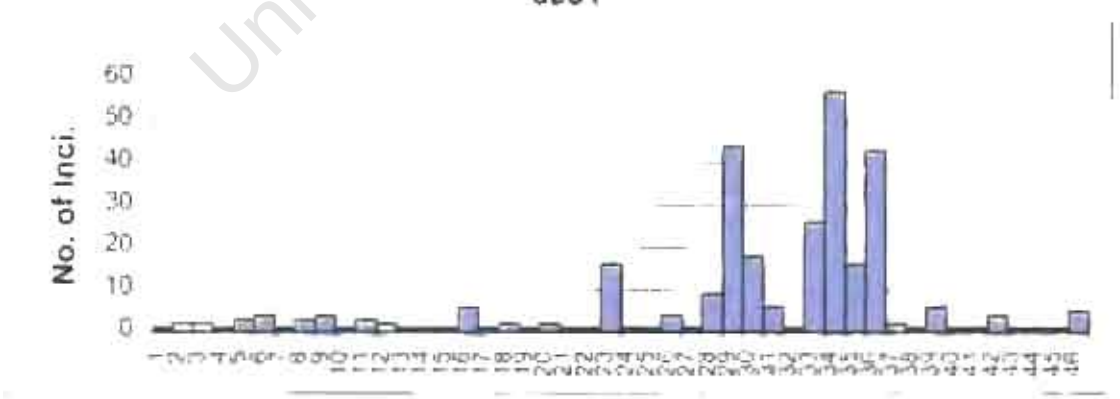
3289

1. 4th AVENUE 2. C/O SONDEREND ROAD AND SEINE ROAD 3. CARBON ROAD 4. CATHLEEN ROAD 5. CORAL COURT 6. DEVILSPEAK ROAD 7. DINA COURT 8. DUINEFONTEIN ROAD, 9.DWYKA STREET 10. ELSIESKRAAL ROAD 11. EVAHOF 12. FALCON ROAD, 13. FLORA COURT 14. FRANCISKAHOF 15. GAILHOF, 16. GAMKA STRAAT 17. GOURITZ ROAD 18. GRAND ROAD, 19. GREAT FISHLAAN 20. GROENBERG ROAD 21. GROOTKOP ROAD 22. H/V DUINEFONTEIN & GEORGE 23. H/V MANENBERG & DOWNSWEG 24. HOUWHOEK ROAD 25. INGA COURT 26. JORDAAN ROAD 27. KARENHOF 28. LAINSBURG ROAD 29. LETABA ROAD 30. LETTIE COURT 31. LILLIANHOF 32. MADGE HOF 33. MANENBERG AVENUE 34. MATHILDAHOF 35. MYMONA CRESCENT 36. NELLIE COURT 37. OLIFANT STREET 38. OMEGA COURT 39. ONDINE HOF 40. PAM COURT 41. PECOS ROAD, 42. PLATE STREET 43. PLUTO ROAD 44. QUARIUS ROAD 45. RENOSTERWEG 46. RIOGRAND WALK ROAD 47. RUIMTE ROAD 48. SABIEWEG 49. SCHELDT ROAD 50. SENATORHOF 51. SONDERED ROAD, 52. THAMES AVENUE, 53. TOUWSBERG ROAD 54. USKSTRAAT 55. VANGUARD ROAD 56. VIVA STREET 57. VYGIEKRAALWEG 58. WYE ROAD 59. ZUURBERG ROAD



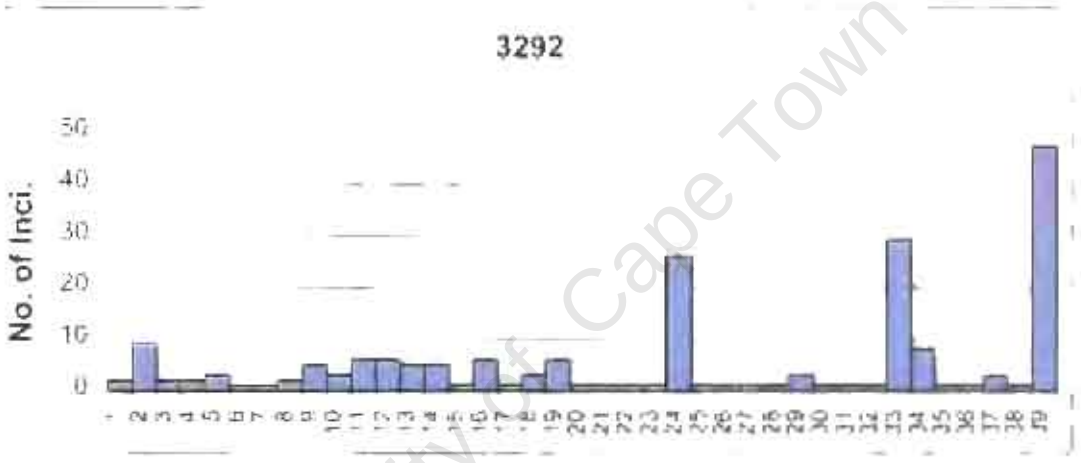
3291

1 2 CD AVENUE 2 ALETTAHOF 3 BEATRIX COURT 4 C/C 4th AVENUE & 5th AVENUE 5 CAMSTRAAT 6 DF DOWNS 7 DINAHOF 8 ERICA HOF 9 FRANCISKAHOF 10 GAMKASTRAAT 11 GRAND STREET 12 GREAT FISHLAAN 13 H/V MANENBERGLAAN & RENOSTERWEG 14 H/V VYGIEKRAALWEG & BOYNEWEG 15 HOUWHOEKSTRAAT 16 JORDAANLOOPPAD 17 JOYCE-HOF 18 KATHLEENHOF 19 LETTIE COURT 20 LILIAN COURT 21 MADGE COURT 22 MAGDAHOF 23 MAMFNBERGLAAN 24 MARICO STREET 25 MATILDA COURT 26 OLGA ROAD 27 ONDINE COURT 28 PAM COURT 29 PECOS LOOPPAD 30 PETA LOOPROAD 31 PLATE ROAD 32 R 10 GRANDE WALK 33 RED RIVER LAAN 34 RENOSTER LOOPPAD 35 RHONE LOOPPAD 36 RIO GRANDESTRAAT 37 RONEL LOOPPAD 38 RONOSTER WALK ROAD 39 RUTH COURT



3292

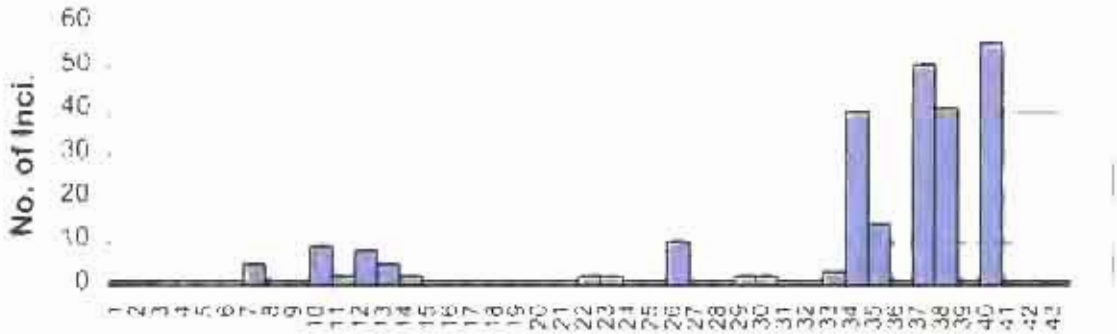
1 BELINDA COURT 2 DE DOWNES ROAD 3 DINAH HOF 4 DUINEFONTEINWEG 5 ERICAHOF 6 EVA HOF 7 FLORA COURT 8 FRANCISKAHOF 9 GAILHOF 10 GREAT FISHLAAN 11 GRIETA COURT 12 HELEN COURT 13 HILDA COURT, 14 INGA COURT, 15 IRVIN ROAD 16 ISABELHOF 17 JHILDA ROAD 18 JOHANNAHOF 19 JOYCE COURT 20 KASOUGA ROAD, 21 KATHLEEN COURT 22 KEISTRAAT, 23 MADGEHOF 24 MANENBERG AVENUE 25 MATILDA COURT 26 NELLIEHOF 27 OLGA STREET 28 ONDINE COURT 29 PECOS ROAD, 30 RENOSTER WALK ROAD, 31 RUIMTE ROAD, 32 RUTHHOF 33 SABIE LOOPPAD 34 SCHELDT LOOPPAD, 35 SILVERSTREAMWEG, 36 STORMSRIVIERWEG 37 SWAKOPSTRAAT 38 TAGUS CLOSE 39 THAMES AVENUE



3293

1 10A 2 4 TH AVENUE 3 ALETTA WALK ROAD 4 BAILEY CLOSE 5 BEATRIX WALK ROAD 6 BELINDA WALK ROAD 7 DUINEFONTEINWEG 8 ELBESTRAAT 9 ELSIESKRAALWEG 10 ERICA COURT 11 EVAHOF 12 FLORA COURT 13 FRANCISCA COURT 14 GAIL HOF 15 GONUBIE ROAD 16 GREATFISHLAAN 17 GRIETA COURT 18 HW STORMRIVIER & THAMESLAAN 19 INGASTRAAT 20 IRVINE STREET 21 ISABELWEG 22 JOHANNA ROAD 23 JORDAANSTRAAT 24 JOYCEHOF 25 LAINSBURG ROAD 26 MANENBERG AVENUE 27 NOELLE COURT 28 PEOPLE'S CENTRE 29 RED RIVER STRAAT 30 RENOSTER WALK ROAD 31 RIO GRANDWALK 32 RUIMTEWEG 33 SABIE ROAD 34 SCHELDT LOOPPAD 35 SEINE LOOPPAD 36 SILVERSTREAMWEG 37 SONCEREND ROAD 38 STORM RIVIER ROAD 39 SUGARLOAF ROAD 40 THAMES AVENUE 41 VENSTER STRAAT 42 VYGIESKRAALWEG 43 ZWARTKOP ROAD

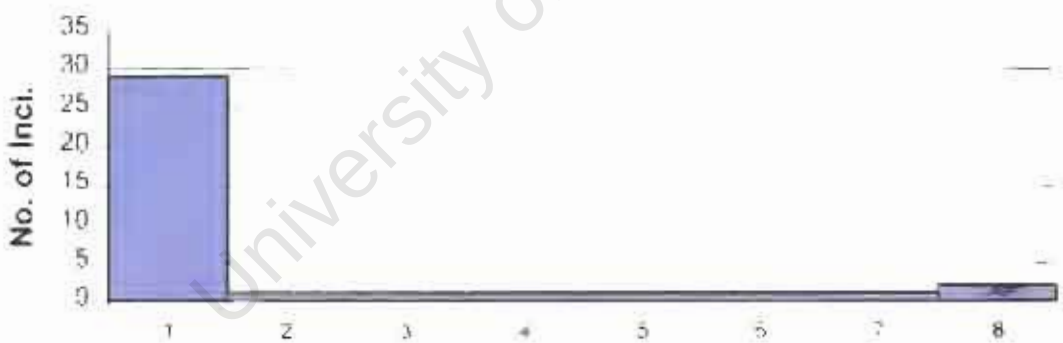
3293



3294

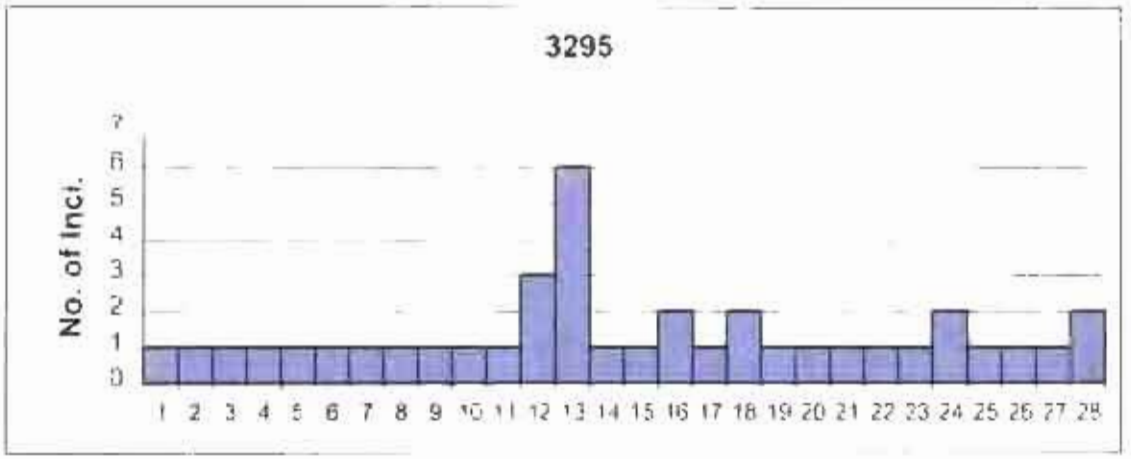
1. DUINEFONTEIN ROAD, 2. H/V DUINEFONTEIN&THE DOWNS 3. IRVINE STREET 4. JOYCE COURT 5. MANENBER AVENUE, 6. RENOSTER ROAD 7. STORMSRIVIER ROAD, 8.THAMES WALK ROAD

3294



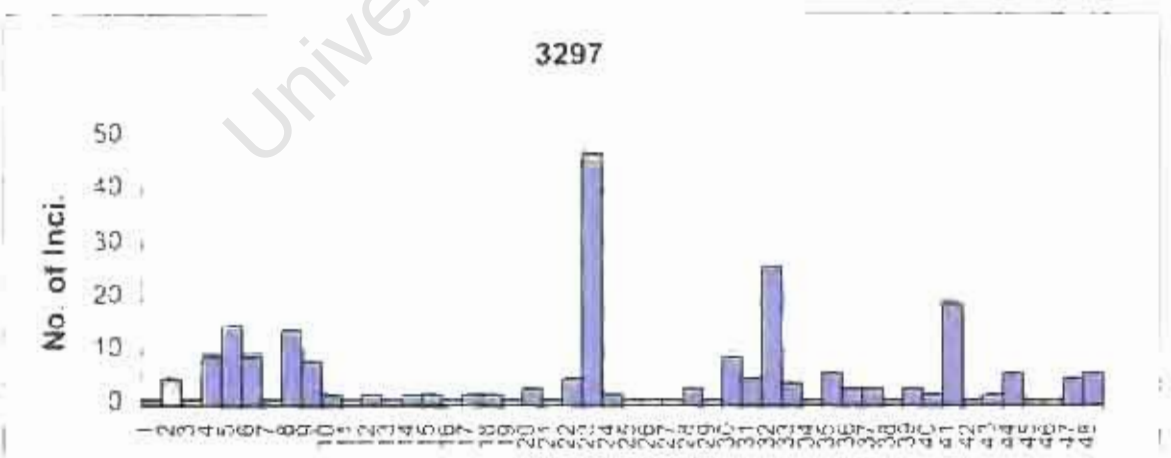
3295

1. AUDREYHOF 2. C/P VYGIEKRAAL & R10 GRAND STREET, 3. COLORADO STREET, 4. GALHOF, 5. GAMTOOSWEG, 6. JOHANNA COURT 7. JORDAAN LOOPPAD 8. JOYCE COURT 9. KASOUGA ROAD 10. KATHLEEN COURT 11. LYNE STREET, 12. MANENBERG AVENUE 13. MARICO STREET, 14. NAHOON STREET, 15. OHIOSTREET 16. OLIFANT 17. R 10 GRANDE WALK ROAD 18. RED RIVERSTRAAT 19. RENOSTERWEG, 20. RHONE WALK ROAD 21. RUIMTEWEG, 22. SABIE ROAD 23. SCHELDT WALK ROAD 24. THAMESLAAN, 25. TOWERKOPSTRAAT 26. VENSTERSTRAAT 27. VISTULAWEG, 28. VYGIEKRAALWEG



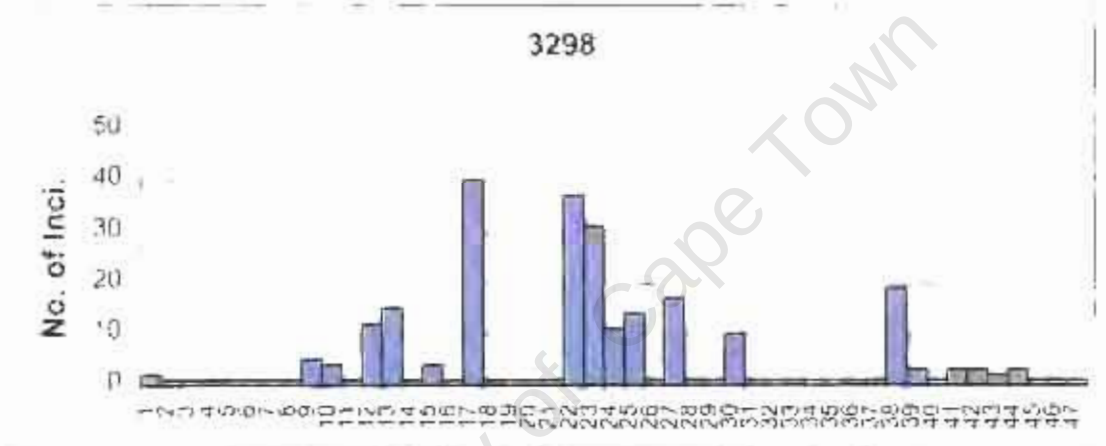
3297

4 TH AVENUE 2 ALETTA LOOPPAD, 3 ALPHAHOF, 4 AUDREY COURT 5 BEATRIX, 6 BELINDA COURT 7 C/O DUINEFONTEIN & I ANSDOWN ROAD, 8. COLLEEN COURT 9 CORRIE COURT 10 DINAHOF 11 DON STRAAT 12 DUINEFONTEIN ROAD 13 ELSIEKRAAL ROAD, 14. GAMKASTRAAT, 15 GREAT FISHLAAN, 16. HELENHOF 17 IRVINE STRAAT 18. ISABELHOF, 19 JOHANNAHOF 20 JORDAAN STRAAT, 21 JOYCEWEG, 22 KEISTRAAT 23 MANENBERG AVENUE 24 MATHILDAHOF 25 N2 SNELWEG, 26 NABY BUS TERMINUS, 27 NOELLEHOF 28 OLGAHOF 29 PAM LOOPPAD 30 PECOS ROAD 31 PETAHOF 32 RED RIVER LOOPPAD, 33 RENOSTER ROAD 34 RIO GRANDEWEG 35 RUIMTEWEG, 36 RUTH HOF, 37 SABIE ROAD, 38. SCHELDTWEG 39 SILVER STREAMWEG, 40 SONDERENDWEG, 41 STORMRIVIER LOOPPAD, 42 SUGARLOAFSTRAAT 43 TAGUSWEG 44 THAMES AVENUE 45 TOWERKOPWEG 46 TUGELA ROAD, 47 VENSTERSTRAAT 48 VYGIEKRAALWEG



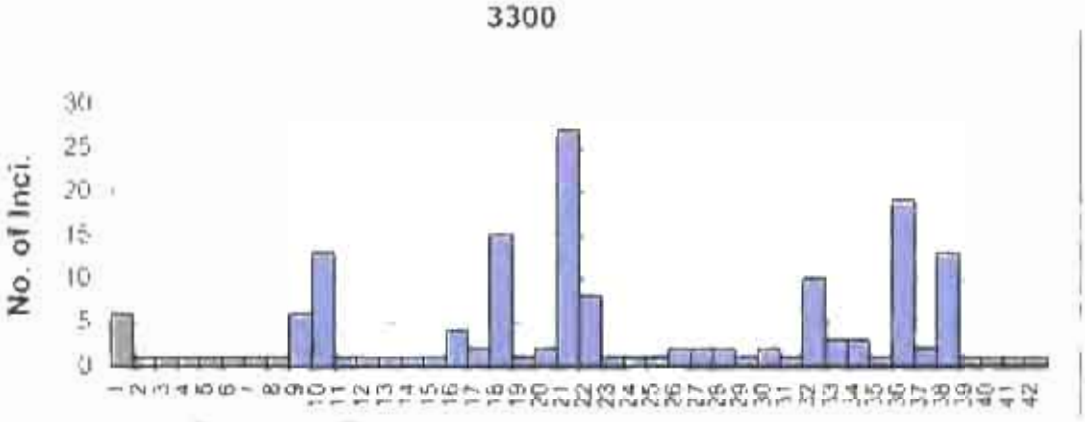
3298

1 2 CD AVENUE 2 5 TH AVENUE 3 ALPHAHOF, 4 BAAKENSE ROAD 5 BEATRIX HOF 6 BELINDAHOF 7 COLLEENHOF 8 DE DOWNSWEG 9 DUINEFONTEIN ROAD 10 ELSIESKRAAL ROAD 11 ERICAHOF 12 GAMKA, 13 GAMTOOS 14 GANGESCLOSE 15 GONUBIESTRAAT 16 GRACE COURT 17 GREAT FISHLAAN 18 GROOTKOP STREET 19 HEXCRESCENT 20 HILDA COURT, 21 HUMBER STREET 22 IRVIN ROAD 23 JORDAAN, 24 KASOUGA ROAD 25 KEI STREET 26 KLIPFONTEIN ROAD 27 LETABA ROAD, 28 LILIAN ROAD, 29 MADGE COURT 30 MANENBERG AVENUE 31 MOSES STREET, 32 NOELLE COURT, 33 OLGA COURT 34 OLIVIA COURT 35 R 10 GRANDE ROAD 36 REDRIVERSTRAAT 37 RHONELOOPPAD, 38 RUIMTE ROAD 39. RUTH COURT, 40 SCHELDTLOOPPAD, 41 SENATOR HOF 42 SONDEREND ROAD 43 STORMRIVER ROAD, 44 THAMES AVENUE 45 TOUWSBERGWEG 46 UKS ROAD 47 VYGIEKRAALWEG



3300

1 ALPHAHOF 2 BELINDA COURT 3 C/D HEXCRESCENT & TOUWSBERG ROAD 4 CARBON ROAD, 5 COCKSCOMB ROAD, 6 COROTHY STREET 7 DANUBES STREET 8 DE DOWNS ROAD 9 DUINEFONTEIN ROAD, 10 DWYKA STRAAT 11 ERICA COURT 12. GAMTOOS ROAD, 13. GOURITZ STREET 14 GRAND WALK ROAD 15 GREATFISH AVENUE 16 GROOTKOP ROAD 17 HEIDEVELD ROAD, 18 HEX CLOSED 19 HILDA COURT 20 JONKERHOEK ROAD, 21 JORDAAN LOOPPAD 22 KLIPFONTEIN ROAD, 23 LANSDOWNEWEG 24 LYNNEWEG 25 MADGE COURT 26 MANENBERG AVENUE 27 N2, 28 OMEGAHOF 29 RHONE LOOPPAD 30 RIUMTEWEG, 31 SABIE LOOPPAD 32 SILVER STREAM PRIMARY SCHOOL 33 SIRIUS ROAD, 34 SLANGHOEK ROAD, 35 SONDERED ROAD 36 SUGAR LOAFSTRAAT 37 TAMBO SQAURE, 38 TOUSBERG, 39 TUGELA ROAD 40 VENSTER STREET 41 WATERBERG ROAD 42 ZAKSTRAAT



Appendix 10

Aerial photograph of Manenberg the whole suburb (2002)

Scale: 1:10 000

Appendix 11

Aerial photograph of police blocks 3292, 3293 and 3297 specifically identifying Sonderentweg

Appendix 12

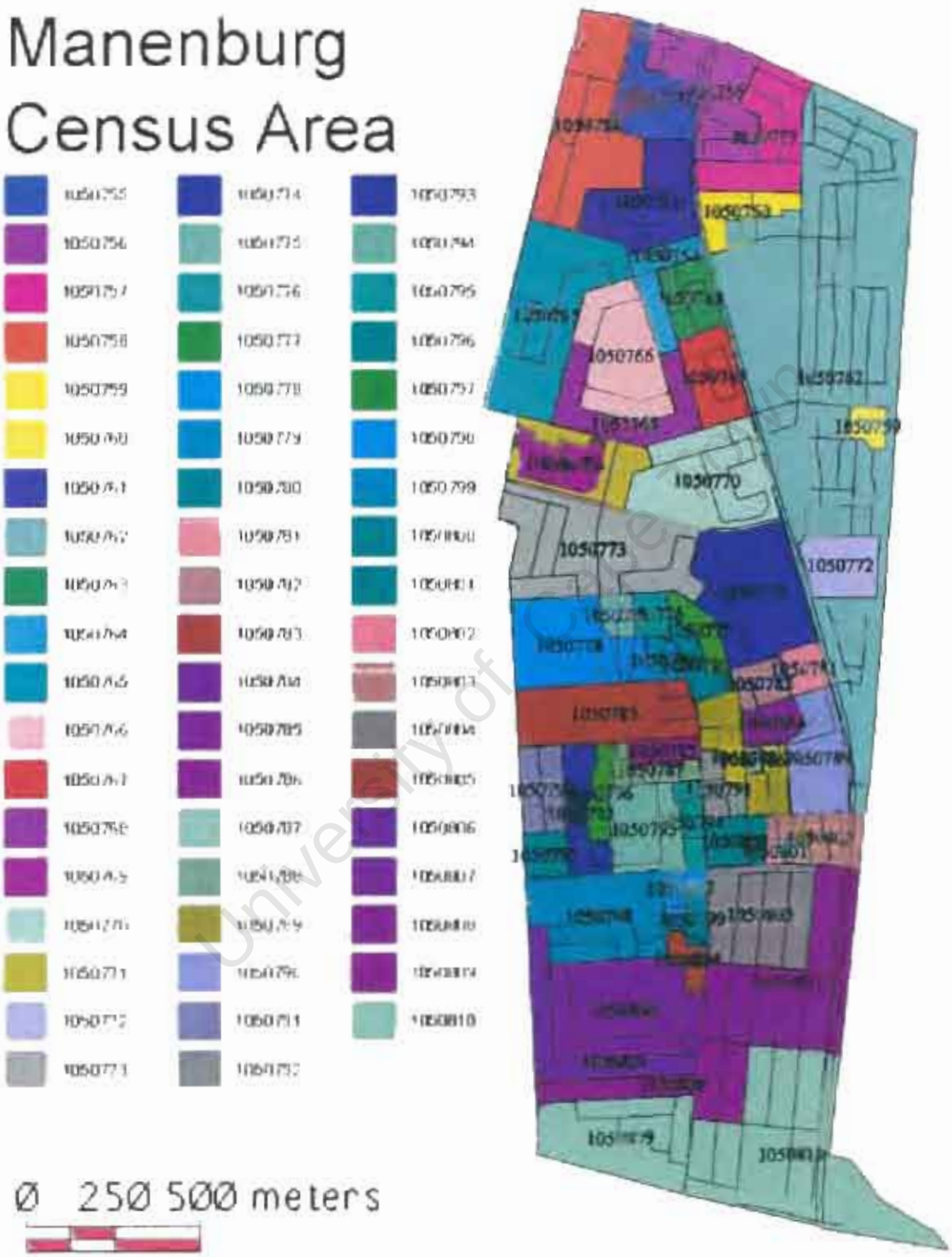
Aerial photograph of police block 3298 identifying Irvine Street

Appendix 13

Aerial photograph of police block 3289 identifying Manenberglaan

Appendix 14

Population census areas for Manenberg (1996)



Appendix 14a

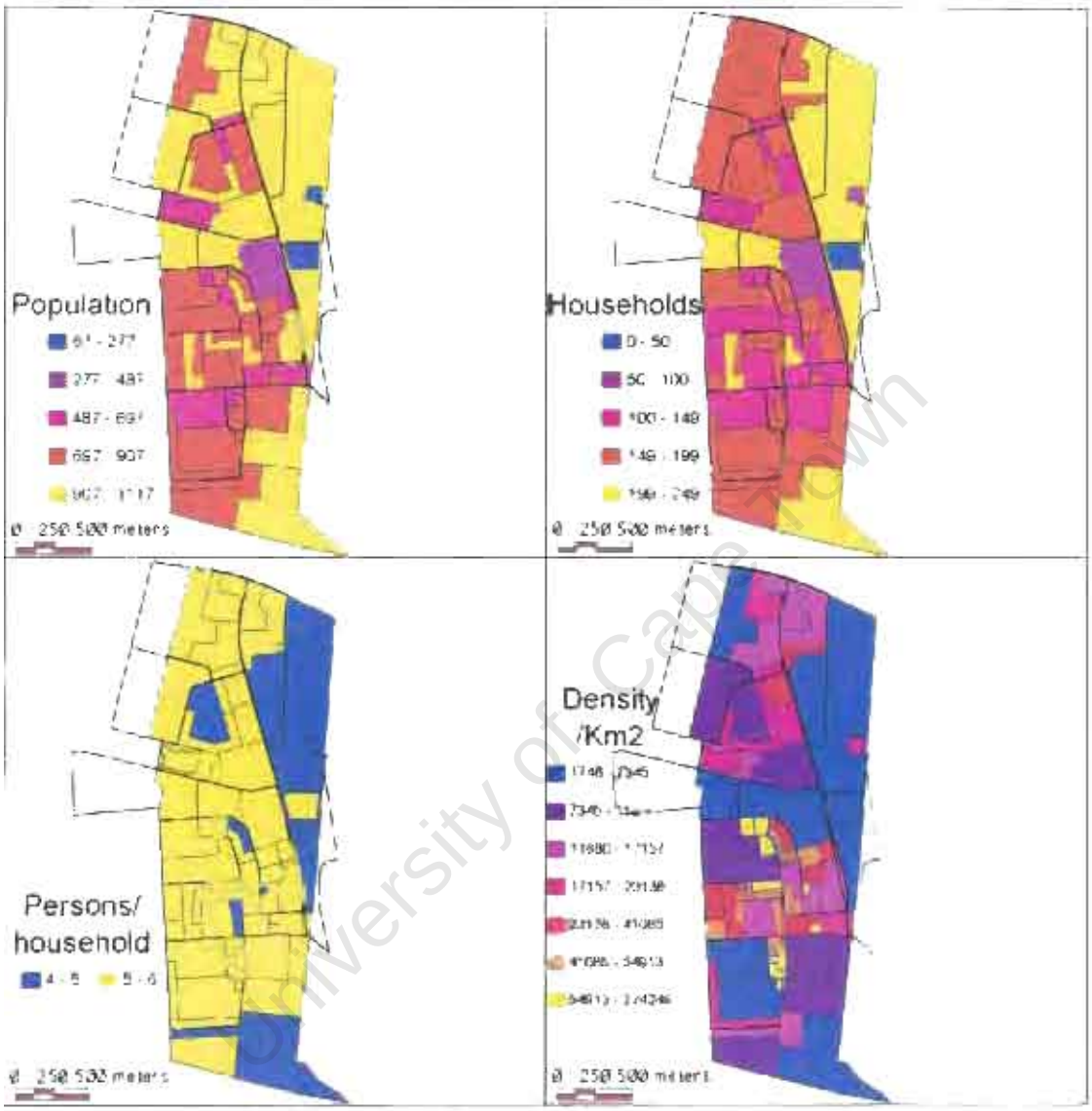
Census areas for Manenberg incorporating building type (1996)

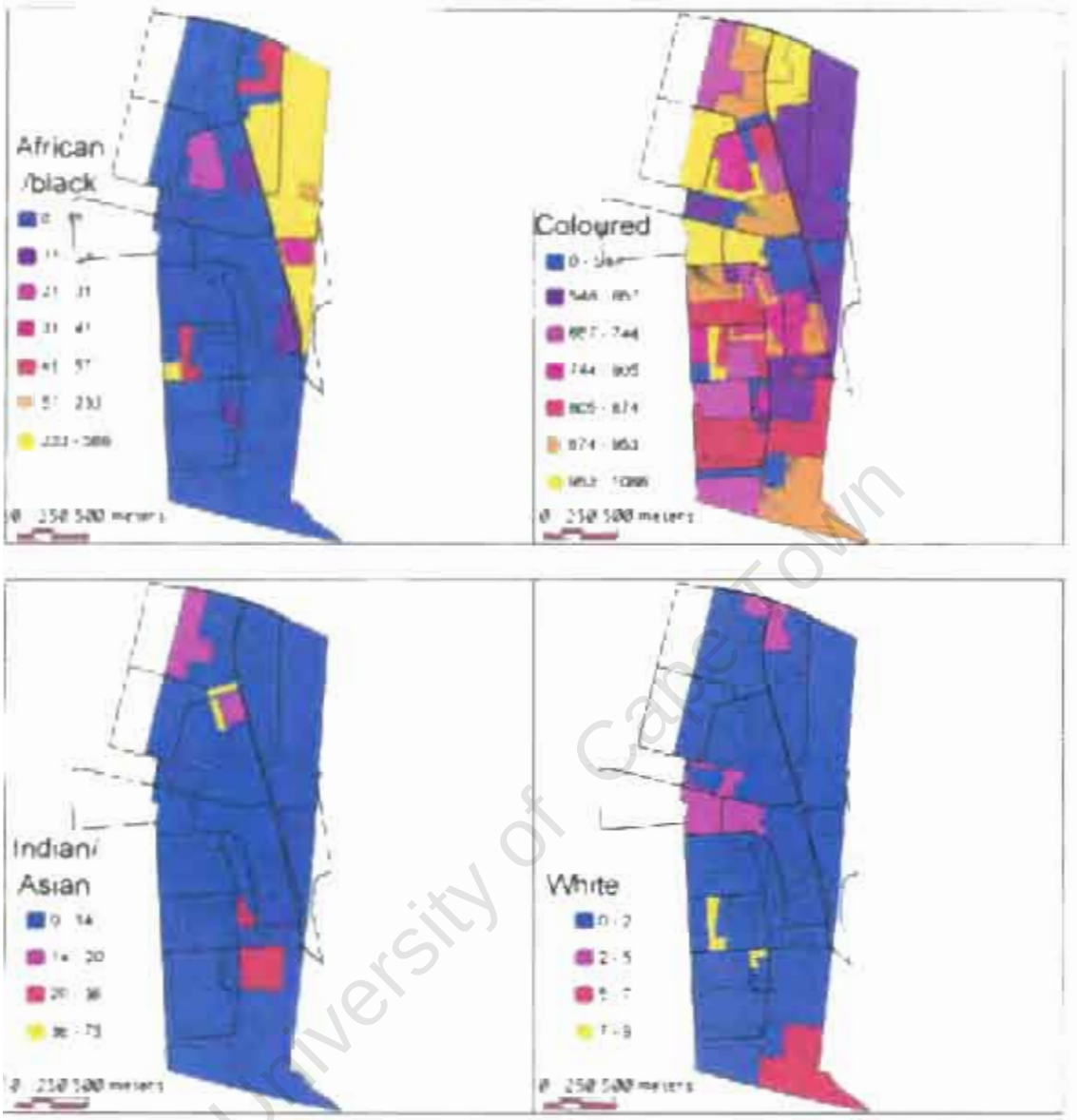
Manenburg Census Area

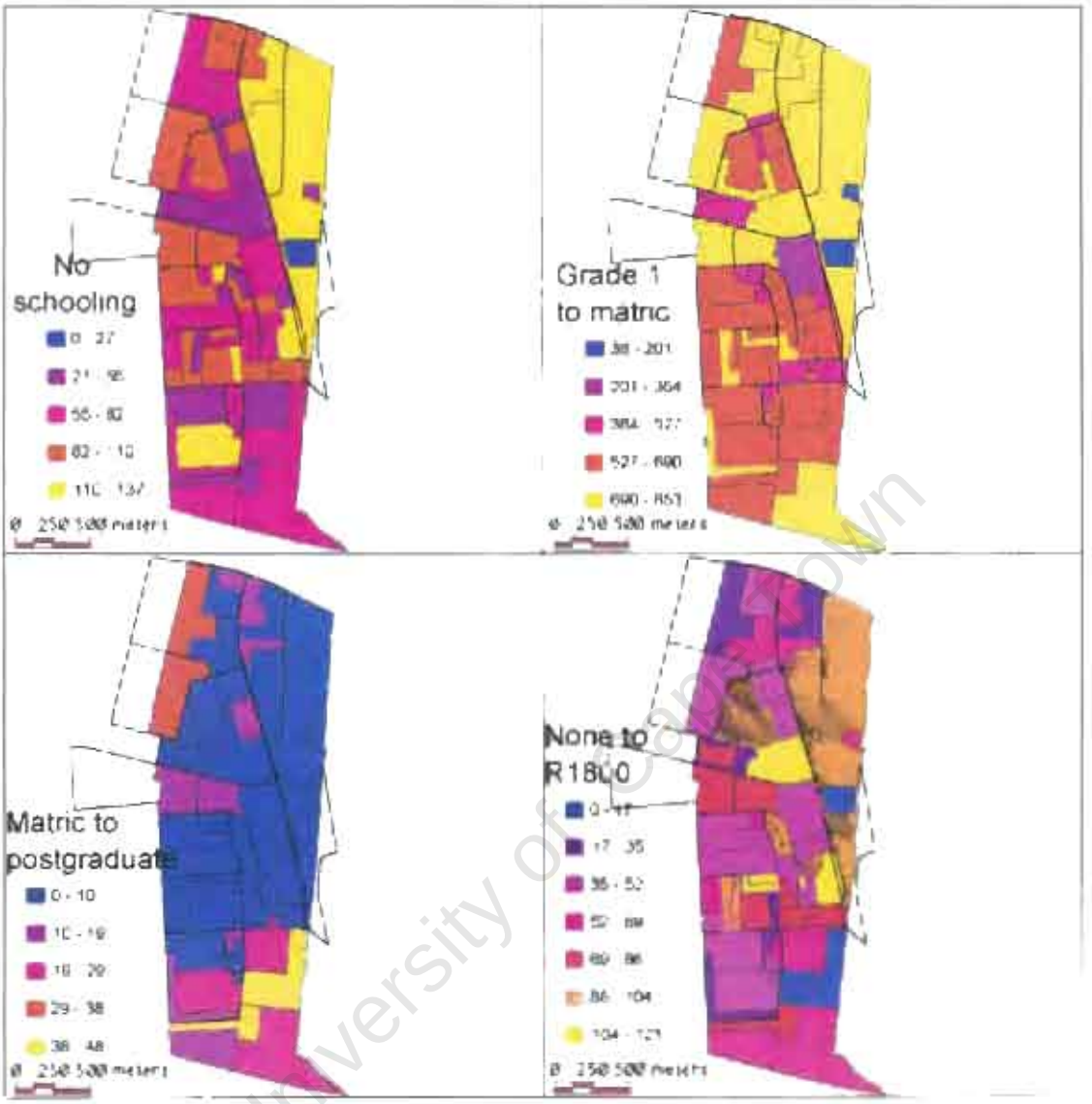
Appendix 14b

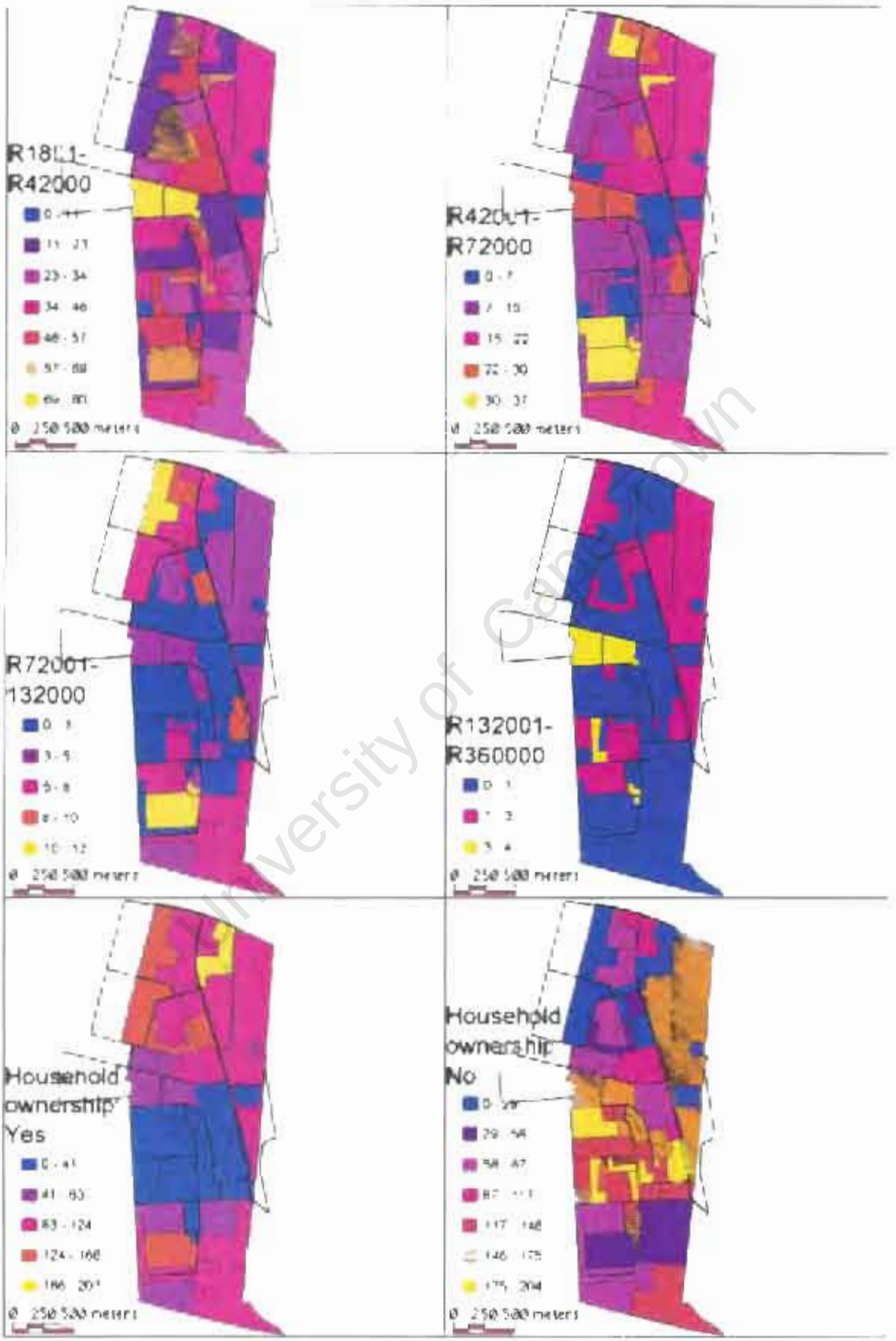
Population census data for Manenberg (1996)

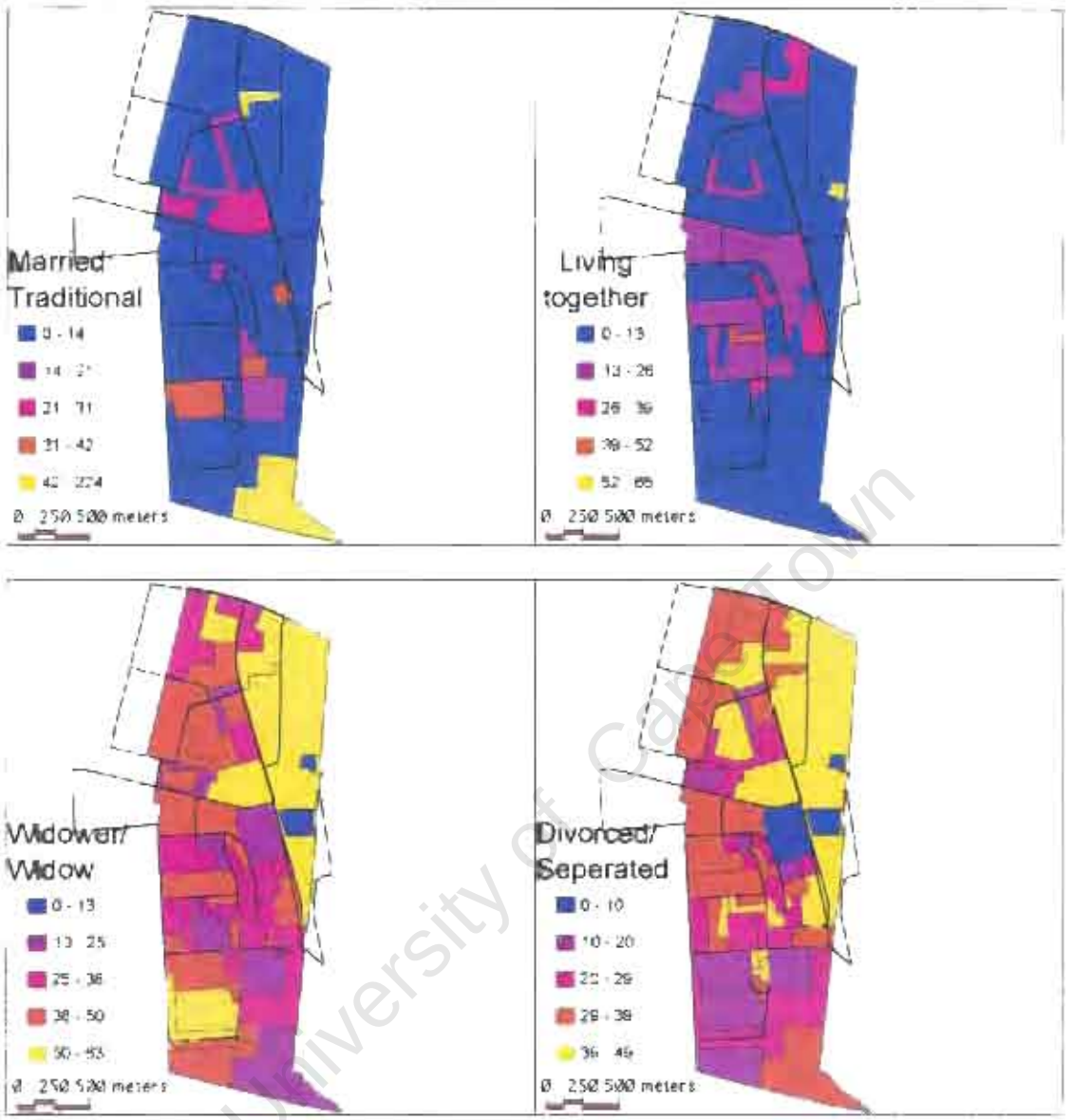
GIS presentation of the population census data (1996) per police block

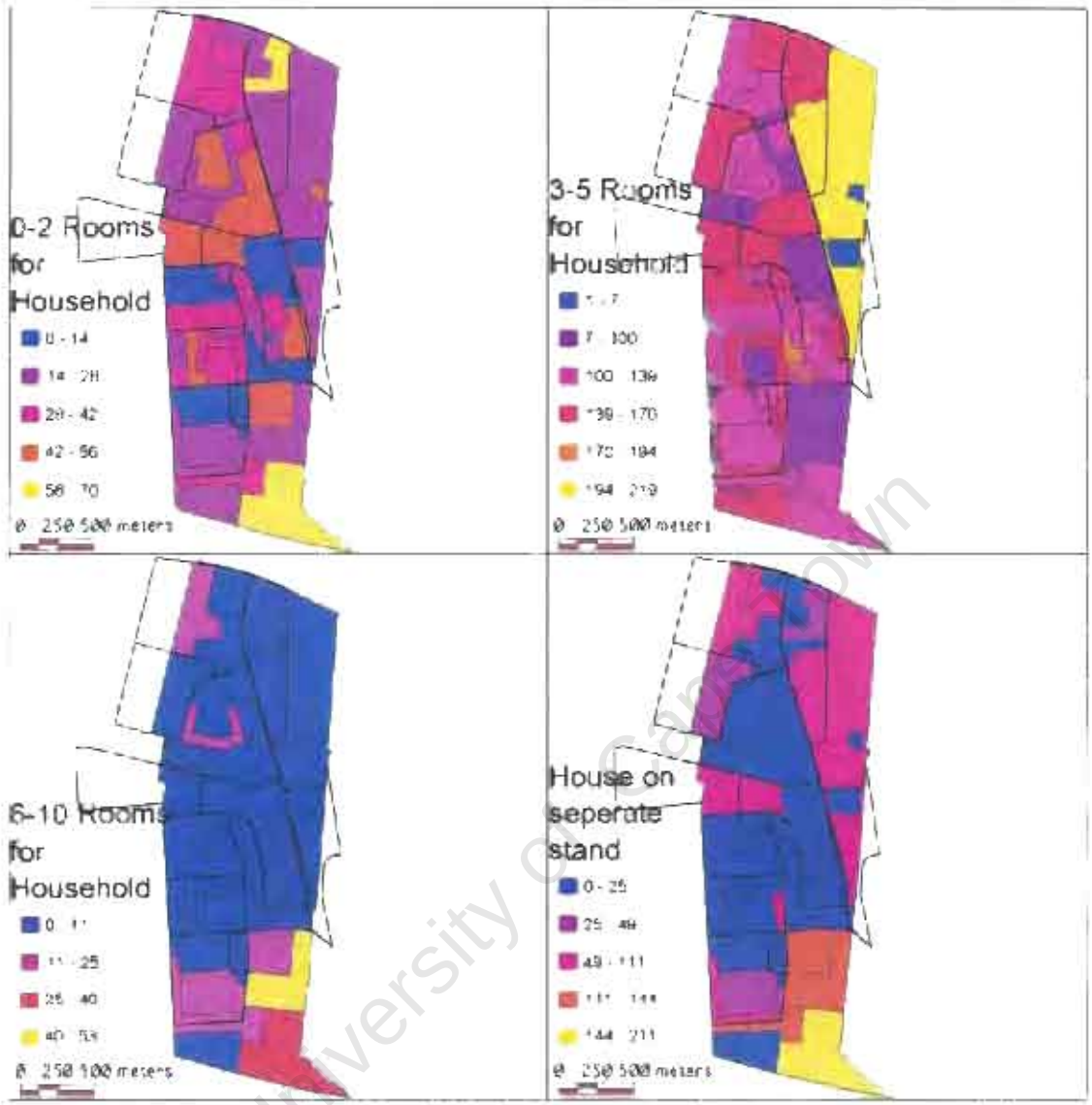


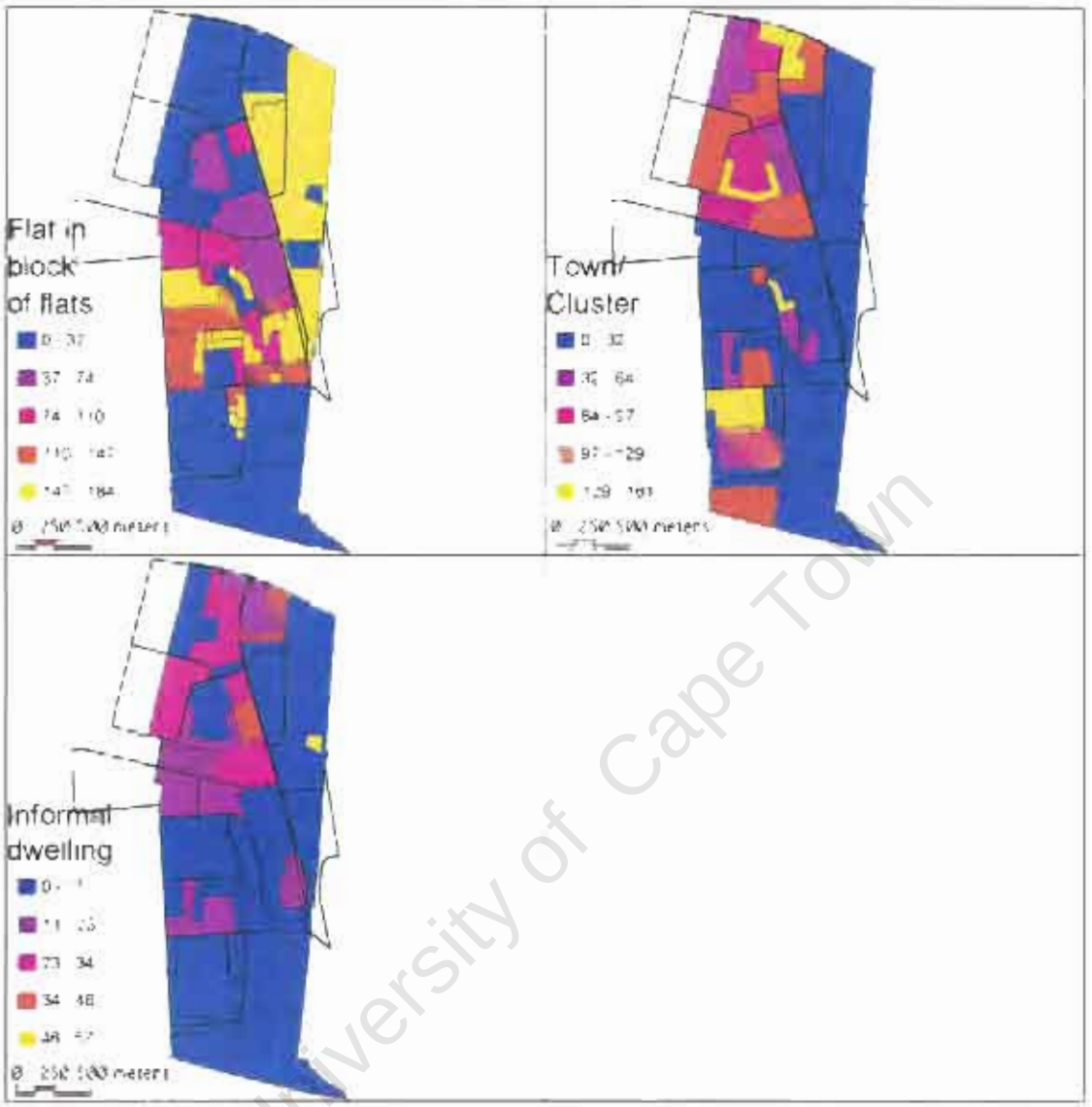












Appendix 15

Population density for Manenberg (1996) by geographical area