UNIVERSITY OF NATAL- DURBAN

THE APPLICATION OF PEDESTRIANISATION AND TRAFFIC CALMING TO CURB VEHICLE AND PEDESTRIAN CONFLICT IN THE NEWCASTLE CBD. A CASE STUDY OF SCOTT STREET.

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DECEMBER 2000

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By

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DEDICATION

- To **Jehovah Jireh, the Most High God** – my Redeemer, Shepherd and Strength – for giving me wisdom, courage, and endurance in all my academic endeavours.

- To the most precious and wonderful memory of my late father, Mr **Mkhithika William Kubheka,** who passed away at the dawn of the finalisation of this work. Thank you for believing in me and for listening to my every dream. Without your never-ending love, interest, guidance, motivation and support I would not have come this far. May your memories live on.

"once again old men and women so old that they use a stick when walking, will be sitting in city squares. And the street will again be full of boys and girls playing".

Zechariah 8: 4 - 5

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ABSTRACT

In response to urban society's disenchantment with the automobile and the conflict that has resulted between vehicles and pedestrians, came the development of pedestrian oriented streets. This constitutes a clear shift in priorities to redress the imbalance in the street in favour of pedestrians with respect to motor vehicles, in a process known as **pedestrianisation.** Much more common, however, was to **traffic calm** those streets in which motor vehicle access was still needed.

This study examines the application of pedestrianisation and traffic calming to the Central Business District (CBD) as a potential solution for mitigating conflict between pedestrians and vehicles. To do this the study evaluates the effectiveness of the Pietermaritzburg (PMB) pedestrianisation and traffic calming plan, by looking at how the area caters/does not cater for the needs of its users (pedestrians and motorists) and tenants.

The evaluation also includes obtaining comments from the planners, tenants and prospective users in Newcastle in order to determine whether the objectives achieved in PMB could be made useful in the proposed pedestrianisation and traffic calming plan of the Newcastle CBD. Findings and conclusions from various data collection methods are presented followed by recommendations that are important for the successful implementation of any pedestrianisation and traffic calming scheme.

CHAPTER ONE:
INTRODUCTION

1.1 The Problem and its Setting

Plowden (1972:9) assumes that due to rapid urbanization and the so-called better employment opportunities believed to exist in urban areas, most people do and must live in towns. Therefore, the efficient organization of life in towns is one of the most important issues facing humanity. However, it is argued that problems concerning transport that town life raises are particularly stubborn in character and far-reaching in effect, leading to an unsatisfactory state of city life. Plowden maintains that there are two sides to the problem of urban transport. Firstly, it is difficult to move about by any means of transport, and secondly, traffic makes towns disagreeable to live in. He argues, as it is widely known, that these problems are not new, neither are the attempts to deal with them. He points out that Julius Caesar prohibited the movement of carts in Rome in the hours of daylight; Claudius extended his ban to the other municipalities of Italy and Marcus Aurelius to every city in the Empire. In London, traffic has been a source of complaint and concern for several centuries.

But, although it is as well to be reminded that urban transportation has been a long-standing problem, and certainly does not stem from the invention of the motor vehicle, it is also true that the motor vehicle has altered the nature of the problem and vastly increased its scale. Trench (1997:143) maintains that cities need safe urban transportation systems. He argues that if city centres are to be made safer and more attractive, then getting in and out of them and moving around has to be easy and safer, which at the moment is not the case.

Historically, the street was the place and space in which people interacted and which people respected as a public environment (Burde 1981:4). As from the late nineteenth century vehicular traffic was only permitted in town centres at certain times of the day, for instance in Singapore traffic entered the city centre in the afternoons and on weekends. Dean cited in Trench and Oc (1990:22) argues that in Leicester (1989), the City Centre Action Programme of the creation of pedestrian preference zones affected nearly the whole central shopping area. This involved the removal of all but essential traffic between 11h00 and 16h00, wherein only emergency service vehicles, buses and cycles displaying orange badges were permitted to enter the pedestrian preference zones. This eventually led to the horizontal separation of pedestrians and carriage traffic into roadway and sidewalk to form a separate independent urban element, which became the verifying design element of the public environment and individual buildings.

Nonetheless, Burde believes that the Western industrial city is probably the most inhumane environment made by man for man. Although less brutal than its nineteenth century precursor, the city of today is more extensive, and with all the improvements that occurred during the nineteenth century in the social environment, the physical environment has not proportionally improved, but rather has retrogressed. The modern city, according to Burde, should be seen as a noble and ennobling place, which does not emerge from the criteria by which the planning process operates. He maintains that the modern city should be a social environment where everyone, i.e. motorists and pedestrians, has freedom of movement.

Planning the development of cities has become dominated by economic determinism in which basic human objectives, such as health, have been assumed to be immeasurable and are therefore, discounted. Burde (1981:4) emphasizes that "in planning the development of cities convenience and growth are the goals; efficiency and money are the criteria of excellence".

Having enumerated on the problems in the modern city, Richards (1990:9) maintains that these problems lie in the shortage of road space and how it can

be used to the best advantage. He points out that if cities are to survive the continuing growth of car ownership and use, rather than building more roads, existing road space must be rationed. He feels that either the drivers of vehicles using road space in congested areas must pay for the congestion they cause to others at the peak hours of the day or exclusive use of the main street or Central Business District (CBD) should be given to essential services and public service vehicles.

Both the above systems are aimed at freeing road space to reduce the use of roads by certain classes of vehicles and to encourage car drivers to switch to alternative means of transport, such as public transport (ibid: 11). The reduction of traffic within a central area will then allow the road space that is freed from cars to be used by essential service vehicles, and for an overall improvement to the environment to be made by widening the pavements, planting trees and/or creating more pedestrian areas.

The development of pedestrian-oriented streets is part of the response to problematic conditions caused by the automobile. Furthermore there has been an acknowledgement that the continued dominance of motor cars as a primary mode of personal transportation has not provided us with freedom of movement as initially perceived (Proceedings of the Fourth National Seminar on Planning Design- PFNS, 1976). It is further argued that urban society's disenchantment with the automobile, and the congestion it causes, is a major factor, which led to the Pedestrian Revolution, in 1967 and 1974 in Paris, which queried pedestrian privileges and forbade cars entry to the Latin Quarter, on the Left Bank of the Seine. This Revolution advocated slogans such as "Cars – Do Not Enter" and "Make way for the pedestrians" (Breines, 1974:10).

Henry Ford described his first gasoline buggy as "something of a nuisance for it made a racket and scared horses". Even in his wildest dreams he could not have foreseen the nuisance it has become - to people! According to Breines (1974:4) the advent of machine transportation has caused a drastic restructuring of the urban form, interposing scale of the vehicle into urban

design. The conflict between pedestrians and vehicles has created an unbalanced competition for urban space. The motor vehicle has pervaded all phases of urban structure, causing a dilution of the human environment. Fruin (1971:1) argues that "the automobile kills and maims the pedestrians, it causes noise, dust and fumes, and is detrimental in its socio-economic impacts. It threatens the very quality and viability of urban life.

On the other hand, Breines (1974:9) maintains that pedestrianisation enhances our physical well being both by reducing air and noise pollution and by encouraging, through the creation of urban strollways, the greater use of footpower. However, the car cannot be disinvented, and banning it entirely cannot be the answer. Many people today have had their lives enriched by the automobile, and though not car owners, they have greatly relied on public transportation, which facilitates ease of access to various things, thereby opening up opportunities. However, public transportation cannot match the automobile for comfort and flexibility. According to Breines (1974:10) the solution is to exploit the advantages of foot and wheel in areas where each operates better. In specified areas within the town, e.g. the CBD, there is a tremendous need for a compromise between pedestrians and vehicles to minimize conflict and congestion. This could include a solution of traffic calming while at the same time taking cognisance of the importance o0fn pedestrians.

As traffic volumes increase various functions of the road often come into conflict with social, economic and recreational functions being threatened by increasing volumes of through traffic. In addition, increasing volumes of through traffic conflict with the needs of local and access-seeking traffic. Therefore, large volumes of traffic, for instance in the Newcastle CBD, have led to congestion and increased accidents, which in turn render the CBD unsafe and inaccessible to both motorists and pedestrians. This leads to an urgent need for an integrated traffic and pedestrian circulation pattern that would facilitate safety, accessibility and convenient parking while reducing speed and accident rate in the town centres. The solution of pedestrianisation

and traffic calming has been suggested as a possible means of addressing this conflict.

Therefore, the main thrust of this study would be to establish whether the application of pedestrianisation and traffic calming measures could be a viable option to deal with problems of congestion and conflict in the town centre.

1.2 Research Goal

The primary goal of this study is to highlight pedestrianisation and traffic calming as an alternative and effective option to minimizing vehicle and pedestrian conflict in the CBD. This will be achieved by comparing the effectiveness of this option in South Africa, using Pietermaritzburg as a reference case study, and evaluating its applicability to Newcastle.

1.3 Research Question

How effective has pedestrianisation and traffic calming been utilized as a solution for mitigating conflict between pedestrians and vehicles in town centres?

1.4 Subsidiary Questions

- What is the nature and severity of conflict existing between pedestrians and vehicles in South Africa?

- What measures can be taken to curb accidents and reduce speed in the CBD?

- How can pedestrianisation and traffic calming enhance safety, convenience and the aesthetics in the CBD?

- What effect will the application of pedestrianisation and traffic calming have on the existing land uses and on tenants?

- What are the implications of pedestrianisation and traffic calming for future planning of CBDs in South Africa?

- What are the strengths and weaknesses of applying pedestrianisation and traffic calming schemes in the CBD?

1.5 Objectives

Following on from the research goal and questions, the objectives for the study are as follows:

- To evaluate the extent of accident occurrence and speed contravention in order to determine the need for pedestrianisation and traffic calming.

- To assess pedestrianisation and traffic calming in SA in order to determine its applicability to Newcastle.

- To examine the effect of pedestrianisation and traffic calming in enhancing safety, comfort, convenience and aesthetic value of town centres.

- To improve Newcastle's image and provide the town centre with its own identity.

- To improve good accessibility and eliminate congestion.

1.6 Research Hypothesis

The following hypothesis for the study has been advanced, that:

> Pedestrianisation and traffic calming of the town centre could mitigate the existing conflict between vehicles and pedestrians and, at the same time, enhance the aesthetic value of the CBD, thus attracting more people into the town centre.

1.7 Research Constraints

Traffic calming and pedestrianisation have been implemented in the CBD areas as well as in residential areas. For example, internationally, these have been applied in Germany, Britain etc. (Hass-Klau, 1992) and locally, they have been applied in the Durban Beach Front, Pietermaritzburg, Randburg etc. For the purpose of this study, direct focus will be placed on traffic calming and pedestrianisation being a potential solution and a combined strategy to help reduce conflict between vehicles and pedestrians in town centers. However lack of relevant documented South African literature on the research topic has hindered progress in the study and has hindered the researcher from drawing from examples in SA.

While conducting interviews and administering questionnaires for the study, the researcher, discovered as outlined in Chapter 8, that some people were not willing to co-operate and others had problems honouring appointments. Insufficient finances and time also posed serious problems and hindered the researcher to stretch the research to the maximum. It is also important to mention that due to time constraints the researcher was unable to get pictures to illustrate the pedestrianisation plan in Pietermaritzburg CBD.

1.8 Definition of Concepts

This section serves to provide an identification and elaboration of various concepts informing the study.

1.8.1 Pedestrianisation

This is a strategy that involves reducing the dependence on the automobile in commercial streets as a primary mode of transport and switching on to an alternative mode, namely walking. It also involves the physical separation of vehicles and pedestrians. It could be described as the conversion of former traffic streets into pedestrian-only zones and represents the ultimate solution to pedestrian-vehicle conflict. It can further include total traffic-free areas and/or traffic-free for a certain time and to a specified class of vehicle (Pharaoh and Russell, 1991:83).

1.8.2 Traffic Calming

Pharaoh and Russell (1990:80) define traffic calming as 'an attempt to achieve calm, safe and environmentally improved conditions on streets'. This strategy may involve restraint in the provision of both road space and parking facilities. However, at the heart of all traffic calming is the concept of speed management, which does not only include reducing the speed of the traffic, but rather involves 'calming' of all elements. Traffic calming deals with carriageway alignment, landscaping measures, chanellising and re-routing traffic as well as its control and regulation (Russell 1990:iv).

1.8.3 Pedestrian and Vehicle Conflict

a) Spatial Conflict

The Fourth National Seminar (PFNS 1976) on Planning Design and Implementation of Bicycle and Pedestrian Facilities, defines spatial conflict as the underlying cause of all pedestrian accidents, which is based on the competition of the pedestrian and the vehicle for urban space. Vehicles require large amounts of space for movement and parking, and demand pre-emptive traffic priority, which affect the urban form and alters patterns of community continuity, identity and cohesiveness. Pre-emptive traffic priority for vehicles has resulted in extensive and expensive traffic signalisation in which the pedestrian receives little consideration.

b) Environmental Conflict

The conflict between vehicles and pedestrians affect the quality of urban life. Vehicles impact upon the urban environment by producing noise fumes and dust. This leads to visual pollution of the city and also affects its aesthetic value. More specifically, this conflict relates also to issues of discomfort, inconvenience of slowing access, inconvenience of diverted or re-routed traffic, danger versus safety of movement and speeding at crossings.

1.9 Types of Pedestrianisation

The Greater London Council (1974) cited in Pooran (1995:25) identifies the following types of pedestrianisation:

1.9.1 Fully Pedestrianised Street

These streets have been designed to cater primarily for pedestrians, with a range of pedestrian facilities and with no obvious provision for vehicles. They have been totally resurfaced and all traffic is banned from entering the street, except for delivery purposes very late at night or early morning. This allows complete freedom of movement for pedestrians. It is in these streets that greatest opportunities are available for environmental improvements, but utmost care should be taken when designing improvements to ensure that they blend in with scale and character. For instance, too additional street furniture in a narrow winding street will create a cluttered atmosphere and restrict movement.

1.9.2 Partial Pedestrian Streets/Malls

In most cases a partial pedestrian street relates to a street that has been designed to accommodate both vehicles and pedestrians. Permitted vehicles include mainly the public transport and service delivery vehicles. It differs from an ordinary street in that full kerbside parking has been removed and the sidewalk extended to incorporate what used to be the parking area. Bays for limited kerbside parking are resurfaced and landscaped, and usually incorporated in a number of pedestrian facilities.

1.9.3 Streets with Selective Traffic Bans

With the removal of certain types of vehicles, particularly private cars, reductions can be achieved in pedestrian vehicular conflict as well as pollution and noise levels. Reduced traffic flows will allow widening of pavements and an increase in the pedestrian phases at signalled intersections. Often when all vehicles except buses and taxis are eliminated, the public transport service operates more efficiently, where permanent widenings are considerable, there are often opportunities for the provision of many features of fully pedestrianised streets.

1.9.4 Occasional Pedestrian Streets

Usually these are market streets closed by the sheer number of pedestrians on market days, or busy shopping streets closed on certain days of the week or times of the year. As traffic will be using the street at other times there is little opportunity for providing additional facilities. In these streets it is therefore, essential that pedestrian flows are high on days of closure in order that the emptiness of the street is submerged by the hustle and bustle of pedestrians.

Many cities have first opted for pedestrian streets by experimental orders, and when these proved successful they were made permanent.

1.10 Rationale for the Study

Generally, the primary focus of the study is to identify ways to attempt to mitigate the negative impact of the motor vehicle in heavily trafficked commercial streets. Only until recently has the importance of the role of the pedestrian been recognized, even though walking has always had more positive effects compared to driving, in terms of mode of transportation. Fruin (1975:12) argues that walking offers predictable travel times, is free, does not consume fossil energy nor does it pollute the atmosphere. Hence the issue of pedestrianisation presents itself as an opportunity in attempting to mitigate the negative impact of the motor vehicle in heavily trafficked commercial streets where pedestrians and vehicles are in conflict.

However, this does not imply that pedestrianisation should be implemented as a means of completely phasing out the use of the motor vehicle. What is suggested is another solution, namely traffic calming, which does not only refer to traffic restraint but it is rather related to the concept of speed management. It is envisaged that this course of action will mitigate the conflict between pedestrians and vehicles.

Intervention in terms of combining both pedestrianisation and traffic calming has been adopted in this dissertation as it provides an opportunity to test out this strategy in the CBD and other nodal areas where the conflict prevails. Furthermore, planning is about seeking and identifying opportunities to structure the urban form that would be beneficial to all. Though traffic calming is seen as being in fashion in countries like Germany, the connection between traffic calming and pedestrianisation has not been so popular in South Africa. This is because traffic calming has, for a long time, been regarded as an instrument for minimizing conflict only in residential areas and/or along major roads. It is only until recently that little attention has been given to heavily trafficked commercial streets, such as those in the CBD. Therefore, such a venture provides planners an opportunity to investigate and experiment with something new and different, which also rouses interest for research.

1.11 Chapter Outline

Chapter Two

This chapter outlines the theoretical material relevant and/or related to pedestrianisation and traffic calming to provide a conceptual framework for the study.

Chapter Three

This chapter presents the research methodology, which outlines the methods through which data was collected as well as analysed.

Chapter Four

This chapter presents the contextual analysis of pedestrianisation and traffic calming in South Africa. It outlines a number of areas where pedestrianisation and traffic calming has been implemented and its effect within South Africa.

Chapter Five

Particular analysis and evaluation of pedestrianisation and traffic calming in Pietermaritzburg, which is a reference study area, is presented in this chapter. Also included is the analysis of the findings of the pilot run conducted in this area, together with its conclusions.

Chapter Six

This chapter presents a background to the study area. It also outlines the existing situation together with all the attempts that have been done to improve the ease of movement in the town centre. It concludes by outlining the reasons for revitalising the CBD, as well as spelling out the already suggested means of improving the area.

An analysis of data collected in the case study area and an interpretation of data as well as the findings will be presented in this chapter. The analysis will be based on the goals of public transport operation can be fulfilled through

application of pedestrianisation and/ or traffic calming schemes. This will also involve an analysis of the goals and objective of each of these schemes and their relevance to the performance criteria.

Chapter Seven

This chapter outlines an interpretation of data obtained from the study area, i.e. the findings and conclusions that can be drawn. It also provides a comparison as well as conclusions that can be made in the case of Pietermaritzburg and Newcastle.

Chapter Eight

In this chapter the recommendations and the limitations of the study will be presented. It will also present the concluding comments emanating from the study.

CHAPTER TWO:
CONCEPTUAL FRAMEWORK

2.1 Introduction

This chapter discusses the conceptual framework or literature review relevant to the study, and which serves as background and foundation upon which the research builds. Data for this chapter was obtained by searching through journals and books as well as searching through the Internet. Literature gathered includes in-depth discussion of pedestrianisation and its history, traffic calming and its history, goals and objectives of both schemes. Before embarking on the historical development of pedestrianisation and traffic calming, the researcher believes that it is proper to outline the extent of the problem of traffic in town, as seen by international authors, since the inception of the motorcar. This would provide a framework on which to refer as the study progresses, and it would also be helpful in drawing conclusions about the study.

2.2 The Essence of the Traffic Problem in Towns

The Buchanan Report (1963:54) argues that the inherited layout of the street in most towns is not suitable to the movement of motor vehicles due to the fact that many of the streets are too narrow for the number of vehicles that use them. The Report also points out that the increase in the number of vehicles themselves, partly on account of the sheer growth of the motor vehicle habit, or partly because of the increase in the size and amount of accommodation in buildings, has been permitted without realising that this would bring more traffic onto the existing streets.

He further notes that access to the great majority of buildings is gained directly from the street onto which they front, and the flow of traffic is obstructed every time a vehicle pulls up to deliver callers or goods. Another

difficulty is the shortage of places where vehicles could be parked, because the streets provide only a very limited supply of parking spaces, and few buildings in the inner parts of town provide internal space for parking. As a result a growing number of vehicles endeavours to force its way through this narrow, intricate street system, thereby increasing traffic congestion and inefficiency.

2.2.1 The Nature of Traffic and Pedestrian Conflict – International Case Studies

Hass-Klau (1990:168) argues that the Buchanan Report encouraged some local authorities to start thinking about pedestrianisation as a solution to problems of congestion, and a few bold ones actually applied it. He points out that it is no accident that Norwich, one of the case studies in the Report, was the first town to close a street to motor traffic, in contrast to pedestrian precincts, which were purpose-built, as in the new towns. According to the Draft Urban Plan of Norwich, for the well-being of the city as a regional shopping centre, pedestrianisation is crucial. Since pedestrianisation was also seen as the key policy for preserving the historic character of the city, two large pedestrian areas were suggested in the city centre.

In 1967, the main shopping street was closed to traffic after the change of the government's highway legislation. Relatively litt6le research was carried out on the effects of pedestrianisation, which was not seen by the government as a basic need for people, shoppers and employees, but as an optional addition that was made possible when city centre ring roads had been built and other roads provided. Therefore, none of these early pedestrianisation schemes had the character of a pedestrian network.

However, in Germany, the first identifiable conversion of a street into a pedestrian mall occurred even before the war, in 1926 in Essen (Hadju, 1988:325). Street closures were usually not a component of any concept of urban planning but were an ad hoc response to the growing congestion in a

number of narrow shopping streets. However, the boom in pedestrianisation schemes that followed became a phenomenon with more complex motivations and effects. By the end of 1973 West German cities had 214 pedestrianised areas; by 1977 there were 370, and in the mid-1980s the figure was estimated at about 800 (Monheim, 1986 cited in Hadju, 1988:325).

Hadju further points out that during the two decades prior to the mid-1980s, traffic-free zones or pedestrian malls had become one of the major urban issues in West Germany. It is said that their introduction, design, evolution and role in the planning of the central areas of individual towns and cities became the concern of government, the business community, transport lobbies, environmentalists and resident action groups. The success or failure of a small initial scheme would cause interested parties to propose its extension or abolition. Also, by the early 1970s the rise of an environmentalist and urban conservation ethos led to a reappraisal of pedestrian malls and the appearance of new participants in the decision making process.

In West Germany, like the United States, city governments had been at the centre of making decisions about establishing pedestrian malls, and had also been responsible for designing and constructing them, especially in West Berlin, Bremen and Hamburg. Hadju argues that the way the first two cities responded to demands for better provision for pedestrians provides a good example of the relationship between the physical layout of a city and traffic planning. On the other hand Hamburg's experience shows the role of city centre activities in influencing the government's response to pressure to meet pedestrians' needs.

Furthermore, the response in cities like West Berlin to the needs of pedestrians did not lead to the creation of an integrated traffic-free area, but rather to the conversion of sections of streets into malls. West Berlin authorities decided to retain their wide streets for motor traffic, but they did also widen some sidewalks to give the area a boulevard character. The wide street has remained a long-established provision for pedestrians on the most famous boulevard of West Berlin, the Kurfurstendamm.

Conversely, people in residential areas were always concerned about the hazards of through traffic on their streets and pressured the city government to alleviate the problem. As a result, while Berlin has only one relatively small fully pedestrianised area, it has been in the forefront of the development of limited motor-access residential streets. The city attempts to improve the urban environment for residents through landscaping streets, renovating building facades, and placing specific restrictions on the entry and movement of motor vehicles (ibid, 327).

West German malls were inspired by the desire to manage city center traffic and preserve or stimulate retail trade in the central business districts. Thus the creation of city center road networks that facilitated the free flow of vehicles took precedence over the retention of buildings or the preservation of urban environments. It is outlined that a vast majority of cities chose to close streets to motor traffic only where it would be impossible to have a full flow of traffic. However by the late 1960s West German municipalities, like other western cities, were becoming aware of the destructive effects of traffic on the urban fabric and the insatiable demands of the motor vehicle for space. Consequently, local governments became increasingly amenable to creating traffic-free zones in city centers.

Seeing the development and prosperity of suburban shopping centers, the West German retail industry leaders advocated the creation of pedestrian malls to encourage increased clusters of specialty shops, restaurants and entertainment facilities as a means of preventing the same death for European city centers that had befallen many of their North American counterparts. It was the recognition of that possibility and the initial success of the midcity malls that changed the early skepticism of the retail trade towards the conversion of shopping streets to pedestrian malls.

Hadju maintains that the commercial success of pedestrianised areas was contagious. They spread to major cities such as Nuremberg, Dortmund and Hanover. Local authorities saw the creation of a vibrant shopping environment

as the prime aim for pedestrianisation. They usually chose the most important shopping street for pedestrianisation, and sometimes also converted the abutting sections of cross streets.

The commercial success of pedestrian malls was shown by the nearly uniform increase in retail turnover and by the rise in property values, however some serious criticisms arose. Commercial success became increasingly linked to the types of shops within the malls and to widening gap between retail rents and property values within the malls and those outside it. A decline of small shops, especially those providing basic services, and a concurrent increase in numbers of department stores, retail chain stores and luxury specialty shops, was reported. Though the report did not quote widespread evidence to link the appearance of pedestrian malls with rises in rents and property values, it endorsed the idea of a cause-and-effect relationship that municipalities claimed exists.

Furthermore, the initial pedestrianisation concept was limited to one or two streets; hence many shops in the city center were left outside the mall area. Because the mall concentrated its consumer retail activity within its area, the fall-off in retail turnover in the adjacent streets was highly detrimental to the shopkeepers there. Also, the inadequacy of traffic management in some cities led to an overloading of the streets to which the vehicles had been diverted. This caused some retailers in a number of cities to oppose pedestrian malls.

2.2.2 An Analysis of Traffic in Towns

Hillman (1983:104) maintains that the Buchanan Report was based on false assumptions which led to a lack of consideration for those without access to the motorcar, and who are dependent on other modes of transport. He points out that its central tenet was that ".... in the foreseeable future nearly all people are going to demand motorcars, and the right to use them". Its attention therefore, needed to be turned in such a way that it determines how our towns could be designed to enable as much advantage as possible to be

taken of their convenience, comfort and speed, as was consistent with the public funds that could be allocated to protect the environment from their public nuisance effects.

Some of the conclusions drawn in the Report reinforced the conventional view that, like hospitals, schools and houses, the provision of more roads is synonymous with progress. Also, allied to this was the judgment that, given adequate funds for environmental protection, restraint on car use could only be justified if predicted demand in peak hours could not be physically accommodated.

Hillman further argues that a primary error in the Report stemmed from the belief that the term, **accessibility**, could be interpreted to represent the freedom to use private motor vehicles from the origin of any journey to its destination without restriction, and that if the planning of our towns and cities was directed to allowing this, it would solve the great majority of travel needs. The Report was falsely founded on a gross miscalculation that "in the foreseeable future the majority of British voters would be car owners". However, some twenty years after this statement was made, the mirage of universal car ownership still remains distant. Hillman argues that only one-third of the adult population in Britain has cars of their own and only half of that hold driving licenses. It is concluded that such miscalculations were fuelled by the forecasts of the time, which were based on relationships between income and vehicle ownership, and on predictions of population and economic growth, which did not transpire.

Allied to this was the attention paid to the accessibility of people without cars of their own (ibid, 105). It did not seem to be appreciated that most peoples' lives in terms of their travel patterns are autonomous, i.e. only a small minority of the trips of members of any household are made with all of them sharing a common origin and destination. Hillman maintains that had travel needs of people without cars been properly considered (with a rigorous analysis of the consequences for the safety and convenience of cycling and walking, and the availability of facilities accessible on foot and of planning for increased car

access), it seems likely that second thoughts would have been given to such wholesale dedication.

Likewise, insufficient attention was paid to the likely consequences of applying the concept of 'environmental areas' to existing urban areas. Had close examination been undertaken, Hillman argues, it would have shown the outcome to be inequitable, not only entailing restriction on movement between areas because of their girdle of traffic, but also exposing people living on the peripheral roads to an even more unfair share of the nuisance generated by traffic than they had previously experienced.

2.3 History of Pedestrianisation

Hass-Klau (1990:1) points out that since the beginning of the twentieth century, conflicts already occurred between the weaker road participants, i.e. pedestrians and cyclists; the existing urban fabric and the motor vehicle. A comprehensive comparison between Britain and Germany indicates that both countries developed specific patterns and had different attitudes towards road transport. The demands for restraint of motor traffic have had different motives in both countries. While in Germany even in the 1920s and 1930s the protection of historic inheritance was a decisive motive, in Britain questions of traffic restraint were raised in connection with road safety and, later in the 1960s, as a means of improving the urban environment.

He further points out that the turning point of unlimited promotion of car use in urban areas took place in Germany during the 1960s and 1970s, whereas the Buchanan Report had already warned against the adverse effects cars would have in urban areas if they are left uncontrolled. According to Mumford (1961:121) Leonardo da Vinci was the first known planner to suggest the separation of pedestrians from heavy traffic arteries to solve the traffic problems of Milan during the fifteenth century. The unpleasantness of traffic congestion was partly caused by the large demand for horse buses and horse

trams. However, by the end of the nineteenth century horse trams were replaced by electric trams, which led to slightly improved street conditions.

Urban planners in the late nineteenth and early twentieth centuries envisioned the street as being, historically, the place and space in which people interacted and which people respected as the public environment. However, the accessible city, i.e. a city which allows free vehicle/pedestrian flow, is disappearing due to high dependence or reliance on the car, and the high levels of mobility, both of which lead to severe congestion as the capacity of the transport system fails to respond (Banister 1994:208). Sharing the same sentiments is Richards (1990:9) who maintains that all cities suffer from congestion at certain times of the day, particularly during peak hours, and measures taken to reduce this are sometimes not effective because of their political inclination.

As it has already been alluded to, in 1490 Leonardo da Vinci envisioned an idealized city in which the pedestrian walkways would be located above service streets and canals so as to promote efficiency and safety (Bednar 1989) cited in Pooran (1995:8). Though the conflict between vehicles and pedestrians was not a great problem in da Vinci's era, it certainly has become one today, thus his solution could be increasingly beneficial. However, this solution remains a difficult and costly system to utilize because it requires specific points of connection between pedestrians and vehicular levels.

Burde (1981:4) points out that during the nineteenth century the horizontal separation of pedestrian and carriage traffic into roadway and sidewalk was implemented as an attempt to eliminate conflict. After the turn of the century the problem became more serious due to the amount and danger posed by the motorized traffic thus, the practice of closing ordinary streets to traffic became more widespread. The 1930s saw the first independent footpath networks in new urban areas, which were after all intended to guarantee free passage for vehicular traffic (ibid.).

During the 1940s and 1950s the idea of traffic-free streets in town centres was conceived but it was only in the 1960s when traffic in the town centres began to increase, that pedestrian areas came into fully existence. It was the traffic-free shopping streets of the inner city and suburban centres as well as the malls and shopping centres that were pacemakers of pedestrian-orientated urban planning. Many of the ideas embodied in shopping centre design set the pattern for central city redevelopment and revitalization (ibid.).

Early forms of pedestrianisation, i.e. road closures and other restrictions on vehicular traffic, may have been a feature in many towns wherein the streets were too narrow to accommodate wheeled traffic. For example, in the United States, ideas to exclude some traffic were common. This is evident in the Report on the Plan of San Francisco, written by Burnham in the early 1900s, wherein he emphasised that heavy traffic should be restricted along the boulevards and completely disallowed on other streets. Many planners at the time were of the opinion that the essential condition of good planning was the provision of a large space, which could be kept completely free of wheeled traffic or from which traffic could be excluded (Ford, 1920 in Hass-Klau, 1990:23).

The contemporary situation indicates that pedestrian streets and zones are becoming a fundamental part of the urban design framework and are having the effect of integrating development. Pedestrianisation, according to Burde, can provide a protective effect on town centres, and in so doing promote mixed uses instead of functional separation.

2.4 History of Traffic Calming

2.4.1 The Early Years

Hass-Klau et al (1992) cited in Pooran (1995:9) argue that the roots of traffic calming vary from one country to another. For instance, in the Netherlands it

was developed by urban planners and traffic engineers who realized that the well being of the people was influenced not only by housing but also by the surrounding streets. These planners and engineers believed it was not enough to improve housing without making the roads more congenial places. In most cases there was a need to combine planning and transport issues in order to improve overall living conditions.

Pharaoh and Russell (1991:81) argue that traffic calming is distinguishable from traditional environmental traffic management in two principal ways; namely:

- It is aimed at reducing the speed of motor traffic in order to reduce its harmful effects, such as safety and pollution, in built-up areas. The removal of through traffic from sensitive areas is often desirable but does not reduce problems caused by the remaining traffic. In addition, the means used to divert through traffic often make access to properties less convenient.
- Its links with the character and function of the road or street. The design of traffic calming schemes is derived from the need to integrate traffic and parking with what is called 'living' functions, and to give greater priority to vulnerable road users.

Transport in urban areas in Britain was influenced by the Buchanan Report of 1963, which warned of the impact of the growth of traffic in towns, however it was largely misunderstood and was seen as a charter for massive new road building. According to Hillman (1983:111), cited in Hass-Klau 'the report was a watershed in the evolution policy in transport planning in Britain'. He saw Buchanan's transport policy as the 'wrong turning' and as lacking clearly defined policy objectives. Even so, the first examples of what today is known as traffic calming measures were implemented in environmental areas, which were designated in many towns by the late 1960s. Thus, Hass- Klau et al (1992) in Pooran (1995:10) points out that Britain was indirectly the forerunner of traffic calming in Europe; and Colin Buchanan is still regarded abroad as the father of traffic calming.

Many European and American towns and cities are experiencing a new trend in transport policy. Policy-makers no longer accept as a norm the urban street where the motor vehicle totally dominates the pedestrian; instead many now seek to achieve a balanced and harmonious co-existence between the two (Hass-Klau, 1990:5). This change leads not only to more livable streets and better protection of urban areas, but also to a reduction in the severity of accidents.

Traffic calming, argues Hass-Klau (1990:3), is by no means a German invention. It was originally developed in the Netherlands under the well-known term "**woonerven**", during the late 1960s and early 1970s, and has since been developed and successfully applied in many other European countries. Hass-Klau sees German traffic calming as a continuation of pedestrianisation. As with pedestrianisation the road space is given back to the cyclist and pedestrian. Essentially, it is an attempt to mix the different transport modes and create a form of peaceful coexistence between them, which vary according to the character of the road.

Furthermore, traffic calming is seen as both a planning and a transport policy, and may in the future become a new way of life in built-up areas. Traffic calming can be used both in a wider and in a more restrictive sense. In a wider sense it may be defined as an overall transport policy concept, which includes, apart from a reduction of the average motor vehicle speed in built-up areas, a strong of the pedestrian, public and bicycle transport. It also involves different restrictive measures against motor vehicles according to the defined needs of the built-up area.

In essence, traffic calming is a bundle of transport policies intended to alleviate adverse environmental, safety and severance effects, that motor vehicle have been – and will be – creating. Hass-Klau maintains that if we are about the cultural inheritance of our towns and villages, traffic calming may well be the only way forward to cope with the increasing number of motor vehicle already forecasted.

2.4.2 The Woonerf

Pharaoh and Russell (1991:83) argue that the earliest and best known examples of traffic calming were the residential areas or streets in Dutch towns reconstructed as shared surfaces, which were known as woonerven (in singular woonerf), which means residential yard. The woonerf became the inspiration for similar schemes during the 1970s in other parts of Europe. The basic design concept was to civilise traffic within residential areas by removing the distinction between footway and carriageway and achieving greater safety by redesigning the streets to ensure that vehicles could proceed no faster than 20km/h. Woonerf design displayed a considerable variety, with its principal features being:

- Humps and ramps.
- Division of the street into short straight sections not in line with one another.
- Removal of kerbs from the streets.
- Repaving of streets with brick and other attractive material.
- Introduction of plants and street furniture to create a pleasant atmosphere and to give definition to urban space.

Although originally developed for local residential areas, Pharaoh and Russell (1991:84) point out that the woonerf concept was extended to shopping areas, village centres, school entrances and other sensitive locations.

However, the main problem with woonerf was not the effectiveness of the design but the limitations to its application resulting from the high costs of the implementation and maintenance, and their suitability only for streets with low traffic volumes, i.e. about 300 vehicles per hour maximum. Consequently, there was a need to find a solution that would be less costly and widely applicable.

2.4.3 30km/h Speed Limit Zones

The 1980s saw the emphasis of traffic calming shifting away from shared surface schemes to a proliferation of street and area-wide schemes within the

legal framework of 30km/h speed limits, and often involving main traffic roads as well as residential areas (Pharaoh and Russell 1991:85). The flexibility of the 30km/h zone allowed its deployment in situations as varied as accident blindspot sites on rural roads to complex junctions on urban roads.

It was found that a high proportion of benefits of shared surface schemes, especially casualty reductions, could be achieved by simpler and cheaper measures, despite smaller reduction in vehicle speed. In the Netherlands, regulations established in 1983 ensured that 30km/h zones are designated only where speeds below 30km/h have already been achieved. In design terms 30km/h zones differ from woonerven or shared space schemes in two important respects, namely:

- Speed reducing measures are generally less severe and/or less frequent.
- The extent of reconstruction is usually more limited with the emphasis being on inserting measures at intervals along a street rather than total reconstruction.

As with the shared space schemes, the 30km/h zones combined speed reduction with environmental enhancement, but using less drastic and therefore cheaper techniques. Low speed traffic needs less space for safer movement, which means that in the 30km/h zones, more space becomes available for pedestrians, parking, planting, seating and for street furniture. Slow speeds also mean that pedestrians should be able to cross the road safely. Nevertheless, at junctions and other locations where pedestrian crossing movements are concentrated, safety and convenience was greatly enhanced by raising whole sections of carriageway or footway height by means of ramps.

2.5 Critiques of Pedestrianisation and Traffic Calming

In examining the critiques levelled against pedestrianisation and traffic calming of town and city centres, this section looks at the experiences in Copenhagen. Lemberg (1990:42) argues that Copenhagen got its first pedestrian street in the central city area during the period of rapid motorisation in the 1960s. This entailed a temporary pedestrianisation of the main shopping street, Stroget, during December to increase the city centre's attractiveness for the Christmas trade. It is said that proposals by town planners and the City Council to make the pedestrian status of Stroget permanent raised a storm of protests. Lemberg claims that the shopkeepers along Stroget were the first to protest, firmly believing that taking away the car shoppers and leaving only poor pedestrians in the street would reduce their turnover and ruin business. He further states that the police in the city rejected the idea as impossible to carry out in practice, because the parallel streets were too narrow to take over the motor traffic banned from the main street, and thus feared that the streets would be permanently congested.

Furthermore, the city engineers felt that numerous pedestrian crossings in the city centre would cause intolerable delays and traffic jams. A local company running the municipal buses and trams, while welcoming the ban on cars and vans, argued that their existing bus routes through Stroget should remain in the street among pedestrians, or else they would loose passengers by running through secondary routes. In sum, all the experts in Copenhagen, with the exception of some town planners, objected heavily and warned against pedestrianisation.

Moreover, certain problems have occurred in Stroget and other pedestrian precincts in Copenhagen. It emerged that pedestrianisation could lead to overcrowding in the city centre (ibid, 51), which could also lead to littering and uncleanliness, because of the overloading of the pedestrainised streets by

showcases and advertisements from shops, and sometimes street musicians and hawkers.

Another disadvantage of pedestrianised town/city centres, according to Lemberg, are the rapidly increasing property values within these areas, which leads to many commercial and specialized shops squeezing their way out of the CBD to the advantage of banks, travel agencies and offices. Therefore, Lemberg advocates that urban planners need to have more control over the commercial uses of pedestrian streets so that more can be done to improve their environmental quality rather than allowing shopowners to reap more benefits.

In his evaluation of pedestrian schemes, Ramsay (1990:54) points out that there are several different approaches to the amount of streetscaping that should be provided in a pedestrian street. He argues that the traditional approach to street design aimed for an integration in the visual sense of the street surface and the street elevations, and consequently aimed for an absence of interrupting objects in the space between frontages. However, he points out that in Paris a vast expanse of barren concrete paving, surrounded by tower blocks of up to 45 storeys high, only served to emphasize the dwarfing effect of the buildings. Also, the Marple precinct intended to have aesthetic effect on the town centre, had so many trees, shrubs and benches crammed in, that there was hardly enough space for pedestrians to make their way through.

Van Geuns (1981:122) argues that pedestrianisation of the main sopping street is believed to bring about changes to the function of the street, for instance, when the main shopping street in Amsterdam was closed to motor traffic, its function changed from a predominantly shopping area into a location for airline offices. Gillisen (1981:321), on the other hand, argues that care should also be taken in terms of the street furniture used within a pedestrian precinct. For instance, the splayed edges of the planter troughs in central Australia were designed primarily to discourage sitting on the top

edges, however, due to lack of sitting areas these ended up being used as benches by pedestrians.

It is, therefore, apparent from this section on the critiques of pedestrianisation that, though a number of towns and cities worldwide have adopted this plan of pedestrianising the central areas, there are various limitations that need to be considered about this plan, prior to its implementation. This could enable the plan to have more advantages than disadvantages to all the users.

2.6 Pedestrianisation and Traffic Calming as a Combined Transport Policy

Hass-Klau (1990:144) argues that road transport policies in Britain during the war and post-war period should be seen in connection with a planning euphoria, which was previously unknown. This period could be regarded as the heyday of urban and regional planning, which led to the formation of a new central government department in 1943. This led to the emergence of new planning ideas and concepts, as well as significant changes for the existing built-up areas. Hass-Klau points out that one of the issues of road transport policies during this time, i.e. the 1940s to the 1950s was the question of how to enhance road safety. This was most relevant in built-up areas and it had become particularly important in relation to the increase in both car ownership and speed of motor traffic after the Second World War.

It was at this stage that it became apparent that a new and comprehensive approach towards road building and traffic management was needed. The inadequacies of the existing urban road network were criticised by many, it became obvious that it was not able to cope satisfactorily with existing – not to mention future- traffic demands. Hass-Klau argues that many cities and towns made new land use plans with reference to the guidelines of the Ministry of Transport. The basic idea was to have fast, safe and uncongested access by car to the city centre. In terms of protecting pedestrians from motor traffic

several ideas were floated, some of which were borrowed from other countries.

Although the evolution of pedestrianisation and traffic calming started off simply and independent of each other as an attempt to reduce danger and improve conditions for pedestrians and cyclists, and to improve environment; their progression has widened up to include a combination of strategies. Authors like Hass-Klau et al (1992) in Pooran (1995:11) view traffic calming combined with pedestrianisation in both residential areas and town centres as part of an overall strategy to reduce the negative impacts of the motor vehicle in these urban areas. Hass-Klau et al cite a number of small and medium sized German towns where town centre streets, which were originally calmed to traffic, have eventually been pedestrianised. The conversion of former traffic streets into pedestrian only zones is not exactly traffic calming, but it represents the ultimate solution to the pedestrian-vehicle conflict (Pharoah and Russell, 1991:83).

2.7 Traffic Calming and Town Planning

Russell (1990:iii) argues that traffic calming is in fashion. Since it much talked about in Britain as well as in South Africa, its popularity is slowly but surely increasing. However, an important question that needs to be answered is 'what is traffic calming?' since despite its popularity too little of it is being practiced. As earlier stated, traffic calming may be defined as an attempt to achieve calm, safe and environmentally improved conditions on streets. Russell points out that there is clearly a risk of traffic calming appearing to be all things to all people. Therefore, a precise definition of its goals is important, which is as follows:

- To improve road safety.
- To reclaim space for pedestrian and non-traffic activities.
- To improve pedestrian mobility and reduce traffic barriers.
- To promote greater feelings of security among users.

- To create an improved local environment.
- To achieve slower vehicle movement.

Explicit from these goals is a clear shift in priorities to redress the balance on the street in favour of pedestrians. This, together with environmental concerns central to the origins of traffic calming in Woonerf, readily lead to traffic calming association with wider sets of transport policies to improve environmental conditions in urban areas. These environmental concerns include 'greening' of the area, which is often an integral objective of such scheme, i.e. introducing plants in order to improve microclimate. Russell (1990:iv) notes that although such policies will be essential in central parts of cities and towns for benefits of traffic calming to be released, it is not helpful to identify traffic calming with traffic restraint or with any style of urban transport planning.

Pharaoh and Russell (1990:80) point out that traffic calming is often casually associated with traffic reduction, which can give rise to confusion. Traffic calming schemes may and often do constitute elements within wider traffic restraint policies, but there are also many schemes where no reduction of traffic is intended. If speed reductions are achieved locally on one or more streets or within a residential area by traffic calming measures, this may divert traffic on to alternative routes. Russell (1990:v) states that at the heart of all traffic calming is the concept of speed management. He further points out that as its potential for speed management has been realized and developed, road safety has assumed greater importance within traffic calming practice most notably so in safe routes to school programs.

Pharaoh and Russell (1991:81) state that traffic calming is distinguishable from traditional environmental traffic management in two principal ways. Firstly, it is aimed at reducing the speed of motor traffic in order to reduce its harmful effects in built-up areas. The removal of unwanted through traffic in sensitive areas is often desirable, but does not reduce problems caused by the traffic that remains. In addition, the means used to divert through traffic,

such as closures, one-way streets, banned turns etc, often make access to properties less convenient. Reducing traffic speed is advantageous in that it directly tackles the main source of the problem while retaining convenient local access.

Secondly, traffic calming links with the character and function of the street. The design of the traffic calming scheme is derived from the recognition of the need to integrate traffic and parking with what is called the 'living' functions, and to give priority to vulnerable road users. The most impressive schemes are also designed to enhance townscapes and environmental qualities of the street. Traffic calming practice in several countries is now consolidated into a coherent framework, which combines speed reduction and function priority features. This framework finds practical expression in the reclassification of urban roads into two categories, namely those where traffic has priority and those where the 'living' has priority. In sum, the traffic calming framework that has evolved over time, then, represents a major departure from the traditional approach to the environmental management inspired by Buchanan in 1963.

2.8 Traffic Calming on Urban Main Road and in Town Centers

The 1980s saw the first attempt to introduce traffic calming on urban main roads, mostly at places where shopping and commercial activity was concentrated. Pharaoh and Russell (1991:88) point out that the creation of effective schemes is usually difficult in such locations because of the greater intensity of the pedestrians and other activity, and thus, greater competition for available space. However, the benefits to be gained are potentially much more substantial.

By the end of the 1980s there were still relatively few main road examples of traffic calming however, some general observations were possible. Firstly, emphasis has mostly been on redistributing street space to provide wider pedestrian areas, bus lanes, parking and servicing bays. This was achieved by the reduction of the main carriageway to a single lane in each direction, with traffic capacity maintained by retaining extra lanes at principal junctions.

Secondly, speed reduction relied mainly on the prevention of overtaking and interruption to traffic flow using signalised crossings and bus stops in the main carriageway.

2.9 Evaluation Criteria

This section covers the goals and objectives as well as the performance criteria used in planning for pedestrian and vehicle movement. These objectives and criteria will also be vital in the analysis of data collected during the survey.

2.9.1 Pedestrian Planning Goals and Objectives

Fruin (1971:56) identifies the primary goals and objectives of an improved program for pedestrians as safety, security, convenience, continuity, comfort, accessibility, system coherence and attractiveness. All goals are interrelated and overlapping therefore, improvements on one objective generally result in opportunities for improvement on the others.

Of all the influences, which a motor or public transport vehicle has on the environment, the question of safety should be uppermost. **Safety** usually involves enabling pedestrians to be in the street and to cross it without risk of injury or harassment from vehicle-users. Safety is inseparable from the matter of accident thus Buchanan (1963) cited in Fruin (1971:58) argues that to be safe, to feel safe at all times and to have no anxiety that your loved ones will be involved in a traffic accident, should be the prerequisite for civilized life. The basic concern for pedestrian safety is the reduction of the vehicle-pedestrian conflict. Fruin argues that the two fundamental means of attaining this objective are the time separation or space separation, either horizontally or vertically. Traffic signalisation represents separation of vehicles and pedestrians in time however, most conventional signalisation methods expose pedestrians to conflict with turning vehicles. Horizontal separation of pedestrians and vehicles can be accomplished by the establishment of pedestrian precincts or malls where vehicular intrusion is restricted or

eliminated. Vertical separation is attainable through the use of underpasses and overpasses, which are not common in South Africa.

Pedestrian **security** has become an important objective in street design in that street configurations should be arranged to enhance clear visibility by other pedestrians and the police. This could be done through provision of high lighting levels and unobstructed lines of sight.

Fruin sees **continuity, comfort, convenience and accessibility** as the primary objectives of the pedestrian network being built or planned. Continuity relates to the location of public transportation system to shopping and other commercial facilities. System coherence relates to the concept of the perception of urban space that is a necessary element of urban design for full utility of urban space to be realized. Pedestrian convenience may be enhanced on most city centres at relatively less capital expenses, by relocating sidewalk obstructions such as telephone booths, refuse cans, mailboxes etc, so as to improve pedestrian flow. Accessibility, i.e. an opportunity to gain quick and easy access to a destination from the transportation system, relates to the provision of parking facilities, provision of loading or servicing facilities and provision of bus or taxi services.

Attractiveness encompasses not only aesthetic design, but also the sense of excitement that should be created by an urban space. Landscaping, pavement colour and texture, and well-designed street furniture components increase the visual variety of the cityscape. Special street events such as concerts, flea markets, seasonal flower exhibitions etc, increase the interest and vitality of any urban space (Fruin 1971:61).

2.9.2 Performance Criteria

To evaluate the data collected during the survey, the results were based on the following criteria:

a) Speed

As a key evaluation criterion, speed reduction is the principal means of achieving road safety objectives. With the direct evaluation of casualty reductions being very difficult for most schemes, speed reduction is often used as a surrogate on the assumption that road safety benefits follow automatically when speed reduction is achieved. Conflicts involving vehicle speeds of 50km/h or more are likely to result in serious injury or death for pedestrians, whereas at speeds below 30km/h the risk of fatal injury is greatly reduced. Traffic calming therefore, in so far as it achieves speed reduction, is certain to yield accident benefits in terms of casualties, unless the risk compensation mechanisms were to operate to offset such gains completely.

It has proved difficult to design erven so that drivers keep within the legal maximum speed of walking pace. However, maximum speeds of 15-20km/h are more easily achieved and appear to have become accepted. The speed reducing effect of physical measures depends particularly on the severity of the elements themselves and the distance between them. Speed reducing elements must be placed no further than 50meters apart and preferably, 30meters apart or less, to prevent accelerating in between. A calm style of driving can be achieved when the street can be driven at a fairly constant speed, without the driver experiencing major discomfort or having to make frequent use of the gearshifts, brakes and steering wheel. In Germany the speed hump has been firmly rejected because it is considered to be illegal. Preferred instead are changes in carriageway level achieved by ramps, plateau and raised 'tables' of 'cushions'. By contrast in both Denmark and Netherlands speed humps are extensively employed since they are regarded as necessary for effective speed reduction, which is also true for South Africa.

b) Accidents

The difficulty in evaluating the road safety success of individual traffic calming schemes has already been referred to, and there is no single criterion of what constitutes success. The 'before' and 'after' periods required to accumulate

sufficient data are simply too long to permit such analysis. Nevertheless, evidence has accumulated over recent years of clear success in reducing casualties.

The majority of calming schemes implemented have been in residential areas, which usually account for less than 20% of injury accident and usually carry less than 30% of total traffic. Nevertheless, the accidents to children are concentrated in residential roads, and it is these that residential traffic calming schemes can be expected to reduce. Major reductions in overall accident totals can only be achieved with measures on the main road network. Increasingly, safety regarded not simply as an absence of accidents, but also as related to perception and use of the street.

c) Traffic Volumes

Reducing traffic volumes create more possibilities for traffic calming measures; it is a means of achieving safety and environmental objectives rather than an end in itself. The smaller the maximum volume, the greater the opportunity for speed and carriageway reduction. Traffic calming may be sufficient in itself to reduce traffic on treated routes or to divert it on to alternative routes, which are less sensitive. The extent to which calming measures reduce and divert traffic depends on factors such as:

- Level of congestion on and directness of alternative routes.
- Degree of speed reduction achieved and relative speed on alternative routes.
- Proportion of 'marginal traffic' such as short trips that can cease to be made.

d) Parking

Changes in parking provision are not usually specified as an objective of traffic calming, but the impact of the scheme on parking is often an important issue. Surplus carriageway width can be used for additional parking. Angled parking can be used instead of lateral parking on both sides. There are safety

benefits claimed by this arrangement, for instance it reduces chances of children being masked by parked cars.

e) Pedestrian and Street Parking

It is suggested that if calmed, the streets become safer and pleasant to be in. Non-traffic street activity will increase in response to the higher quality environment.

f) Perceived Security

For traffic calming to be deemed successful it is important that the level of risk be in reasonable accord with public perception of safety. If residents perceive a street as safe, but their resulting behaviour exposes them to danger, this may aggravate the accident rate, thereby leaving them with irresolvable problems.

g) Visual Appearance

Redesigning to calm traffic inevitably alters the appearance of the streets and greater effort has been made to introduce design that enhance rather than detract from the street scene. The greening of an area is often an integral and major objective of schemes introducing planting in order to improve appearance and microclimate. Trees and other plants also increase the acceptability of the calming measures.

[An abridged version by Pharaoh and Russell
1991:94 – 103]

2.10 Conclusion

The discussion above serves as a theoretical basis upon which the results and/or the analysis of the study will relate. The literature review does reveal that pedestrianisation and traffic calming are two different strategies, however,

what appears to be common between the two are their objectives, namely **safety, security, comfort, accessibility** and an **improved environment.** It is upon these main objectives, apart from others, that the study focuses in its analysis of what could be the successes and failures of applying pedestrianisation and/or traffic calming in the case study area. Following on this chapter is an outline of the procedures or methodology followed in undertaking the study.

CHAPTER THREE:
RESEARCH METHODOLOGY

3.1 Introduction

Secondary data for the study, which includes international and South African experiences with pedestrianisation and traffic calming, was collected from the books and journals, which helped the researcher to compile a comprehensive conceptual framework for the study. Other data was collected from relevant media such as the Internet, newspapers etc. Primary data was gathered through the administration of questionnaires, conducting interviews as well as undergoing an observation exercise, all of which helped the researcher to gather as much information on the research topic as possible, and to have a direct experience of getting into contact with the vehicle and pedestrian problems outlined in Chapter 1.

The study involved an evaluation/assessment of pedestrianisation and traffic calming in Pietermaritzburg CBD in order to use the lessons learnt, as precedence for the application of these schemes in the Newcastle CBD. The effectiveness and feasibility of pedestrianisation and traffic calming in both Pietermaritzburg and Newcastle was evaluated in terms of the already alluded to planning goals and objectives; namely safety, security, comfort and convenience, continuity and attractiveness. The researcher was also aware that performance criteria such as speed, accidents, volumes of traffic and noise pollution are critical issues that need to be addressed in the application of pedestrians and traffic calming schemes.

After the evaluation process, an attempt was made to determine where successes/solutions of pedestrianisation and traffic calming in Pietermaritzburg could be applicable to the situation in Newcastle. The analysis also focused on the failures and the reasons thereof, which served to provide lessons for areas that are not being utilized in the application of pedestrianisation and traffic calming. The research data was collected using the following methods:

3.2 Questionnaires

The structure and design of the questionnaires was influenced by the goals and objectives of the study. Open-ended questions related to the strength and weaknesses of pedestrianisation and traffic calming were asked, so as to gain respondents' opinions and views on the plan. There were also structured questions to save time and make analysis easier.

A pilot study was conducted to establish the relevance of the questionnaire to the study. A random sampling method was adopted and questionnaires were administered to a sample population of 30 in each area, to yield diverse set of ideas for the purpose of the study. However, since people are sometimes reluctant to participate, the questionnaires were administered on the basis of those people willing to participate. No particular age, gender or racial group was targeted however; the sample population constituted 10 pedestrians, 10 motorists, 5 commuters and 5 hawkers. An attempt was made to include a cross section of respondents such as teenagers, adults, the aged, the handicapped etc.

Questions to the users embraced the following:

- Frequency at which users come to town.
- Time of day and method of travel.
- Purpose of trip.
- Ease of finding one's way through the town.
- Impressions about the pedestrian and vehicle conflict.
- Impressions about the proposed pedestrianisation and traffic calming scheme.
- Rating of the town centre according to goals and objectives.

From these questions the researcher aimed to gain an understanding of how often do the people come to the CBD, which would give the researcher an idea of which times of the year are the busiest, when is the period of worst congestion, do people really have any problems finding their way through

town and what could be their feelings as well their knowledge on the proposed plan to pedestrianise the CBD, specifically Scott Street.

The questionnaires were administered within the pedestrianised CBD in Pietermaritzburg and along Allen and Scott Streets in the Newcastle town centre. Taking into account the traffic variations during weekdays and weekends, and in order to achieve a certain degree of standardization the periods during which the questionnaires were administered varied, however, considerable care was taken to administer 40% of the questionnaires during weekdays and 60% on Fridays and Saturdays, during which many people come to town.

3.3 Interviews

Interviews with planners and tenants were also conducted. Interviewing planners was seen as vital in the sense that, during the 1999 Traffic and Transportation Study in Newcastle they were involved in the whole planning process, therefore the researcher believes that valuable information could be attained from them. Two planners were interviewed, namely Mr Kebone Masange, a chief town planner who was leading the team of planners working closely with Mr Eric Ngomane of Stanway Edwards Ngomane Associates on the Traffic and Transportation Study. Mr Ngomane was also interviewed through electronic mail. Mr Simon Barkhuizen, Dept of Public Works (Newcastle Municipality) was interviewed in the bid to establish the severity and extent of pedestrian and vehicle conflict as well as congestion along Scott Street, and for involvement in the transport engineering in Newcastle.

In both areas, tenants were interviewed with the hope of getting the business community's view regarding pedestrianisation and traffic calming schemes, and establishing the effects that these schemes could have in their business. Tenants in this case refer to shopowners located within the pedestrianised areas. These are made up of managers, shop owners and informal traders along Church Street in Pietermaritzburg and Scott Street in Newcastle. A sample of eight and fifteen shops, respectively, was selected, which

comprised shops of various categories. Interviews with tenants attempted to establish the effects that an efficient and systematic operation of transport could have, in terms of uplifting the local economy.

The questions for the interview include:

- The interviewee's role in the transportation plan of Newcastle, e.g. planner's role.
- Possibility of curbing conflict in the town centre.
- Their view of pedestrianisation and traffic calming as a solution.
- The future of commercial functions in the CBD if the scheme is applied.
- Effects of the scheme on local economic development.
- Its role in town centre renewal and revitalization.

The questions for both questionnaires and interviews were structured to embrace the goals and objectives of pedestrianisation and traffic calming, which include safety, security, comfort, convenience, accessibility and attractiveness. These questions were aimed also at establishing whether this scheme has worked in Pietermaritzburg, and whether it can work for Newcastle as well as improve the town's identity. The performance criteria, such as speed, accidents, parking, traffic volumes and visual appearance, served to determine the various themes under which data was collected, in an attempt to strengthen the results of the study and to help prove or disprove the hypothesis. The researcher also relied extensively on existing relevant documents and on newspaper articles as well as electronic media.

3.4 Participant Observation

The researcher engaged in a formal participant observation exercise to assess the prevailing situation in the town centre. The observation technique was used, as it allow the researcher to examine the conditions without interruption. Observation also allowed the researcher ample time to do pedestrian and vehicular traffic counts per hour, between 7h00 and 18h00 during weekdays, between 8h00 and 13h00 on Saturdays as well as between

7h00 and 18h00 on month-ends. These traffic counts enabled the researcher to determine the extent of congestion and to estimate the severity of conflict between pedestrians and vehicles in the CBD. Observations also allowed the researcher to assess the area in terms of safety, security, convenience, comfort, accessibility and attractiveness, all of which are the performance criteria outlined in chapter two.

3.5 Data Analysis

In analysing the data collected during the survey, the researcher relied on the basic goals and objectives of pedestrian planning. Each objective was looked at separately, i.e. respondents were asked to rate each objective in order of importance – from very poor to very good. Respondents were also asked to divulge basic information such as frequency of coming to CBD, time at which they come, mode of transport they use etc. which helped the researcher to establish the extent of congestion and conflict and to determine whether these justify the need for the proposed plan of pedestrianising the Newcastle CBD.

3.6 Conclusion

The above discussion outlines the basic method followed in undertaking the study, as well as the methods in which data was collected. Also included is the way in which data was analysed. The next chapter covers an in-depth contextualisation of pedestrianisation and traffic calming to South Africa.

CHAPTER FOUR:
PEDESTRIANISATION AND TRAFFIC CALMING IN SOUTH AFRICA

4.1 Introduction

This chapter provides an in-depth analysis of pedestrianisation and traffic calming in South Africa (SA). It seeks to contextualise these urban planning schemes that are pedestrianisation and traffic calming, to the existing situation in many South African towns and cities. To do this, a number of examples will be discussed where pedestrianisation and traffic calming have been adopted as a means to curb the problem of traffic congestion as well as vehicle and pedestrian conflict in the CBDs. The chapter presents a further analysis of the development of some of the pedestrian malls in SA, and the rationale behind their development.

4.2 Historical Development of Pedestrianisation and Traffic Calming in SA

According to Burde cited in Architecture SA (1981, no. 15:4), it was in the forties and fifties that the idea of traffic-free streets in town centres was conceived, however it was in the sixties that pedestrian areas came into being. It should be noted that pedestrian-orientated towns in SA are still at the pioneering stage in its development. Traffic-free shopping streets of the inner-city and suburban centres together with malls and shopping centres have become pacemakers of pedestrian-orientated urban planning. With the escalation of pedestrianised and traffic calmed town centres, the fears of shopowners become alleviated as they realize that pedestrian zones increase pedestrian traffic, and thus bring with it increased sales and values. Burde maintains that pedestrian streets should, therefore, not be viewed as "consumption ghettoes" or shopping centres, organized around the location of

consumer magnets, rather they should be recognized as places of great complexity and variety.

As in other countries, pedestrianisation and traffic calming in SA came about as a result of a growing awareness of the importance of preserving the city core (Gruen 1973:158). The Port Elizabeth City Engineers Report (1975:1) maintains that pedestrianisation of the Port Elizabeth (PE) city centre was precipitated by the need to locate a new civic centre, which also awakened the need for redevelopment of the CBD. The redevelopment programme was made up of an original conceptual design movement system, whose prime objective was to find an answer to the problems facing the hardcore of the CBD at the time. The Report argues that the main problem that led to the need for redevelopment was convenience of movement to and within the CBD. The general belief was that only by achieving a high standard of convenience would the PE CBD be able to compete with the modern suburban business centres, particularly the newly-designed centres.

Johannesburg, on the other hand, adopted pedestrianisation of the central area as a means of dealing with the problems inherited from its gridiron street layout (Fry, 1976:2). He argues that in terms of traffic management the city experienced a variety of problems, which necessitated that drastic measures be taken in order to render the city a safe and convenient urban environment. Among others, Fry outlines the following problems as major causes for concern:

- Numerous points of vehicle/pedestrian conflict at cross streets.
- Interruption of easy flow of both vehicles and pedestrians at cross streets.
- Short blocks provided little vehicle storage capacity, leading to congestion during rush hours.
- The fine mesh of streets allowed for choice of routes so that traffic is heavily dispersed over a large number of streets.

Such a multiplicity of heavily loaded streets tended to degrade portions of the city.

It is further stated that many SA cities such as Cape Town, Pietermaritzburg, and indeed Johannesburg, tended to suffer from overall monotony with almost identically sized city blocks separated by streets of similar width. Some cities also had few opportunities for vistas, crescents, squares etc, and one's ability to locate and identify oneself within the area was curtailed by the lack of landmarks visible from street level. In addition, in SA like in other American and European towns and cities, the traditional aspect of a town's pedestrian life was, for a long time, very poorly developed (ibid, 3).

In sum, pedestrian life is also affected by attitudes not necessarily peculiar to SA cities and towns but which have existed and in fact do exist in many other cities of the world. The above statement refers to the lack of consideration given to pedestrians when signs, mini-substations, parking metres and telephone kiosks are sited on pavements with little or no regard to the residual pavement width.

4.3 Pedestrian Areas and Pedestrian Malls in SA

As Gruen (1973:13) puts it, as long as the public environment, i.e. the streets with their sidewalks, public places and squares, are safe and agreeable, the efforts of an individual merchant in the area of showmanship can be concentrated on the appearance of the exterior of his store, on the show windows and their display, and on the achievement of a pleasant shopping atmosphere inside and outside the store. But he argues that whenever the public environment becomes hostile, then merchants are forced to band together, separated from hostility to create a more pleasant and sympathetic environment for trade.

The conflicts and disturbances plaguing the public environment forces the merchant to call the help of architects, planners and urbanists to create environmental conditions which will give him a chance to survive. Gruen further argues that because the merchant is the immediate contact with the

individual, he has to develop an acute understanding of the needs and requirements, which the ordinary citizen consciously or subconsciously demands from a good environment.

Due to the apparent need for merchants to avoid conflict and disturbance, and their desire to provide the community with a convenient and comfortable shopping experience, many have led them to resort to locating in pedestrian malls, which are rapidly increasing in SA. Rubenstein (1978:6) describes a mall as a new kind of street or plaza in the central city business areas oriented towards pedestrians, and served by public transport. A mall, according to the SA Institute of Town and Regional Planners (SAITRP) (1975:119), should be planned according to these principles:

- Distinguishable by physical separation of pedestrians from vehicles.
- Establishment in zones of maximum pedestrian activity.
- Provision for through movement of people on foot, for spaces of rest and recreation, social contact, visual interest, shade and outdoor eating.
- Provision for a continuity of safe and pleasant walking in the city centre.

This section presents two examples of areas in SA wherein pedestrian and traffic calming has been implemented.

4.3.1 Randburg Mall

Rubenstein (1978:3) argues that there are many reasons for building a mall, the primary being to revitalise an area of the CBD in a given city/town in order to increase retail sales, to strengthen property values, to compete with suburban shopping centres, and to encourage private investments by creating a stable environment for retail business. He maintains that a mall also creates an image of a city, thereby generating a feeling of uniqueness and pride among residents, and demonstrating that the town/city council and merchants are able to work together to improve their city.

In addition, it creates new opportunities for the promotion of retail sales, and provides a place in which to improve the quality and variety of downtown activities, such as exhibitions, concerts, fashion shows, flea markets, arts and crafts festivals as well as other events. In sum, a well-developed mall creates an improved physical and social environment for the area in which it is located, for the surrounding areas. The Randburg Mall, nonetheless, is no exception to the above painted picture.

The Randburg Mall was constructed as part of a comprehensive Urban Design Plan aimed at creating a new town centre for a rapidly expanding municipality, and to encourage developers to invest in the area (Senior in Architecture SA No 15, 1981:10). In outlining the background of the Randburg Mall, Senior points out that when planning commenced in Johannesburg in the 1970s, the town centre was very much a 'backwoods' area with limited development, surrounded by large tracts of vacant land. It is stated that at the time Randburg was a dormitory town and relied totally on the Johannesburg CBD for work opportunities, major shopping and entertainment facilities.

The area had considerable parking problems and major traffic congestion. It was also environmentally unacceptable as it had a poor image, lacked identity, had poor quality buildings, and was similar to a typical American type suburban strip shopping area. Planning of the Randburg Mall was based of the following objectives:

- to create a town centre by providing amenities and activities to make the town more self-sufficient.
- to improve the town's poor image and provide it with its own special identity.
- to provide plenty of free parking.
- to provide good accessibility and eliminate congestion.
- to provide a safe and pleasant environment for pedestrians, taking local climatic conditions into account.
- to strengthen existing shopping facilities and increase turnover for shop owners.

- to invest a minimum of public money to obtain maximum benefit by attracting additional development to the town.

Senior (1981:11) further points out that the Randburg Mall consists of three blocks of approximately 500m long, from Hendrick Verwoerd Drive in the east to Kent Avenue in the west. It is characterized by a ring road system, which was aimed at removing through-traffic from the area. All three blocks are separated by two north-south roads, however, care has been taken in the design to ensure safety of pedestrians at these crossings. This has been achieved by restricting crossing points by the use of plants and built-up elements, by provision of a central island and by the provision of robots. It is noticeable that many new property developments have been attracted to Randburg as a result of the town centre improvements. Trust Bank Centre, Sanlam Centre, Randburg City and SA Permanent Building Society are among the most important private developments that have occurred on the mall as a result of the initiative taken by the Randburg Town Council.

Provision has also been made for a direct pedestrian connection from the eastern end of the mall to the Civic Centre complex. A bridge provides a symbolic gateway to the Randburg town centre. The pedestrian environment is carefully protected from the major road intersection by means of a 2m high earth berm, landscaped with large shrubs and trees. Furthermore, a paving pattern has been used to reinforce the spatial quality of the mall, to accentuate its major elements, to define the entrances to adjacent developments and to provide a comprehensive visual link to adjacent streets.

Provision has been made for emergency vehicles and a continuous route of 4.5m wide and 3.5m high has been maintained, which is completely free of obstructions. It meanders through the mall to avoid long straight vistas. It is also interesting to note that the mall has managed to provide approximately 9000 free parking bays in its close proximity. The city council has also succeeded in providing a sufficient number of public toilet facilities close to the parking lots that are situated behind the mall, while each shopping centre has its own public toilets.

While the mall has excellent design features, it appears that there is a problem with lighting. Lastly, in terms of safety and security the two major roads cutting through the system appear to be a threat to the pedestrians using the mall. It has, however, deteriorated considerably in recent years and can no longer compete with the new high standard and high-tech suburban shopping malls.

4.3.2 Cape Town

The first implementation of pedestrianisation/traffic calming in Cape Town was the establishment of a temporary mall in Church Street in 1975/76. This was followed by the pedestrianisation of Castle Street between St Georges and Adderley Streets (SAITRP 1975:part 2). For some time Cape Town had been floundering in a crisis of decision-making of whether or not to pedestrianise. The two main issues at stake were, first, could the city afford it and secondly, would it present a security problem?

This uncertainty led to a thorough examination of overseas precedents, and it was later considered that the most relevant examples for the city existed in Australia and Europe. Eventually a comprehensive report for pedestrian network for Cape Town was produced, covering the following main sections:

- transportation system
- open space system
- design and implementation of pedestrianisation.
- outside shopping centres and their competitive effect on trade.
- historic areas, financing and development controls.

It was resolved that the pedestrian network should stem from major pedestrian generators, which were the Cape Town railway station, bus termini and parking garages (ibid.). It was also agreed that the network would be linked to major precincts such as the shopping centre core. Pedestrianisation and traffic calming in Cape Town has managed to revitalise the CBD and to

attract investment and improve the quality of the environment, which brings more people into the CBD with a snowball effect on the generation of cash flow. In sum, Cape Town appears in many respects, to be a more mature city and has managed to lend itself to traffic calming and pedestrianisation admirably.

4.4 Conclusion

A brief picture of pedestrianisation and traffic calming in South Africa has been presented, which would have a major influence in any pedestrianisation plan within SA. However, the next chapter is devoted to an analysis of pedestrianisation and traffic calming in Pietermaritzburg, which serves as a reference case study area for the study.

CHAPTER FIVE:
ANALYSIS OF REFERENCE CASE STUDY AREA: PIETERMARITZBURG

5.1 Introduction

This chapter presents a more focused discussion of pedestrianisation and traffic calming in Pietermaritzburg (PMB), based on the data gathered from secondary sources, this include the rationale for the implementation of the above-mentioned scheme, arguments for and against its implementation as well as its effectiveness to the users. The chapter also outlines the findings obtained from the pilot survey conducted in the PMB CBD, which would serve as a springboard on which the possibility of pedestrianisation and traffic calming in the Newcastle CBD could be based. This exercise provides a clear basis for investigating the successes and failures of traffic calming in PMB.

5.2 Setting

Pietermaritzburg is situated astride one of South Africa's major development axes (N3), which runs between Durban and Gauteng. At the metropolitan level, PMB provides the dominant educational, market, legal, administration, banking, retail, industrial and service function for the whole of KwaZulu Natal area. Within the municipal boundary of the city, the central area is by far the most important zone of commercial activity, providing a full range of goods and services. A hive of shopper activity created by a combination of office workers, inner city residents, suburban residents and out-of-town residents, provides conditions required for the sale of both durable and convenience goods. In addition to the central area's attraction as a retail centre, it also provides employment opportunities (City Engineers Department, 1988).

5.2.1 Brief History of PMB Traffic System

Since the mid 1980s PMB has been faced with the problems of mitigating the conflict between pedestrians and vehicular traffic, due to the increase of vehicles in the city centre. According to PMB 150 Years (1988:34) traffic counts conducted by that time indicate that approximately 174 000 vehicles a day entered and left the CBD, which resulted in tremendous pressure put on existing routes. This problem led to the introduction of a one-way street system with pedestrian crossings, the development by entrepreneurs of off-street parking and the provision of additional arterial road capacity. The new one-way system and improved signal phasing relieved congested traffic flows in the CBD. However, due to the rapid growth of the city's suburbs and more road accident occurrence in the city, a more reliable and effective solution was deemed essential (ibid.).

5.2.2 Plans for Pedestrianisation/Traffic Calming in PMB

Thorrington-Smith et al (1973:81) argue that the proposal to pedestrianise the PMB central area was supposed to take into account the continuing viability of a hardcore of the shops and offices, which depended on its continuing accessibility and convenience. Accessibility, on the one hand, depended on the planning of private and public transport and their respective terminal facilities, i.e. the parking ground, while convenience, on the other hand, depended largely on the ease and safety of pedestrian movement. It was felt that pedestrianisation plans should be made in such a way that within the city centre the pedestrians will be 'kings' and they should be closely linked together with pedestrian links. Such areas were to become precincts, where the total environment could be enhanced and protected. Thus, Professor Buchanan of Britain called these central areas ' environmental areas', i.e. areas where people can live, work, shop, look about and move around on foot in reasonable freedom from the hazards of motor traffic. It is further stated that proper and efficient pedestrian planning should be the basis for quality planning. Some objectives pertaining to the pedestrian plan in PMB were:

- To stimulate investment into the area.
- To provide direction for business in the area.
- To develop the central area so that it competes with other centres.
- To demonstrate confidence to the people.

The city council's plan to pedestrianise was presented in full awareness of the status of the city as one of the finest urban environments in SA and probably as being among the best examples of Victorian cities in the world (Natal Witness, August 1983). Therefore, it became important that the historic and architectural quality of the city be protected and sustained despite the plans, for pedestrianisation.

Pedestrianisation and traffic calming were intended to provide a revamp to the city centre, with the city engineers plan to make pedestrian malls along Church Street, between Timber and Printing Office Streets. It was envisaged that this pedestrian area would also have adequate and convenient parking alternatives, and that the general business areas would have greater control over the external appearance of buildings (The Daily News, December 1983).

Finally, the city council recommended that it was extremely important for any pedestrianisation plan to have regard for adequate parking facilities, an efficient transportation system linking the mall with surrounding residential areas and a service loading facility. Hence rear vehicular access lanes between Church and Pietermaritz Streets as well as between Church and Longmarket Streets were entrenched into the plan.

5.2.3 An Analysis of the Current Condition

As part of the PMB 2000 Plan, pedestrianisation and traffic calming scheme was adopted, as a means of solving the traffic problem in the PMB CBD. The strategic planning exercise on which this PMB 2000 project was based considered five key areas in which metropolitan planning is crucial, namely housing, employment, the quality of life, human relations and city finance.

Each of these was seen to be reliant on the development of PMB as a qualitative city capable of enhancing long-term economic opportunity and growth, and promoting a city in which the full socio-economic profile of citizens had a stake.

It is further argued that the major thrust of the PMB 2000 plan was the preparation of a central area Master Plan, which incorporated the following urban design principles:

- A road system designed to separate through traffic from local traffic.
- A series of pedestrian areas were created in the inner core of the city to avoid conflict between pedestrians and vehicles.
- Adequate provision was made for providing well-located parking facilities with access to major road networks.
- A range of new facilities were injected into the central area to make it attractive and exciting to people.
- Several environmental improvements were made to enhance aesthetics.

Pedestrian and traffic calming scheme implemented in PMB include the creation of pedestrian dominated spaces, particularly in Church Street. Vehicles have been permitted into these areas for service and access. The remainder of Church Street is a local road with improved amenities for pedestrians. This urban design framework was structured to strengthen the use of lanes by upgrading the quality of paving and street furniture (City Engineers Dept, 1988).

5.2.4 Lessons from PMB Experience

Due to pedestrianisation and traffic calming of Church Street, major traffic that used to be concentrated on the pedestrianised area has now been redirected to the by-pass, and also, there is maximum use of the 'traffic box' created around the core of the central area. This has helped to deviate vehicular traffic to use alternative routes, which go past and around the traffic calmed area. It has also been observed that the issue of safety and security around the

pedestrian mall was not on the priority list when planning the city centre. However, this does not mean that safety and security was completely ignored, but rather it as more implicit than explicit.

Although the aesthetics play a major role in pedestrianisation of a town centre, safety and security, according to the findings of the Malls Touring Party, is particularly important to ensure that there is a reduction of accidents, maximum control of crime and vagrants as well as provide the users, mostly pedestrians, with peace of mind. It was observed that although there were pedestrian crossings at intersections, most motorists did not give priority to crossing pedestrians (Mall Touring Party, 1984:126).

Also important to note is the fact that PMB lacks clear signage to distinguish the pedestrian paths from vehicle paths (Pooran, 1995:92). Although the scheme in PMB has many advantages especially to street vendors, their location is considered to be an inconvenience to pedestrians and leaves a number of tenants unhappy. As in many other towns and cities with pedestrianised CBDs, insufficient and unaffordable parking is seen as the main problem of the plan in PMB. This has deterred motorists from coming to the CBD due to the inconvenience caused by lack of parking lots and the high costs of using parking garages.

On a positive note, PMB CBD exhibits very good aesthetic qualities due to landscaping, flowers, trees etc. In PMB the separation of pedestrians and vehicles, though implicitly focused on safety and security, was particularly bent on revamping and renewing the city centre. Finally, PMB tends to have more of pedestrian 'vibe' as compared to other areas with pedestrianised or traffic calmed central areas.

5.3 Collection of Data

For the analysis to occur it is essential that data from various sources be collected - as outlined in the Research Methodology. One vital component

was the collection of data by means of a questionnaire, which was administered to pedestrians and motorists in order to determine their assessment of the plan in PMB. The questionnaire produced important findings, and its analysis is necessary in order to interpret these findings. As mentioned in Chapter 3, the structure of the questionnaire was influenced by the goal and objectives of the study. Some of the questions in the questionnaire were structured, in order to save time and for easier analysis, however those relating to strengths and weaknesses of the plan were open-ended to gain people's view and opinion on the plan.

5.3.1 Sampling Technique for the Questionnaire

The administration of the questionnaire to the users in PMB was a pilot run attempting to uncover the effectiveness of pedestrianisation and traffic calming in the CBD, within a limited time period. A sample of 30 people was randomly selected for administration of the questionnaire, with no particular concern for age, sex or race group. However, an attempt was made to deal with a diverse section of uses, namely teenagers, adults, senior citizens.

5.3.2 Administration of the Questionnaire

Where

The questionnaires were administered in the PMB CBD, i.e. an area within Longmarket, Chapel, Pietermaritz and Commercial Streets (highlighted in map 3).

When

The questionnaires were administered on Mondays, the 13th and 20th November 2000, between 10h00 and 15h30.

How

The researcher walked around in the study area, approaching people at random. Care was taken to question a cross-section of users, particularly those willing to participate. Each questionnaire took an average of five minutes to complete. Some respondents showed enthusiasm to participate and commented on a wide range of issues, however care was taken not to allow them to stray away from the relevant issues. Other respondents showed lack of understanding, therefore the researcher was, in some cases, compelled to provide clarity. Most of the responses to the questionnaires were good and sufficient to pursue further study.

5.3.3 Interviews with Tenants

A number of interviews were conducted with the tenants in PMB. These included shopowners/managers of stores in the town centre. A sample of eight tenants was interviewed because, though the area has a large variety of shops, the researcher was highly limited by time constraints. In selecting the tenants an attempt was made to choose from various categories of shops, and the rationale behind these interviews was to determine the effect pedestrianisation has had on the business in the area.

Interviews with tenants were conducted on the 14th and 15th November 2000 as well as on the 22nd November 2000 between 10h00 and 16h00. The researcher had difficulty obtaining a cross section of categories, as some managers were reluctant to co-operate and insisted that all questions be directed to their head office.

5.4 Findings

5.4.1 Questionnaires

The findings of the questionnaires administered to the respondents on PMB are as follows.

The majority of the respondents, i.e. 68%, came from the suburbs surrounding PMB. Twenty percent indicated that they live in the town centre, and 12% came from the areas outside PMB.

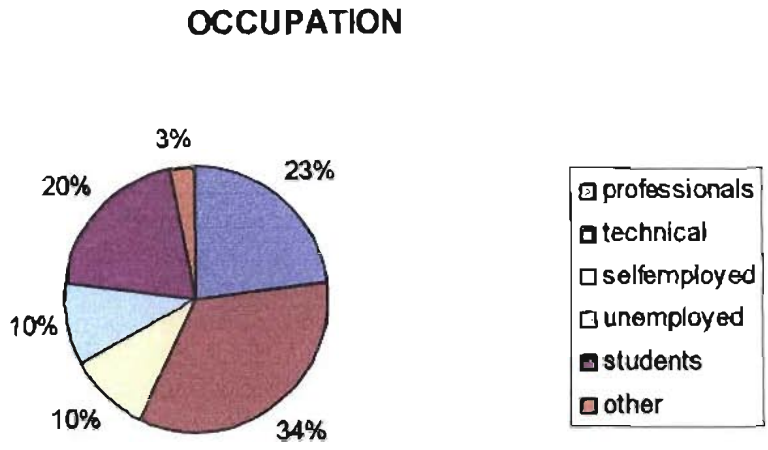
The majority of the respondents (60%) were females while 40% were males. The respondents have been grouped in terms of age groups, as follows:

Table 1: Age

Age (Years)	No. of Respondents	Percentage (%)
10 - 19	5	17
20 – 29	13	43
30 – 39	4	13
40 – 49	4	13
50 – 59	2	7
60 and above	2	7
TOTAL	**30**	**100**

It is evident from Table 1 that although an attempt was made to obtain a cross section of users, the majority of respondents, i.e. 43%, were between ages 20 and 29. Seventeen percent of the respondents came from age category 10-19. Another twenty six percent of these came from ages 30-39 (13%) and 40-49 (13%). The remaining fourteen percent was constituted by ages 50-59 (7%) as well as ages 60 and above (7%).

Occupation (Figure 1)



It is evident from Fig 1 that the majority of the respondents (34%) are employed in the technical and administration field. Forty three percent of the respondents is constituted by those employed in the professional (23%) as well as the students (20%). The remaining 23% of the respondents came either from the self-employed (10%), the unemployed (10%) or the other (3%) categories.

Frequency of Trips (Figure 2)

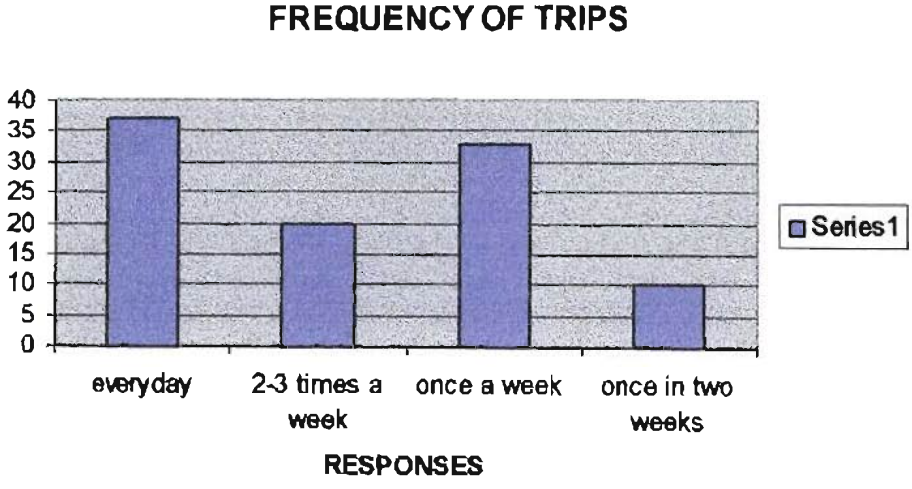


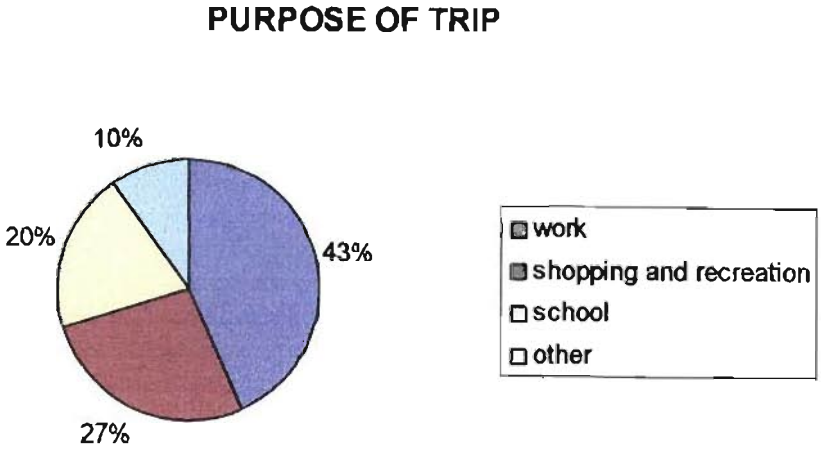
Figure 2 shows that the majority of the respondents, (37%), come to the CBD on daily basis, while 33% come on weekly basis. Another 20% of the respondents stated that they come to the CBD 2-3 times a week and the remaining ten percent comes once in two weeks.

Table 2: Time

Time	No. of Responses	Percentage %
Before 08h00	9	30
08h00-11h59	6	20
12h00-15h59	12	40
After 16h00	3	10
Total	**30**	**100**

Table 2 indicates that the majority of the respondents, i.e. 40%, normally come to the CBD and seek parking during the 12h00 -15h59 time slot. Another 50% of the respondents come to town either before 08h000 (30%) or between 08h00 and 11h59 (20%). The remaining 10% use the CBD after 16h00.

Purpose of Trip (Figure 3)



Forty three percent of the respondents stated that they come to the CBD for work purposes, while 27% come for shopping and recreation reasons. Another 20% come to the CBD for school purposes, and the remaining 10% come for other unspecified reasons.

Table 2: Mode of Transport

Transport	No. of Responses	Percentage %
Private Car	13	43
Minibus Taxi	9	30
Bus	3	10
Walk	5	17
Total	**30**	**100**

From Table 3 above, it is apparent that the majority, 43%, of the respondents travel to the CBD by private vehicles. The next popular mode of transport is the minibus taxi, by which 30% of the respondents travel. Seventeen percent of the respondents stated that they travel on foot to the CBD, while the remaining 10% travel by bus.

Table 4: Ease of Movement in CBD

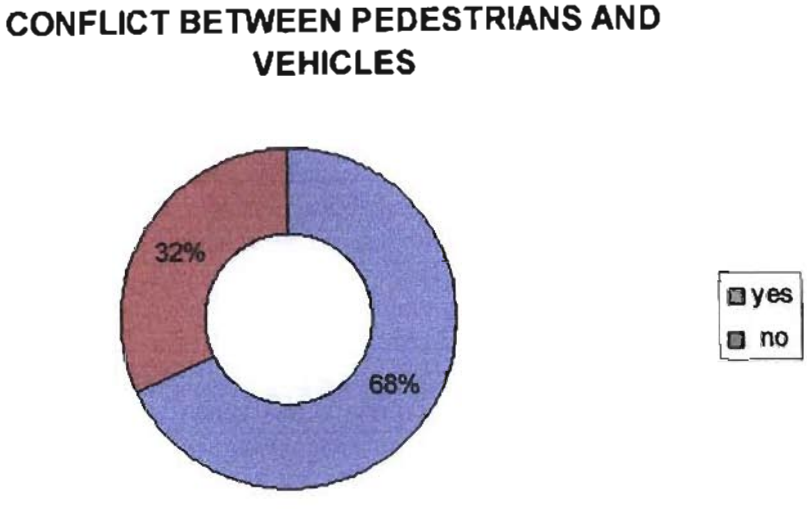
Movement	No. of Responses	Percentage %
Easy	4	13
Relatively Difficult	8	27
Very Difficult	18	60
Total	**30**	**100**

Of those respondents who travel by private vehicles to the CBD, 60% claims that it is very difficult to move around in the CBD while looking for parking. Another 27% stated that it is relatively difficult to fond parking, while the remaining 13% of the respondents reported having no problems in finding parking in the CBD, as already indicated in Table 4.

Impressions about the Plan

Fifty six percent of the respondents had a positive impression about the plan, while 30 % had a negative impression. Fourteen percent felt indifferent about the plan.

Conflict between Pedestrians and Vehicles (Figure 4)



It is evident from Figure 4 that the majority, 68%, of the respondents feel that conflict still exists between pedestrians and vehicles in the PMB CBD. The remaining 32% stated that the plan has managed to solve the conflict in the CBD.

Comments from the respondents on the effectiveness of the plan revealed that weaknesses outnumbered the strengths. Among the weaknesses pointed out are these: insufficient parking, insufficient sitting areas, insufficient space for pedestrian movement, lack of clear signage, insufficient pedestrian crossing points, lack of safety and security as well as inconsiderate attitude of the drivers. Strengths to the plan included socialising opportunities and ability to walk freely from one shop to another, without threat from passing vehicles.

Rating the Plan

Table 5: Ratings for Safety

Rating	No. of Responses	Percentage %
Very Good	4	13
Good	4	13
Fair	12	40
Poor	7	24
Very Poor	3	10
Total	**30**	**100**

It is evident from the table above that the plan was rated as being fair in terms of safety by 40% of the people interviewed. Another twenty six percent rated safety as either very good (13%) or good (13%). The remaining 34% of the respondents rated safety as either poor (24%) or very poor (10%).

Table 6: Ratings for Security

Rating	No. of Responses	Percentage %
Very Good	-	-
Good	-	-
Fair	8	27
Poor	18	60
Very Poor	4	13
Total	**30**	**100**

Table 6 indicates that the majority of the respondents (60%) rated the plan in terms of security as being poor. Twenty seven percent felt that security should be given a fair rating, whereas 13% rated it as being very poor.

Table 7: Ratings for Comfort

Rating	No. of Responses	Percentage %
Very Good	1	3
Good	4	13
Fair	14	47
Poor	2	7
Very Poor	9	30
Total	**30**	**100**

The majority of the respondents (47%) rated the plan as being fair in terms of providing comfort to its users. Thirty percent stated that the plan is very poor in terms of comfort. The remaining 23% respondents rated comfort as either very good (3%), good (13%) or poor (7%).

Table 8: Ratings for Convenience

Rating	No. of Responses	Percentage %
Very Good	4	13
Good	5	17
Fair	12	40
Poor	3	10
Very Poor	6	20
Total	**30**	**100**

Table 8 above, indicates that the majority of the respondents, i.e. 40%, rated convenience as being fair. Twenty percent rated convenience of the plan as very poor, while 10% rated it as poor. The remaining 30% of the respondents rated the plan in terms of convenience as either good (17%) or very good (13%).

Table 9: Ratings for Accessibility

Rating	No. of Responses	Percentage %
Very Good	-	-
Good	6	20
Fair	18	60
Poor	1	3
Very Poor	5	17
Total	**30**	**100**

Table 9 shows that the majority of respondents (60%) rated accessibility of the plan as being fair. Twenty percent rated it as good. Another 17% rated it as being very poor, while 3% indicated that the plan is poor in terms of accessibility.

Table 10: Rating for Attractiveness

Rating	No. of Responses	Percentage %
Very Good	5	17
Good	5	17
Fair	14	46
Poor	3	10
Very Poor	3	10
Total	**30**	**100**

In terms of attractiveness the majority of the respondents, 46%, rated the plan as fair. Thirty four percent of the respondents rated attractiveness of the plan as being either good (17%) or very good (17%). An equal number of respondents, i.e. 10% each, rated the plan as either poor or very poor in terms of attractiveness.

From the above presentation of the findings, it can be noted that the pedestrianisation and traffic calming scheme has been received with mixed

feelings by its users in PMB. It is also evident from the findings that although the majority of the respondents expressed a positive impression about the plan, most responses to this scheme in terms of comfort, convenience, security, accessibility and attractiveness indicate that the plan is either fair or poor.

5.4.2 Interviews with Tenants

Of the tenants interviewed, the majority stated that that pedestrianisation and traffic calming of the CBD has had a positive effect on their business. According to Ms Thabile Ntshangase, a Cosmetics Manageress, Edgars (15 November 2000):

> "Passing trade has a proportional effect on business. This plan has made provision for pedestrian ways, which in turn has increased passing trade. It is more convenient to be a shopper on foot than a shopper travelling in a car".

Most tenants stated that business has been on par, i.e. it has not deteriorated in any way as a result of the plan. Some tenants claim that the plan has injected new business opportunities into the CBD. They point out that many of the large department stores have relocated to the "heart of pedestrian activity". A large number of stores have plans to renovate, either to increase floor space or to give the store a facelift. According to tenants all this was done as a direct result of the influence of the pedestrianisation plan, as well as towards making the stores more attractive to pedestrians.

However, those tenants that are not located within the pedestrian precinct argue that their exclusion has had a negative impact on their business, as people are not attracted to their location. One of the main grievances of the tenants seems to be the issues of insufficient parking, which they claim is the direct result of the pedestrianisation plan. These tenants point out that lack of

parking had deterred some shoppers from coming into their stores, which in turn has had an indirect negative influence on business.

5.5 Conclusion

5.5.1 Questionnaires to Users

The majority of the respondents come to the PMB CBD mainly for work, shopping, recreation or social reasons, with the frequency of trips being made on daily basis. Most of the respondents are employed in the clerical and administration field and the popular mode of transport is the private motor vehicle. Parking is regarded as a major problem at all times, particularly during weekends and month-ends. The majority of the respondents have a positive impression about the pedestrianisation plan in the town centre, despite the fact that they feel that conflict still exists between vehicles and pedestrians in the CBD, which could be attributed to the growth of the population. However, many people in the area view this plan as a step towards mitigating this conflict.

The pedestrianisation plan was rated as being fair in terms of safety, convenience, comfort, accessibility and attractiveness, but poor in terms of security.

Strengths of the plan include sufficient space for pedestrian movement as well as adequate provision for sitting areas. It also provides an attractive and adequate environment in which one could socialise and meet people.

With regard to the weaknesses of the plan the issues of insufficient parking is the most critical. The real issue is that of price as opposed to supply, on which more attention was paid in deriving a comprehensive policy that would address the issue of subsidisation of casual parking. It is clear that until the

problem of parking is settled, support for pedestrianisation and traffic calming would decline.

5.5.2 Interviews with Tenants

Overall the pedestrianisation and traffic calming scheme has been positively received by tenants. Initiatives have been taken by many tenants to make their stores inviting to customers. Business has also improved since the implementation of this pedestrianisation plan.

CHAPTER SIX:
ANALYSIS OF CASE STUDY AREA: NEWCASTLE

6.1 Introduction

The chapter presents the case study area, which is Scott Street in the Newcastle CBD. An analysis of the setting as well as the historical development of the area will also be presented. There will also be a brief outline of the lessons learnt from the Traffic and Transportation study conducted by the Newcastle Local Council (NLC) in collaboration with Stanway Edwards Ngomane Associates, in 1999. These will help the researcher to be able to draw conclusions and make recommendations basing the arguments on recently acquired data. The chapter further presents a plan for the application of pedestrianisation and traffic calming to the Newcastle central area.

The chapter also presents an analysis of data collected about the possibility of applying pedestrianisation and traffic calming to the Newcastle CBD. An outline of the procedures used when sample for the study was selected and the administration of the questionnaires. An analysis of the questionnaires and the presentation of data are also outlined, with a further analysis of data collected during interviews with planners and tenants. The chapter concludes by presenting the findings of questionnaires, interviews as well as participant observation.

6.2 Setting

The NLC is situated in the northwestern portion of the Umzinyati Region, which, in turn, is situated in the northwestern KwaZulu-Natal (KZN) (see map 1). Being one of the six local council urban areas, the NLC is the largest local council in the region – it is ±222km in extent, contains the third largest population concentration in KZN, and is the fourth largest urban node in the

province (Newcastle LDP, 1999:17). It straddles the N11 road linking Newcastle with Ladysmith down to Durban, to the south and Volksrust up to Gauteng, to the north. Until the 1970s Newcastle was a small town, however during the early seventies it was identified as an industrial decentralisation point and the development of Iscor and associated developments, resulted in a dramatic expansion of the former Borough of Newcastle. The expansion led to the establishment of Madadeni and Osizweni, which also took place during the early 1970s, as regional relocation townships for the former Northern Natal, which was part of the national apartheid land policies of the time (see map 2). Madadeni was originally developed as a **model township** for about 20 000 families, while Osizweni was established as a **self-help township** of ±10 000 site (ibid, 20).

The Newcastle CBD, on the other hand, consists of the traditional gridiron pattern of street blocks of ±4.05ha each, and each block consists of approximately ten lots of ±4 047 square meters (Newcastle CBD Development Plan, 1983:4). Despite a number of subdivisions that have taken place, this basic pattern remains the basis for development in the central area. The commercial activities in the CBD began as a market and gradually expanded to more intensive functions, which during the late sixties were mainly restricted to Allen and Scott Streets.

Since the late seventies an increase in commercial land has been observed and development has mostly been in the form of redevelopment of existing commercial lots, especially along Scott Street where small shops made place for larger modern shops and office buildings (see

photo 1). Thus the Newcastle CBD, which is bounded by Hardwick, Harding, Sutherland and Murchison Streets, has developed into a retail hardcore. The development taking place along Allen and Scott Streets has led to an increase of vehicular traffic in the town centre, which, in turn, has resulted in traffic congestion and parking problems, while also posing a threat to pedestrian movement (ibid, 2).

6.3 Lessons Learnt from 1999 Traffic and Transportation Study

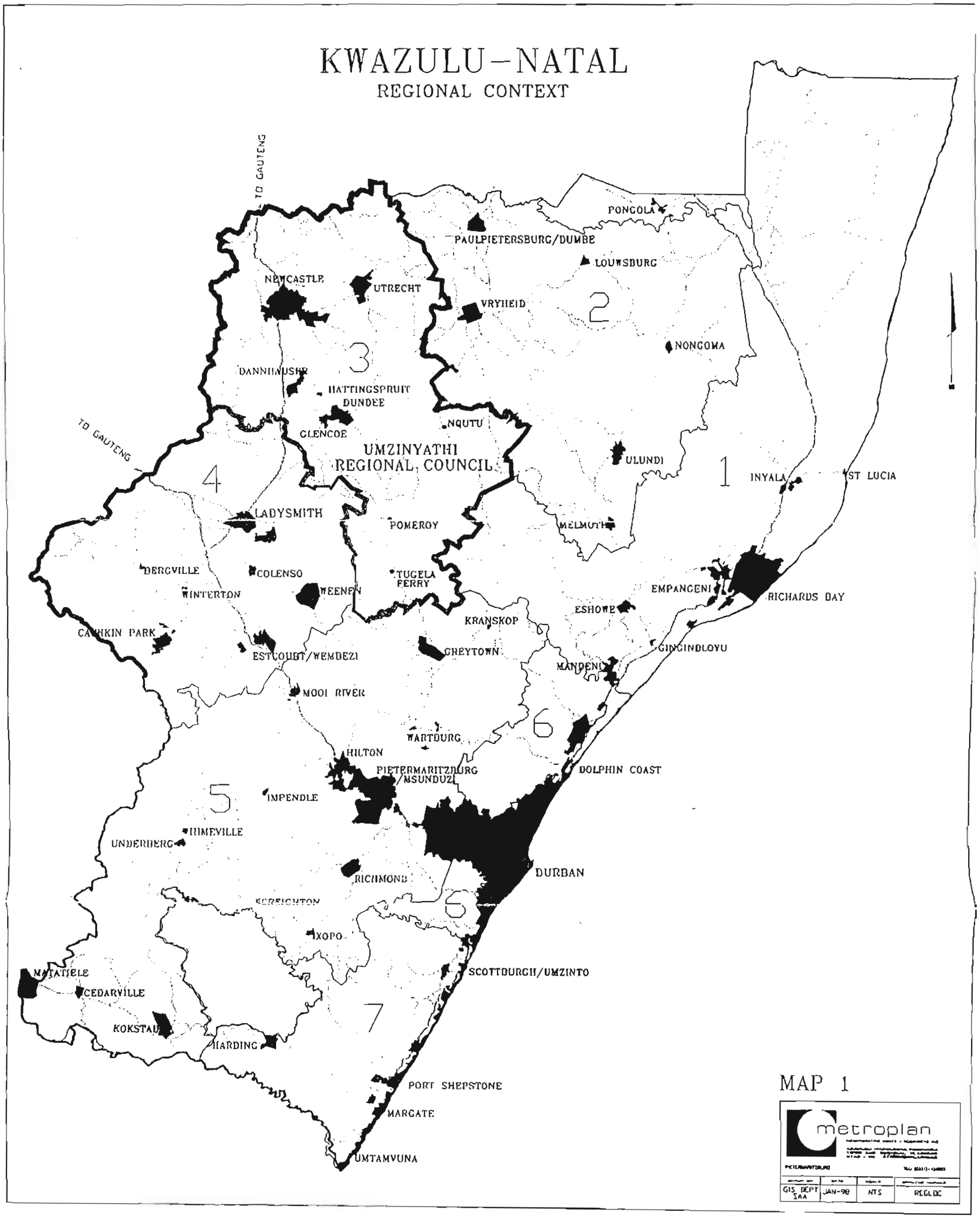
The study concluded that transportation, in Newcastle, forms an integral part of the daily life, and people need transport to go to work, to visit friends, families and relatives. However, the type of transport that makes the most difference in people's lives is land transport, which includes walking, cars, taxis, buses etc. The Newcastle Local Council (NLC) argues that because many vehicles and pedestrians share the same road space at the same time, the interaction between the vehicles and pedestrians is not always easy. In fact, as the number of vehicles and pedestrians grow, serious circulation problems crop up. These problems manifest themselves in the form of accidents, traffic congestion, crime, environmental degradation, long waiting hours at public transport facilities, lack of adequate facilities for passengers and public transport vehicles etc.

While conducting an overall Traffic and Transportation Study in 1999, Stanway Edwards Ngomane Associates (SENA) was requested to investigate as a priority the traffic and transportation problems being experienced in relation to Scott Street. This work was efficiently undertaken and the following problems were identified, amongst others:

- Lack of taxi stops in the CBD.
- Inadequate public transport operation.
- Inadequate provision for taxis and hawkers' needs.
- Poor standard of workmanship in the CBD.

KWAZULU–NATAL

REGIONAL CONTEXT

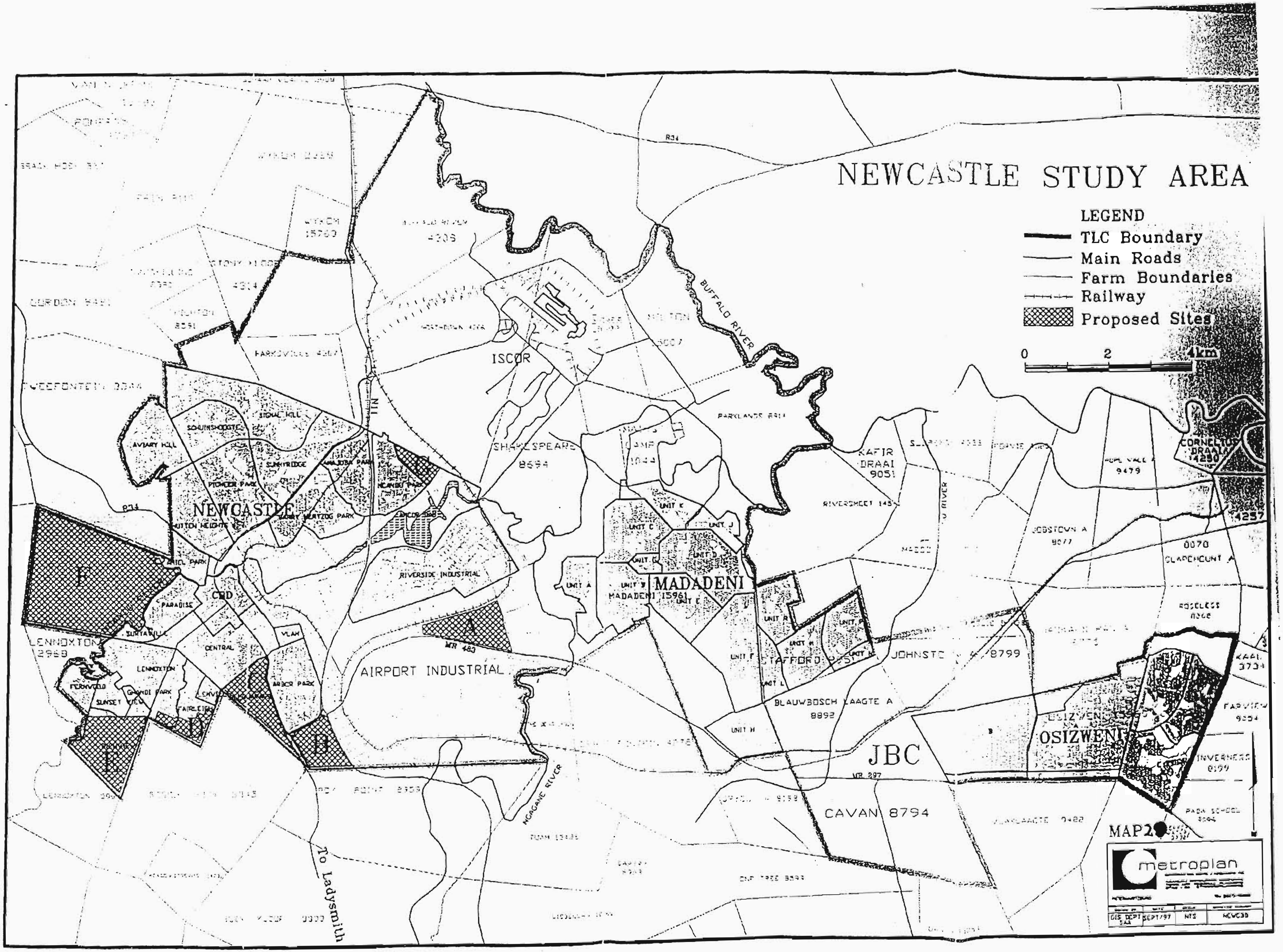


MAP 1

metroplan

PIETERMARITZBURG

GIS DEPT SAA	JAN-98	NTS	REGLOC


NEWCASTLE STUDY AREA
LEGEND
TLC Boundary
Main Roads
Farm Boundaries
Railway
Proposed Sites
0
2
4km
BUFFALO RIVER
ISCOR
NEWCASTLE
MADADENI
OSIZWENI
JBC
AIRPORT INDUSTRIAL
RIVERSIDE INDUSTRIAL
SHAKESPEARE
8694
KAFIR
DRAAI
9051
CAVAN 8794
BLAUWBOSCH LAAGTE A
8892
STAFFORD
LENNOXTON
2969
PARKLANDS
CBD
PARADISE
CENTRAL
AVIARY HILL
NGAGANE RIVER
To Ladysmith
MR 297
MR 480
A
B
D
E
F
G
MAP29
metroplan

- Vehicle and pedestrian conflict.
- Traffic delays at signalised intersections.
- Inadequate parking facilities and pedestrian crossings
- Deterioration of the town centre.

For the above mentioned problems SENA proposed both short and long term remedial measures in their Scott Street report. The short term remedies included:

- Implementing concurrent right and left-turning signal phases at road intersections.
- Placing peak period parking restrictions on Scott Street.
- Improving aesthetics in the town centre.
- Improving town centre traffic signal.

The longer-term considerations proposed were as follows:

- Promoting off-street parking in town centre.
- Investigating the feasibility of providing satellite public transport rank to the southeast and south west of Allen Street.
- Maintaining Scott Street as an attractive bypass.

[Adopted from the Draft Newcastle Local Development Plan, 2000:14-19]

The researcher, after careful consideration of the traffic and transportation problems in the CBD and the proposed remedial measures, feels that a more integrated approach to solving these problems in the Newcastle town centre will be feasible. This feeling inspired the researcher to look at pedestrianisation and traffic calming schemes as a potential means to solve problems of congestion, conflict and public transport operation in Newcastle. Since these schemes have worked well in international countries such as London in the city of Oxford, and locally in Pietermaritzburg, the researcher believes that the application of one/ both of these schemes in Newcastle along Scott Street, even experimentally, could provide solutions to the outlined problems and enhance the aesthetic value of the town centre.

6.4 The Pedestrianisation/Traffic Calming Plan for Newcastle CBD

It appears that the two primary aims of calming the escalation of traffic in a particular area are; firstly, due to congestion and the rising conflict between pedestrians and vehicles, and secondly, for purposes of revitalising or revamping the CBD in order that it becomes able to compete with towns of similar size, thereby attracting opportunities for economic growth. Therefore, the pedestrianisation/traffic calming plan for Newcastle is based on the above elucidated aims, and it is believed that if this plan gets successfully implemented, it will the town a major economic boost allowing it to have its own unique but very attractive image and identity.

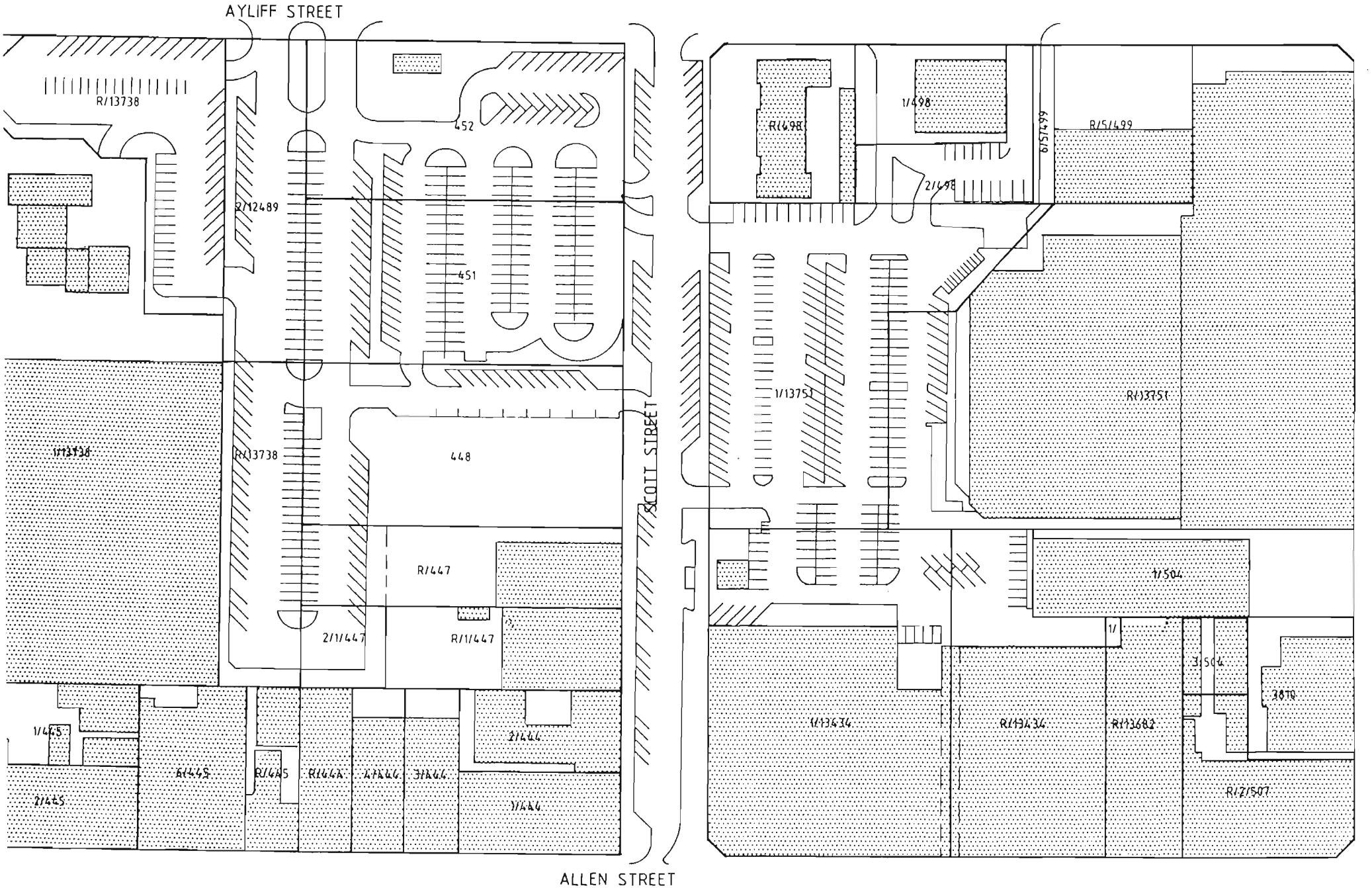
Presently, the study area is partially calmed to traffic, i.e. the block between Allen and Voortrekker Streets, which only allows left turning to north-bound traffic (see photo 2). Photo 3 indicates that this road is reserved only for one-way traffic. Therefore, the pedestrianisation/traffic calming plan proposes that the portion of Scott Street, from Voortrekker Street through to Ayliff Street (see map 3), be closed to private vehicular traffic and made a pedestrian area, wherein the block between Allen and Ayliff Streets will be fully pedestrianised, i.e. giving pedestrians priority over vehicles, and the block between Allen and Voortrekker Streets remains in its state of being a one way traffic calmed road.

Since the area of proposed pedestrianisation houses a variety of land uses such as major banking and financial institutions, major chain stores, furniture houses, the town's post office etc, rear vehicular entrances and parking facilities will be provided, and the existing restricted parking garages be open to every motorist at affordable daily charges. It is also important to mention that the pedestrianised block will be open solely for access by emergency and light delivery vehicles, which, the researcher believes, do not pose a threat to pedestrians due to the predictable times at which they come.

After the closure of Scott Street to vehicular traffic, the revamping process will then commence, which will include:

- Modern design paving of the road and sidewalks.
- Planting of seasonal trees/shrubs and flowers at strategic locations along the pedestrian strip.
- Installation of modern-day street furniture, e.g. benches, shelter etc, at strategic points.
- Installation of modern and attractive neon and fluorescent lighting.


LINCOLN ST
TERMINUS ST
CHURCH ST
SUTHERLAND ST
VOORTREKKER ST
BADGER ST
KIRKLAND ST
MURCHISON ST
SCOTT ST
HARDWICK ST
ALICE ST
PATERSON ST
YORK ST
HOSPITAL ST
CBD
LARGER CBD



SCALE : 1 : 1 000

MAP 4

- Turning one of the alleys along Scott Street into an amusement alley with coffee shops, exclusive restaurants, ice-cream and popcorn parlours etc. – long term plan.

Due to the pedestrianisation/traffic calming of Scott Street south- and north-bound private vehicles will be disallowed to go through the CBD along Allen Street, because this will pose a threat to pedestrians at the intersection of Scott and Allen Streets. Only minibus taxis, delivery and service vehicles will be allowed to use that road, however all vehicles will have no restrictions along Allen Street before 08h00 in the morning and 16h30 in the afternoon.

Most of the private vehicles will access the CBD through Murchison and Harding Streets, and their access will either be from the eastern or western part of the town. This means that by partial closure of Scot Street to vehicles Murchison and Harding Streets will become the main traffic feeders into the CBD. This plan for a pedestrian mall is one of the medium to long term goals for development in Newcastle, also reiterated by the SENA study. Since it will require extensive financial support from the local government and from the ratepayers, a carefully planned strategy for its implementation is vital.

The above section has attempted to present a clear background to the study area. The researcher is positive that if pedestrianisation/traffic calming plan presented could be implemented, it will improve the prevailing conditions, enhance the town's overall image and identity and help generate additional economic development for the NLC. This will lead to a horizontal expansion of the town centre, therefore, improvement of the downtown environment, which involves renovation of derelict buildings and implementation of modern design

landscaping, is vital. Having familiarised ourselves with the study area, the following section presents local people's views about the proposed plan.

6.5 Collection of Data

6.5.1 Sampling Technique for the Questionnaire

Like in PMB, the administration of the questionnaire to the users in Newcastle was a pilot exercise, attempting to gather people's views and understanding, as well as attitude to the proposed pedestrianisation/traffic calming plan for the CBD. The pilot study was conducted within a very limited time period due to the researcher's academic commitments. A sample population of 30 people was randomly selected, and the questionnaires were administered to the sample population without any specific focus on a particular sex, age, race group etc, rather, the sample was selected from a wide variety of people, i.e. both pedestrians and motorists. An attempt was made to deal with a cross-section of users, i.e. youth, adults and senior citizens.

6.5.2 Administration of the Questionnaire

Where

The questionnaires were administered in the Newcastle CBD, an area used by a wide spectrum of people from the various magisterial districts constituting the NLC. The CBD is bounded by Murchison, Hardwick, Harding and Voortrekker Streets (highlighted in map 4).

When

The questionnaires were administered on Thursday 19 October 2000, and Saturdays 21 and 28 October 2000 between 10h00 and 16h30.

How

The same procedure carried out in PMB was followed in Newcastle.

6.5.3 Interviews with Planners

These were conducted with two people involved with the Traffic and Transportation Study (1999) for the NLC, as well as with someone involved with the whole traffic management in the Newcastle CBD.

The first interview was conducted with Mr Kebone Masange on the 12th October 2000. Mr Masange is a chief town planner in the Strategic Planning Dept of the NLC. He was directly involved in the Traffic and Transportation Study conducted in 1999, and has been working with the Newcastle CBD Revitalisation Committee, which has managed to produce a Draft Development Plan for the CBD, for the past 18 months.

The second interview was conducted with Mr Simon Barkhuizen on the 26th October 2000. Mr Barkhuizen is an engineer in the Public Works Dept in the NLC. He was partly involved in the Traffic and Transportation Study, however his special area of focus for the past five years has been in the maintenance and renewal of the CBD. He is one of the few advocates for pedestrianisation of the Newcastle CBD.

The third interview was conducted through electronic mail with Mr Eric Ngomane on the 7th November 2000. Mr Ngomane is an engineer working for the transportation engineers and planners firm known as Stanway Edwards Ngomane Associates (SENA), which is based in Johannesburg. He has been involved with a prior Transportation Study for Ladysmith and Newcastle in 1987, and his 1999 study drew major conclusions for the Newcastle CBD, some of which have precipitated the researcher to undertake this study.

6.5.4 Interviews with Tenants

A set of interviews was also conducted with the tenants in the study area. As indicated in Chapter 1, these included the shopowners and managers of the shops in the area. A large sample of fifteen tenants was interviewed since the CBD is characterised by a wide variety of shops. The rationale behind interviewing tenants was to determine the effects that the application of pedestrianisation could have on the overall business in the area.

These interviews were conducted on the 10th and 11th October 2000 as well as on the 1st and 2nd November 2000, between 09h00 and 15h00. As in PMB, the researcher experienced some difficulties, though, in accessing a cross-section of categories because some managers were too suspicious, while others lacked insight into the issues covered in the study, and others were reluctant to answer and referred the researcher to their head office. However the researcher managed to get willing participants from financial and banking institutions, jewellery shops, clothing and shoe stores, furniture shops, take-away restaurants and stationery shops.

6.2.5 Participant Observation

The researcher undertook a formal participant observation exercise on the 27th October 2000 to assess the prevailing conditions in the Newcastle CBD. The researcher played the role of both the motorist and pedestrian, as a means of assessing how the implementation of the proposed plan could cater for the needs of each user. The researcher also walked around the study area analysing the extent of conflict between vehicles and pedestrians, and also assessing the physical fabric of the CBD. This exercise helped to determine the possible strengths and weaknesses of applying the proposed plan to the Newcastle CBD.

6.6 Findings

6.6.1 Questionnaires

This section presents the findings of the questionnaires administered to the respondents in Newcastle.

The majority of the respondents, i.e. 63%, came from the suburbs and townships constituting the NLC. Twenty percent of the respondents are those who live in the town centre, and 17% came from areas outside Newcastle.

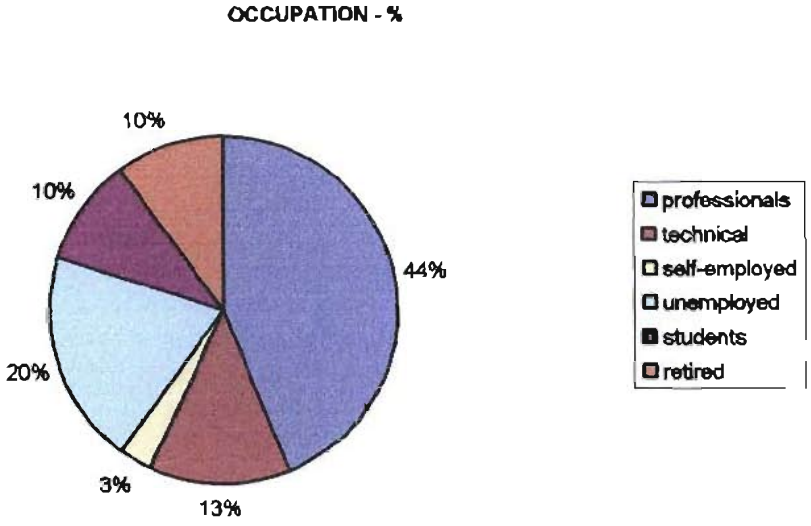
Unlike in PMB, the majority of the respondents were males, i.e. 53%, and females were 47%. The respondents were grouped under the following age categories, as indicated in Table 1.

Table 1: Age

Age (years)	**No. of Responses**	**Percentage(%)**
10-19	2	7
20-29	7	23
30-39	16	53
40-49	-	-
50-59	3	10
60 and above	2	7
TOTAL	**30**	**100**

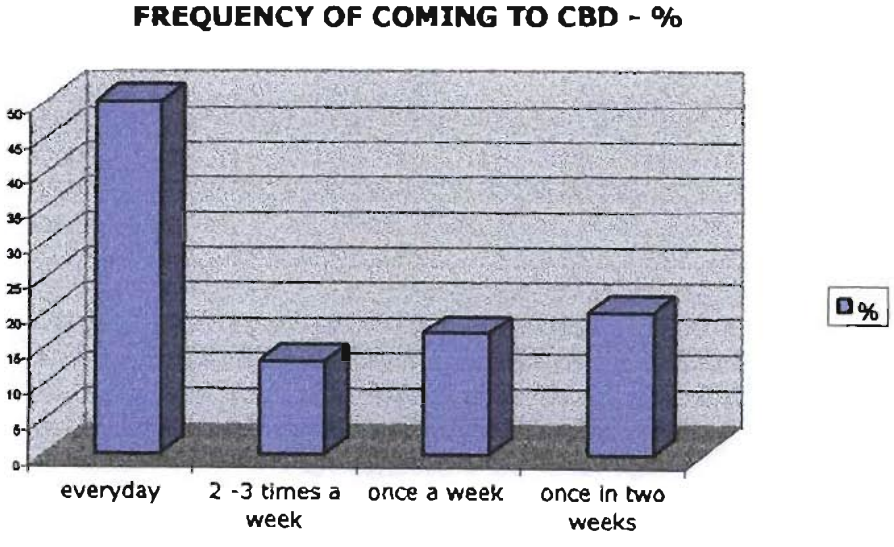
From Table 1 it is evident that although an attempt was made at obtaining a cross-section of prospective users, the majority of respondents (53%) came from the ages 30 – 39. Twenty three percent of the respondents came from the 20 – 29 years categories. The remaining 24% respondents were constituted by the 50 – 59 age category (10%), the 10 – 19 years category as well as the 60 and over category, each of which had 7%.

Occupation (Fig. 1)



The majority of the respondents (44%) in the Newcastle CBD were professionals employed in various fields such as teachers, radiographers, social workers etc. Sixteen percent were those in the technical (13%) and self employment (3%) categories. The remaining 40% was constituted by respondents who were either unemployed (20%), students (10%) or retired (10%).

Frequency of Trips (Fig. 2)



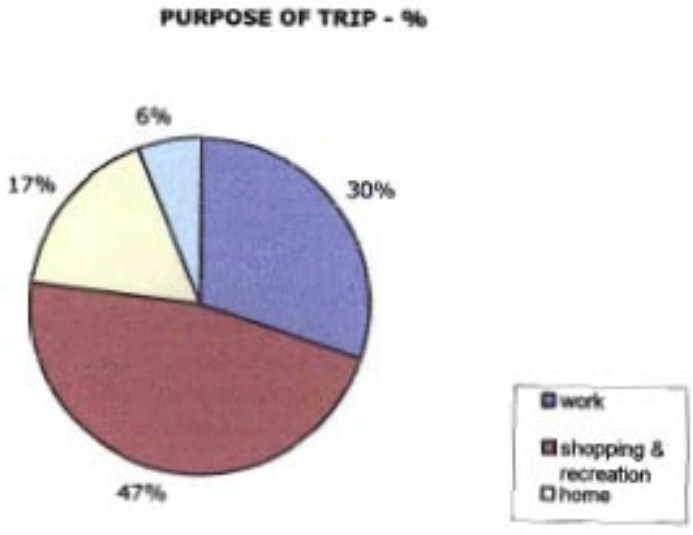
The majority of the respondents (50%) indicated that they come to the CBD on daily basis, while 20% stated that they come only once in two weeks. Another 17% of the respondents indicated that they come on a weekly basis, and the remaining 13% stated that they come two to three times a week.

Table 2: Time

Time	No. of Responses	Percentage - %
Before 08h00	7	23
08h00 – 11h59	6	20
12h00 – 15h59	10	34
After 16h00	7	23
TOTAL	**30**	**100**

Table 2 indicates that the majority of the respondents, i.e. 34%, normally come to town and seek parking areas during the 12h00 – 15h59 time slot. Another 46% of the respondents come to town, either before 08h00 (23%) or after 16h00(23%). The remaining 20% use the CBD between 08h00 and 12h00.

Purpose of the Trip (fig. 3)



Thirty percent of the respondents stated that they come to the CBD for work and other personal purposes, while 47% come for shopping, socialising and recreational reasons. Seventeen percent indicated that they normally come to the CBD because it is on their way home, i.e. these are staying in town and in the surrounding areas. The remaining 6% come to town for school purposes.

Table 3: Mode of Transport

Mode	No. of Responses	Percentage - %
Private Car	12	40
Bus	2	7
Minibus Taxi	14	46
Walk	2	7
Total	**30**	**100**

From Table 3 above, it is evident that the majority of respondents, i.e. 46%, travel to the CBD by minibus taxis, which constitutes public transport. the next popular mode of transport is the private vehicle, which is used by 40% of the respondents. The remaining 14% constitutes respondents travelling to the CBD either by bus (7%) or on foot (7%).

Table 4: Ease of movement in CBD

Movement	No. of Responses	Percentage - %
Easy	5	16
Relatively Difficult	15	50
Very Difficult	10	34
Total	**30**	**100**

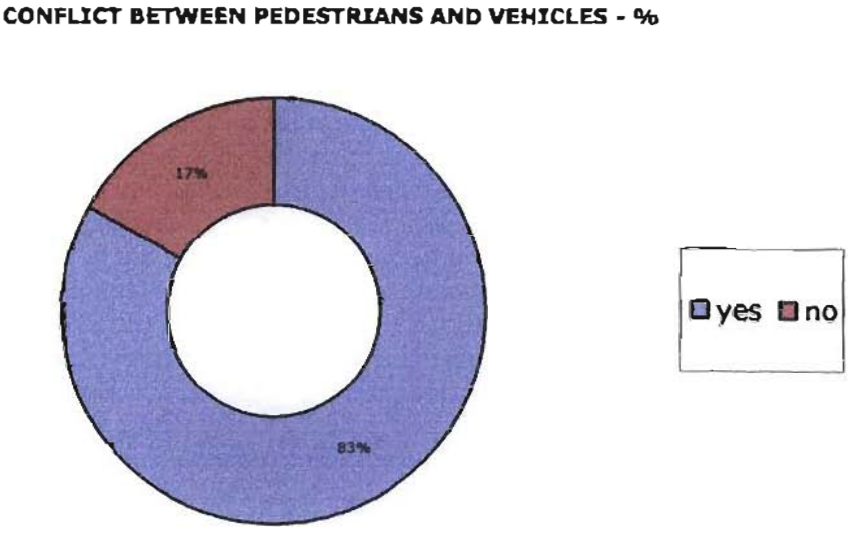
Both private vehicle users and commuters believe that it is relatively difficult to fond one's was around the CBD, due to congestion problems. Of the 34% were the private vehicle users and 16% were the commuters. Another 34% expressed a deep concern about the difficulty of finding one's way through the

CBD especially on busy days of the month, 16% of the respondents indicated that they have not had any difficulties finding their way through the CBD.

Impressions about Pedestrianisation/Traffic Calming

Eighty percent of the respondents have positive impression about the application of the proposed plan, while only 12% expressed a negative impression towards the plan. Eight percent of the respondents expressed indifference about the proposed plan.

Conflict between Vehicles and Pedestrians (Fig. 4)



Of the thirty respondents approached, 83% indicated that there is a major conflict between pedestrians and vehicles in the CBD, which requires urgent attention by the traffic authorities. Of these the remaining 17% believe that there is no conflict existing between pedestrians and motorists.

Table 5: Town's Image and Identity

Image	No. of Responses	Percentage - %
Yes	22	73
No	3	10
Indifferent	50	17
Total	**30**	**100**

Table 5 indicates that of the thirty respondents approached, the majority, i.e. 73%, believes that the proposed plan of pedestrianising and calming traffic in the CBD could help enhance the town's image and give it a unique identity. Another 10% indicated that they do not believe that the proposed plan could do anything in terms of improving the town's image and identity. The remaining 17% indicated lack of insight into the proposed plan.

On the strengths and weaknesses that could crop up as a result of the implementation of the proposed plan, the respondents expressed more strengths than weaknesses, which the plan could bring to the town centre. Some of the strengths included:

- sufficient space for pedestrian movement.
- more safety and security measures to be implemented.
- enhanced and improved town centre.
- clearly visible road signs.
- opportunities to socialise and meet other people.
- opportunities to walk around without threats from passing cars.
- a chance to do window-shopping without interference from passing cars.
- the proposed amusement centre will attract more people, thus increase sales.

However, it is believed that there are weaknesses that the proposed plan will bring to the CBD. These include the fact that the plan will do little to solve the existing parking problem, but it will exacerbate the problem unless more

parking facilities are provided in close proximity to the CBD. It is believed that the plan could also promote vagrancy unless proper control and patrol measures are would be taken. Hawkers are seen as another threat to the proposed plan, since they have a tendency to flock along the pedestrian paths. It is believed that this could hinder the flow of pedestrians, which in tun, could lead to lack of comfort, convenience, safety and security, which are some of the main principles for pedestrianisation.

Rating the Plan

Table 6: Ratings for Safety

Rating	No. of Responses	Percentage - %
Very good	8	47
Good	14	27
Fair	6	20
Poor	2	6
Very poor	-	-
Total	**30**	**100**

Table 6 depicts that in terms of providing safety, the proposed plan is rated as being good by 47% respondents. Twenty seven percent of the respondents believe that the implementation of this plan could render the CBD a safe environment. The remaining 26% rated the impact of the proposed plan on safety of the CBD as either fair (20%) or poor (6%).

Table 7: Ratings for Security

Rating	No. of Responses	Percentage - %
Very good	10	34
Good	4	13
Fair	11	37
Poor	4	13
Very poor	1	3
Total	**30**	**100**

It is evident from table 7 above, that the majority of the respondents regard the proposed plan as having fair chances (37%) of bringing security to the CBD. Thirty four percent of the respondents indicate that the plan could have a very good impact in terms security in the town centre. Another twenty six percent rated the proposed plan's chances of being able to provide security as either good (13%) or poor (13%). The remaining 3% rated the plan's chances for security provision as being very poor.

Table 8: Ratings for Convenience

Rating	No. of Responses	Percentage - %
Very good	5	17
Good	10	33
Fair	11	37
Poor	4	13
Very poor	-	-
Total	**30**	**100**

The majority of the respondents, i.e. 37%, as indicated in table 8, rated the proposed plan's chances of being able to provide convenience to the users as fair. Thirty three percent of them believe that the plan has a good chance of providing convenience to both pedestrians and motorists. Another 17% rated that plan as having a very good chance of allowing convenient movement to users, while 13% rated the plan's chances as poor.

Table 9: Ratings for Comfort

Rating	No. of Responses	Percentage - %
Very good	9	30
Good	8	27
Fair	8	27
Poor	3	10
Very poor	2	6
Total	**30**	**100**

The majority of the respondents (30%) rated the proposed plan as very good in terms of comfort. Fifty four percent rated the plan as either good (27%) or fair (27%). The remaining 16% of the respondents also rated the plan as either poor (10%) or very poor (6%) in terms of its likelihood to provide comfort to the users.

Table 10: Ratings for Accessibility

Rating	No. of Responses	Percentage - %
Very good	11	37
Good	7	23
Fair	3	10
Poor	6	20
Very poor	3	10
Total	**30**	**100**

Table 10 depicts that the majority of the respondents, i.e. 37%, believes that the proposed plan could make the CBD very easily accessible. Another 23% of the respondents look at the plan as good in terms of providing access to the town centre. The remaining forty percent of the respondents believe that the proposed plan would provide either poor (20%), fair (10%) or very poor (10%) access to the CBD.

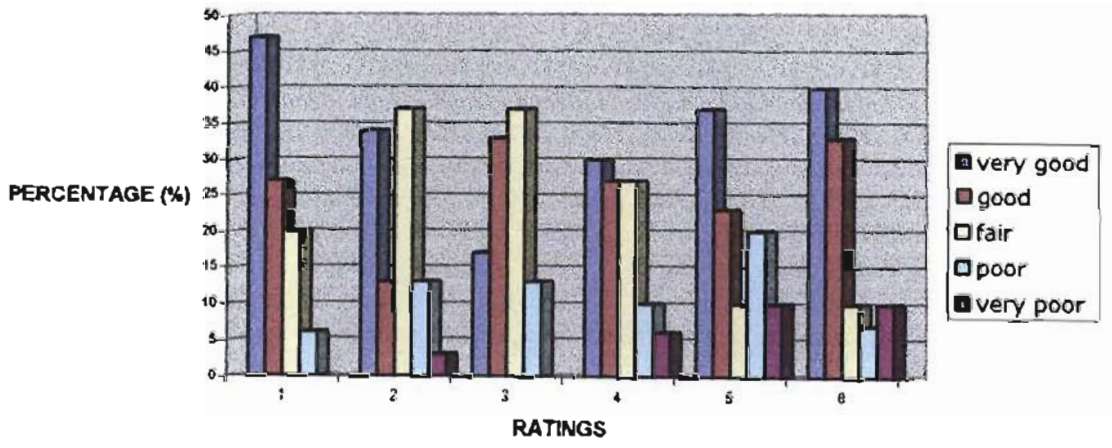
Table 11: Ratings for Attractiveness

Rating	No. of Responses	Percentage - %
Very good	12	40
Good	10	33
Fair	3	10
Poor	2	7
Very poor	3	10
Total	**30**	**100**

Table 11 indicates that in terms of attractiveness the proposed plan was rated by the majority, i.e. 73%, of respondents as either very good (40%) or good (33%). Twenty percent of then respondents see the proposed plan as either fair (10%) or very poor (10%), in terms of making the CBD attractive. Only seven percent regard the plan as being poor in terms of its ability to make the town centre attractive.

It is clear from the above presentation of the findings that although the proposal to pedestrianise or apply traffic calming to the Newcastle CBD has been received by the prospective users with mixed feelings, the majority of the respondent displayed a positive impression towards the implementation of this plan. Though there were traces of the lack of insight that were discovered in some cases, most of the respondents seemed to fully understand the issues the issues involved in the proposed plan. Positive impressions from the respondents were evident in terms of safety, comfort, accessibility, and attractiveness the proposed plan would bring to the CBD. However, the researcher detected some traces of negative impressions towards the plan, especially in terms of its viability in providing security and convenience to all its users. The rating of the proposed plan is clearly illustrated in Fig. 5 below.

RATING THE PEDESTRIANISATION/TRAFFIC CALMING PLAN FOR NEWCASTLE CBD



6.6.2 Interviews with Planners
Interview One: Mr K. Masange

Mr Masange believes that the proposed plan could work well for Newcastle if, before its implementation, an intensive study could be conducted and the experiences of towns such as Pietermaritzburg are considered. He points out that the proposed plan could have a positive impact on the declining economy of Newcastle, since it has chances of injecting new investment opportunities. He says that, with the looming prospect of Newcastle being a new base for the regional council offices, more conflict between vehicles and pedestrians should be expected, and then an efficient plan be put together, in advance, for such possibilities. He supports the idea of:

> "constructing an amusement alley/bridge within the pedestrian area, which will have unique features such as exclusive restaurants, electronic game shops, ice cream parlous etc, which would be accessed through modern design escalators – where people could walk, sit and relax".

He further points out that such a development would give a major and noticeable "facelift" to the Newcastle CBD, which would give the area its own unique identity.

However, he emphasizes that such a plan should be carefully studied before implementation, because, otherwise, it could leave the CBD "in a state of disarray". He points out that the existing parking problem could be exacerbated by such a plan because most motorists tend to be negative towards using parkades at a cost. He also points out that hawkers and vagrants could become a problem if there is a lack of management and security measures.

In sum, he supports the proposed plan with the belief that it will help revitalise the "seemingly dead and predictable" atmosphere of the Newcastle CBD.

Interview Two: Mr S. Barkhuizen

Mr Barkhuizen suggests that though the proposed plan would work well to boost the economy in the area, as well as the whole region, it would require proper financial planning from the local council and the business community in Newcastle. As a member of the Newcastle Chamber of Commerce and Industry, he points out that the proposed plan should also be discussed with the business community. He also pointed out that the plan could help reduce accidents, which occur mainly at intersections, and provide appropriate measures for speed management. From his engineering point of view, Mr Barkhuizen points out that:

> "since major renovations would have to be made, particularly on Scott Street, the process of implementation should be done in phases. It should be ensured that proper management and maintenance measures are in place even before it is implemented".

In terms of street furniture, Mr Barkhuizen maintains that benches should be avoided because they have turned out, in other pedestrianised areas, "to provide comfortable sleeping zones to vagrants". He further states that care should be taken that if trees are planted, they be properly maintained.

Mr Barkhuizen also points out that the conflict existing in the CBD, becomes worse during weekends, month-ends and the festive season, therefore more efficient and easily comprehendible signage and signalised traffic lights should be installed to ease the flow of traffic.

Interview Three: Mr E. Ngomane

Mr Ngomane points out that the major problem in the Newcastle CBD is traffic congestion and parking, which in turn, lead to a conflict between vehicular traffic and pedestrians. Other problems identified in the town centre include

right turning vehicle blocking lanes at intersection, double parking, loading and lack of passenger drop-off zones, as well as lack of pedestrian crossings.

He also believes that the plan to pedestrianise Scott Street should be regarded as a medium-term plan, while giving immediate attention to the problems alluded to above. He states that pedestrianisation would be most beneficial to the businesses along Scott Street since it will increase the number of people using the road, and thus the sales. He points out that safety and security should be highly considered in the plan, as it is important for people to feel safe from outside interference when using a pedestrianised area.

Lastly, Mr Ngomane points out that though a pedestrianised CBD could be a viable option in terms of economic upliftment in other towns and cities, he does not see it having positive economic spin-offs for Newcastle. Therefore it could be applied as a means of easing conflict and reducing congestion.

6.6.3 Interviews with Tenants

Of the fifteen tenants interviewed, the majority, i.e. 60%, feels that the pedestrianisation and traffic calming of Newcastle CBD would have a negative impact on their businesses. One tenant, Ms Barbara Boyce, a store manageress at Cuthberts believes that:

> " there is basically no conflict in the CBD, it only happens on a very small-scale on weekends and month-ends".

She reiterated this statement contrary to popular belief, because she believes that the plan will only serve to invite hawkers who will move away from the shelter they have been provided with, and try to relocate in the pedestrianised area, thereby obstructing access to the shops along Scott Street.

Other tenants are worried that the closure of Scott Street to vehicles will hinder prospective "clients on wheels" to even look through the windows while driving past. Others are concerned about the issue of parking. They argue that if a person parks his/her car in front of a particular shop, he/she usually looks through the windows and, they claim that, eight out of twelve such people end up being regular customers. So if the vehicles were disallowed entry into Scott Street, the business around the area would suffer decline.

Meanwhile 40% of the tenants are for the idea of pedestrianisation/traffic calming of the CBD. Mr Johan Brandon, a manager at The Hub, and Mr Willie Swanepoel, a manager at Furn City believe that the plan could work well for the businesses within the pedestrianised area. Mr Brandon, whose shop is located on the traffic calmed road within the Victorian Mall, points out that their location is one area that receives maximum exposure to prospective clients. He says that walking should be looked at as a form of relaxation, and when people are in a relaxed mood they tend to spend more.

Therefore, these tenants believe that if the proposed plan could be carried forward, more people will use the area solely for its convenience, comfort and aesthetic nature. When more people come to the CBD because of its revitalised state it would mean an increase in turnover. However a number of problems that could crop up have also been identified. These include amongst other things littering, loitering that could lead to crime, as well as vagrancy, which threatens safety and security.

6.6.4 Participant Observation

The researcher stays in Newcastle so, though the observation exercise was undertaken on a particular day, i.e. 27th October 2000, some of the everyday observations were useful in this study. It was observed that there is an evident conflict between pedestrians and motorists in the town centre, particularly during weekends and month-ends. This conflict is seen as a result of the glaring problem of congestion and parking in the CBD. It was observed that

there is a maximum of ±125 pedestrians crossing from one side of Scott Street to the other and back, and ±185 crossing to and fro at the intersection of Scott and Allen Streets.

During the walks around the CBD the researcher observed that there is a clear attitude of intolerance between motorists and pedestrians. The motorists were inconsiderate to the pedestrians crossing the road. They refused to give pedestrians preference and forced their way through even if circumstances disallowed such behaviour. This kind of behaviour was clearly noticed from minibus taxi drivers who showed little consideration for the pedestrians, let alone the law.

6.7 Conclusion

6.7.1 Questionnaire to Users

From the findings presented earlier in the chapter, it became apparent that the majority of the respondents were the males between the ages 30 and 39, and most respondents indicated that they come to the CBD mainly for shopping, socialising and for recreational purposes. Most of the respondents are employed as professionals, who include teachers, social workers, radiographers, nurses etc, and the most popular mode of transportation turned out to be the minibus taxi.

The majority of the respondents indicated that they come to the CBD between 12h00 and 16h00, and they also pointed out that this time slot experiences the worst traffic congestion and parking problems, particularly during weekends, month-ends and the festive season. The majority of the respondents confirmed that there is a conflict existing between pedestrians and vehicular traffic in the Newcastle CBD, which makes movement either on foot or by car relatively difficult. Therefore the majority of respondents view

the proposed plan of pedestrianisation/traffic calming as a move towards mitigating this conflict.

The majority of the respondents had positive impressions about the proposed plan and also believed that it could have positive spin-offs, and could improve the town's image and provide it with a unique identity. The respondents have expressed more strengths than weaknesses that the proposed plan could have for the town, and all these have already been alluded to earlier on in the chapter.

6.7.2 Interviews with Planners

in the interviews with planners it became apparent that tough the proposed plan could have positive effects in terms of stimulating investments and pumping more economic power into the CBD, there seems to be major problems that need to be given priority. The issue of provide more parking facilities stands out requiring urgent attention. Therefore, the planners expressed that if the proposed plan has a "built-in" strategy to solve the existing parking and congestion problems in the CBD, it should be implemented with immediate effect.

6.7.3 Interviews with Tenants

The majority of the tenants feel that the proposed plan would come as a threat to their businesses. The closure of Scott Street to vehicles, they believe, would cause a major decline in the number of customers because they claim that they get clients from people who use the parking lots in front of their stores. The closure would also be a major hassle to their present clientele, because they would have to drive around seeking alternative parking. Therefore, the majority of the tenants see the proposed plan as a threat to their turnover.

6.7.4 Participant Observation

From the observation exercise it became clear to the researcher that before the proposed plan could be implemented, an intensive study of experiences in other pedestrianised towns and cities in South Africa should be undertaken. This would inform the proposers of the plan of developments in other area and would help them to avoid repeating mistakes that have been done in those areas. This would also provide insight as to how well the plan could work for Newcastle. Lastly, the researcher believes that the proposed plan could help to reduce the increasing volumes of traffic along Scott Street because maximum use would then be made of other alternative roads, thus reducing the existing threat to pedestrians.

CHAPTER SEVEN:
AN ANALYSIS OF THE CASE STUDY AREA

7.1 Introduction

This chapter of the study presents an interpretation of the findings and conclusions presented in the previous chapter. The chapter also covers an analysis of the findings in terms of the primary objectives of pedestrian planning alluded to in subsection 2.5 of chapter 2. these objectives would be presented as a comparison between PMB, which has already been pedestrianised, and Newcastle, wherein the plan to pedestrianise is still at a proposal stage. The researcher has decided to compare these two areas, irrespective of the fact PMB is a big city and Newcastle in a town, because of the proposed plan to relocate the government's regional offices to Newcastle. It is believed that this move will bring major economic boost to the town, and therefore result in the expansion of the whole area.

As in PMB, it should be noted that in Newcastle the road earmarked for pedestrianisation and traffic calming is not the main traffic carrier. Scott Street is an important access road, which stretches from the CBD to the eastern suburbs. However, as it has been indicated in Chapter 4, alternative routes would be used after the implementation of pedestrianisation/traffic calming. The interpretation would be carried out in a manner that would assess what PMB has achieved in terms of pedestrian planning, and look at whether it is applicable to Newcastle. The main areas of focus would be whether the proposed plan would achieve safety, security, convenience, comfort, attractive and accessible for the Newcastle CBD.

7.2 Safety

Safety, as indicated in the conceptual framework, usually involves enabling pedestrians to be in the street and cross it without risk of injury or harassment from vehicle users. As we have heard in Chapter 3, the PMB

pedestrianisation plan did not take safety as a priority. This, however, does not mean that safety in the PMB plan was entirely ignored. Although pedestrians were provided with pedestrian crossings at intersections, the other semi-pedestrian areas were devoid of any. It has also been revealed that the motorists in PMB do not give much regard and/or priority to crossing pedestrians.

The same experiences could pose serious problems in terms of safety if the proposed pedestrianisation/traffic calming plan of the Newcastle CBD could be implemented without taking cognisance of experiences in other towns and cities in SA. Since it became obvious from the findings that most respondents, including tenants and planners, believe that safety should one of the priorities if such a plan is to be implemented, the NLC and stakeholders involved in planning should consider safety as an important component of the plan, and a measure of successful implementation of the plan.

7.3 Security

The PMB CBD is considered to be poor in terms of the security measures. The pedestrianisation plan in the city centre does not offer a feeling/sense of security to the users, because of its lack of management and/or patrol services, e.g. security guards or policemen. The CBD also has a problem of a high crime rate so though the pedestrian area is open and permits free movement, one always has to look over one's shoulder when walking because of the prevalence of pick pocketing. Also, the lack of a clear line of visibility in the city centre affects perceived security among the users.

From this experience, the researcher believes that since the majority of the people involved in the study believe that the plan has a fair chance of providing security for the users in the CBD, it is vitally important that appropriate measures are taken beforehand to ensure that security within the pedestrianised CBD is guaranteed. This could be achieved by ensuring that

adequately trained security services is acquired in the area on a 24 hours basis, so as to scare away prospective intruders.

Safety and security of both the vehicle users and the pedestrians have emerged to be important factors when considering such development, as is proposed in the Newcastle CBD, since a lack thereof could lead to even serious economic decline.

7.4 Comfort and Convenience

Comfort and convenience of a particular town or city may be enhanced by relocating sidewalk obstructions such as telephone booths, mailboxes, refuse cans etc, so as to improve pedestrian flow. As already stated in Chapter 3, the pedestrianisation plan in PMB has improved comfort in the CBD with its provision of outdoor restaurants and benches, just to mention a few, and other areas for downtown activities such as exhibitions, concerts, flea markets etc. Convenience was apparently not achieved by the PMB plan because of the lack of clear signage in the CBD, which is supposed to distinguish pedestrian paths from vehicle paths.
Although the pedestrianisation plan has been advantageous in some parts of the PMB CBD, especially to traders, however their location is considered to be an inconvenience to pedestrians because the traders hinder pedestrian flow. Another problem with the plan has been insufficient and unaffordable parking facilities.

In Newcastle, the proposed plan has been received with mixed feelings in terms of its possibility to provide comfort and convenience to the users. In terms of convenience, it is believed that the proposed plan has a fair chance. This is due to the fact that the area is presently experiencing a problem of lack of parking facilities in the CBD. The closure of the CBD to vehicular traffic could exacerbate the existing problem and lead to more traffic congestion.

It is also important to note that the hawkers have also been cited as a possible cause of inconvenience in pedestrian areas. Care should therefore be taken that in the proposed plan all these concerns are attended to, before the plan could be implemented. Another concern expressed in terms of convenience of the plan, is the lack of pedestrian crossings, which does, and also could lead to high accident rates. Therefore traffic authorities and those involved in the planning of a pedestrianised CBD, should ensure that the area to be pedestrianised or calmed to traffic has sufficient access for pedestrians to be able to cross, and that the motorists yield and give pedestrians their right of way.

In terms of comfort the respondents believe that the proposed plan has a very good potential. The provision of exclusive restaurants, amusement centre, electronic game shops etc, would enhance the present condition in the CBD by offering various forms of entertainment to the users. This would also attract more people into the CBD, thereby increasing sales even for other shops in the surrounding area.

In sum, Newcastle has a potential to achieve both a convenient and comfortable CBD through their proposed plan to pedestrianise, if the planners and other stakeholders could carefully examine experiences of other areas and use them as precedence in terms of turning the proposed plan into a viable transformation plan for the area.

7.5 Attractiveness

As pointed out in Chapter 2 attractiveness with regard to pedestrianisation/traffic calming does not only encompass the aesthetic design, but also the sense of excitement that should be created by an urban space. PMB exhibits good aesthetic qualities with the presence of modern landscaping, flowers, trees and water features. In the proposal to pedestrianise the CBD, the central area was designed so as to serve as a stage for ongoing organised promotions, such as concerts, to attract people to

the area. This was a good idea, which works well for a town or city, if full advantage of that provision is utilised.

Since the respondents in Newcastle look at the proposed plan as having a potential to attract more people and to turn the CBD into an attractive area with an improved image, the design features that are working successfully for PMB could be adopted. Furthermore, studies of other pedestrian area, such as Sandton and Randburg Malls, and their experiences could help with the facilitation of a plan that would work well to mitigate the existing traffic problems of the area.

7.5 Conclusion

It is apparent from the above discussion that any plan for pedestrianisation or traffic calming should take into account the existing problems, such as parking, as well as those that may arise as a result of the plan. It is possible, as was the case in Randburg, to provide parking within the pedestrianised area without limits and to locate parking lots within accessible walking distance to the stores. Care should also be taken that sufficient amount of space is allocated to pedestrian paths and design elements proposed for a particular area. These are vital factors that need to be considered when pedestrianisation or traffic calming measures are taken for a particular area. Also important is the extent to which a pedestrianisation or traffic calming plan could provide a safe, secure, comfortable, convenient and attractive environment.

CHAPTER EIGHT:
RECOMMENDATIONS AND CONCLUSIONS

8.1 Introduction

This final chapter presents the recommendations for the study based on the findings and conclusions thereof. The recommendations will focus specifically on what pedestrianisation and/or traffic calming can do to fight the conflict existing between pedestrians and vehicles. Since the study focuses on the potential for application of pedestrianisation and traffic calming to solve the conflict in the CBD, it is important to note that every commercial activity in the CBD does experience this conflict. Hence vital measures need to be taken to mitigate this conflict, since the needs of one pedestrian are just as important as those of many pedestrians. However, pedestrianisation or traffic calming could be efficiently applicable in large commercial streets rather than in other parts of town.

As the study progressed the researcher has learnt various important facts about pedestrianisation either from literature or from observations. These facts and experiences of various towns and cities form the gist of this chapter, since they form the basis on which the researcher makes recommendations and draws conclusions.

8.2 Recommendations

8.2.1 Dynamism of each area

Each area has a unique character and specific aspects of pedestrianisation, and traffic calming needs to take heed of such uniqueness and dynamism of a particular area. This may include the nature and severity of the conflict as well as the concentration of vehicular and pedestrian traffic in an area.

The attributes of an area in relation to attracting business, investments and tourists, need to be highly considered. If, for an example, an area is to attract

tourists, its special attributes should be highlighted in the proposal. These could include aspects such as historical and cultural significance of an area, important buildings, landmarks etc.

It is also essential that an area have a distinctive character that would highlight its unique elements and give it its own flair and identity even to tourists.

8.2.2 Safety, security, comfort, convenience accessibility and attractiveness

These are the primary objectives of principles that need to be considered when planning a pedestrian area. When pedestrianised or traffic calmed streets are safer and pleasant to be in, non-traffic street activities would increase in response to the higher quality environment. If these objectives are not achieved people would rather not come to such areas, thereby de-valuing all other attractive features. This means that these primary objectives may serve as determining factors as to whether people use the pedestrianised/traffic calmed area or not.

The issue of security and safety also relates to the presence of patrol services within the pedestrian area, which may involve the presence of security guards and/or policemen. This service is vital in cases where a pedestrian or motorist is in danger or require assistance. Therefore, this services should always be available and accessible to the users in a pedestrianised area. People with special needs , such as the elderly and the physically challenged, should also be given special consideration when pedestrian areas are designed because they also are expected to benefit from the facilities when completed.

Care should be taken that when planning for pedestrianisation or traffic calming of a particular area, an appealing and attractive environment is created. This could be achieved by providing modern design landscaping,

water features, trees and plants, different coloured and textured paving as well as street furniture.

8.2.3 Separation of different forms of traffic

It is important to separate the different forms of traffic in a pedestrianised town centre. In an area of conflict between pedestrians and vehicles, preference should, where possible, be given to local traffic and pedestrians rather than to through traffic. This is more feasible in a situation where the pedestrianised or traffic calmed road is not the main access or feeder into the CBD. It is vital for through traffic to have an alternative route, through which passing traffic can go without having to enter into the town centre. This could ensure that traffic congestion and high speed are controlled and minimised in the town centre. Another solution could be to redirect through traffic to a by-pass of traffic-box created around the core of the pedestrian area, leading this traffic to drive around rather than through the central area.

It is also important to separate pedestrians and vehicular traffic so as to make the area safer and thus, more attractive to pedestrians. In areas where pedestrians are not exposed to the noise and fumes from exhaust pipes or physical danger from vehicles themselves, they tend to relax and enjoy shopping and other amenities offered by the central area. One of the most popular ways of separating pedestrians from vehicles is through the creation of vehicular-free pedestrian area, such as pedestrian malls, plazas, parks etc. Although vehicular traffic would have to be either re-routed, re-channelled or re-directed, pedestrianisation would have a greater impact in this instance.

8.2.4 Signage and demarcations

First and foremost signage with the town centre needs to be clearly visible. It is vital for both pedestrians and motorists to be able to interpret a road sign, i.e. what the sign says they can or cannot do. Pedestrians should also have a clear understanding and knowledge of where are they allowed or not allowed

to cross, and both pedestrians and motorists need to know their location and orientation within the central area. Demarcations, such as one-metre poles preventing vehicle entrance to a pedestrian area, should serve the purpose for which they have been intended, and these should not be obstructions in any way to pedestrians.

Where by-passes for re-routed traffic have been created, they should be easily accessible from the pedestrianised or traffic calmed area. These should also be planned in such a way that they ensure free flow of traffic, thus helping to relieve the central area from the problem of congestion.

8.2.5 Parking

People coming to the central area should be able to find parking facilities that are affordable and conveniently located so that they could be in a position to leave their vehicles in the parking area and move about on foot, thus experiencing the footpower. Within the pedestrianised areas there should be attractive activities organised for the benefit of both the motorists and pedestrians.

8.2.6 Activities and Facilities

Any pedestrianisation plan should include activities that are aimed at increasing pedestrian flow. Pedestrian malls, for instance, have the potential to facilitate social activities but need to provide sufficient activities to attract people to stay. These should include restaurants, sidewalk cafes, concerts, street theatres etc. Flea markets should also be allowed to operate, especially on weekends. This would help facilitate and promote mutual contact among the people in the community as well as beyond.

Facilities such as litter-bins and toilets that are often taken for granted should also be sufficiently provided. The spreading of activities could also be suggested as a way of integrating the pedestrianised/traffic calmed are, thus

making facilities more accessible to pedestrians and thereby evenly distributing pedestrian flow.

8.2.7.Implications for existing land uses

There is a need for a close co-operation with traders in the area as such a plan would have either a direct or indirect impact on the commercial and other land uses in the area. Attention should be given to informal traders so that their location does not in any way affect pedestrian flow or obstruct the existing shops in the pedestrianised area. Hawkers should be provided with kiosks and their location be integrated within the design framework so that it contributes to the distinctive character of the pedestrian area.

8.2.8 Implications for planning

Planners involved in pedestrianising the town centre should bear in mind that the space to be created needs to be sympathetic to the needs of the people, which constitutes the main aim of planning. Any urban space is ultimately related to the street and its activities, its relationship with intersecting movement routes, and its ability to accommodate people's social behaviour. It is also important to remember that, as Hadju (1988:22) puts it, "pedestrians enjoy the pedestrianised areas as places in which they could window-shop, stop and observe, converse or **just be"**.

8.2.9 Public participation

Though the issue of public participation has not been highlighted in this study, it is nevertheless important to briefly outline it as an essential component in a plan to pedestrianise or apply traffic calming measures in a particular area. Public participation should be part of the planning process as the public remains being important stakeholders, and should therefore, play a significant role. Through public participation the needs and aspirations of those affected

by the development could become easily known and taken cognisance of. Public participation process provides an opportunity to note people's opinions on those aspects that could make the plan successful, because it is being developed for the sole benefit of the people in the area.

8.3 Conclusions

At this concluding stage of the document, a summary of the findings together with the gist of the recommendations is presented to give a complete picture concerning the whole study.

The findings from the case study have revealed that pedestrianisation and traffic calming are accepted by the majority of respondents as the most appropriate means to mitigate the conflict between pedestrians and vehicles in the Newcastle CBD. The acceptance of this plan could be attributed to proper attention being devoted to the pedestrian planning objectives, which include safety, security, convenience, comfort, attractiveness etc.

The recommendations that stem from these findings are either directly or indirectly related to the above-mentioned objectives of pedestrian planning. These recommendations are covered by issues such as dynamism of each area, signage and demarcation, convenient and affordable parking etc.

Prior to evaluating whether the goal of the study has been achieved or not, an evaluation of the research objectives will first be presented.

Objective 1: To assess pedestrianisation and traffic calming in SA in order to determine its applicability to Newcastle.

As it has emerged in the analysis of the case study area, i.e. Chapter 5,this objective has been achieved. The experiences relating to pedestrianisation in places like PMB, Randburg and others, have led to the researcher concluding

that the existing problem of congestion and conflict in the town centre could be efficiently solved through the application of pedestrianisation and traffic calming, which will ease movement and traffic flow in the CBD. Since in areas like PMB pedestrianising the central area has solved the conflict between pedestrians and vehicles, the same strategy could be adopted in Newcastle with full assurance that the successes accomplished in PMB will also be achieved in Newcastle.

Objective 2: To examine the effect of pedestrianisation and traffic calming in enhancing safety, security, convenience comfort and aesthetic character of the town centre.

The findings of the ratings relating to the objectives of pedestrian planning revealed that these objectives need to be taken cognisance of for a pedestrianisation plan to succeed. It has emerged in the previous chapters that the basic concern of pedestrian safety and security is the reduction of pedestrian/vehicle conflict. The findings also indicated the people love to be pampered, and that if adequate care is taken in the planning process for pedestrianisation and traffic calming that the plan offers convenience and comfort, people get attracted to the area, which in turn guarantees the success of the plan.

Objective 3: To evaluate the extent of accident occurrence and speed contravention in order to determine the need for pedestrianisation.

Though not directly investigated, the findings revealed that the present layout of the Newcastle CBD exacerbates high speed, which leads to high accident rates. The researcher found out that most of the accidents occur at the road intersections because the motorists ignore the traffic lights and other road signs. The application of traffic calming features such as pedestrian crossings or ramps could help to manage speed levels within the CBD. This in turn could lead to a lower rate of accidents. Therefore, from the findings it has

emerged that precautions have to be taken in planning pedestrian areas to ensure that they are designed to lower speed and accidents.

Objective 4: To improve Newcastle's image and provide the town centre with its own identity.

One of the main focus areas of pedestrianisation and traffic calming is to make the central area attractive to its users as well as to prospective investors. Therefore, one can conclude that the modern design of pedestrian areas should be done in such a way that the features installed improve and enhance the current condition of the pedestrianised area. This should be done to ensure that more business come or relocate into the area, which would also "pump up" the declining economies.

Objective 5: To provide efficient accessibility and eliminate congestion.

This objective has been achieved because it has emerged from the study that most people in the area support the idea of pedestrianising the town centre, provided that a clear distinction is made in terms of providing access to CBD for both pedestrians and motorists. The issue of providing by-passes and alternative routes through which access to the CBD could be made possible, has also been raised. Allowing only public vehicles through the main street in the town centre that intersects the study area, would compel other private vehicle users to consider using public transport as an alternative. This could be a major success in de-congesting the CBD.

From the above evaluation of the objectives of the study it can be concluded that the primary goal of this study, which is "to highlight pedestrianisation and traffic calming as an effective alternative to minimise vehicle and pedestrian conflict in the CBD". From the findings it has emerged that the majority of the respondents in the area believe that if this scheme could be applied in Newcastle, the existing conflict could be curbed. However, the success of this plan depends entirely on the use of experiences from other towns as a

stepping stone towards successful implementation. From the finding it emerged that the scheme could have a generally positive impact as a means of mitigating conflict between pedestrians and vehicles in the CBD.

Thus the hypothesis the pedestrianisation and traffic calming of the CBD could mitigate existing conflict between pedestrians and vehicles, and enhance the aesthetic value of the CBD, thereby attracting more people to the town centre, **is accepted.**

This implies that pedestrianisation and traffic calming presents new challenges and possibilities in the planning of pedestrian areas. In theory these measures should not be looked at in isolation, rather as part of more extensive developments and in combination with other measures such as environmental traffic management. In practice the success of these schemes has been widely demonstrated in a variety of applications in residential areas, e.g. woonerf, and CBDs, e.g. PMB, as well as in shopping complexes such as the Randburg Mall. Further studies need to be undertaken in order to develop the potential of these schemes in towns like Newcastle.

As stated in Chapter 2 of this document, it has been only recently that attention has been given to heavily trafficked commercial streets in SA. Such a venture provides planners with an opportunity to address the pedestrian and vehicle conflict experienced in/along these streets while at the same time investigating and experimenting with a totally new and different strategy for revitalising central areas. In sum, pedestrianisation and traffic calming implies realising the importance of using the streets, which could be for walking, driving, relaxing, and making maximum use of the benefits associated with prioritising pedestrian movement over vehicle movement. This would be emphasised by the words of Prophet Zecharia in the Old Testament, which goes thus:

> **"once again old men and women so old that they use a stick when walking, will be sitting in city squares. And the streets will again be full of boys and girls playing". Zecharia 8: 3 – 5**

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APPENDIX ONE: QUESTIONNAIRES TO USERS

UNIVERSITY OF NATAL - DURBAN
DEPARTMENT OF TOWN AND REGIONAL PLANNING

QUESTIONNAIRE

Research Topic: The applicability of pedestrianisation and traffic calming to curb conflict between pedestrians and conflict in the Newcastle CBD. The case of Scotts Street.

Please put a cross (X) where appropriate or answer in the space provided.

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1. Place of residence

2. Sex

Female
Male

3. Age

10 - 19
20 - 29
30 - 39
40 - 49
50 - 59
60 and above

4. Occupation

- Directorate / Managerial
- Technical / Administrative
- Unskilled
- Housewife
- Self-employed
- Unemployed
- Retired
- Student
- Other, please specify

5. How frequent do you come to the town center?

- Everyday
- Once a week
- 2-3 times a week
- Once every two weeks
- Other, please specify

6. At what time do you usually come?

- Before 8h00
- 8h00 - 11h59
- 12h00 - 15h59
- After 16h00

7. What is the purpose of the trip?

- Work
- Personal business
- Shopping and recreation
- School
- Home
- Other, specify

8. What is your mode of transport to town center?

- Private vehicle
- Bus
- Minibus taxi
- Meter taxi
- Walk
- Other, please specify

9. If you are a private vehicle user, how difficult/easy is it to drive around the town center or to access parking (in your answer consider the distance you walk between where you intend going and where you access parking)?

Easy
Relatively far
Very far

10. If you are a commuter, where do you normally alight?

Closer
Relatively far
Very far

11. Briefly explain the severity of vehicle and pedestrian conflict in the town center.

.....
.....
.....
.....

12. What is your impression of pedestrianisation and traffic calming as a solution to conflict between pedestrians and vehicles?

.....
.....
.....
.....
.....
.....

13. How do you perceive the application of such a plan in the town center in terms of:

Safety	1	2	3	4	5
Security	1	2	3	4	5
Convenience	1	2	3	4	5
Comfort	1	2	3	4	5
Accessibility	1	2	3	4	5
Attractiveness	1	2	3	4	5

Ratings : 1 - very good
2 - good
3 - fair
4 - poor
5 - very poor

14. How, do you think, the application of this plan will affect the town's image and identity?

.....
.....
.....
.....
.....

15.What do you think could be the strengths and weaknesses of pedestrianising and calming the traffic in this particular town center?

Strengths / what could work well for the town

.....
.....
.....
.....

Weaknesses / problems that could be encountered

.....
.....
.....
.....
.....

Date:..... Time:.....
Person Interviewed:.....

THANK YOU FOR YOUR TIME AND CO-OPERATION.

T. BIYELA
991238796

APPENDIX TWO: QUESTIONS TO PLANNERS AND TENANTS

UNIVERSITY OF NATAL - DURBAN
DEPT OF TOWN AND REGIONAL PLANNING

INTERVIEW SCHEDULE

Research Topic: The applicability of pedestrianisation and traffic calming to curb conflict between pedestrians and conflict in the Newcastle CBD. The case of Scotts Street.

TO PLANNERS

1. What is your role in the transportation planning of Newcastle?

2. Do you think the town center needs any improvements in terms of better traffic regulation and facilitation? Why?

3. Is there any conflict experienced between vehicular traffic and pedestrians in town? Where exactly?

4. What is your view on pedestrianisation and traffic calming being applied as a solution to curb conflict?

5. Will the application of pedestrianisation and traffic calming have any impact on the existing commercial functions in the CBD? How could it impact on the function?

6. What effects, if any, can pedestrianisation or traffic calming have on the local economy?

7. What physical design features can be applied specifically to this town to give it its own image and a unique identity (in terms of street décor, furniture, trees etc.)

8. What role can traffic calming and pedestrianisation play in the revitalization and renewal of this town center?

9. Do you think pedestrianisation and traffic calming can render the CBD a safe and secure environment and reduce accidents? How?

10. What impact will pedestrianisation and traffic calming have on the street vendors along the case study area? Are there any plans to provide them with better facilities or relocate them?

11. What positive effects / spin-offs can this plan have for Newcastle?

Date:..... Time:.....

Person Interviewed:.....

THANK YOU FOR YOUR TIME AND CO-OPERATION.

T. BIYELA
991238796

UNIVERSITY OF NATAL - DURBAN
DEPT OF TOWN AND REGIONAL PLANNING

INTERVIEW SCHEDULE

Research Topic: The applicability of pedestrianisation and traffic calming to curb conflict between pedestrians and conflict in the Newcastle CBD. The case of Scotts Street.

TO TENANTS

1. What do you think of the conflict between pedestrian and vehicular traffic along Scotts Street and in the street?

2. Does the conflict in any way affect you business (whether positively or negatively)?

3. Do you think the application of traffic calming and pedestrianisation on this block could be a solution to the existing vehicle and pedestrian conflict?

4. What effect will the plan have on your business? Are you in favour or against such a plan being implemented?

5. Do you, as a business, feel in any way threatened by such a plan? Why?

6. How can such a development work for you? In other words what can be the positive and negative aspects of this plan for your business?

7. What do you feel should be done to improve the image of the CBD while also attracting business into the CBD?

8. Can pedestrianisation and traffic calming render the CBD a safe and secure environment in terms of crime that usually dominates town centers?

Date:..... Time:.....

Person Interviewed:.....

THANK YOU FOR YOUR TIME AND CO-OPERATION.

T. BIYELA
991238796