

**AN INVESTIGATION OF COMMUTER SATISFACTION IN THE USE OF  
MUTHURWA TERMINUS, NAIROBI, KENYA.**

**BY**

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## DECLARATION

This research project is my original work and has not been presented to any other college or university for any academic credentials or any other award.

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## **DEDICATION**

I dedicate this project to David for his love, support and encouragement and to our daughters, Grace and Miriam, for their inspiration and support.

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All errors in this project are mine.

## **TABLE OF CONTENTS**

|                                  |      |
|----------------------------------|------|
| Declaration .....                | ii   |
| Dedication .....                 | iii  |
| Acknowledgements.....            | iv   |
| Table of Contents .....          | v    |
| List of Tables.....              | viii |
| List of Figures.....             | ix   |
| Abbreviations and Acronyms ..... | x    |
| Abstract.....                    | xi   |

## **CHAPTER ONE**

### **INTRODUCTION**

|  |    |
|--|----|
| 1.1 Background to the study .....          | 1  |
| 1.2 Statement of the research problem..... | 3  |
| 1.3 Research Questions.....                | 5  |
| 1.4 Research Objectives .....              | 6  |
| 1.5 Assumptions of the Study.....          | 6  |
| 1.6 Justification of the Study .....       | 6  |
| 1.7 Scope and Study Limitations .....      | 8  |
| 1.8 Definition of Operational Terms.....   | 10 |

## **CHAPTER TWO**

### **LITERATURE REVIEW**

|   |    |
|---|----|
| 2.1 Introduction.....                       | 12 |
| 2.2 Transport Policies .....                | 12 |
| 2.3 Overview of Urban Public Transport..... | 14 |
| 2.4 Urban Public Transport Globally.....    | 15 |
| 2.4.1 London-United Kingdom.....            | 15 |

|   |    |
|---|----|
| 2.4.2 Port of Singapore-Asia.....                     | 16 |
| 2.4.3 Bay Area in California-USA.....                 | 16 |
| 2.5 Africa’s Urban Transport.....                     | 17 |
| 2.6 Nairobi, Kenya.....                               | 18 |
| 2.7 Modal Split, Current and Future Projections ..... | 19 |
| 2.8 Vehicle Flow.....                                 | 20 |
| 2.9 Matatu Public Transport .....                     | 21 |
| 2.10 Nairobi Urban Transport Studies .....            | 22 |
| 2.11 Theoretical and Conceptual Framework.....        | 23 |
| 2.12 Gaps Identified.....                             | 28 |

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

|  |    |
|--|----|
| 3.1 Introduction.....                    | 29 |
| 3.2 Study Site .....                     | 29 |
| 3.3 Research Design.....                 | 33 |
| 3.4 Target Population.....               | 34 |
| 3.5 Sampling Procedure .....             | 34 |
| 3.6 Data Collection Procedures.....      | 35 |
| 3.6.1 Questionnaires.....                | 36 |
| 3.6.2 Pre-Testing of Questionnaires..... | 37 |
| 3.6.3 Interviews.....                    | 37 |
| 3.7 Data Analysis and Presentation.....  | 38 |
| 3.8 Ethical Considerations .....         | 39 |

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

|  |    |
|--|----|
| 4.0 Introduction.....                  | 40 |
| 4.1 Gender and Age of Respondents..... | 40 |

|       |   |    |
|-------|---|----|
| 4.2   | Origins and Destinations.....                       | 41 |
| 4.3   | Travel Means Commuter use from Muthurwa to CBD..... | 43 |
| 4.4   | Frequency of use of Muthurwa Terminus.....          | 43 |
| 4.5   | Commuter Satisfaction.....                          | 44 |
| 4.5.1 | Satisfaction Versus Gender and Age factor.....      | 45 |
| 4.5.2 | Satisfaction against Commuter Destination.....      | 45 |
| 4.6   | Preferred Location of a Terminus.....               | 47 |

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

|       |                                    |    |
|-------|------------------------------------|----|
| 5.1   | Introduction.....                  | 50 |
| 5.2   | Summary of Research Findings.....  | 50 |
| 5.3   | Conclusions.....                   | 51 |
| 5.4   | Recommendations.....               | 51 |
| 5.4.1 | Policy Makers Recommendations..... | 51 |
| 5.4.2 | Planners Recommendations.....      | 52 |
| 5.4.3 | Scholars Recommendations.....      | 52 |

|  |                   |    |
|--|-------------------|----|
|  | BIBLIOGRAPHY..... | 53 |
|--|-------------------|----|

## **APPENDICES**

|  |   |    |
|--|---|----|
|  | Appendix I: Commuters' Questionnaire..... | 57 |
|  | Appendix II: Interview Schedule.....      | 59 |

## LIST OF TABLES

|   |    |
|---|----|
| Table 2.1 Urbanization Trends in Africa .....             | 17 |
| Table 2.2 Modal Split .....                               | 19 |
| Table 2.3 Major Roads Vehicle Capacities in Nairobi ..... | 20 |
| Table 3.1 Sampling Frame.....                             | 35 |
| Table 4.1.1 Gender of the Respondents.....                | 40 |
| Table 4.1.2 Age of the Respondents.....                   | 40 |
| Table 4.2.1 Points of Origin.....                         | 41 |
| Table 4.2.2 Commuter Destinations.....                    | 42 |
| Table 4.3 Means Commuters Use from Muthurwa.....          | 43 |
| Table 4.4 Preferred Location of Matatu Terminus .....     | 47 |



## LIST OF FIGURES

|  |    |
|--|----|
| Figure 2.1 Four Stage Directional Travel Process.....                          | 24 |
| Figure 2.2 Conceptual Framework.....   | 27 |
| Figure 3.1 Nairobi Administrative Boundaries.....                              | 30 |
| Figure 3.2 Map of Muthurwa Study Site.....                                     | 31 |
| Figure 3.3 Nairobi Eastern Estates and Matatu Routes.....                      | 32 |
| Figure 4.1 Commuter Destinations.....  | 42 |
| Figure 4.2 Frequency of use of Muthurwa Terminus.....                          | 43 |
| Figure 4.3 Commuters' Levels of Satisfaction.....                              | 44 |
| Figure 4.4 Commuters' Levels of Satisfaction against Destinations.....         | 46 |
| Figure 4.5 Commuters' Preferred Location of Terminus against Destinations..... | 48 |

## **ABBREVIATIONS AND ACRONYMS**

|               |   |
|---------------|---|
| <b>BART</b>   | Bay Area Rapid Transit System                         |
| <b>BRT</b>    | Bus Rapid Transit                                     |
| <b>CATS</b>   | Chicago Area Transportation Study                     |
| <b>CBD</b>    | Central Business District                             |
| <b>GDP</b>    | Gross Domestic Product                                |
| <b>GOVT</b>   | Government  |
| <b>GPO</b>    | General Post Office                                   |
| <b>GSU</b>    | General Service Unit                                  |
| <b>IDA</b>    | International Development Agency                      |
| <b>IMT</b>    | Intermediate Means of Transport                       |
| <b>ITS</b>    | Intelligent Transport Systems                         |
| <b>JICA</b>   | Japanese International Cooperation Agency             |
| <b>KBS</b>    | Kenya Bus Services                                    |
| <b>KENCOM</b> | Kenya Commercial Bank Bus Stop                        |
| <b>KNH</b>    | Kenyatta National Hoapital                            |
| <b>KUTIP</b>  | Kenya Urban Transport Infrastructure Program          |
| <b>MOA</b>    | Matatu Owners Association                             |
| <b>MVOA</b>   | Matatu Vehicle Operators Association                  |
| <b>MWA</b>    | Matatu Welfare Association                            |
| <b>NCC</b>    | Nairobi City Council                                  |
| <b>O-D</b>    | Origin-Destination                                    |
| <b>SACCO</b>  | Savings and Credit Co-operative Society Organizations |
| <b>PSV</b>    | Public Service Vehicle                                |
| <b>TPT</b>    | Transport   |
| <b>UNCHS</b>  | United Nations Centre for Human Settlements           |
| <b>UTI</b>    | United Transport International                        |
| <b>UTOS</b>   | United Transport Overseas Services                    |
| <b>SPSS</b>   | Statistical Package for Social Sciences               |

## ABSTRACT

The problem under investigation is that commuters who use Muthurwa terminus are not satisfied. Matatus take them to Muthurwa while their destination is the city center and beyond. This does not meet conditions of the Four-Stage Directional Travel process, Trip Generation (whether to travel), Trip Distribution (where to travel), Modal Choice (what mode of travel to use) and Traffic Assignment (what route to take).

The major objective was to investigate commuter satisfaction in using Muthurwa Terminus. The specific objectives were (i) gender and age of commuters, (ii) the origins of commuters, (iii) destinations of commuters, (iv) travel means commuters use from Muthurwa to CBD and (vi) the commuters' preferred location for a terminal. CBDs tend to have the highest concentration of work places. Worldwide, use of public transport means into the central business district are encouraged (Banjo, 1995).

The target population was all commuters who use Muthurwa Terminus. A stratified random sample of 80 commuters from 4 major route groups whose matatus use Muthurwa Terminus was surveyed, 20 commuters per route group. Data was collected using questionnaires and interview schedules. Data was analysed using SPSS package.

An estimated 20,000 commuters use Muthurwa terminus daily (NCC By-Laws 2007). Currently, no transport service provider in Nairobi provides cross-city public transport service (Integrated National Transport Policy 2004). This relocation runs counter to the theme of encouraging public transport.

On origins, most commuters were from Kayole (35%). On destination, majority of commuters were travelling beyond city centre 55%. Those to CBD were 37.5%.

Those to CBD and beyond combined were 92.5%. On frequency the study established that 62.5% of commuters used Muthurwa terminus Monday to Friday, 35% every day of the week and 2.5% used the terminus occasionally.

The study established that 53% of sampled commuters were not satisfied with Muthurwa terminus. 25% were neutral. 22% indicated they were satisfied. The study established that 60% of commuters prefer a terminus located in the city centre. A small group, 3% preferred Muthurwa terminus.

Policy makers ensure commuter needs are established before relocations of their public travel means. Connectivity should be considered whenever terminals are being developed. Planners improve the terminus by expanding roads to reduce congestion which is a daily occurrence. Installation of more lighting would improve security especially at night.

Gaps identified for scholars; A study of the level of satisfaction by matatu operators at Muthurwa terminus; A study of time taken to walk from Muthurwa to CBD; A study on characteristics of residential areas where most of the commuters originated; A study on satisfaction levels by commuters using other terminals relocated from CBD such as Westlands and Ngara.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background to the Study**

Transport is crucial to economic development. Without access to jobs, health facilities, education, recreation and other amenities, the quality of life suffers. This access depends on availability, affordability and connectivity of transport means. Inappropriate transport strategies, policies and programs result in un-equitable transport provision. According to the World Bank studies inadequate transport infrastructure is a constraint to agricultural productivity (World Bank 1996). An ideal transport and traffic policy should allow for maximum protection of both public and private means of travel. It is the balance of public and private transport means that urban transport planners need to address.

Public transport is a shared passenger transportation service which is available for use by the general public, as distinct from modes such as taxis or hired buses which are not shared by strangers without private arrangement. Public transport modes in Kenya include buses, “matatus”, trains, airlines and ferries. Urban public transport is provided by many private transport operators.

Writing on problems of urban passenger transport in Britain, Clifford Sharp maintains that reducing the number of people who work in a city center rarely effect modal choice. Jobs, commercial activities, services, learning institutions and recreation centers tend to be located in CBD (Sharp, 1965).

They present economic hubs and Nairobi is no exception. The current phenomena where all major public and private universities in Kenya and East Africa have set up campuses in Nairobi Central Business District attest to this. For some countries the Gross Domestic Product (GDP) of over 50% is accounted in urban areas. In Nigeria 60% of GDP is accounted for in the city of Lagos (Obudho, 1992). Most commuter trips have a CBD connection.

Public transport in the Kenya is a crucial part of the solution to the nation's economic and energy challenges. It helps ferry people from one point to another, who otherwise would have problems because they do not have private transport. Public transportation provides personal mobility and freedom for people from every walk of life. Access to public transportation gives people transportation options to get to work, go to school or visiting friends. It also provides job opportunities to the many drivers and touts who are employed in this sector.

Public means of travel are efficient in use of public resources such as roads, terminals and parking for overall economic common good. A bus with 45 commuters takes space of only two standard saloon cars. To move the same number of people the road requires space for nine cars. This assumes that the cars carry a full load of five passengers which is not the case in Nairobi. In practice, saloon cars ferry an average of two (2) people making them a very inefficient user of road space.

Urban road passenger transport policy in the Ministry of Transport put it in perspective. Their mission is to promote an efficient, effective, coordinated, integrated, affordable, safe, reliable, and environmentally friendly road passenger transport (Integrated National Transport Policy 2004). This is to enhance passenger mobility and service accessibility. This policy document has proposed an expansion of the city into a large metropolis covering areas such as Thika, Kangundo, Machakos, Kajiado, Kikuyu, Limuru and Kiambu townships. Such cannot be done with terminals where commuters do not have connectivity to other parts of the city. This policy development plan on transport indicate that matatus will be relocated from CBD to act as feeders to an integrated public bus and rail transport system. Buses using dedicated bus lanes will be introduced and major terminals integrated not just with other vehicle routes but passenger rail services. Until such plans are actualized, matatus remain the major means of public transport to CBD. This makes the current study on commuter satisfaction in the use of Muthurwa terminus very important.

This study was undertaken to investigate the commuter satisfaction in the use of Muthurwa terminal where matatus serving the eastern part of Nairobi were relocated as per Nairobi City Council by-laws (NCC by-laws 2007). Relocation of public

service vehicles that serve the eastern part of Nairobi to terminate at Muthurwa terminus did not seek to find out how commuters will be affected by the move. These by laws gave a legal frame-work to decongest Central Business District.

Many matatus and hawkers were enclosing on most roads which resulted to traffic jams throughout the day. Investors in CBD started relocating due to obstruction by hawkers at their business entrances. The streets became dirty and the CBD unattractive to most investors.

A popular description of Nairobi by its residents as “The City in the Sun” had changed to “The City in the Gabbage”. The commuter using the terminal did not feature. This study sort to find out if the move met commuter travel needs in terms of access to jobs, services and recreation. It also surveyed their gender and age, sort to find out if they were satisfied using the terminus. Other investigations were commuter origins and their destinations. They are the dependent variable while NCC policies and by-laws 2007 are the independent variable.

Urban transport affects activities within urban areas. It includes not only the physical elements such as roads and vehicles but also systematic elements among them legal, institutional and financial frameworks. Perhaps more importantly, the political will and policy directions, United Nations Centre for Human Settlements (Banjo. A 1995). The current study, An Investigation of Commuter Satisfaction in the use of Muthurwa terminus falls within infrastructure element. Terminals provide commuter interchange points.

## **1.2 Statement of the Research Problem**

Commuters are not satisfied with Muthurwa terminus as their destinations are CBD and beyond. There is a connectivity problem. Central Business Districts tend to have the highest concentration of work places.

Nairobi lacks an organized bus or rail transport system covering all areas or a cross-city network service of public travel means. Public transport is offered by matatus owned by different people Jeniffer Graeff, (2009).

Owners have invested in transport business for a profit. Commuters who use matatus as well as the terminus do not feature in their plans.

This presents problems to commuters as their needs and views are hardly included by policy makers, planners or service providers, yet they are the consumers of the service. Terminals act as hubs where commuters seek connections to other destinations. There is a connectivity problem because those traveling with matatus terminating at Muthurwa have to walk to CBD. Breaking of their journey is a problem as it causes delay. The same thing applies to those who need a cross city service from their trip origin to their final destination. For example, a person who lives in Embakasi and works at the Survey of Kenya along Thika road alights at Muthurwa terminal and walk to globe roundabout terminus where matatus that give a connection to Thika road are located. There is no connecting route from Muthurwa to various cross-city destinations such as Kenyatta National Hospital (KNH) on Ngong road, Survey of Kenya and General Service Unit (GSU) on Thika road, Nairobi Safari Walk and Bomas of Kenya on Langata road. This is highly inconvenient. In many cities of the world, Central Business District (CBD) have better infrastructure.

The importance of access to work and other services by those using Muthurwa terminus should not be ignored. Muthurwa commuters have to walk to CBD. If their destination is beyond CBD such as Community, Kenyatta National Hospital, Westland's, or Langata, they walk to CBD to get connection to vehicles going to their destination.

Muthurwa bus terminus was constructed in the year 2006 by Nairobi City Council to cater for matatus mainly from the eastern parts of Nairobi. The main idea to decongest the city centre of many matatus transporting commuters from different routes and all terminating at city centre. A second reason was to create a permanent place for small traders/hawkers who sold their merchandises along the busy streets of Nairobi. The opening and subsequent use of this bus terminus and market elicited a lot of reactions from people among them matatu operators, commuters and small traders/hawkers (NCC By-Laws 2007 and 2008).



There is a problem due to lack of cross city public transport means. In Nairobi, Kenya Bus Services Limited (KBS) provided that service until 2006 when the company wound up.

Connectivity is a major problem in Muthurwa. Those who need a cross city service from their trip origin to their final destination cannot get it there. Breaking of a journey causes delay and is highly inconvenient to the commuter. Trip cost in time and money increases considerably when a means of travel does not get you to your final destination (Omar, 1977).

The problem investigated in this research is derived from a directional theoretical hypothesis. “Muthurwa terminus does not meet commuter travel needs as per the four stage travel process of trip origin, trip distribution, modal choice and traffic assignment”.

The current phenomena where all major public and private Universities in Kenya and East Africa have set up campuses in Nairobi Central Business District (CBD) attest to this. Most Commuter trips have a CBD connection. The importance of access to work and other services by commuters using Muthurwa terminus cannot be underestimated. They walk to get into CBD. If their destination is beyond CBD, they walk more or take other vehicles to places such as Community, Kenyatta National Hospital, Westlands, Langata or Thika road. This generates fatigue and stress even before commuters get to their work places. Other problems in the terminal include congestion with more vehicles than the space provided, narrow roads, poor lighting at night, environmental pollution with dumping sites around the terminal and insecurity.

### **1.3 Research Questions**

Commuters are not satisfied with Muthurwa terminus. This study investigates commuter satisfaction in the use of Muthurwa terminus. Major research question is; Are commuters satisfied with Muthurwa terminus? Other research questions are;

1. What are the origins and destinations of commuters using Muthurwa bus terminus?
2. What means of transport do commuters use to CBD from Muthurwa Terminus?

3. Does the use of Muthurwa bus terminus meet the travel needs of commuters in terms of access to jobs, commerce, industry and services?
4. Where is the preferred location of a terminus by commuters using Muthurwa?

#### **1.4 Research Objectives**

The general objective of the study “An investigation of Commuter Satisfaction in the use of Muthurwa Terminus” is to provide policy makers and planners of Urban Public Transport with researched data on commuter satisfaction for those who use Muthurwa terminus. The major objective was to investigate commuter satisfaction in the use of Muthurwa terminus. Other objectives are;

1. Commuter origins and destinations;
2. Gender and age of commuters;
3. The means commuters use from Muthurwa to CBD;
4. Commuters preferred location for a terminal;

#### **1.5 Assumptions of the study**

Assumptions of this study were:

1. Destinations of commuters using Muthurwa terminus is not Muthurwa. There is hardly any trip attraction there. Trip attractions are in CBD and beyond.
2. Use of Muthurwa matatu terminus does not meet the travel need of commuters in terms of access to jobs, commerce, industry and services. It does not fulfill the four stage travel process, trip generation, trip distribution, modal choice and traffic assignment.

#### **1.6 Justification of the Study**

Majority of Nairobi commuters depend on matatus as the only means of public transport. Most people have no access to organized public bus transport or private car means. The aggressive cartel driven mode of matatu operation in Nairobi present many challenges of control by the government and the city council of Nairobi.

A number of studies have been done regarding public travel in Nairobi metropolitan area which include; A Study on Organization and Future of Matatu industry in

Nairobi, Study of the Performance, Owners, Workers, their associations and, potential for improvement, Chitere. (2004); A study on the role of the Matatu Industry in Kenya: Economic Costs, Benefits, and Policy Concerns, Ndungu Kimanu, Thomas N. Kibua, Munyundo Masinde (2004).

None of these studies touched on commuters using Muthurwa terminus. It is also a new terminus put up when Muthurwa market was constructed in the period 2005/2006. The current study, “An Investigation of Commuter Satisfaction in the use of Muthurwa Terminus” fills such a gap.

Building of the bus terminus and the hawkers market was partly a way of making the hawkers accept the relocation process to their new place. Commuters have to pass through the market to access the terminus to and from the city centre.

Muthurwa terminus has been operating for six years. NCC relocated matatus originating from different residential estates in the eastern part of Nairobi to terminate at Muthurwa instead of Central Business District (NCC Bus Stations By-Laws 2007). It is significant and important to establish how the use of this terminus affect commuters.

The study sought to find out commuter age and gender, their origins and destinations, the frequency of usage their preferred location for a terminal. Major investigation was satisfaction levels in the use of terminus as well as where they preferred a terminal location. Other surveyed issues were travel means commuters used from Muthurwa to CBD. This relocation generated conflict not just with commuters but also with owners of Matatus relocated to Muthurwa. Some challenged the decision in court.

Infrastructure provided should include terminals where interchange with other modes and means of transport exist. These have a role to play in encouraging public travel use, Vijayakumar, S. and Jacobs, G.D (1983). Muthurwa terminus does not meet the criteria of encouraging use of public means of travel.

The need for transport service is a derived demand. It is not an end in itself. This makes the four stage directional hypothesis model of trip generation, trip distribution, modal choice and trip assignment relevant in the study. Commuters want access to

job, school, services such as health, commerce and recreation. Muthurwa is not the place within Nairobi where those services are located. Most are in Central Business District and beyond.

Those seeking services from the government offices which are located in upperhill have a connectivity problem. Sick people seeking medical services in Kenyatta National Hospital (KNH) require a connection without walking to CBD. Such move encourages the middle class who can get a car even on credit go for it as private means from the same area freely access CBD. Matatu owners fearing loss of business use other routes to access CBD which to some extent defeat original goal of decongesting CBD.

The target population requires matatus that take them right into CBD not Muthurwa. Their satisfaction is relevant as they are major stakeholders in the industry. The study makes a major contribution in future planning of public transport of Kenya's Urban Centers and the eastern part of Nairobi Metropolitan area in particular.

### **1.7 Scope and Study Limitations**

Existing informal cartels which control operation of matatus were suspicious of data collectors at the bus terminus posing risk to them. To overcome this, the researcher clarified that data was purely for an academic project. They facilitated after confirming data collectors were not a threat to their operations.

Resources in terms of time and money has been a major challenge. It is at a personal cost with no grant or funding from an institution. It was done part time and took a long period.

Not all the issues related to commuters at Muthurwa can be addressed by this study. Such would require volumes of books and it is not within the scope of this study.

The study scope is limited to the questions raised in the questionnaire as contained in the appendix to help investigate the major objective "commuter satisfaction in the use of Muthurwa terminus Nairobi, Kenya".

There are many unresolved issues relating to Muthurwa terminus. After the commissioning of the market and terminus many challenges ensued. Traffic volumes in and out of Muthurwa are very high relative to the infrastructure provided. This has

led to traffic jams which at times extend all the way to the city stadium roundabout especially in the evening peak hours. Matatu operators forced to use the terminus started using other routes through eastleigh to access CBD. This defeated original plans by NCC. However, for the purposes of this study, accessibility to the site was ideal which is critical for research Singleton, (1993).

## **1.8 Definition of Operational Terms**

**Transport Policy** - Refers to guiding principals of moving people and goods from one geographical location to another. The same flow for information and ideas referred to as communication (Urban Transport Sector Policy paper, World Bank May 1975)

**Public Passenger Transport** - The business of moving people by shared means such as a vehicle at a charge, usually referred to as fare (Transport Licensing Board Cap 404)

**Public Service Vehicle (PSV)** - One that satisfies the Transport Licensing Board Act Cap 404. It is required to have a defined route, regular time table and fixed fare structure (Irandu, 1982).

**Matatu** - Refers to public Service vehicles of 7-39 passenger capacity within the Kenyan context. In a presentation given during a Habitat forum in Nairobi Kenya, Brian Williams referred to public transport and para-transit means such as the minibuses of Nairobi which fill in gaps especially during high peak travel demand (Habitat Debate, 2002). Advantages of matatus is their flexibility and accessibility to areas where buses can't. They are sensitive to changes in demand (Irandu, 1982).

**Commuter** - This refers to people using joint means of public travel at a fare (Irandu, 1982).

**An Urban Settlement** - Defined as an area with a minimum of 100,000 people, embracing a central city (Central Business District ) plus adjacent areas with economic relationships where over 65% of economically active people are engaged in non-agricultural activities (Sharp, 1965).

**Para-Transit** - Means of public transport which falls between a ‘taxi like’ flexible service where the passenger dictates and determines destination and ‘bus like’ predefined continuous point to point. Bus services have immediate boarding and alighting points along the way (Fouracre & Maunder, 1979).

**Modal Split** - Modal split refers to appropriate division of total trips for passengers or freight between different modes of travel such as bus, rail, car, bicycle or walking (Study on Master Plan for Urban Transport in the Nairobi Metropolitan Area 2005). This distribution is dynamic and is affected by speed, cost, length of journey, safety, convenience, comfort, available alternatives etc.

**Intermediate Means of Transport (IMT)** - These are travel means that fall between mechanized fuel and electric propelled machines such as vehicles, ships, aircrafts and walking. They include amongst others bicycles, tricycles and animal drawn carts. It’s clearly spelt in a paper entitled, “Promoting Sustainable Mobility in Kenya” (Irandu, 1997).

**Suburbanization** - This is the movement to outer areas in major cities of the world (Habitat 2002). In Kenya, growth of areas such as Athi River, Kitengela, Mlolongo, Ongata Rongai, Ngong, Ruiru Ruai and Thika district after the Thika super highway was opened in 2011 are a manifestation of suburbanization in Nairobi Kenya.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

Transportation is as old as human kind. Walking, using human energy is itself a form of non motorized transport. Fastest mechanized means of travel in 6000 BC was camel caravan at 8 miles per hour. By 1600 BC horse drawn chariots speeds were 20 miles per hour. Globalization in the 20<sup>th</sup> and 21<sup>st</sup> centuries has made transport a major space modifier. With aircrafts traveling at over 2000 kms per hour, the world without distance concept has become a reality. Transport is not just about moving people and goods, it includes infrastructure, social, economic and environmental impacts.

Circulation, a major human phenomenon comprises transport, the movement of goods and people, logistics, the movement of goods and services, and communication the movement of information and ideas. Transport is one of the main factors affecting location and distribution of economic activities Goldberg, (1972). It has a major influence on economic and social change. There is close association between urban growth and demand for transport in major cities of the world. Time and money travel costs are interchangeable. This is referred to as cost of transport being met in 'double currency' Meyer, et al, (1965).

#### 2.2 Transport Policies

Historically, transport planning was done as a subset of land use planning. Modern approach however has it as a discipline though related closely to land use planning. Social, economic and political factors in developing countries have policies that produce inadequate and un-equitable transport systems.

World over, public means of travel to central business districts are encouraged while private means such as private cars are discouraged.

Hay (1993) examined four models of transport policy approach namely; formal equity; uniform access; least social cost; free market access. Transport affects different groups of people in different ways.



Muthurwa commuter study falls within free market access. Matatus are private vehicles providing public transport service at a profit. There is free entry and exit as investors seek areas of highest returns for their investments. Private capital does not guard the best interest of public as its major aim is profitability. While the policy on public transport may be clear, practicing it presents difficulties as there are always vested interests in social, economics and political circles. This dynamism is a major theme globally Whitelegg and Haq (1975).

Matatu industry has played a central role in mobility, politics and economics in Kenya. Nairobi public travel means users depend on them as organized bus companies are no longer in existence. An ideal transport and traffic policy would be to allow for maximum protection of both public and private means of travel. In reality, this ideal is difficult to achieve. It is the balance in transport and traffic issues that all urban transport planners have to address. This would lead to policies that would satisfy or dissatisfy, encourage or discourage the means that serve the travel needs of the public. Commuters who use matatu means of travel should be incorporated in public road transport and traffic plans to provide views on their connectivity needs.

Major strategies of government intervention in matatu industry are in their operations, ownership and management and hardly incorporate commuters. The government has reorganized matatu associations into companies or Savings and Credit Cooperative Societies (SACCOs) to qualify for licensing as Public Service Vehicle (PSV) within Nairobi Metropolitan Region (Integrated National Transport Policy 2004). However, the commuter, a major stakeholder in this industry is under represented. Commuter perspective is hardly sought when changes or implementation of strategies in the industry are undertaken. Time distance in terms of travel time makes commuters get concerned with relative locations. People are not so much concerned with absolute distance. It is the cost in time, money, safety, comfort and efficiency that they focus on.

The movement from home to bus stop, time spent waiting for public means, time taken on board in the public means up to the terminus and time taken from terminus to

commuter destination is critical. This study sought to fill one such gap by undertaking research on commuters' satisfaction for those who use Muthurwa terminus.

Three criteria can be used to assess service quality, service quality theories; provider's ability to meet customer demand; customer satisfaction and customer perception of quality of service provided Chartterjee & Yilmaz, (1993). The Commuter is the consumer of the transport service provided at Muthurwa terminus. Having been incorporated in the Traffic Act Cap 403, matatus are public services vehicles by law. All references to public service vehicle in this study refer to matatu means of public travel.

### **2.3 Overview of Urban Public Transport**

As third world countries become urbanized, urban planners should pay close attention to urban transportation (Developing World Land Transport 1987). Cities are widely acknowledged as engines of economic growth, cultural exchange and technology transfer centers. They provide access to jobs, markets, services and help reduce regional and inter-urban inequality. Areas with better transport facilities like roads, commuter bus services or matatus tend to attract denser populations and more industries. Areas with poor or no transport means tend to lag behind Irandu, (1982).

Urban growth, distribution and transportation in developing countries take a job led intra-urban, 'within urban centers' and inter-urban, 'between different urban centers' dimension. Movement to outer areas in major cities (sub urbanization), is affected by transport development. Most people will choose to reside in areas where they can access public transport. Rural urban migration is high and demand for public travel means rises fast.

According to the United Nations World Urbanization Prospects (1994), half of the world's population was projected to live in urban areas by the end of year 2008. This means that demand for transport in urban areas for those living there continues to grow. In the last 50 years, world population has doubled from 3 billion to 6 billion while urban population has risen fourfold from 267 million to 1.1 billion

(Obudho, 1992). In urban areas, the movement in search of work, commerce, services or recreation from areas of origin to destination using private or public means present a major challenge of congestion. This arises because of high concentration of jobs in central business districts as office space, commercial centers and services tend to locate there.

Data derived from 150 cities in developing countries show that for every 1,000 additional people in those cities, 350-400 daily public transport trips are generated. Similarly, for every additional square kilometer of city growth, 500 daily public transport trips are generated (Developing World Land Transport 1988). People make several trips in a day for different reason such as work, school, college, recreation or shopping. The composition of the family, their income level, age, access to a private car influence public travel demand.

## **2.4 Urban Public Transport Globally**

### **2.4.1 London- United Kingdom**

Car restraint in central business district and restriction imply discrimination. In Britain, local authorities are required to make transport plans with public travel commuter interests by providing connection services and amenities at bus termini. They facilitate public service means and secure the safety and convenience of persons using or desiring to use such vehicles. United Kingdom County Council Act of 1972 Section 202 and 203 gave them responsibility to develop policies promoting efficient and coordinated systems of public transport in London Starkie, (1973).

The Ministry of Transport in Great Britain put a lot of emphasis in transport planning. Planning of urban areas should also consider the future population growth, residential as well as commercial centre developments Borchest, (1961). This study seeks to recommend such an approach not only for commuters who use Muthurwa terminus but all public travel means users in Nairobi, Kenya.

### **2.4.2 Port of Singapore- Asia**

A case for long term land use and transport planning as envisaged in this study is derived from the port of Singapore. That country has unique geographical phenomena. This port city is a large metropolis.

Being a small country with a land mass of 41 by 23 square kilometers it has a well planned public transport. Physical constraints of limited land mass has made the country adapt a highly integrated transport planning approach. It has achieved this by systematic integrated land use and transportation policies directed at encouraging the use of public transport systems. Transport policies are integrated with all national development plans that span 10 to 20 years, on a long term approach. A highly controlled metropolis development is guided towards the desired direction in use of public transport systems. Development objectives are aimed at improved community life, accessibility to work, services and recreation. Transport policy, a powerful geographic instrument, has been used to guide this development. The commuter, not vehicle access, is the guiding factor. The size of settlements, types of transport modes and their inter linkages are planned up to 20 years before the actual implementation.

A mass rapid rail transport policy is that people live within walking or cycling distances to railway stations. The system is planned with high integration of different modes of transport, termini and accessibility. From the rapid rail system, short bus rides connect commuters to areas where industries, commerce and services are located. The Railway management provides parking for bicycles as many people cycle to the railway stations (Developing World Land Transport 1988). This is a policy approach that many countries especially in low developed areas should emulate. Public transport policy implementation should satisfy the commuters and encourage use of public means of travel.

### **2.4.3 Bay Area in California-USA**

A different scenario has existed in the Bay area in California. Many residents relocated to sub-urban areas due to access to private car and a good road network leading to commercial activities slowing down in their CBD.

Transport policy has been used to reverse the trend. Bay Area Rapid Transit (BART) system in San Francisco, a rail based integrated public means of travel was developed to stimulate movement into a declining CBD. Restriction of access by private cars in some areas of CBD, efficient and cheaper public travel means as well as good terminus with social amenities was introduced to encourage commuters. This urban rail public travel system is highly accessible and integrated.

The current study seeks to get data that will guide the planning of an integrated and accessible public road transport system for commuters who use Muthurwa terminus. The same would be recommended when relocations of any public service means from CBD are done.

## 2.5 Africa's Urban Transport

Urban areas in Africa have been unable to supply education, health and transport facilities to ever increasing demand due to rapid population increase. This occurs due to high birth rates as well as rural urban migration.

**Table 2.1 Urbanization Trends in Africa**

| Sub Region/Year     | 1960 | 1980 | 2000 | 2025 Projected |
|---------------------|------|------|------|----------------|
| World Trend         | 34.2 | 39.4 | 47.5 | 61.1           |
| Developed countries | 61.3 | 71.3 | 76.3 | 84             |
| Low Developed       | 22.5 | 29.2 | 46.7 | 57             |
| Africa, Continent   | 18.4 | 27.3 | 37.3 | 53.8           |
| Eastern Africa      | 7.4  | 14.6 | 24.6 | 41.2           |
| Southern Africa     | 41.9 | 44.5 | 50.7 | 66.6           |
| Northern Africa     | 30.2 | 40.4 | 48.3 | 63.4           |
| Western Africa      | 14.5 | 25.8 | 40.6 | 59.2           |
| Middle Africa       | 17.9 | 28.1 | 35.9 | 54.0           |

**Source: United Nations World Urbanization Prospects (1995) New York UN Publication.**

Urban transport conditions have deteriorated with congestion, poor roads and lack of appropriate terminal facilities (Habitat 11 Global Workshop 1995). It needs to be sustainable in the long term Adegboyega Banjo; (UNCHS, 1995).

From table 2.1, Eastern Africa is the least urbanized while Southern Africa is the most urbanized in the African continent. Sustainable urban transport provides access to people, not vehicles (United Nations 1994).

Urban transport is the glue that holds different settlements and economic activities together in cities of the world (UNCHS 1998). Banjo 1985 gives some factors that contribute to problems of third world cities which include; inadequate technical and material resources; inadequate attention to and provision for mobility needs in both planned and unplanned settlements; inadequate awareness of transport implications of land use developments; absence of long-term strategic perspectives in transport actions, resulting in reactive rather than prescriptive planning; dominance by highway engineering view of the problem without adequate consideration of who suffers and who benefits from changes in transport policies. The study of commuter satisfaction with using Muthurwa terminal where matatus from the eastlands were relocated was done under similar background in Nairobi, Kenya.

## **2.6 Nairobi, Kenya**

Development of Nairobi as an urban center goes back to 1899 when the Kenya Uganda Railway reached there. A workshop for materials used in the remaining section of the railway line was established. In 1907, the administrative functions for the British Colony then were moved from Mombasa to Nairobi. In 1928, Nairobi became a municipal council. It was granted city status in 1950, becoming the first city in East Africa. As at 2004, it was estimated that Nairobi day population was 4.1 millions. The reason for specifying the day population is given because many people in the outlying areas around Nairobi such as Thika, Kiambu, Limuru, Kajiado, Machakos and kangundo commute daily to work in the city. It is projected to grow at 2.1% annually and reach 6.9 millions by 2025 (Master Plan for Urban Transport 2005).

Urban public road transport in Nairobi dates back to 1934. United Transport International (UTI) later United Transport Overseas Services (UTOS) was given a franchise to run a public bus service by the colonial administration then for the European inhabitants. They started with two (2) buses and the birth of the oldest urban bus company, Kenya Bus Services Limited was operational.

## 2.7 Modal Split, Current and Future Projections

The mode of transport in urban areas is determined by many factors. They include amongst others, availability, accessibility, affordability and integration with other modes (Muriuki, 1976). The structure of any network has a geographical dimension as well (Kansky, 1963). Nairobi modal split is walking, using public vehicles or private means. Private means includes private cars, organized company transport, school transport and cycling.

**Table 2.2 Modal Split**

| Year    | 2004 | 2010 | 2015 Projected | 2025 Projected |
|---------|------|------|----------------|----------------|
| Walk    | 49%  | 48%  | 45%            | 44%            |
| Public  | 36%  | 35%  | 34%            | 30%            |
| Private | 15%  | 18%  | 21%            | 26%            |

**Source: Study of Master Plan for Urban Transport in Nairobi Metropolitan Area (2004) pp 9; a Ministry of Transport Publication.**

This trend where public and non-motorized means of travel are declining while the private car is growing is a worrying one for an urban area in low developed country like Kenya. Even in 1970, walking was the dominant mode of travel within Nairobi (Nairobi Metropolitan Growth Strategy 1974). Urgent policies that encourage public travel means in Nairobi are required.

## 2.8 Vehicle Flow

The current flow of public service vehicles in Nairobi is based on owners seeking profitable routes. Connectivity, accessibility, integration and co-ordination for the commuter are hardly considered. The policy of decongesting the city centre of Nairobi should not be done independent of commuter needs. While vehicle flow is high on a daily basis, public means move 78% of commuters but accounts 36% of the vehicle volume.

22% of commuters are moved by 64% volume of private vehicles, (The Study of the Master Plan for Urban Transport in the Nairobi Metropolitan Area 2005).

**Table 2.3 Major Roads Vehicle Capacities in Nairobi**

| <b>Name of the Road</b> | <b>2004 No. lanes</b> | <b>Rd capacity Vehicles</b> | <b>Vehicle Actual 2004</b> | <b>Vehicle forecast 2010</b> | <b>Growth in numbers</b> | <b>% Growth</b> |
|-------------------------|-----------------------|-----------------------------|----------------------------|------------------------------|--------------------------|-----------------|
| <b>Murang'a</b>         | <b>4</b>              | <b>50,000</b>               | <b>83,849</b>              | <b>116,640</b>               | <b>32,791</b>            | <b>39%</b>      |
| <b>Jogoo</b>            | <b>4</b>              | <b>50,000</b>               | <b>63,601</b>              | <b>84,653</b>                | <b>21,052</b>            | <b>33%</b>      |
| <b>Mombasa</b>          | <b>4</b>              | <b>50,000</b>               | <b>39,313</b>              | <b>51,538</b>                | <b>12,225</b>            | <b>31%</b>      |
| <b>Langata</b>          | <b>4</b>              | <b>60,000</b>               | <b>44,123</b>              | <b>61,650</b>                | <b>17,527</b>            | <b>39%</b>      |
| <b>Ngong</b>            | <b>2</b>              | <b>25,000</b>               | <b>30,148</b>              | <b>50,706</b>                | <b>20,558</b>            | <b>68%</b>      |
| <b>Chiromo</b>          | <b>6</b>              | <b>75,000</b>               | <b>72,693</b>              | <b>89,132</b>                | <b>16,439</b>            | <b>23%</b>      |
| <b>Total</b>            | <b>34</b>             | <b>420,000</b>              | <b>407,579</b>             | <b>563,850</b>               | <b>156,271</b>           | <b>38%</b>      |

Source: Study of Master plan for Urban Transport in Nairobi Metropolitan Area (2005).

The current study focused on commuters from the eastern part of Nairobi who use Jogoo and landhies road. They reside in heavily populated eastern estates of Nairobi. These include amongst others Dandora, Embakasi, Kayole, Komarock, Umoja, Buruburu, Jericho, Makadara, Uhuru, Kimathi, and Kaloleni. Decongesting of Nairobi



CBD from matatus and hawkers is a noble action. However, it should consider commuter needs for public transport and terminal.

Development of an integrated and accessible public travel system, especially buses accessing CBD while restraining the private car to encourage use of public transport is a recurrent theme (The Nairobi Metropolitan Growth Strategy Volume 1, 1973). Urban transport problems in Nairobi have existed for many years. Fair (1960) observed that its chief problems were those of physical growth, increasing complexity of land use and peri-urban sprawl, lengthening journeys to work and of the growing intensity of traffic within the CBD. Many years later in 2011, the situation remains as observed earlier.

## **2.9 Matatu Public Transport**

The genesis of Commuters using Matatus as public service vehicles at a fare was made through a decree by the first president of Kenya Mzee Jomo Kenyatta in June 1973. They operated informally more as shared taxis prior to this declaration. This decree that small personal vans can carry commuters at a fee but should not break traffic rules was a contradiction. They had not been registered as public service vehicles then. It allowed them to operate without any form of public service licensing. While the decree was made to improve mobility and create more jobs, it created problems of control by the traffic department of the city council of Nairobi. Currently, the matatu industry plays a central role in mobility, economics and politics. It also introduced competition to the then Kenya Bus Services Limited that had a monopolistic franchise to transport commuters within Nairobi city boundaries.

Public transport plays a major role in economic development. An estimated 20,000 matatus operate in the Nairobi Metropolitan Area Jeniffer Graeff, (2009). The Traffic Act Cap 403 and the Transport Licensing Act Cap 404 now cover matatus as public service vehicles. They are a common feature in virtually all towns in Kenya. They are also popular with Commuters as they have high frequencies and access areas where buses do not Irandu, (1982).

Approximately 4.82 million trips are made daily within the Nairobi Metropolitan Region. Of these 49% by walking, 4% cycle, 11% use private means while 36% use public service vehicles (Study on the Master Plan for Urban Transport in the Nairobi Metropolitan Area 2005).

Matatu mode of public travel in Nairobi evokes different memories to different people who use the roads. To the private motorist, the harassment by matatu drivers as they hoot, overtake and change lanes causes stress. To cyclists and pedestrians they present a great safety risk as they overtake other vehicles sometimes using pedestrian and cycle paths. They constitute a major problem in the management of city traffic Manundu & Lamba (1982).

Matatus are public service vehicles (PSVs) of no standardized make. They include pickups built to carry passengers, minibuses, nissan vans. These means of public transport in Nairobi play a major role in economic development. In the current study, no sociological, political, ownership, employment or comparison with conventional bus systems is considered. The current study focuses on satisfaction by commuters who use them at Muthurwa terminus.

## **2.10 Nairobi Urban Transport Studies**

Many transport studies undertaken for Nairobi Urban area have reference to developing and improving a bus public transport system. They include among others; Towards Efficient Management of Public Transport in the City of Nairobi through Application of Intelligent Transport Systems Irandu (2008); The Nairobi Metropolitan Region Bus Rapid Transit Program (BRT) (2007); Study of Master Plan for Urban Transport in Nairobi Metropolitan Area (2005), a Ministry of Transport Publication; 1948 urban master plan; 1973 metropolitan growth strategy volume 1; The 1977 bus lanes and bus ways feasibility study and 1979 Nairobi Urban Transport Problems Study (Post Buckley and Ministry of Local Government Publications). One particular study led to amendments in the traffic act cap 403 to include matatus, the 1982 study on matatu mode of travel which made major recommendations which included:

- i. The Nairobi City Council provides parking for matatus in Nairobi CBD.
- ii. The Ministry of Transport through the traffic department license them as (PSVs) Cap 403 Section 96 (3) d and cap 404 section 8.

The traffic department, through motor vehicle inspection unit inspects them annually to conform to safety standards.

The 1999 post Buckley study recommended an organized bus system while recognizing matatus as part of public transport in Nairobi. Since some of the recommendations are yet to be implemented, the matatu continues to provide critical public travel means for most commuters who have no access private means of travel. This study was based on the recognition that currently, no aspect of transport planning in Nairobi can ignore the commuter. Those who use Muthurwa terminus where some matatus terminate are major stakeholders.

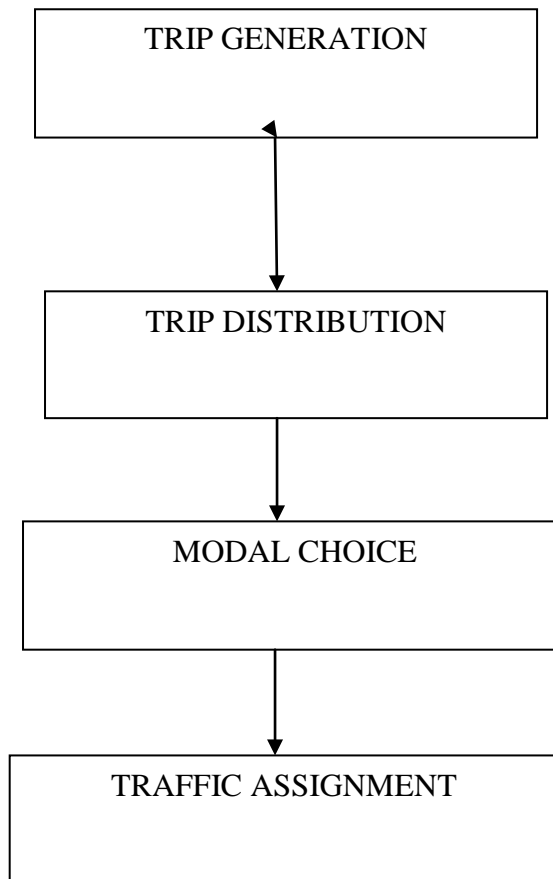
## **2.11 Theoretical and Conceptual Framework**

The four stage directional travel process of trip generation, trip distribution, modal choice and traffic assignment has been used in this research Clark, (1987). Trip attraction areas from the eastern part of Nairobi where commuters using Muthurwa terminus originate are not at Muthurwa. Trip distribution, “destination choice” is made before a journey is taken. It is the utility demand of a place away from commuters residence or location that triggers travel need, a derived demand Irandu (2008). Muthurwa with no commercial organizations, schools, hospitals, recreation areas or government offices cannot be commuters’ destination.

Figure 2.1

**CONVENTIONAL FOUR STAGE TRAVEL PROCESS**

**Source: Developing World Land Transport 1987 Page 152**



The four stage process summarized in figure 2.1 was the major guide in this study. Trip Generation (whether to travel), Trip Distribution (where to travel), Modal Choice (what mode of travel to use) and Traffic Assignment (route to follow) were considered. Gravity model (after newton's law of gravity theory) address trip attractions, trip generation and trip deterrent. The deterrent notion assumes people attempt to minimize time, money and effort to travel subject to their being able to carry out desired activity John M Clark, (1987). Muthurwa terminus works against this as commuters have to use more time, energy and even money to get to their destinations.

Criteria of assessing service quality (in this study), Muthurwa terminus infrastructure fall within three broad areas, provider's ability to meet customer demand, customer satisfaction and customer perception of quality of service provided Chartterjee & Yilmaz, (1996). The Commuter is the consumer of the service provided at Muthurwa terminus. Derived demand for transport into CBD, provision of transport infrastructure such as Muthurwa Terminus, roads and the means used (Matatus) are interdependent.

Traditional reasons for having most offices in CBDs were to make them accessible by public transport users. In Nairobi many residents, especially in the eastern part of the city with a high concentration of low and middle income residential areas rely heavily on public travel means, mainly matatus. There is a complicated trade-off between housing costs and cost of traveling to work Meyer, et al (1965). Housing costs in the Eastlands are generally lower than in the western and southern parts of Nairobi. Out of 4.82 millions daily trips in Nairobi in 2004, more than 50% were in the Eastlands (The study of the Master Plan for Urban Transport in the Nairobi Metropolitan Area 2005).

When NCC relocated the Eastlands matatus to Muthurwa, commuters going to the CBD and beyond alight at Muthurwa. This has both negative and positive effects as shown in conceptual framework figure 2.2

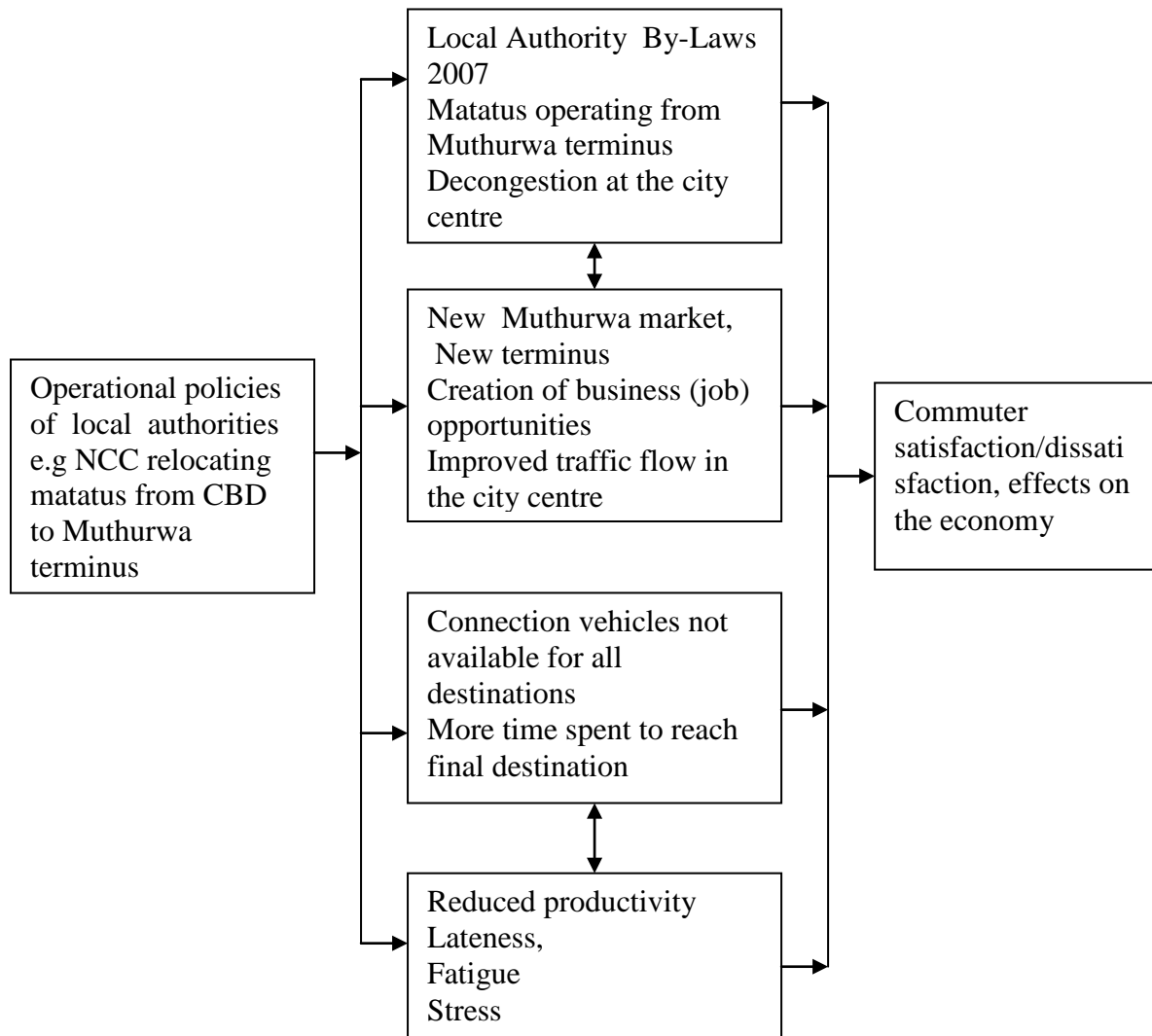
Assuming that the commuters are destined for CBD and beyond they have to walk from Muthurwa to CBD. From there, those going beyond CBD get vehicles to their destinations.

Challenges to the commuter such as connectivity with vehicles to other destinations, more time, stress, fatigue and money spent to reach their destinations. This could lead to reduced productivity in the work place due to possible lateness and dissatisfaction with transport service which impact negatively on the economy.

There are positive effects of using Muthurwa terminus such as; Decongestion of city centre from matatus and hawkers; Reduced traffic jam in the CBD; Increased customers for the traders at Muthurwa market as commuters have to pass through there. Walking is healthy and those who daily use this terminus exercise indirectly.

Figure 2.2

**CONCEPTUAL FRAMEWORK**



Source: Researcher 2011

## **2.12 Gaps Identified**

Major gap identified is the lack of commuter consideration and involvement in development of policies, plans as well as changes in transport operations. A clear point is the relocation of public service vehicles (PSVs) operating in the eastern part of Nairobi to terminate in Muthurwa instead of CBD, (NCC by-laws 2007). This was done and the impact to the commuter, a major stake holder hardly considered. It is such gap that this research has filled.

A second gap identified is a lack of walk paths or cycle paths from Muthurwa to Central Business District. These non-motorized means of travel would encourage commuters to walk or cycle to CBD which is good for a healthy nation,

A third gap identified is lack of environmental conservation at Muthurwa. Gabbage, clogged drainage and stagnant water all make the terminus un-attractive to commuters. Trees and flowers can be planted to improve the environment at Muthurwa terminus.



## **CHAPTER THREE**

### **METHODOLOGY**

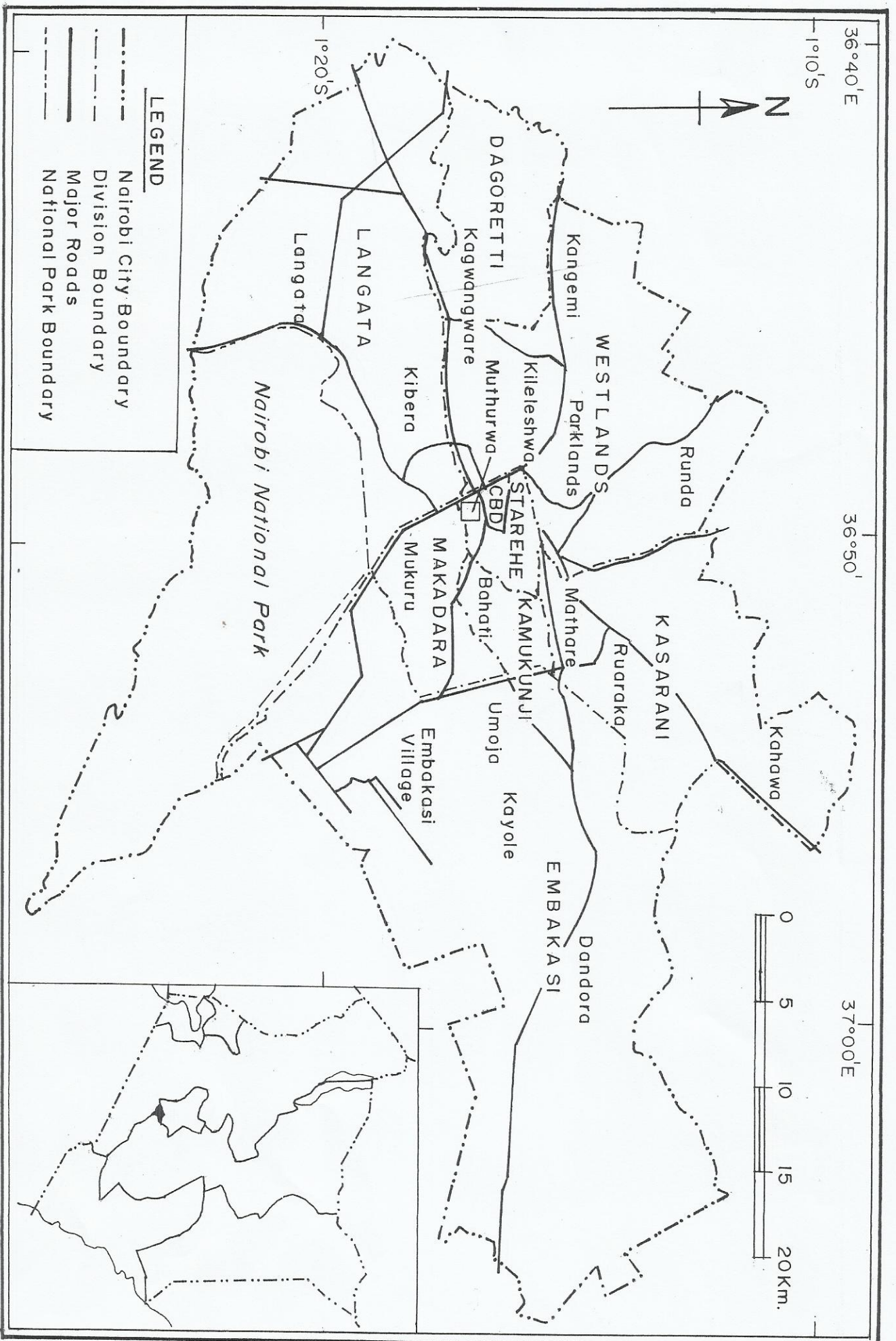
#### **3.1 Introduction**

This section presents the methodology that was used to conduct this study. It covers the study site, research design, target population, sampling procedure and frame, instruments of data collection, data collection procedures, analysis and presentation.

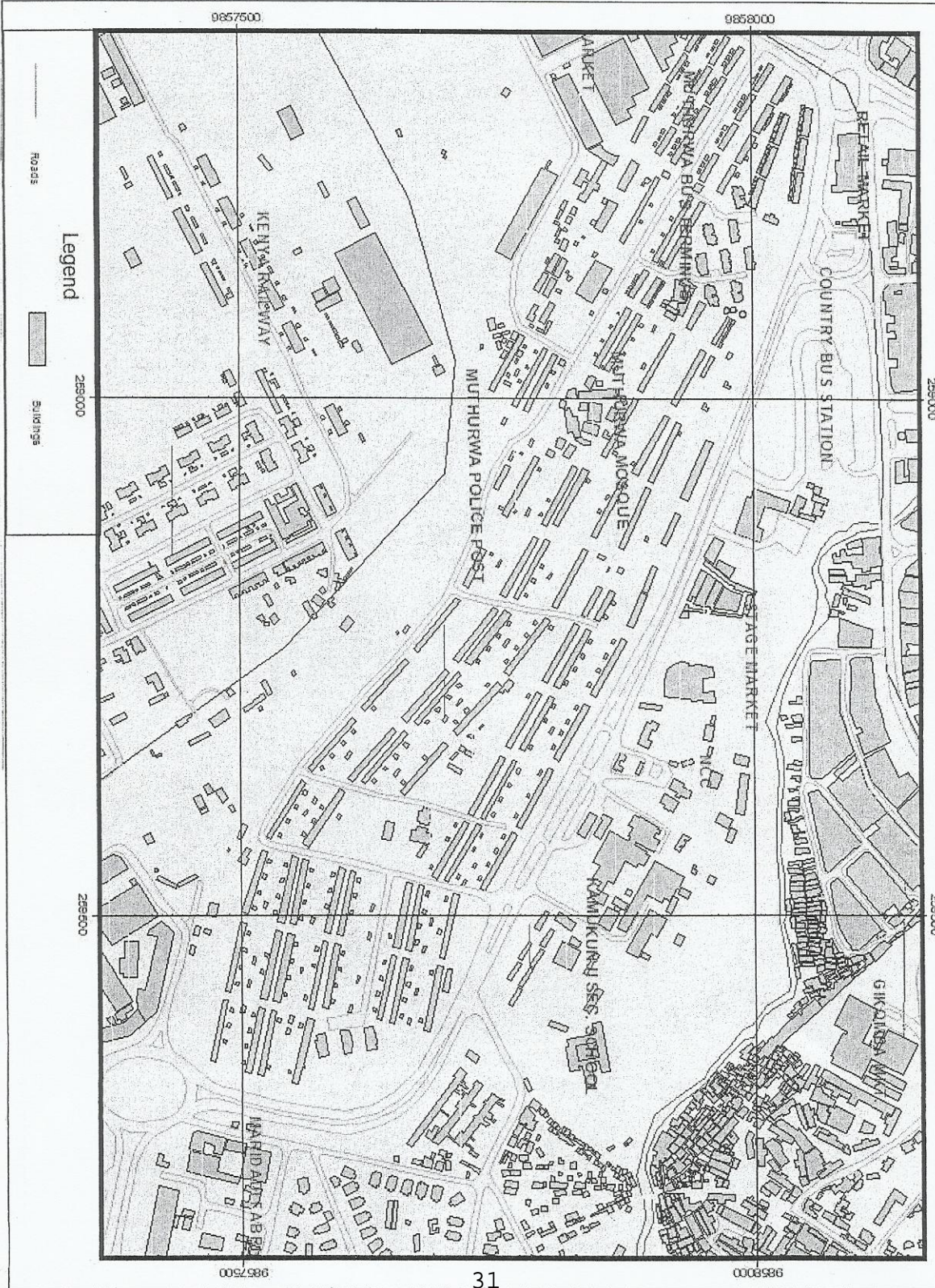
#### **3.2 Study Site**

The origin of Muthurwa bus terminus dates back to the year 2005/2006. Nairobi City Council constructed market stores to relocate hawkers operating along the streets in Central Business District to a permanent place. A map of Muthurwa bus terminus (Figure 3.2) clearly defines the research site. It is less than a kilometer to the northwest of the city centre. Construction of the bus terminus for public service vehicles routes operating on the eastern part of Nairobi was to decongest the city centre of the many matatus. It covers an area of 2 square kilometers with machakos country bus park to the north, city centre to the west, industrial area to the south and city stadium to the east.

The survey covered Muthurwa Bus Terminus with entry along Landhies road and exit at Lusaka, Jogoo and Landhies road roundabout. Map of Nairobi region figure 3.1 Muthurwa terminus/hawkers market figure 3.2 and a map of Nairobi City eastern residential estates and matatu routes, figure 3.3 put the study site in perspective.



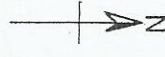
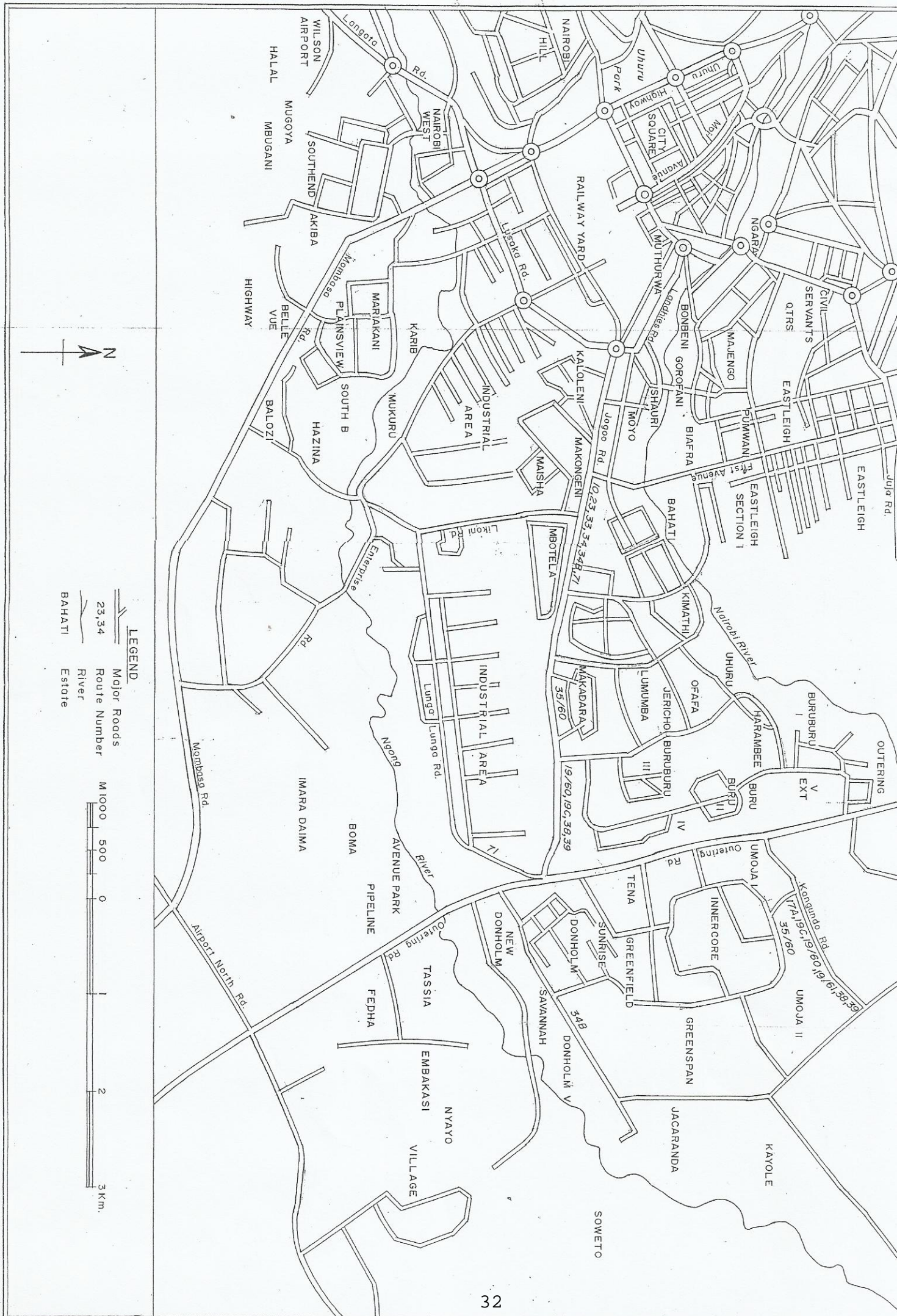
MAP OF MUTHURWA MATATU TERMINUS



Legend  
ROADS  
BUILDINGS

Source: Google Map

3.2



**LEGEND**

- Major Roads
- Route Number
- River
- Estote



Figure 3.2 Map of Nairobi City, Eastlands.

Source: Modified from the Nairobi & Environs map, Survey of Kenya.

### **3.3 Research Design**

A research design refers to arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research with economy to procedure Kothari, (2004). According to Cooper and Schindler (2003), the research design provides answers to issues such as techniques to be used to gather data, the kind of sampling strategies and tools to be used and how to deal with time and cost constraints. A research design is a plan, structure and strategy of investigation conceived so as to obtain answers to research questions Kerlinger, (1973). The plan is the outline of the research, and includes all activities pertaining to the research from beginning to end. Mugenda (1999), Kothari (2004) and Orodho and Kombo (2002) all recommend use of descriptive research design where the objective of the research is to establish certain facts about perception, opinions, habits or social issues.

The study used an exploratory design. As stated by Saunders, Lewis and Thornhill (2007) exploratory studies are studies that put an emphasis on studying a situation or a problem in order to explain the relationship between variables. The exploratory approach is useful as the research sought to clarify whether commuters from the eastlands estates of Nairobi were satisfied by the setting up of Muthurwa terminus. Using the academic literature available, the study sought to explain the challenges faced by the stakeholders involved in dealing with the transport problems.

In order to address the above, the study adopted the case study strategy, using the Muthurwa Terminus in Nairobi. Shuttleworth (2008) defines the case study as an in depth study of a particular situation rather than a sweeping statistical survey. Shuttleworth (2008) further explains that it is a method used to narrow down a very broad field of research into one easily researchable topic. Case studies research excel at bringing us to understand complex issues or objects, and can extend experience or add strength to what is already known through previous research. The case study was considered as the appropriate strategy for this study. A major objective is to provide a critical and in depth understanding of the challenges of commuters at Muthurwa terminus, Saunders, Lewis and Thornhill (2007). They are major stakeholders involved in transport industry within Nairobi urban area.

The current study is on commuter satisfaction in the use of Muthurwa Bus Terminus. The dependent variable is the commuter satisfaction while independent variable is Nairobi City Council By-Laws and Muthurwa terminus.

### **3.4 Target Population**

The target population for this study comprised of commuters who use Muthurwa bus terminus from Matatu route numbers 58/10, 33/34, 35/60, and 19/60. This group of commuters come from eastlands parts of Nairobi and use the matatus terminating at Muthurwa to various destinations in the city and beyond. They originate from Buruburu, Donholm, Umoja, Embakasi, Kayole and Dandora estates among others in Eastlands.

### **3.5 Sampling Procedure**

The number of commuters using Muthurwa bus terminus on daily basis is estimated to be over 20,000 (Nairobi City Council By-Laws 2008). The number of matatus using Muthurwa terminus in 2008 was estimated at 200 daily. They are 14, 25, and 29 seater passenger capacity. They had an average trip load of 21 passengers accounting for an average of 104 passengers daily.

A stratified random sampling technique was used in this study to draw the sample population. Each of the four route groups (58/10, 33/34, 35/60, 19/60), represented a stratus. From each route group (stratus), 20 respondents were randomly picked making the total sample size for the four strata to 80 respondents.

To ensure a more representative sample size, 5 respondents in each of the strata were obtained by getting 2, 1 and 2 respondents in the morning peak hour, lunch hour and evening peak hours respectively per day totaling to 20 commuters/respondents per day. To minimize bias in selecting a respondent in each case, the 5<sup>th</sup> commuter to alight from a Matatu was included in the sample as a respondent sampling unit. According to Kish (1965), between 30 to 200 elements are considered sufficient for sample size when the distribution approaches normality. Sample size of 80 was considered sufficient for the study.

**Table 3.1 – Sampling Frame**

| <b>Route Group</b>                   | <b>Sample</b> |
|--------------------------------------|---------------|
| Dandora/ Buruburu/Maringo – 36/58/10 | 20            |
| Embakasi/Donholm/Umoja – 33/34/35    | 20            |
| Komarock/Kayole – 19/60              | 20            |
| Others                               | 20            |

### **3.6 Data Collection Procedures**

Data collection involves contacting members of the sample that the research will be conducted in order to collect the required information about the study (Cooper and Schindler, 2003). Data collection involves consulting primary and secondary data sources in order to elicit information, facts, evidence, proofs or truths regarding the research problems (Babbie, 2004). Data collection also involves gathering both numeric as well as text information so that the final database represents both quantitative and qualitative information. According to Chandran (2004), data collection involves operationalising the research design into instruments of data collection with a view to collecting data in order to meet the research objectives. Data collection methods include use of interviews, observation, and questionnaires (Chandran, 2004).

The data collection exercise involved administration of structured questionnaires and interviews with commuters at Muthurwa terminus as these were the most appropriate for collecting information required for the study on commuter satisfaction. The questionnaires were administered to commuters.

Interviews were conducted on some of the commuters from eastlands and Matatu terminus managers. The researcher trained two research assistants on data collection procedures up to the point when data was sorted and coded for entry into the computer. The training program included practice sessions in conducting open-ended

questions and documenting sources and a detailed explanation of the purpose of the study. Based on results of the pre-test, the researcher assigned the research assistants particular sections within the terminus. Emphasis was given to both primary and secondary data. For secondary data documents, sources were employed whereby use of previous documents or materials to support the data received from questionnaires were employed.

### **3.6.1 Questionnaires**

Engel (2005) describes a questionnaire in the context of communication discipline as structured, goal-oriented communication. The main purpose of a questionnaire is to communicate to the respondent what is intended and to elicit desired response in terms of empirical data from the respondents in order to achieve the research objectives (Chandran, 2004). Babbie (1989) observes that questionnaires are more appropriate when addressing sensitive issues, especially when the survey offers anonymity to avoid reluctance or deviation from respondents. Chandran (2004) argues that survey questions fall into two broad categories, depending on the research context; structured (close-ended) or unstructured (open-ended) and disguised or undisguised questions. A structured question is one in which response alternatives are provided whereas an unstructured question does not provide response alternatives for the respondent to choose from. A disguised question employs various means to get at the information. He further argues that such an approach is essential and appropriate when the questions touch on issues that are sensitive or threatening to pose directly. An undisguised question is straightforward and seeks for the desired information.

Some drawbacks of using questionnaires are: a) questionnaires cannot obtain large amounts of information and b) participants may generally refuse to cooperate with a long or complex questionnaire unless they perceive a personal benefit.

The questionnaires were administered to the sample population in the respective routes at Muthurwa bus terminus. Respondents filled in and returned questionnaire on site. The questionnaire captured data on respondents' age, frequency of their use of the terminus, route origin, destination, preferred terminus and recommended improvements in order to gauge the level of commuter satisfaction of the use of Muthurwa bus terminus.



### **3.6.2 Pre -Testing of Questionnaire**

A pre-test according to Robson (2002) is the testing of one's instruments with participants who match the participants to be involved in the actual study. This is vital in ensuring that the respondents understand the questions. Pre-testing enables the researcher to receive important feedback on how questions can be re-worded or restructured to be more effective; poor wording or order of questions; identify errors in the questionnaire layout and instructions; determine problems caused by the respondent's inability or unwillingness to answer the questions; suggest additional response categories that can be pre-coded on the questionnaire; and provide a preliminary indication of the length of the interview and any refusal problems or instructions to skip questions. It can help to see if the respondents understand your questions and give useful answers.

### **3.6.3 Interviews**

An interview is an oral administration of questions with an intention to obtain in-depth enquiry about a certain study so as to meet certain objectives (Kothari, 2004). Interviews provide in-depth information about a particular research issue or question. Since the information is not quantifiable, the interview method often is described as a qualitative research method. Interviews are particularly useful for getting the story behind a participant's experiences.

The interviewer can pursue in-depth information around the topic and are useful as follow-up to respondents to questionnaires, or further investigate their responses (Jack and Norman, 2000). The advantages of in-depth interviews are that they are ideal for investigating personal, sensitive or confidential information, which is unsuitable to cover in a group format. Interviewing is also the best method to apply when seeking for individual interpretations and responses. The disadvantage of in-depth interviews is that the respondent may be unwilling to open up and can be costly in terms of time and the skilled labour required.

### **3.7 Data Analysis and Presentation**

Data in their raw form do not speak for themselves and thus the need for data processing and analysis. Data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study (Yin, 1994). The researcher needs to rely on experience and literature to present the evidence in various ways, using various interpretations. This becomes necessary because statistical analysis is not necessarily used in all studies. This study employed a series of statistical tests that helped in preparation of data to the reader. In qualitative data analysis, content analysis was used which involved looking at emerging patterns. According to Creswell (1998), disadvantages of interviewing such as time consuming, the researcher's presence and participation may bias the responses. They can be compensated with questionnaires and content analysis. Both qualitative and quantitative data were analyzed. The quantitative data findings was presented using descriptive statistics methods namely percentages and frequencies. The qualitative data was discussed qualitatively, using information that emanated from the responses.

The researcher used Statistical Package for Social Sciences (SPSS) to analyze the data and present it. The steps to be followed included coding, editing and data entry among others (Singleton, 1993). First, data entry scheme was prepared in SPSS in accordance with the coding of the questionnaires. Coded questionnaire data was entered into computer environment for analysis.

Both frequencies and descriptive statistics were applied in the analysis of different variables. Related data were also cross-tabulated to establish how they compared. Results of data analysis have been presented through charts and frequency tables in the next chapter.

### **3.8 Ethical Considerations**

Saunders, M. Lewis, P. & Thornhill, A. (2007) defines research ethics as the appropriateness of the researcher's behaviour in relation to the rights of those who become the subject of the research project, or who are affected by it. Throughout the study, the researcher observed appropriate behaviour in relation to the right of commuters within the Muthurwa terminus who participated in the study. Access to persons and information, the data collection and storage, the data analysis and interpretation and the way the report was written was all be done in the way no individual who participated in the research was prejudiced.

Throughout the research, the following principles were observed:

- At the designing stage of the research: The Ministry of Transport officials were duly briefed about the research objectives. At this stage University of Nairobi also provided a request letter to certify the research was solely for academic purpose.
- Data collection stage: At this stage, all the respondents received an introductory brief on the purpose of the research and how the exercise would be conducted through interviews and questionnaires. All data that was collected was anonymous.
- Data analysis: During data processing the anonymity and confidentiality of information continued to be observed and no specific names were mentioned.
- Use of data: The participants were explained that the data from the research may be put in the public domain for a free access.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.0 Introduction

This chapter presents data analysis and discussion of the study findings.

The major objective was to investigate commuter satisfaction with Muthurwa terminus

#### 4.1 Gender and Age of Respondents

A total of 80 respondents were interviewed of which 46% were male and 54% female. Out of the age brackets considered, only 5% were under 20 years and 13% aged 50 years and above. Majority of the commuters at Muthurwa terminus were aged between 20-49 at 82%, table 4.1.1 and 4.1.2 below.

**Table 4.1.1 Gender of the Respondents**

| <b>Gender of Respodent</b> | <b>Frequency</b> | <b>Percentage</b> |
|----------------------------|------------------|-------------------|
| Male                       | 37               | 46                |
| Female                     | 43               | 54                |
| <b>Total</b>               | <b>80</b>        | <b>100%</b>       |

**Source: Research Data 2011**

**Table 4.1.2 Age of the Respondents**

| <b>Age bracket</b> | <b>Frequency</b> | <b>Percentage</b> |
|--------------------|------------------|-------------------|
| Below 20 years     | 4                | 5                 |
| 20 – 29 years      | 22               | 27                |
| 30 – 39 years      | 34               | 42                |
| 40 – 49 years      | 10               | 13                |
| Over 50 years      | 10               | 13                |
| <b>Total</b>       | <b>80</b>        | <b>100</b>        |

**Source: Research Data 2011**

## 4.2 Origins and Destinations

One of the objectives of this study was to determine the major origins and destinations for commuters who use Matatus operating from Muthurwa Terminus. Majority of commuters (35%) came from Kayole, followed by 17.5% who came from Umoja. Another 12.5% of the Commuters came from Embakasi. Other points of origin included Buruburu, Dandora, Donholm, and Lungalunga. Commuters who use matatus relocated from city centre to Muthurwa terminus reside in heavily populated eastern estates of Nairobi. Table 4.2.1 and 4.2.2 illustrates origins and destinations of commuters using Muthurwa terminus.

**Table 4.2.1 Points of Origin**

| <b>Point of origin</b> | <b>No. Of Commuters</b> | <b>Percent (%)</b> |  |
|------------------------|-------------------------|--------------------|--|
| Kayole                 | 28                      | 35.0               |  |
| Umoja                  | 14                      | 17.5               |  |
| Embakasi               | 10                      | 12.5               |  |
| Buruburu               | 8                       | 10.0               |  |
| Dandora                | 8                       | 10.0               |  |
| Donholm                | 8                       | 10.0               |  |
| Ruai                   | 2                       | 2.5                |  |
| Lungalunga             | 2                       | 2.5                |  |
| <b>Total</b>           | <b>80</b>               | <b>100.0</b>       |  |

**Source: Research Data 201**

### 4.2.2 Commuter Destinations

The major destination for commuters using Muthurwa terminus was City centre (37%), followed by Community area (20%) and Westlands (12%). Ngong Road and Langata Road had 10% each. Table 4.2.2 and figure 4.1 clearly illustrates this.

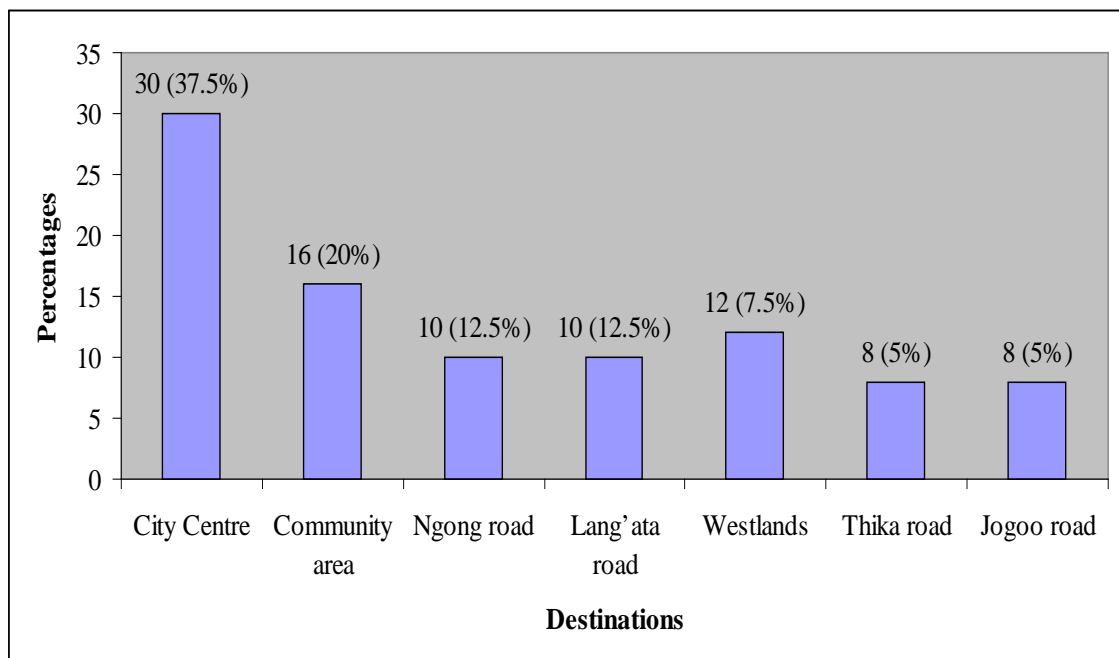
As discussed in theoretical frame work, a place has to have trip attractions to make those travelling target it as a destination. Less than 2% indicated they were satisfied with Muthurwa Terminus.

**Table 4.2.2 Commuter Destinations**

| <b>Destination</b> | <b>Frequency</b> | <b>Percentage</b> |
|--------------------|------------------|-------------------|
| City Centre        | 30               | 37.5              |
| Community Area     | 16               | 20.0              |
| Ngong Road         | 10               | 12.5              |
| Langata Road       | 10               | 12.5              |
| Westlands          | 6                | 7.5               |
| Thika Road         | 4                | 5.0               |
| Jogoo Road         | 4                | 5.0               |
| <b>Total</b>       | <b>80</b>        | <b>100</b>        |

**Source: Research Data 2011**

**Figure 4.1 Commuter Destinations**



**Source: Research Data 2011**

### 4.3 Travel Means Commuters used from Muthurwa to CBD

It was established that majority of commuters walked to CBD (55%)

**Table 4.3 – Means of Transport to CBD**

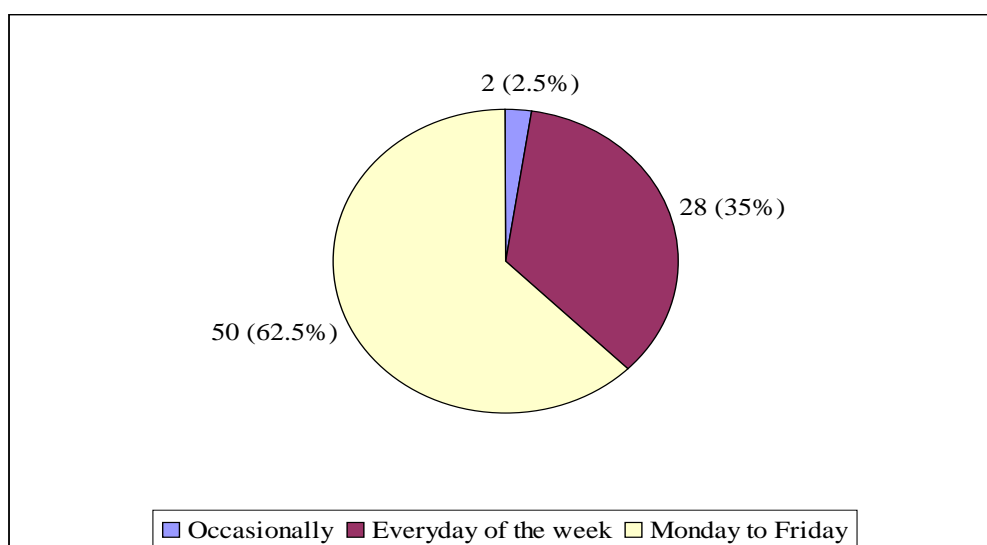
| Means of transport | Frequency | Percentage   |  |
|--------------------|-----------|--------------|--|
| Walk               | 44        | 55.0         |  |
| Shuttle bus        | 30        | 37.5         |  |
| Motor cycle        | 4         | 5.0          |  |
| Tuktuk             | 2         | 2.5          |  |
| <b>Total</b>       | <b>80</b> | <b>100.0</b> |  |

**Source: Research Data 2011**

### 4.4 Frequency of Muthurwa Terminal Usage by Commuter

Majority of the commuters (62.5%) indicated they the terminus from Monday to Friday, 35% used it daily while 2.5% used it occasionally basis (figure 4.2). This could reflect commuters being office employees who commute on week days and not weekends.

**Figure 4.2 Frequency of use of Muthurwa terminus**

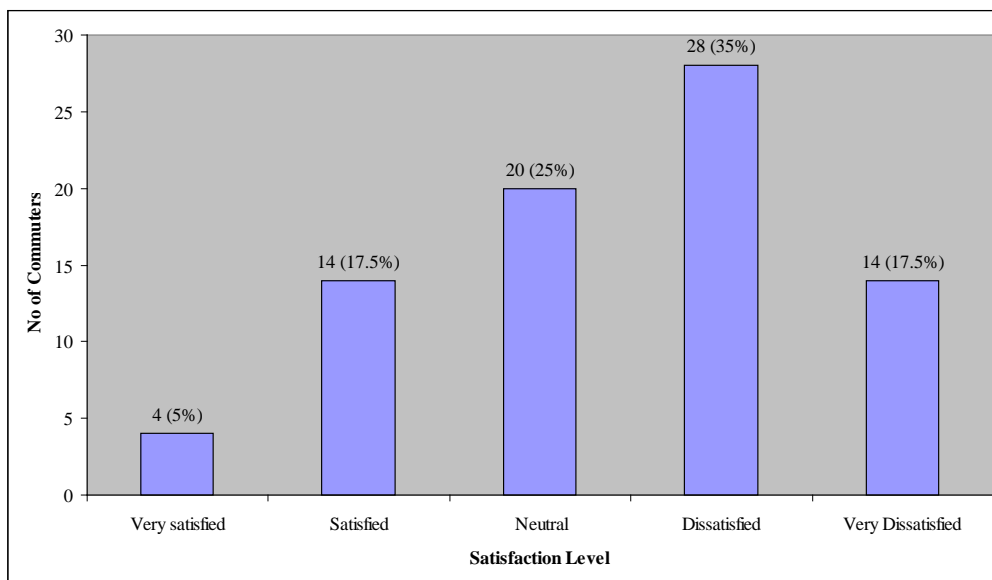


**Source: Research Data 2011**

#### 4.5 Commuter Satisfaction

People make several trips in a day for different reasons such as work, school or college attendance, recreation, and shopping among others. The composition of the family, their income level, age, access to a private car or not, all influence public travel demand. Having established that only 1% of the commuters are destined for Muthurwa, how then does the 99% of the commuters with destination to city centre and beyond get to their final destinations?

**Figure 4.3 Commuters' levels of satisfaction**



**Source: Research Data 2011**

Figure 4.3 shows 53% of surveyed commuters were dissatisfied with the terminus. 25% were neutral while 22% were satisfied at Muthurwa Terminus. This implies that the large proportions of commuters who use Muthurwa terminus are not satisfied with it because it was not their destination. Public transport policy makers and planners require commuter perspective while making such changes.

The changes should meet and satisfy commuters travel needs which would encourage them to use public means of travel. However transport planning is a political, social, economic and environmental process whose dynamism may not cover all those affected. Parking policies, land use planning, where people choose to live, housing prices, working hours, among other factors have a bearing in transport planning.



#### **4.5.1 Satisfaction Versus Gender and Age factor**

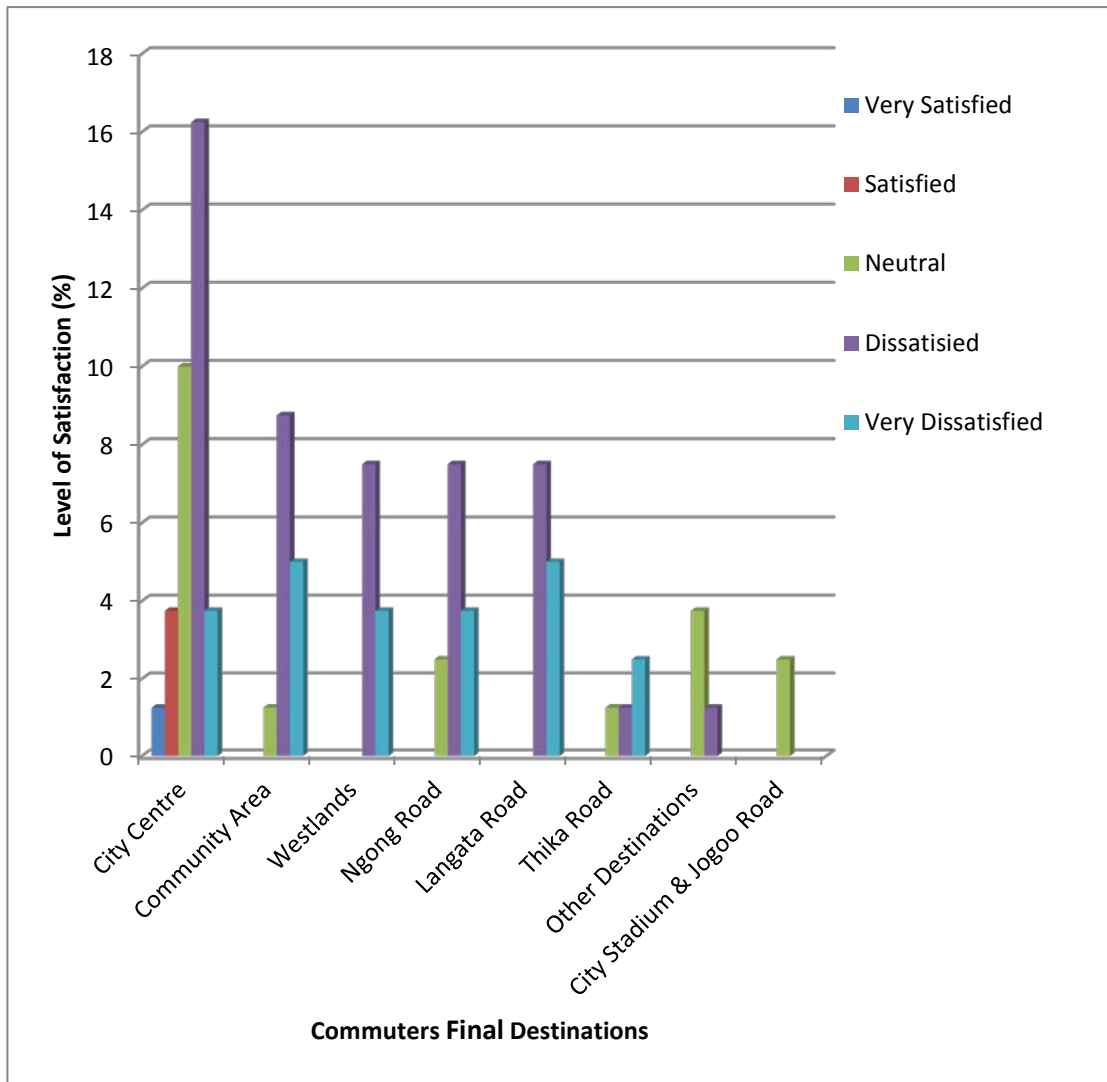
An investigation on how satisfaction level was affected by the commuters' sex, age, destination and frequency of travel was analyzed. This was done through cross tabulation of data. Female commuters were more dissatisfied by the use of Muthurwa than their male counterparts. The age group of between 30-39 and 40-49 who also happen to form majority of those who commute to town Monday to Friday, were quite dissatisfied by the use of Muthurwa.

#### **4.5.2 Satisfaction against commuter destination**

In terms of destination, the commuters destined for city centre and beyond were particularly dissatisfied by being dropped at Muthurwa.

The issues raised were high total cost, more time taken and connectivity to their final destinations. This research established that a small group of commuters (1%) whose destination was Muthurwa were satisfied by the use of the terminus.

**Figure 4.4: Commuters' Level of Satisfaction against respective Destinations**



**Source: Research Data 2011**

#### 4.6 Preferred Location of Matatu Terminus

Majority of commuters were not satisfied with the terminus. Analysis of their responses to the question of their preferred location for a terminal is shown in table 4.4 below.

**Table 4.4 Preferred Location of Matatu Terminus**

| <b>Preferred location</b> | <b>No. of Commuters</b> | <b>Percent</b> |  |
|---------------------------|-------------------------|----------------|--|
| City centre               | 48                      | 60.0           |  |
| Bus station               | 20                      | 25             |  |
| Across to Westlands       | 4                       | 5.0            |  |
| Across to KNH             | 2                       | 2.5            |  |
| Muthurwa                  | 2                       | 2.5            |  |
| Railways                  | 2                       | 2.5            |  |
| Community centre          | 2                       | 2.5            |  |
| <b>Total</b>              | <b>80</b>               | <b>100.0</b>   |  |

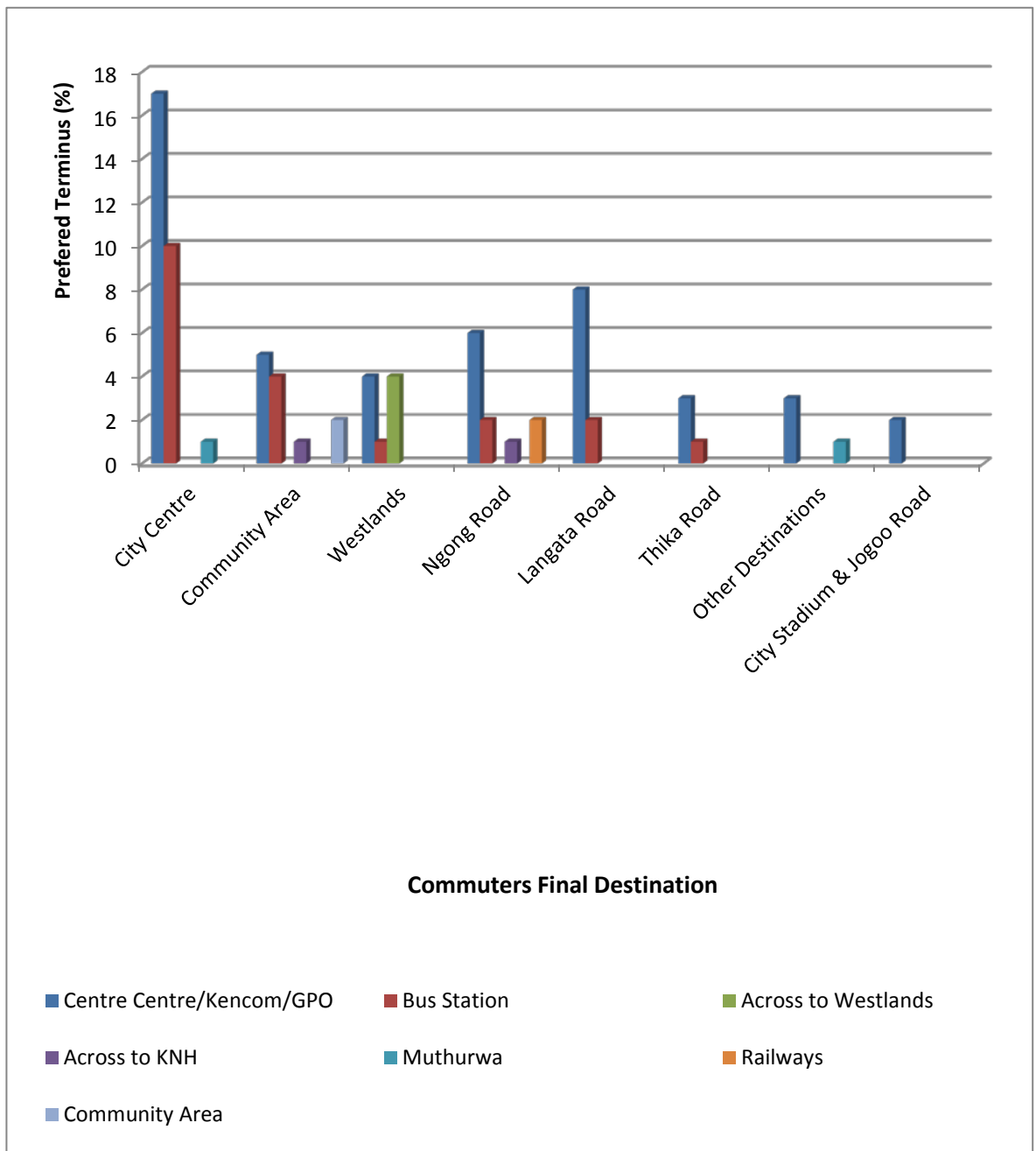
**Source: Research Data 2011**

The table shows that majority 60% of the commuters preferred matatu terminus located in the city centre. 25% preferred to have it at the central bus station which is also in Central Business District. Other preferred locations included Westlands, KNH, Railways and Community area. It is notable that only 1% of the commuters preferred the current location at Muthurwa.

Majority of the commuters indicated that they had issues with congestion, security and lighting at the Terminus. While commuters used the terminus, they did not think the location was the best place. Improvement issues raised by commuters were provision of public transport services that got them to the city centre, public transport vehicles that run across the city and de-congesting Muthurwa terminus.

Since the destination of commuters influenced their preferred location of a terminal, this study performed a cross tabulation analysis between commuters preferred location of terminus and the respective final destinations.

**Figure 4.5: Commuters' Preferred Location of Terminus against Destination**



**Source: Research Data 2011**

From figure 4.5 commuters destined for various parts of Nairobi, Kenya Commercial Bank Bus Stop, popularly known as KenCom and General Post Office Bus Stop, popularly known as GPO were the most preferred terminus within the city centre.

Such locations are strategic for connecting to vehicles proceeding to many other parts of the city without walking for long. Central Bus Station (formerly Kenya Bus Station) followed in preference by commuters to various destinations. It is the oldest transport interchange hub for city routes.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter covers the summary of study findings on the research project “An Investigation on Commuter Satisfaction in the use Muthurwa Terminus Nairobi Kenya”. It also covers conclusions, recommendations and suggestions for further studies.

#### 5.2 Summary of Research Findings

The study established that majority of commuters (35%) had Kayole estate as their trip origin. 17.5% had Umoja Estate as their trip origin and 12.5% had trip origin as Embakasi Estate. Other points of origin included Buruburu, Dandora, Donholm and Lungalunga. On gender the study established that 54% of commuters were female while 46% were male. On age, 80% were 20 – 49 years with few commuters below 20 years or above 49 years. The study established that most commuters went beyond the city centre 62% while those to the city center were 37%. Only 1% had Muthurwa as their destination. Commuters who alighted at Muthurwa terminus walked city centre.

It was observed that those who used other means to get to the CBD such as shuttle buses, motor cycles and tuktuks alighted along Ladhies Road where such means were available before the vehicle got to the terminus

On frequency the study established that 62.5% of commuters used Muthurwa terminus Monday to Friday, 35% every day of the week and 2.5% on occasionally.

The study established that 53% of commuters were dissatisfied using Muthurwa terminus, 25% indicated they were neutral while 22% indicated they were satisfied. The study established that 60% of commuters prefer a terminus located in the city centre, 37% other areas. A small group preferred the current location of Muthurwa terminus 3%.

### **5.3 Conclusions**

**Based on the study findings, the following are major conclusions;**

Most commuters are not satisfied with use of Muthurwa terminus, 53%. It is not their preferred location for terminus 99%. More female commuters use the terminus 54% compared to 46% male.

Over 95% of commuters were in the age bracket 20-49 years. Destinations of commuters using Muthurwa bus terminus are city centre and beyond. Walking is the major mode of travel by commuters to CBD from Muthurwa terminus. Use of Muthurwa bus terminus does not meet the travel need of commuters in terms of access to jobs, commerce, industry and services.

Muthurwa terminus is congested; commuters do not feel secure as it is poorly lit and filthy. Journey cost in time and money increased for those whose destinations were beyond city centre. This has an impact on productivity due to fatigue and related travel stress. Access to public means that get workers to their destinations is important in getting productive workers.

### **5.4 Recommendations**

#### **5.4.1 Policy Makers Recommendations**

- 1) Urban Transport planners establish commuter travel needs in a particular area before relocating their public service vehicles.
- 2) Interconnectivity should be considered in future when deciding on a terminal location. Terminals act as transport hubs in meeting needs of commuters destined to different areas within and outside the city.
- 3) In Nairobi, a cross-city public transport service to Ngong Road and Westlands from the eastern residential areas should be provided.

#### **5.4.2 Planners Recommendations**

1. Muthurwa Terminus should be decongested and improved by expanding the roads and enforcing discipline among vehicles operators.
2. Security should be improved at the Muthurwa Terminus by improving the lighting system.
3. The environment should be protected by enforcing proper garbage collection and cleanliness.

#### **5.4.3 Scholars Recommendations**

1. A study on satisfaction levels by Matatu operators at Muthurwa Terminus.
2. A study on satisfaction levels by commuters using other terminals relocated from CBD such as Westlands and Ngara.
3. A study of time taken walking to the city centre and other destinations from muthurwa and their implications to productivity.
4. A study on characteristics of residential areas where most of the commuters originated.



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## APPENDICES

### APPENDIX I

#### COMMUTERS QUESTIONNAIRE

This research is for academic purpose. Kindly provide answers to the questions as honestly as possible. Responses to the questions will be treated as confidential. Do not write your name anywhere. Kindly tick ( ) in the box that reflects your choice or fill in the required information in the space provided. Thank you.

1. Please indicate your gender

Male [ ] Female [ ]

2. Please Indicate your Age

Below 20 Years [ ] Between 20-29 [ ]  
Between 30-39 [ ] Between 40-49 [ ]  
50 and Above [ ]

3. My trip starts from:

Kayole [ ] Umoja [ ] Buru Buru [ ]  
Embakasi [ ] Dandora [ ] Donholm [ ]

Other, please specify .....

4. My destination is:

City Centre [ ] Community area [ ]  
Westlands [ ] Ngong Road [ ]  
Lang'ata Road [ ] Thika Road [ ]

Other, please specify .....

5. I use Matatus that terminate at Muthurwa

Every day of the week [ ]

Monday to Friday [ ]

Saturday and Sunday [ ]

Other, please specify .....

6. I am satisfied using Matatus that terminate at Muthurwa Terminus

Very Satisfied [ ] Satisfied [ ] Neutral [ ]

Disatisfied [ ] Very Disatisfied [ ]

7. I travel to Muthurwa in:

Nissan Matatu [ ] Big Bus [ ] MinibusTuk Tuk [ ]

Other, specify.....

8. From Muthurwa to the city centre, I use

Shuttle Bus [ ] Bicycle [ ]

Motor cycle [ ] Tuk Tuk [ ]

Other, specify.....

State where you would prefer your terminus.

.....  
.....

**APPENDIX II**

**INTERVIEW SCHEDULE**

1. What are the advantages of Commuters using Matatus at Muthurwa Terminus?

- (i) .....
- (ii) .....
- (iii) .....
- (iv) .....

2. Do Commuters give any feedback over the use of Muthurwa Terminus?

Yes [ ] No [ ]

3. If yes to question two, what issues do they raise?

- (i) .....
- (ii) .....
- (iii) .....

4. What suggestions would you give to improve services provided to Commuters who use Muthurwa Terminus but their trip end is beyond Muthurwa?

- (i) .....
- (ii) .....
- (iii) .....

(iv) .....

.....

(v) .....

.....