TITLE:

HOUSING LAYOUT DESIGN AND CRIME REDUCTION IN RDP DEVELOPMENTS: A CASE STUDY OF CHESTERVILLE, DURBAN IN KWAZULU NATAL.

A DISSERTATION SUBMITTTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF A MASTER OF HOUSING IN THE SCHOOL OF BUILT ENVIRONMENT AND DEVELOPMENT STUDIES.

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2013

DECLARATION

Submitted in partial fulfilment of the requirements for the degree of Masters of Housing, in the Graduate Programme in the School of Built Environment and Development Studies,
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South Africa.

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. It is being submitted for the degree of Masters of Housing in the Faculty of Humanities, Development and Social Science, University of Kwazulu Natal, Durban, South Africa. None of the present work has been submitted previously for any degree or examination in any other university.

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NOVEMBER 2013

ACKNOWLEDGEMENTS

ABSTRACT

It is argued that housing designs and layout systems for crime prevention can have either positive or negative implications on the actual prevention of crime. Therefore, this research explores the exact implications that housing designs and layout systems have in relation to crime in RDP development neighbourhoods. Various principles such as defensible space principles and crime prevention through environmental design are emphasized in this study: Surveillance, territoriality, access control, image and milieu. Other supporting characteristics like housing design principles including housing structures, support activities and gated communities are highly elaborated, as well as street layout. These analytical criteria were used to examine the Chesterville RDP developments. Procedurally, the evaluation entailed analysing both street layout and housing design and analysing the views and perceptions of people living in the area. The findings indicate that residents of Chesterville display high level of perception of safety although they do acknowledge that there is petty crime once in a while. The researcher asserts that overall housing design and layout systems for crime prevention have positive implications on crime reduction in residential areas.

The study also investigated the type of criminal activities that occur in the area. The study analysed the types of criminal activities which were related to housing and layout in Chesterville RDP developments. Data was collected by conducting household surveys and an interview with the community leader. Local and international case studies that were used revealed interesting scenarios of the usage of environmental design to aid crime prevention. In the context of Chesterville the main findings showed that there is a sense safety in the area although assault was found to be high. The study thus proposed recommendations in an attempt to improve crime reduction in Chesterville as a whole.

This dissertation is structured as follows: The chapter one introduces the research problem, research questions, hypothesis, and the research method used to conduct the study. Chapter two provides both the theoretical framework and the literature review for the topic being studied. International and national case studies are used to support the flow of the argument. Chapter three introduces the geographical and historical background of case studies in which the study was conducted. This historical background is linked to the topic of study to help to understand the phenomenon of crime prevention. Chapter four deals with the presentation

and analysis of data collected and in chapter five conclusions are drawn from the findings and recommendations are made.

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LIST OF ABBREVATIONS AND ACRONYMS

3-D	Designation, Definition and Design
ANC	African National Congress
BNG	Breaking New Ground
CBD	Central Business District
CCTV	Closed Circuit Television
CMDA	Cato Manor Development Association
CMDF	Cato Manor Development Forum
CPTED	Crime Prevention Through Environmental Design
CSI	Community Safety Initiative
CSIR	Council for Scientific and Industrial Research
CRA	Chesterville Resident Association
EIA	Environmental Impact Assessment
EMI's	Environmental Management Inspectors
FGD	Focus Group Discussion
IDP's	Integrated Development Plans
IPT	Independent Project Trust
JOBURG	Johannesburg
LDO's	Land Development Objectives
NCPS	National Crime Prevention Strategy
NETCOM	Network and Communication
RDP	Reconstruction and Development Programmes
SAPS	South African Police Service
STATS SA	Statistics South Africa

Chapter 1

Introduction and research methodology

1.1 Introduction

Crime is one of the biggest problems in cities around the world; it creates concerns such as violence and community disintegration, which affects thousands of people's lives every day. Crime is experienced in all hierarchies of housing; high, middle and low cost housing developments in Chesterville. Low cost housing developments may be referred to as social housing, public and even Reconstruction and Development Programmes (RDP) starter houses (Mkuzo, 2011). The focus of this research was on crime experienced in low cost RDP housing developments. This is because throughout South Africa RDP housing developments have been stigmatized with a high rate of crime such as robbery, hijacking and housebreaking (Lehohla, 2006). Crime is defined as an act or omission that violates the law and is punishable upon conviction and it includes offences against a person or property, drug offences and motor vehicle offences (Palmary, 2001). According to Brantingham and Brantingham, (2001) cited in Marzbali et al (2012), crime typically occurs when three things happen at the same time and in the same space: a motivated offender, a suitable target and an appropriate opportunity. Figure 1 below illustrates the basic elements of crime.
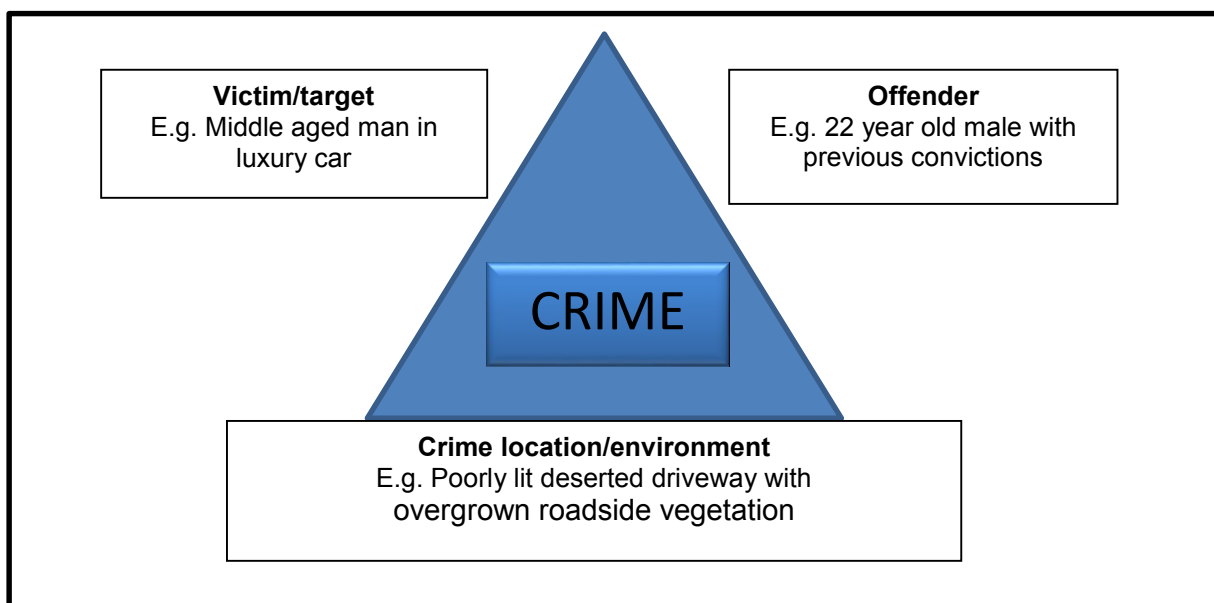
Figure 1: Basic Element of Crime [Sourced from www.cpted.co.za]

Since crime is a major problem in many countries, the topic of crime prevention has become broad and surrounds many different environmental spaces such as residential, open and commercial places (Cozens and Hillier, 2008). Architects, designers, and town planners have been concerned with crime problems in urban centres and residential areas and how to design ways to prevent such crimes (Marzbali et al 2012). Crime Prevention Through Environmental Design (CPTED) is one method which has been used by planners and architects to mitigate crime. CPTED is a concept used to create positive behavioural effects by manipulating the physical environment, which in turn, diminishes offender activity and the fear of crime (Jeffery, 1972).

The layout design of an area plays a great role in how that built environment is perceived by people. According to Goodenough (2006), the way people perceive an area either encourages or defers them from acting criminally against people or property. Chesterville is a low cost residential area which is part of the Cato Manor area of the eThekwini Municipal Region, and has an estimated population of 14 008 (Capmon, 2012). Since the 1990's, a lot of expansion has taken place from the original 'Chesterville', built in the 1940s (Mohamed, 2002). The Chesterville which is now referred to consists of a number of residential areas, such as Chesterville Extensions 1, 2 and 3, Bonela, Insimbini Incremental Phase 2 and Ridgeview. Characteristics of Chesterville include widespread of poverty, unemployment, high prevalence of HIV infection, a general lack of social support, domestic abuse and violence, orphaned children, dysfunctional households, low levels of education, and crime (Vukukhanye, 2013). According to Stats SA (2001) Chesterville experiences unacceptable levels of crimes such as theft, assault such as stabbings and muggings, hijacking, rape and murder. Subsequently, to the Stats SA research (2011), the rate of criminal activities have significantly been reported to have decreased because ways to reduce crime through the environment have been discovered and implemented. Ndlovu (2001) argues that when there is crime in an area the residents start to develop fear and as a result of fear of crime they move from one place to the next because of their unsafe environment. This results in residents not being able to invest freely in their houses because of fear of criminal activities in their surrounding environment.

1.2 Research Problem

The problem identified in this study is the prevalence of crime at the Chesterville RDP development residential neighbourhood. A survey conducted by the Independent Project Trust (IPT) indicated that burglary, robbery and assault were the most prevalent criminal activities experienced in Chesterville (Goodenough, 2006). The Chesterville RDP development area was constructed as part of a project implemented by the Cato Manor Development Association (CMDA)[1]. This project was tested in many areas of Cato Manor including Chesterville. The development of houses was a form of delivery system to provide housing for the Chesterville community. According to Maharaj and Khan (1998), the CMDA finalised the design and layout plans of the area and this was done in consultation with the community. Maharaj and Khan (1998) further argue that the plans did not attempt to resolve the issues of crime in the area, yet the challenge facing the post-apartheid South African housing policy[2] is to provide not only houses for people but also a safe environment for people to live in (BNG, 2004). The international experience of using Crime Prevention Through Environmental Design (CPTED) has shown that there are many ways in which crime can be reduced or prevented through incorporating environmental design, housing design and layout systems (Casteel and Peek-Asa, 2000). This can be argued not to have been prioritized in the context of low-cost residential areas such as RDP developments in Chesterville.

Residents of Chesterville face and experience high rates of criminal activities and this has created fear amongst people in the neighbourhood (Goodenough, 2006). This could be because when the area was initially developed through the CMDA presidential project, the planners did not prioritize as means to prevent crime or spaces that prevent criminal activities. According to CMDA (1994-2002) the priority for the Chesterville incremental phase 1[3] was to provide much housing for the people as quickly as possible without emphasizing much on the design and layout aspects of the area. Hence it is important to

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[1] Cato Manor Development Association founded in 1993. CMDA is an agency responsible for redevelopment in the Cato Manor area. Projects of the CMDA consists of construction of low-cost housing, schools, libraries, police station, community hall etc.

[2] Example: White Paper on Housing (1994)

[3] CMDA housing projects were constructed in rotation style, this means that one area would be developed at a certain period of time and then when it is complete they would move to the next area for example: Chesterville Incremental Phase 1 and Chesterville Ext

understand the roles of housing and layout designs in order to determine how such designs influence or reduce crime in a residential area.

According to Franklin (2010), housing and layout design is defined as the way a housing unit is located in relation to services, access roads, size of the streets, and position of the house relative to its neighbours. In the case of Chesterville, the majority of the houses are single standing RDP houses on individual plots as well as detached houses sharing plots. According to Franklin (2010), a good housing and layout design is one in which the houses are not isolated from the street layouts and have a relationship with other elements of the surrounding environments such as open space, car parking and access roads. Access roads to a residential area can determine the level of criminal activities. Arguably, houses located on streets which are close to the main roads with heavy traffic will be most vulnerable to crime (Cozens and Hillier, 2008). The perpetrators may most likely target such houses close to the main roads because potentially it will be easy for them to exit the area. In essence this study will assess the housing and layout design of Chesterville in order to evaluate whether such layout designs have facilitated the occurrence of crime or facilitated the reduction in housing and layout-related crimes.

1.3 Objectives of the study

The main objectives of the study are:

1. To evaluate the extent to which housing and layout design of Chesterville have contributed to the occurrence or reduction of crime in the area.

2. To assess the different approaches to crime prevention such as defensive space and CPTED entail, in order to evaluate their applicability in an area such as Chesterville.

3. To make suggestions as to how to reduce crime through housing interventions in Chesterville.

1.4 Research question

To what extent has the housing and layout design of Chesterville RDP housing development impacted on criminal activities in the area?

1.4.1 Subsidiary questions

The following questions were designed specifically to best serve the purpose of the research. The questions are directly linked with the main research question:

1. What kind of criminal activities are experienced in Chesterville?
2. How are these criminal activities related to housing and layout design of the area?
3. What physical characteristics of the layout design can assist to reduce crime?
4. What physical interventions can be enhanced to the housing structure to prevent crime?
5. How can the concept of defensive space be applied in Chesterville to reduce criminal activities?
6. In what ways can the principles of CPTED be applied in Chesterville as methods of crime reduction?
7. What methods do people use to prevent crime in Chesterville?
8. How can the community of Chesterville assist in crime reduction strategies in their neighbourhood?

1.5 Working Hypothesis

The use of appropriate housing and layout design can lead to a reduction of criminal activities in RDP residential areas.

1.6 Definition of Key Concepts

1.6.1 Crime Prevention Through Environmental Design (CPTED)

CPTED uses a variety of disciplines to foresee the offender's mind-set and hence create an environment that deters criminal behaviour. Crowe (2000) states that the central theory used to arrive at the strategies is the analysis of crime and the environment where it occur using an analytic question "why here". Furthermore, such analyses have proved that: crimes are specific and situational; crime distribution correlates to land use and transport network, and offenders are usually optimistic and commits crime in place they know well (Atlas, 2008). Moreover, these analyses reveal that opportunities for crime arise out of daily activities and places that are often without observation. The strategies that are employed to achieve CPTED objectives are through the use of, natural surveillance, alarm and warning systems

installation, and access control (Jeffery, 1971). Some of these strategies were observed in Chesterville and used as guidelines in order to assess the patterns of criminal activities and also to determine whether such strategies could be used as a means to prevent criminal activities in the future.

1.6.2 Crime prevention

There are various ways in which crime prevention is defined. According to Fernandez (2005) crime prevention is any initiative or policy which reduces, avoids or eliminates victimization by crime or violence. It includes government and non-governmental initiatives to reduce fear of crime as well as lessen the impact of crime on victims. The different levels of crime prevention are primary, secondary and tertiary. According to Kruger (2001) at the primary level, crime prevention refers to population-based programs such as public education on crime and how to use the physical environment to help reduce criminal activities. At the secondary level, crime prevention refers to programs that target those at higher risk for criminal activity. This level would include programs for youth at risk of leaving school and parenting programs for high-risk parents. At the tertiary level, crime prevention refers to rehabilitative and supervision programs for offenders to reduce re-offending. The working definition fitting the context of this study is primary crime prevention.

Primary crime prevention refers to the techniques which are used in the physical and social environment at large and more importantly modification of the physical environment to reduce criminal opportunity (CSIR, 1997 and Kruger, 2005). It must be noted that focusing on ways to reduce the need or desire of certain individuals to commit crime is not easy but other ways such as controlling the opportunity for crime to occur can be used as a method of reduction. For example, a home which has burglar proof doors and windows reduces the opportunity of being broken into when compared to a home without (Fenelly, 1989 and Franklin, 2010). This is an example of a primary crime prevention technique based on the physical modification of a house. Such technique among others could be recommended for the residents of Chesterville to help to reduce crime targeted at their homes.

1.6.3 Housing and layout design

Layout design can be defined as a means of creating a physical environment to reach the desired goals of a community whether that desire is efficiency, beauty, behaviour, modification or control (CSIR, 1997). Housing design incorporate the positioning of buildings, wall structures, doors, windows, spaces between houses, and access points while the layout design incorporates the street size and arrangement of blocks in the neighbourhood. The two concepts are distinct in that housing design is about the actual built form and the layout focuses on the arrangement of lot, block and street pattern (Kruger, 2005). A well designed layout and house structure is argued to have the ability to prevent occurrences of criminal activities as there is a relationship between the built environment and criminal behaviour (Casteel and Peek-Asa, 2000).

Colquhoun (1991) cited in Ndlovu (2001) suggest that houses should be designed to create a sense of security and local belonging. This means that houses should not face the street, rather they should face each other and be accessed on each side of the street. The houses should be designed in a manner that lets residents have natural surveillance over each other's homes. The layout of the streets should create a pattern of roads and footpaths which relate to the houses. This is important because the residents will have access to their homes and at the same time facilitate natural surveillance from the house. When there is natural surveillance it means that there are always people on the streets and people watching over each other from their homes, allowing for them to identify strangers in their area (Cozens and Hillier (2008). Natural surveillance has been argued to discourage criminals to offend because they fear being recognised or even being caught (Newman, 1996 and Jeffery, 1971).

1.6.4 RDP developments

The Reconstruction and Development Programme (RDP) was a South African socio-economic policy framework which was implemented in 1994 by the African National Congress (ANC). It came after months of discussions, consultations and negotiations between the ANC, its Alliance partners the Congress of South African Trade Unions (COSATU), and the South African Communist Party, and mass organizations in the wider civil society (Corder, 1997). The ANC's main aim in developing and implementing the RDP was to address socio-economic problems that were caused by the apartheid regime (ANC, 1994). The term reconstruction materialized because of the way in which the apartheid policies were

structured to divide between race in order to prevent mix use of the physical environment, socio economic, land and health care. In this regard black and Indian people were not allowed to work or live in the city because the city was structured and designed to restrict movement and occupation of black and Indian people. An example was the Group Areas Act No. 41 of 1950 and Reservation of Separate Amenities Act No. 49 of 1953, which segregated people by race and area in which they lived in.

When the democratic government came to power in 1994, poverty alleviation and the creation of a better life for all became the central focus in its endeavor to rebuild the country (ANC, 1994). The consequences of the past inequalities left many South Africans destitute. A large number, mainly black citizens, were very poor, had no proper homes to go to and therefore stayed in shacks[4] (ANC, 1994). Among other challenges such as unemployment, crime, and lack of infrastructure, the new government inherited a major problem as the majority of communities were, and to a large extent some are still, without a decent dwelling (Mkuzo, 2011). It is through this realization that the need to launch housing projects throughout the country came about. In an attempt to improve the quality of the lives of its citizens, the government introduced low-cost housing projects through its Reconstruction and Development Programme (RDP) (Mkuzo, 2011). Hence the houses built through this programme were later commonly known as 'RDP Houses'. The low-cost houses built through the government housing programme were common in the urban areas of the Republic of South Africa. Through the Reconstruction and Development Programme, the government embarked on a full scale development mission of building houses for the poor. This was in line with what the majority of the people expected after the first democratic elections which were held on 27 April in 1994 (ANC, 1994).

The RDP set a new policy agenda for the country based on the principles of meeting people's basic needs on a sustainable basis. In 1996 the Constitution of the Republic of South Africa was adopted, this Constitution entrenches the right to basic needs, and this includes the right to housing (Corder, 1997). It is the government's duty to take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of this right; the right to housing is a Constitutional right (ANC, 1994). The Constitution compels the government to ensure that its people have access to adequate housing. Consequently, the government launched various housing projects throughout South Africa. To date, these

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[4] The term which is used to describe informal housing

projects have seen many municipalities across South Africa benefiting from the scheme resulting in many houses built and delivered to beneficiaries (Mkuzo, 2011).

The RDP housing development in Chesterville Township[5] was part of the Cato Manor Development Association Presidential project piloted post-1994 (CMDA, 1994-2002 and Mohamed, 2002). One of the objectives to deliver housing to the previously disadvantaged community was through starter houses which could be consolidated in time. Chesterville is one of the residential areas that comprises of RDP housing developments that were constructed in the post-apartheid period (Mohamed, 2002). It can be argued that when the area was initially designed, it was not based on any methods of crime prevention such as CPTED but to provide housing for low-income people.

1.7 Research Methodology

This section of the study comprises of secondary sources of data which are discussed briefly in the literature review. It also comprises of primary sources of data which was gathered through an in-depth interview and household surveys which were subsequently analysed.

1.7.1 Primary sources

Information was collected from the following sources using the following research methods and tools.

1.7.1.1 Interview with Chesterville Community Leader

Primary data was acquired through an in-depth interview with the Community leader of Chesterville. The community leader was approached before the study commenced, and the first meeting was arranged. Upon this meeting the researcher informed him of the intentions for the study and to ask permission to access the community. Apart from getting access to the community, the community leader was also asked if he could take part in an in depth interview which contributed greatly to the study. This individual was the right candidate for

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[5] Historically, in apartheid South Africa, the term "township" was used to depict the place where black people resided on the urban periphery. It has become an accepted English word to describe the same areas even in contemporary South Africa. Despite obvious poverty, which has also led to the rise in informal settlements within these areas, townships have seen expansive development in the post-apartheid era. They are vibrant, overcrowded and popular.

this interview because not only is he the community leader of Chesterville but also a member in the Chesterville Community Association. His knowledge of the neighbourhood together with his experience and involvement in the Community association was important to gain baseline information about the study area and the status of the crime situation.

1.7.2 Chesterville Household Survey

Primary data was also acquired through a household survey. The candidates who were eligible for this survey were the residents of Chesterville both male and females who have been staying in Chesterville for a year and more. The residents are most likely to know about the criminal activities that occur in their residential area. The household survey was semi-structured and consisted of open-ended questions. With open-ended questions, usually a given set of questions are covered and additional space is given to the participant to elaborate if probed (Japp, 2006). The reason why open-ended questions were chosen for the survey was because open-ended questions have an advantage of allowing the researcher to probe for underlying factors relating to the research. The factors which were emphasized in the survey questions were the types of criminal activities Chesterville experiences and whether they are housing and layout-related. It was also crucial to explore the types of methods which the residents of Chesterville use as a way to prevent crime in their neighbourhood and how efficient those methods have been.

1.7.2.1 Sample Size for Household Survey

Chesterville has a total population of approximately 14 408 and a total number of 3 450 households (Capmon, 2012). Chesterville households are divided into formal housing (2 500), informal (867), traditional housing (31) and other unidentified types of housing (35). The researcher was interested in the formal types of houses which are 2 500 (Capmon, 2012). The researcher used stratified sampling because she was interested in obtaining the perceptions and experiences of residents in Chesterville whose homes fall under a set of defined categories. According to Stats SA (2011) stratified sampling is a method of sampling designed to divide population into homogenous subgroups. The researcher identified five categories (subgroups) and each of the categories was setting a scenario of likely places for criminal activities to occur in Chesterville. The sample size which the researcher choose for this study was 5% of the 2 500 houses; 5% represent 125 houses which were then chosen to participate in the survey. The selection of these categories was based on the assumption that

those houses and the people living in them are the most targeted victims for house breaking, robbery, assault, rape and mugging. The information needed to be obtained from the survey were those highlighted in the research's sub questions i.e. the residents' response to the level of crime in their neighbourhood. The categories which the researcher identified in Chesterville were:

1. **Houses facing the main roads**

   Chesterville has four main roads; Mahlathi Rd, Prince Bhekuzulu Rd, Ngwenya Rd and Molife Rd. 40 houses were randomly selected along each of these main roads to represent this category.

2. **Houses close to the neighbourhood entrance**

   Chesterville has six entrances but only four enter into the RDP development residential area. These entrances are; Mahlati Rd, Imbali Ave, Phola Pl and Ngwenya Rd. This category was represented by 18 houses which were selected at random along the four named entrances.

3. **Houses close to shops and other economic activities both formal and informal**

   Six roads were identified as locations for both formal and informal economic activities for example; café shops, spaza shops[6], street vending, mechanical shops and taverns. These roads are Langalibalele Rd, Masuku Rd, Sihotho Rd, Maphephetha Rd, Cebisileville Ln and Phola Pl. 25 houses close to economic activities were selected at random along these roads to represent this category.

4. **Houses at the end of a street/road (dead-end streets)**

   The researcher identified four streets in Chesterville which end as a dead-end[7]. These streets are Thames Rd, Bhubesi Rd, IsiKhalo Rd and Cebekhulu Rd. This category was represented by 22 houses selected randomly along the dead-end streets.

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[6] An informal type of shop were convenient goods are sold, for example soap, bread, cold drinks, cigarettes, fruits and vegetables

[7] A Dead-end is a street or road that ends with nothing beyond it. It may end as a cul-de sac opening to a river, trees, vacant land etc.

5. Corner houses

The researcher identified several corner houses along the layout of Chesterville thus, 20 houses were selected at random in numerous corner locations to represent this category.

1.7.3 Secondary Sources

For secondary sources, the study made extensive use of literature from books, journals and research articles. The literature provided the study with valuable information on specific issues related to the built environment which informed the study on how housing and layout designs are created. Some specific literature was on crime prevention as well as how housing design and layout may facilitate the occurrence or prevention of crime. Related local and international case studies on the usage of CPTED were also used as precedents and recommendations were drawn from it. Literature has been written on crime prevention and safety strategies in residential areas, that is why it would be essential to also look at how those strategies have succeeded or failed. A White Paper on Safety and Security 1998 as amended in 2004 was consulted. This policy informed this study on a strategic approach of how bodies of government[8] have implemented ways in which South Africa as a whole fight crime and consequently at a community level such as Chesterville.

1.7.4 Pilot Study

The researcher found it important to conduct a mini pilot study in Chesterville to get an idea of how the community would respond to the household surveys. The pilot study assisted the researcher to find out if the prospective participants would understand the purpose of the study and the probable questions which would be asked. In the case where the participants did not understand the questions, the researcher went back and improved the questions by rephrasing them in a simplified manner. The sample size for the pilot study was 10 households, and two were chosen from each of the categories. The pilot study assisted the researcher to determine which day and time would be suitable to conduct the survey and also to determine the response rate from the prospective participants.

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[8] Bodies of government such as provincial, national and local

1.7.5 Data collection procedure and Data analysis

The researcher approached the Community leader of Chesterville, to set up a meeting to discuss the purpose of the study and to get access to the community. The community leader was enthusiastic about the research and welcomed the researcher to access the community, he also offered to inform the local councillor, about the concerns of the research. Once the researcher had gained access into Chesterville, the researcher then proceeded to evaluate the suitable time and days to conduct the household survey. The researcher found that the most suitable days to conduct the survey were on Saturday and Sundays. These two days were ideal for the researcher and the respondents because the majority of them were available at home during the weekend. The researcher hired an assistant to help with the survey. The assistant was there to help complete the survey while the researcher interviews the respondents and also to interpret the question in IsiZulu to those respondents who preferred to use their home language.

Data was analysed using qualitative methods of data analysis. The questions which were raised in the survey and the interview enabled the researcher to provide the necessary data to answer the research question and to test the working hypotheses. The key aspects about crime reduction, CPTED and Defensive Space, which were believed to have an influence on unpacking the research question were used to interpret data. The method which was used to process the participant's responses was selective coding[9] which was used to code the different responses of the participants. Similar responses were grouped together to be analysed in percentages, graphs and tables.

1.7.6 Limitations

There were five limitations that need to be acknowledged and addressed regarding this study. The first limitation was the language barrier. The researcher is a non-Zulu speaking individual, thus making it difficult to use the isiZulu language during the household survey. Many of the respondents were not willing to communicate in English and they indicated that it was because it is not their primary language. This limitation was resolved because the

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[9] Selective coding is done after having found the core variable, the core explains the behavior of the participants in resolving their main concern. The tentative core is never wrong, it just more or less fits with the data. After choosing the core variable then one can selectively code data with the core variable guiding the coding.

researcher hired a Zulu speaking assistant to help in conducting and translating the questions on the household survey to isiZulu.

The second limitation was the failure of the tape recorder to produce good quality sound. The researcher realized after two days that the sound quality was bad and the contents of what was recorded were not usable. The reasons which the researcher identified to be hindering the quality of the sound were because the survey were conducted outdoors and there was noise from people in the streets, radio and cars passing by. Therefore the researcher decided to discontinue to record. Nevertheless the researcher continued to collect data through interviews of the household survey and note taking.

The third limitation was participants withdrawing from the survey. The total sample size of the 125 household was chosen but only 87 participants took part in the survey. Out of the 38 participants left only 4 refused to take apart in the household survey and their reasons were that they did not have time, which the researcher respected and moved on to the next participants. The 34 who remained are the participants who took part in the survey but withdrew in the middle of the survey. Some of the participant's reasons for withdrawing were that the survey was long and they are tired of answering. Some said that they cannot finish because they would like to finish cooking while some said they do not want to finish because the researcher might be an undercover police looking for information. The researcher assured the participants that this was a confidential academic research that had no harmful intention and thanked them for participating.

The forth limitation had to do with the difficulty to obtain enough participants to take part in the focus group. The reason why a focus group was chosen was because a focus group would have been appropriate to assist the researcher to develop a discussion with the participants which was related to their knowledge and experiences with regards to crime reduction in Chesterville. According to Gibbs (1997) focus groups can be cumbersome to assemble, as the use of such a method could discourage participation from inarticulate or unconfident respondents. Secondly, the group nature of the method precludes confidentiality of responses. Lastly, separating an individual view from the collective response can be complex, as individual respondents are influenced by group responses (Gibbs, 1997). A scheduled Focus Group Discussion (FGD) was anticipated to be used to collect data from members of the

Chesterville Resident Association and from the Vukukhanye organisation. These two groups worked together to ensure that community safety initiatives (CSI) were implemented in Chesterville. A focus group would have been appropriate because it would have given the researcher the opportunity to develop a discussion with them related to their knowledge and experiences with working in conjunction with each other on the Community Safety Initiative (CSI) Programmes.

According to Vukukhanye (2009) the aim of the CSI programme was to reduce crime and promote development of this historically disadvantaged community where crime and other socio- economic stresses are high. Some of the underlying aspects which the researcher needed to know from the focus group discussion were why and when the Vukukhanye organisation and the Chesterville Community were founded and what were the factors that steered to its establishment. It was also important to find out whether the community safety initiative programmes in the Chesterville area have failed or succeeded. By getting this information the researcher was thus able to consider possible recommendations for crime reduction in Chesterville. Nonetheless the researcher failed to assemble a focus group because the chairperson of the Vukukhanye Organisation said that they had handed over the Community Safety Initiatives and other programmes to the Chesterville Resident Association (CRA). When the researcher communicated with the CRA about scheduling a focus group there was a positive response towards this. The date for the focus group was near and the participants which were recruited by the community leader forwarded that they had commitments and thus will not be able to make it. A second date was scheduled and the participants were still not available for the focus group.

1.8 Chapter Outline

Chapter 1: Introduction and Research Methodology
This is an introductory chapter which includes the outline of the research problem, the objectives of the study, the research question and subsidiary questions and the working hypotheses. A discussion of a research methodology is also incorporated in this chapter.

Chapter 2: Theoretical framework and Literature review
The chapter provides theoretical and conceptual framework perspective with regards to the research. It also illustrates what has been researched in the field of housing and layout-related

methods to crime reduction. The literature also provides a standpoint within which the research problem and research questions are explored. This chapter also explores local and international case studies on crime reduction, the successes and failures of how crime prevention approaches were implemented.

Chapter 3: Historical background of the study area
This chapter gives a brief historical background of the Greater Cato Manor and more specific Chesterville from the mid- 1600s up to date. The impact of the history of Cato Manor on the development of Chesterville is provided in this chapter.

Chapter 4: Presentation and analysis of findings
The chapter explains the meanings and conclusions drawn from research outcomes and the implications of the findings.

Chapter 5: Conclusions and Recommendations
Conclusions will be made based on the findings of the study and recommendations on how to deal with some of the problems that have been identified in the research.

Chapter 2

Theoretical Framework and Literature review

2.1 Introduction

The literature review and conceptual framework provide the context within which the study was structured. It further critically explores the impact of Housing layout and design in relation to crime reduction in RDP housing developments. This chapter is going to discuss some theories and previous studies which have been used to prevent and reduce crime in the built environment.

Theories and approaches that were used in this study include the Crime Prevention Through Environmental Design (CPTED) by Jeffery Ray (1972), Defensive Space Theory by Oscar Newman (1996), and situational approach to crime prevention. The topic of crime prevention is broad and encompasses many different environmental situations. Town planners have been concerned with crime plaguing urban centres and residential neighbourhoods because it is important that people live in environments in which they feel safe (Crowe, 2000). This concern for environmental safety for the public has led to extensive research on the subject of crime prevention (CSIR, 2007).

In the book "Design Outlines for Creating Defensible spaces", Newman (1972) outlined five basic principles of designing a defensible space. These basic principles are: the allocation to different groups the specific environment they are able to use and control, for instance the basketball court is best assigned to male teenagers. Second principle entails demarcation of space in housing developments to exhibit the zone under the control of specific inhabitants. Third, invokes the strategic juxtaposition. Fourth, incorporation of the streets within the direct influence of an inhabited setting and the embracing of building styles which eludes the stigma of irregularity that normally allows others to make out the susceptibility. And fifth, involves seclusion of a specific group of residents (Newman, 1972). Although the notion of using defensive space has been explored in the early 1970's by different writers, it was only in 1972 that it was coined by Oscar Newman as a theory. He then suggested that environmental design has the ability to promote a latent feeling of territoriality amongst

residents which might as a result encourage people to act against criminals and criminal acts in their community (Newman, 1972).

2.2 Theories and Approaches

2.2.1 Defensive space theory

The defensible space notion emerged during the spring of 1964 at the Washington University in St. Louis, USA. A group of planners and architects were investigating life in a public housing project in St. Louis and they began inquiring into the possible effects of the architectural setting on the social well-being of community and on the crime and vandalism prevailing there (Newman, 1972). Defensive Space is a terminology used to describe an environment whose physical attributes building plan, location and function allows the occupants themselves to become key agents in safeguarding them (Jeffery, 1971 and Newman, 1972). In other words defensive space is both a social and physical phenomenon, which means that a housing unit is only secure if its inhabitants intend to take on the role of safeguarding it (Newman, 1972). The theory emphasizes that a location is safer when its individuals possess a sense of responsibility for it; Newman (1996) puts it as, the criminal is secluded because his territory is removed. This means that if each space is owned and catered for by a conscientious caretaker then a burglar will feel more vulnerable perpetrating his crime (Newman, 1972).

In the defensive space theory there are four factors that constitute a defensible space: the concept of territoriality, which is a sense of possession and control for a particular property; natural surveillance, which is the connection between a location's physical attributes and the inhabitants' ability to monitor what is happening; the physical space's Image or ability to convey a sense of security; and milieu, which is other characteristics that may have an effect on security like nearness to a busy road (Newman, 1996 and 1972). According to the theory, housing projects that stir up territorial sentiments are usually effective in combating crime and defacement. Newman (1972) argues that through good design people should not only feel comfortable in questioning what is happening in their surroundings, they should feel compelled to do so. This means that any criminal should be able to perceive a watchful community monitoring his actions. Newman (1972, 1996) focused on three physical mechanisms of achieving defensible space:

1. **Territoriality: The capacity of the physical environment to create perceived zones of territorial influences.**

Territorial reinforcement employs design elements such as sidewalks, landscaping, and porches to help distinguish between public and private areas and helps users' exhibit signs of "ownership" that send "hands off" messages to would-be offenders (Newman, 1972 and 1996). The concept of territorial reinforcement suggests that physical design can create or extend a sphere of territorial influence and potential offenders perceive that territorial influence. For example: low walls, landscape and paving patterns to clearly define the space around a unit entry as belonging to the residents of the unit. Territorial Reinforcement also fosters a sense of ownership because people take more interest in something they own or when they feel intrinsically involved. Therefore, the environment should be designed to clearly delineate private spaces by providing obvious defined entries, patios, balconies and terraces by using low walls, landscape and paving patterns to delineate ownership and responsibility (Newman, 1972 and Jeffery 1971).

Figure 2: Illustration of usage of street frontage to attract and enhance pedestrian activities as well as strengthen territoriality. Image sourced from the CPTED guidelines from National crime prevention Council, 2003)

2. **Natural Surveillance: The capacity of physical design to provide natural surveillance opportunities for residents and their agents.**

Natural Surveillance is a design concept directed primarily at keeping intruders under observation. It utilizes design features to increase the visibility of a property or building. The proper placement and design of windows, lighting, and landscaping increases the ability of those who care to observe intruders as well as regular users, and thus provides the opportunity to challenge inappropriate behaviour or report it to the police or the property owner (Newman, 1996). Goodenough (2006) asserts that when natural surveillance is used to its greatest advantage, it maximizes the potential to deter crime by making the offender's behaviour more easily noticeable to a passing individual, police patrol, or private security detail. Jeffery (1971) argues that a good visual connection between residential and/or commercial units and public environments such as streets, common areas, parks, sidewalks, parking areas and alleys. Place activity rooms such as kitchens, living/family rooms and lobbies to allow for good viewing of parking, streets and/or common areas.

Figure 3: A transparent fence allows for surveillance onto and from the street. Image sourced from Kruger et al (2001), Designing safer places

3. Image and Milieu: The capacity of design to influence the perception of a project's uniqueness, isolation and stigma.

According to Kruger and Landman (2003), urban decay and its resultant degradation make people using these areas feel unsafe. Often this reduces the number of users, which could exacerbate the crime problem. A good design and an effective management of spaces in the city are necessary factors that prevent precincts from becoming actual or perceived 'hot spots' for crime (Franklin, 2010). Vacant land that is not maintained or unoccupied buildings can both contribute to decay as do litter and the breakdown of services. The image of spaces can be improved by ensuring human scale in design, using attractive colours or materials, providing adequate lighting, and designing for high levels of activity (Kruger and Landman, 2003). Figure 4 below shows an illustration of how image and milieu is used in order to create a sense of welcoming and safety. A good design like this also offers the residents natural surveillance of the surround around their home and they can also overlook the streets and other activities in and around their yard.

Figure 4: Illustration of image and milieu. (Image by researcher, 2013)

Based on these three physical mechanisms, Newman (1996) asserts that residents can restructure the physical layout of their communities to allow control over the areas around their homes. Newman's defensible space ideas represented a brilliant attempt to use architectural form to rescue public housing in the United States from the destructions of crime (Goodenough, 2006). This was because Newman (1972 and 1973) believed that the design of public housing developments discouraged residents from taking responsibility for public areas and from exercising their normal territorial instincts to exclude predatory offenders. In particular, he criticized the large scale of the buildings which made it impossible for residents to recognize strangers, the multitude of unsupervised access points that made it easy for offenders to enter the area and to escape after committing crime. To emphasize his theory he then provided a range of detailed design suggestions for creating "defensible space" through reducing anonymity, increasing surveillance and reducing escape routes for offenders (Newman, 1972 and 1996). Newman's defensive theory was used in this study to evaluate which of the defensive mechanisms can be used or have been used in Chesterville to help reduce crime.

2.2.2 Crime prevention through environmental design (CPTED)

Crime prevention through environmental design can be defined as the implementation of measures to reduce the causes of, and the opportunities for, criminal events, and to address the fear of crime through the application of sound design and management principles to built environments (Jeffery, 1972). Understanding crime is critical to its prevention. Whether or not a crime occurs depends on the interaction of several elements. These elements include the physical and social environment in which a crime occurs, the presence of active or passive forms of surveillance, the perpetrator, and the target or victim of a crime (CSIR 2001). The form of the built environment can influence these elements and several design principles are fundamental in designing to reduce crime. In line with the findings of this research, defensible space is then designed to reduce crime and the fear of crime while improving the quality of life. In Crime Prevention through Environmental Design the four most widespread CPTED approaches are: natural surveillance or close watch, natural territorial reinforcement or fortification, natural access control or and target hardening (Jacobs, 1961). The following are the descriptions of the principles:

2.2.2.1 Natural surveillance and visibility

Natural surveillance in CPTED is achieved by maximising opportunities for observance of public and private areas either by users or residents during the course of their normal activities (passive surveillance) or by police or other security personnel (active surveillance) (Kruger, 2005). This type of surveillance ensures that environments are made visible through effective lighting and uninterrupted lines of sight. It can also be referred to as the presence of "protective eyes" because of the extent of visual contact people have with a space and whether their presence is visible to determine whether they can intervene and have their users feel safe (Kruger and Liebermann, 2001). Passive surveillance depends on a range of design factors including the placing of windows, doors and other openings, the distances between buildings, the sizes of public spaces and types of land use (Franklin, 2010). Some of these factors were assessed in Chesterville in order to determine their presence or absence in the area. See figure 5 below illustrating the concept of active surveillance.
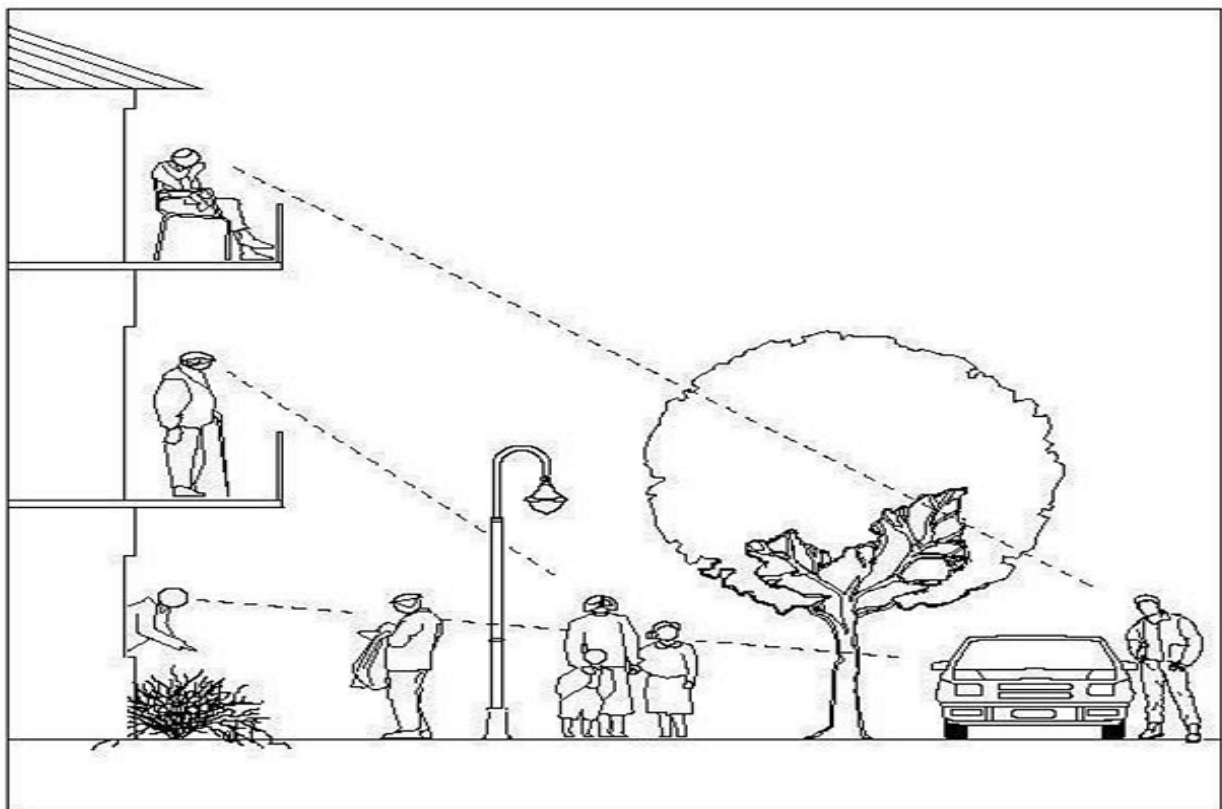
Figure 5: Illustration of active surveillance (image sourced from Google, 2014)

Active surveillance refers to surveillance by police or other agents whose main function is to patrol an area and surveillance is improved if there is good visibility (Kruger, 2007).

According to Jeffery (1971) and Kruger (2005) visibility is the degree to which an environment is made visible by elements such as lighting and uninterrupted lines of sight. Dark or twisting streets, alleys, entrances and doorways can act as havens for potential offenders and increase residents' and visitors' fear of crime (Kruger, 2005). The way in which lighting is designed and positioned, and the way roads and paths are laid out can prevent many of these problems and render environments and users visible to anyone in the environment. Criminals in such a space feel scrutinized and self-aware, this diminishes the chance of them engaging in unlawful acts in such a space, this strategy takes effect by cutting down the opportunities for engaging in unlawful behaviour (Meyer and Qhobela, 1998). In such a design, sidewalks on the streets are made intentionally wide so as to accommodate as many pedestrians as possible. Unnecessary walls are usually eliminated because the walls block the resident's line of vision, windows are positioned overlooking opportunistic points of entry and by closed circuit television (CCTV) is used to monitor suspicious individuals (Kruger and Liebermann, 2001).

2.2.2.2 Territoriality and defensible space

Territoriality is a sense of ownership of one's living or working environments. Places can be designed and managed in ways that encourage owners to take responsibility for them through a concept such as "defensible space" (Newman, 1972 and 1996). Spaces are defensible if people are able to exercise control over them. The benefits of increased territoriality include avoiding wasted or vacant space through the use of areas for explicit purposes and the greater likelihood of intervention by passive observers because they feel responsible for their environments (Kruger, 2005). The design of building edges and the delineation of boundaries to mark private, semi-public and public spaces make the use of spaces unmistakable to people frequenting the city and increase the chances that they will be owned and maintained by their users. Kruger (2005) and Jeffery (1971) emphasize that territoriality and defensible space can be encouraged in a number of ways.

- Avoid tracts of vacant land without designated uses or control. All spaces should have an explicit purpose and be the clear responsibility of some individual or group. This is because open spaces without designated uses, which present themselves as vacant or abandoned land, are likely to become sites for crime.

- Design the public realm so as to increase people's ability to read the built environment. Create an identifiable neighbourhood character through the layout, architecture, street furniture, landscaping, as well as consistency in the approaches utilised. This is because when people understand the language of the built environment, their interaction to it improves. This reduces the fear of crime because people are able to locate themselves in the neighbourhood, even if they are there for the first time.

2.2.2.3 Access and escape routes

According to CSIR (2001), access and escape routes are available to both the offender and the victim. The sites of certain types of criminal events are often deliberately chosen by the offender before the act, for access to escape routes. For example: when car hijackings are planned they are also often prearranged to allow quick escape routes. The layout of transport routes and the juxtaposition of different types of space influence the ease of access and escape (Kruger, 2005). There are a number of ways to limit easy access and escape routes for criminals and promote escape routes for victims through environmental design.

- Avoid ending roads and streets on vacant or undeveloped land. Rather ensure that these end at property edges, at controlled open spaces or in recognised pedestrian paths.
- Carefully plan the location, size and design of large open spaces such as large parks and golf courses so as to avoid their becoming areas of refuge and escape for offenders. This is because Crime statistics suggest a correlation between the location of incidents of housebreaking and access to large open spaces.

Figure 6: Example of visible access road (Image by researcher, 2013)

2.2.2.4 Target-hardening

Target-hardening is the physical strengthening of building frontages or boundary walls to reduce the attractiveness or vulnerability of potential targets (CSIR, 2001 and Kruger, 2005). Most people in residential areas use walls around their houses and burglar bars on windows and doors as a way to prevent their homes being broken into. Target hardening is often the first solution that occurs to residents and designers because it physically reduces opportunities for crime. According to Newman (1996) however, the common mistake that is done is to violate other principles of defensive space in the process. If target-hardening in buildings obstructs lines of sight or obstructs natural surveillance, then such target hardening is unlikely to be an effective crime prevention strategy in the long term. A positive way to promote target-hardening is through the application of appropriate barriers and fences which does not hinder passive natural surveillance by casual passers-by or police patrols. Considering this, it is better to replace high walls with a more transparent fence or barrier and avoid setbacks and recesses in property walls which become ideal places for potential offenders to hide and wait before and after committing crime (Kruger, 2005). See (figure 7) below an example of target hardening.

2.3 Situational approach to crime prevention

The situational approach to crime prevention originated in Britain. Its development was influenced by two independent concepts; "defensible space" by Oscar Newman and "Crime Prevention through Environmental design" by Jeffery Ray (Clarke, 2009). Both concepts had ideas which attempted to use architectural and environmental designs to reduce places that created opportunities for crime. A number of authors and crime prevention specialists have highlighted the need for a holistic approach to crime prevention for cities, these authors include Weckerley and Whitzman 1995; Wilson and Wileman 2005 (Landman and Kruger, 2009). Holistic approach requires the development of a local, community-based crime prevention strategy that takes into account the needs of all the urban residents and the impact of different crime prevention initiatives on the city as a whole, while also indicating which crime prevention initiatives would be the most appropriate for a particular situation (Rondeau et al 2005 cited in Landman and Kruger, 2009).

Situational approach to crime prevention encompasses strategies that reduce opportunities for crime. This is done by modifying the situation in which offence occurs (Clarke, 1997 and

Casteel and Peek-Asa, 2000). This approach incorporates crime prevention through environmental design by focusing on making the built environment less conducive to crime. This may include, for example; improving mechanisms for surveillance through better lighting and usage of open space for natural surveillance (Clarke, 1997 and Goodenough, 2006). Interventions that work in one environment or location may not be successful in another due to the varying factors that play a role in the occurrence of a crime. Therefore, planning and design interventions need to be combined with other crime prevention approaches (Landman and Liebermann, 2005). It is necessary to have a clear understanding of the possible causes of the different crime types that are being addressed, since different types of crime require different responses. Jeffery (1971) stressed that CPTED interventions have to be context-specific and based on a local crime analysis. According to Clark (1998) "the more complete the designer's knowledge of a problem, including visual images, the more enriched the design solution will be". This means that one has to analyse a specific neighbourhood and consider a situational approach to crime reduction. Given this, there is a need for a site-specific analysis that takes into account the existing and potential crime activity in order to feed the information into the design or modification process (Landman and Kruger, 2009).

Clark (1998) asserts that, "adding a crime analysis component to the site analysis process that identifies crime patterns, the behavioural and environmental context, crime attractors and generators, and the criminality of places and paths will allow design solutions to be more accurately focussed on reducing the actual crime opportunities". For example: in the revitalising parks through the use of CPTED project in Houston, the implementation of the project started with individual park assessments. The modifications were designed to address park-specific problems, including trails leading to remote areas of the parks; and motion detectors and high intensity lighting to improve opportunities for surveillance of after-hours congregation points (NCPC, 1997).

In the case of Chesterville, the researcher assessed the factors that cause criminal activities in different areas of the neighbourhood. Once the causes were identified, ways to mitigate such crimes were suggested which revolve around the causes. For example, the housing and layout designs of the area had to be thoroughly assessed in order to identify whether the design facilitates the occurrence or reduction of criminal activities. This theory helped to guide the

study in order to come up with suggestions that could be used to prevent crime based on where and how they are occurring.

2.4 A review of housing and environmental design on crime reduction

Essentially crime in South Africa affects different people and parts of the city in different ways. According to Ndlovu (2001), people who live in gated communities do not experience crime the same way as people who live in open access neighbourhoods. This is because those who live in gated communities have closed access to their area and not anybody enters because of security and entrance rules depending on the area. Open neighbourhoods have a free flow access in and out of the neighbourhood; this makes residents vulnerable to incidences such as crime due to the fact that there is not much control over who enters the area (Fernandez 2005). Ndlovu (2001) asserts that the way in which crime affects people has implications for planning and prioritization of design interventions into residential areas. Hence the notion of adapting and exploiting the environment, particularly the residential built environment, to assist with crime prevention is not new. According to Prevatt (1998), CSIR (2005), and Fernandez (2005); countries like Canada, the United States and the United Kingdom have used crime prevention through environmental design as one of their best design strategies in order to reduce crime in both urban centres and residential areas.

The concept of using the environment as a defence mechanism is not a new one. According to Goodenough (2006) even in medieval times it was a standard procedure to ensure the safety of big cities by building walls around it. At that time caves, which were placed on high ridges had only one entrance and castles had canal dug around it, these serves as examples of how people during the medieval time made use of the environment in making their dwellings more defensive. According to Newman (1972), during the last thousand years every culture developed its own architectural building techniques to define the territoriality of their dwelling. In the beginning of the twentieth century these principles of building and inherited ways of life were largely lost due to the development of large cities and residential areas (Jacobs, 1961). In the 1960's, as the new developments emerged, pioneers in the built environment developed an interest in making use of the environment as a defensive mechanism (Meyer and Qhobela, 1998). Researchers with architectural background such as Oscar Newman, Jane Jacobs and Elizabeth Wood identified the need for change in the planning environment (CSIR, 2007). It was mainly Jacobs and Woods who initiated the built

environment approaches, although it was Newman who popularized and fully developed this concept in his early work in the 1970's (Meyer and Qhobela, 1998).

Elizabeth Woods proposed that public housing should be designed internally and externally, providing areas for exercise, play and strolling. She emphasized that these areas would be private but still providing residents with surveillance opportunities (O'Block, 1981). The primary aim of her theory was the improvement of visibility, advising that children's recreation areas and adults sitting areas should be placed within the view of the apartment, see figure 8 below. Her concept was aimed at achieving natural surveillance by residents and she focused on creating more fulfilling environments for low income populations (O'Block, 1981). She was mainly advocating for recreational facilities, meeting places of all types, shops, churches and sport areas to be accommodated within the housing project (Meyer and Qhobela, 1998).

Figure 8: Recreational areas within close proximity to residential areas (Image sourced from Google, 2014).

On the other hand Jane Jacobs (1961) also contributed to this research field with her book "Death and Life of Great American Cities". In summary, she describes the inadequacies of the city planning and rebuilding methods. This was because Jacobs (1961) believed that the

public rather than the police are a critical factor in controlling crime in a neighbourhood. Her contribution included introducing ways of making the street a safe part of the environment in the following ways:

1. Public and private spaces should be clearly demarcated from one another.
2. There must be eyes on the street in terms of natural surveillance both active and passive.
3. The buildings on the street must be able to handle strangers and to ensure the safety of both resident and strangers and must be oriented towards the street.
4. The sidewalks should have a continuous flow of pedestrians to increase the number of effective eyes on the street as well as encouraging the people in building along the street to watch the sidewalk in adequate numbers (Jacobs, 1961).

In the 1970's Newman coined the concept of Defensive Space with his attempts of improving the living condition of the low-cost house projects (Meyer and Qhobela, 1998). Although other researchers had come up with ways to control living conditions in residential neighbourhoods, arguable Newman (1972) was the first to actually link crime reduction directly with housing and street design changes. He developed the concept of Defensive Space, which aimed to place all the spaces in a neighbourhood under observation and local control that will inhabit or decrease crimes of opportunity.

2.5 Crime Prevention Through Environmental Design in a South African Context

Kruger (2005) asserts that South African cities and towns have been shaped to a large degree by planning practices that were a result of apartheid policies. Cities were divided into various zones based on race, see (figure 9) below an example of the apartheid model. The central business core was surrounded by residential areas traditionally reserved for the white population. These areas were usually characterised by sophisticated and well-maintained infrastructure and facilities (Kruger, 2005). On the periphery of the town or city, townships were created for the migrant black labour force. Most of these areas were underdeveloped and lack adequate infrastructure and social amenities. The Coloured and Indian communities were situated between the white and black areas to act as a buffer (Kruger, 2005). The white communities were further separated from the townships by purposely-designed buffer zones, which were either set aside for industry or left unused and this resulted in informal settlements spontaneously developing (Kruger, 2005).

FIGURE 24-14 The late apartheid city.
Adapted from Simon (1989).
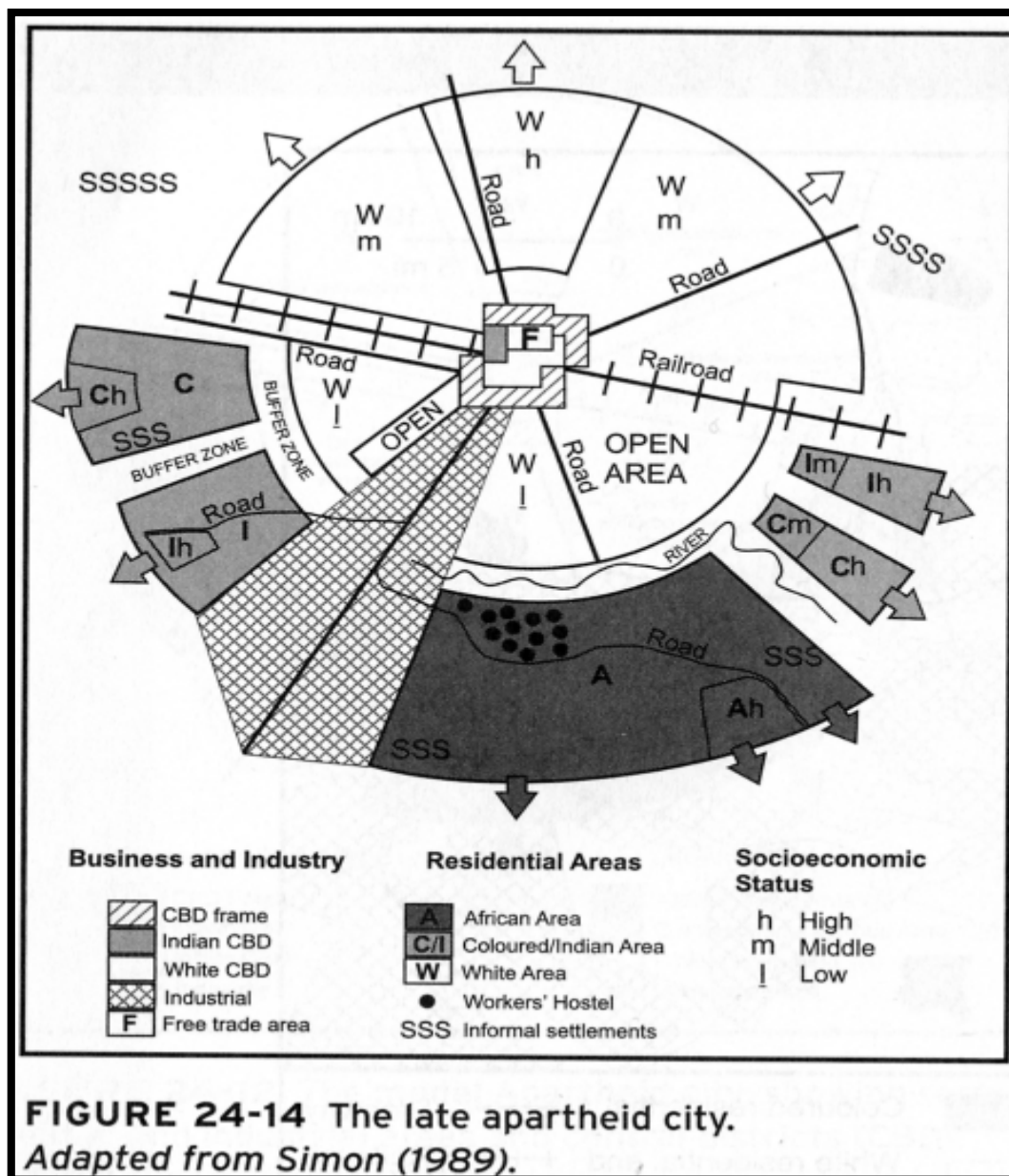
Figure 9: Example of an Apartheid Model (Image sourced from Simon, 1989).

After the 1994 elections, Government committed itself to developing more liveable, equitable and sustainable cities (ANC, 1994). Key elements of this framework included pursuing a more compact urban form, facilitating higher densities, mixed land use development, and integrating land use and public transport planning, so as to ensure more diverse and responsive environments whilst reducing travelling distances (Kruger, 2005). Despite all these well-intended measures, the inequalities and inefficiencies of the apartheid space economy, has lingered on. According to Landman and Kruger (2009), in South Africa

environmental design has been identified as one of the four pillars of the National Crime Prevention Strategy (1996), and was subsequently also been recognised for its value in the White Paper on Safety and Security (1998). The White Paper identifies two broad approaches to crime prevention, namely law enforcement and social crime prevention. Environmental design to reduce crime is highlighted as an element of social crime prevention. It can be defined as follows:

"Crime Prevention through planning and design aims to reduce the causes of, and opportunities for, criminal events and to address the fear of crime by applying sound planning, design and management principles to the built environment" (Designing Safer Places, 2001 cited in Landman and Kruger 2009).

A number of basic principles emerge as fundamental in designing to reduce crime. While these principles are universal in the design of safer environments, they have been adapted to suit the characteristics and dynamics of South African cities (Kruger, 2005). Most of these cities were shaped by apartheid planning principles, which contribute to the crime problems. With this in mind, crime prevention through environmental design becomes an even greater challenge (Ndlovu, 2001). The CPTED principles described in previous sections directly support the aims and objectives of the comprehensive housing plan, the Breaking New Ground (BNG, 2004). The vision of the National Department of Housing is that of "A nation housed in sustainable human settlements with access to socio-economic infrastructure". This vision is expanded on and reinforced in the "Breaking New Ground" document, with the Department committing itself to meeting a number of objectives, including:

1) Combating crime, promoting social cohesion and improving quality of life for the poor.
2) Utilising housing as an instrument for the development of sustainable human settlements, in support of spatial restructuring (BNG, 2004).

At a strategic level, planning approaches could be adopted by local government to actively encourage the reduction of vacant land, 24-hour land use, the pedestrian use of infrastructure, equitable provision of facilities and amenities. This could be supported by more detailed CPTED guidelines aimed at guiding the design of the physical development at local level (CSIR 2001). It is highly impossible that crime prevention through environmental design (CPTED) can be used to prevent all crimes because there are types of crimes that do not fall

under the category of housing development and the built environment e.g. highjacking, bank robbery, drug trafficking and mineral smuggling. The crimes that are assumed relevant in housing neighbourhoods are assault and property crimes such as theft, burglary, damaging of property, robbery in public areas, and hijacking especially in driveways and in intersections (Stollard, 1991). Preventing crime in residential areas has become a key challenge to government in post-apartheid South Africa. Subsequently, the National Crime prevention strategy (NCPS) has put into perspective a full implementation of crime prevention through environmental design in housing but there is little experience to be draw from South Africa (White Paper on Safety and Security, 1998).

South African cities have experienced significant expansion and spatial transformation post 1994. It is arguable that this transformation has been accompanied by a number of challenges including high levels of unemployment, inequality, insecurity and crime (ANC, 1994). Landman (2012), asserts that the release of crime statistics 2011 has indicated that some crimes such as burglary, assault, rape, robbery and theft have steadily increased while others such as murder and hijacking have decreased significantly from 67.9% per 100 000 people to 37.3% per 100 000 people between 2008-2010. In the latest crime statistic released 19th September 2013, Police Minister Nathi Mthethwa was positive that crime had decreased in many parts of the country although there are still areas which need improvement (News24, 2013). There have been various responses to crime prevention ranging from increasing law enforcement effort to intervention in the built environment. Many of these interventions include an over emphasis on target hardening through hard boundaries such as fences, walls, burglar bars on windows and doors (Landman, 2012 and Kruger and Landman, 2008). Many countries have used CPTED in their cities, residential neighbourhoods as well as in recreational areas.

2.6 Local case studies of approaches to crime prevention

2.6.1 South Africa, Johannesburg

According to Cheetham (2001), a number of Safer City Initiatives, similar to those in the USA have been implemented in South African cities, with Johannesburg being the most advanced. Since the installation of Closed Circuit Television (CCTV) in 1997, crime has

dropped by 57 % in areas where the cameras are installed (Gauteng News, 2001 cited in Cheetham, 2001).

2.6.1.1 Overview of the Johannesburg safety strategy

The Joburg 2030 City Safety Strategy is the City of Johannesburg's key development plan, which contains a radically new approach to crime reduction and public safety (Joburg City Safety Strategy, 2007). In order to give effect to those provisions of the Joburg 2030 City Safety Strategy which deal with crime and public safety, the City decided to develop an integrated and multi-disciplinary Joburg City Safety Strategy. The Joburg City Safety Strategy aimed to define a common approach to dealing with crime, violence and safety and security in Johannesburg (Cheetham, 2001). This safety strategy was also guided by external agencies involved with safety and security in Johannesburg, such as the South African Police Service (SAPS). The Joburg City Safety Strategy (2007) proposed the urgency of putting in place programmes short to medium-term initiatives of local crime prevention interventions. The Initiatives launched included:

- The Johannesburg Safer City Project, 1997
- A Business Plan for the Development of a Comprehensive and Integrated Strategy to Reduce Crime and Violence in Greater Johannesburg, 2000
- The establishment of the Johannesburg Metropolitan Police Department in March 2001

In order for the Johannesburg city to implement the proposed strategies, the city together with SAPS and Stats SA had to conduct a crime analysis report of Johannesburg. According to Joburg City Safety Strategy (2007), Johannesburg is unique because it produces a large fraction of South Africa's GDP, and it contains a very large fraction of the country's vehicle crime, bank robberies, and fraud. The most recent crime statistics, which are available from the SAPS indicated that Johannesburg still stands out in South Africa as having a far higher incidence of crime than most other areas. Arguably, this might be because the city is relatively near the land borders to neighbouring states and contains the largest international airport, which facilitates the smuggling of stolen vehicles and other transnational organised crime (Cheetham, 2001). It is also notable that the highest levels of interpersonal violence in Johannesburg takes place in the historically black townships in and around Johannesburg and in urban areas which have decayed such as Hillbrow and the CBD (Joburg City Safety

Strategy, 2007). High levels of property crime take place in these areas however, much of the serious property crime, including housebreaking, business burglary, armed robbery and the hijacking of vehicles, takes place in the more affluent parts such as; Johannesburg Central and Booysens, Moroko, Yeoville and Eldorado.

Once the main areas were identified it was then easy to strategize programmes to address how crime reduction initiatives would be implemented. Environmental design was on the agenda, but is mostly focused on how certain environments affect the safety of citizens and not on reducing crime through design. Although evidence suggests that the council's approach to environmental design is not yet holistic, this has not hindered the city from incorporating the principle in a number of projects, which are contributing to the current revitalization of Johannesburg (Cheetham, 2001). Private architects and urban designers were employed to provide a framework and principles for creating safer communities. One example was the Baralink Development Corridor Scheme, which links Soweto to Johannesburg's CBD. Another example was the revitalization of the Western Joubert Park Precinct including Jack Minster Square, Joubert Park and the Johannesburg Art Gallery, which used the principles of designing out crime by making physical changes to the environment (Joburg City Safety Strategy, 2007). The success of these projects will inform future policy on using environmental design for crime prevention.

2.6.2 South Africa, North West Province

The White Paper on Safety and Security (1998) places a responsibility on Provincial Departments in this sector to ensure the implementation of the National Crime Prevention Strategy (NCPS). The Department of Transport, Roads and Community Safety of the North West Province therefore has a constitutional responsibility to promote, coordinate, monitor and evaluate implementation of the (NCPS) in the province (Kruger et al, 2006). Successful implementation of the NCPS depends on a balanced focus on its four pillars. The province has thus far paid attention to pillars one to three, which focus on re-engineering of the criminal justice system and public values and education respectively. This strategy focuses on the second pillar of the NCPS which addresses Crime Prevention through Environmental Design (CPTED). Kruger et al (2006) argues that the department realised that the implementation of CPTED need to be based on a clear strategy if pillar two is to be

effectively implemented and coordinated. Furthermore, it was recognised that achievable goals for the short, medium and long term needed to be identified and a set of criteria developed to assist with the monitoring and evaluation of the implementation of the strategy.

2.6.2.1 Socio- Spatial Context of North West

The North West Province is divided into four district municipalities and 21 local municipalities. These local municipalities comprise settlements ranging from large urban areas classified as primary regional centres (three) through secondary regional centres (five), to one tertiary regional centre and numerous smaller district centres (seven) and rural district centres (three) (Kruger et al, 2006). This settlement pattern provides evidence of its sparse population density distribution system. The population is settled in a low-density dispersed settlement pattern in the eastern and central parts with a higher density dispersed settlement pattern towards the north-eastern part of the province. 60% of the population resides in mainly rural areas largely concentrated in the eastern part of the province. The economy of the province remains mainly agrarian with small pockets of tourism. Historically mining has played a major part in the local economy's development and today Rustenburg, one of the primary urban centres, enjoys a reputation as the fastest growing town in the country, owing to the mining boom in the area. The growth of the town has been facilitated by the development of the N4 highway, which provides an east west corridor from Mozambique to Botswana/Namibia (Kruger et al, 2006). The urban areas cover a mere 1, 4% of the entire land area. Almost three quarters (71%) of the land is privately owned with some further 14% being state owned, 2% is tribal owned and 13% is tribal/state land (Kruger et al, 2006).

2.6.2.2 Crime situation in the North West

There are five major crimes which are arguably the most prevalent in the north west province these are; violent assault, common assault, burglary at residential premises, theft out of or from motor vehicle and aggravating robbery. According to Kruger et al (2006) these types of crime stand out as being the most prevalent crime in North West. There have been debates on why municipalities are often reluctant to incorporate crime prevention in to their portfolio of activities due to the fact that crime prevention policy and legislation are not seen to be clear enough on their roles and responsibilities (NCPC, 2003). According to Kruger et al (2006) with respect to CPTED specifically, policy and legislation do not exist that compel

municipalities to ensure that spatial planning and physical development initiatives are guided by CPTED principles.

2.6.2.3 What has been done for the North West province?

The municipality had a vision and strategic priorities as to how CPTED will be implemented and incorporated into their physical environment. Their vision stated: "A safe and secure province where physical environment reduces opportunity for crime and supports the development of safer communities" (Kruger et al, 2006). Some of their priorities were; to enhance integration between national and local government and the community, to build capacity and raise awareness of crime prevention and CPTED principles, encourage community participation and to initiate CPTED initiatives. What was also important was the realization of the importance of enabling legislation as well as acquiring adequate funding from local government departments (Kruger et al, 2006). The department's Strategic Plan 2005/09 highlights informal settlement upgrading and social housing as priority interventions. The department has the opportunity to promote the development of safer environments by, for instance, providing guidelines with respect to the incorporation of CPTED principles in such housing development projects. Some of the departments are as follows:

2.6.2.4 Department of Public Works

It is the department's mission to provide and maintain all provincial land and building infrastructure in an integrated, sustainable manner. As such, the department could potentially play a significant role in creating safer communities through appropriate planning, design and management of the physical environment (CSIR, 2001). Through collaboration with the Department of Transport, Roads, and Community Safety, the concept of CPTED could be incorporated into some of the activities of the department. The department could play an important role in the implementation of the CPTED strategy, for example by requiring that CPTED principles be applied to all infrastructure development projects (Kruger et al, 2006). Infrastructure maintenance also provides opportunities for the department to contribute to the creation of safer environments. A lack of maintenance could result in certain areas becoming unsafe, and therefore a well-managed maintenance programme could increase levels of safety. Furthermore, the expanded Public Works Programme could also be linked to crime prevention initiatives. The Public Works programmes could include projects such as the

upgrading of roads and sidewalks. As a result these projects could pro-actively assist to increase community safety and reduce opportunities for criminal activities to occur (NCPC, 2003 and Kruger et al, 2006).

2.6.2.5 Department of Agriculture and Environment Affairs

This department aims to create an enabling environment for sustainable development to achieve socio-economic upliftment of the people of North West Province. The particular focus of this department on issues pertaining to the environment creates opportunities for incorporating CPTED in some of its core activities (Kruger et al, 2006). Cooperation between the department and the Department of Transport, Roads, and Community Safety could facilitate the early identification of areas which are potentially unsafe and allow for preventive measures to be put in place timeously. For instance, vacant land sometimes increases opportunities for crime. Coordination between the two departments could identify interventions to reduce crime levels that are not ecologically damaging. Another possibility is to utilise the community participation component of the Environmental Impact Assessment (EIA) process as a platform to raise awareness about CPTED (NCPC, 2003). The envisaged introduction of Environmental Management Inspectors (EMIs) to monitor compliance with relevant environmental legislation may also provide opportunities for introducing CPTED principles to new developments.

2.6.2.6 Department of Human Settlements

The Breaking New Ground (BNG, 2004) asserts that there should be enhancing the Housing Product because there is a need to develop more appropriate settlement designs and housing products and to ensure appropriate housing quality in both the urban and rural environments. The new human settlements plan accordingly proposes the following:

1) Enhancing settlement design – The Department has introduced of enhancing measures and incentives to include design professionals at planning and project design stages, and will develop design guidelines for designers and regulators to achieve sustainable and environmentally efficient settlements. This is aimed at promoting the sustainable human settlement which are designed to prevent crime as well as providing development of dignified size of house that supports morality of family and society (BNG, 2004).

2) Enhancing housing design – The Department identified that there was a need to make housing interventions more effective, to enhance the technologies and knowledge which are being used to construct housing to improve shelter, services and tenure. The priorities for the people living there is the need to focus on "changing the face" of the stereotypical "RDP" houses and settlements through promotion of alternative technology and design. The Department has investigated measures and incentives to enhance housing design and promote alternative technologies, including support and protection to ensure sustainable environmental and sustainable design.

2.6.2.7 Department of Education

Kruger et al, (2006) and CSIR, (2001) argues that learners, and particularly young girls, are often victimised at school or on their way to and from school. In many cases, the physical environment enhances opportunities for crimes to be perpetrated against learners. For example, it has been found that the positioning and design of ablution blocks at schools could increase opportunities for crimes such as rape to be committed on the school premises. Also, learners are often particularly vulnerable in poorer areas where they have to walk to school along unsafe routes, for example; across vacant poorly maintained land or through dark areas (Kruger et al, 2006). The department, together with schools and learners, should collaborate with the Department of Transport, Roads, and Community Safety in identifying problem areas and developing appropriate responses and interventions to reduce safety risks for learners and teachers.

2.7 International case studies of approaches to crime prevention

2.7.1   Canada, Ottawa

Ottawa is a county in Canada where CPTED had been used successfully in an existing residential neighbourhood. CPTED has been a success in Ottawa because the bodies responsible for initiating CPTED have incorporated the police service and security personal within the community to support crime prevention. They also encourage residents to have fences, locks and burglar doors and windows to protect people and their properties. They furthermore used CPTED principles such as street lighting, target hardening, closed circuit television (CCTV) and street closure as a way to reduce potential areas for criminal activities (Pra Inc, 2009). The community of Ottawa have recommended that if CPTED is implemented

at a planning phase subsequently criminal activities would be lower as compared to the case where CPTED is implemented on an existing area.

Although the application of CPTED in Ottawa was a success, there were areas of concerns identified. Implementation of CPTED in Ottawa was not adequately funded by the government, it was not mandated by legislation or regulation, it was not linked to a broader crime prevention strategy and furthermore, it was not coordinated with the municipal planning process (Pra Inc, 2009). These are some of the concerns raised by the community of Ottawa. The significance of the Ottawa CPTED experience for this study is to look at their success strategies and determine how those methods could be recommended for Chesterville and furthermore to learn from the concerns raised by the Ottawa community.

2.7.1.1 Overview of CPTED in Ottawa

The Ottawa Police Service has conducted a study which shows that properly implemented CPTED strategies have helped to reduce crime in Ottawa (VanRyswyk and Shimuzu, 2007 cited in Pra Inc, 2009). This study randomly selected 10 locations that were audited during the planning process and 10 existing locations where audits were requested by the owners/occupiers. According to Pra Inc (2009), the researchers found that where recommendations were implemented at the planning stage, subsequent criminal activity was very low. They also found that the crime problems predicted by the CPTED analyst have occurred in locations where recommendations were not implemented. Similarly, they found that where the owners of existing locations followed the recommendations of the analyst, crime decreased. If recommendations were not implemented, crime subsequently remained the same or increased.

2.7.1.2 Recommendations drawn from the Ottawa Municipality

According to Pra Inc (2009), Crime Prevention in Ottawa began the process of integrating CPTED into municipal planning by organizing a planning meeting for those with an interest in community safety and CPTED. The goals included:

I. Familiarizing people with Crime Prevention Through Environmental Design. Participants will have different levels of knowledge about CPTED and all of them

should know the strengths and weaknesses of CPTED and understand its role as part of a comprehensive crime prevention strategy.

II. Developing an inventory of the CPTED-related activities now taking place in Ottawa.

III. Establishing a network of people who should be involved in increasing the use of CPTED in Ottawa.

IV. Establishing the structure for a CPTED Working Group to move ahead with the next steps in the process (Pra Inc, 2009).

Crime Prevention in Ottawa was convened and support the CPTED Working Group that coordinate CPTED activities. This CPTED Working Group had the responsibility of developing terms of reference, setting priorities, assigning tasks, monitoring activities and outcomes, and making recommendations concerning the resources required to implement CPTED recommendations (Pra Inc, 2009). The Working Group was tasked to report back to the City Manager's office. A municipal official was given the task of facilitating the use of CPTED in Ottawa. This person would be responsible for moving the initiative through the political and administrative systems. The person can be a senior planner or other senior administrator who champion the process and deal with barriers to change (Pra Inc, 2009 and Landman and Liebermann, 2005).

Another important aspect was public education campaign which is developed to familiarize the public with the benefits of CPTED. The Working Group considered the following several jurisdictions that use terms such as "Design Out Crime" which may have more public appeal than the term CPTED (Landman, 2009). A process was developed gave the public input into the use of CPTED. Members of groups such as neighbourhood associations and women's organizations had access to CPTED training and have the opportunity to participate in community crime audits and to review development plans. Alignment of some aspects of CPTED planning with the Neighbourhood Planning Initiative helped to ensure public participation. Finally, the City of Ottawa and Crime Prevention Ottawa worked with other municipalities to encourage the provincial and federal governments to play a greater role in developing and supporting CPTED as part of a broad crime prevention strategy (Pra Inc, 2009).

Crime prevention is not an add-on strategy but should be mainstreamed into the core business of the city and all relevant departments need to acknowledge their role and responsibilities (Kruger et al, 2006). In Canada, different departments incorporated CPTED into their core functions of Municipal departments. For example: The Building and Inspections department instituted security requirements for parking garages and multi-unit housing. The Parks and Recreation department adopted a new policy for security in parks and recreation centres, and offers free self-defence classes for woman. Public Works has re-lit most city streets with energy efficient, pedestrian friendly street lighting. The Housing department completed extensive evaluations of CPTED-based improvements to existing facilities. The Planning and Development department integrated safety into its master plan and published design guidelines for development review (Pra Inc, 2009).

2.7.2 England, Bradford

In some countries the structure of the city council may require adjustment in order to enhance and support a multi-agency approach; this was done in Bradford, England. The city Council implemented a "corporate" approach to dealing with safety (Landman and Kruger, 2009). As with many organisations or state institutions, Bradford City Council has been structured on a functional basis. This did not contribute to enabling a corporate approach to dealing with inter-departmental issues such as community safety. In an attempt to adopt a corporate approach while still fulfilling traditional service requirements, it implemented a new planning process that included identifying the following corporate priorities: rebuilding communities, partnerships for local regeneration, better education for all, a clean, healthy and valued environment, and fighting crime for a safer district (Landman and Kruger, 2009). The political and senior management structures were altered in order to reflect these priorities, and a community plan was developed to implement them. Performance indicators and targets were identified for each service, which, together with their costing attempted to quantify the inputs for the key service areas. Strategic performance indicators included consultation, analysis of effective partnerships, and reduction in crime and the fear of crime (Safety in Numbers: Promoting Community Safety 1999 cited in (Landman and Kruger, 2009).

2.7.3 Asia, Singapore

Singapore is one of the developing Asian countries which is advanced in its transport system, social facilities and public housing policy. Since they have one of the best public housing

policies, it was easy for them to incorporate CPTED in established housing developments as well as new ones. According to National Crime Prevention Council (NCPC) (2003), Singapore have been utilizing the concept of CPTED for many years, it was only recently that they reconceptualised strategic plans to enforce it in the built environment. According to Newman (1996), the principles of CPTED are territoriality, target hardening, natural surveillance and aesthetics. In Singapore they came up with another approach to CPTED called the "Three D approach OR 3-D", (Designation, Definition and Design). This approach is based on the ability to ask certain questions concerned with the given built environment and how well those questions can be answered. The 3-D approach is as follows:

Designation

1. The designated purpose of a specific space should be used accordingly.
2. Evaluation should be made to determine how well the space support its current use.
3. Identification of all conflicts between the designated purpose and current purpose must be pointed out.

Definition

1. The space must be defined and identified as to who owns it.
2. Borders must be clearly identified and where are they located.

Design

1. The manner in which physical design is structured it should support the intended function of the area.

The NCPC (2003) argued that if such questions are considered in a pre-designing stage of a development, planners and architects who are planning an area could then establish guiding information to design or modify space in order to create positive, natural surveillance, natural access control, territorial reinforcement, target hardening and maintenance.

2.7. 3.1 Examples of CPTED strategies applied in Singapore's public housing adopted from the (NCPC, 1997 and NCPC, 2003).

1. Lighting
All pedestrian walkways leading to buildings and car parks were lighted using public street standard and the lights were maintained regularly. See figure below illustrating how lighting near building can be implemented.

2. Street signs

Street names and block numbers are located in visible positions from the public road as well as within the housing development. There are also maps at central locations visible for anybody to see including visitors, delivery people and emergency services.

3. Formal surveillance

The community was trained by the Singapore public housing unit. The community was trained on how to respond to emergencies, residents are encouraged to report suspicious activities within the residential area. There is also formal security personnel who patrol the area regularly especially at night.

4. Mixed land use

Variety of land use was encouraged with emphasis on the residential and then the supporting services both formal and informal. Some of the services are; retail, post office, delivery service, street vending, and recreation. This is because land-use mix generates and encourages pedestrian activities which in turn serve as natural surveillance.

5. Park and open spaces

Small parks and edges of open spaces were designed in a way such that they overlooked housing developments. Walkways and foot paths were created in clear sight lines from the roads and housing developments, see figure 11 below

Figure 11: Parks and Open spaces (image soured form Google, 2014).

Conclusions

The aim of this chapter was to explore the theories and approaches which influence crime reduction in residential neighbourhoods. Crime Prevention Through Environmental Design (CPTED) is based on the idea that proper design and effective use of the built environment can lead to a reduction in the incidence and fear of crime (Kruger, 2005). CPTED design strategies have evolved from the 1970's up to date and its techniques have been used for years by urban experts such as Jane Jacobs and Oscar Newman to explore the relationship between the built environment and criminal behaviour. The importance of CPTED for this study was to evaluate which of the four elements could be used in Chesterville as methods of crime prevention and to what extent the community could get involved in crime reduction strategies in their own neighbourhood.

The literature review section analysed and provided insight on the principles of the defensible space and CPTED in the built environment. Ndlovu (2001) asserts that it has been proved that

crime prevention through environmental design is the best option for crime reduction in residential areas. It is important to note that in this literature, although crime prevention through environmental design may be the key factor in solving residential criminal problems, it cannot work successfully in isolation to major social factors such as poverty, unemployment and lack of education. Some of the elements which have been explored in this chapter were the key concepts and elements of both approaches which are surveillance, image, territoriality and milieu.

On an international level, research on the implementation of CPTED and Defensive Space has been going on for years to test its success and failures. Countries like Canada, the United States and the United Kingdom have used crime prevention through environmental design as one of their design strategies in order to try and reduce crime. This chapter looked at some of the examples of how crime prevention approaches were implemented internationally. It also looked at a South African example in the North West Province where CPTED was implemented for crime prevention. Therefore as a way of informing the study experiences of other countries and their recommendations will be drawn and used later in the conclusion and recommendation chapter. The chapter also explored some of the key lessons from local and International experiences regarding the implementation of crime prevention strategies. Positive outcomes were identified as well as learn from the challenges in order to draw recommendations which might be considered for Chesterville and also the eThekwini Municipality as a whole.

Chapter 3

Historical Background of study area

3.1 Introduction

This chapter gives a brief historical background of the Greater Cato Manor and more specifically Chesterville from the mid- 1970s up to date. The impact of the history of Cato Manor on the development of Chesterville is provided in this chapter.

3.2 Historical Background of Cato Manor

Cato Manor lies on the West of Central Durban. It is bordered by the Pavilion Shopping Mall and the N3 freeway on the north, Sarnia Road on the south, Manor Gardens and the University of KwaZulu-Natal on the east and Westville Prison on the west (Mhagama, 2004). Cato Manor is an area of approximately 2000 hectares, of which 900 hectares are suitable for development, with a population of about 97,000. Cato Manor consists of sub settlements such as Chesterville, Sherwood, Bonela, Wiggins, Umkumbaan, Bellair, Hillary and Ridgeview (CMDA, 2003), See Figure 2. It is strategically located just seven kilometres west of the Central Business District (CBD) of the major South African port city of eThekwini, and is traversed by the national N2 freeway. The history of Cato Manor is one that is intrinsically connected with the history of the Apartheid State (Vukukhanye, 2012). It was once a vibrant multi-cultural community of 100,000 people, a melting pot of Indian and African cultures surviving in the shadow of the city that excluded them. Under the Apartheid Group Areas Act of 1955, thousands of people were forcibly removed to the African townships of KwaMashu and Umlazi, and the Indian township of Chatsworth after Cato Manor was designated for white occupation (CMDA, 2003).

According to Vukukhanye (2009, 2012) by the late 1960s most of Cato Manor had been vacated. It remained largely unoccupied and undeveloped for the next 20 years. In the lead-up to South Africa's transition to democracy in the late 1980s and early 1990s, Cato Manor re-emerged as a contested urban space that attracted waves of land invasions, resulting in widespread informal settlement (CMDA, 2003 and NETCOM, 2003). The political significance of the forced removals in the 1960s, coupled with decades of official neglect,

environmental degradation and the social consequences of rapid, uncontrolled informal settlement, provided the challenge for key role-players in Durban's public community and non-governmental sectors to embark on a ground-breaking collaborative urban renewal initiative. In the 1990s, the greater Cato Manor Development Forum (CMDF) was formed and began negotiating a new future for the area, based on an integrated approach to redevelopment (CMDA, 2003). The new Cato Manor is envisaged as a cluster of well planned, medium and high-density suburbs with the necessary schools, shops, clinics and recreational facilities, close to the city centre and serviced by an efficient mass transport system, where families can make their homes and gain access to employment (Vukukhanye, 2012).
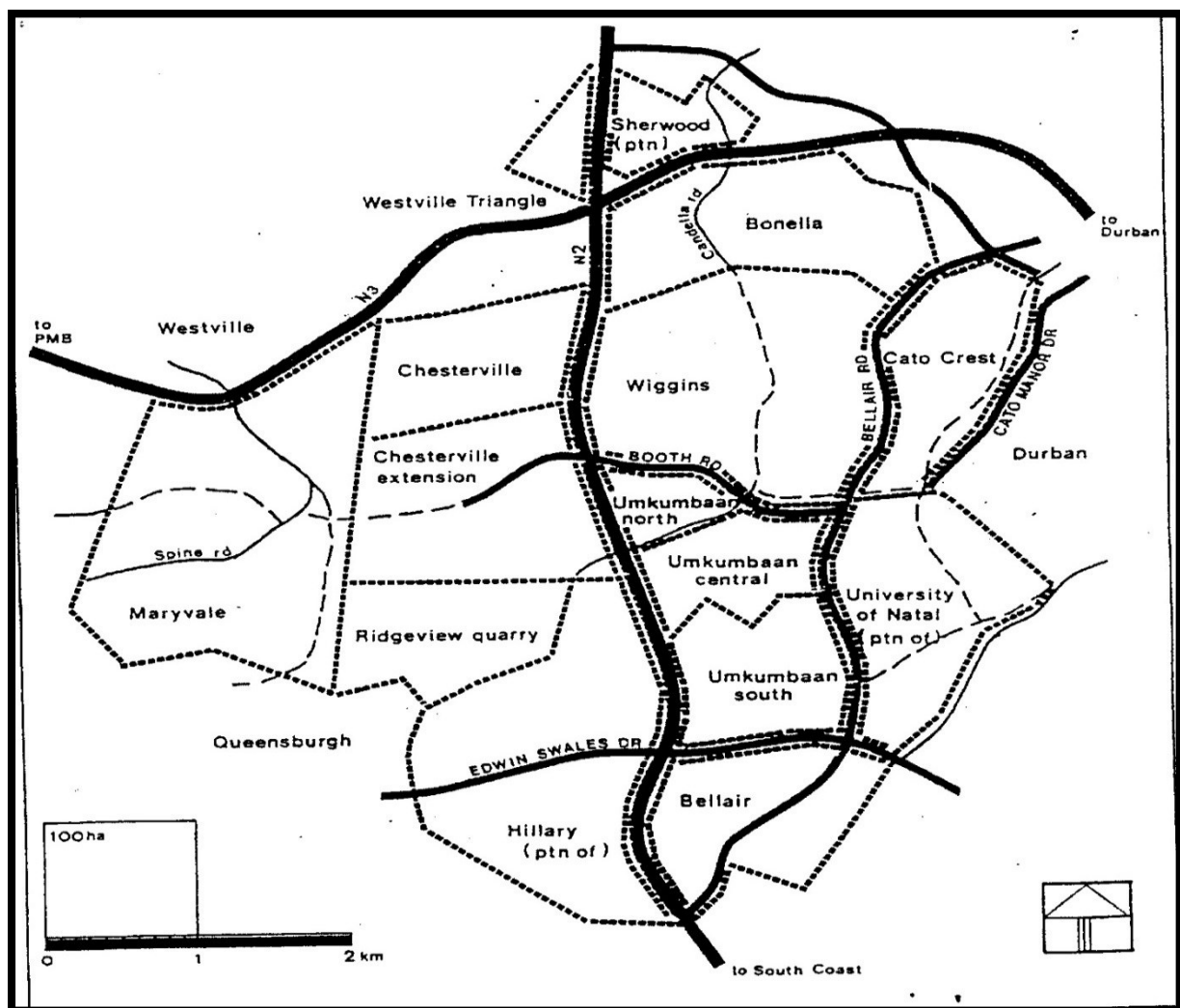
Figure 12: Site Map of Greater Cato Manor [Picture from Google 2013]

3.3 Description of and significance of study area

Chesterville is part of the Cato Manor area of the eThekwini Municipal Region, and has an estimated population of 14 008 people (CAPMON, 2013). Since the 1990's, a lot of expansion has taken place from the original 'Chesterville', built in the 1940s, see figure 2 for location and extension of Chesterville. The 'Chesterville' which is now referred to consists of a number of residential areas, such as Chesterville Extensions 1, 2 & 3, Bonela (part), Insimbini, Incremental Phase 2, Fast Track, Infill and Ridgeview, see Figure 2and 3. These merge with Mayville as one travel eastwards towards the University of Kwazulu Natal (CMDA, 2003). Characteristics of Chesterville include widespread poverty, unemployment, high prevalence of HIV infection, crime, domestic abuse and violence, orphaned children, dysfunctional households and low levels of education (Vukukhanye, 2013).
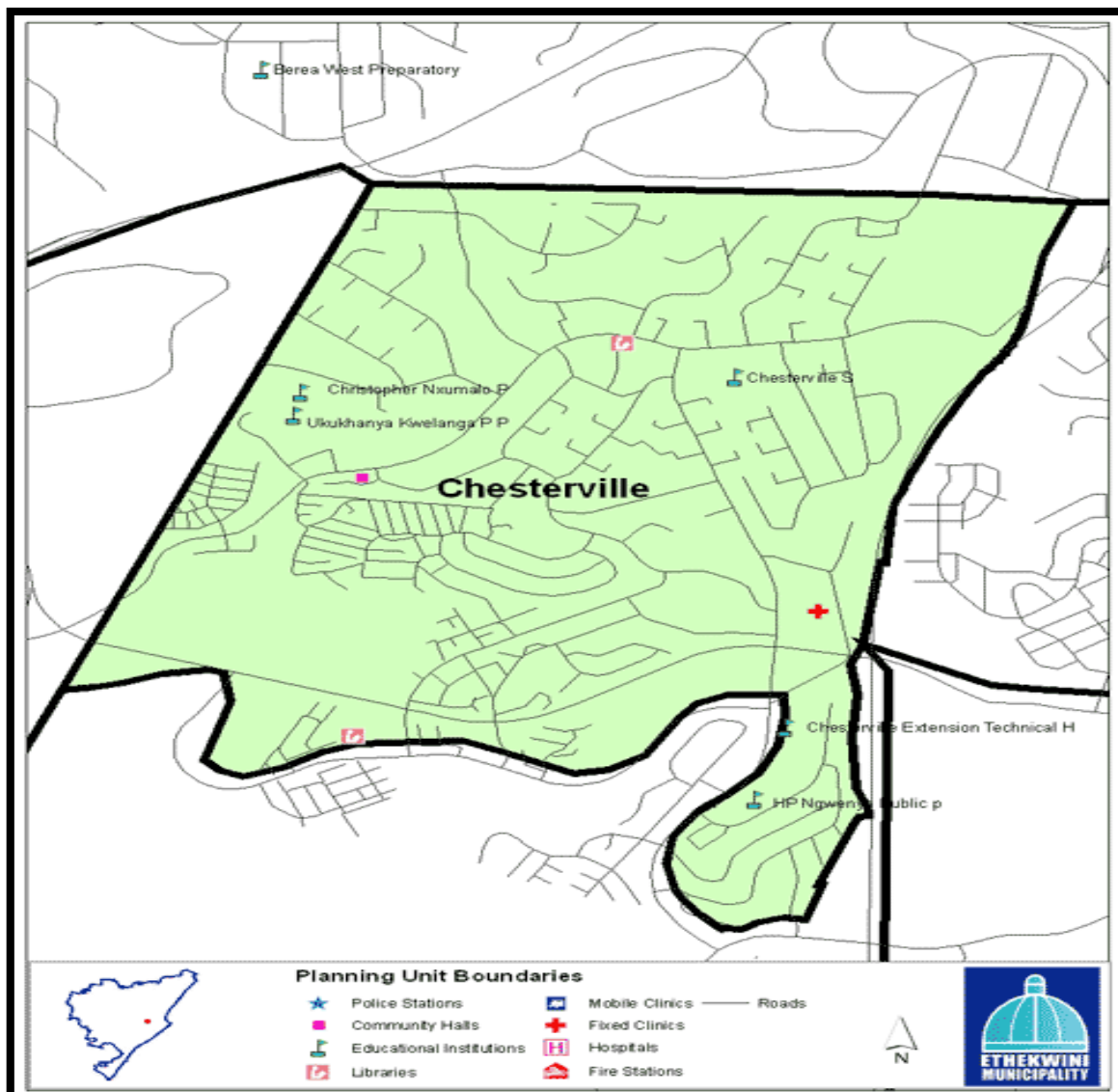
Figure 13: Sketch Map of Study Area [Picture Sourced from Capmon, 2013]

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3.4 Community Profile

3.4.1 Education
According to Vukukhanye (2009), in 2007 the Grade 12 pass rate at Chesterville Secondary School was only 47%. The Stats SA (2001) results suggest that in Chesterville only 31% of the population over 20 years old had passed Grade 12 and only 5% of the population over 20 have an education higher than high school level. This is lower than the average for the Durban Metro as a whole, where 10% of those over 20 years old have a post-secondary school education (Stats SA, 2001). The latest Stats SA (2011) thus suggest that in the ten years period the average grade 12 pass rate rose to 61% especially with the changes in the education system countrywide.

3.4.2 Unemployment and Poverty

Comparing unemployment of The eThekwini Municipality from 1996, 2001 and the latest 2011 shows that unemployment rate was 32.4% in 1996, 43.0 % in 2001 and 30.2 % in 2011. EThekwini suffers from the highest unemployment rate (30.2%) of any metropolitan area in the country (Stats SA, 2011). Statistics suggest that this is even higher in Chesterville, at 25%. According to CAPMON, (2013), only 5% of individuals in Chesterville earn more than R1, 600 per month and 20% of households are unemployed.

3.4.3 HIV/AIDS

Chesterville is a high risk community for HIV infection with an alarming 45% of pregnant women attending the local state ante-natal clinic being HIV positive (NETCOM, 2003). According to the eThekwini Economic Review 2006/7, the eThekwini Municipality has the highest HIV prevalence among antenatal attendees of any health district in the country, with a 39% infection rate in 2004/5. KwaZulu-Natal is also the province with the highest HIV prevalence among the 15-24 year old age group (Stats SA, 2010). Many HIV positive poor people, especially in 'Fast-Track' and Insimbini are unable to take ARV medication as they have too little food and the medication cannot be taken on an empty stomach. Vukukhanye (2012), asserts that the Street Committees are working towards motivating that the clinic allocation of one packet of porridge per week be increased to two packets. The Street Committee member's participation in the current 'War on Poverty' campaign may assist with this objective (Vukukhanye, 2012).

3.4.4 Crime and Community Dysfunction

According to Vukukhanye (2012), Chesterville experiences unacceptable levels of crimes such as theft, assault (e.g. stabbings and muggings), hijacking, rape and murder. To resolve such problems the Chesterville Residents Association in collaboration with Vukukhanye established Community Safety Initiatives (CSI) which includes crime awareness which lead to the formation of street committees (Vukukhanye, 2012).

3.5 History of Street Committee

Since July 2008 Vukukhanye and the Chesterville Residents Association have been engaging with business, government and civil society towards the establishment of formalized community safety groupings (namely 'street committees') in Chesterville, Cato Manor (Vukukhanye, 2010-2012. According to the community leader of Chesterville, the purpose of this initiative was to make the local area a safer, more productive place to live and work. He assets that the training of residents and the formation of Street Committees started in June 2009. To date 26 street committees have been established in the following areas of broader Chesterville: Chesterville (Roads 1, 3, 5, 8, 11, 12, 13/14, 15, 16, 17, 18, 27), Chesterville Extensions 1-3, Bonella (part), Insimbini, Incremental Phase 2, Insimbini, Mashxha, Fast Track, Infill and Ridgeview. There is also an on-going cooperation with all stakeholders concerned with community safety, such as the South African Police, The Department of Community Safety and Liaison and eThekwini Municipality (e.g. Cato Manor Area Based Management Office, Safer Cities) and NGOs is critical to the effectiveness of this intervention (Vukukhanye, 2010-2012). Most of Chesterville falls within the jurisdiction of the Cato Manor Police Station, and the level of engagement and commitment from this station has been very encouraging.

3.6 Street Committee profile

The following are recent examples of cases dealt with by Chesterville Street Committees:

3.6.1 Fraudulent electricity connections

The eThekwini Municipality is working with the community to identify and disconnect such illegal connections, one of which recently resulted in severe burn wounds to a 2 year old girl.

The Councillor of Ward 30 has cooperated with the Street Committee in 'Fast Track West' to remove illegal wires hanging over a small stream where children play (Vukukhanye, 2010-2012).

3.6.2 The building of shacks in Jamaica

Due to plans for an RDP home development near the Westville Prison, many people have been trying to take up residence in shacks in the 'Jamaica' area of Chesterville in order to potentially get onto the housing list. The Chesterville Resident Association (CRA) consulted Councillor Peer (Ward 24) and then met with the shack dwellers to discourage them from building shacks and explained that this was illegal and would not make them eligible for a new home. Informal settlements are not desirable as they are always associated with higher levels of crime (Vukukhanye, 2012).

3.6.3. Illegal sale of bond houses in Chesterville Extension 1

The Chesterville Extension 1 Street Committee is assisting (e.g. providing testimony in court) in two cases where resident's homes are being fraudulently sold by agents. In one case the home was sold after the death of the owner, without the family being notified. The street committee also testifies in court in cases where homes already owned (rightful owners paying mortgage bonds) are being fraudulently sold by agents (SAPS, 2008)

3.6.4 Stolen vehicles being brought into Chesterville

According to SAPS (2008) cars in Durban are stolen and are brought into Chesterville to be potentially sold. Ngcobo (2013) asserts that in many cases they are parked and watched from a distance to see if they have tracking devices. "The residents are cautioned against this and advised to call the Cato Manor police station when such suspicious vehicles are identified" (Ngcobo, 2013).

Chapter 4

Presentation and analysis of findings

4.1 Introduction

This chapter deals with the presentation of the findings of the study. The data was collected through household surveys, interview and observation. Both primary and secondary sources were used to gather data for the topic of housing layout design and crime reduction in RDP developments. The data collected was used to analyse and interpret crime situation in Chesterville and how the housing and layout design facilitates the occurrence or reduction of crime in RDP housing developments. The aim was to answer the main research questions of the study: To what extent has the housing and layout design of Chesterville RDP housing development impacted on criminal activities in the area?, which was presented in the first chapter of the document. The findings of the study are presented through graphical illustrations such as tables, images and bar charts. The researcher structured the household surveys according to categories of possible locations where crime is likely to occur. As mentioned in the first chapter, a sample of 125 households in Chesterville was selected but only 87 responded. The selection of the sample was divided into five categories because there was an assumption that those houses and people living in them are the most probable targets for house breaking, theft, assault and mugging. These categories and analysis were also guided by the theoretical framework of the study; the reason for this was to avoid the researcher from detouring from the theoretical framework laid in the beginning of the study.

4.2 Presentation of the Chesterville RDP development Case Study

Chesterville is part of the Cato Manor area of the eThekwini Municipal Region, and has an estimated population of 14 008 individual (CAPMON, 2013). Since the 1990's, a lot of expansion has taken place from the original 'Chesterville', built in the 1940s, see figure 2 for location and extension of Chesterville. The 'Chesterville' which is now referred to consists of a number of residential areas, such as Chesterville Extensions 1, 2 & 3, Bonela (part), Insimbini, Incremental Phase 2, Fast Track, Infill and Ridgeview. These merge with Mayville as one travel eastwards towards the University of Kwazulu Natal (CMDA, 2003). Characteristics of Chesterville include widespread poverty, unemployment, and a high

prevalence of HIV infection, crime, domestic abuse and violence, orphaned children, dysfunctional households, low levels of education, and a general lack of social support (Vukukhanye, 2013).

4.3 Chesterville Demographics

Table 1 below shows the population of Chesterville in terms of race. The table indicates that Chesterville is mostly dominated by the African race standing at 13 933, followed by Coloureds at 30, Whites at 26 and Indians with the lowest population of 18 (CAPMON, 2013). Although it is evident that the majority of the population in Chesterville is the African race, it is arguable that there is multinational diversity in the area consisting of different cultures, languages and religions. This may be attributed to the fact that Chesterville is the only Township located close to the CBD, close to major transport routes, shopping centres and social facilities; hence it has attracted people from different places and races.

Table 1: Chesterville Demographics [Source: capmon.durban.gov.za]

The People (Source: Sapmon.durban.gov.za)		
Total Population	14008	%
African	13933	97.2 %
Coloured	30	1 %
White	26	1 %
Indian	18	0.8 %

4.4 Housing Typologies

Table 2 below indicates that Chesterville housing typology consists of mostly formal housing which constitutes 73%, informal housing counts for 25%, traditional housing and other unnamed type of housing with 1% each. This study however focused only on the formal housing typology which consists of 2 500 households of which the 5% sample size was derived from. Figure 13 below shows am RDP housing type in Chesterville.

Household Type		
Number Of Households	3430	%
Formal	2500	73
Informal	867	25
Traditional	31	1
Other	35	1

Figure 14: RDP House in Chesterville (Image by reseacher, 2013)

4.4.1   The categories of houses were as follows:

4.4.1.1 From the category of houses facing the main roads, 40 houses were targeted but only 32 responded.

4.4.1.2 For the houses close to the neighbourhood entrance, 18 houses were approached and only 15 took part in the survey

4.4.1.3 Houses close to shops and/or other economic activities, 25 houses were visited and a good 24 responded

4.4.1.4 From the category of houses at the end of the street, 22 houses approached but only 14 individuals responded

4.4.1.5 For corner houses, 20 houses were targeted and only 11 responded.

Categories of Houses

	Category 1: Houses by main road	Category 2: Houses by Entrance	Category 3: Close to economic activities	Category 4: Houses at the end of the street	Category 5: corner houses	Total
■ Targeted	40	18	25	22	20	125
■ Responded	32	15	24	14	11	87

Number of Households (y-axis: 0–140)
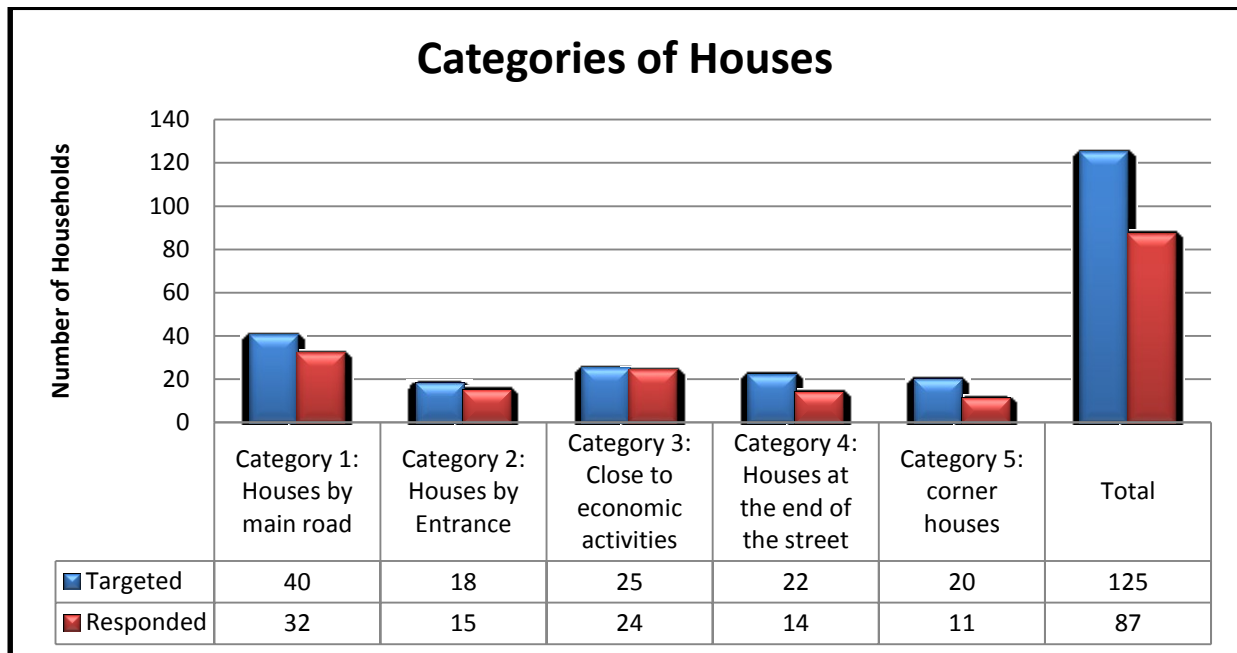
4.5 Findings

According to Ndlovu, (2001) it is believed that the two approaches, i.e.; Defensible Space and Crime Prevention Through Environmental Design (CPTED), are the basics of crime prevention in housing neighbourhoods. Therefore the gist of this research was to analyse these concepts using these principles to find out the reality about whether the two approaches really play a role in crime reduction in residential neighbourhoods or not. Subsequently the researcher wanted to find out the kind of criminal activities which are experienced in Chesterville and how those activities are related to housing and layout design of the area. Table 4 below shows the types of crime experienced in Chesterville as identified by the residents. In the table below "Yes" refers to respondents who acknowledged they have experienced some kind of crime and "No" for those respondents who have not experience any crime.

Table 4: Types of Crime experienced in Chesterville

Type of crime	Yes	No
Robbery	08%	92%
Burglary	11%	89%
Theft	09%	91%
Assault	68%	32%

The findings were that robbery, burglar, theft and assault were the types of crimes which the residents identified. When residents where asked why the assault is more prevalent, there was a repeated responses across the majority of the respondents. Seemingly assault in Chesterville is associated with the estranged youth on drugs (whoonga)[10]. The suspects are commonly found in areas which are not clearly visible to public surveillance such as obscure walkways and corner of streets. One example is the Pavilion road, as confirmed by the residents and community leader. Robbery, burglary and theft crimes are more housing related and are not as high compare to assault. Respondents said that once in a while they hear about a break in or robbery and usually the victims are those who do not have burglar proof windows or the case were the thieves enter from the roof and raid the house for valuable items.

4.5.1 Street layout design analysis

In chapter 1 the researcher outlined a series of questions which were derived from the main research question. One of those questions was concerned with the physical characteristics of the layout design which can assist to reduce crime in Chesterville. This particular question was important because it possesses the strategies to make a constructive analysis of the street pattern in Chesterville. After the researcher was familiar with the area it made it easy to find information that was needed, for example, whether the street layout design was a cuI de sac, a grid or a loop design. The analysis also entailed evaluation of lots and blocks to see how they are arranged. The researcher also thought it would be important to analyse a map of the area in order to determine the street layout design. Figure 15 below illustrates a street layout which the researcher has indicated the most common street layout design being the loop, cul de sac and grid design. This analysis assisted the researcher to find out if the area reflects a defensible layout.

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[10] Whoonga (also known as Nyaope or wunga) is a street drug that has allegedly come into widespread use in South Africa since 2010, mostly in the impoverished townships of Durban.

Figure 15: Street layout [Source: Google Earth, 2013]

After analysing the street layout design, the researcher identified that along the main road there are housing along Mahlathi Rd and other access streets that branch off the main road there is a series of both long and short open loops and cul de sac designs. Open loops refers to street that does not have a dead end instead the road is in a loop form and most sites are adjacent to each other (Ndlovu, 2001). The researcher found that the area which most respondents identified as a hot spot for criminal activities is along the Ziqubu road which ends in a cul de sac design. At the end of this street is the gravel road which people use as a short cut to The Pavilion Mall, (see figure 16 below). On the picture, which the researcher took, one cannot see The Pavilion on the background. This is the road that respondents said theft and assault mainly occur.

Respondents attributed that the layout of the street is ineffective as far as size because it is very narrow approximately 1.5 m such that two cars cannot pass at the same time; one has to stop and let the other one pass. Respondents asserted that only the main road is wide enough to allow two cars to pass at the same time. Figure 17 below shows the extent of how narrow the roads in Chesterville are this collaborates with what the respondents said. The width of the road can only be good in a scenario where the police are looking for suspects who are using a car to escape because it would be easy to block the road.
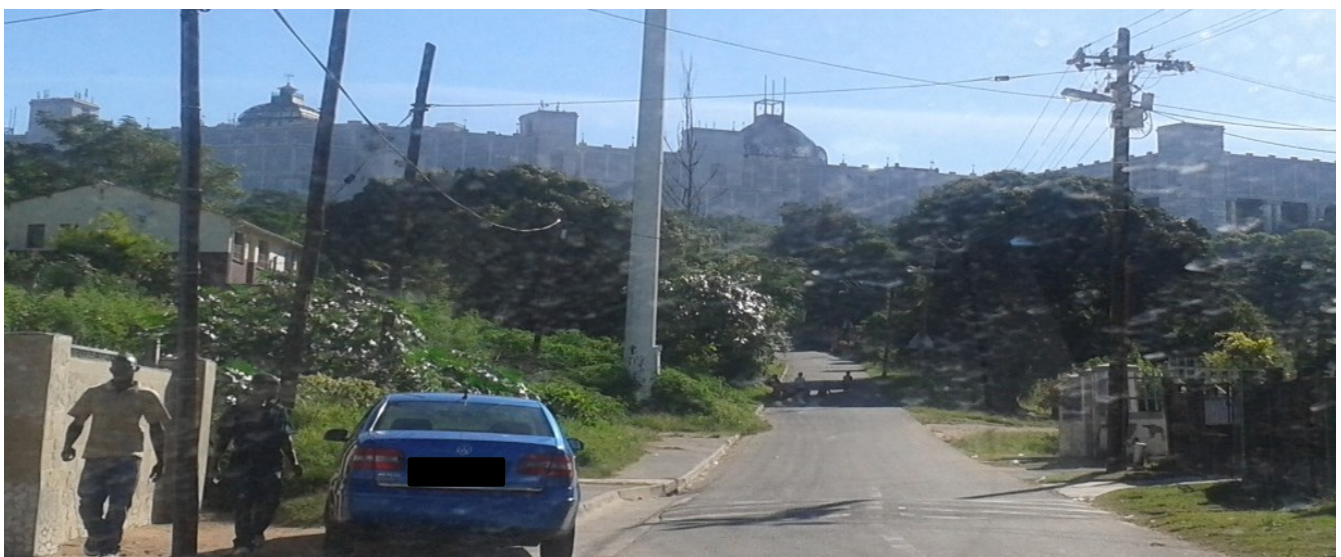
Figure 17: Showing how narrow the roads are for two cars to pass at the same time Picture by researcher 2013

One feature which the researcher observed during data collection was a variety of obscure areas, which presents a potentially dangerous space for crime to occur. One example which the researcher identified was a walkway path, this path was bushy and surrounded by alien vegetation and does not offer much for a person to see if there is a potential offender.

Figure 18: Obscure walk path which may present potential place for crime to occur. [Pictures by researcher 2013]

Areas such as the one presented in figure 18 above create potentially suitable areas for crime to occur. The reason why such places are not safe is because not many people use such routes; the people who use it are those who wish to take shortcuts instead of using the main road to get to where they are going. Another interesting observation was the level of people around the streets and as well as areas where there are economic activities. The researcher observed that during the day the streets are filled with people, especially along the areas where there are tuck shops, taverns and public phone areas. The researcher concluded that with the level of activity on the streets, this could play a great role in natural surveillance of the area during the day. The level of activity on the street could discourage an offender to attempt any criminal activity because of fear of being seen or caught.

Figure 19: level of activity on the street. [Picture Sourced on Google 2013]

4.5.2 Housing design analysis

Having the street layout analysis satisfactorily completed it was therefore imperative that housing design analysis was also conducted as housing design to a greater extent is a determining factor to crime reduction in the area. The section in Chesterville in which the study was conducted is the RDP houses, which were constructed post 1994 and also the old township houses which were built in the 1940's during apartheid period (CMDA, 2003). The designs are a typical two to four-roomed house. Figure 20 below illustrates an example of the type of housing designs which are common in Chesterville. The information that was needed entailed finding the physical environment in terms of housing design and crime deterrent features in the area and also fundamentally assess the opportunity for crime occurrence in the area. However the analysis was made using the CPTED. The criteria included elements such as territoriality, surveillance, image, milieu, and target hardening.

Table 5: Showing appropriateness of housing design

Total Surveyed	Good housing design (frontage facing street, spacing between houses)	Total Responses	Percentage
87	Yes	72	83%
	No	15	17%

Housing design analysis focused on the built environment, looking at how houses are located and where they are facing, how many houses surrounding the area, what types of rooms are facing the common space, how much space is left between houses, are there any hiding places, and what types of windows are facing the common area. On Table 5 the researcher found that in most houses (83%), living room and the kitchen are the sides which face the main road. This has led the researcher to conclude that the residents have the ability to see all activities which are happening outside of their house as well as their neighbour's house. This element creates a sense of territoriality as well as natural surveillance. Figure 20 below illustrates frontage of houses facing the street

Figure 20: RDP housing in Chesterville illustrating direction of frontage. [Picture by researcher 2013]

4.5.3 Typology and Groupings of housing

The two types of housing that were identified in Chesterville are single standing RDP houses (Figure 20) and semi-detached Old Township houses (Figure 21). According to Newman (1996) semi-detached houses refers to two houses build as one structure but separated by a wall and both have their own entrance. This type of housing is common in Chesterville. Most of the houses are located approximately 5 meters from the access road. The houses face the

road with the living room door facing the road. There is an exception to corner houses, which show the side of the house towards the main road. This was most common on streets which were Y shaped. The researcher thus interpreted that 83% of most homes have a frontage view of the living room or the kitchen and the bedrooms located behind. The way in which the frontage of the house is designed allows for maximum view of the activities occurring in the surrounding area of the household.

Figure 21: Example of a detached house. [Picture by researcher 2013]

The way in which respondents perceive safety in their neighbourhood is correlated to both the housing layout and the relationship they have with their neighbours. Refer to table 6 below showing that 73% of the respondent indicated that they interact with their neighbours because their houses are so closely together and mostly share a yard. The variety of responses indicated that they interact with each other at their homes, in the streets and at church. As a result, surveillance of the space around their home is possible. 23% of the respondents said they do not interact with their neighbour as much because they work night shift jobs, other simply said they do not get along with them for personal reasons but they can still overlook the space around their neighbour's house because houses are detached.

Total Surveyed	Good relationship with neighbour	Total Responses	percentage
87	Yes	64	73%
	No	23	27%

For single standing RDP houses the space between houses is approximately 2 meters. Also depending on the type of fencing they have. 83 % of the respondent's houses have burglar proof windows and burglar door with exception to 17 % who indicated that they plan to have it installed to the house when they can afford it.

From analysis of the housing design the researcher found that natural surveillance is their strongest feature as they are able to overlook all the activities happening in the street and at their neighbour's house. Some of the respondents also mentioned that with natural surveillance they can over-look the clothing line. They also emphasized that it is very safe to leave clothes to dry and that no one will steal them. Figure 22 below shows a line of clothing left to air-dry in a household which does not have a fence or a gate. The researcher therefore concluded that resident's strongest feature is natural surveillance.

Figure 22: clothing left to air-dry [Picture taken by researcher 2013]

4.5.4 Street committee

The Vukukhanye organization and the Chesterville Residents Association collaborated with business, government and civil society in the establishment of formal "community safety groupings" known as the street committees in Chesterville and also in the Cato Manor region (Vukukhanye, 2010 and 2012). The Street Committee Project planning began in June 2008 and the implementation of operational street committees started in June 2009. To date 26 street committees have been established. The purpose of this initiative was to make the local area a safer, more productive place to live and work. These small committees of street representatives form the nucleus of the community, and facilitate crime prevention by providing a means for rapid dissemination of information and providing education to residents. Support from Vukukhanye has, for example, included the formulation of Street Committee "Policies and Procedures Manual", Street Committee Constitution, Street Committee facilitator training toolkit, Street Committee presentation template, toolkits for running street meetings and community meetings (Vukukhanye, 2010 and 2012). From some of the interview with some of Chesterville's residents, the respondents stated that the main functions of the Street Committee are:

1. Reduce crime through:
   • Promoting community participation and vigilance
   • Early identification, reporting and prevention of crimes
   • Collective identification of suspects
   • Cooperation with police services

2. Other social interventions, such as:
   • Prevention and resolution of domestic violence
   • Social welfare issues e.g. orphans, disabled, and the elderly
   • Liaison with local business people
   • Protection and empowerment of women and children
   • Promoting education and sport
   • Environment and service delivery

The researcher concluded that the Street Committee in Chesterville is operational and works effectively according to the residents. The respondents asserted that the Street Committee are

the ones who respond first to any form of disturbance in the area. The Street committee can be recommended in other communities as a formal structure for community outreach i.e. crime solving agents, protection and empowering of woman, cooperation with police services as well as promoting crime prevention awareness.

4.5.5 Perception of Safety

Residents were asked what the most common criminal activities that occurs in the area were. The respondents indicated that robbery, burglary, assault and theft were the most common, see table 4 for results. There were some respondents who indicated other types of crime, most of the respondents who said other explained that it is because they had not experienced crime in the area. The researcher further went to ask the respondents questions related to the perception of safety in Chesterville. Some of the questions were whether they enjoy living in the area, whether they feel safe or not in the area, and if they have been victims of crime. Figure 23 below illustrates in both a table and graph how the respondents view the perception of safety in Chesterville.

Perception of safety in Chesterville

	Respondents who enjoy living in the area	General feeling of safety	Respondents who have been victims of crime
NO	0	20.70%	86.20%
YES	100%	70.30%	13.80%
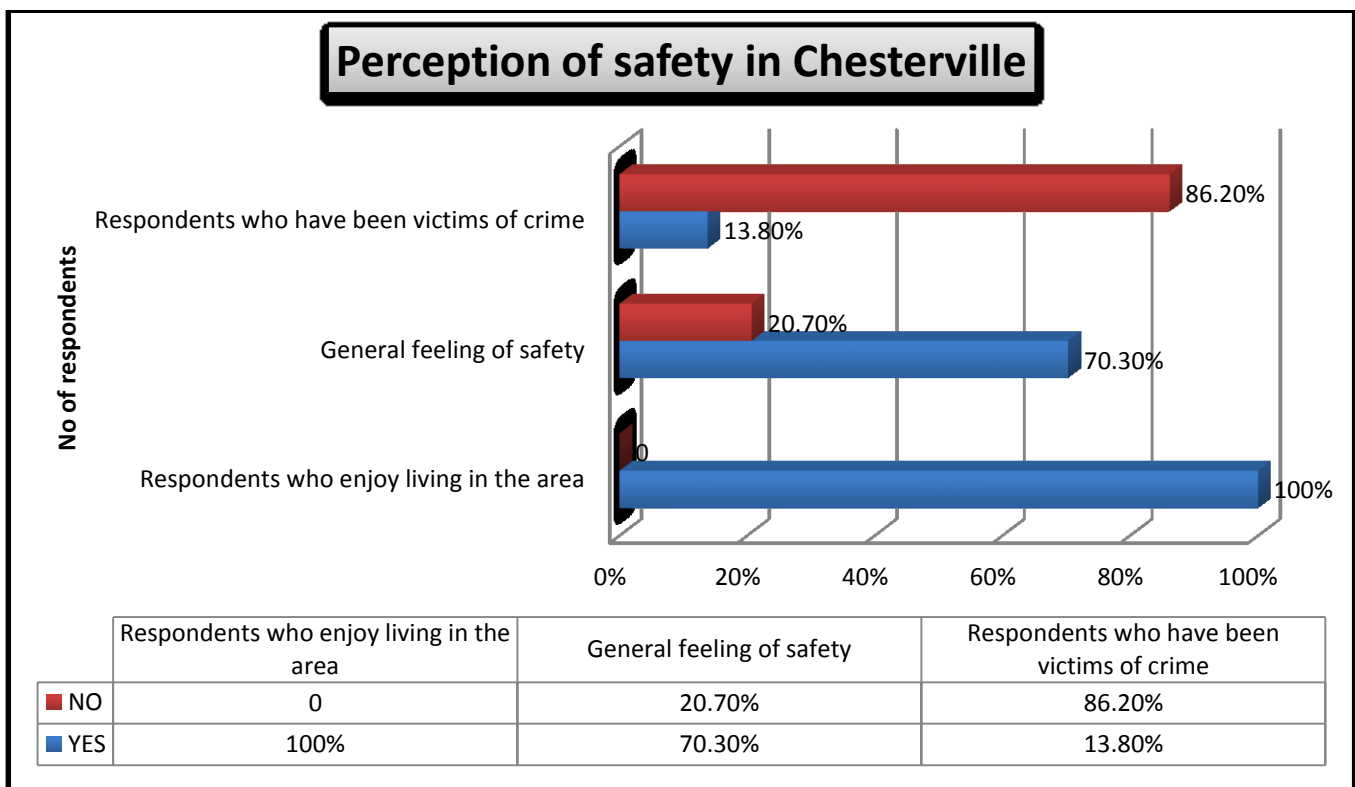
Figure 23: Respondents perception of safety

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The respondents were asked if they enjoy living in Chesterville, and 100% responded that they do enjoy living in the area. When they were asked to give reasons for their answers most of the respondents asserted that they enjoy living in their area because they had been living there for a very long time, and that Chesterville is close to the CBD, and close to major transport routes and all other social amenities. Respondents were also asked if they feel safe living in Chesterville. Figure 23 above shows that 79.3% of respondents claimed they feel safe living in the area, while 20.7% of respondents confessed their discontent living in that area. Those who claimed they feel safe asserted that it is because they had not experienced crime since they stayed in Chesterville.

Those who responded negatively, claiming they do not feel safe living in the area supported their responses by saying that they are scared of being assaulted or robbed, 13.80% said they had been victims of crime. Others emphasized that in reality, the area does not have crime in the way in which it is usually portrayed by the media. Other respondents strongly acknowledged that in the early 90's, crime was very high because when Chesterville started developing, many people were attracted to the area. In essence, the researcher concluded that, in general residents feel safe living in Chesterville although 20.7% of the responded said they do not feel safe, the majority of the respondents feel safe and 86.2 said they have never been victims of crime. Based on the responses, the researcher thus acknowledged that Chesterville is a safe neighbourhood to live in.

4.5.6 Sense of Territoriality in the neighbourhood

When respondents were asked how easy is it to look over their neighbour's house 91% of respondents agreed that it is very easy to observe their neighbour's house when she/he is not present. Most of them emphasized that their homes are in close proximity to each other in terms of placement of houses. At least 9% of residents stressed that it is not easy to watch over their neighbour's house while he/she is not in. Residents were also asked if they feel it is their responsibility to guard the area and 68% of residents said no because if they put matters in their own hands it usually turns out violent in a township like Chesterville. They then suggested that it must be the responsibility of the police or the street committee. 32% of the respondents pointed out that they feel it is their responsibility to guard their area. Some of them added that they want a safe environment for their children and grandchildren and will take part in community safety initiatives to ensure that. The researcher thus concluded that

the residents have a sense of positive territoriality over their own household as well as their neighbour's house especially because most of the houses are 1 and 3 metres apart depending on the landscape.

Table 7: Showing ease of looking over neighbours house

Total Surveyed	Ease of looking over neighbours house	Total Responses	percentage
87	Yes	79	91%
	No	8	09%

4.5.7 Active Surveillance

Respondents mentioned that there is a gravel road that goes up to the Westville Pavilion Mall; this road has been reported to be a hot spot for petty crimes, assault, and sometimes theft. The respondents highlighted that most targeted victims are people who work in the Mall and walk to work in the early hours of the morning and come back late in the evening.
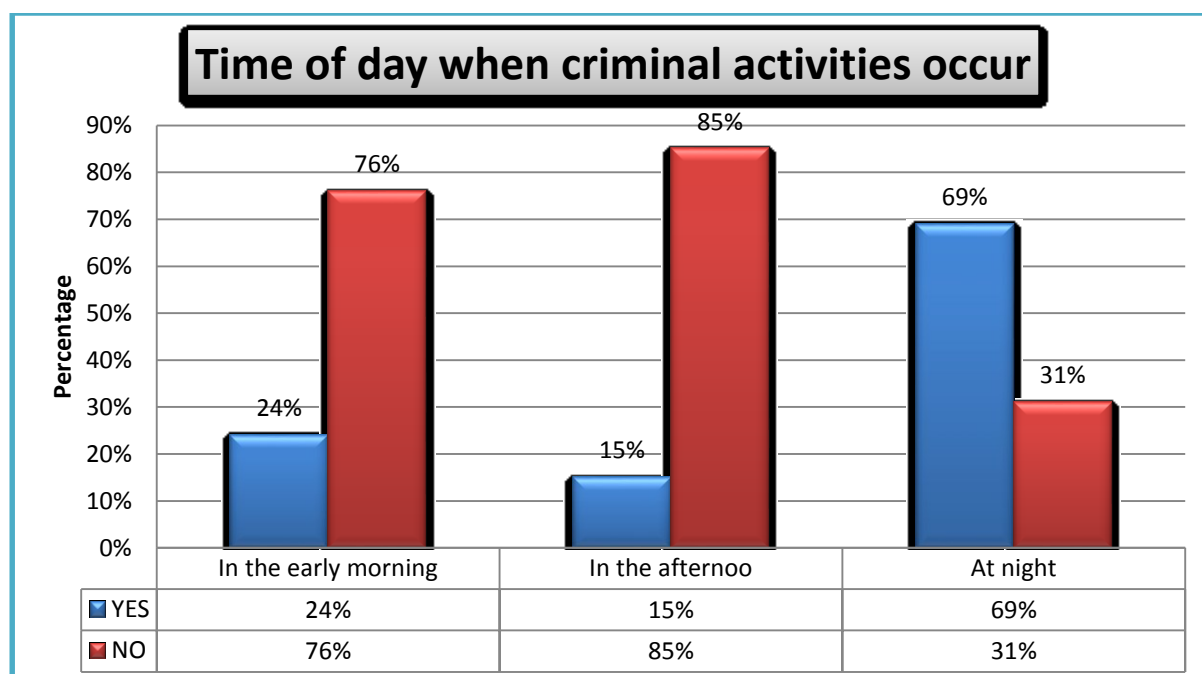
Figure 24: Time of day when criminal activities occurs

Respondents also attributed that most of the crime that occurs in this area happens at night (69%) although the rate increases during the festive seasons. The researcher observed that this gravel road starts at the end in a cul de sac which after this point there is no street lighting since it's beyond the residential area. The road in question is informal and does not have lights nor is it maintained (Ngcobo, 2013). Potentially the houses around this road could be targeted because of the way the area is laid out and also because there is no sufficient street lighting at night.

The researcher went to this area post data collection to observe the lighting of the area at night. There is one light in the area covering the cul de sac, unfortunately the light was very dim at the time of the visit. A conclusion was made that there is no sufficient lighting at night for the houses around this road. The response by the Street Committee and Vukukhanye to crime which occurs on that road was to partner with the Pavilion Mall to train 10 members from the community to patrol the identified area but this was mostly for petty offenders (Vukukhanye, 2012). According to Ngcobo (2013), for the last 2 years Chesterville residents have been appointed as "Community Liaison Officers" to work alongside security personnel at the Pavilion shopping centre during the busy December/January period. The aim was to help improve safety and security at the Pavilion; as well as protect Chesterville residents (many of whom are Pavilion staff) particularly when walking between the Pavilion and Chesterville, as well as help deal with child offenders found misbehaving. The researcher concluded that this area lacks adequate security personnel (active surveillance) both during the day and at night. The element of active surveillance is important because this road could be potentially used as an escape route.

4.5.8 Target Hardening

The researcher targeted 25 houses close to economic activities such as tuck shops, spaza shops[11], taverns, street vendors, and other informal businesses. At least 24 residents responded, and others own their own home based business. The respondents who own their own home-based businesses asserted that it is safe although once in a while there is threat of their premises being robbed due to the fact that the offender assumed they have money kept in the shop. They further explained that they take more precautionary measures to make sure

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[11] Spaza shop is an informal term which people in townships refer to when they mean a convenient shop. It is usually on the street along taxi route or can be in someone's house as a back shop.

the premises are well secured by having burglar proof windows, doors, and a dog in some cases. The researcher established that respondents in all the categories perceived crime the same way and asserted that Chesterville is a safe neighbourhood. Therefore the researcher concluded that households which own home-based businesses had the necessary physical modification such as burglar proof doors, windows, and lockable gates in their homes for protection against potential burglary. This led the researcher to further conclude that residents are aware of the potential crime that could occur in the area hence they put in means to prevent crime if it were to occur.

The researcher also noticed that there is proof of community awareness about crime and warning signs to alert possible offenders that they are being watched (eyes of the street[12]). See figure 25 below is an example of a poster put up in the Chesterville community for crime awareness.

Figure 25: Crime Awareness poster found in Chesterville. [Picture by researcher, 2013]

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[12] A concept of awareness initiated by the street committee to alert the community to watch for crime, how to report crime and warning to offenders that they are being watched.

4.6. Conclusions

The aim of this chapter was to present data analysis and findings. After careful evaluation of the layout and housing design, and from analysing the responses from the household survey, it was clear that the residents in Chesterville feel safe. Most of them acknowledge that there is petty crime once in a while but nothing that would make them feel unsafe. This chapter looked at the housing typologies in Chesterville as well as analyse the different responses from the five housing categories. One of the key aspects discovered, was the presence of a street committee, which plays a great role in assuring community safety. Different illustrations were used to show examples of how territoriality, active surveillance, target hardening, and parks would create a more Defensive space. The following chapter suggests recommendations that are useful for now and in the future in Chesterville RDP developments

Chapter 5

Conclusions and Recommendations

5.1 Introduction

This chapter is the conclusion of the study. It revisits the research question, the hypothesis, and suggests recommendations based on the findings. The research question of this study was: To what extent has the housing and layout design of Chesterville RDP housing development impacted on criminal activities in the area?

In chapter one crime reduction was categorized in to three levels: primary, secondary and tertiary crime prevention. The working definition fitting the context of this study was primary crime prevention. Primary crime prevention refers to the techniques which are used in the physical and social environment at large and more importantly modification of the physical environment to reduce criminal opportunity (CSIR, 1997 and Kruger, 2005). It was noted that focusing on ways to reduce the need or desire of certain individuals to commit crime is not easy but other ways such as controlling the opportunity for crime to occur can be used as a method of reduction. For example, a home which has burglar proof doors and windows reduces the opportunity of being broken into when compared to a home without (Fenelly, 1989 and Franklin, 2010). This research was undertaken in order to understand the role of housing and layout designs in crime prevention, more specifically the impacts of physical environment on RDP housing neighbourhoods in terms of crime. Theories were drawn from literature to support the hypothesis that "The use of appropriate housing and layout design can lead to a reduction of criminal activities in RDP residential areas".

Chesterville is an open access neighbourhood; hence the researcher argued that the neighbourhood does not offer its residents a sense of territoriality because most people are only worried about the space around their house and not worried about the whole neighbourhood in general. Another reason why there is no high level of territoriality is because most of the houses are semi-detached so there no complete ownership of the space around them. Although there were a few respondents stressing about petty crime, assault, and lack of safety. As a result, the information found in this research made the researcher to conclude that generally the majority of people enjoy living in Chesterville and they feel safe.

In examining to find out whether housing layout design plays a role in crime prevention, the researcher found that there are both negative and positive implications to crime prevention in a RDP housing development. Certain tentative conclusions for the key issues of the research can be drawn from the whole analysis. Crime prevention is not a fix-all solution to a range of design problems and crime prevention strategies.

Chapter 4 of presentation and data analysis of research findings was prepared following the principles and approaches of the Defensible space and Crime prevention through environmental design (CPTED). The basic idea was to experiment all those principles together with the theories whether they play any role in crime prevention in a South African context or not. The researcher argued that a Defensible Space is practically a model for residential environments, which inhibits crime by creating the physical expression of a social fabric that defends itself (Newman, 1972). Hence the housing layout of the area is physically designed to defend itself. The researcher strongly recommends that the physical design of the area must be maintained when necessary and also by making sure footpaths are not overgrown with bushes and tree branches are not covering the house frontage or the street view.

The limitations of Defensible space have previously recognized that crime free housing designs and layout systems cannot work independently. Therefore deliberation of social and economic factors as they animate or cause crime to occur is required (Ndlovu, 2001). To a large degree it is undeniable that unemployment, poverty, human stress, and social exclusion are the great courses of crime. However, it is important that in implementing crime free housing a careful thought of including the core determinants of crime is important if real crime prevention needs to be achieved (CSIR, 2007). Subsequently, it is an indisputable fact that crime prevention through environmental design cannot effectively work without tackling the root causes of crime. For that reason, the support of government in poverty alleviation and increasing job opportunities so that people will be able to support themselves and forget about committing crime is needed (Kruger et al, 2006). The concept of crime prevention through housing designs can work very effectively if all contributing factors of high levels of crime are also dealt with. According to Stollard (1991), it was found that within the Defensible Space Area there are houses surrounded by security walls. This was seen to obstruct natural surveillance from the street, which fails the whole purpose of designing out crime. However it is recommended that at least residents replace security walls with more

transparent fences because the purpose of enclosing residential areas is promotion of natural surveillance and easy control of the area by residents. Figure 15 below illustrates ways in which residents control access into their homes i.e. security walls, burglar windows and gates, and transparent fence.

5.2 Recommendations

Based on the above discussions, a number of key recommendations on crime prevention to contribute meaningfully to the growth and development of Chesterville are made below.

5.2.1 Physical modification of the house

Physical modification of the house reduces the attractiveness or vulnerability of potential targets by physically strengthening it or installing mechanisms that will reduce the effort required to commit an offence. Examples are; installation of burglar proof windows and doors, security alarm, lockable gate and a transparent fence as opposed to a security wall. Such technique among others could be recommended for the residents of Chesterville to help to reduce crime targeted at their homes. Figure 26 and 27 below is an example of physical modification of the house to reduce occurrence of crime.

Figure 26: Housing Modification 1 [image by researcher, 2013]

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5.2.2 Maintenance of neighbourhood landscape

The community has to initiate strategies and liaise with the eThekwini Department public works in order to come up with programmes which will be responsible for the cleaning and repairing of streets, cutting of overgrown roadside bushes, trimming of tree brunches hanging over buildings, and clearing up of path ways. When bushes and trees are trimmed down it makes houses, other community buildings, and roads to be more visible and attractive, ensuring that the physical appearance of that environment creates a positive image and instil a feeling of safety due to natural surveillance.

5.2.3 Community Participation/Involvement

In order to ensure preventive designs are safer, communities must be involved from the initial planning and design stages through to management. Vilakazi (2001), cited in Ndlovu (2001), argues that in order to stimulate greater feelings of proprietorship in residents, community's needs and preferences call for prioritization. This is believed to facilitate or motivate residents' co-operation and conformance to the standard behaviour reflecting the defensive

design principles. Community involvement from the first stages of the project will boost their motivation to support the project and want to be involved in it. Qhobela and Mabena (1998), argue that any prevention chances of success depends largely on a community's cohesiveness, motivation, and empowerment, hence the general key issues for an effective crime prevention programme stand as follows:

❖ The community should be the focal point of effective crime prevention.
❖ The community needs to identify and respond to short-and long term-needs.
❖ Crime prevention efforts should bring together individuals from a range of sectors in order to tackle crime.
❖ Strategies for preventing crime should be supported by the whole community in that particular neighbourhood.

5.2.4 Involving Local and National departments

The researcher supports and agrees with the approaches that were used in the North West to get Local and National Departments involved in strategies on creating sustainable and safer human settlements. The departments which could be involved are Department of Human Settlements, Public Works, and SA Police service (SAPS). The researcher asserts that environmental design interventions should be implemented at a local level because the local authority will be in the best position to take the lead in this regard. A number of policy documents frame the role of local government in supporting the SAPS with the development and implementation of crime prevention initiatives (CSIR, 2007). In particular, the White Paper on Safety and Security, published in September 1998, identifies local government as a key role-player in local level crime prevention.

Mechanisms such as Integrated Development Plans (IDP's) and Land Development Objectives (LDO's) compel local authorities to respond to the needs of their communities (CSIR, 2007). Crime is often identified by communities as a priority problem, which places a particular responsibility on local authorities to provide safer living environments. For developments which already exist, programmes to upgrade them may be introduced. For new developments, the approaches of CPTED and Defensive Space should be implemented from the initial stages of design, construction stage until the completion stage. Key role-players within local government must include professionals such as physical planners, urban

designers, architects and landscape architects. Those role players must be involved in transport and roads, parks and public open spaces, housing, as well as the strategic decision-makers and those involved with public safety, by-law enforcement (CSIR, 2007).

5.2.5 Securing township businesses using police force

For an entrepreneur, there are a number of challenges to running a sustainable business in the township. Securing a business against crime threats does not immediately fall within the expertise of an average entrepreneur anywhere. The average township business is uninsured, the risk profile stipulated by insurance companies often being too high even for those who are considering insuring their businesses (Ngantweni, 2010). The statistics for crime are misleading because of the small number of businesses in townships and the lack of data on the size of the population in each township. Often the police response times and the quality of service are unsatisfactory; suspects are never caught, goods are never recovered, and no background checks are done by businesses to vet employees (Mhagama, 2004). According to (Ngantweni, 2010), better secured businesses enhance economic activity in townships. The following are some strategies for doing this:

1. Whether in consultation with the police or on their own, businesses must educate themselves on risk management practices with regard to crime. At areas where there are businesses pro-active surveillance such as CCTV must be installed, burglar proof doors and windows as well as a secure lockable gate.
2. Businesses ought to adopt a "friends of the police culture". This will eliminate any corrupt practices on the part of the police, where these are a problem for crime prevention (SAPS, 2008)
3. The quality of investigations of crimes committed against township businesses requires a drastic improvement. This should include a better effort on the part of the police to recover stolen stock, as this has major cost implications for a business and its continued viability in certain instances.

5.3 Conclusions

The research has argue that defensive housing designs and layout systems carry positive implications in crime reduction and play a very significant role in crime prevention. Based on international studies and guided by the local context, five principles were identified which

were crucial to establishing how the physical environment either reduces or increases the opportunities for crime. These principles are not in conflict with other sound planning and design principles. Although they are aimed at creating a safer physical environment, they also support the creation of well performing living environments in general. These were: surveillance and visibility, territoriality, access and escape routes, image and aesthetics, and target hardening.

What the researcher has recognized is that the most important point in any given situation is that these principles all need to work together to be effective as crime-preventive measures. At the same time they need to be working along with other planning principles for the planning of well-functioning settlements. It is unrealistic however, to expect to be able to prevent all types of crime using the same methods, or that crime prevention through environmental design alone can solve all types of crime. Therefore, an understanding of the crime patterns in a locality is essential and that particular types of crime can be addressed through particular design responses. Given that crime patterns differ, interventions should not only take into account the ease of implementation, but also consider which problems are more conducive to resolution through design measures and thus, where the impact is likely to be greatest.

After evaluating the layout and housing design and from analysing the responses from the household survey, it was clear that the majority of residents in Chesterville feel safe. Most of them acknowledge that there is petty crime once in a while and they identified where such criminal activities occur. The area which was identified by many was the pavilion road. What was interesting about this particular area is that the Chesterville Resident Association together with The Pavilion Mall have initiated ways to help reduce the occurrence of petty crime in that area. Chesterville has an effective Street Committee which deals particularly with crime watch and also other social issues within their community. The researcher can thus conclude that the Chesterville community as a whole together with the Vukukhanye Organization identified the day to day issues faced in the area and strategized different initiatives aimed to resolve those issues. The researcher may also alert that the ways in which the community itself go about to prevent crime is not so much based on their knowledge of defensive design theory or CPTED but more of common instinct.

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APPENDICES

Appendix 1
Informed Consent Form

(To be read out by researcher before the beginning of the interview. One copy of the form to be left with the respondent; one copy to be signed by the respondent and kept by the researcher.)

My name is Awelani Ndwamato (student number 207506898). I am doing research on a study entitled 'Housing layout design and crime reduction in RDP developments: A Case study of Chesterville'. This study is supervised by Mr Myeni Vincent at the School of Built Environment and Development Studies, University of KwaZulu-Natal. I am managing the project and should you have any questions my contact details are:

School of Built Environment and Development Studies, University of KwaZulu-Natal,

Durban. Cell: +27729262405. Email: awe.ndwamato@gmail.com or

207506898@stu.ukzn.ac.za.

Thank you for agreeing to take part in the Research. Before we start I would like to emphasize that:

-your participation is entirely voluntary;

-you are free to refuse to answer any question;

-you are free to withdraw at any time.

The interview will be kept strictly confidential and will be available only to members of the research team. You are however advised that the contents of the interview many be disclosed if disclosure is required by the law. Excerpts from the interview may be made part of the final research report. Do you give your consent for: *(please tick one of the options below)*

Your name, position and organisation, or	
Your position and organisation, or	
Your organisation or type of organisation *(please specify),* or	
None of the above	

To be used in the report?

Please sign this form to show that I have read the contents to you.

--------------------------------------- (signed)

----------------------- (date)

--------------------------------------- (print name)

Write your address below if you wish to receive a copy of the research report:

Appendix 2

Chesterville Household Survey

Category of House : --------------------------------
Date : --------------------------------
Survey no : --------------------------------

<center>Tick the appropriate box</center>

---

1. Sex

Female	
Male	

2. For how many years have you been living in Chesterville?

Less than 5 years	
5 to 10 years	
10 to 15 years	
15 to 20 years	
More than 20 years	

Perceptions and experiences of residents about the safety of Chesterville

3. Do you enjoy living in this place?

Yes	
No	

Explain your answer?

----

4. Do you feel safe living in this area?

Yes	
No	

Explain your answer?

----

5. Have you experienced some criminal activities in this area?

Not at all	
Sometimes	
Most of the time	
Always	

Explain your answer?

----

6. How would you rate the level of safety in this area?

Very safe	
Slightly unsafe	
Not safe at all	

Give a reason for your answer.

----

7. Are there any people you know who have left the area because of crime?

Yes	
No	

8. Have you or one of your family ever been a victim of criminal activities this area?

Yes	
No	

 *NOTE: If No skip to 10

9. What type of crime was it? You may choose more than one if applicable

Robbery	
Burglary	
Theft	
Assault	
Other, specify	

10. From your experience what is the most common crime occurring in the area? (You may choose more than one if applicable.

Theft	
Robbery	
Burglary	
Housebreaking	
Assault	

Other, specify	

11. What time of day do these criminal activities mostly happen?

In the early morning	
In the afternoon	
At night	
Other, specify	

Explain your answer?

----

12. What time of the year do criminal activities mostly occur?

Public holidays	
Christmas holidays	
Easter holidays	
Any day generally	
Other, specify	

13. Do you interact with your neighbours?

Yes	
No	

14. How easy is it to interact with your neighbours?

Very easy	
Difficult	

Please explain your answer

----

15. Where do you interact with them?

In their homes	
In the street	
In the common space	
Other, specify	

16. Do you feel it is your responsibility to protect the surroundings of your area against crime?

Yes	
No	

Explain your answer

<u>Perceptions and experiences about the housing and street layout</u>

17. Were you involved in the planning, decision-making and implementation of this area?

Yes	
No	

Support your answer

----

18. What is your opinion about the layout of your street in terms of crime reduction?

Effective	
Ineffective	

If effective explain how, if not why?

----

19. Is anyone in charge of managing safety programmes in your areas?

Yes	
No	

20. According to your understanding how is your area managed generally in terms of safety?

I do not know	
Managed well	
Not managed well	

Explain your answer

----

21. What do you think can be done to help reduce crime in your neighbourhood?

----

22. Are there any ways you have attempted to prevent yourself, your family and your house from crime?

Yes	
No	

23. What physical enhancements have you made to your house to prevent against crime? (Choose more than one if applicable)

It is fenced	
It has a lockable gate	
Burglar proof door	
burglar proof windows	
Security alarm	
Security camera (CCTV)	
Other, specify	

24. Do you think that those physical enhancements have helped reduce crime against your house?

Yes	
No	

Please support your answer---

25. Are you aware of the Chesterville Community Safety Initiative (CSI) implemented since 2009 to reduce crime in your area?

Yes	
No	

26. Do you think the Chesterville Safety Initiative has helped to reduce criminal activities in your area?

Yes	
Maybe	
No	
Do not know	

Explain your answer--

Thank you for your time and participation

Appendix 3

Interview with Chesterville Community Leader

Date   **:** --------------------------------

No of participants   **:** --------------------------------

Tick the appropriate box and answer to your best knowledge in the open-ended questions.

1. Do any of you live in Chesterville?

Yes	
No	

    If no, proceed to 3

2. For how many years have you been living in Chesterville?

Less than 5 years	
5 to 10 years	
10 to 15 years	
15 to 20 years	
More than 20 years	

3. When was the Vukukhanye organisation established?

----

4. Why was it established?

----

5. What is the vision for this organisation for the Chesterville community?

----

6. What are the aims and objectives of this organisation?

----

7. What are the different stakeholders within this organisation?

----

8. Is the Chesterville Community Association incorporated in this organisation?

Yes	
No	

9. Explain your answer

----

10. For how many years has the Chesterville Association been incorporated in the Vukukhanye organisation?

----

11. Does the Vukukhanye and Chesterville Resident Association share the same vision?

----

12. Explain your answer

----

13. Do you think Chesterville is a safe neighbourhood?

Yes	
No	
Do not know	

14. If yes why, if no why?

----

15. What are the most common crimes in Chesterville? Choose more than one if applicable.

Robbery	
Housebreaking	
Burglar	
Assault	
Rape	
Other, specify	

16. How have those crimes been identified?

Observation by people	
By the police	
Other, specify	

17. Please support your answer

----

18. Which community safety programmes have been initiated by the Vukukhanye
    organisation and the Chesterville Community Association to help reduce crime?

----

19. How have those community safety programmes been implemented in Chesterville?

----

20. In your opinion, do you think these programmes have succeeded in facilitating crime reduction?

Yes	
No	

21. If yes how, if no why?

----

22. In your opinion, do you think the streets of Chesterville are designed in a way which reduces or increases the chance of crime occurring?

The street design reduces crime	
The street design increases crime	

23. Explain your answer

----

24. Are you aware of the ideas of using natural surveillance and street lighting as a way to help reduce the occurrence of criminal activities?

Yes	
No	

25. Do you think that the ideas of using natural surveillance and street lighting would help to reduce the occurrence of criminal activities?

Yes	
No	
Do not know	

26. Explain your answer

----

27. Do you know of any methods which the community of Chesterville can use to help
    prevent against criminal activities in their neighbourhood?

Yes	
No	

28. What methods are those?

----

29. Do you think Chesterville could be made safer if those methods are used?

Yes	
No	

30. Please support your answer

Thank you for your time and participation