# PLANNING FOR FUNCTIONAL OPERATIONS OF NON-MOTORIZED AND MOTORIZED TRANSPORTATION IN THE CENTRAL BUSINESS DISTRICT OF MASERU - LESOTHO.

By

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## DECLARATION

This Thesis is my original work and has not been presented for the degree in any other University.

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This Thesis has been submitted for examination with my approval as a University Supervisor.

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## DEDICATION

This work I dedicate to my Dear Parents, my beloved Uncles, Brothers and Sisters, in appreciation of their contribution to my academic life.

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**ABSTRACT:**

This study focusses on the planning for functional operations of Non-Motorized and Motorized transportation in the Central Business of Maseru - Lesotho. This has been done within the framework of the existing transport circulation system of the study area.

The importance of transport in urban areas can not be underestimated. Transport is the circulation system of any urban area, and it connects the land-uses in space. It connects other parts of the urban areas to one another. Transport provides accessibility while accessibility is one of the most critical determinants of location of sites and resources.

The transport system should provide a balanced set of public and private modes which can serve a given area in the prevailing social, economic and environemtnal circumstances - be convinient, reliable and safe for both users and non-users,with appropriate considerations given to non-motorized transportation.

The study highlights the problems encountered within the area of study - this inculdes, the walking pavements which are inadequate and very narrow. In some cases the pavements are taken over by other activities such as trading.

It was also observed that, Kingsway Highway - the principal business, shopping street

and most direct favoured route for travelling to the border post from virtually all areas outside Maseru is under severe traffic congestion.

The main bus terminus which serves as the inter-change point between regional buses and between buses and taxis is grossly overcrowded and is under continous threat by commercial development.

From the above outlined findings in the study areas revealed that Maseru has been growing without any comprehensive transport plan - hence there is conflict between non-motorized and motorized modes.

In a way of counteracting the above outlined problems, the study has come up with a policy recommendations by way of a design plan. It could then be concluded that the planning for functional operations of NMT and MT should be given a priority. The study notes that the conflict between such modes continue to reach unproportional levels in the CBD of Maseru.

## TABLE OF CONTENTS

**CHAPTER FIVE:**

## LIST OF MAPS

**CONTENTS** **PAGES**

## LIST OF TABLES

**CONTENT** **PAGES**

## LIST OF FIGURES

**CONTENTS** **PAGES**

## LIST OF PLATES

**CONTENTS** **PAGES**

# CHAPTER ONE

## 1.0 URBANIZATION AND TRANSPORT

The rapid pace of urbanization taking place in the developing countries pose a number of serious problems for both the urban residents and governments. These problems relate to the management and provision of adequate urban services at the costs the economics can support at sustainable levels (Obiero, 1994).

The rapid growth of Maseru is estimated as being 7% per annum mainly as a result of rural - urban migration. Obviously, such a population growth rate, which surpasses the rate of economic growth, is a strain on services and infrastructure in the city - such services include housing, education, health and infrastructural services such as water, sanitation and transport.

Cities cannot exist without transport. People living and working in cities depend upon transport for their basic mobility. Equally, they use transport to move their goods and services. The city becomes the market place for this system of exchange. Indeed, transport has been seen as an important sector in the economy charged with the responsibility of promoting economic growth and development.

The challenge facing planners, policy-makers and urban managers today is how to identify and develop appropriate transport policies strategies and systems that are sustainable both economically and environmentally and at the same time provide adequate and viable accessibility and mobility levels to all urban residents. One such strategy with high potential is Non Motorized Transport (NMT) - encouraging more pedestrian trips, use of bicycles and horse carts. The NMT strategy to work successfully, should be well co-ordinated and integrated with other motorized modes especially public transport (Obiero, 1994).

A well functioning city centre, which requires optimal utilization of land taking into account environmental and economic factors, should be served by a good transport network (i.e. network and parking facilities) which can sustain the needs generated by the built environment. Thus, this study concerns itself with the planning for functional and integrated operations of non-motorized transport with other modes of transport in Maseru, so as to effect an efficient provision which may lead to urban sustainable development.

Typical travel modes within the Maseru Central Business District (CBD) include public and private buses/mini-buses, private cars, taxis, walking and limited cycling and horse riding. So planning for functional operation will therefore enhance the needs of the urban community.

Early study by Maseru Urban Project Diagnostic Study (MUPDS), (1987) indicated that 80% of the vehicles were used daily, and the remaining 20% were used when necessary/needed which could be once a week or so. Of these, public transport accounts for 56% of the total number, while walking follows with 19%, cycling 10% and others 15%. The uses to which these modes are put to include journey to work (55%), shopping 25% and other purposes accounting for 20%. This means that a large proportion city's growing population still concentrate their activities in the CBD, hence increasing the conflict between different modes.

## 1. THE STUDY ISSUE

The rapid growth of Maseru's traffic volume during the last few years as a result of mass car ownership and population growth has put a visible strain on the town's existing road network. The major traffic flows in the CBD area - occur at the Circle (Roundabout) with the highest flow along the main North 1 in both directions.

Traffic peaks usually occur between 7.30 and 9.00a.m. and also between 4.30 and 6.00 p.m. and to certain extend during lunch time. During these periods, traffic congestion is at its highest. Pedestrian (and cyclists) safety in Maseru is very unsatisfactory despite the fact that walking is a common mode of travel especially in the CBD areas. The most risky areas for pedestrians are along Kingsway, Main North 1,Main South 1 and around the bus terminals. There is only one marked pedestrian crossing on Kingsway, and as

a result many pedestrians are forced to cross at several other undersignated places. These elements of conflict between pedestrians and motorists had resulted into many accidents.

The other major crucial problem regards the main old bus terminal. It is grossly overloaded and it can no longer cope with the existing traffic congestion. Its existence is also under continuous threat of encroachment by commercial development. The space is limited and the unplanned interaction of activities make this problem complex. It should be noted that, this bus terminus acts as an interchange point for regional buses, mini-buses and taxis. The other problem regarding the old main bus terminal, concerns parking for different township taxis - their co-ordination is unsatisfactory which has resulted into poor network linkage. This unsatisfactory situation has led to passengers' frustration and has discouraged rural people travelling to Maseru even for necessary services.

In a bid to solve or rather reduce strain on the terminus, the Government of Lesotho had temporarily developed an alternative new bus terminus. This also has its own kind of problems. It is poorly located in the sense that its surrounded by three primary schools. The siting of the new terminus has created several unfavourable situations. Children are no longer safe due to prevailing traffic congestion. The continuous noise and often smell of exhaust fumes had led to a poor learning environment. The other problem with new bus terminus is inconvenient to the travellers since it is not centrally located.

Furthermore it is situated on private land and the local authority has not compensated its registered owners.

Another interesting aspect of the terminal is that it caters also for international traffic from the Republic of South Africa (RSA) (Makhetha, 1988). The above mentioned situation create problems for Lesotho in general and Maseru in particular when catering for most of the traffic from South Africa. There is no permanent terminal for mini-buses, buses and taxis coming from South Africa, and as a result, the small parking at the border post is also overloaded with both local and South-Africa bound public transport (Plate No.1).

**PLATE NO. 1 SHOWS CONFLICT BETWEEN SOUTH AFRICA AND LESOTHO**

**NMT AT THE BORDER POST.**

Conflict between South-Africa and Lesotho's taxis at border post's parking.

**Table I: A daily Cross-Border trips by Lesotho fleet vehicles**

| Estimate Interchange of Road Transport Activity Lesotho - fleet vehicles on RSA Roads and Vice Versa | | | | |
|---|---|---|---|---|
| | Light & Medium | Minibus | Buses | Trucks |
| 1. At Maseru per 12 Hours | 1.1 | 0.2 | - | 0.1 |
| 2. Estimated National total (000 per 24 Hour day) | 3.5 | 0.5 | 0.1 | 0.5 |
| **Source: Lesotho National Transport Study - Final Report 1994 March.** | | | | |

The parking at the border post was not originally meant for the purpose of acting as a major terminal. The traffic congestion is unbearable and unfortunately, the pedestrians are the main victims. Their movement is hampered adversely. Table 2 shows the number of accidents in the CBD routes in Maseru.

**Table 2: No. of Accidents with Maseru**

| YEAR | ACCIDENTS | P/ KILLED | P/ INJURED | A/ KILLED | V/ DAMAGED | OFFENCES |
|---|---|---|---|---|---|---|
| 1989 | 1,256 | 136 | 689 | 11 | 1,664 | 5,257 |
| 1990 | 1,064 | 92 | 489 | 15 | 1,391 | 3,885 |
| 1991 | 914 | 104 | 396 | 10 | 1,987 | 4,855 |
| 1992 | 1,123 | 91 | 729 | 31 | 1,547 | 2,996 |
| 1993 | 1,380 | 123 | 663 | 28 | 1,951 | 3,562 |

**Source: Department of Police Traffic Office.**

Public parking is located at various places along Kingsway and the other marked areas, including street side parking. There are additional parking spaces at Lesotho National Development Centre (LNDC), at the former Basotho National Party (BNP) Centre, and a miscellany of other private parking including spaces associated with large shops. The problem with BNP public parking place is that, it is located in the prime area, but it is mainly used by private light vehicles (cars, vans). It remains unoccupied during most part of the day which is not optimal use of prime located urban land.

In brief, research issues which form the focus of this study are:-

1. The conflict between non-motorized transport (NMT) and motorized transportation in the CBD area and routes. This interferes with smooth flow of traffic particularly at peak hour time. (At this particular time the pedestrians encountered some difficulties in travelling since the vehicles used even the provided pavements).

   The main cause of the stated conflict is the increasing traffic flows especially along the rudimentary road network of Kingsway (i.e. within the CBD area). The other contributory factory is that Maseru has developed without a comprehensive and planned pedestrian network, hence the conflict between non-motorized and motorized traffic.

2. Inadequate size of bus terminus. The cause of inadequacy of the size of bus terminus is that it is located in the busiest part of the town next to the market. This is the area where most of the shops are located on a small piece of land. To add to this, the area has confused interaction between rural buses, city buses, local traffic, street market activities and passengers. In the midst of this confusion, the shops are coming up in the area to congest it even further. It can no longer cope with existing traffic congestion.

From the above observations, it can be stated that:-

1. The pedestrians safety in Maseru CBD and at bus terminus is unsatisfactory.

2. There is a conflict between NMT and motorized transportation in the CBD and at bus terminals, which therefore impairs efficient traffic flow in those particular areas.

3. The bus terminus has no adequate capacity.

4. At the peak, the Kingsway route the main traffic corridor serving the CBD its capacity is surpassed.

## 1.2 OBJECTIVES OF THE STUDY

In order to evaluate the above stated research issues, the study sets out the following objectives:-

1. Examine the nature and structure of the traffic (flows) in the CBD, along Kingsway, and around bus terminals in Maseru.

2. Examine the conflict between NMT modes and motorized modes in the CBD area and on approaches to and within the bus terminals.

3. Evaluate public parking capacity and operations in the CBD.

4. Plan and design a traffic circulation system with the aim of minimizing traffic flow problems (i.e. congestion) and integrating NMT and motorized modes in the CBD.

## 1.3. STUDY HYPOTHESIS

The study had the following working hypothesis:-

1. The continuous encroachment by commercial development on the terminus area has been as a result of poor planning and development control management by both local and central government.

2. The under capacity and the resultant problems of main bus terminus has been as a result of poor transport planning.

3. The failure for provision of smooth movement of both NMT and motorised transportation has been as a result of poor planning.

4. The siting and development of the temporary terminus has been due to lack of appropriate planning tools and principles for such type of development (i.e. lack of qualified staff, weakness of the development control mechanisms and unclear understanding of the planning process).

## 1.4 STUDY ASSUMPTIONS

The study was undertaken within a set of general assumptions which are:-

1. That NMT would remain one of the major modes of transport in Maseru particularly within CBD for long time.

2. That the provision of integrated modes of transportation within the CBD, would no doubt enhance social and economic development in Maseru town.

3. That the success of planning for a functional operations of both NMT and motorized transport in the CBD and around the bus terminus will highly depend on the government (both local and national) action. The successful implementation of such strategy will also depend on the involvement of community participation in decision making.

4. That there will be inadequate resources to facilitate the implementation of all projects, transportation study inclusive. Hence, there is need to mobilise financial resources from several sources including international agencies, etc.

5. The proper and efficient management, maintenance of the existing road network within the CBD and its environs, would greatly help to erase the conflict between

NMT and motorized transport in the study area.

## 1.5 SCOPE OF THE STUDY

The study for planning of the functional operations of non-motorized and motorized transportation in Maseru has to address several problems and issues. One of the major problems is the conflict in the functioning of both the NMT and motorized traffic in the city. Therefore, the study concentrates on the analysis of the transport situation in the CBD with special reference to Kingsway Highway, Moshoeshoe Road and Institution Road. The focus of analysis has also include the main bus terminus and other terminals in the CBD. In addition the study has evaluated public parking in the town centre.

In carrying out the above stated analysis, the study has taken into consideration the Maseru Development Plans for infrastructure such as the road network, bus terminals and public transportation.

Consequently the scope of the study is limited to the following aspects:-

An evaluation and assessment of current existing traffic characteristics of both public and private transport. The study has assessed the future impact of the main bus terminal as an interchange point for regional buses and mini-buses as well as taxis.

The study has also looked at the possible ways of relieving traffic congestion along Kingsway which has surpassed its capacity.

The study has paid special attention on the possibilities of making improvements to enhance pedestrian and cyclist safety in response to the rise of traffic flows.

A special attention has also been given to the function of parking facilities within the CBD and the current function of "parking discs". The study has further looked at the system which has been adopted on the regulation of public transport.

The study had carefully studied the detailed plans drawn by South-African consultants for the on going construction of Maseru relief bridge.

In conclusion, the study had evaluated the impact of all the on-going development projects in the study area (i.e. their future impact on the traffic attraction/generation.

## 1.6. RESEARCH METHODOLOGY

### 1.6.1 Data Collection

The study was based on a multi-survey method. Preliminary data was collected from published and unpublished documents. These included documents prepared by Lesotho

Lands Survey and Physical Planning Division, Ministry of Roads and Public Works, Maseru City Council and from distinguished authors and from many other agencies. For a further detailed information, field survey and a data collection on current situation of bus terminals, direct observation and the use of photo apparatus and informal interviews. These were directed to the commuters.

In addition to field survey, direct observation were undertaken to register more features regarding various aspects of the study, in particular the methods of the management of the areas in question. Direct observation in this study was used to gather information on the state of traffic circulation within the areas in question and the old main bus terminus as an interchange point.

Other important informants identified included officials from Ministry of Roads and Public Works, Maseru City Council, Department of Lands, Survey and Physical Planning, Ministry of Transport and Communication and newly established Department of Environmental Secretariat under the Prime Minister's Office.

For a further detailed survey and data collection- the Primary sources were employed and included were both household and commuters' questionnaires and traffic counts.

The traffic counts were performed along Kingsway Highway in all its directions, along both Constitution and Moshoeshoe Roads - both acting as relief roads of Kingsway

Highway. The exercise was mainly done to register all traffic volume generated by all different kind of modes. This was therefore performed at particular times of the day.

Households were used as sampling units in the study. A random sample of 120 households was selected out of four residential areas around Maseru Urban area. These were Maseru West/Hills View, Moshoeshoe II, Lithabaneng/Lithoteng/Lower Seli and Motimposo. Table 3 shows the densities in the selected sampled areas:-

**Table 3: Household Questionnaires Sampled Areas.**

| SECTOR | POPULATION PP/HA |
|---|---|
| Maseru West | 27 |
| Moshoeshoe II | 44 |
| Lithabaneng | 200 |
| Motimposo | 29 |

**Source: Maseru Development Plan by LSPP (1990)**

Maseru West form part of West Central Business District. This area represents the high income residential areas. 99% of the population use motorized transport to commute within the CBD. There is no public transport in this area.

Moshoeshoe II residential area is 2 Km from the West CBD. It represents a combination of middle high income and limited high income and limited middle poor residents. It is

located along Mohokare (caldom) river, on the south-eastern of the city. There is very limited public transport in this area.

Lithabaneng residential area is located 4.5 KM from the CBD along Main South 1 Highway. The area is a slum like, it consists of both old traditional villages and modern developments. The infrastructure development in the area is unsatisfactory. This area is consists of all different types of income levels. In this area, there is fairly plenty of public transport.

Motimposo is located 3.5 Km from the CBD along Main North 1 Highway. It represents a combination of middle and low income level. It consists of old village and modern housing. There is a very limited urban sprawl development within the area. There is plenty of public transport.

The commuters questionnaires were administered. A random sample of 120 commuters was selected within the study area. This included all different type of commuters ranging from school children, drivers, civil servants, street vendors and many others.
In an effort to carry out field survey effectively four assistants were employed.

### 1.6.2 Data Analysis:

Various methods have been employed in the study. This include the frequency tables, different types of graphs such as bar and pie charts. There is an extensive design work in this study. All in all the study has employed descriptive method throughout.

## 1.7 LITERATURE REVIEW

The problem of Urban Transportation has greatly increased in recent years and there is little hope that the conditions will improve. The population explosion of the last two decades vastly enlarges the dimensions of movement of people and their possessions. The impact of the change in birth rate is yet to be felt appreciably on the demand for automobiles (George M.S., 1968).

Further rising incomes enlarges car ownership. If road facilities are utilized moderately, congestion seems to increase geometrically for a time as the car population rises arithmetically. However, no matter what is done to induce people to change their travel modes, or goods vehicles to change their routes, there will eventually still be congestion on many roads.

Some metropolitan cities of developed countries like Sweden, Denmark and Holland may give pointers as to the typical traffic management measures which improve on the use

of existing roads in order to move people rather than vehicles. These may include some or all the following:-

- Pedestrianisation of central shopping - area roads
- Bus priority measures - bus lanes, bus ways etc.,
- One way systems, and
- Linked traffic signals.

From some of these traffic management measure the lesson learnt is that a transport plan is developed as a complete package of projects and policies, conceived as unified whole. It should be implemented comprehensively in a cross-the board stages in accordance with a carefully conceived, financially realistic, and as an annual sub-programme derived in turn from a longer or wide scope programme.

Different transport planning methods have been developed over the world in a bid to alleviate the transport problems. In the public transport sector, different policies and operational frameworks have been formulated within which urban movement in each country could be solved (Otieno, C.K. 1991).

There has been several transport planning strategies in different countries such as one-way systems in Lesotho which is well known and which increase the capacity of existing roads by about 50 percent. It will also reduce the likelihood of accidents, by reducing

the number of points of conflict at intersections. The one major factor which is often adequately considered in the implementation of one-way system is however environmental impact on the lesser roads brought into the system by introduction of the gyratory. When commercial streets become through roads, commercial parking becomes difficult and the quality of life deteriorates.

In any transport system, there is interaction between activities and flows of people, vehicles and goods which it generates. The emphasis then is design transport system that maximize mobility and accessibility of people between and within the various but interrelated activity zones which form part of the Urban system. One of such schemes is pedestrianisation. Pedestrianisation measures have been used to improve the flow of traffic through towns, in order to improve the pedestrians environment. Therefore, the closing of streets to motorized traffic is much to be recommended as a planning tool of any traffic management system. The main problem associated with their approach in the existing urban areas is that of access to the properties affected by the street closure (Wells, G.R. 1975).

One of the most recent study in Maseru is concerned with the central street controlled parking. This study covered adequately the control of traffic in the CBD which inevitably proved necessary, even in the quietest and best-planned of towns has streets.

The study recommended two standard and well-known methods of controls, which are:-

1. Disc Parking

2 Parking Metres.

It should be noted that Maseru has also developed without a comprehensive plan for traffic network. Therefore, development has continued in an uncontrolled manner - although a comprehensive traffic and public transportation study for Greater Maseru as for many years been a priority for Roads Branch and Lands Survey and Physical Planning Department. It has never been carried out due to financial constraints.

Maseru Central Business District - West local Plan was drafted in June 1991 by Lands Survey and Physical planning (LSPP) which provided a comprehensive plan for development of Maseru in which recommendations were made for the development potential of the CBD. But this has to be examined in relation to optimal traffic capacity of the road network that serves the areas. The findings showed that within the central area of the city and particularly on the stretch between Basotho Hat and the Circle, all types of traffic (i.e. by passing and CBD service trucks public transport and taxis; private cars, pedestrians and occasional bicycles and horses) mix without segregation. At peak hours the generated and through traffic develop a critical and dangerous situation as far as road capacity and safety is concerned.

The study projected that, the population of Maseru is expected to grow (Maseru Development Plan medium growth Scenario) almost 400,000 by 2015. This means that growth could be five-fold during 1985 - 2025 (i.e. in four decades).

The study came up with the major policies recommendations for transport for the future development of the city (MDP, 1987) The thrust of the plan was outlined below:-

1. The plan was made to improve in the order in the built environment and the administrative and commercial functions of the CBD, increased traffic safety, and the introduction of traffic segregation in some parts of the CBD, and its relation to existing parks.

2. The plan also endeavoured to achieve a better balance of activities to get a living city centre after office hours by introducing mixed land uses along Kingsway Highway.

3. The local plan also provide maximum possible safety to pedestrians through a re-structural road network and a consistent and integrated pedestrian ways system. Most people move by foot within to and from the CBD area due to the concentration of Commercial and working places and their interrelation. Thus the facilitation of pedestrians movements in terms of safety and distance has central role in the design of traffic and land use.

The Plan recommended for public parking space as complement to above provisions to compensate the deficit resulting from application of planning standards to existing facilities within CBD since new office development require 1 parking bay per 100 $m_2$ gross total floor area. While commercial facilities require 1 parking bay per 50 $m_2$ gross total floor area **Source:- (MDP, 1989 Dept LSPP).**

This study sets out to examine similar problems but at a planning and architectural level. This study seeks to enhance the knowledge on how to plan a functional operations of NMT and motorized transportation, mainly to address the problem of traffic congestion in the CBD bus terminals and parking facilities in order to sustain a well functioning city centre at optimal utilization of land taking into account environmental, economic factors.

## 1.8 CONSTRAINS OF THE STUDY

The intention of the study was to select the largest samples, but there were avoidable constraints, such as financial, time and many others.

Unfortunately, lack of reliable data had prevented a thorough analysis of the present situation on road accidents and especially of the processes of changes during period. However, a few trends become apparent from limited data available.

# CHAPTER TWO

## 2.0 FACTORS ABOUT THE STUDY AREA.

## 2.1 MASERU: A HISTORICAL PERSPECTIVE

Maseru as the Capital of Lesotho dates from 1869, which makes it older than most capitals of countries in the region. It is, for example, older than Gaborone, Harare, Lilongwe, Lusaka, Mbabane, Nairobi and Windhoek. It is 14 years younger than Pretoria (David P. Ambrose, 1991.) (Map No.1 ).

To telescope a great deal of history into a short time, in the 19th century, Lesotho under King Moshoeshoe I became engaged in a series of wars with the neighbouring Orange Free State Republic, (OFS) founded by white Settlers. This led to a succession of invasions and loss of land, and the area where Maseru now stands was under OFS occupation from 1866 to 1869. In 1868, the British, after a request from King Moshoeshoe I, had declared Lesotho to be British territory. At the Treaty of Arrival North in 1869, the Conquered Territory East of Mohokare (Caldon) River was restored to Lesotho, but the Land to the West was lost.

This paved the way for the British to establish the present colonial Capital in March 1869 on a Strategic Site overlooking the river which is the border (Map No.2). That is where you find Maseru today.

From 1884 to the present time, Maseru grew at first slowly, but there were periods of rapid growth, such as the Anglo-Boer War(1894) which stimulated the growth of Communications Links and trade. For much of 20th Century, Maseru was essentially a small village, and private houses merged with business premises along its single main street. Most buildings of that era have now vanished from the Central Business District (CBD), although some older buildings can be found adjoining what is now known as Kingsway Highway.

Because it could not expand Westwards, Maseru spread Eastwards, North Eastwards and Southwards. Until Independence, the City's boundary to a large extent contained urban growth. But from the late 1960 onwards, new areas subject to virtually no formal planning developed in the peri-urban areas.

**MAP 1: MAP SHOWING LOCATION OF LESOTHO**

**MAP 2: MAP SHOWING THE LOCATION OF MASERU**

## 2.2 GEOGRAPHICAL INFORMATION

This section carries a description of the study area to include its location, area and extent. It also includes the climatic factors and the description of ecological zones within the study area.

### 2.2.1 Location Of The Study Area

The study area is located towards the Western part of Maseru Urban Area (M.U.A.). It begins at Maseru border post and continues along Kingsway for about 3 km and ends at old main terminus from main North 1 and New temporary terminus from Main South 1, also incorporating areas located 300 - 500 m North and south of Kingsway.

### 2.2.2. Study Area Boundary

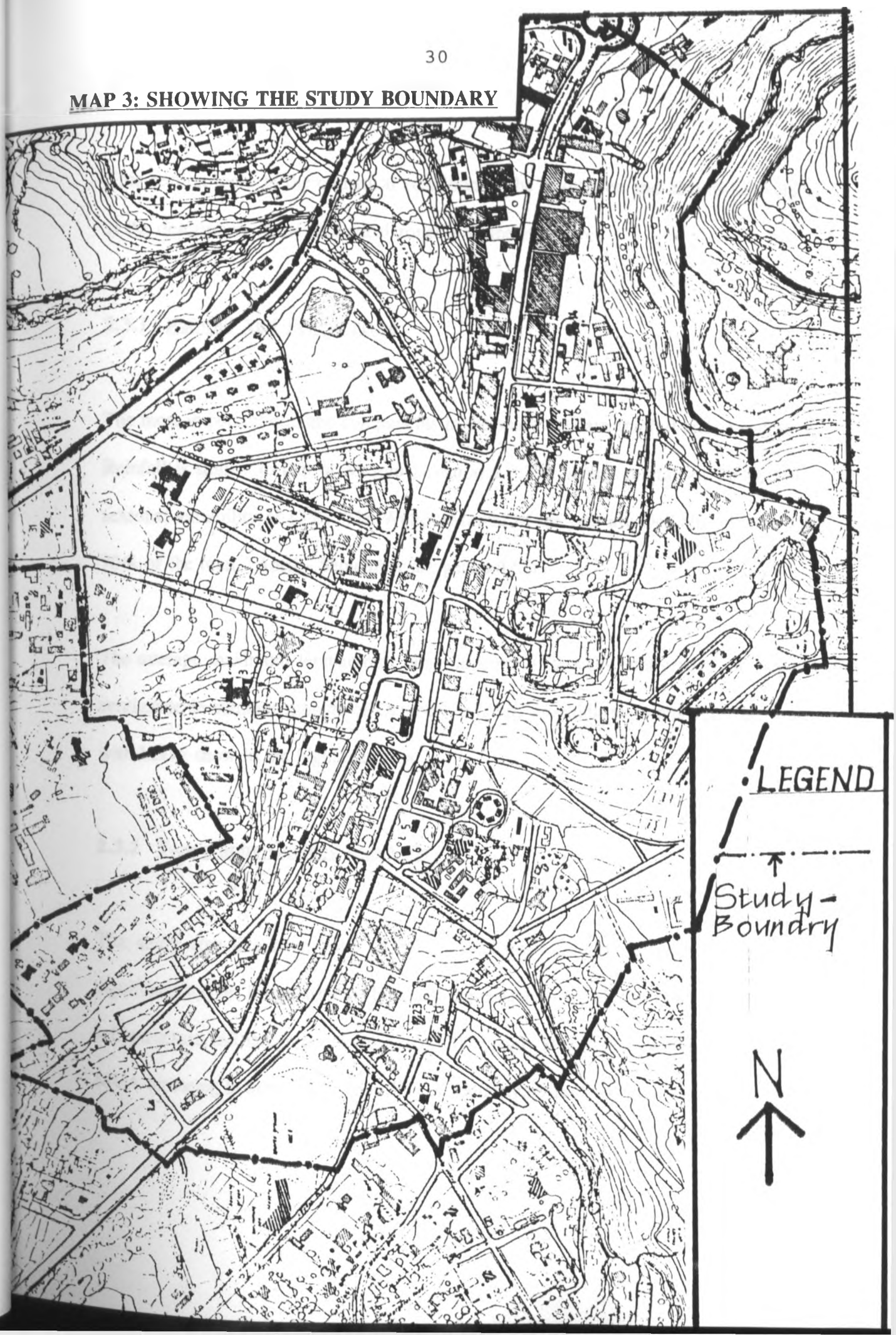
Starting anti-clockwise, the study Area Boundary begins from Main Old Bus terminus from Main North 1 and from new temporary Bus terminus from main South 1 continues to the main traffic office where Lesotholi Road joins Moshoeshoe Road. At this junction the boundary follows Lesotholi Road Southward until it joins Assissi Road, following it Westwards up to the boundary between the Royal Palace. The boundary follows the property line of the Royal Palace until it joins Tona-Kholo and further towards the Northwest along the latter road until it joins Caldwell Road. (Map No.3)

The boundary then follows Caldwell Road towards Southwest until it reaches constitution Road where it follows until it joins both Kingsway and moshoeshoe Roads. At this junction the boundary follows Kingsway Rood to the border post.

The study area boundary crosses Kingsway to continue further Southwards between Maseru Club building and the Sports grounds until it joins Ladgen Rood. It turns East along this Road and after 50m turns again South East running between China Garden to join Orpen Road, then turns South West passing local police station until it joins Bowker Road.

Turning North East the boundary joins Pope John Paul Road and follows it towards South East, climbing the slope until reaching Bureau of Statistics Southern boundary and Nightingale Road. It turns North and then East North of UNDPs Offices to follow the slope of the Lesotho Sun Hotel until joining the AME Church Boundary and Traffic Circle.

**MAP 3: SHOWING THE STUDY BOUNDARY**



## 2.3 PHYSICAL FEATURES

This section looks at the climatical condition of the study area and also to be included is the description of the ecological zones with the study area.

### 2.3.1 Rainfall And Temperature

The most important climatic components in the study area are rainfall and temperature. Rainfall is similar to that of Maseru Urban area. The annual rainfall of 700m with a seasonal variability of 13%. The Wettest-Months of the year are October - March with 70% of the total. April - September are generally dry.

The average maximum temperature range is from 20 degrees centigrade - 30 degrees centigrade in summer months of October - March, dropping to minus 2 in the winter with heavy snow in the highlands area.

### 2.3.2 Topography Geology And Soils

The study area like most parts of MUA, is characterized by varied landscape with significant terrain irregularities - hills and depressions - which represent constraints to infrastructure and integrated development. The study area is geologically similar to MUA featuring both the early consolidated sedimentary rocks as well as unconsolidated

pedesedintary rocks with soils and clays forming a thin layer over the sedimentary beds.

The study area is characterized by three main types of soil namely exposed rocks, shallow soils and duplex soils consisting of permeable surface soil overlying impermeable clay. The depth of impermeable topsoil varies between 0.3m to depths in excess of 3m.

## 2.4 LAND-USE

The focus on this section is the land-use situation in the study area.

The study area consist of both commercial and administrative activities in Maseru Urban Area (MUA), a condition that shows in the break down of land use categories (Map No.4).

**Table 4 Existing land-Use - MUA**

| LAND-USE | AREA (HA.) | PERCENTAGE |
|---|---|---|
| Commercial | 16.67 | 12.82 |
| Office | 24.25 | 18.65 |
| Civil and Community | 11.52 | 8.86 |
| Industrial | 1.00 | 0.70 |
| Housing | 25.89 | 19.91 |
| Open Space | 24.39 | 18.80 |
| Roads and Under-developed | 26.28 | 20.26 |
| TOTAL | 130 | 100 |

**Source: Maseru Development Plan (1989) LSPP**

### 2.4.1 Commercial Use

The major commercial development are located along Kingsway, usually sited on or a few metres from the plot boundary. The Lesotho National Development Corporation (LNDC) Shopping Centre is one of the retail centres. The LNDC is currently undertaking another major, huge shopping and office complex along Kingsway and on a site directly opposite the existing LNDC Centre. (Plate No.2) There are other localized shopping Centre in the Market/Bus terminus area.

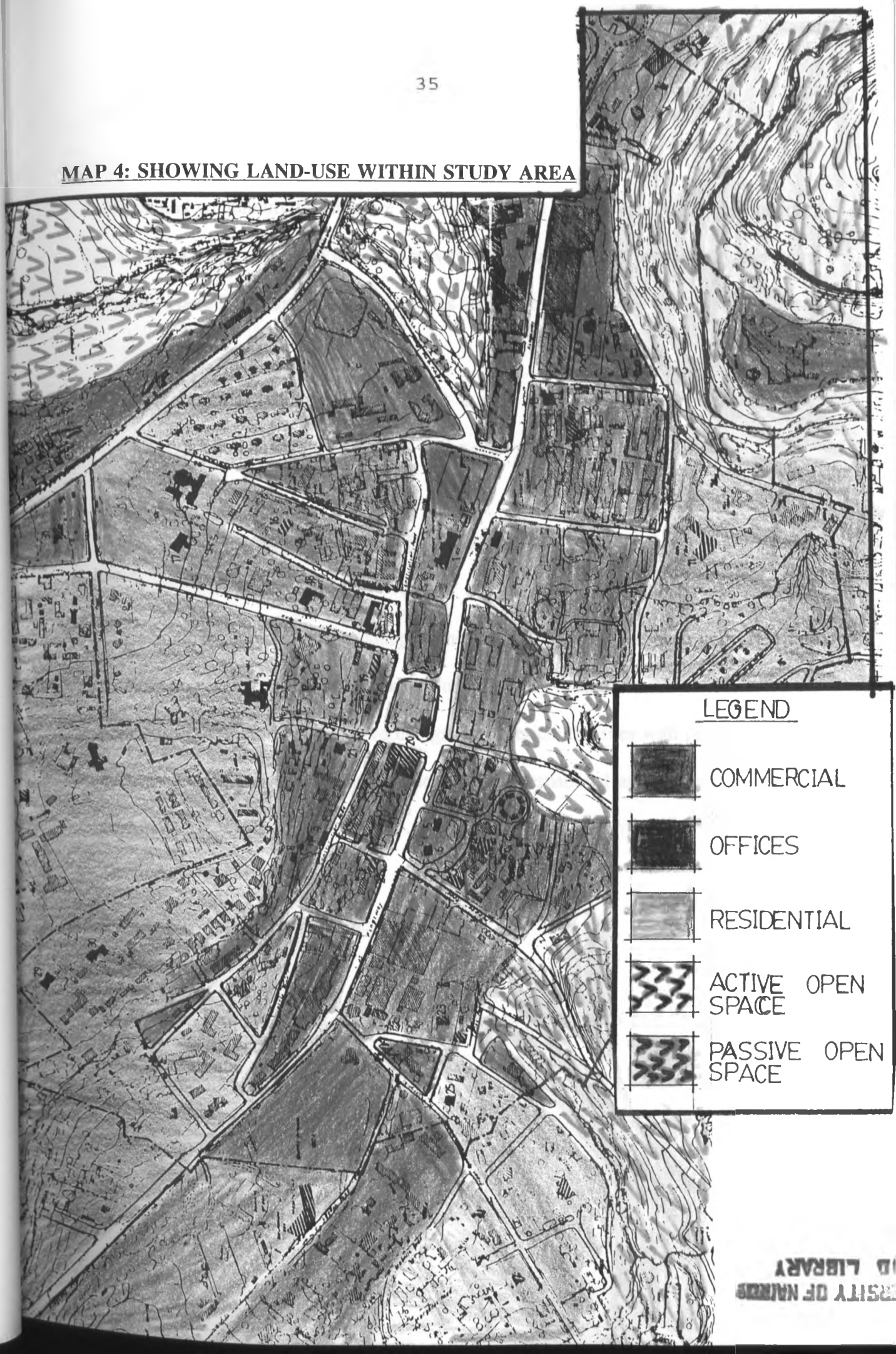
Five banks headquarters are also located in the Central part of the CBD along Kingsway. Major financial institutions (building, insurance) are also located within the study area. The two major hotels and popular restaurants are also built within the CBD: Lancer's Inn, Victoria Hotel, Oberge Restaurant, and Chinese Palace.

**PLATE NO.2 SHOWS ON-GOING CONSTRUCTION LNDC SHOPPING CENTRE.**


### 2.4.2 Office Use

Almost all Government Headquarters offices, major private professional offices and two large parastatal organisations are located within the study area. Other Government Offices and Ministries are situated on adjacent roads to Kingsway such as Parliament, Lerotholi, Constitution and High Court Roads.

**MAP 4: SHOWING LAND-USE WITHIN STUDY AREA**



### 2.4.3 Other Developments

Major and community facilities are also found within CBD-West: Police Headquarters National Library etc. The largest plot within the study area is occupied by the Royal Palace where His Majesty the King resides and has offices.

The bus terminal (within the study area) is also surrounded by three schools. The biggest two churches are also situated in the study area.

## 2.4 RESIDENTIAL DEVELOPMENT

Most number of residential buildings within the study area have been converted into offices, however there are still a number of residences in the area. In this context, the area North of Victoria Hotel is worth significant residential sites with prestige housing such as Kwena and Letsie Flats, residences for international agencies and diplomatic corps.

## 2.5 URBAN FORM

Buildings within study area can be divided into two categories based on the period of constructions and to extent on height.

The first category of building consist mainly of single sandstone buildings are still in as a reasonable structural condition.

The second category buildings were erected during the Post-Independence period and there are rather dominating in the study area. This category consists mostly of both single storey and high-rise commercial and offices buildings. The dominating construction material used are mainly brick and corrugated iron sheets. However currently the use of roofing tiles seem to dominate.

Open spaces are rapidly diminishing within the central areas, especially, with the ever going on construction of new buildings.

Very few outdoor recreational spaces exist in the central area apart from the three developed parks within the study area. Two of these parks, Moshoeshoe statue park on Pope John Paul Road and Makanyane Square on constitution Road are historic significance. Central Park on Moshoeshoe Road is mainly used for active recreation activities by children and passive recreation by adults. Its inaccessibility from Kingsway is a hindrance towards its full utilization.

This lack of abundant recreation spaces has led to a situation whereby people utilize the various roads, that are planted with grass as resting places during lunch breaks. It is

very common to see people playing cards on the various carriageways. Others use the walking pavements for playing various games.

There is no defined proportional between activities such as the height of buildings in relation with either the width of communication routes or provision of open spaces. If control measures are not taken, Maseru CBD will be overshadowed. Most of the buildings will not have experienced sun's rays.

## 2.6 POPULATION

According to Maseru Development Plan drafted in 1989 by Maseru Physical Planing Division, the population of the Maseru Urban Area has doubled every ten (10) Years since 1966 - from a population of 28,000 to 55,000 in 1976 and to almost 110,000 in 1986. This shows an average growth rate of 7% per annum.

It should also be observed that by 1986, 60% of Lesotho's total Urban population could be found in Maseru. In comparison with other towns, the population of Maseru is also eight times that of second largest town - i.e. the sign or element of primacy.

## 2.7 LAND TENURE SITUATION

The question of the prevailing land tenure in the study area was carefully studied - in as much as it has highest bearing in the future planning of the functional operations of NMT and motorized transportation. Land ownership in the study area can be classified under three categories:-

Leaseholds, titles deeds and state land allocated to Government bodies (Map No.5)

1. Title Deeds:- There is no security of land for a private land ownership holding this type of document. His plot demarcation was done on the basis of measuring plot and defining boundaries without any surveying.

2. Leaseholds: There is a legal security of tenure to private plot owners. Plot is fully surveyed and cadastrally plotted on maps. Plots with lease titles are accepted as collateral securities by financial institutions and can be mortgaged.

3. State Land:- In this case, an individual governments Ministry has a legal security of tenure called users certificate. The plot is fully surveyed and cadastrally plotted on maps.

It should be noted that in Lesotho, the Government can compulsorily acquire private land needed for any public purposes, though it has to pay compensation to the private plot

owner. Hence, all the plots which will be affected by the future implementation of the findings will only depend largely on Government will to respect the plan and to involve the planning authority in all matters affected by planning regulations.

Most of plots owned by both private and parastatals in the study area are underutilized and others are undeveloped, which is not an optimal use of prime located Urban Land.

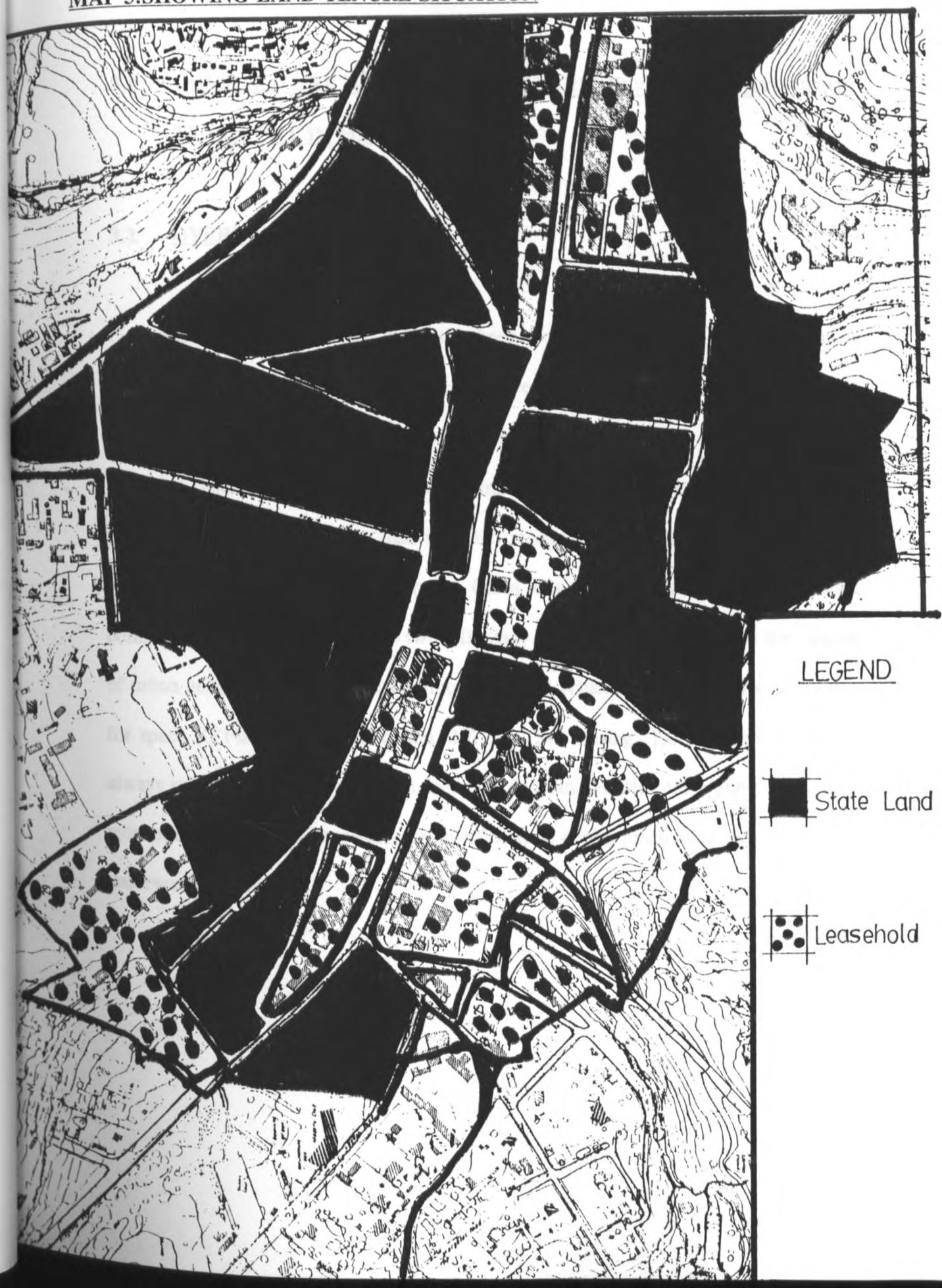
In the study area, Government owned the bulk of Land, in terms of size. Although there is no big deal to acquire land on Government areas for provision of infrastructure or any related uses.

## 2.8 INFRASTRUCTURE

Any future planning of functional operations of integrated transportation, will no doubt affect other components of infrastructure in as much as they are to be linked to each other or rather they depend to one another. Hence the study did not fail to take a heed on the current situation of other components of the infrastructure within the study area.

Direct observation was used as a primary source of information as it was rather difficult to get information or rather drawing plans from the relevant department.

**MAP 5:SHOWING LAND-TENURE SITUATION**



# CHAPTER THREE

## 3.0 CONFLICT BETWEEN NON-MOTORIZED AND MOTORIZED TRANSPORT IN MASERU

### 3.1 OVERVIEW

Generally, pedestrian interests have not been well catered for in urban movement systems. Yet most journeys in cities require an element of walking and many, particularly by non-car-owning households, are still exclusively made on foot. In central Business Districts many inter-functional links are achieved via pedestrian or non-motorized-only journeys rather than vehicular modes. The facilities provided for non-motorized and vehicular movement in Cities ensures that there will be constant competition for space between the two. In many ways it is true to say that the "nature of urban geography dictates that non-motorized and vehicles are continually competing for space (O'Flaherly, and Parkinson, 1972, p. 34, Masing, 1972). This conflict is always most marked in City centres, where pedestrian densities are highest throughout most of the day in shopping streets and in office areas during lunch hour and the morning and evening rush hours.

## 3.2 ROADS LAYOUT

Maseru has been growing without a comprehensive plan, hence there is no co-ordination between development activities in the city. The urban reserves are laid out in a neat grid iron pattern with large, extensive fully serviced plots, Ironically, such a layout is quite unsuitable and uneconomical due to the country's largely uneven topography. Complementary services are also restricted to very small central business areas without any future expansion (Sekhesa A.M. 1991).

There is only one main street and the CBD is restricted to both sides of the road, with virtually no room for expansion. This has prevented any comprehensive planning and development for the CBD expansion. Immediately surrounding the CBD are the administrative buildings. The residential areas for the foreigners, ministers and also most high ranking people are separated from those of the "natives" who are mainly civil servants.

It should be noted that in the CBD area, there is no system of priority street use; for instance no streets or other routes used exclusively for NMT or primarily for shopping, hence conflict between NMT and motorized transport within the CBD. Its only gazetted roads such as Moshoeshoe Road, Main South 1, Main North 1 and Pioneer Road which can be said to be distributary roads in central area. However, these roads also have dual purposes (i.e. they perform as local services roads as well as local distributors).

The study area is transversed by three main roads. These are Main North 1, Main South 1 and Kingsway Highway. All these roads start at the Circle (Roundabout). There are other important roads within the area such as Moshoeshoe road which also branches from the Circle to the Industrial area. There is also Pioneer Road to Thetsane Industrial area and the roads to Sefikeng and Thaba-Bosiu in the east and a short stretch of road branching from the Main North 1 near Lakeside Hotel through Lower Thamae Township to Main South 1 at Thabong estate. These are all gazetted roads and are maintained by the Central Government through the Department of Roads.

Other important roads include Constitution, Calden and Airport roads. These and the rest of the ungazetted roads within urban area are in the study area. They are under the responsibility of the Town Engineer of Maseru City Council.

### 3.2.1 Kingsway Highway Network

Kingsway Highway Road is a gazetted road with a 30m road reserve and is a four-lane street serving the principal Central Business District area and it is also the most direct route for both NMT and MT travelling from the border post to virtually all areas outside Maseru. It also acts as a principal access road to most of major employment zones, such as government offices, banks etc.

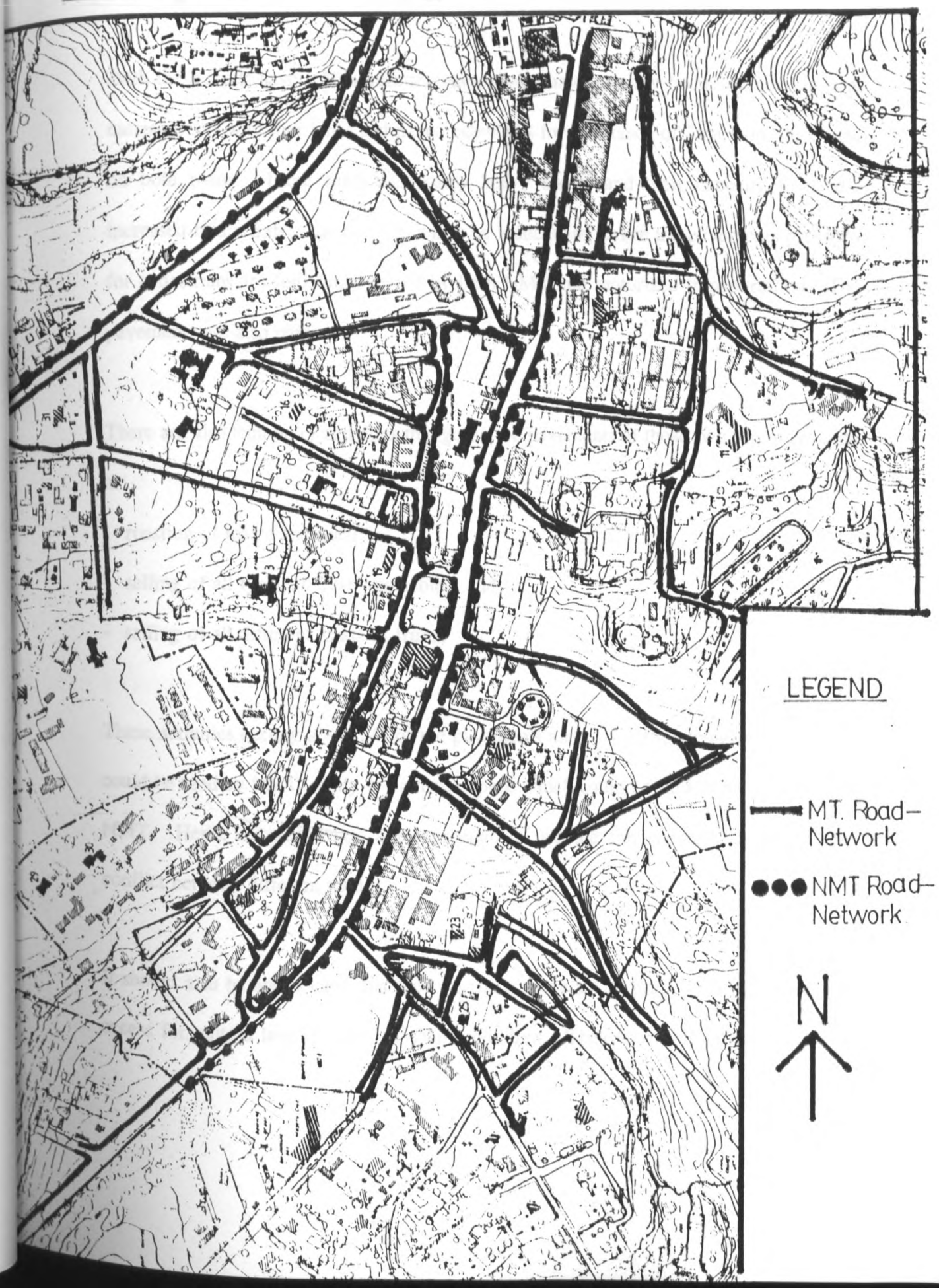
Most buses, mini-buses, taxis, private vehicles as well as pedestrians use Kingsway as their principal travel route hence traffic congestion especially during peak hours. This often leads to conflict between NMT and motorized transport.

During evening peak, most pedestrian workers in CBD prefer to walk along Kingsway pavement up to the bus terminals. Pedestrians count carried by Roads Branch on two working days along the pavement (both sides) showed that it is a busy pedestrian _ 5,200 pedestrians pass on this pavement during evening peak (4.45-5.30 p.m.) on their way home.

The pavements of Kingsway Highway are narrow with the width of 2 metres. So the effective width for NMT movements is reduced by street vendors. The capacity of the pavement is not adequate when compared to the volume of pedestrians, hence they experience a lot of inconveniences in their movements. In most cases, these temporary activities that take place on the pavements have forced NMT to use the carriageway, resulting into the conflict between different modes of transport.

It must be noted that Kingsway Highway is also a major and busy pedestrian commuter road from the residential townships to the CBD and vis versa (Map No.6 ).

**MAP 6: SHOWING ROADS NETWORK FOR BOTH NMT AND MT**



### 3.2.2 Main South 1 and Main North 1 Roads

Both these roads have a 30m gazetted reserve and have recently been upgraded to dual carriageways with four lanes and paved sidewalks for a distance of 2km from the Circle on both roads. These roads also carry heavy traffic and their capacity to handle increased future traffic has been shown to be inadequate, hence the pavements provided for pedestrians are sometimes shared by both NMT and motorized transportation. The pavements are also narrow.

There are also temporary activities that go on the pavements of those two highways such as:-

- roasting of maize and meat;
- selling of all types of fresh vegetables; and
- selling of all different kinds of fruits.

These activities occupy about 3/4 of the pavements and as such reducing the space that could be used by NMT. Only 1/4 a metre space which could be said to be available for NMT. Hence the pedestrians are compelled to use the carriageways, resulting into conflict between different modes.

It should also be appreciated that the two roads serve/act as principal roads providing access for quite a large number of school children. They travel along the pavements

from their homes to the schools and vis versa. There are food kiosks along Main South 1 Road. Also there is much of littering along the pavements. These activities have negative effects on School children which in most cases are forced to walk on the carriageway, and hence lot of conflicts between them and vehicles. Along these roads, there is also an element of vehicles parking on the pavement, hence pedestrians have to endure quite a lot of inconveniences.

All the same, the roads are provided with bus stops by way of lybys along the upgraded parts of these roads and are clearly sign posted.

### 3.2.3 Moshoeshoe Road

This Road has a 30m gazetted reserve and is a three-lane road linking the industrial areas with the Central Business District (CBD). Many heavy vehicles use this road and there are proposals by Roads Branch to widen it to 50m road reserve. However, the question of built up environment is the main constraint. There is a fairly feasible surfaced pedestrian sideways away from the carriageway which have been constructed along parts of this road by the Maseru City Council.

### 3.2.4 Pioneer Road Network

Pioneer Road is a two-lane road with a gazetted reserve of 30m. It links the Thetsane Industrial areas with the CBD. The road has been upgraded to a satisfactory standard although pedestrian walkways have not been provided. The movement of pedestrians/ NMT on this road is at stake.

Below is the summary of existing carriageway widths for gazetted roads.

| ROADS | CARRIAGE WAY WIDTHS | OVERALL WIDTH |
|---|---|---|
| Kingsway | 9.0m - 18.5m | 19.2m - 31.8m |
| Moshoeshoe | 10.0m - 16.0m | 19.6m - 24.7m |
| Pioneer | 7.0m - 10.0m | 23.0m - 32.0m |
| Main N2orth 1 | 2 by 7.0m | 20m |
| Main South 1 | 2 by 7.0m | 30m |

**Table No. 5 Summary of Existing Carriageway Widths.**

**Source: (Roads Branch, March, 1989)**

### 3.2.5 Constitution Road Network

This road is one of the ungazetted roads within the study area. Like many other ungazetted roads, it does not have any definite reserve. The width varies although it is

tarred. Of late, this road is playing a big role within the study area. It is being used as relief road for Kingsway Highway especially during morning peak hours. Hence it has experienced many pot-holes. It was not initially meant for this type of traffic volume. The road is also been tremendously encroached upon by some of the government office development.

Initially, this road was meant to access some few offices and residential developments such as the Kings Palace, etc. Of late, the road is being targeted also to access the on-going huge shopping complex within the study area.

There is a very limited walking pavements on certain parts of the road, and in good number of cases, they are very narrow. The conflict between NMT and motorized transport is extremely high on this road.

The current state of the road is unsatisfactory. It has experienced a very severe pot-hole problem of late. It has been overloaded by the high volume of traffic.

### 3.2.6 Other Roads Within the Study Area

Caledon and Airport Roads do not have definite reserves as they are usually wider and narrower at some parts and although tarred. Their Standard is relatively low.

Earth/gravel roads within the area are also a very poor standard. Market Road is similarly of low standard and most severely pot-holed. There are no provision for NMT pathways on these roads. Hence the NMT are forced to travel on the carriage ways. These are some of the busiest roads in the study area.

### 3.2.7 Non-Motorized Network

NMT Network (Map No. 6) shows the major pedestrian commuting routes within the CBD areas. It is therefore from the routes one could formulate his/her judgement towards the problems facing the pedestrians commuting within the CBD.

As regards width of pavements one would find that many streets have narrow pavements while space exist mainly everywhere in the CBD. As it has been mentioned in the previous chapters, Maseru has developed without any kind of plan. Planning was only done recently, when the Department of Lands Survey and Physical Planning (LSPP) was established in 1986 and in 1989 the Maseru Master Plan was drawn by the department. One of the suggestions was that was every rebuilding in the urban area the ground floor frontage or the setback should be 10 metres, so as to allow the increase in NMT flow. Since the plan had been drawn, there had been only two buildings constructed along Kingsway_ that is Lesotho Agricultural Bank Corporation and Lesotho Metropolitan Insurance. Hence the problems remain the same.

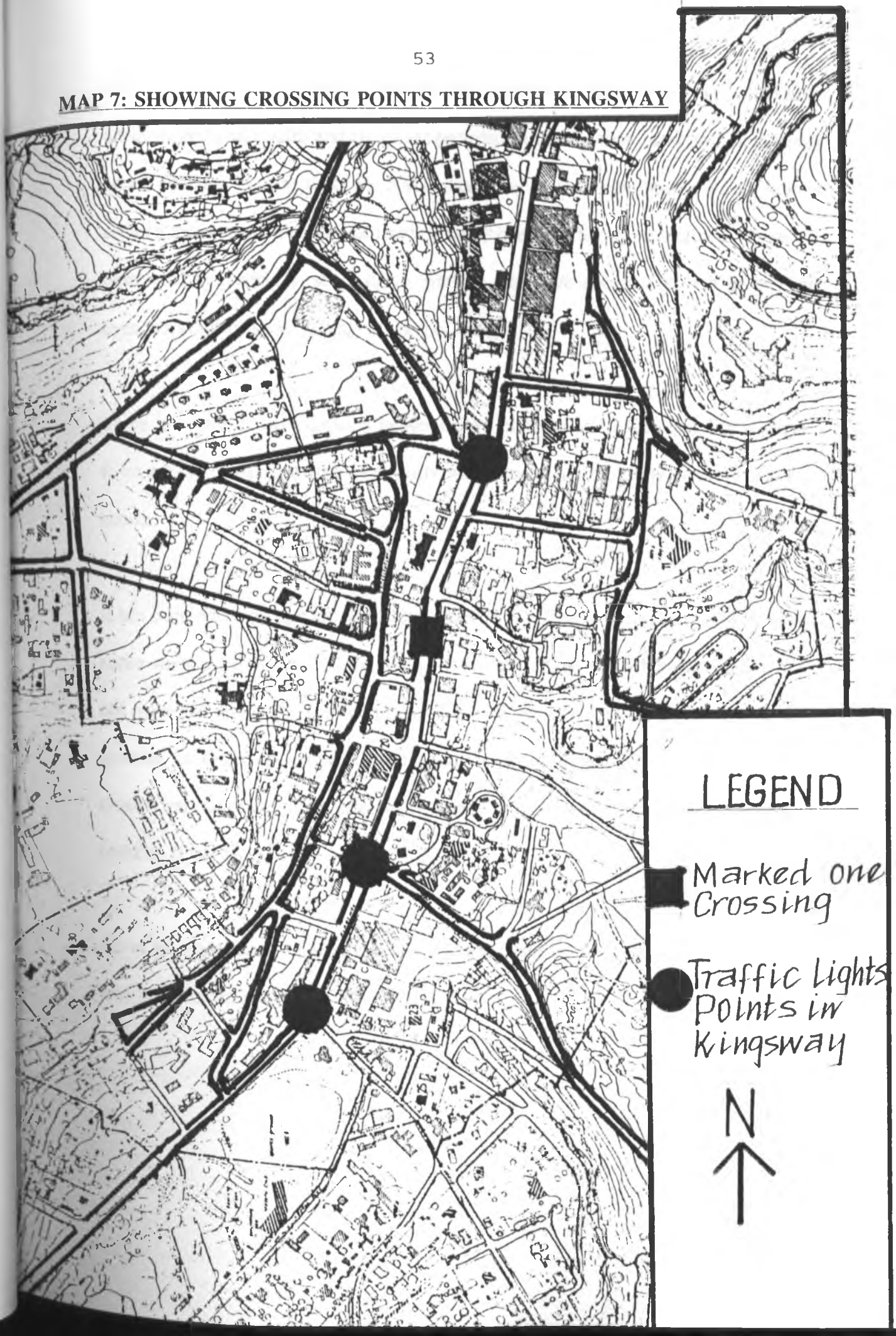
### 3.2.8 Pedestrian Crossing

The MPTS (1986) noted the particular unsatisfactory safety to non-motorized transport in the CBD despite that walking is a common mode of travel. There is only one crossing point on Kingsway Highway, (Map. No.7 ) which is between Pioneer and Parliament roads. The distance from the crossing point to Parliament Road traffic lights is 400m while 530 metres to the Pioneer Road traffic lights. There is no provision of pavement in the central median, that could facilitate the pedestrians to wait during peak hours. The crossing is however uncontrolled and as a result has a high portion of accidents. Since there is only one crossing, pedestrians and other NMT cross at various places along this road especially at the Post Office and Lesotho Bank building.

There are also four traffic lights installed at certain points along Kingsway (Map. No.7 ). The state of their operations are unsatisfactory. In most cases, they are not in operation, hence create some inconvenience to NMT, as there are no traffic policemen especially at evening peak hour and lunch peak. Therefore, NMT users still undergo some delays in their movements.

The element of ignorance by most pedestrians as regards the operations of traffic light system should not be overlooked. They seem not to understand what the various symbols in the light meant. Hence, in most cases they collide with vehicles.

**MAP 7: SHOWING CROSSING POINTS THROUGH KINGSWAY**



Since the majority of the people have no cars it would be expected that we would have adequate pedestrian paths and cycleways provided. Unfortunately, in almost all the town areas, although in some cases the NMT routes may be shown on Master Plans, little is seen on the ground. Pedestrians routes are disjointed and hardly maintained. Some are obstructed by roadsigns, street lights, whereas others are encroached onto by bus lay-byes, caravans or sheds selling all sorts of things.

There is a lack of co-ordination between town planners and engineers. For example, there are no proper crossing over storm water drains, on our busy roads and round-abouts.

It has been observed that the dangerous areas for NMT have been noted as those along entire stretches of Kingsway, the Main North 1 and Main South 1 Highways and both old main and temporary bus terminals. However there is only one marked pedestrian crossing on Kingsway between Pioneer and Parliament Roads, yet a lot of pedestrians cross at various places along this road especially at the Post-Office and the Lesotho Bank building (Plate No. 2).

All-in all, pedestrians and cyclists have all been taken for a ride and are getting a raw deal in the urban area, especially in the CBD.

**PLATE 2: CONFLICT BETWEEN NMT AND MT IN CROSSING KINGSWAY**

The only roundabout within study area the roundabout caters all traffic going in and out of the CBD.


Crossing Kingsway by pedestrians is tough prospect to confront.

## 3.3 TRAFFIC CHARACTERISTICS

It has been shown that the major traffic flows in the Maseru urban area occur at the circle with the highest flows recorded along the Main North 1 in both directions (8,962 vehicles per day between 6.00a.m. and 6.00p.m.) Traffic peaks usually occur between 7.30a.m. - 8.30a.m. and between 4.30p.m. and 5.30p.m. as well as at lunch time. Kingsway and Moshoeshoe Roads are carrying high traffic flows.

The peak hour traffic, incidentally, also concides with the pedestrian flows in the CBD areas and as such there are many conflict areas between the NMT and motorized transportation, with the pedestrians in the losing end in terms of safety, comfort as well as convenience.

In 1982, there were 33,004 registered vehicles in Lesotho of which 25,004 (65%) were registered in Maseru. About 63% of all vehicles registered in Maseru were private vehicles and 37% were public or government owned. Of the total number of private vehicles about 49% were trucks/vans, 31% were cars and 12% were buses/combis. Other categories accounted for the remaining 8%. In the case of government vehicles, 35% were trucks/vans, 22% were cars, 13% were tractors and 12% were buses/combis. Other categories accounted for about 18%.

These figures, therefore indicate that a largest proportion of vehicles in Maseru are heavy vehicles followed by motor cars.

**TRAFFIC ACCOUNTS 1994**

| COUNT STATION | TYPE OF VEHICLES | VEHICLE/DAY FROM 6 A.M.-6 P.M. |
|---|---|---|
| MASERU BRIDGE | LV | 4,210 |
| | MV | 1,233 |
| | HV | 980 |
| | B | 10 |
| | NMT | 3,110 |
| | TOTAL | 9,543 |
| KINGSWAY | LV | 5,160 |
| | MV | 2,123 |
| | HV | 627 |
| | B | 8 |
| | NMT | 4,340 |
| | TOTAL | 12,258 |

| | | |
|---|---|---|
| MAIN NORTH 1 | LV | 2,210 |
| | MV | 2,540 |
| | HV | 160 |
| | B | 30 |
| | NMT | 1,820 |
| | TOTAL | 6,760 |
| MAIN SOUTH 1 | LV | 2,224 |
| | MV | 3,520 |
| | HV | 190 |
| | B | 15 |
| | NMT | 2,210 |
| | TOTAL | 8,159 |
| CONSTITUTION | LV | 1,252 |
| | MV | 1,160 |
| | HV | 30 |
| | B | 5 |
| | NMT | 1,212 |
| | TOTAL | 3,659 |

| | | |
|---|---|---|
| MOSHOESHOE ROAD | LV | 1,220 |
| | MV | 2,540 |
| | HV | 900 |
| | B | 20 |
| | NMT | 1,210 |
| | TOTAL | 3,604 |

**Note:**

LV Light Vehicles

MV Medium Vehicles

B Buses

NMT Non-Motorized Transport

### 3.3.1 Traffic Problems

One of the major traffic problems in the CBD area is caused by lunch time traffic especially in the outbound directions between 12.30 and 1300 hours each day. The reason for such peaking are related to the non-staggering of lunch hours and to the collection of school children.

Another problem of traffic condition is related to ever increasing growth in the volume of traffic entering the CBD area. Findings from traffic survey carried out in 1993, by

Roads Branch, showed that the growth rate of vehicles, around the CBD have been increasing. These growth had been monitored both in the morning and evening peak hour periods. From these surveys, it is evident that general traffic activity along Kingsway increased at the average of 15% between 1986-1990 during morning while activities during evening peak hour, increased at an average rate of 10% per annum. The implication of this traffic growth is that the rate of overall growth in private vehicle ownership over the next ten years will be approximately 120,000 vehicles.

The motorization of the street means people on foot or any other NMT feel as if they do not belong to urban areas. Safety campaigns run time and again commonly emphasize the obligation of NMT to stay out of the way of cars - not the other way round. The most vulnerable road users are therefore expected to take the lions share of responsibility for their own safety.

It is time that motorized drivers bore this responsibility. It is they who wield the greatest threat to society - with their speed, mass, noise and pollution. Several people, including school children are killed each year due to vehicles on our roads.

Other traffic difficulties in the CBD area apart from the congested streets is associated with the critical intersections in Kingsway Highway and both Main North and South 1. These intersections have relatively high traffic volumes and at which turning movements which are difficult to make and delays are common. These critical intersections have a

negative effects on both NMT and motorized transportation (i.e. the level of conflict between different modes is substantially high). The signals traffic in the CBD of Maseru at present seem to favour motorized transport.

### 3.3.2 Accidents

Information gleaned from the Police Traffic Officer indicate that the area around the Circle and the Main North and South 1 at the stretch of St. James High School to National Teachers Training Centre are accidents "blackSpots". While on Main North One, the stretch from Lesotho High School to Lakeside are identified as potential "black spots". However, lack of information as to areas particularly prone to recurring accidents makes it difficult to pin-point exactly where accidents "black spots" for the town are.

Although no specific data exists for Maseru Urban area, the Police Traffic Office maintains that a higher proportion of traffic accidents in Maseru occur within the urban area between the CBD and Lakeside along the Main North 1 and Lithabaneg along Main South 1.

Table 3.2.2.1 gives a summary of traffic accidents for Maseru urban area for the years 1990 to 1994. In general, traffic accidents have tended to decline from 1990 to 1992 and have again shown an upward trend in the last two years.

**BLE NO.7 SUMMARY OF TRAFFIC ACCIDENTS FOR MASERU CBD**

| Year | Accidents | People Killed | People Injured | Animals Killed | Vehicles Damaged | Offenses Reported |
|---|---|---|---|---|---|---|
| 1990 | 1,256 | 136 | 689 | 11 | 1,664 | 5,257 |
| 1991 | 1,064 | 92 | 489 | 15 | 1,391 | 3,885 |
| 1992 | 914 | 104 | 396 | 10 | 1,987 | 4,855 |
| 1993 | 1,123 | 91 | 729 | 31 | 1,547 | 2,996 |
| 1994 | 1,380 | 123 | 663 | 28 | 1,951 | 3,562 |

**Source:- Department of Police Traffic Office**

### 3.3.3 Non-Motorized Traffic

Within Maseru Central area, there are certain buildings and areas which of particular importance and there is need to provide for adequate pedestrian or NMT access and the maintenance of a visual balance in relation to traffic.

Most of the NMT commuter traffic to the central Area of Maseru comes from Hoohlo estate via Moshoeshoe Road, Airport Road, Market Road, Main North and South 1

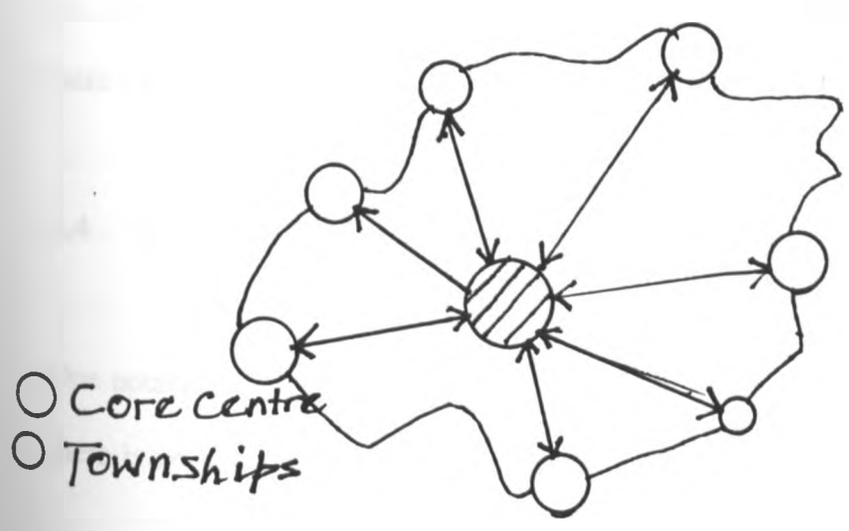
Highways. Other important routes are Pioneer routes and constitution all this traffic goes through Kingsway Highway.

The various land uses in the CBD area of Maseru are also traffic generators as most people and vehicles concentrated daily. (See map of land use in the CBD).

From the survey it was evident that, trips from various residential areas to either work, shopping, school or other useful purposes dominated the modal split. Percentage of the commuter trips were made by taxis, compared to percentage by private vehicles and percentage were made on foot.

It was also observed that the various residential townships outside the central Area are the major pedestrian traffic generators to the CBD area and industrial area. Fig No.8 shows the NMT traffic generators from the various directions of Maseru to the CBD. The list below gives the location of the major residential townships in Maseru that are regarded as NMT and MT generators.

**FIGURE NO 1. NMT GENERATORS FROM VARIOUS DIRECTION**



Apart from those pedestrian that commute on foot to and from the outlying residential township, then those who commute by means of public transport such as taxis, mini-buses etc and there are those who commute by means of private vehicles.

As such the various arrival and departure points of those modes of transport can also reviewed as NMT traffic generators within CBD. Such arrival and departure points includes the bus terminals of which the busy ones are:-

- Main old bus terminals (Market Centre).
- Carlton Centre - Kingsway Highway.
- Standard Bank - Kingsway Highway.
- Lesotho Bank/Post Office - Kingsway Highway Area
- LNDC Centre - Kingsway Highway
- Agriculture Bank - Kingsway Highway Area
- Mafafa Shopping Centre - Kingsway Highway.

As for the country buses, taxis and mini-buses, most of them arrive and depart at the main old bus terminal and also at the proposed temporary bus terminal.

## 3.4 PARKING FACILITIES

One notable problem in the CBD area of Maseru is brought about by parking. Since there is no positive system of priority street use, you find that the principal shopping

street is also a principal road and parking street - this is the case for instance with Kingsway. As such there is no separation for pedestrians and vehicles, private, public and services.

Pavements are generally narrow on most streets especially in the older parts of CBD area, with the results that NMT are frequently in close proximity to vehicles parked at the kerb or to fast moving traffic. It is a common sight to find many vehicles parked in almost every available space and thus leaving very little or no space for non-motorized transport.

Loading and unloading services area and rear alleys, in the central area are commonly used as long term parking streets this makes loading and unloading bays inconvenient to use. It is therefore frequent to find the NMT's pavement being utilized, instead, for loading and unloading.

Parking problems are complicated by the interests of many special groups. Retail merchants desire attractive parking facilities near their businesses but are often unwilling to invest the necessary funds to provide the facilities. They resist changes and improvements proposed by public officials for the general improvement of traffic and parking conditions in the CBD area as they think primarily of the availability of curb spaces through the average business frontage in the retail district has only two or three curb spaces to serve it.

Curb parking seriously affects street capacity through the narrowing of the roadway available for moving traffic, the placement of vehicles at the curb, and the frictions created by cars moving in and out of parking spaces.

A high percentage of accidents in the CBD streets involves cars which are parking and unparking. Parking maneurers also cause many collusions in which the parking car is not directly involved. In most cases, pedestrians figured prominently in parked car accidents.

Parking areas in most cases tend to deteriorate the physical environmental standard of an area. Environmental standards here is to be seen to refer to the general comfort, convenience and aesthetic quality of the physical surroundings and this from the eyes of the people living and walking about in that area. This poor environment is directly and indirectly affected by the pressures of vehicles in the central areas.

### 3.4.1. Terminals

The Main Bus Terminal is at the Maseru Market area (Map No. 8). The terminus is grossly congested and is in an unsatisfactory condition. Its existence is also under continuous threat of encroachment by commercial development. The space is limited and unplanned interaction of activities makes the problem complex (Plate No. 4). The bus terminus also act as an interchange point for regional buses, mini-buses and taxis. The

main bus terminal's other problem concerns parking for different townships taxis - their co-ordination is unsatisfactory this had led into poor network linkage. This unsatisfactory situation has also led to passengers frustration and has discouraged rural people travelling to Maseru even for necessary services. The conflict between NMT and MT in this area is very high and is also marked by high rate of accidents between NMT and MT (Plate No.5).

The government of Lesotho had temporarily developed an alternative temporary new bus terminal called "Manthabiseng (Plate 6 and Map 9). The siting of the new terminus has created several problems. For one its surrounded by three primary schools, hence school children are no longer safe due to prevailing traffic congestion. The rate of accidents had also increased within the area. The continuous noise and often smell of exhaust fumes had led to a poor learning environment.

The terminus is inconvenient to the travellers. It is also located/sited on private land and the local Authority has not compensated its registered owners.

There are a few other designated stops in town with the result that buses and taxis stop in the streets to pick up and drop passengers. Even the few stops that exist are often occupied by parked private cars.

In sub-urban residential areas buses and mini-buses stop at very well established points along the routes they use although these are neither designated as stops nor are they constructed to serve the purpose. No terminal or holding areas exist for buses/mini buses.

The terminal is an essential part of the transportation system, and its development cannot be neglected. Because some parking facilities have a strong influence on land uses in their immediate vicinity, they have had broader interest for planners than just as to their location.

### 3.4.2 Public Parking

Public parking spaces are located at various places along Kingsway between Orpen Road and the Circle and the market/bus-stop area including side streets parking (Map No. 10.). Most of the parking (about 300) are embayed. There are also additional 200 parking spaces at the LNDC centre, about 60 at the former BNP centre and a miscellany of other private parking spaces associated with large shops.

Within the central area, parking is regulated by way of one-hour twenty lisente (Mo.20) "Parking discs" during business hours. However, parking time can exceed the one-hour limit provided it is paid for.

The "parking disc" system has however, not performed as envisaged. Firstly, no study was undertaken prior to the implementation of the system. The initial aim was to distribute parking spaces fairly amongst people on business within the town centre but parking requirements for people working within the central area were overlooked - not all business establishments and offices provide parking for their staff. Secondly, the system was not given enough publicity with the result that many people are still not aware of it.

Another problem lies with the Traffic Court for people who have been fined for parking without displaying parking discs and have failed to pay within the stipulated time (7 days). It would appear as though the Court considers ignoring parking discs not a very serious traffic offence.

There is virtually no control over the length of parking time in other areas of Maseru. It has been observed that the occupancy of parking spaces is not over high with the result that it is usually easy to find a parking space close to the destination of one's trip.

**MAP 8 SHOWING MAIN BUS TERMINUS**

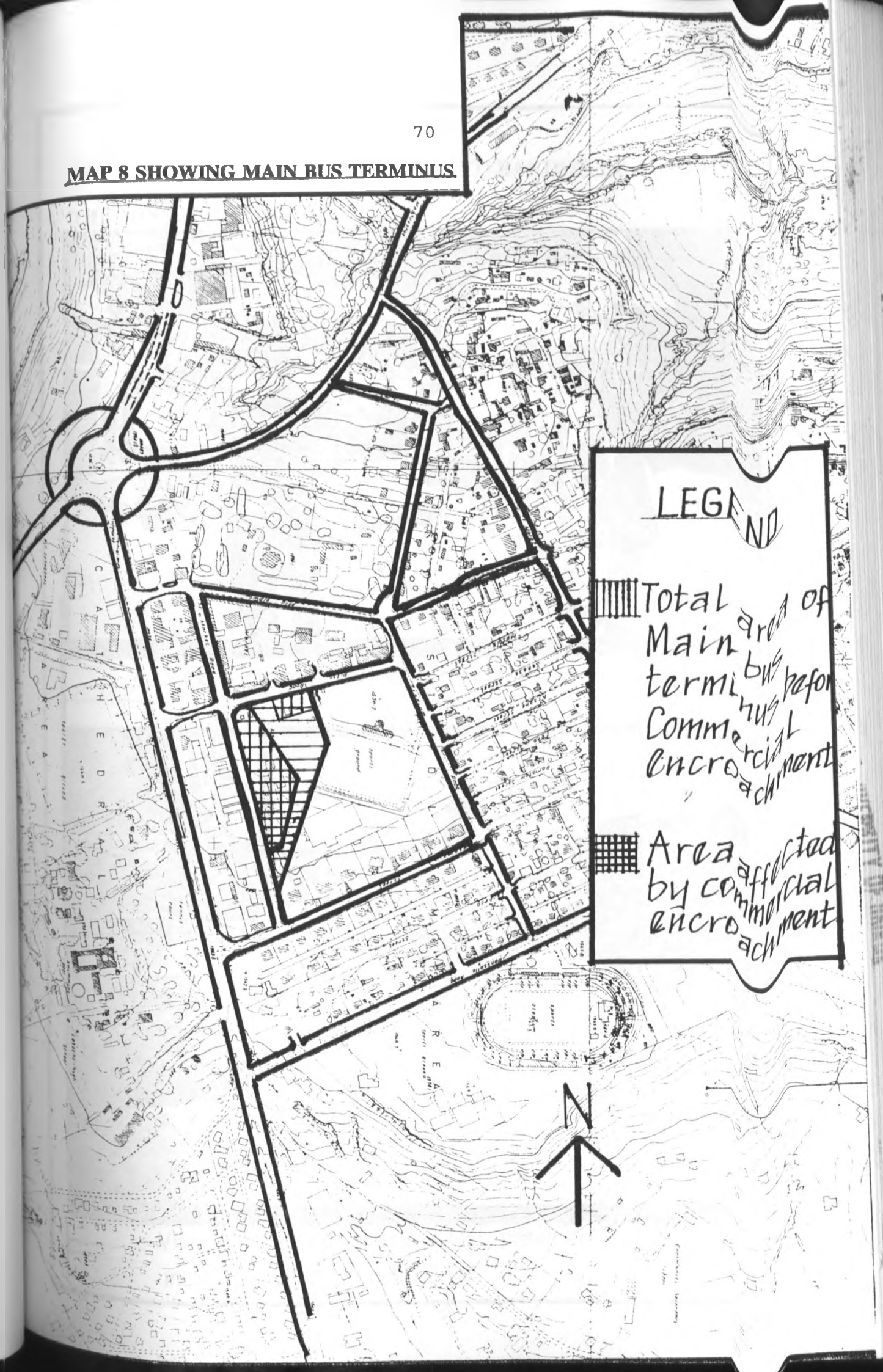


**PLATE NO. 4 SHOWING UNPLANNED INTERACTION OF ACTIVITIES IN THE MIN BUS TERMINUS**


Various of trade activities taking place on the NMT's Pavement. Hence course inconvinience to NMT.

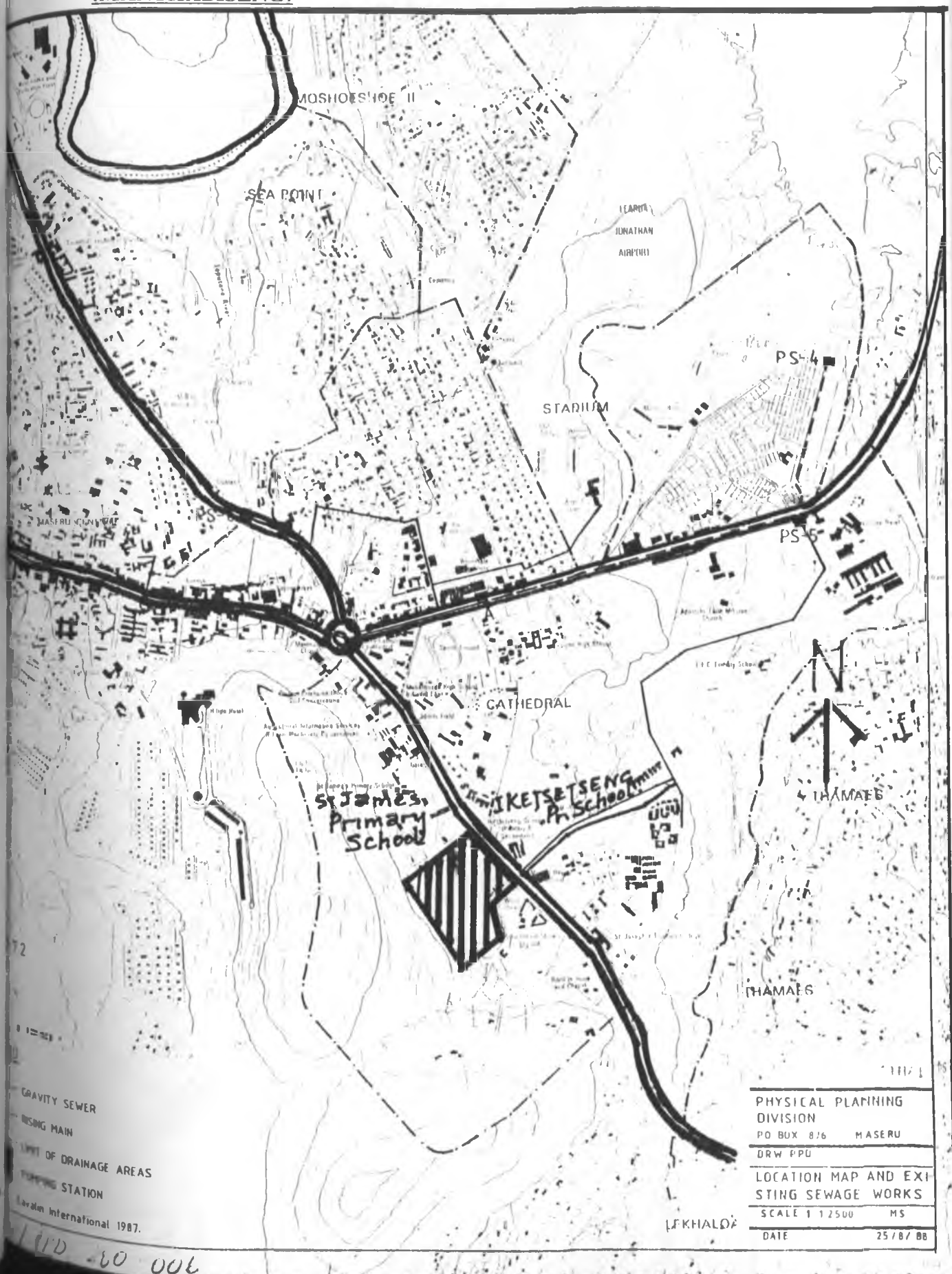

Vihecles parking on the NMT's pavement coursing an inconvinience for pedestrians.

**PLATE NO. 5: SHOWING CONFLICT BETWEEN NMT AND MT IN THE MAIN BUS TEMRMINUS**


CONFLICT OF NMT AND MT AT MAIN BUS-TERMINUS.

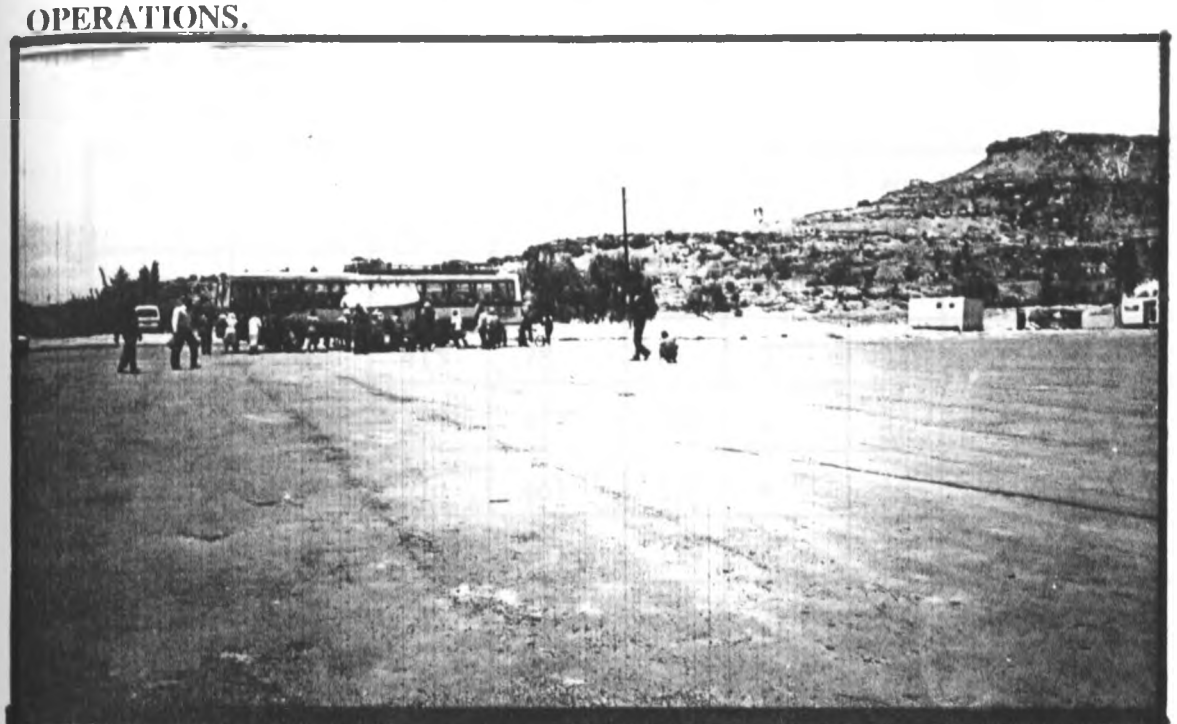

CONGESTION AND CONFLICT OF DIFFERENT TYPES-MODES IN THE CBD OF MASERU.

## MAP 9 SHOWING LOCATION OF TEMPORARY BUS TERMINUS (MANTHABISENG)



## MAP 10 PUBLIC PARKING FACILITIES

**PLATE 6 LOCATION OF TEMPORARY BUS TERMINUS AND ITS OPERATIONS.**



Location of New temporary bus terminus. The terminus deserted thoughout the day.

The most busiest operational time of New temporary bus terminus.

## 3.5 VEHICLES OWNERSHIP

The (Table No. 8) shows the number of vehicles registered since 1989 to 1993

| YEAR | VANS | TRUCKS | CARS | COMBIS | M/BUSES | BUSES | TRACTORS | TRAILER | M/BIKE |
|---|---|---|---|---|---|---|---|---|---|
| 1989 | 448 | 201 | 440 | 107 | 6 | 29 | 28 | 45 | 34 |
| 1990 | 566 | 415 | 78 | 8 | 21 | 31 | 42 | 42 | 21 |
| 1991 | 491 | 129 | 472 | 102 | 4 | 42 | 13 | 37 | 13 |
| 1992 | 432 | 91 | 461 | 116 | 4 | 15 | 15 | 32 | 8 |
| 1993 | 511 | 55 | 493 | 119 | 2 | 10 | 7 | 39 | 15 |
| TOTAL | 2448 | 585 | 2,281 | 522 | 24 | 117 | 94 | 195 | 91 |

**Source:- Traffic Department**

Of the total number of vehicles registered in Maseru, from 1989 to 1993; 2,448 were vans, followed by 2,281 cars, trucks registered third with 585, then combis with 522, trailers seen to be important in the country with 195 followed by 117 buses. It could then be observed that there is a feasible trend on Motorbike which registered the total of 91 - there is no doubt mini-buses are not popular in the country with only 24.

These figures, therefore, indicate that a larger proportion of vehicles in Maseru are light vehicles as compared with heavy vehicles which registered the highest value in 1982 downwards.

## 3.6 TRAFFIC VS ENVIRONMENT

Accidents are the fourth highest cause of death in the world, with traffic responsible for 39% of all accident fatalities and 13 percent of all accident injures. Traffic accidents result from actual failure of the road user, the vehicle. Hence the presence of vehicles in any part of the city brings about the problems of accidents, anxiety, inconvenience which are normally caused by large or fast moving vehicles that in many instances are out of scale with the environment.

Other environmental problems resulting from traffic flows such as pollution from car exhaust fumes (over which there is no control), noise, vibration, visual intrusion and severance are gradually increasing although still relatively low by international standards. These are likely to be felt soon as a result of increasing traffic flows and due to the fact that all major roads pass near residential areas.

The World conservation Union has stressed that the environmental resources should be managed to ensure the long term sustainable utilization of species and ecosystems, minimizing survival risks and generally keep open as many future use options as possible. When sustainable development is perceived as a concept that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987, p.43). Then a transport system mainly based on motorized transport cannot be considered a sustainable option. From studies made in several

countries, most people in developing countries have no access to transport services, they simply WALK. Despite this fact, there is high increase in motorization in third world Cities which cater for the mobility needs of the small rich minority. The results in traffic congestion and unoptimal use of other scarce resources (S.Obiero, 1994).

# CHAPTER FOUR

## 4.0 DATA INTERPRETATION

## 4.1 INTRODUCTION

The study had two types of questionnaires namely household and commuters. The total number of questions were 240 (ie 120 from each type). The commuters questionnaires were administered within the study area. A random sampling of people was used.

The household questionnaire on the other hand was administered to 120 households in four different townships in Maseru. The townships are as follows;- Maseru West/ Hillsview, Moshoeshoe II, Motimposo and Lithabaneng/Lithoteng /Seoli. In administering or designing this type of questionnaires, the writer had intended to register in detail the problems relating to transport in its broadest sense. Such problems could include lack of public transport in other parts of township, hence affect the household income. This trend can assist in defining the pattern of modal spilt within the study area. In most cases modal spilt can furnish the writer to register or examine the nature and structure of traffic within the study area.

## 4.2 HOUSEHOLD CHARACTERISTICS

### 4.2.1 General

The survey returned 120 households of which 59.8% and 40.2% were male and female headed respectively. The average household size was 4.021 persons. The nuclear family gave the lowest average household size of 3.8 while extended family gave higher averages of 5.1 and 5.6 for de facto and de jure respectively.

Out of these respondents, 68% were married, 23.7% were single while 5.1 were either divorced or separated and the remaining 3.1% were either widower or widow.

### 4.2.2 Ages

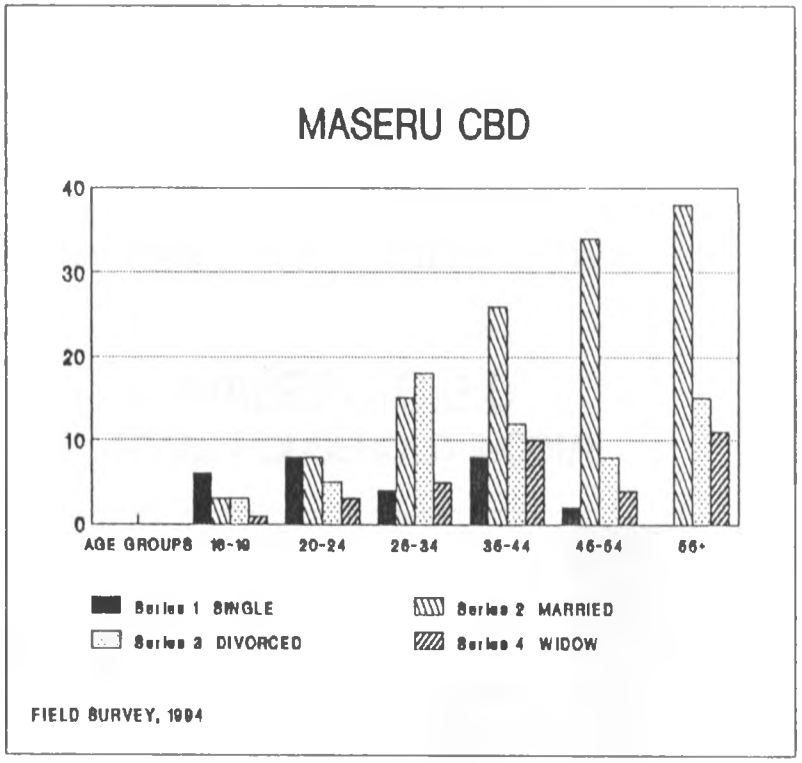
The ages of households heads range from above 16 to above 55 (see Table No. 9).

| AGE GROUP | NUMBER | PERCENTAGE |
|---|---|---|
| 16-19 | 14 | 5 |
| 20-24 | 24 | 10 |
| 25-34 | 42 | 18 |
| 35-44 | 48 | 20 |
| 45-54 | 48 | 20 |
| 55+ | 64 | 27 |
| TOTAL | 240 | 100 |

**Source: Field Survey, 1994**

FIG. NO. 2

SEX RATIOS BY STATUS




Source: Field Survey 1994

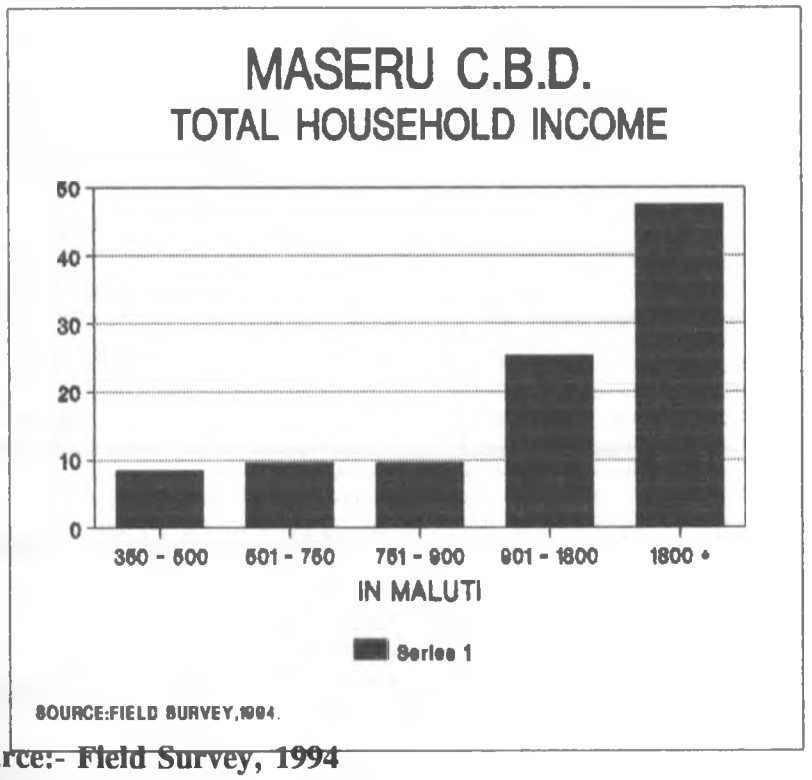
## 4.3 HOUSEHOLD INCOME

The source of income can determine the nature and structure of the traffic generation within the study area. The person who works or has a business in the study area

### 4.3.1 Income and Expenditure

The income is the positive indicator for the choice of mode, the households expenditure and the trip purpose and many others. Hence the expenditure patterns of the households were carefully examined in order to establish the households ability to pay for transport services.

**FIGURE NO. 3 TOTAL HOUSEHOLDS INCOME**




**Source:- Field Survey, 1994**

It was found from the survey that 47.4% of the household are earning 1,800 Maluti or higher for their monthly income. This is followed by 25.3% of the households who earn 901-1,800 maluti 8.4% Of household earns between 350-500 maluti.

definitely will commute differently from the person practising farming - who only occasionally commute to the city for marketing purposes. The mode of transport used by farmers will differ from the employees.

**TABLE NO.10 SOURCES OF INCOME**

| SOURCE | PERCENTAGE |
|---|---|
| Farming | 3.1 |
| Employment | 64.9 |
| Business | 19.6 |
| Employment/Business | 6.2 |
| Employment/Farming | 3.2 |
| Bus/Employment/Farming | 1.0 |
| Any Other | 1.0 |
| Total | 100 |

**Source:- Field Survey 1994.**

Employment seems to register the highest cases of 64.9%. This shows that most of the people rely on employment as their major source of income. This trend has a very positive relationship with the transportation system as its the only way of commuting to the urban city. Most of employment zone is concentrated in the CBD.

Employment in this case included self-employment and domestic help.

## 4.4 TRIP MAKING CHARACTERISTICS

Trip making under this kind of study is vital, hence it provides the trip generating behaviour undertaken by household member. The result or trend enables us to examine the kind of traffic flow handled by the road transport within the area of study.

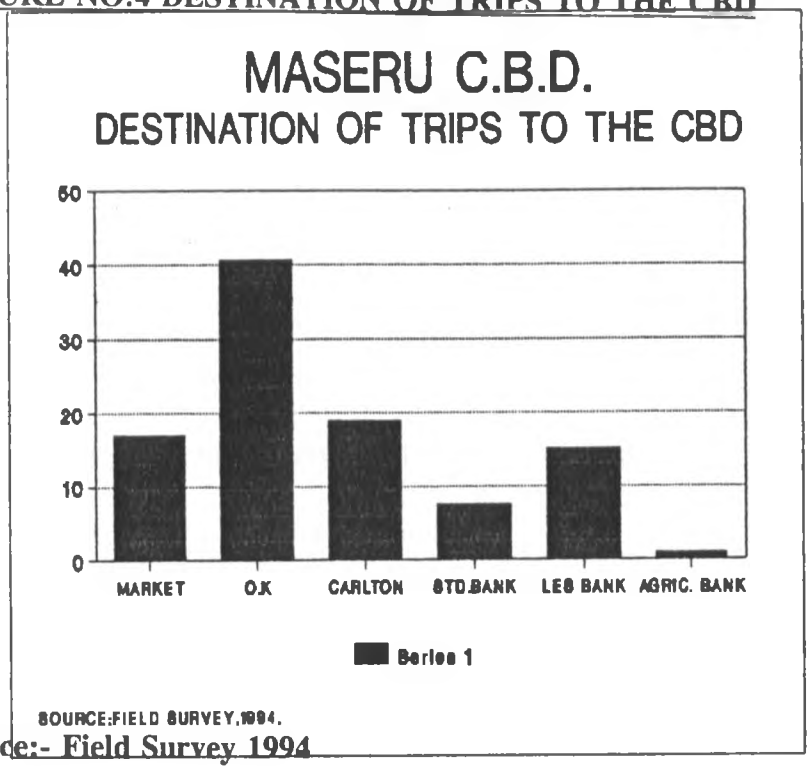
### 4.4.1 Origin and Trip Destination/Distribution

Household and commuter survey revealed that most trips originated from homes. The journey to work started from homes. This had registered the highest score of 43.0%. The importance of this information revealed one of the set objectives of the study that, to examine the nature and structure of traffic (flows) in the CBD, along Kingsway Highway and around bus terminals.

The journey to work is done in almost 5-6 days per week gives the state of traffic flow in the areas in question within the study. The journey to work presents the most serious transport problem such as the conflict between NMT and MT in the CBD.

The journey to work was represented by 42.3% of the cases, the other trips were between residential and journey for shopping which scored 19%, journey to school (12.5%) and work and shopping scored (103%).

**FIGURE NO.4 DESTINATION OF TRIPS TO THE CBD**




**Source:- Field Survey 1994**

As long as Kingsway remains the principal access road to the CBD where employment zones and shopping development concentrated. The journey to work will continue to have a positive significant with problems regarding transport system in the central of the city.

Maseru CBD has and will continue to be the source of poor environmental associate with traffic, such as congestion, pollution etc.

### 4.4.2 Modal Split

Cities cannot exist without transport. People living and working in cities depend upon

transport for their basic mobility. Equally, they use transport to move their goods and services. The city becomes the market place for this system of exchange. Indeed, transport has been seen as an important sector in the economy.

Despite all those above, in the developing countries, where the majority of the people have no cars it would be expected that, we would have adequate pedestrian and cycle-ways provided. Unfortunately, in almost all the towns, although these may be shown on master plans, little is seen on the ground.

From the survey, it was found that there exists two types of transport dominating in travelling . These are public transport such as taxis which being used by 49.5% households, followed by the number of 34.0% respondents who have access to private vehicles. There was a significant number of households about 3.1% who have access to the company vehicles.

Walking from residential to the CBD is not common in Lesotho - Only 2.1% of respondents claimed to walk from residential to the CBD. Walking is common within the CBD, this was noted by a significant majority of the households (85%).

Most households prefer to use taxis than any other public transport. This was noted by the highest score of 45.4% of the cases. But there was also a high number of households 29.9% who felt that the question of preference does not exist in most cases, taxis are the

only alternative to the private vehicles.

Modal choice by individuals therefore involves some consideration of the value of time. It simply controls an individuals ability to be in the right place at the right time to take advantage of the opportunities he wishes to utilize. Equally, if choice of car as opposed to taxi for the journey to work creates a time saving for the individual, all he does is allow him to spend more time in the way that he prefers. The value of time to an individual may even vary according to the length of the journey to work (Wabe, 1966).

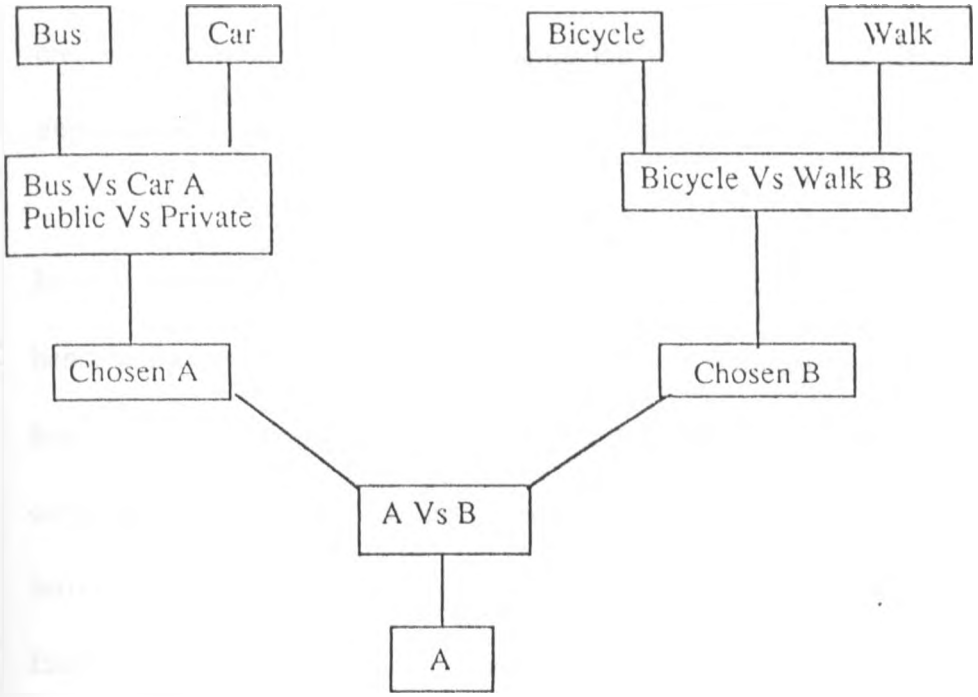
Money cost although its roles should not be overstated, also plays its part in modal choice decisions. It may well be that by choosing to travel to work by bus, but only at the cost of a longer journey time.

In most behaviourial models the choice of mode by an individual or by a group of individuals with similar characteristics of location, economic, status or car ownership is viewed as a problem of binary choice (Warner, 1962; Wilson, 1967; Lisco, 1968; Stopher, 1969).

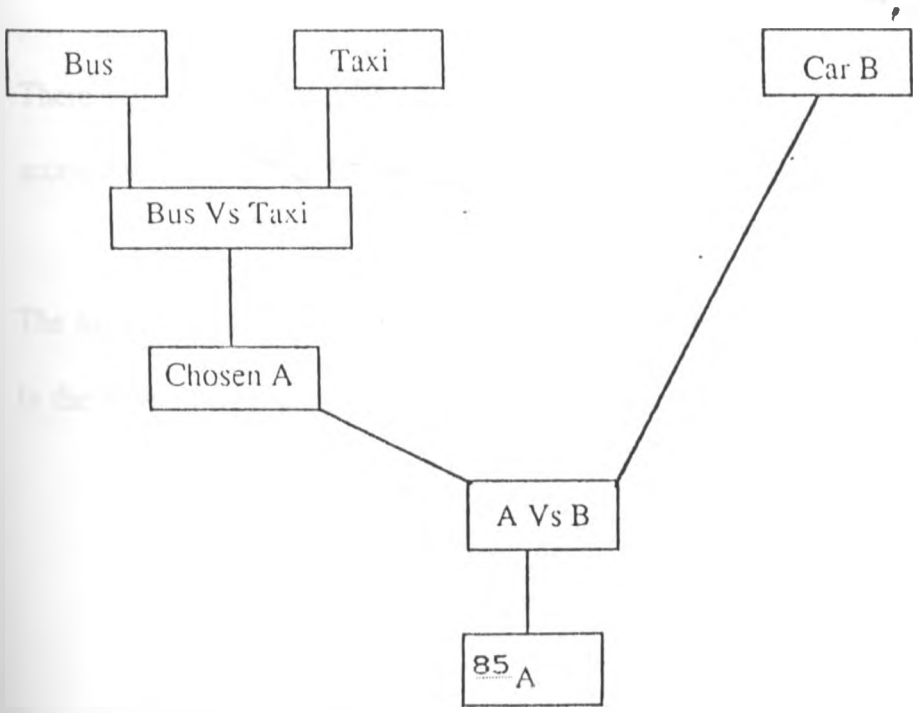
The study therefore has employed the schematic model of binary choice to travel mode within the study area by the households. The results are as follows:-

**FIGURE NO. 5 SCHEMATIC MODEL OF BINARY**

1.




2.



### 4.4.3 Frequency of Travelling

One of the most famous architect Le Corbusur argued that in most cases people would prefer to use the least effort in doing things. They would prefer to work and stay under one roof in order to save time. Hence the frequency of travelling depends on the importancy, the nature of occupation and availability of time.

In most towns, work places are located some miles away from the residential places, hence daily commuting is evident. Maseru's poor planning dates back to the planning history of the country. The emphasize is that Maseru had been growing without a comprehensive transport planning, hence there is no co-ordination between urban activities. There is no proper co-ordination between residential and employment. Employment tends to be a nuclei in the core of the city. Its only accessible by the principal road-Kingsway Highway. This element has resulted into a daily travel by workers which registered the highest score of 77.3%.

There were other people who seems to commute to the city twice or once a week, this accounted for 7.2% and 4.1% respectively.

The high demand of travelling to the city performing different activities show how life in the town is throughout the whole week. But this also call for the planners and

decision makers to take appropriate measures in solving the continuous transportation associates problems, such as ever increasing conflict between NMT and MT.

Below is the table showing the kind of trend the respondents seem to travel to the study area.

**TABLE NO. 11 TRAVELLING FREQUENCY**

| NUMBER | PERCENTAGE |
|---|---|
| Daily | 77.3 |
| Twice a Week | 7.2 |
| Once a Week | 4.1 |
| Thrice a Week | 6.2 |
| Any Others | 5.1 |

The nature and structure of traffic is somehow consistent daily, very depressing and frustrating. This kind of travelling has a negative effect on the traffic circulation system within the CBD.

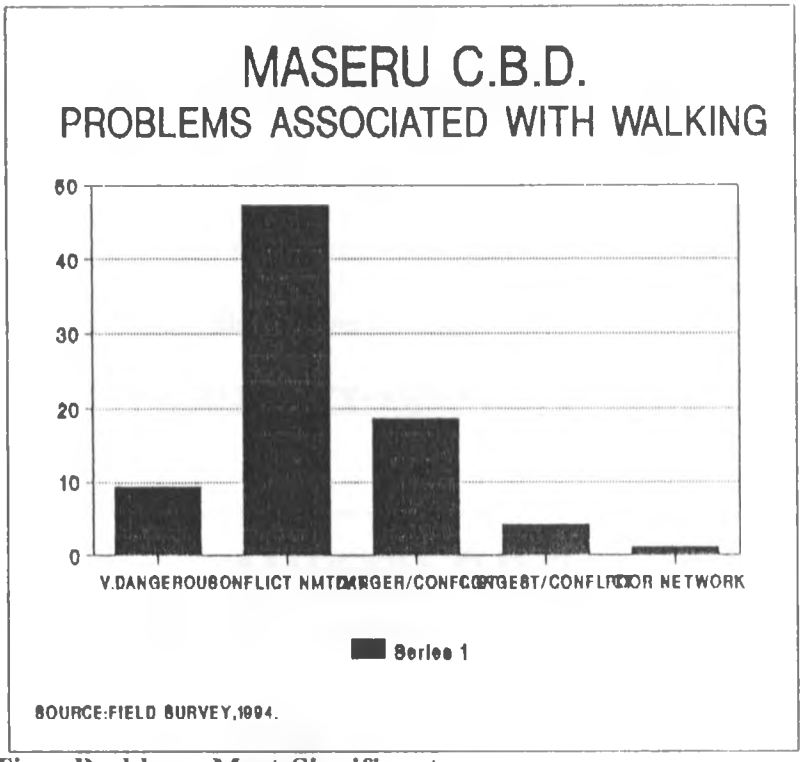
The respondents were asked to give problems they meet in driving and walking in the CBD. The data shows that 84.5% walking respondents felt that there was a really big problem in walking in the CBD while 15.5% saw no problem, they felt to manoeuvre their way without any hassles.

The driving respondents on the other hand felt that there was no big deal in driving in the CBD, those registered 54.8% while those who felt insecure in driving within the CBD were 46.2% of the cases.

This could be traced back to the planning history of the country. This also proofs one of the general hypothesis of the study, that the failure for provision of smooth movement of both NMT and Motorized transportation has been 1 as a result of poor transport planning. This has been proved to be true from the data analysis, 46.2% respondents claimed that, they are not satisfied in driving within the study area, due to the danger and conflict between NMT and Motorized transport. On the other hand, 47.2% pedestrian respondents conveyed their unsatisfactory movement within the CBD, due to the conflict between both NMT and motorized transport. These two high figures proved that there exists a problem of conflict between modes of transport in the CBD.

FIGURE NO. 6: SHOWS THE RESULTS OF RESPONDENTS.

1. PROBLEMS EXPERIENCED IN WALKING




4 .5.1 Time Problems Most Significant

It is now evident that there exists conflict between Non-Motorized transport and motorized transportation, hence it is significant to know when such a problem is most significant. The most important issue to note is that this conflict can result another type of problem which is congestion.

From the previous chapters, we have observed that the traffic entering to the Kingsway from Main North and South 1 through the Circle is unbearable hence Kingsway can not cope with such volume.

The problems experienced become most significant during morning and evening peak hours (28.4%). Morning alone registered the second highest 22.2% while during lunch peak the score 7.4 and evening peak is 14.9%. Other 11.1 of the respondents acknowledged that the problems are more significant over weekends. This trend could be attributed to the migrant traffic from Republic of South-Africa and other contributory from city leisures such as soccer etc. The other 23.5% felt that the problem within the study area is unbearable almost everytime/day.

**FIGURE NO. 7: PROBLEMS EXPERIENCED IN DRIVING**

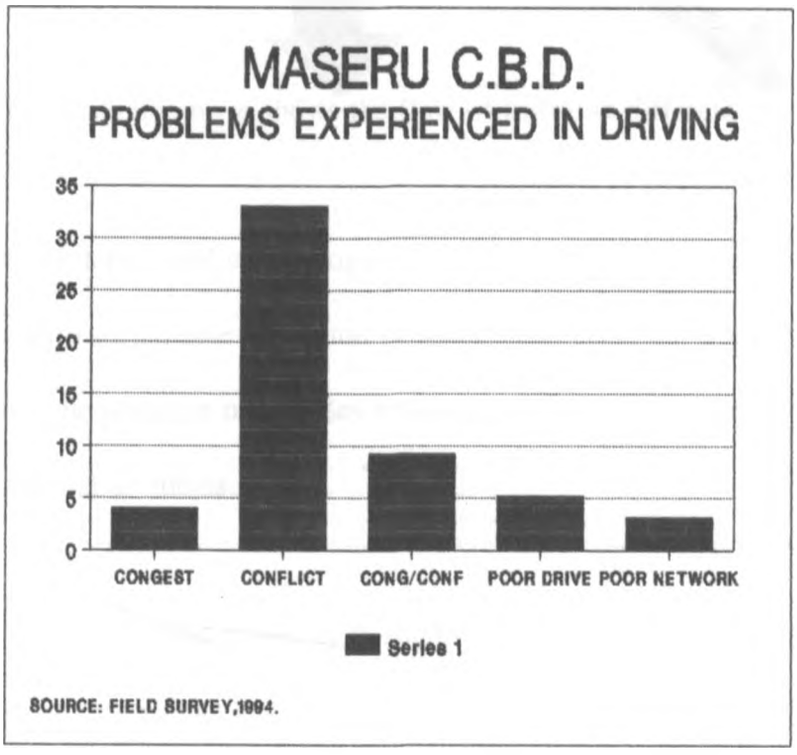
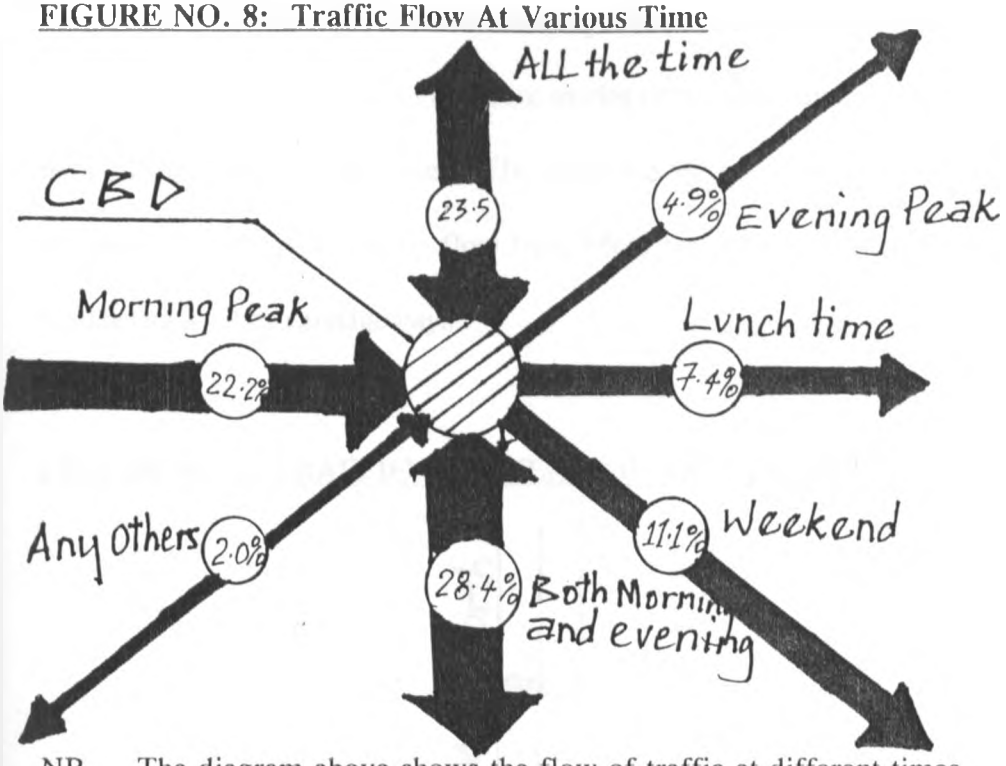


**FIGURE NO. 8: Traffic Flow At Various Time**



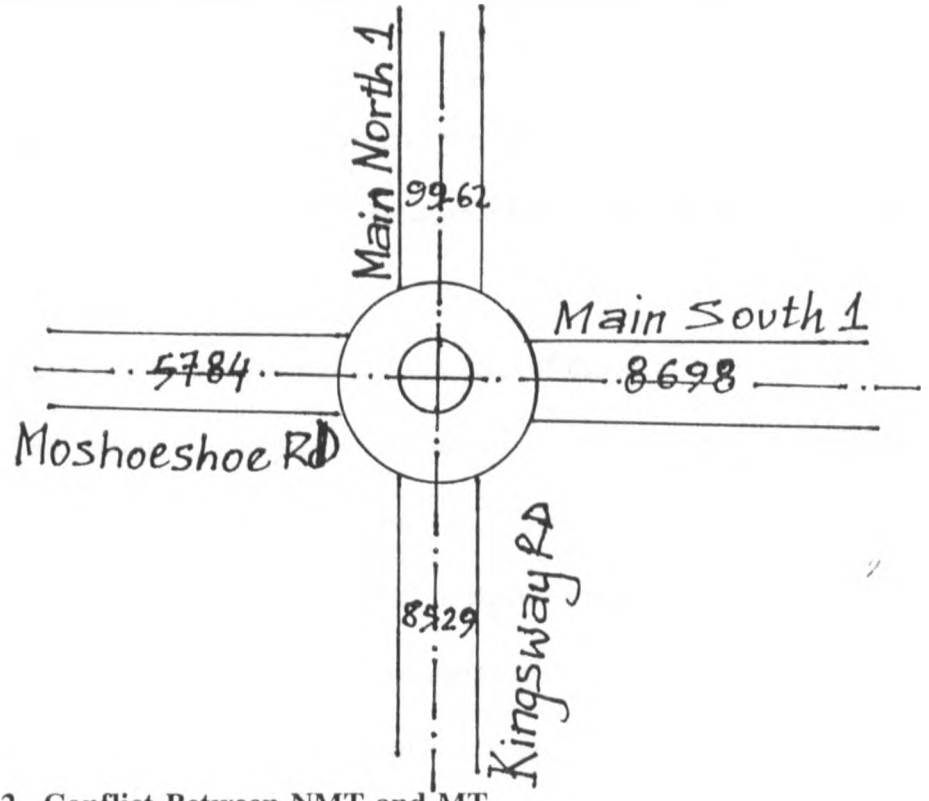

NB. The diagram above shows the flow of traffic at different times.

There is an international call to conserve and preserve environmental resources to ensure the long term sustainable utilization of species and ecosystems and minimizing survival risks. But the presence of vehicles in any part of the city brings about the problems of congestion and accidents.

In this study the rates of modes of transport used by the household members were looked into so as to measure the nature and structure of traffic congestion within the study area. From the results, taxis registered the highest cases of 49.5 percentages followed by private vehicles which scored 34.0% cases, walking became the third with 5.0% cases.

The study revealed that, there exist congestion especially during peak hours, this is attributed by conflict between different modes of transport and also the structure of roads network within the study area. The evidence of such structure exists at the traffic roundabout where both traffic flow from Main North and South 1 enter into Kingsway, which has 4 lanes carriageways.

**FIGURE NO.9: TRAFFIC CIRCULATION FROM CIRCLE**




### 4.5.2 Conflict Between NMT and MT

Regarding the conflict between NMT and Motorized transportation, this is evidenced by the number and type of solutions been suggested by numerous of the respondents.

Segregation of NMT from motorized transport scored the highest cases of 34.8%. While those who felt that, the introduction of pedestrianisation precincts, could be a viable solution registered 22.8%. There were other who felt that, somehow the introduction of one way traffic in other parts of CBD's streets could reduce the conflict, those scored 14.1 percent of the cases. Lastly, other respondents about 6.5% felt that; there is a burning need to provide or introduce additional traffic lights within the intersection of the CBD streets.

All the given solutions seem to have the most significant relationship with the problem encountered that of the conflict between NMT and motorized transport within the CBD.

The suggested solutions seem to have been of the short term than long term. At least, there are taking us somewhere, the approach is more of public participation which is a vital for any sustainable development. The future development of any project depends largely on the ability of the public to organize or involve themselves in the decisions-making process. Some of the respondents felt that there exists a conflict problem within their city, that alone calls for the planners, engineers and many other technical staff and politicians to sit together in order to seek an appropriate solutions.

One of the major objective of the study is to come up with a plan and design traffic circulation system with the aim of minimizing traffic flow problems (i.e Congestion) and integrating NMT and Motorized transportation in the CBD of Maseru. The achievement

of such study depends heavily from the suggested solutions by the public, as they form part and parcel of the study. The aim of the writer is to use her technical expertise to bring up the community plan into reality. She is just facilitating.

The aim of the plan is to address the core issues of the transport system within the CBD and its environs. The plan is to correct what is existing on the ground. Hence, the suggested solutions as they are more of corrective in nature than the cause of the problem.

Its always argued that, the long term solutions should address the real core issues of the system for sustainability.In most cases some people turn to challenge the idea, as such planning alone involves, requires resources and political willingness. All these are rather difficult to achieve at the given time, hence our plans should not be rigid, should always be flexible to accommodate any prevailing situation. So this plan will be future oriented, with the provision of phasing during implementation, hence both short and long term solutions will be provided by the plan.

### 4.5.3 Accidents

Accidents are the highest cause of death in Lesotho with traffic responsible for 77% of all accident fatalities and 14% of all injuries.

The available figures from the police show that in Maseru there have been 1256 accidents in 1992, 1064 accidents in 1993 and 236 accidents the first four months of 1994, 110 persons were killed and 500 injured in 1992.

During the last decade the number of accidents has more than doubled but in the last few years the number has stabilized.

In 1992 Maseru accounted 1,064 road accidents with the total of 1,792 accidents in the country. (Table No.12) shows that the extent of accidents in Maseru as compared with other districts. There is something very significant about the table - the higher the urbanization in the district, the higher the number of accidents recorded. It could then be concluded that there is a significant relation between urbanization and number of accidents.

## TABLE NO.12 ACCIDENTS PER DISTRICT 1992

| DISTRICT | ACCIDENTS | P/KILLED | P/INJURED | A/INJURED | V/DAMAGED | OFFENCE |
|---|---|---|---|---|---|---|
| Butha-Butha | 63 | 15 | 56 | 0 | 57 | 503 |
| Leribe | 194 | 34 | 136 | 10 | 234 | 703 |
| Teya-Teyaneng | 103 | 16 | 77 | 13 | 124 | 173 |
| Maseru | 1064 | 92 | 489 | 15 | 1391 | 3885 |
| Mafeteng | 106 | 25 | 126 | 22 | 127 | 572 |
| Mohaleshoek | 138 | 15 | 115 | 8 | 117 | 356 |
| Quthing | 56 | 10 | 51 | 0 | 52 | 302 |
| Qachasnek | 22 | 6 | 59 | 21 | 21 | 170 |
| Mokhotlong | 24 | 13 | 27 | 1 | 24 | 134 |
| Thaba-Tseka | 22 | 5 | 26 | 0 | 19 | 35 |
| TOTAL | 1792 | 231 | 1162 | 71 | 2166 | 6833 |

**Source: Traffic Police, 1994.**

Maseru had the highest number of accidents in the overall, even traffic offences recorded. Lithabaneng seems to be a danger spot in Maseru District.

Motor vehicles accidents occurring along the Main South 1 Road have for the past years increased alarmingly, especially in the Lithabaneng areas, between Lefikeng and Matala.

Parents in this area live in constant fear for the safety of their children, as motorists past at unbelievable speed. Their fears are not of a neurotic parental nature, but are based on real and recent events.

On the 2nd May, 1991 on the same road a mini-bus carrying children from various schools in Maseru, went off the road, trying to avoid colliding with on-coming traffic, thus overturning and nearly creating mass casualties. The distance between the site of the accident and the spot where the alleged culprit was forced to stop, also indicates that he was also travelling at a high speed.

People have started thinking of this road as the killer highway, and they feel that some measures need to be taken to secure the safety of people living there, and those using this road either as pedestrians or in motor vehicles.

## 4.6 OBSERVATIONS/QUESTIONNAIRES.

A number of observations were made regarding traffic characteristics roads network and provision of facilities along them. The reason behind the thorough observations was done in order to establish the extent of the problem and find its explanation in terms of physical components.

### 4.6.1 Terminals Facilities

Maseru Urban areas is noted by inadequacy of provision of bus terminals. Within the residential areas there are no bus terminals facilities with the exception of Khubetsoana township. Along all the streets in Maseru there are very few bus stop shelters.

### 4.6.1.1. Main Old Bus Terminal

The major old bus terminal is grossly over loaded and it can no longer cope with the existing traffic congestion. Its existence is also under continuous threat of encroachment by commercial development. The space is limited and the unplanned interaction of activities make this problem complex.

The above statements were evidenced by 97.9% who felt that the terminus is too small and hence congested. Only 2.1% of the respondents felt the old main bus terminus is still adequate to serve the existing flow of traffic.

### 4.6.1.2 New Temporary Bus Terminus (Manthabiseng)

Manthabiseng bus terminal is poorly located as its surrounded by three primary schools. Its siting has created several problems. School children are no longer safe due to continuous prevailing traffic congestion. The noise and often smell of exhaust fumes had led to a poor learning environment. Its siting is inconvenient to the travellers.

The study established that 47.2% of the respondents felt that the location of temporary bus terminus reduce the traffic flow in the CBD. While 52.6% of the respondents, mainly pedestrians, on the other hand felt that Manthabiseng is an inappropriate tool to reduce the flow of traffic from the CBD.

The respondents were asked to give the reason why they think the location of the terminus is poor, or it does not reduce traffic. It was established by the study that 67.5% of the respondents felt that Manthabiseng bus terminus - its siting is not convenient for commuters. The other 25.0% felt that its siting is closed to both Main South 1 Road and surrounded by lot of institutions (especially primary schools). Other 5.0%of the respondents believed that Manthabiseng is a best solution as it prevents heavy buses from entering the CBD. Finally, only 2.5% of the respondents felt that Maseru is poorly planned whatever government does to solve a problem is okay with them.

### 4.6.2 Parking Facilities

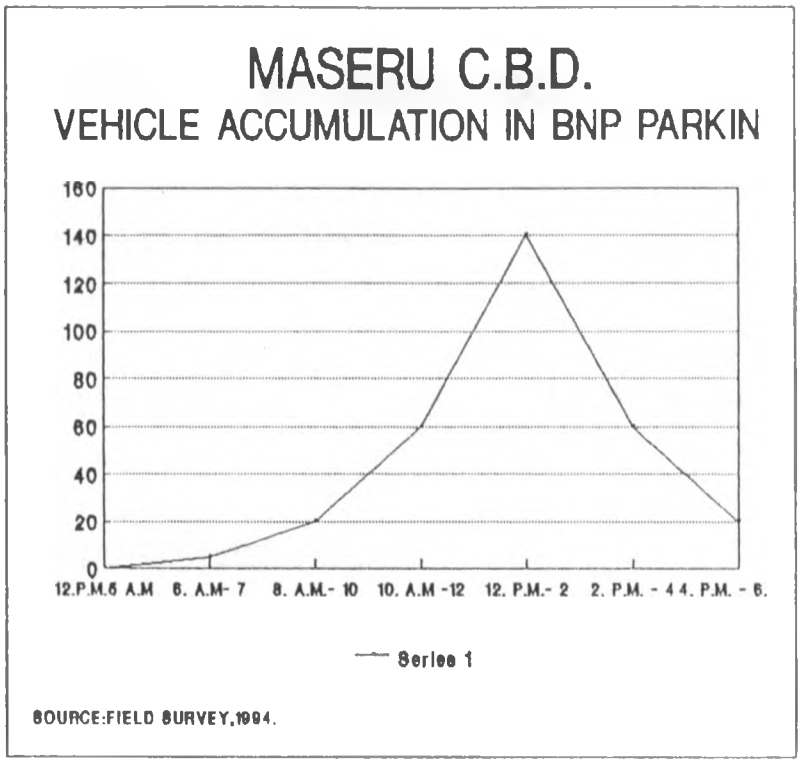
Demand for parking in a given area is strongly influenced by land-use and by competing forms of transportation. Parking problems are likely to develop in areas devoted in commercial or business districts. Hence Maseru is not exception in that type of crises.

As the population of a community increases there is, in general a decrease in the percentage of road users who select the private motor vehicle as the means of movement. In smaller cities like Maseru as many as 80 Percent of the persons entering CBD do so by private auto. However, these absolute numbers of private vehicles demanding parking space generally increase with city size and car ownership, and it is these that generate parking problem.

Use of space in CBD illustrates the use of land for traffic and parking purposes. In the central section or core of Maseru, densely occupied by commercial, government, or other uses which generate large volumes of traffic, demand for parking space exceeds the supply.

Parking Demands:- The study did manage to make a count survey in one of the most central located public parking B.N.P. In this case, the number of vehicles parked in this area at a given instant is one of the measure of parking demand.

**FIGURE 10 VEHICLES ACCUMULATION IN BNP PARKING FACILITY**



# CHAPTER FIVE:

## 5.0 FINDINGS AND RECOMMENDATIONS

## 5.1 SUMMARY OF FINDINGS

This is summary of the main findings as established by the study.

### 5.1.1. Transport Network in General

Evaluation of the transport network in general in the study area revealed that Maseru has been growing without any comprehensive transport plan. For example, there is no provision of the following facilities:-

a) Pedestrianisation precincts;

b) Adequate walking pavements;

c) Network of one way street system on some parts of routes in the CBD to allow smooth flow of traffic.

However, the examination of the transport situation shows that with a proper designed plan for traffic circulation system, the traffic flow problems can be minimized.

The study further shows that Maseru traffic volume has put a visible strain on the town's existing road network. The major traffic flows have been established to occur at the Circle (Roundabout) with the highest concentration along the Main North I Road, in both directions.

### 5.1.2 Kingsway Highway

The findings from the study show that Kingsway Highway is under severe traffic congestion. It was established that despite the fact that kingsway road serves as the principal business and shopping street, it is also the most direct favoured route for traffic travelling to the border post from virtually all areas outside Maseru.

### 5.1.3. Moshoeshoe Road

The study noted that Moshoeshoe Road can play a significant role as a by-pass road in filtering traffic from Kingsway Highway especially traffic which has no business in the central area including the CBD. The road is currently linking the industrial areas with the CBD.

### 5.1.4 Pioneer Road

An investigation of the study noted that Pioneer Road with only two lanes is a very important road linking the Thetsane industrial area with the CBD. The study appreciated that with proper improvements, the road can play a significant role in minimizing traffic congestion in the CBD.

### 5.1.5 Other Roads Within the CBD

Constitution, Airport roads etc are most important roads within the study area. The study acknowledged that some of these roads are currently being used as relief roads for Kingsway Highway. But at the same time, the study noted that their hierarchy has been lowered hence most of them are severely pot-holed.

### 5.1.6 NMT Network

The study established that NMT in Maseru CBD is hardly catered for. In most cases walking pavements are inadequate and very narrow. In some cases, walking pavements are taken over by other activities such as trading. It was also been examined by the study that Kingsway Highway has only one marked pedestrian crossing.

### 5.1.7 Main Bus Terminus

The study established that the bus terminus is grossly overcrowded and is in dire need of upgrading especially if it is to continue as the Main Bus Terminus and inter-change point between regional buses and between buses and taxis. It was also noted that the terminus is under continuous threat by commercial development.

## 5.2 RECOMMENDATIONS

From the above outlined findings of the study, several policy recommendations have been made. These recommendations cover several areas or aspects such as:-

1. Redesign of a traffic circulation system,
2. Vehicular traffic by-pass,
3. NMT traffic,
4. Public Transport Terminals,
5. Parking Facilities and
6. Land Use.

### 5.2.1 Redesign of Traffic Circulation System.

One of the main objectives of the study is to plan and design a traffic circulation system with the aim of minimizing traffic flow problems (i.e. congestions) and integrating NMT and motorized modes in the CBD. Hence (Map No.11) shows the recommended transport network within the study area. The concept behind such a plan is the increase/provision of traffic safety:-

a) by introduction of traffic segregation in parts of the CBD with good links to existing parking areas and introduction of an integrated pedestrian ways system.

b) by introduction of one way systems in parts of the routes in the CBD.

c) by introduction of pedestrianisation precincts in parts of the CBD.

d) by introduction of strictly morning delivery (short-term) bus terminus within the CBD.

e) by the construction of Kingsway's relief road (KRR) - this is seen as vitally important in addressing the current serious traffic congestion on Kingsway.

**MAP NO. 11 SHOWING PROPOSED CIRCULATION PLAN**

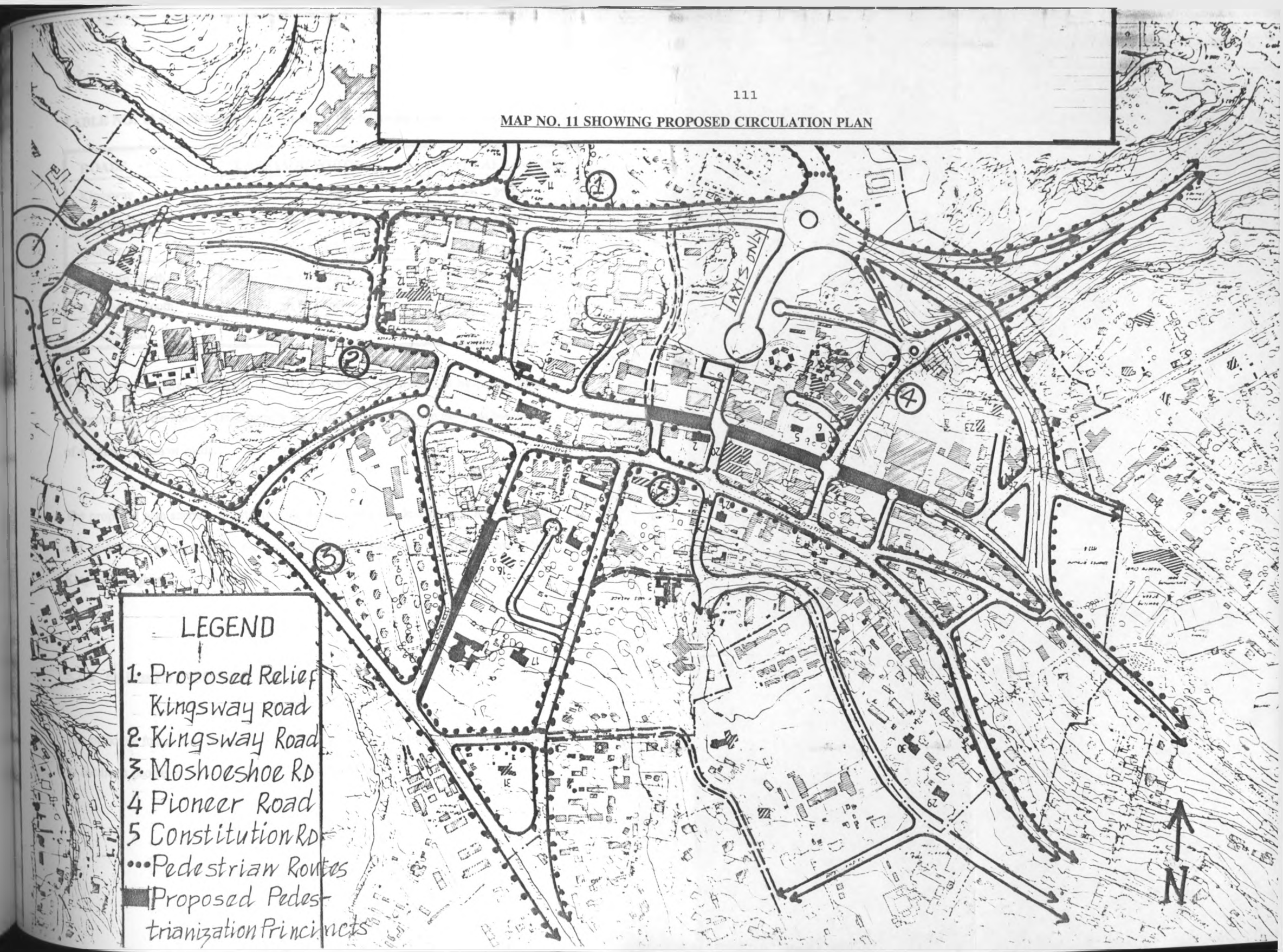


**TABLE NO. 13 Modifications will be done to the following roads network:-**

| ROADS | CARRIAGE WIDTH | OVERALL WIDTH |
|---|---|---|
| Kingsway | 9.0m - 18.5m(4 Lanes) | 19.2m - 31.8m |
| Moshoeshoe | 10.0m - 16.0m (3 Lanes) | 19.6m - 24.7m |
| Pioneer | 7.0m - 10.0m (2 Lanes) | 23.0m - 32.0m |
| A1-Main North | 2 by 7.0m (4 Lanes) | 30m |
| A2 - Main South | 2 by 7.0m (4 Lanes) | 30m |
| Constitution | 2 Lanes | - |

It is important to stress that KRR is one of a series of new roads and by-passes which are proposed in the Maseru Development plan and can not be seen in isolation but as part of a whole system of roads.

The proposed plan attempts to establish the balance between development and vehicular and pedestrian needs through road network which copes with traffic to and from Kingsway Highway.

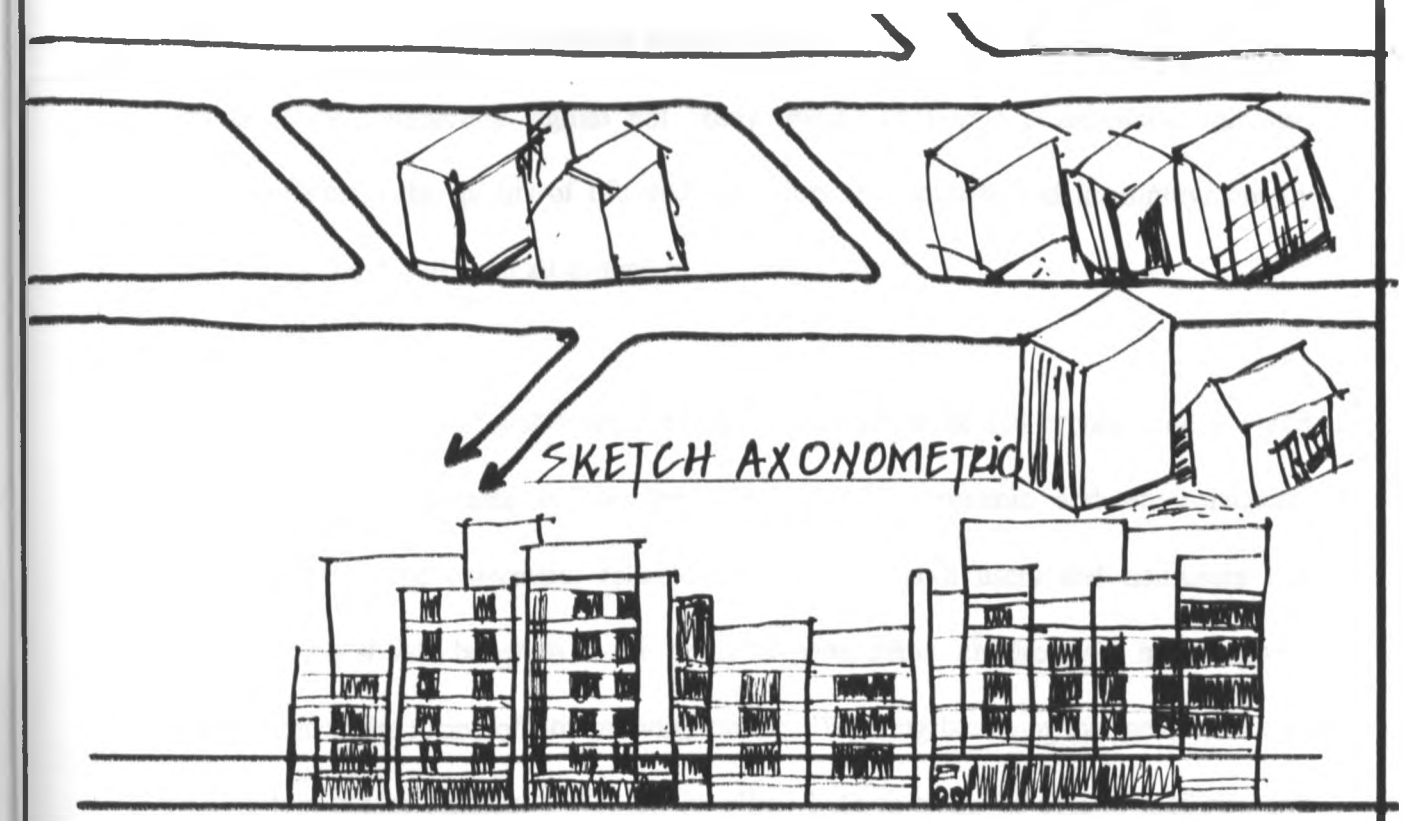
### 5.2.2 By-Pass For Vehicular Traffic

The principle function of planning and political policies in the transport field is basically to facilitate people to get around safely and conveniently.

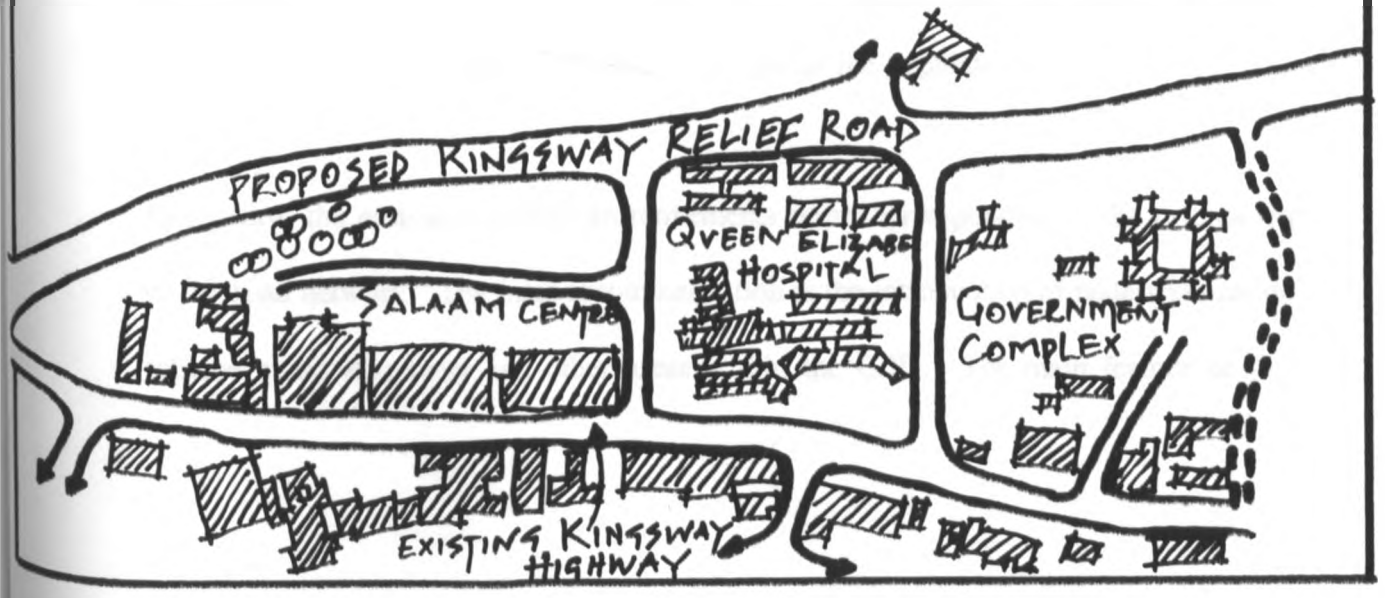
The motorized transport in this respect is a suitable way of getting around and given choice, people prefer to go by vehicle motorized transport.

Hence the fundamental element in the plan is the construction of a by-pass south of Kingsway (Fig No.11 ). If this is achieved then it will make possible for the pedestrianisation of some parts of Kingsway.

**FIGURE NO. 11 CROSS SECTION OF KINGSWAY IN RELATION WITH RELIEF BY-PASS.**




ROAD NETWORK CROSS SECTION



### 5.2.3 Non-Motorized Traffic

The main goal of transportation policy should be to meet the demands of the population for various kinds of travel and transport of goods, to the extent that the costs involved are justified by the benefits received by the community as a whole (Figure 12). The well being of the community implies not only overall economic development but also improvement in the quality of life and reduction of inequities and unemployment by facilitating the mobility of all groups of the population.

The transport system should provide a balanced set of public and private modes which can serve a given area in the prevailing social, economic and environmental circumstances - be convenient reliable and safe for both users and non-users i.e. consideration should be given to the needs of pedestrians, children, the handicapped, cyclists and other forms of slow moving traffic. Walking is one of the most basic and to a certain extent efficient modes of travelling both in terms of cost of facilities and space occupied by footpaths. Bicycles have proved their virtue in many developing countries e.g. China and India. In fact this is the only means of personal transport generally within reach of the low-income groups of the population.

In Maseru, the east-west pedestrian movements occur corresponding to the orientation of the road network. The main recommendation is the introduction of pedestrianization scheme along Kingsway and other areas within the CBD. The main feature of this

system is abolition of vehicular traffic in some parts of kingsway which thus will provide the most important pedestrian artery within the CBD.

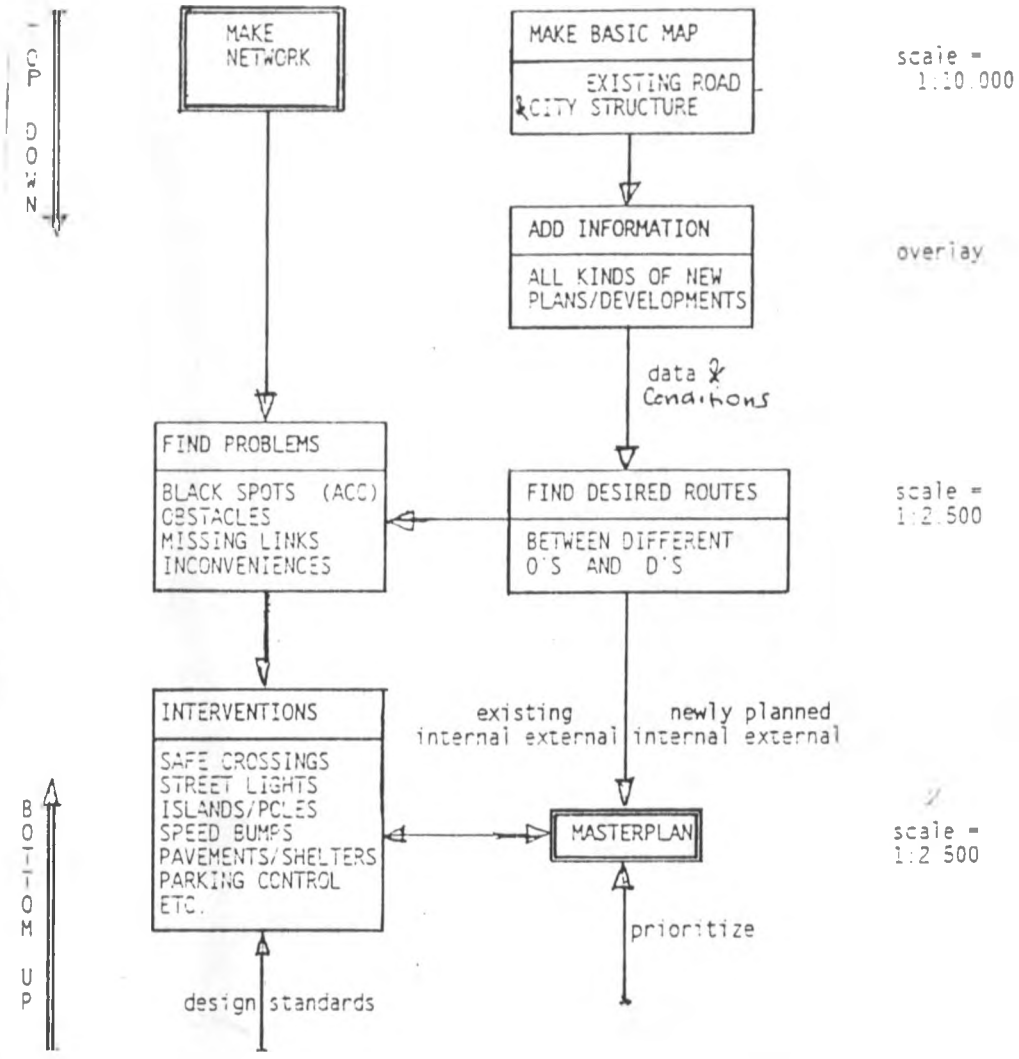
Phasing the construction of KRR gives the opportunity to also pedestrianize Kingsway by steps. Phase one creates pedestrian precincts along LNDC centre from its Western end to Pioneer Road, thus, integrating the pedestrian areas in the future development, north of Kingsway with the existing pedestrian precinct South of it. Phase 2 introduces a new pedestrian area between Pioneer Road and Palace Road about 150-200m long which makes direct contact with Saint Johns Church park providing possibility of extension. Phase 3 incorporate the Lesotho Bank Office Complex.

At the Western end of Kingsway, pedestrian ways join the road system proposed by the 1990 Kingsway Landscaping study by C. Hagmanic Hjorth. At the eastern end of Kingsway, pedestrian movements will join circle system end of Kingsway, where vehicular traffic is not allowed. This pedestrianisation part of Kingsway in connection with the Circle, should be comprehensive re-development of the Cycles Western Area, between Moshoeshoe Road and KRR.

Hence the first and main objective for NMT planning for the CBD in Maseru as a whole is to provide a maximum possible safety to pedestrians and cyclists through a re-structured road network and a consistent integrated pedestrian ways system. Walking is the least protected type of travel in the town. This is supported by number of accidents

and casualties which occur in Maseru, involving pedestrians. Most people move by foot within to and from the study area due to the concentration of the commercial and working places and their interrelations. Thus, the facilitation of pedestrians movements in terms of safety and distance has a central role in the design of traffic and Land-Use in the CBD of Maseru.

**FIGURE 12 NMT PLANNING POLICY**




Source: SSATP Urban NMT studies, report 12, Page 25.

**FIGURE 13: CROSS SECTION OF KINGSWAY ROAD**

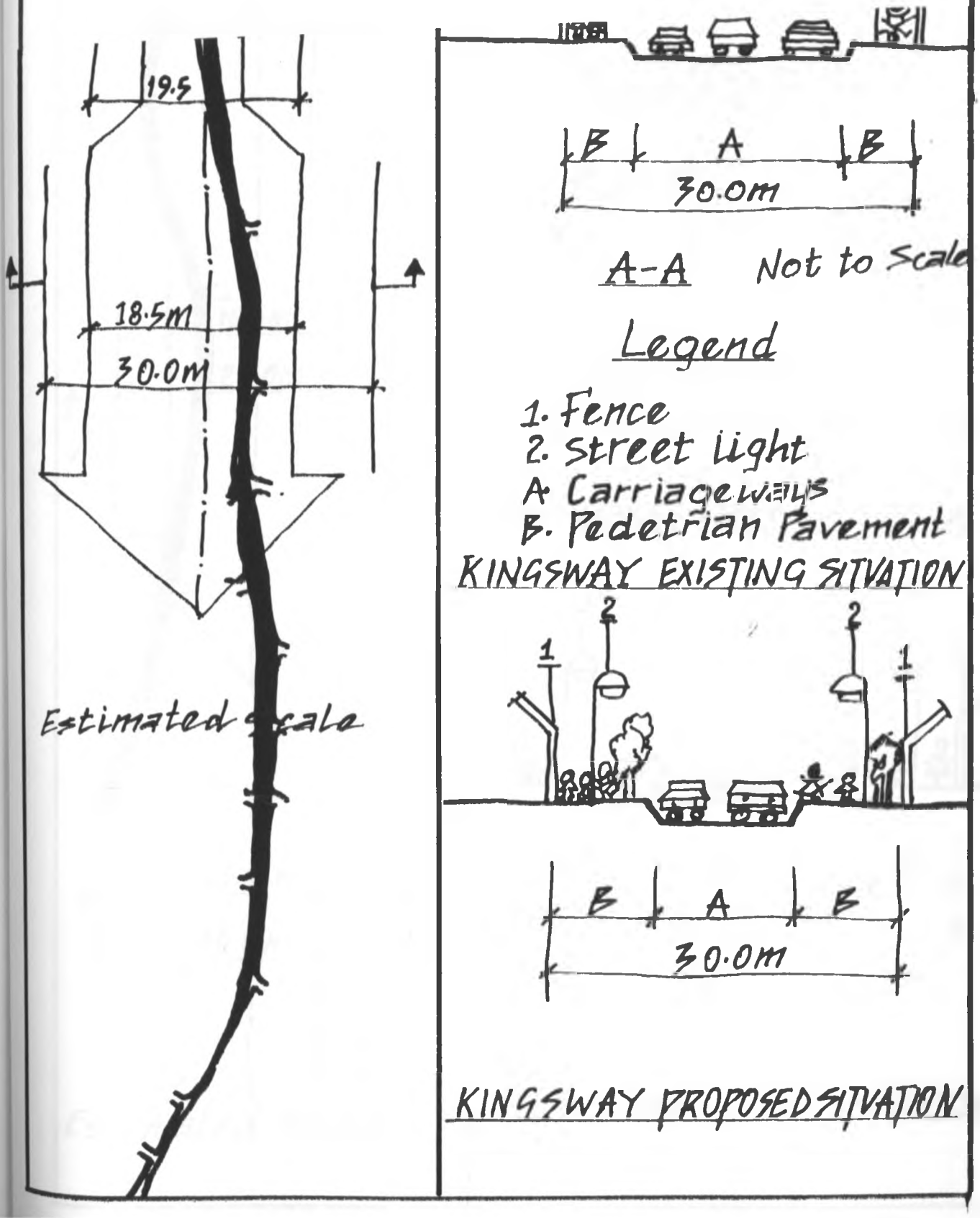
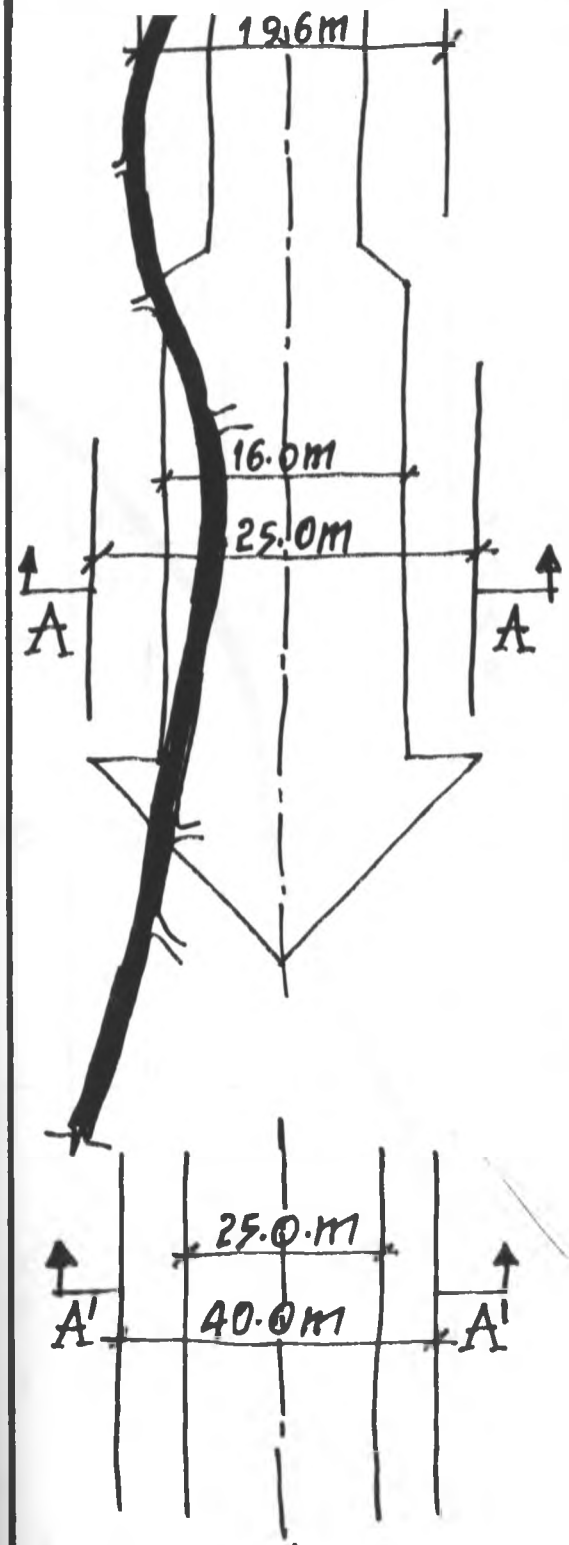
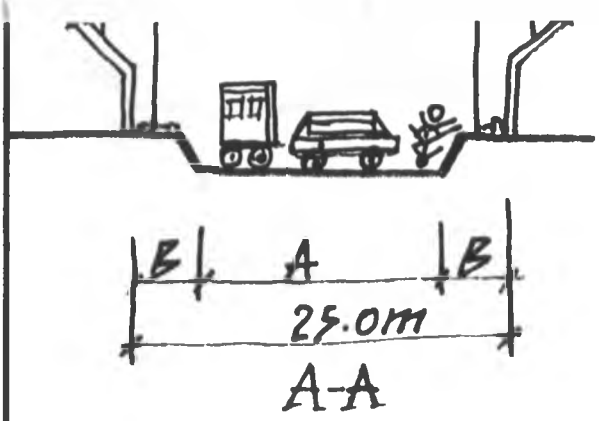


**FIGURE 15: CROSS SECTION OF MOSHOESHOE ROAD**

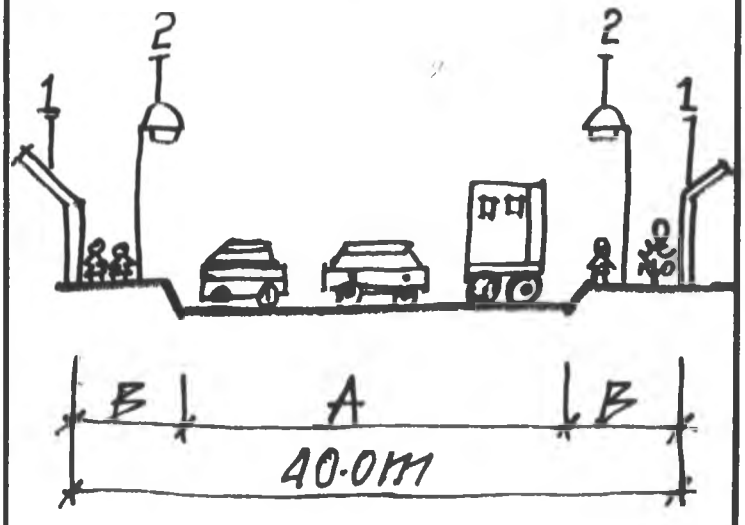



A-A

1. Fence
2. Street Light
A. Carriageways
B. Pedestrian Pavement

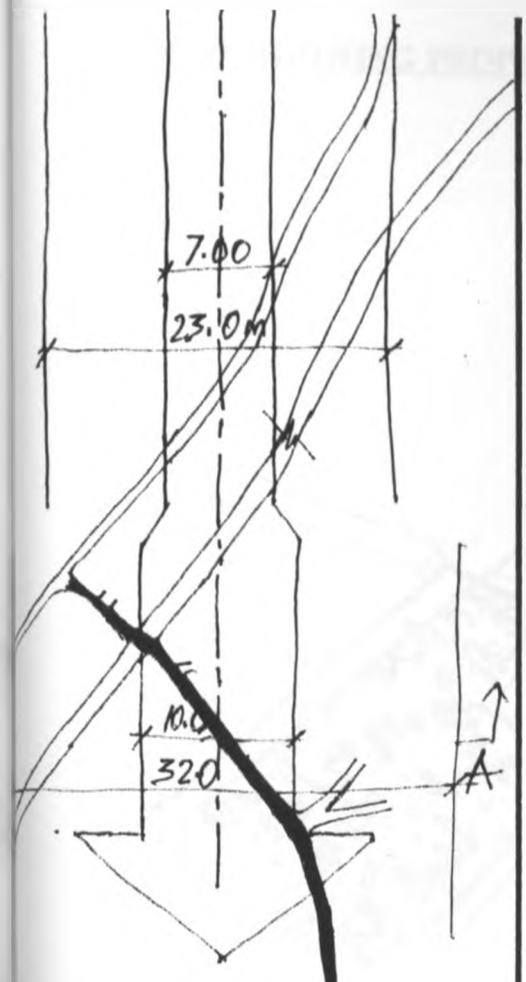
MOSHOESHOE EXISTING SITUATION



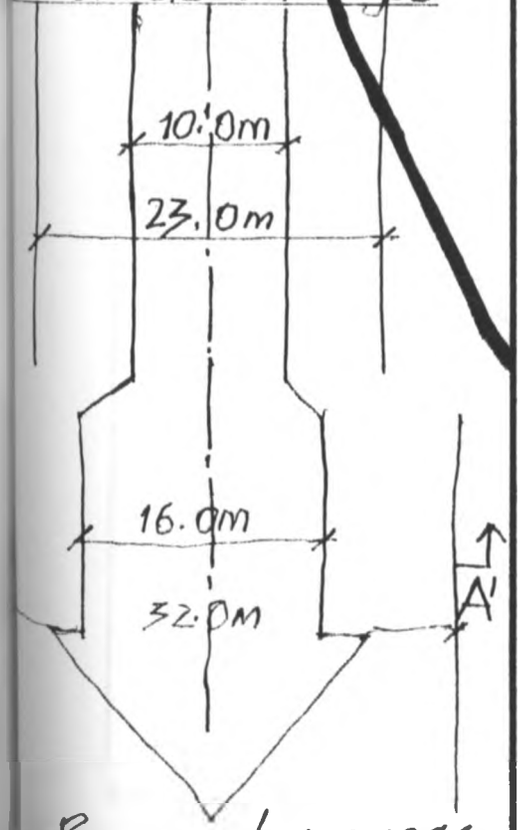

A'-A'

MOSHOESHOE PROPOSED SITUATION

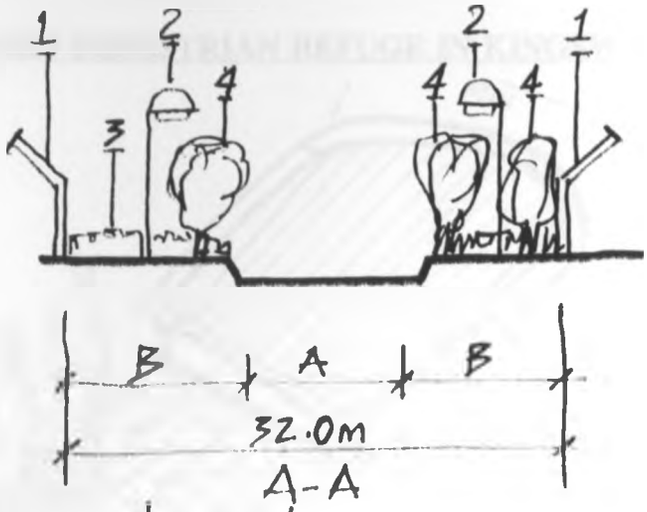
**FIGURE 17: CROSS SECTION OF PIONEER ROAD**




oneer as it ranges



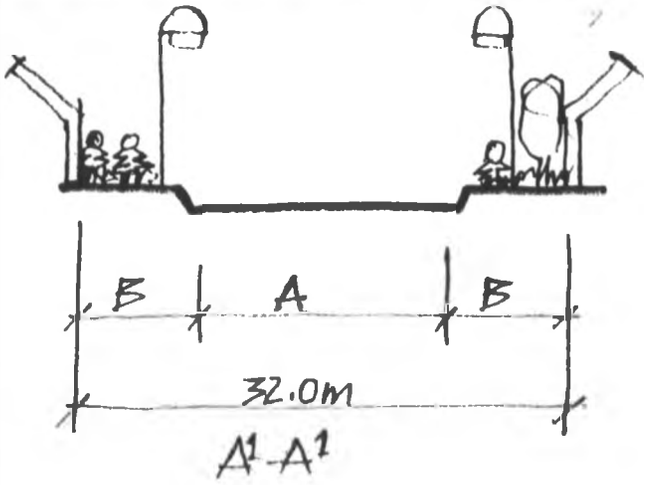

Proposed ranges




Legend

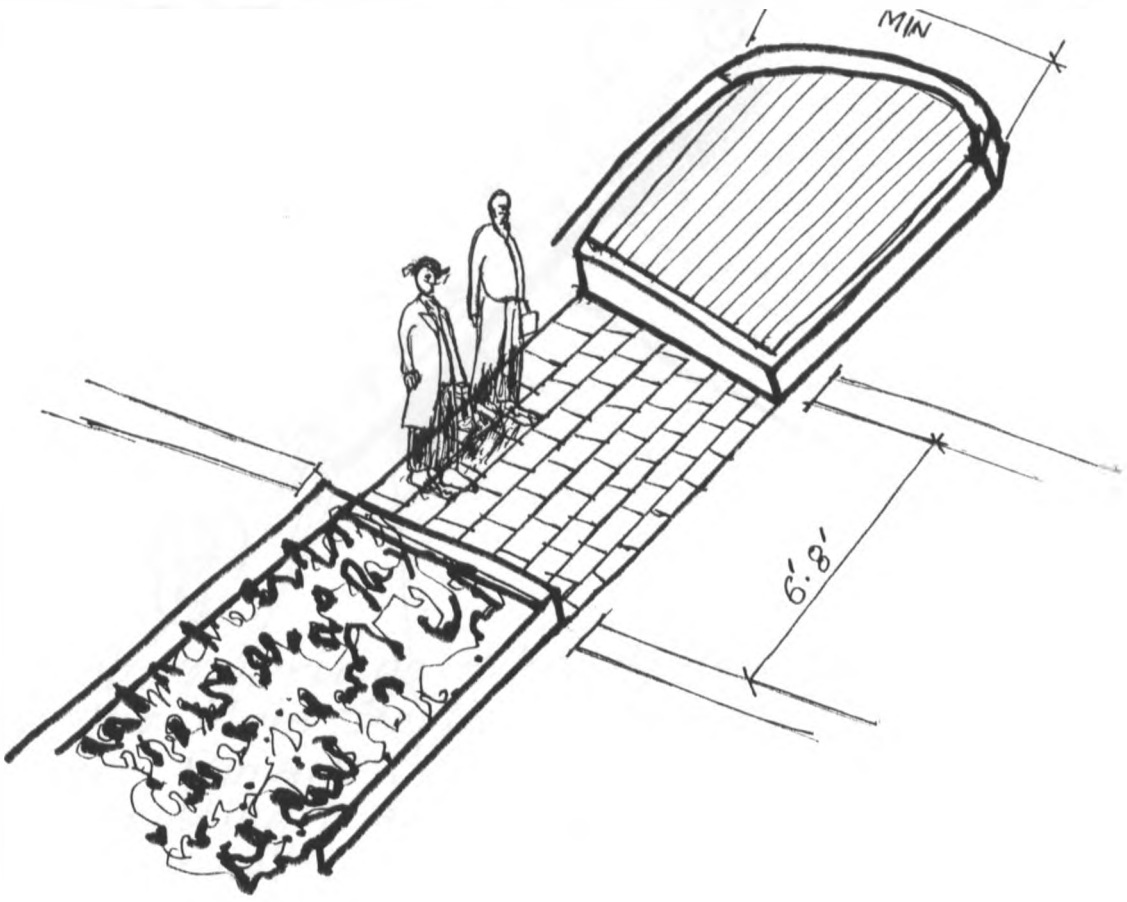
1. FENCE
2. STREET LIGHT
3 BUSHES
4 TREES/FORESTRY
A CARRIAGEWAY
B. UNHABITED AREA FOR NMT

Pioneer Existing Situation




Pioneer Proposed Situation

**FIG 19: SHOWING PROPOSED PEDESTRIAN REFUGE IN KINGSWAY**

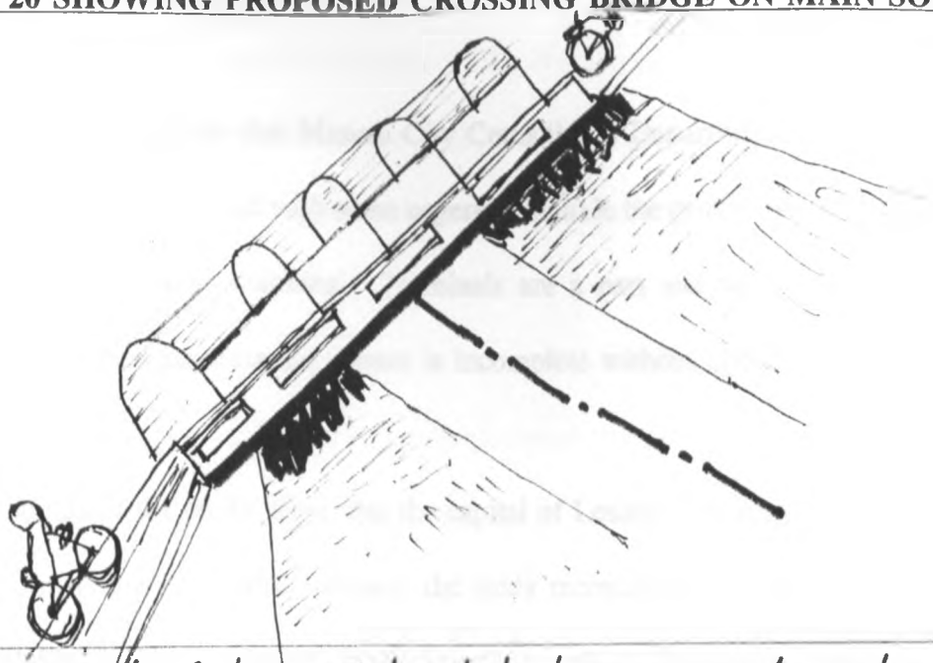



NOT TO SCALE

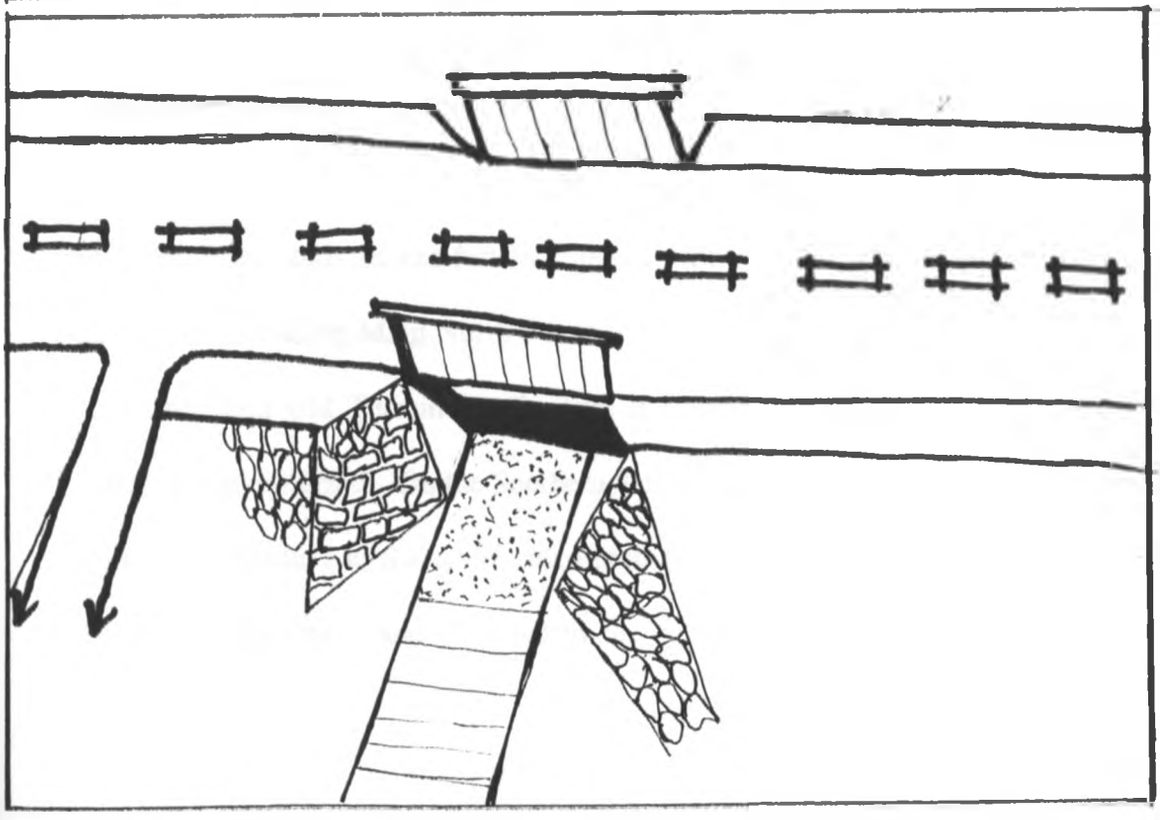
AREA TO COVERED BY REFUGES

The study recommends pedestrian refuge along Kingsway Highway. This should be considered particularly on stretch between Standard Bank Centre to the Main Post-Office. N.B, THIS WILL ONLY BE EFFECTIVE BEFORE THE TAKE-OFF OF PROPOSED PLAN BY STUDY.

**FIGURE 20 SHOWING PROPOSED CROSSING BRIDGE ON MAIN SOUTH 1 ROAD**



The above bridge should be constructed on the Main South 1 Highway near St James Primary School. This should replace the existing traffic lights. There is high concentration of Institutions the Vicinity.



SHOWING THE PROPOSED TUNNEL FOR NMT

### 5.2.4 Public Transport Terminals

The study recommends that Maseru City Council and Department of Lands Survey and Physical Planning, should with some urgency, include the provision of bus terminals into their overall transport planning. Terminals are a part and parcel of Urban transport system. Urban transportation system is incomplete without appropriate terminals.

The findings of the study show that the capital of Lesotho has major problems as far as bus terminals are concerned. Hence, the study recommends the exapnsion of the main old terminus. The extension should cover the entire Pitso Ground which is located adjustant to the bus terminus (Map No.12) shows how the proposed layout for the operational bus stop will look like.

Alternatively, the study recommends that the old bus terminus could be used by local townships taxis only.

In addition the study makes further proposals for new bus terminals. On the northern side of Maseru along Main North 1 to the place known as Ha Foso approximately 5 km from the Main Old Terminus - the land is owned by Ministry of Agriculture. It is currently underutilized. On the Southern Side of Maseru - the terminus is recommended along Main South 1 to the place called Matala. The area is approximately 4 KM from the CBD. The virgin land is owned by the government.

The study recommends that all the buses/taxis and mini taxis from up country should not be allowed to alight passengers in the CBD, but instead should use the two proposed terminals. The Southern Bus terminus will therefore cater for all Southern bus/taxis etc. and same with the Northern bus terminus. All these will be linked to the CBD by the local townships taxis.

This study further recommends some improvement in the central terminals facilities such as Moshoeshoe Statue Park serving as morning delivery terminus for local taxis - the provision of such operation is provided by the new proposed Kingsway Relief Road.

As regards the South-African taxis's terminus, the study recommends that there is need to revisit the past agreements signed by two governments in order to review some of the custom's regulations. The negotiations should include the agreement on certain issues regarding a smooth flow of traffic between the two countries. For example, the Lesotho Taxis should be allowed to alight the passengers across the border of S.A. since there is adequate bus terminus.

### 5.2.5. Public Parking Facilities

There is no doubt, Maseru CBD faces an acute shortage of parking facilities. This had been attributed to the failure of any comprehensive transport plan for the city.

However the new developments of commercial facilities provide their own on-site parking following planning standards as stipulated by Physical Planning Division:-

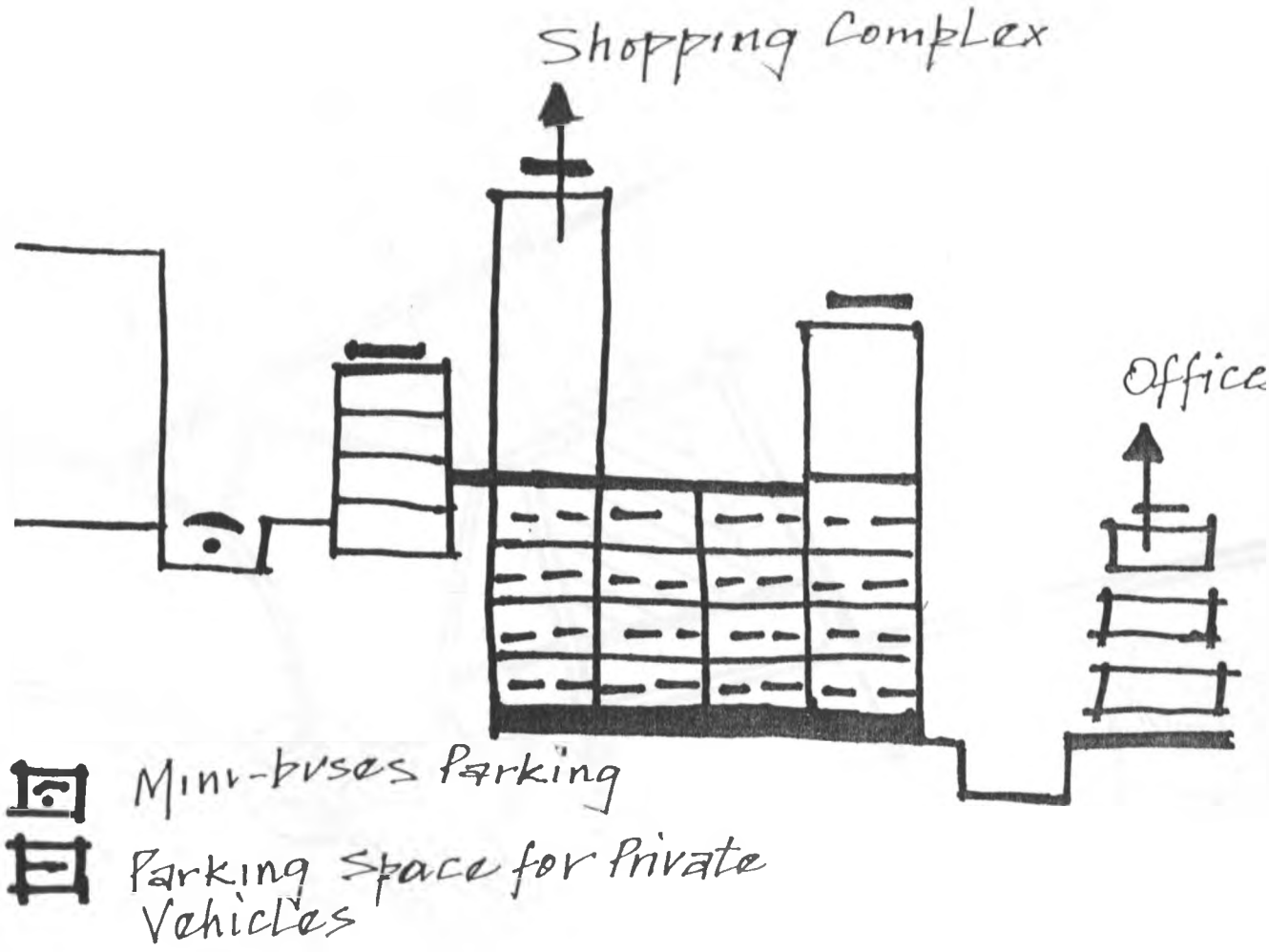
(1) New office developments, 1 parking bay per 100 $M_2$ gross total floor area.

(2) Flats within the CBD, 1 parking bay per flat.

Additional to this, this study caters for public parking space as a complement to the above provisions to compensate the deficit resulting from the application of planning standards to existing facilities within the CBD.

Besides street parking this study recommends major parking lots within the study area. The proposed area is presently consists of offices of temporary structures by Ministry of Labour and Employment. The redevelopment of the area by the local authority is vital. The three-storey facility will adapt to the slightly slopping terrain and with its location being central to almost everything such as banks, National Library, Museum and also British Council Library.

**FIGURE NO.21: SHOWING PROPOSED PUBLIC PARKING AT LABOUR AND EMPLOYMMENT AREA:**




This type of recommendation is in line with the government policy strategy to mobilize some revenue generation for the Maseru City Council.


## LEGEND

Pedestrianizatio
Princincts

Proposed Parkin

Proposed Plots
to be developed a
termin us renting
warehouses and
terminus Office bl

NOTE: The major
Proposal is on
Way System

### 5.2.6 Land - Use

Transport is one of the major land-use in urban area. In a well balanced town, transport infrastructure takes between 25-35% of the urban land.

Transport is the circulation system of the urban space. It connects the land-uses. It connects other parts of the urban areas to one another. Transport provide accessibility while accessibility is one of the most important determinants of locations of sites and resources. Hence, the central business district being one of the most important parts in urban areas should be well serviced by transport infrastructure.

Based on the above transport planning principles for future harmonious transport and land-use development, the study therefore recommends the following:-

(1) Any redevelopments bounding on constitution Road have to keep at least 10 metres distance from the carriage ways centre line to plot.

(2) The areas north of Constitution Road should maintain their existing land-uses, but the height for buildings will be limited to two stories - development regulations will be those stipulated in MDP and Physical Planning Department's Development Control Code.

(3) Along Kingsway on the South of it - earmarked land uses should remain as at present; buildings heights with the exception of Lancer's Inn where redevelopment is possible. Height of new buildings should be limited to a maximum of 10 metres. No high rise building should be permitted within 100 metres of St. John's Church.

The main concern of the study is the principle of "*feet-first*" "*Feet First*" implies that walking should be the number one transportation priority in Maseru CBD followed by bicycles and public transit. The private car should be the mode of last choice.

There are plenty of ways to liberate the streets for, by implementing "traffic calming," as is done in numerous European cities. This study on the other hand after achieving its goal on proposing KRR, second stage is to modify existing streets to give all users adequate space (Section 5.2.1.).

## 5.3 FURTHER RESEARCH

Due to previous mentioned limitation the study only concentrated on a small section of the CBD in Maseru. Hence, there are various aspects, which the study did not examine adequately. As such further research is needed in the following areas:-

(1) The problem of movement by handicapped in relation to their accessibility in most offices in the CBD of Maseru.

(2) The number and nature of accidents and black spots in the urban area of Maseru, This type of information will enable the planners to come up with alternative proposals which could reduce the accidents or provide maximum functional operations of NMT and MT in Maseru, and

(3) The problems of vendors which hinder the smooth flow of traffic in the CBD of Maseru.

## 5.4 CONCLUSIONS

The main objective of the study was to plan and design a traffic circulation system with the aim of minimizing traffic flow problems (i.e. congestion), and integrating NMT and motorized modes in the CBD. In most cases, the study has used more of descriptive method which concentrated on exposing the areas of the problems in order to come to viable and implementation solutions.

In many developing countries, transportation planning is carried out using methodologies which emerged in developed countries. Such applications have serious limitations, because conditions in developing countries are different, particularly with respect to financial and human resources, the level of motorization and political - context of the decision making process. Many comprehensive land-use transportation studies were undertaken for large metropolitan areas, but few, if any of them have considered the poor

sections of population for specific analysis. The studies tend to address "the needs of the upper 50% of the population in income terms and in many cases the top 25%." This is evidenced by the high level of conflict between NMT and MT in those countries in question.

This study revealed that Maseru - the capital of Lesotho has the population of 350,000 with the urban growth rate of 7%. Of which only small proportion of population owns their own vehicles - this shows that walking is predominant mode of transport for all purposes of trips. Its also noted that Maseru registered the highest number of accidents as compared with other districts, and unfortunately most victims are pedestrians and animals.

The planning for functional operations of NMT and MT should be given a priority. The study notes that the conflict between such modes continue to reach unproportional levels in the CBD of Maseru.

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## UNPUBLISHED THESES


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41. ----------,(1994); National Transport Study in Lesotho, Prepared by Consulting Engineers- Maseru.

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QUESTIONNAIRE FOR COMMUTERS

1. Questionnaire number.....
2. Date.....
3. Respondents Names.....
4. Age.....
5. Place of Residence.....
6. Place of work/Destination.....
7. Do you travel to the City Centre daily?
   (1) Yes
   (2) No
8. What are your reasons for travelling?
   (1) Working
   (2) Shopping
   (3) Schooling
   (4) Going to or coming from S.A./Transit
   (5) Any Other (Specify)
9. What mode of transport do you use?
   (1) Public Transport
       (a) Bus
       (b) Taxis
   (2) Private Vehicle
       (a) Driver
       (b) Passenger
   (3) Cycling
   (4) Walking
   (5) Other (Specify)
10. What are your reasons for the choice of this mode?
   (1) It is Convinient
   (2) It is only one available
   (3) Other (Specify)
11. At what place do your trips end in the CDB
   (1) Market Centre
   (2) U.K. Centre
   (3) Carlton Centre
       Other (Specify)
12. Grade the following problems in order of how they affect you most?
   (a) Long Walking/travelling distance from CBD bus/terminals to your final destination.
   (b) Long waiting hours at the CBD Bus Terminals
   (c) Heavy traffic jams at peak hours
   (d) Crowding in the Bus Terminals and CBD
   (e) Risky to mix/cross with motorized traffic
   (f) Pollution due to fumes and noise
   (g) Other (Specify).
13. Do you consider the present main bus terminals in the CBD a hindrance to traffic flow?
   (1) Yes
   (2) No
   (3) Explain

14. Do you consider the location if the temporaty, bus terminals convinient in terms of reducing traffic in the CBD?
    (1) Yes
    (2) No
    Explain
15. Of the following reasons, which one do you think makes commuters to cross anywhere on the Kingsway Highway or Broad/Alight drop in places other than bus stops (thick as applicable).
    (a) Bus stops are not placed in ideal places in relation destinations.
    (b) There are no signs facilitating the movement of pedestrians in the Kingsway Road.
    (c) The slow moving traffic in the Kingsway Highway makes it convinient to drop and walk, to avoid being late.
    (d) Other (Specify)

16. Suggestions/Proposals to alleviate some of the stated notices problems
    (1) Introduce traffic lights
    (2) Segregate the NMT from motorized transportation
    (3) Introduce pedestrianization precints
    (4) Any Other (Specify)

## INTERVIEW SCHEDULE

**THE PROVISION OF NEW TERMINAL FACILITIES (For Municipal Officials)**

1. What creteria used in allocation of this new bus terminals.
   .....
2. What was the creteria used in the location of main bus terminal in the CBD.
   .....
3. How do the two terminal link to each other?
   .....
4. What was the creteria used in the location of these many small in co-ordinated bus stops points?
   .....
5. How do they link to each and relate to the two bus terminals
   .....

6. How does the CBD link with the bus terminals with special reference to non-motorized transportation
   .....

7. Can you justify why the intra-urban transportation can be separated from the regional transportation
   Explain.....

8. Why do you think passengers like crossing everwhere in the Kingsway Highway.

9. A number of studies has been done on transportation circulation within the City e.g. Maseru CBD by LSPP and unpublished Thesis by Mrs. Makhetha 1988.
"Maseru Development plan" by LSPP which recommended out by-pass a relief recommended out a by-pass as a relief road for Kingsway and provide a new bus terminals.
What are some of the bottlenecks that has hindered the implementation of such proposals?

## TRAFFIC MOVING TIME SURVEYS

Time of Survey ------- to -------
Date.....
Survey taken between ..... and .....bus stops
Type of Vehicle.....
Arrival time.....
Time Spent at each bus stop
---
---
---
---
Time spent at traffic lights
---
---
---
---

Time of arrival at control point observation of other intervening factors

## HOUSEHOLD SURVEY

Road transport problems in the CBD and bus terminals with special reference to the conflict between the motorized and pedestrians:-
Area----------
Date----------
Time----------
Name of Respondents----------

1. How many people live in this household?----------

2. Please fill the table below indicating the infromation of the other members of the household you live with.

| | SEX | AGE | MARITAL STATUS | OCCUPATION | PLACE OF WORK |
|---|---|---|---|---|---|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |

3. What is the level of the total income of the household per month in Maluti
   (a) 350-500
   (b) 501-750
   (c) 751-900
   (d) 901-1,800
   (e) 1,800 +

4. What are sources of Income?
   (a) Employment
   (b) Business
   (c) Farming
   (d) Other (Specify)

5. Which modes do household members use to go to the City Centre? (Tick as applicable)
1. Public transport
   (a) Buses
   (b) Taxis
2. Company Vehicles
3. Cycling
4. Walking
5. Private Cars
   (a) Passenger
   (b) Driver
   (c) Other (Specify)

6. What is the trip purpose?
   1. Journey to Work
   2. Journey to School
   3. Shopping
   4. Others (Specify)

7. What is the mode used?
   1. It is convineint
   2. it is the only one available
   3. It is cheap/saves money
   4. It saves time
   5. It is healthy
   6. Other (Specify)

8. On average how long does it take one to wait at the bus terminal before a vehicle comes?
   1. During weekends
   2. Public Holidays
   3. During Crash Hours

9. How often do you travel to the town centre?
   1. Daily
   2. Twice a Week
   3. Once a Week
   4. Other (Specify)

10. Do you encounter any problem when moving/travelling within the city?
   1. Yes
   2. No.

11. If Yes, what problems
   1. Risky to mix, cross with morotized traffic
   2. Pollution due to fumes and noise
   3. Heavy traffic jam at peak hours
   4. Crowding at the CBD bus terminus
   5. Others (Specify)

12. When these problems most significant
   1. Morning Peak
   2. Evening Peak
   3. Lunch Time
   4. Weekend
   5. Others (Specify)

13. Why are they significant at this time
   1. People going to their places of work
   2. People going back home from work
   3. People going out for lunch
   4. People Shopping
   5. Any Others

   What other modes do household members use?
   1. Public transport
   2. Company Vehicle
   3. Cycling
   4. Walking
   5. Other (Specify)

14. Do you think the problems can be solved
   1. Yes
   2. No

15. If yes, what is your suggestion to the solution
    1. Introduce one way traffic lanes
    2. Segregate the NMT from motorized transport
    3. Any Other (Specify)

16. Are you satisfied in making along the streets in the town
    1. Yes
    2. No

    If No, why are you not satisfied?
    1. Very dangerous
    2. Lot of conflict between NMT and Motorized transport
    3. Congested hence unsafety
    4. Any Other (Specify)

17. Are you satisfied in driving in the town?
    1. Yes
    2. No

    If No, why are you not satisfied?
    1. Very congested hence waste of fuel
    2. Very dangerous, conflict between NMT and motorized transport
    3. Any Other (Specify).

18. What improvements would you like to see with regard to movement of both vehicles and people in this town?
    1. Pedestrian should be segregated from motorized transport
    2. Introduce traffic lights in the junctions
    3. Introduce one way traffic in other parts of the CBD routes
    4. Introduce pedestrianization preceints
    5. Any other (Specify)