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***'Boda boda'* bicycle taxis and their role in urban transport systems: Case studies of Nakuru and Kisumu, Kenya**



A 120-credit dissertation presented by
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In partial fulfilment of the degree of

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at the
UNIVERSITY OF CAPE TOWN

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DECLARATION

I hereby declare that this dissertation is my own work and has never been submitted in any other institution for any purpose whatsoever. Where assistance was sought from people or information was obtained from any source the parties or information has been rightfully acknowledged or clearly referenced accordingly.

This work is being submitted for a Master of Science in Engineering at the University of Cape Town.

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ABSTRACT

This dissertation reports on an investigation into the role played by '*boda boda*' in urban transport systems in Kenya. A '*boda boda*' is a bicycle taxi which transports both passengers and goods. The bicycle taxi has a padded cushion fitted onto a reinforced rear seat; typically removed when transporting goods. The research aimed, firstly, to understand the operating characteristics of, and challenges facing, '*boda boda*' services, and secondly, to explore the measures that might be formulated by the concerned authorities to manage and support them. With regard to the latter aim, given the growth in motorcycle taxis at the expense of bicycle taxis elsewhere in the region, the research sought to make a recommendation on whether authorities should embrace or resist this trend. In order to achieve these research objectives, case studies were carried out in Kisumu and Nakuru, both of which have many '*boda boda*' operating in them relative to other Kenyan cities and towns.

The study involved a survey of '*boda boda*' operators (n=250 in Kisumu, n=250 in Nakuru) as well as interviews with officials from local authorities. The study found that '*boda boda*' provide 'for hire' services to all parties willing to pay the stipulated fare, from a 'stage' (pick up point) along many routes within the urban areas. It was found that '*boda boda*' occupy identifiable market niches with respect to the types of services provided and passengers served; namely short distance (<1 km) trips, off-road trips where vehicles cannot go, and work trips. It was found that, on average, '*boda boda*' charge lower fares than the alternative modes (buses, *matatus*, *tuk tuks* and motorcycle taxis) for equivalent trips. Owner operators were found to earn more than hiring operators. It was also found that '*boda boda*' operations provide a direct livelihood for many people, and indirectly to even more people employed by support services. On average, operators supported three dependants.

Literature review and interviews with operators and local authority officials revealed that there were no *de jure* bicycle taxi regulations or support measures applied in either Nakuru or Kisumu. It is argued that the responsible authorities should formulate and implement measures to regulate and support '*boda boda*'. It is recommended that these measures should take the form of: the formulation of a non-motorised transport policy; the construction of shared bicycle lanes on strategic routes to support safe and efficient '*boda boda*' operation; the promulgation of by-laws to manage bicycle lane use and to enforce safe operating practices; the introduction of insurance cover for '*boda boda*' operators; and promotion of '*boda boda*' operator association membership to facilitate democratic representation in negotiations with authorities.

The observed (but largely unquantified) increase in motorcycle '*boda boda*' operations in the case towns, at the expense of bicycle '*boda boda*' market share, is a cause for concern. It is recommended that this trend should be resisted with clear evidence-based policies, particularly with respect to the niche market bicycle taxis currently serve, on the grounds that motorcycle taxis produce greater tailpipe and life-cycle emissions, have poor safety records, and have higher market entry costs which diminishes poverty alleviation benefits.

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SUMMARY

'*Boda boda*' bicycles started their operations in Kenya in the 1960's in Busia town (located at the Kenya and Uganda border). From here the bicycle taxis spread to other rural and urban areas in both countries, though at different rates. Initially they were used to smuggle goods across the border but in time they transformed into an informal 'for hire' type of transport services catering largely for passenger needs.

Based on observations carried out prior to the research on the '*boda boda*' bicycle taxi operations (not supported by quantitative data) it appeared that they provide unique and essential informal transport services. They appeared to provide valuable, highly accessible and environmentally friendly transport services particularly in urban areas, but seemed to operate without support from the national or local transport authorities, and have been left to establish their own operational rules. Although the authorities had the legal capacity to manage the bicycle taxi operations within their areas of jurisdiction it appeared that they had failed to put in place the mechanisms required to manage bicycle taxi operations. Conflicts with other road users sometimes resulted in the local authorities banning the bicycle taxis from providing services to some parts of the urban areas without considering the service they provide to users.

The purpose of this research was to investigate the role played by '*boda boda*' bicycle taxis in urban transport systems in Kenya. It aimed, firstly, to understand the operating characteristics of, and challenges facing, '*boda boda*' services, and secondly, to explore the measures that might be formulated by the concerned authorities to manage and support them. With regard to the latter aim, given the growth in motorcycle taxis at the expense of bicycle taxis elsewhere in the region, the research sought to make a recommendation on whether authorities should embrace or resist this trend. In order to achieve this, two main questions relating to '*boda boda*' bicycle taxi operations needed to be answered. The first asked what role the '*boda boda*' bicycle taxis play in urban transport systems. The answer to this provided an in-depth understanding of the operating characteristics of the bicycle taxis, the types of services they provide, the market niche they serve, their impact on socio-economics and the regulatory and support measures that were in place to manage them. The second question asked what policy measures the transportation authorities should formulate in response to the information revealed about operations of the '*boda boda*' bicycle taxis. The answer to this question provided the basis on which the measures required to be formulated by the relevant transport authorities were recommended.

Chapter 1 of this dissertation outlines the motivation for the research, research question, research objectives, selection and description of case study areas, the emerging threat on '*boda boda*' bicycle taxis, and the organisation of the document. In order to obtain data that would be used in the development of recommendations for this study, three research strategies were formulated. The three strategies used were a review of previous studies carried out on 'for hire' bicycles in Kenya, the rest

of Africa and the World, the development of tools to collect and analyse data on 'boda boda' operations and challenges, and interviews with local authority officials from the case study towns of Nakuru and Kisumu.

The review of literature from previous studies of 'for hire' bicycles is presented in chapter 2. The literature review was intended to identify what was already known about the bicycle taxis in order to identify gaps in knowledge of 'boda boda' bicycle taxi operations that needed to be filled; methods that were previously used to obtain information on the bicycle taxis with or without success; and the regulatory framework that warranted consideration in Kenya. The literature review focused on two key questions. The first question is:

(i) What role do 'boda boda' bicycle taxis play in urban transport systems?

To address this question an in-depth review was undertaken of the available literature on the operating characteristics of 'for hire' bicycle taxis, types of transport services provided by the bicycle taxis, market niche served and impact of the bicycle taxis on socio-economics.

A search for available literature on 'boda boda' bicycle taxi operations in Kenya revealed that few major studies have been carried out on the bicycle taxis but some minor studies were carried out for articles published in popular media. These studies could not provide adequate information to address the research question. The search however found that some major studies were carried out on the cycle taxis in Uganda and other parts of the world. The literature review obtained from those studies found that 'for hire' bicycles (tricycles) provide services for various trip purposes and lengths, the majority of which were short distance trips and on average charged lower fares than the alternative modes for equivalent trips. The study revealed that bicycle taxis provide area wide transport services and serve market niches. The results also revealed that there were a large number of people directly and indirectly employed by the bicycle taxi industry. The second question is:

(ii) What bicycle taxi regulatory and support measures are in place?

To answer this question a review of the regulatory measures used in various places to regulate 'for hire' bicycle taxis was carried out. The regulatory measures that were specifically reviewed were those relating to by-laws passed and enforced by local authorities or police and those relating to 'for hire' bicycle operations which are enforced by the associations.

The review suggested that no bicycle taxi regulatory and support measures were in place in either Nakuru or Kisumu towns. It was also found that Kenya (as well as the rest of Africa) lacked comprehensive policies to manage 'for hire' bicycles. Some local authorities in Europe, Asia and America however had some qualitative and quantitative regulatory frameworks in place to manage rickshaws and pedicabs.

In summary; the literature review established that there were gaps in knowledge of 'boda boda' bicycle taxi operations in Kenya regarding the operating characteristics, types of transport services they provide, market niche they serve, their impact on socio-economics as well as regulatory measures required to manage them. Based on those findings it was concluded that there was a need to

carry out a study in Kenya, particularly in Kisumu and Nakuru where bicycle taxis are commonly used. Interviews with '*boda boda*' operators and local authority officials were identified as the most appropriate method to obtain the required information.

The research method adopted in carrying out this research is presented in chapter 3. The chapter is based on three main questions which include:

(i) What are the methods required to carry out this research?

This question aimed at identifying the issues to be addressed before the research commenced. The first task was to define the role of the researcher in the study at all stages. The second task was to formulate the activities required to prepare the survey instruments. The literature review was used to inform the design of the survey instruments.

(ii) How will the research be designed?

The research design was comprised of the pilot survey and the main data collection survey. The purpose of the pilot survey was to test the survey instruments and assist in sample design. After testing the survey instruments, adjustments were made to accommodate the findings of the pilot survey. The adjusted research instruments together with the ethics form were submitted for approval to the Faculty Ethics Committee and were approved.

(iii) How will the data be collected and analysed?

The survey involved collection of both quantitative and qualitative data. Quantitative data was randomly obtained from the bicycle taxi operators from selected '*boda boda*' bicycle taxi stages in Nakuru town and Kisumu city using questionnaires. The quantitative data was entered into a database and analysed using Microsoft Excel. Qualitative information relating to the bicycles taxi operations was obtained through personal interviews with local authority officials using questionnaires.

Chapter 4 presents the results obtained from analysis of data collected in this study. The data analysis was carried out based on various queries in line with the research objectives but mainly focused on answering the following questions:

- What are the '*boda boda*' bicycles operating characteristics?
- What type of transport services do '*boda boda*' bicycles provide?
- What market niche do the '*boda boda*' bicycles serve?
- What is the socio-economic impact of '*boda boda*' bicycles?
- What regulation of and supports for '*boda boda*' bicycle taxis are in place?

The results obtained from the data analysis are presented in tabular format. The results show that on average each bicycle taxi made about 15 trips per day most of which were short distance trips and worked for an average of 12 hours per day. It was also established that the bicycle taxis provide area wide transport services and they serve market niches which included short distance trips not exceeding one kilometre long, off-road trips where vehicles cannot pass, and work trips. Additionally the bicycle taxi industry in both Nakuru and Kisumu towns directly provided employment

opportunities for about 16,000 people and supported the livelihood of many others. However the local authorities failed to formulate a regulatory framework to manage the bicycle taxi operations.

Chapter 5 presents the discussion of the results obtained in the data analysis. This chapter provides an in-depth discussion of the results obtained in order to identify the implications of the results on the research objectives. Further the discussion aimed to provide the basis for drawing conclusions from the study. The data obtained revealed that ‘*boda boda*’ bicycle taxis account for a significant share of the passenger and goods trips in both Kisumu and Nakuru towns with a total of about 240,000 trips per day, most of which are short distance trips. On average, work trips had the largest share of all trip purposes with 65% and other trips shared the remaining 35%. Overall owner operators earned more money per day than the hiring operators whereas operators in Nakuru town earned more per day than the operators in Kisumu city. Over 90% of the operators in both Kisumu and Nakuru towns were aged between 18 and 32 years and supported an average of three dependants.

The bicycle taxis provide an area-wide type of transport service where they operate from a ‘stage’ (pick up point) and are hired from there to take passengers to other places within the town.

In both Nakuru and Kisumu towns the study revealed that the bicycle taxis served certain market niches. The niche served, based on the categories analysed and presented as averages for both towns, include off-road trips in areas impassable by vehicular modes which accounted for 37%, women users who accounted for 55%, work trips which accounted 65%, users aged between 31 and 55 years who accounted 40%, and short distance trips which accounted for 79%.

Most bicycle taxi operators in Nakuru town were members of a registered ‘*boda boda*’ operators’ association but all the operators interviewed in Kisumu city were not members of a registered association. The operators however wanted the government to support them by formulating operating policies and underwriting loans to buy good quality bicycles or motorcycles, while the non-governmental organisations or private sector should support them with loans to buy good quality bicycles or motorcycles and provide training on basic management skills to improve their business skills.

Chapter 6 presents the conclusions drawn from the research and based on the research questions presented in chapter 1 of this dissertation. The conclusions drawn in this chapter were based on the findings of the literature review as well as those drawn from the data analysis. The results presented in chapter 5 revealed that the bicycle taxis play an important role in urban transport systems where they provide transport to a given market niches which could suffer if the bicycles ceased to operate. The bicycle taxis also provide direct and indirect employment opportunities to many people in areas where they operate and support the livelihoods of dependants of the people employed directly and indirectly by the industry. This shows that they play an important role in urban transport systems and therefore need to be promoted. The literature review also established that there were no *de jure* bicycle taxi regulatory and support measures in Nakuru and Kisumu towns as well as nationally.

The first recommendation based on the findings of this study is that the Ministry of Public Works should formulate a national non-motorised transport policy. This would provide harmonized directives to all local authorities in relation to non-motorised transportation in general and ‘*boda boda*’ bicycle taxis in particular. The national authority should formulate measures to support and promote the industry not only to create jobs but to support this sustainable mode of transport.

The second recommendation suggested by the findings of this study is that the local authorities should formulate by-laws at the local level in line with the national policy objectives to manage and support the bicycle taxi operations for the benefit of all stakeholders. This would ensure that the bicycle taxi operations are carried out in a structured way to promote the services.

The third recommendation arising from the findings is that the local authorities should provide dedicated bicycle lanes along roadways serving large volumes of ‘*boda boda*’ passengers. This would reduce the conflicts that occur between the bicycle taxis and the vehicular traffic and thus minimize the dangers associated with competition for road space with vehicular traffic.

The fourth recommendation in respect to the findings of this study is that all local authorities should formulate measures to ensure that all the bicycle taxi operators take insurance covers for their operations. The bicycle taxi associations can negotiate with insurance firms for provision of group cover for its members.

The fifth recommendation in view of the findings of this study is that all the ‘*boda boda*’ bicycle taxi operators should be members of a registered bicycle taxi association. This would ensure that the bicycle taxi operators are democratically presented when dealing with the local authorities or other agencies on all matters relating to the bicycle taxis.

The sixth recommendation in view of the findings of this study is that the bicycle taxi operators should be encouraged to switch from bicycles to higher capacity modes such as pedicabs. Such action can increase their earnings per day because the pedicabs provide transport services to a minimum of two passengers per trip and that would mean double the amount earned using the bicycle.

The observed (but largely unquantified) increase in motorcycle ‘*boda boda*’ operations in the case towns, at the expense of bicycle ‘*boda boda*’ market share is a cause for concern. It is recommended that this trend should be resisted with clear evidence-based policies, particularly with respect to the niche market bicycle taxis currently serve, on the grounds that motorcycle taxis produce greater tailpipe and life-cycle emissions, have poor safety records, and have higher market entry costs which diminishes poverty alleviation benefits.

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1. INTRODUCTION

1.1 Motivation for the research

'*Boda boda*' bicycles started operating in Kenya in the 1960's in Busia town (Malmberg-Calvo, 1994), located at the Kenya and Uganda border. From there the bicycle taxis spread to other rural and urban areas in both countries, albeit at different rates. Initially they were used to smuggle goods across the border but in time they transformed into an informal 'for hire' type of transport service catering largely for passenger needs. To date they have been informally integrated and accepted as part of the country's transport systems. In some areas the bicycle taxis are the only readily available modes of transport (Maino, 2002).

Based on observations carried out prior to the research on the '*boda boda*' bicycle taxi operations (not supported by quantitative data) they appeared to provide unique and essential informal type of transport services. However it seemed that the relevant transport authorities had ignored them by leaving them to set their own operational rules. Thus this research was motivated by the need to promote the bicycle taxis which appeared to provide essential, highly accessible and environmentally friendly transport services, particularly in urban areas, but seemed to operate without support from the national or local transport authorities. Although the authorities had the legal capacity to manage bicycle taxi operations within their areas of jurisdiction it appeared like they had failed to put in place the required mechanisms to manage bicycle taxi operations. Conflicts with other road users sometimes resulted to the local authorities banning the bicycle taxis from providing services to some parts of the urban areas without considering impact on the users (The Nation, 2006).

In Kenya a large number of youth graduate from schools at different levels of education every year to join the labour market. However the labour market appears incapable of supplying adequate jobs to match the demand, resulting in an unemployment rate of about 40% (CIA World Fact Book 2009). Therefore through developing measures to increase the utilisation of bicycle taxis, the '*boda boda*' industry would provide increased employment opportunities to the unemployed youths. '*Boda boda*' bicycle taxis also provide a form of sustainable transport service which causes little or no damage to the environment. The bicycle taxi services appear to be highly accessible and affordable to most low income earners in the rural and urban areas in which they operate. Thus promoting the '*boda boda*' bicycle transportation services would provide triple benefits of providing affordable intermediate transport services, creating employment opportunities, as well as limiting carbon emissions.

Observation of traffic conditions in major urban areas in Kenya by the researcher (not supported by data) particularly during the peak periods showed that the demand for space in the roadways exceeded the available space as witnessed by traffic congestion during peak periods. Promoting non-motorised transport and in particular '*boda boda*' bicycle taxis would provide one

avenue through which the problem could be addressed. To effectively promote the utilisation of the 'boda boda' bicycles however, a number of problems faced by the 'boda boda' industry need to be overcome. The most important would be the recognition of the role played by the bicycle taxis in the transport systems by the relevant transport authorities. This would create an environment where all the stakeholders in the industry clearly understand their roles, thus minimizing the conflicts between them.

Based on the foregoing the problem therefore is to establish and evaluate the role played by 'boda boda' bicycle taxis in urban transport system in Kenya and explore the measures that are required to be formulated by the relevant transport authorities in the country to manage and promote the role.



Figure1.1: 'Boda boda' bicycle taxi carrying a passenger (Odinga Odinga road), Nakuru

1.2 Research questions

Based on the research problem identified in the previous section, two research questions were formulated: (1) What role do 'boda boda' bicycle taxis play in urban transport system in Kenya, and (2) what policy measures should the transport authorities in the country formulate in response to revealed operational challenges facing 'boda boda' bicycle taxis?

To answer these questions a critical analysis of the 'boda boda' bicycle taxis operations was carried out to obtain detailed information on the services provided by the bicycle taxis and whether there are any regulatory measures formulated by the relevant authorities to manage them. To obtain

the required information necessary to form meaningful conclusions, the relationship of bicycle taxi operators to the other stakeholders within the transport sector needed investigation. In order to answer the two research questions, responses to the following sub-questions had to be provided:

- (i) What are the operating characteristics of 'boda boda' bicycle taxis?
- (ii) What type of transport services do 'boda boda' bicycle taxis provide?
- (iii) What market niches do 'boda boda' bicycle taxis serve?
- (iv) What is the impact of 'boda boda' bicycle taxis on socio-economics?
- (v) What are the measures that have been put in place by the relevant authorities to regulate and support 'boda boda' bicycle taxi operations?

1.3 Description of case study areas

While this study aimed to determine the role played 'boda boda' bicycle taxis in urban transport systems in Kenya it was found difficult in terms of time and cost to carry out the research in all of the urban areas in the country where the bicycle taxis were operating. It was therefore decided that use of case studies was the most suitable method to carry out the study. A detailed search in the urban areas where the 'boda boda' bicycle taxis are commonly used identified Kisumu city and Nakuru town as the most suitable urban areas to carry out the study. This was mainly because of the following:

- (i) Kisumu city and Nakuru town both had a high numbers of 'boda boda' bicycle taxis operating in their streets.
- (ii) 'Boda boda' bicycle taxis operations and management in Nakuru town was better organised than those in Kisumu city according to a pilot survey carried out prior to this study. Thus potentially interesting comparison would be facilitated.

Nakuru town lies about 160 kilometres north-west of Nairobi, the capital city of Kenya. It is located along the Northern transport corridor which links Uganda, Rwanda, Burundi, Ethiopia, Southern Sudan and Eastern parts of Democratic Republic of Congo to the port of Mombasa. It was founded in 1904 (UN-Habitat, et al, 2003). It lies between Menengai crater and Lake Nakuru. Nakuru town covers an area of 102 square kilometres. According to the 1999 National population census the population of the town was about 300,000 people. However a census carried out in 2003 in the town gave a population of about 360,000 people with a growth rate of 7% per annum (UN-Habitat et al, 2003) and the current population would be about 575,000 people at this rate of growth. Economic activities in Nakuru town are mainly agriculture and tourism related. Nakuru town is the provincial capital of Rift valley province and serves 34 districts which make it the largest province in Kenya.

Passenger transport in Nakuru town is mainly provided by minibus taxis (*matatus*) and 'boda boda' bicycle taxis. Metered taxis, tricycle taxis (*tuk tuk*) and motorcycle taxis also provide transportation services but there are few of them compared to the number of minibus taxis (*matatus*) and 'boda boda' bicycles. Buses in Nakuru town provide long distance transport services between the

town and other urban or rural areas. Both the minibus taxis (*matatus*) and the '*boda boda*' bicycle taxis are privately owned but have highly fragmented ownership.

'*Boda boda*' bicycle taxis started their operations in Nakuru town in 2003 (The Nation, 2006). Thereafter they rapidly increased in number and, according to the town planning department of the Nakuru Municipal Council, the '*boda boda*' bicycles accounted for about 50% of all the trips made in the town other than those made on foot. However no information relating to the modal split in the town was available from the Nakuru Municipal Council.

Kisumu city lies on the eastern shore of Lake Victoria approximately 400 kilometres north-west of Nairobi. It is located along the transport corridor which links the great lakes region comprising of Uganda, Rwanda, Burundi and some parts of Tanzania to the port of Mombasa. Kisumu city was founded in 1901 and to date it is the third largest city in Kenya covering an area of about 297 square kilometres (Makajuma, 2006). According to the 1999 national population census the town had a population of about 200,000 people with a growth rate of 2.8% (Makajuma, 2006). However a survey carried out in 2001 gave the population as 360,000 people with a growth rate of 2.8% (Central Bureau of Statistics, 2001) and the current population would be about 480,000 people at this rate of growth. Economic activities in Kisumu city are mainly agriculture related. Kisumu city is the provincial capital of Nyanza province and serves as the provincial headquarters for twelve districts.

Passenger transportation in the town is mainly provided by minibus (*matatus*) and '*boda boda*' bicycle taxis. Buses provide long distance transport services between Kisumu city and other urban and rural areas. Minibus taxis (*matatus*) and the '*boda boda*' bicycle taxis in Kisumu city are privately owned but with highly fragmented ownership. Other passenger transport modes operating in Kisumu include metered taxis, motorcycles and tricycle (*tuk-tuk*) taxis. '*Boda boda*' bicycle taxis started operating in Kisumu city in 1997 (Kisumu City Council, 2005) and rapidly increased in number in the city streets. According to a survey carried out in Kisumu city the '*boda boda*' bicycle taxis accounts for 16% of the total passenger transportation services in the city including walking (Makajuma, 2006).

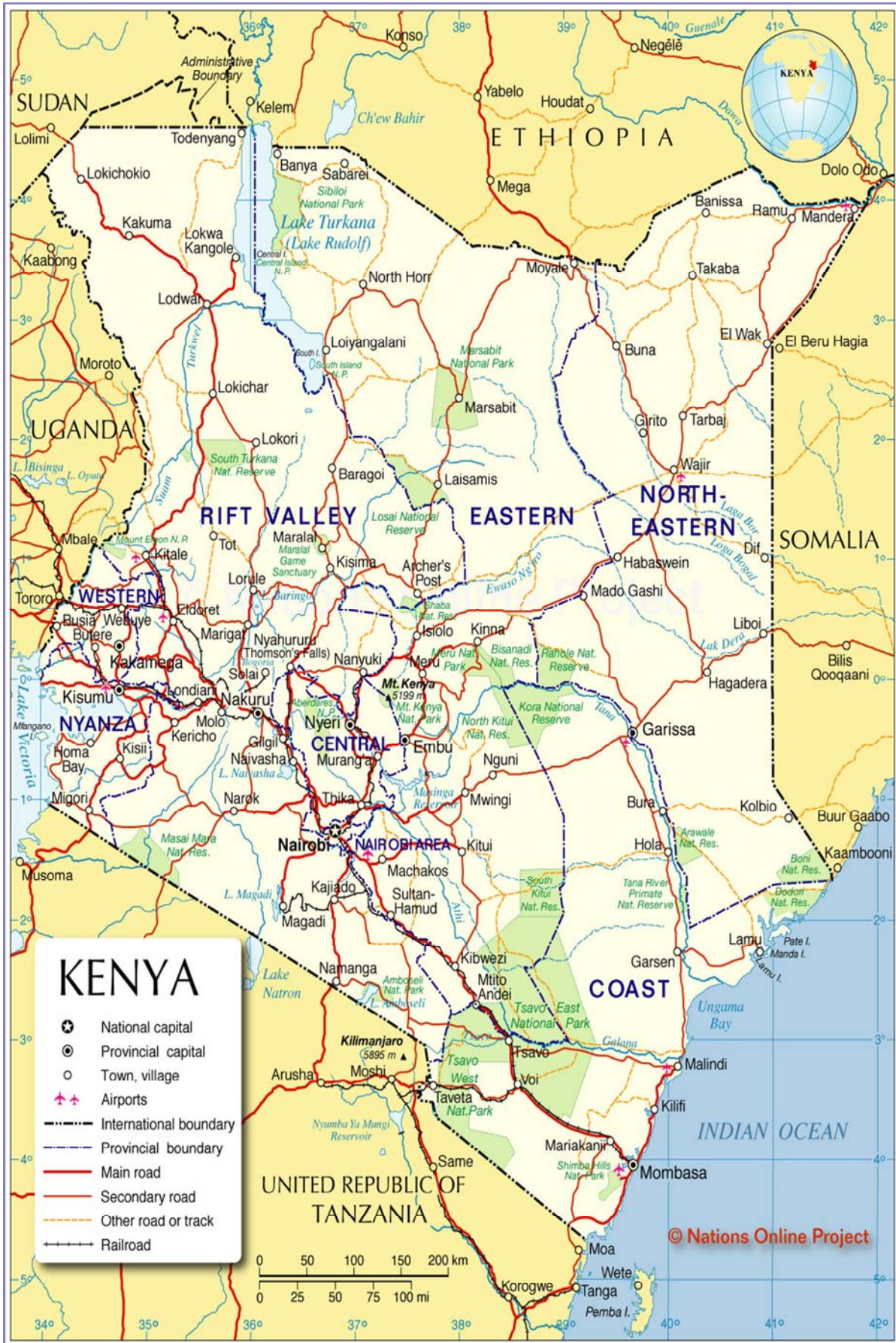


Figure 1.2: Map of Kenya (Source: <http://www.nationsonline.org>).

1.4 Emerging threat to 'boda boda' bicycle taxis

Although this study focused on the operations of 'boda boda' bicycle taxis, a significant number of motorcycle taxis (also known as 'boda boda') was noted at many of the stages where the interviews were conducted. Over the past two decades, motorcycle taxis have emerged in East Africa as a motorised variant, and at the expense, of bicycle 'boda boda'. As in the case of bicycle 'boda boda' innovation and diffusion, motorcycle 'boda boda' emerged earlier and spread faster in Uganda – following the deregulation of motorcycle imports in 1994 (Kamuhanda and Schmidt 2009, Kisaalita and Sentongo-Kibalama 2007). Motorcycle taxis in West Africa emerged a decade earlier, in response to a poorly served passenger market and relatively unrestricted market entry, and have grown into a dominant travel mode – known locally as *ganzemidjan* in Benin, *bendskin* in Cameroon, *kabu kabu* in Niger, *okada* in Nigeria, and *oleyia* in Togo (Diaz Olvera *et al* 2010, Mahlstein 2009). Many medium-sized Nigerian cities, for instance, rely solely on *okada* for intra-city transport services (Cervero 2000). In comparison, Kenyan motorcycle taxis have emerged very recently – stimulated by the introduction of a zero-rated import duty on motorcycles below 250cc in the 2006 national budget – but, despite spreading fast, would appear from anecdotal reports to be less numerous than bicycle 'boda boda' at this point in time.

1.5 Organisation of the document

The first pages of this dissertation presented the abstract, acknowledgement and summary. These were followed by a table of contents and a list of figures. The dissertation consists of six main chapters.

Chapter one presents an introduction to the dissertation and is made up of four subsections. These subsections include a motivation for the research, the research question, description of case study areas, and an outline of the organisation of the document.

Chapter two presents a review of literature on 'boda boda' bicycle taxis and other 'for hire' bicycle taxis in Kenya as well as other parts of the world. The chapter reviews literature that is relevant to the research objectives in terms of operational characteristics, support mechanisms and regulatory measures.

Chapter three presents the method followed to carry out the study. It outlines the procedure that was followed to carry out the research and present the results.

Chapter four presents the results obtained from analysis of the data obtained from the research. It describes the results based on the various data attributes and, where appropriate, presents them in tables.

Chapter five discusses the results of the research. It aims to present the implications of the results obtained from the data analysis process with respect to the objectives of the research.

Chapter six brings together the research finding into conclusions based on the research questions. It integrates the findings from the literature review and those obtained from the primary research to make recommendations for policy action and further research.

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2. LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of previous studies carried out on ‘for hire’ bicycles. The purpose of this chapter was to review past studies on ‘*boda boda*’ bicycle taxis and ‘for hire’¹ bicycle taxi operations in Kenya and other parts of the world where bicycle taxis were commonly found in order to understand the role they play in urban transport systems and the regulatory measures formulated or warranting consideration by the relevant transport authorities. Additional goals of the literature review were to establish gaps in knowledge of the bicycle taxi operations that needed to be filled and the methods used to obtain the information with or without success as well as problems encountered. In order to address this question, in Chapter 2 the available literature on ‘*boda boda*’ bicycle taxis and other ‘for hire’ bicycles was reviewed under five main sections, those being:

- Review of Kisumu literature.
- Review of Nakuru literature.
- Review of literature on the rest of Kenya.
- Review of literature on the rest of Africa.
- Review of literature on the rest of the World.

The literature reviewed in this chapter was obtained from academic reports and popular media. In each section a critical investigation was carried out based on the research questions. The main sections in the literature review were further subdivided into five sub-sections, but due to the nature of the available literature some sections had less than five sub-sections. The sub-sections include:

- ‘*Boda boda*’ (for hire) bicycles operating characteristics.
- Types of transport services provide by ‘*boda boda*’ (for hire) bicycle taxis.
- Market niche served by the ‘*boda boda*’ (for hire) bicycle taxis.
- Impact of ‘*boda boda*’ (for hire) bicycle taxis on socio-economics.
- ‘*Boda boda*’ (for hire) bicycle taxi regulations and supports that are in place.

Based on the above criteria, various studies and articles were systematically reviewed. This chapter begins with an introduction which is followed by background material. These are followed by a review of Kisumu literature, a review of Nakuru literature, a review of literature on the rest of Kenya, a review of literature on the rest of Africa, and on the rest of the World, before closing with a conclusion.

¹ A ‘for hire’ transportation service is a service usually without fixed routes provided by an operator and available to any party able to pay fares charged. This service can be adjusted from time to time by the operator to suit individual passenger needs (Vuchic, 2007).



Figure 2.1: 'Boda boda' bicycle taxis stage in Busia town (border post).

2.2 Background

'Boda boda' bicycles are known to have originated from around Busia town. They were first used to smuggle goods across the Kenya-Uganda border in the 1960's (Malmberg-Calvo, 1994). However the service did not pick up until early 1970's when the smuggling of goods from Kenya (*magendo*)², during the political chaos³ in Uganda gave a major boost to the use of bicycles for commercial purposes and later for passenger transportation. It is claimed that the smuggling of goods during this period may have provided the main stimulus for their development (Howe, 2001). Over the years they transformed into an informal 'for hire' type of transport service catering largely for passenger needs in many rural and urban areas in both countries. 'Boda boda' bicycle taxis provide significant and unique transport services (Howe *et al*, 2003) and therefore understanding the role played by the 'boda boda' bicycle taxi operations in urban transport systems would provide useful information to inform the study to identify the regulatory and support measures that need to be formulated by the relevant transport authorities in response to the reviewed operations

² *Magendo* was illegal cross border trade which involved smuggling of goods from Kenya to Uganda and *vice versa*.

³ During this time Uganda's democratically elected government was overthrown by the armed forces and the Kenyan government responded by closing the border between the two countries.

2.3 Review of Kisumu literature

This section presents a review of studies carried out in Kisumu city by various organisations and persons. One major study was carried out on urban mobility by the Kisumu City Council in 2005 and by-laws relating to '*boda boda*' operations were formulated by the Council in 2008. The other studies were carried out by various persons for articles published in newspapers and magazines. These include: Taylor D for "Development Kenya" in 2006, Limbe L for "Daily Nation" in 2006, Butunyi C and Ochieng L for "Daily Nation" in 2008, Njenga P and Maganya J for Regional perspective in 2004.

2.3.1 '*Boda boda*' bicycle taxis operating characteristics

2.3.1.1 Nature of trips

'*Boda boda*' bicycle taxis in Kisumu city provide convenient and accessible transport services to areas that are not served by other modes of public transport. A survey (2005, n=290) conducted in the city shows that '*boda boda*' bicycle taxis provide transport services to the majority of the city's residents with different levels of income some of whom live in areas inaccessible by vehicle. (Kisumu City Council, 2005). This shows that the '*boda boda*' bicycle taxis serve routes where there are no other transport modes. However the study failed to indicate whether the bicycle taxis provided feeder services to high capacity modes or direct services to various destinations.

Similarly, another survey (2008, sample size unknown) conducted in Kisumu city shows that '*boda boda*' bicycle taxis provide cheap transport services that have the ability to access most of the areas that are inaccessible by motor vehicles (Butunyi *et al*, 2008). According to the survey travellers preferred to use the bicycle taxis because they provide a door to door service which cannot be provided by the *matatus*. Additionally busy parents delegated the role of taking and picking their children to and from school to '*boda boda*' bicycle operators thus saving time. The findings of this study show that many users had faith in the '*boda boda*' taxi operators to a point of entrusting the safety of their children to them. The study also showed that the bicycle taxis provided services where other modes could not access which means the users were captive to the bicycle taxis. The author failed to investigate on whether the bicycle taxis provided feeder services or direct services to various destinations or both.

2.3.1.2 Number of operators and hours worked

The estimated number of '*boda boda*' taxis which were operating in Kisumu city was about 8,000 bicycles providing services to various routes in the city (Kisumu City Council, 2005). A bicycle traffic survey (2005, n=8,000) conducted at selected points on the busiest roads in the city for twelve hours daytime showed that the highest concentration of bicycles was around Jomo Kenyatta highway. The highest number of bicycles that passed a survey point in the twelve hours was 18,788. It can be

seen from this survey that the *'boda boda'* bicycle taxi industry is a source of livelihood to many people in Kisumu city based on the estimated number of bicycle. However the study failed to investigate the measures required to support the bicycles taxi operations in the city for the benefit of the council, operators and the users.



Figure 2.2: *'Boda boda'* bicycles (Head office stage), Nakuru



Figure 2.3: *Boda boda* cycle operator wearing uniform, (border point), Busia

2.3.1.3 Fares charged and operator earnings

A survey (2005, n=290) conducted in Kisumu city showed that *'boda boda'* bicycle taxis charged a minimum of Kshs 10 (USD 0.13) and a maximum of Kshs 40 (USD 0.50) depending on the distance covered (Kisumu City Council, 2005). According to the data obtained in the survey the average fare was Kshs15 (USD 0.19) but the majority of the users paid Kshs 10 (USD 0.13)). This survey shows that the *'boda boda'* bicycle taxis charged low fares but the report failed to provide information on, and compare, the fares charged by the other transport modes operating in the city..

Another study (2006, sample size unknown) carried out in Kisumu town showed that *'boda boda'* bicycle taxis charged Kshs20 (USD 0.25) to carry passengers across the city (Taylor, 2006). According to the study there were about 5,000 *'boda boda'* bicycle taxis operating in the city by the year 2000 and each operator then earned about Kshs240 (USD 3.0) per day. This report confirmed that *'boda boda'* operators charged low fares and earn low daily wages. However the study failed to investigate the measures required to improve the earnings of the operators.

A survey (2005, sample size unknown) conducted in Kisumu showed that there was about 5,000 bicycle taxis in Kisumu town (UNDP, 2005). According to the survey each bicycle transported about 10 persons per day and earned about Kshs 250 (USD 3.13) per day. Although this provided information on the number of trips made by the bicycle taxis it failed to provide information on the length of the trips.

2.3.1.4 'Boda boda' bicycle users

A survey (2005, n=290) conducted in Kisumu city showed that most of the 'boda boda' bicycle users were employed people, students and business persons (Kisumu City Council, 2005). According to the survey the majority of the users were self employed persons, employed persons and students. The survey also showed that men used the 'boda boda' bicycle taxis more than women. An interview carried out on the bicycle users showed that 96% of all those interviewed earned less than Kshs10,000 (USD 125) per month. This report shows that most of the 'boda boda' bicycle taxis users were low income earners who used the bicycles to access economic and social activities. The report however failed to investigate measures required to improve the bicycle taxi services to attract middle income earners.

Another survey (2006, sample size unknown) also conducted in Kisumu city showed that 'boda boda' bicycle taxis provide transport services to employed person, business community and school children (Taylor, 2006). According to the survey the bicycle taxis were commonly used by women to transport large bags of maize and by fisherman to transport fish to the markets. Although this report tried to classify the users by trip purposes, it failed to give an indication of the gender split and the age of the users.



Figure 2.4: 'Boda boda' stage (Fanana), Kisumu



Figure 2.5: 'Boda boda' taxis participating in a racing competition, Nakuru

2.3.1.5 Problems faced

2.3.1.5.1 Problems faced by users

A study (2005, n=290) carried out in Kisumu city shows that the reasons that discouraged many people from using 'boda boda' bicycle taxis include lack of safety where the bicycles are operating in mixed traffic, the careless manner of 'boda boda' operations, untrained operators, lack of insurance covers for passengers, and the bad behaviour of some operators (Kisumu City Council, 2005). According to the study only 27% of the 'boda boda' bicycle taxi operators had some formal training

in road use. The behaviour of '*boda boda*' operators frequently features in public debate. However this report failed to suggest the measures required to address the problem.

2.3.1.5.2 Problems faced by other road users

A study (2006, sample size unknown) carried out in Kisumu city showed that some '*boda boda*' bicycle operators did not observe road traffic rules thus inconveniencing other road users (Limbe, 2006). According to the study fatal accidents involving the bicycle taxis and motor vehicles occurred frequently in the city streets. The study also showed that it was not unusual in the city to see a large vehicle brake suddenly to give way to a bicycle in order to save the lives of the two people on it. This report provided information on the problems caused by the bicycle taxis to other road users but it failed to provide information on measures required to sensitize the bicycle operators on the need to observe road traffic rules.

2.3.2 Type of transport services provided by '*boda boda*' bicycles

A study (2006, sample size unknown) carried out in Kisumu city shows that '*boda boda*' bicycle taxis move customers from one residential estate across the city to another residential estate (Limbe, 2006). They also provide door to door services and even wait for customers as they go about their businesses without charging them for waiting. This report confirms the flexibility of the '*boda boda*' bicycle taxi operations. However the report failed to indicate the trip lengths and how long the bicycle taxis would wait for a customer without increasing their charges.

2.3.3 Market niche

A study (2006, sample size unknown) carried in Kisumu city showed that '*boda boda*' bicycle taxis in the city provided transport services for short and long distance trips (Taylor, 2006). According to the study the bicycle taxis provided complimentary services to other modes of public transport. '*Boda boda*' bicycle taxi users interviewed in the city said they preferred to use the bicycle taxis because they are faster and charged half of what *matatus* charged in the same route. This report shows that '*boda boda*' bicycle taxis in Kisumu provide flexible service in terms of distance and fares. It failed however to provide information on trip lengths.

2.3.4 Impacts of '*boda boda*' bicycles on socio-economics

2.3.4.1 Employment opportunities and dependants

The '*boda boda*' bicycle taxi industry in Kisumu city provided a source of income to a large number of unemployed youth (Kisumu City Council, 2005). Over 8,000 people depended directly on the bicycles for their livelihood. According to the City Council, unemployed youth in the city were absorbed by the '*boda boda*' bicycle taxi industry. Bicycle repair workshops and food kiosks that

were supported by the '*boda boda*' bicycles provided income to many other people in the city. This report showed that the '*boda boda*' industry was one of the biggest employers in Kisumu city. However the report failed to provide the number of people who were directly and indirectly employed by the industry and the number of dependants.

Another survey (2007, sample size unknown) conducted in Kisumu city showed that the '*boda boda*' industry employed more than 5,000 people in the city alone each earning Kshs 250 (USD 3.12) per day (Mwiti *et al*, 2007). According to the report '*boda boda*' bicycles also helped people in rural areas to gain access to crucial facilities such as hospitals and schools. Although the report provided information on the number of the people employed directly by the '*boda boda*' industry in Kisumu city and the amount they earned it failed to indicate the number of dependants.

2.3.4.2 Impacts on the environment

'*Boda boda*' bicycle taxi operations are, in general, environmentally friendly (Kisumu City Council, 2005). Increased use of bicycles reduces the demand for motorised transport thus reducing the emission level from passenger and goods transport. Use of bicycle transport services results in cleaner air and less noise. The high number of bicycles in Kisumu city, however, contributed to the increase in numbers of bicycle maintenance and repair shops. Those workshops lacked proper waste disposal systems for grease, oils and used rubber, all of which are environmental contaminants. This report clearly shows that increase utilisation has more advantages than disadvantages to the environment but it failed to identify the mechanisms required to ensure that the repair workshops comply with the required environmental protection standards.

2.3.5 Regulations and associations

2.3.5.1 Regulation

In 2006 the Kisumu City Council formulated strategies to regulate '*boda boda*' operations in the city. The strategies include enactment of by-laws to separate '*boda boda*' bicycle taxis from vehicular traffic through construction of bicycle lanes and ensure that '*boda boda*' operated in designated areas outside the central business district (Butunyi *et al*, 2008). The project was started but not completed. According to the Kisumu Town Clerk (Butunyi *et al*, 2008) the proposed by-laws were still waiting for the minister for Local Government to gazette them. He conceded however that expelling the cyclists from the streets would have adverse effects on the city's economy because many youths derived their livelihood from the '*boda boda*' business. The '*boda boda*' riders on the other hand felt that implementation of the new by-laws would deny them opportunities to render efficient transport services to their clients. This report shows that the city had developed mechanisms to regulate the bicycle taxis but it failed to indicate how the measures affected their operations.

Another study (2006, sample size unknown) also carried out in Kisumu City showed that many fatal accidents involving 'boda boda' bicycle taxis and vehicle occurred due to the lack of organisation of public transport in the city (Limbe, 2006). The City Council responded by formulating by-laws aimed to separate vehicles from 'boda boda' bicycle taxis, motorcycles and tri-cycle taxis (*tuk-tuk*). The issues specifically addressed by the new by-laws included requiring all operators to have identity cards, requiring all bicycle, motorcycle and tri-cycle taxis to use dedicated lanes and requiring the bicycle, motorcycle and tricycle taxis to operate from designated areas. According to the report, the new by-laws were meant to legitimize 'boda boda' business. The report clearly outlined Kisumu city's action plan on 'boda boda' taxis. It failed, however, to determine whether there is adequate space on the sides of the city's roads for bicycle lanes as well as pedestrian walkways.

In Kisumu City the Council formulated some operating policies in 2008 to regulate 'boda boda' bicycle taxi operations in the city (Kisumu City Council, 2008). The regulatory measures were approved by the minister in charge but up to the time of preparation of this report the by-laws were yet to be implemented. The by-laws relating to the 'boda boda' bicycle taxi operations in Kisumu city addressed issues relating to registration of the operators, vetting of operators, allocation of routes and designated stages, operating hours and the wearing of uniforms. Other items addressed included the safety and security of users, the mechanical condition of the bicycles, operating ethics, operator identification, knowledge of traffic rules and the consequences of contravening the by-laws. These by-laws provided a comprehensive account of the regulatory framework that was required to manage the 'boda boda' bicycle taxis in the city. The council failed, however, to formulate policies relating to promoting the industry.



Figure 2.6: 'Boda boda' bicycle taxi (near swan stage), Kisumu.



Figure 2.7: 'Boda boda' stage (Menengai), Nakuru

2.3.5.2 Associations

A survey (2004, sample size unknown) carried out in Kisumu showed there was a ‘*boda boda*’ bicycle taxi association in the city (Njenga et al, 2004). According to the survey the association known, as Kibos Ngware Group linked Kisumu town centre to three suburban markets of Chinga, Kibos and Kondele. Although the survey showed that an association existed in Kisumu it failed to provide detailed information on the role of the association and its benefits to the members.

2.4 Review of Nakuru literature.

This section presents a review of studies carried out in Nakuru town by various organisations and persons. According to the literature obtained, no major study was carried out on ‘*boda boda*’ bicycle taxis in Nakuru but the Council formulated by-laws relating to ‘*boda boda*’ operations in 2008. Some minor studies were carried out by various persons for articles published in newspapers and magazines. These include: Omondi G for the “Daily Nation” in 2007, Ngige F for “East African Standard” in 2005 and the “Daily Nation” in 2006.



Figure 2.8: ‘*Boda boda*’ bicycle (Holy cross), Nakuru.



Figure 2.9: ‘*Boda boda*’ bicycle: (Medical stage), Nakuru.

2.4.1 ‘*Boda boda*’ bicycles operating characteristics

2.4.1.1 ‘*Boda boda*’ bicycle taxi operators

A study (2006, sample size unknown) carried out in Nakuru showed that there was a young woman operating a ‘*boda boda*’ bicycle taxi in the town, a business which was largely performed by young men (Ngige, 2006). The 23 year old mother of two, a standard six dropout, operated the ‘*boda boda*’ bicycle taxi outside one of the hotels in the town. This report shows that women can operate a ‘*boda boda*’ bicycle taxi business successfully just like their male counterparts but it failed to investigate measures required to encourage more women to get involved in the ‘*boda boda*’ trade.

2.4.1.2 Fares charged and operator earnings

A study (2005, sample size unknown) carried out in Nakuru on '*boda boda*' bicycle operations showed that the taxis charged fares that varied depending on the distance covered and the route taken (Ngige, 2005). According to the study the fares ranged between Kshs 15 and Kshs 20 (USD 0.19 and 0.25). The total earnings per day ranged between Kshs 50 (USD 0.63) on a bad day and Kshs 500 (USD 6.30) on a good day. This report shows that the '*boda boda*' bicycle taxis had the capacity to provide decent income to the riders but failed to identify the measures required to improve the income.

2.4.1.3 Problems faced

2.4.1.3.1 Problems faced by operators

A study (2007, sample size unknown) carried out in Nakuru showed that the Kenya government increased taxation on bicycles despite the growing number of jobless youth turning to '*boda boda*' bicycle taxis to earn a living (Omondi, 2007). Under pressure from the other East Africa community members Kenya introduced a 10% import duty on bicycles and bicycle spare parts in the June 2007 budget. This duty together with the value added tax pushed the bicycle prices up making them unaffordable to low income earners who comprised the majority of prospective '*boda boda*' operators. The high cost of bicycles forced many operators to share a bicycle or hire them from non-operators at a cost of about Kshs 70 (USD 0.88) per day, leaving them with little money to take home. Taxation places a burden on many businesses but this report failed to investigate the measures required to lower the cost of entering into the business.

A survey (2006, sample size unknown) conducted in Nakuru, showed that '*boda boda*' bicycle taxis were banned from the central business district. (The Nation, 2007). They were relocated to Odinga Odinga Street which, according to the operators, was far from the town centre where there were many customers. Despite making them operate away from their customers, the Municipal Council also charged each bicycle taxi Kshs 300 (USD 2.95) per month, an amount most operators claimed was too high. The Council also fined them Kshs 700 (USD 6.8) for trespassing in the designated areas. Police also frequently harassed them, accusing them of causing many accidents in the town. Although this report highlighted the problems faced by '*boda boda*' bicycle taxi operators in the town it failed to indicate whether the bicycles were responsible for the wrongs of which they are accused.

2.4.1.3.2 Problems faced by users

A study (2007, sample size unknown) carried in Nakuru showed that some users complained that the sector was run by criminals who together with accomplices sometimes robbed passengers on the way

(Omondi, 2007). *'Boda boda'* users were also concerned about road safety because most of the operators did not obey road traffic rules and abandoned them after causing accidents. Although this report has highlighted some problems faced by *'boda boda'* taxi users it failed to suggest measures to address the problems.

2.4.2 Types of transport services provided by *'boda boda'* taxis

A study (2007, sample size unknown) carried out in Nakuru on *'boda boda'* bicycle taxis showed that they provided flexible transport services to commuters within the town, especially on routes that were poorly serviced by *matatu* and hired taxis (Omondi, 2007). They also provided services that connected residential estates to town centres where there were no direct *matatu* routes. This report shows that *'boda boda'* bicycles provided an attractive transport service, resulting in conflict with their competitors but failed to explore how *'boda boda'* services could be promoted to benefit more users.



Figure 2.10: *'Boda boda'* bicycle (Kongowea market), Mombasa.



Figure 2.11: *'Boda boda'* bicycle (Makasembo stage), Kisumu.

2.4.3 Impact on socio-economics: employment opportunities

According to the Chairman of the Nakuru *'boda boda'* association the industry in the town employed 6,000 people. (Omondi, 2007). The Nakuru Municipal Council collected Kshs 360 (USD 2.95) per month from each operator giving an annual income to the Council of over two million Kenya shillings (250,000 dollars). This figure excluded fines of Kshs 700 (USD 8.85) charged for trespassing in designated areas which, according to the operators, earned the Council more money than the regular monthly revenue. This report clearly shows that the *'boda boda'* industry provides employment to many and also contributes to the Municipal Council coffers, but it failed to provide an indication of the number of people employed indirectly by the industry.

2.4.4 Regulations and associations

2.4.4.1 Regulations

According to a survey (2007, sample size unknown) conducted in Nakuru town, the rapid increase in the '*boda boda*' bicycle taxis in the town forced the Municipal Council to intervene by banning them from operating in the town centre and relocating them to outlying areas (Omondi, 2007). The Council also proposed other measures to manage the bicycle taxi operations such as operating from designation areas and requiring all operators to wear uniforms with a serial number for easy identification. The measures were yet to be implemented. These measures, if implemented, could improve the image of '*boda boda*' taxis but the report failed to establish how long it would take the Council to implement them.

Nakuru Municipal Council formulated some operating policies in 2008 to regulate '*boda boda*' bicycle taxi operations in the town (Nakuru Municipal Council, 2008). The regulatory measures were approved by the minister in charge the same year but up to the time of preparation of this report the by-laws had yet to be implemented. The proposed by-laws addressed matters relating to payment of fees to the Council, licensing of the bicycles and road-worthiness of the bicycles together with medical fitness of, and training for the operators. Other items covered in the by-laws include issues relating to the safety of riders and their passengers such as the wearing of helmets and gloves and requiring the bicycles to operate from designated areas as well as the penalties for not observing the by-laws. These by-laws provided a comprehensive account of the regulatory framework that was required by the Nakuru Municipal Council to manage the '*boda boda*' bicycle taxis in the town. However the Council failed to formulate policies relating to the promotion of operations of the bicycle taxi services.

2.4.4.2 Associations

Most of the '*boda boda*' bicycle taxi operators in Nakuru belonged to a registered association to which they paid a fee. The number of registered operators in the town was about 6,000 (Omondi, 2007). The role of the association was to enforce operational discipline, defend operators in cases of harassment by security officials and to trace relatives in the case of accidents. The role of the association was clearly stated in this report but it failed to establish how much each member paid to the association and what the money was used for.

2.5 Review of the rest of Kenya literature

This section presents a review of studies carried out in the rest of Kenya. According to the literature obtained, no major study was carried out on '*boda boda*' bicycle taxis in the rest of Kenya. Some studies, however, were carried out by various persons for articles published in newspapers and

magazines. These include: Maino E. for “News from Africa” in 2002, Mwiti L and Muriithi F for “Street News Service” in 2007.

2.5.1 ‘Boda boda’ bicycle taxis operating characteristics

2.5.1.1 Number of operators and hours worked

A survey (2002, sample size unknown) conducted on ‘*boda boda*’ bicycles estimated the number of ‘*boda boda*’ bicycle taxi operators in the whole of Western Province to be about 200,000 (Maino, 2002). According to the then Western Provincial Commissioner, most of the operators were youths. This report shows that ‘*boda boda*’ bicycles provide employment to many young people but failed to suggest mechanisms to promote the ‘*boda boda*’ industry to create more employment.

2.5.1.2 Fares charged and operator earnings

A study (2002, sample size unknown) carried out in Bungoma town showed that those to whom ‘*boda boda*’ bicycle taxis provide a source of income are male secondary school leavers (Maino, 2002). The operators in the town earned about Kshs 200 (USD 2.50) per day after deducting the cost of lunch and repairs to the bicycle. Elsewhere in Kakamega town ‘*boda boda*’ bicycle taxis charged Kshs 5 (USD 0.06) per kilometre travelled. On average the bicycle taxi riders in the town earned a total of Kshs 240 (USD 3) per day. This report showed that ‘*boda boda*’ bicycle taxi operators earned just enough money for their basic needs but failed to suggest measures to increase the earnings of ‘*boda boda*’ operators.

Another study (2007, sample size unknown) carried out in Juja town showed that the fare charged by ‘*boda boda*’ bicycle taxis in the town varied with the length of the trip (Mwiti *et al*, 2007). According to the study the average operator earned Kshs 400 (USD 5) per day. This report showed that ‘*boda boda*’ bicycle taxis had the potential to earn sufficient money for the operators but failed to suggest measures that might improve the earnings of the operators.

2.5.1.3 ‘Boda boda’ bicycle taxi operators

The ‘*boda boda*’ bicycle taxi business provided employment for many able-bodied young men, the majority having dropped out of school before completing their studies (Mwiti *et al*, 2007). Others had joined the business after completing standard 8 for lack of funds to continue. This report showed that ‘*boda boda*’ bicycle taxi operators had low educational qualifications but the report failed to investigate why most joined the industry before completing their studies and to suggest measures required to support them in completing their education before venturing into the business.

2.5.1.4 Problems faced

2.5.1.4.1 Problems faced by users

A survey (2007, sample size unknown) conducted on 'boda boda' bicycle taxis in Juja town found that the operators in the town were feared by women (Mwiti *et al*, 2007). According to the survey they were constantly accused of rape and spreading HIV/AIDS. This report suggested that some of the operators were involved in criminal activities but failed to provide adequate information to enable the appropriate authorities to take action.

2.5.1.4.2 Problems faced by operators

There were no documented problems faced by operators.

2.5.2 Types of services provided by 'boda boda' bicycle taxis

A study (2002, sample size unknown) carried out on 'boda boda' bicycles in Western Province showed that they provided transport services to various places in rural areas where the road networks are poor and motorised transport services are lacking (Maino, 2002). The bicycle taxis operated from stages on main roads or market places and in some places the bicycle taxis were the only available means of transport providing transport to people going to work, acting as 'school vans' for teachers and pupils, being used as 'staff busses' and even providing transport to government officials. This report showed that 'boda boda' bicycles were used to provide a variety of transport services but the author failed to provide information relating to travel demand, road networks, lengths and types of trips and available alternative modes for comparison.



Figure 2.12: 'Boda boda' garage (near Makasembo stage), Kisumu.



Figure 2.13: 'Boda boda' stage (Kilimani stage), Kisumu.

2.5.3 Regulations and Associations

2.5.3.1 Regulations

In Busia town the municipal council formulated some operating policies in 2009 to regulate 'boda boda' bicycle taxi operations. The proposed regulatory measures were then submitted to the Ministry of Local Government for approval in January 2010 but up to the time of preparation of this report the by-laws had yet to be approved. The proposed by-laws addressed matters relating to the 'boda boda' bicycle taxi operations in Busia town such as licensing, badges for identification as well as the penalties for operating without paying the required fees. The by-laws also proposed the allocation of designated areas for the bicycle taxis together with the maintaining of a register containing the names of all the bicycle taxis operators providing services within the town (Busia Municipal Council, 2010). These by-laws concentrated on the regulations relating to licensing of the bicycle taxis at the expense of the other regulatory measures. The by-laws totally ignored matters relating to the safety of the users and operators. Additionally the Municipal Council failed to formulate policies to promote the use of 'boda boda' bicycle taxis in its area of jurisdiction despite this being the town in Kenya where the bicycle taxis first started their operations.

2.5.3.2 Associations

Most of the villages in Western Kenya where 'boda boda' bicycle taxis were operating had a 'boda boda' association (Maino, 2002). Each operator in the village paid a membership fee of Kshs 500 (USD 6.5) and a daily contribution of Kshs 20 (USD 0.25). On registration, a member was given an identity card, identification number and a small flag. The money collected from the members was used in emergencies such as paying hospital bills for sick members or paying damages to clients in the case of accidents. The associations also enforced operational discipline on their members. Although the report stated the duties of the associations, it failed to provide details on how the associations enforced the operation discipline on their members.

Elsewhere in Juja the 'boda boda' operators had formed associations which operated as cartels (Mwiti *et al*, 2007). The cartels set operational rules which regulated membership to the various groups that were allowed to operate from the stages within the area. This report clearly shows 'boda boda' bicycle associations can be used to achieve various objectives but did not indicate whether the said associations were legal or illegal organisations and the amounts paid as membership fees.

2.6 Review of literature from the rest of Africa

This section presents a review of studies carried out in the rest of Africa by various organisations and persons particularly in Uganda where several major studies were carried out. These major studies were conducted by: Malmberg-Calvo C in 1994, Howe J in 2001, Howe J and Maunder D in 2004,

Howe J and Davis A in 2003, Howe J in 2003 and Heyen-Perschon J in 2004. The other studies were carried out by various persons for articles published in newspapers and magazines. These include: Banda M in 2008, Abili S in 2006, Muhumuza J in 2006, Odeke A in 2001, The New Times-Rwanda in 2009, Aanyu R in 2007 and Schindler H in 2009.

2.6.1 'Boda boda' bicycle taxis operating characteristics

2.6.1.1 Nature of trips

A study (1994, sample size unknown) carried out in Uganda showed that '*boda boda*' bicycle taxis operated either alongside the other modes of transport or providing feeder services to the other modes (Malmberg-Calvo, 1994). According to the study '*boda boda*' bicycles provided 'for hire' taxi services which were operated from 'stages' in towns, trading centres and bus stops on major highways. This study shows the types of transport service provided by the bicycle taxis but it failed to provide information relating to trip purposes.

A study (2006, sample size unknown) carried out on '*boda boda*' showed that within the East African region the standard bicycle with a locally made and usually multi-coloured rear carrier had become one of the most popular means of transportation in many rural and urban areas (Muhumuza, 2006). In Uganda the bicycle taxis were commonly used to carry heavy loads to and from markets. They operated together with the other modes of transport by providing complimentary services. According to the study '*boda boda*' bicycle taxis in Kampala provided an efficient and cheap service because the bicycle did not get stuck in traffic congestion, dropped passengers and goods at their door steps. This report shows that '*boda boda*' bicycle taxis provided essential transport services. However the report failed to indicate the types of the trips made by the bicycles.

A survey (2006, sample size unknown) conducted in Busia town showed that a bicycle was very popular among the majority of the town's low income earners because it provided a readily available source of income (Isingoma, 2006). According to the survey '*boda boda*' riders' laboured up and down the hilly terrain in the town to transport water, foodstuffs and smuggle goods across the Kenya-Uganda border. This report shows that '*boda boda*' bicycle taxis provided various types of transport service but did not provide information on the quantities of goods carried by the bicycles and the role played by the bicycle in relation to the other modes of transport.

Another study (2004, sample size unknown) also carried out in Uganda showed that '*boda boda*' bicycle taxis provided transport for farm produce from rural areas to urban markets and manufactured goods from urban to rural areas (Heyen-Perschon, 2004). According to the study the bicycle taxis also provided passenger transport allowing the rural poor to access basic facilities such as health care centres, schools and other social facilities. It can be seen that '*boda boda*' bicycles taxis provide convenient transport services to the rural poor. However this study failed to provide information on the types of trips they provide in relation to the other transport modes.

Another study (2006, sample size unknown) carried out in Lira, one of the key bicycle districts in Uganda, showed that *'boda boda'* bicycles were so numerous that pedestrians and motor vehicles found it difficult to move through the streets (Abili, 2006). In this town the bicycles were used to carry passengers and for the transportation of goods such as bags of potatoes, crate of soda, bags of cement as well as other baggage goods. This report shows that *'boda boda'* bicycle taxis provide efficient transport services for passenger and goods but did not provide information on the weight of the goods carried by the bicycles.

Similarly another study (2003, sample size unknown) carried out in Uganda showed that *'boda boda'* bicycle taxis provide short distance transport services in rural and urban areas (Howe, 2003). According to the study the bicycle taxis provided transport services alongside conventional transport services. In rural areas they provided feeder services to major roads with high capacity transport services. This study provided information on the types of services *'boda boda'* bicycles provide but failed to provide information on the lengths of trips made by the bicycles.

Another survey (2008, sample size unknown) conducted in Malawi showed that bicycle taxis were used to provide passenger and goods transportation services in areas which were predominantly inhabited by the poor (Banda, 2008). In this country the bicycle taxis provided a transport service for short to medium distance trips. Although this report gave the types of services that were provided by the 'for hire' bicycles it failed to provide information on the operational relationship between the bicycles and the other available modes of transport.



Figure 2.14: *'Boda boda'* motorcycle taxi, (Nairobi road), Kisumu



Figure 2.15: *'Boda boda'* motorcycle taxi, (near Kibuye stage), Kisumu

2.6.1.2 Number of operators and hours worked.

A survey (2006, sample size unknown) conducted in Uganda showed that most of the *'boda boda'* bicycle operators started their operations at 06h00 and carried passengers until 11h00 when they took

a break to carry goods for business people as well as take lunch (Muhumuza, 2006). The passenger services resumed at around 17h00 and operated up to 21h00. This report provided information on the number of hours worked by the 'boda boda' bicycle taxi operators but failed to provide information on the number of operators providing the services.

Another survey (2003, sample size unknown) also conducted in Uganda showed that approximately 200,000 'boda boda' taxis were operating in the country but the number of operators was assumed to be more than the bicycles owing to the sharing of bicycles (Howe, 2003). This report provided an indication of the number of 'boda boda' bicycle operators in Uganda but not the number of hours worked by the operators.

2.6.1.3 Fares charged and operator earnings

In Busia town 'boda boda' bicycle taxis charged a flat rate of Ushs 200 (USD 0.12) to transport goods or passengers from the Kenya-Uganda border to any location in the town (Isingoma, 2006). To transport a 100 kg sack of smuggled beans the bicycle taxis charged between Ushs 200 and Ushs400 (USD 0.12 and 0.24) depending on the short cut chosen and the risks involved. This report shows that 'boda boda' fares varied according to the situation but not whether the fares charged at the border town were standard or higher than the fares charged elsewhere, particularly considering that some of the activities in Busia town are illegal.

Another study (2003, sample size unknown) carried out on 'boda boda' bicycle taxi operations in Uganda showed that the number of passengers carried by the bicycle taxis depended on the location of the stage and the number of bicycles (Howe *et al*, 2003). According to the study the bicycle operators in Kampala carried between 75 and 330 passengers per week with a mean of 153 passengers per week, or 22 passengers per day, while those in Jinja carried between 35 and 160 passengers per week with a mean of 86 passengers per week, or 12 passengers per day. The total weekly earnings for the operators ranged between USD 7 and USD 59 per week with an average of USD 24 per week. This report provided a detailed account of the bicycle taxi operations in Jinja but failed to give detailed information on 'boda boda' taxi charges in other towns for comparison.

Similarly, another study (1994, sample size unknown) carried out in Uganda showed that fares charged by 'boda boda' bicycle taxis varied from one place to another depending on the road condition, terrain, goods carried, the customer and a general assessment of the customers' ability to pay (Malmberg-Calvo, 1994). According to the study fares varied at different times of the day in many places but generally they were higher in big towns than in small ones. Fares in Tororo varied between Ushs 600 and Ushs 1500 (USD 0.35 and USD 0.88) for distances of over two kilometres. For shorter distances up to two kilometres the fares were about Ushs150 (USD 0.18). The lowest fare charged by riders was Ushs 100 (USD 0.06). 'Boda boda' bicycle operators who owned the bicycle earned about Ushs 27,960 (USD 16) per month above operating costs. Those riders who rented the

bicycles paid the owners between Ushs 500 and Ushs700 (USD 0.25 and 0.39) per day. Some of the bicycle owners paid the riders a basic salary of Ushs 4,000 (USD 2.23) per month plus the right to keep the excess money above the rental fee. This report provided a comprehensive account of fares charged by '*boda boda*' bicycle taxis and the operators' earnings. However it failed to provide information on the amount of money charged to transport goods.

Another study (2003, sample size unknown) also carried out in Uganda showed that '*boda boda*' bicycle taxis charged less than the other modes of transport for equivalent distances (Howe, 2003). Although the fares varied from one stage to another the study established that '*boda boda*' bicycle taxis charged half the fares charged by motorcycles. For distances not exceeding one kilometre bicycle taxis charged USD 0.17 while motorcycles charged USD 0.28. The operator earnings per day were estimated to be about USD 3.74 and USD 2.04 per day for Kampala and Jinja respectively. This report gives a clear account of fares charged by '*boda boda*' riders in some areas in Uganda. The study focused predominantly on fares charged in major urban areas and failed to provide information on the fares charged by bicycle riders in small towns and rural areas or operators' daily income.

A survey conducted in Malawi (2008, sample size unknown) on 'for hire' bicycles showed that on average the riders charged 70 Malawi kwacha (USD 0.50) per trip and on a good day the operators earned 700 Malawi kwacha (USD 5), equivalent to 10 trips per day (Banda, 2008). Vehicles operating in that route charged 150 Malawi Kwacha (USD 1.1), which was unaffordable to most commuters. This report shows that "for hire" bicycles provide cheaper transport services compared to their competitors but did not provide information relating to the charges for various trip lengths.

Another study (2004, sample size unknown) carried out in Uganda showed that the fares charged by '*boda boda*' bicycle taxis varied with the place, number of passengers carried and distance travelled (Howe *et al*, 2004). The study found that the bicycle taxis charged higher fares in large cities than in small towns and rural areas. On average '*boda boda*' riders charged about USD 0.17 for distances up to one kilometre. The minimum income for the riders was about USD 1.84 per day with an average of USD 3.4 per day. This report shows clearly the average earnings for the '*boda boda*' riders per day but the study failed to indicate the amount charged by the riders for trips exceeding one kilometre in length.

Another study (2001, sample size unknown) carried out in Uganda showed that '*boda boda*' bicycle taxi fares varied from stage to stage depending on the length of the trip (Howe, 2001). On average in this study, the bicycle taxis charged USD 0.2 for trips not exceeding one kilometre and USD 1.15 for trips between two and four kilometres. Although this report provided information on the fares charged by '*boda boda*' bicycle taxi operators it failed to provide information relating to operators earnings per day.

2.6.1.4 'Boda boda' bicycle taxi operators

A study (2003, sample size unknown) carried out in Uganda showed, that all the '*boda boda*' bicycle operators were men (Howe, 2003). According to the study over 60% of the operators were youthful males less than 24 years old. 56% of the operators had primary level education and 44% had secondary education or a diploma certificate but none of them had university education. The study also showed that 67% of the operators were married and had dependants. This report provided detailed information on '*boda boda*' operators but did not investigate why women were not actively involved in the business.

Another study (2006, sample size unknown) also carried out on '*boda boda*' bicycles in Uganda showed that all the operators were male youths with a standard seven (Grade seven) certificate and below (Muhumuza, 2006). According to the study most of the operators said they were satisfied with the job arguing that it provided food to their families. Although this report provided information on the operators' educational qualification it failed to provide information on the socio-economics of the operators.

Similarly another study (2003, sample size unknown) carried out in Uganda, showed that most of the '*boda boda*' operators were men (Howe, 2001). Although no good reason was found as to why women were not involved in the '*boda boda*' business, cultural reasons, long hours of working away from home and assumed harassment by male customers were suggested as the possible reasons. This report shows that most of the operators are men but it failed to suggest measures to encourage women to join the operations.

Another study (1994, sample size unknown) also carried out on '*boda boda*' bicycle operators in Uganda showed that all of them were men aged between 18 and 30 years (Malmberg-Calvo, 1994). According to the study most of them were generally school dropouts with limited possibilities of getting any other paid jobs. Although this report provided the ages of operators it failed to give information on the actual levels of education of the operators.

2.6.1.5 'Boda boda' bicycle taxi users

Studies (2003, sample size unknown) carried out in Uganda to determine the types of transport commonly used by households showed that '*boda boda*' bicycle taxis accounted for 8-11% of the household trips but this tended to decline with increases in household income (Howe *et al*, 2003). According to the studies, men used the bicycle taxi services more than women with 61% to 39% split. The studies also showed that '*boda boda*' bicycle taxi users were drawn from labourers, the business community, employed persons, students and sick people. This report provided comprehensive information on '*boda boda*' bicycle taxi users but it failed to provide any information on the trip lengths.



Figure 2.16: 'Boda boda' bicycles (Bus station), Kisumu



Figure 2.17: 'Boda boda' bicycles (Head office stage),-Nakuru

Another study (1994, sample size unknown) also carried out in urban areas in Uganda on the 'boda boda' bicycle taxis users showed that women use 'boda boda' bicycle taxi as frequently as men (Malmberg-Calvo, 1994). According to the study women carrying babies were commonly seen riding on 'boda boda' bicycle taxis. Although this report provided information on the types of transport services 'boda boda' bicycles taxis provides it failed to provide information on the percentage split between men and women.

Similarly another study (2001, sample size unknown) also carried out on 'boda boda' bicycle taxis users in Uganda showed that the users were employed persons, business people, students and health care facility workers (Howe, 2001). According to the study, employed persons accounted for 43%, self employed persons about 38% and students about 18%. The study also showed that the average age for the male users was 31 years and that of female users is 28 years but none of the users were over 50 years old. This report provided detailed information on 'boda boda' bicycle taxi users but failed to provide information on the income levels of the users.

A survey (2008, sample size unknown) conducted on "for hire" bicycle taxis in Malawi showed that the bicycle taxi users were drawn from employed persons, business people, students, hospital staff, sick people heading to hospitals and visitors touring the area (Banda, 2008). Although this report provided some information on the users it failed to provide information on the age, gender split and level of income of the users.



Figure 2.18: 'Boda boda' bicycles (Harina stage), Kisumu



Figure 2.19: 'Boda boda' bicycle (near Weavers stage), Nakuru.

2.6.1.6 Problems faced.

2.6.1.6.1 Problems faced by operators

A survey (2001, sample size unknown) conducted in Uganda, showed that owners and operators of 'boda boda' bicycle taxis were faced with operational problems relating to harassment by law enforcement officials and minibus operators (Howe, 2001). This report provided information on problems caused by people but it failed to investigate problems related to costs of running the business and problems arising from conflicts with vehicular traffic on the roads.

Another study (2006, sample size unknown) also carried out in Uganda showed that some passengers refused to pay the operators or harassed them once they had reached their destinations (Muhumuza, 2006). According to the study some passengers on reaching their destination either jumped off the bicycle and vanished without paying the fare or become violent when asked to pay. In addition, minibus taxis harassed the bicycle taxi operators on the roadways by pushing them off the road, accusing them of stealing their customers. The operators also faced other problems such as bad weather, accidents and poor road conditions. This report provided a detailed account of the problems faced by 'boda boda' bicycle operators but failed to suggest how those problems could be addressed.

A survey (2009, sample size unknown) conducted in Rwanda showed that 'boda boda' bicycle taxis operations were banned in many urban areas because of increased number of accidents involving the bicycle taxis and motor vehicles (The New Times, 2009). According to the study, banning the bicycles from the towns reduced operators earning by more than 50%. Although this study provided information on the reasons used by the local authorities to ban the bicycles from operating in the town centres it failed to investigate alternative measures that could address the problem.

2.6.1.6.2 Problems faced by prospective operators

A study (2003, sample size unknown) carried out in Uganda showed, that owners and operators of 'boda boda' bicycle taxis were faced with various entry barriers and operational problems (Howe, 2003). According to the study, the operational problems faced include high cost of entry to the industry, lack of credit facilities to buy or replace old bicycles, difficulties in obtaining spare parts, poor maintenance skills and high taxation. This report provided information on problems faced by operators when entering into the industry and in the course of operating their businesses but failed to provide suggestions on measures required to address these problems.

2.6.1.6.3 Problems faced by other road users

A survey (2009, sample size unknown) conducted on 'boda boda' bicycle taxis in major urban centres in Rwanda showed that there were many bicycle taxis on the roads and conflicts with vehicular traffic exposed the passengers, operators and other road users dangers associated with vehicles. According to the report, over 50% of the fatal accidents in major towns involved the bicycle taxis (The New Times, 2009). This report showed the percentage of accidents involving bicycle taxis but it failed to provide information on whether the bicycles were responsible for those accidents.

2.6.1.6.4 Problems faced by users

A study (2001, sample size unknown) carried out in Eastern Uganda, showed that 'boda boda' bicycle operators in the area had a bad reputation (Odeke, 2001). According to the study female passengers frequently reported them to the police for using obscene language and fights for passengers frequently occurred among bicycle taxi operators. This report provided information on the problems faced by 'boda boda' bicycle taxi users but it failed to suggest mechanisms required to address them.

Another study (2003, sample size unknown) also carried out in Uganda, showed that some of the 'boda boda' bicycle taxi operators had a poor image among users (Howe, 2003). According to the study 72% of the women users complained about the operators' reckless, inexperienced riding, lack of respect for traffic rules, overcharging, theft, poor and dirty appearance, and arrogance. This report provided a detailed account of problems faced by 'boda boda' bicycle taxi users but failed to investigate the measure required to address the problem.

2.6.2 Type of transport services provided by 'boda boda' bicycle taxis

A study (2003, sample size unknown) carried out on 'boda boda' bicycle taxi operations in Uganda showed that they mainly provided passenger services but was sometimes hired to carry goods to various places (Howe *et al*, 2003). The studies concluded that 'boda boda' bicycle taxis provided transport mostly for short distance trips in urban areas where they operated alongside the other modes or provided services in urban areas where the trip densities were low and the roads were bad. They

also provided feeder service to main roads to compliment large volume transport services. This study clearly shows that *'boda boda'* bicycles provided various types of transport services. However the report failed to investigate the nature of trips made by the users.

2.6.3 Market niche

A study (2001, sample size unknown) carried out in Uganda on *'boda boda'* bicycle taxis showed that they provided short distance, low capacity transport services that were able to serve low density demands and in places where accessibility by vehicular transport is restricted by width or nature of access routes (Howe, 2001). According to the study they were also commonly used to provide access to many low income urban settlements and as feeder transport to major transport routes. In heavy traffic conditions they are valued for their ability to weave through the traffic thus shortening door to door travel times. This study clearly shows the types of transport service provided by *'boda boda'* bicycle taxis but failed to indicate the nature and purposes of the trips made by the users.

Another study (2004, sample size unknown) carried out on the *'boda boda'* bicycle taxis in Uganda showed that the bicycle taxis commanded a significant share of the transport market in provision of transport services for passenger and goods (Howe *et al*, 2004). According to the study the bicycle taxis provided transport service for short distance trips in rural and urban areas. The study also showed that *'boda boda'* bicycle taxis provided various types of transport services depending on geographical conditions and demands. The common types of transport services that *'boda boda'* bicycle taxis provide include operating alongside the conventional transport modes by competing with them, providing feeder services to main routes in urban areas where passenger volumes were low or access roads were impassable by vehicles and feeder services to main roads in rural areas where high capacity transport services were available. This study shows that *'boda boda'* bicycles taxis provide various types of transport services to meet different transport needs but it failed to provide information on trip purposes.

Studies (2004, sample size unknown) carried out in Uganda showed that *'boda boda'* bicycle taxis operate well in relatively flat rural areas and in urban areas where demand for transport services is low or the existing roads are in a poor state making vehicular transportation uneconomical (Howe *et al*, 2004). According to these studies the mean household trip length varied with income from 1.3 kilometres to 5.4 kilometres but rarely exceed three kilometres. This report shows clearly the nature of the transport services provided by *'boda boda'* bicycle taxis but did not provide details on trip purposes.

Another study (2001, sample size unknown) carried out in Uganda showed that *'boda boda'* bicycle taxis provide low capacity transport service in rural and urban areas but were restricted to areas with flat terrain where they are used to provide transport services for short distance trips,

normally less than five kilometres long (Howe, 2001). This report provided information on the nature of 'boda boda' bicycles but it failed to provide information on the trips purposes.

2.6.4 Impacts on socio-economics

2.6.4.1 Employment opportunities and dependants

A survey (2003, Sample size unknown) conducted in Uganda to determine the number of 'boda boda' bicycle taxis operating in the country showed that there were about 200,000 bicycle taxis (Howe, 2003). According to the survey 67% of the 'boda boda' bicycle taxi operators were married and had dependants. On average each 'boda boda' bicycle taxi directly supported the livelihood of six people. Thus the total number of people who directly relied on 'boda boda' bicycle taxis for their living was about 1.2 million people. This report provided information on the number of the people whose livelihood directly depended on the 'boda boda' bicycles but failed to provide information on the number of people indirectly supported by the bicycle taxis.

Another study (2004, sample size unknown), also carried out in Uganda, showed that the 'boda boda' bicycle taxi industry directly created employment to the operators, most of whom come from poor families (Heyen-Perschon, 2004), and indirectly created employment for bicycle mechanics, blacksmiths and kiosk operators. The study also showed that every 'boda boda' bicycle taxi operator supported on average six dependants. According to the study, a total of 1.6 million people, or about 7% of Uganda's population, depended on the bicycle taxis for their livelihood. This report provided information on the total number of people who depended on the bicycle taxis for their livelihoods. However it failed to provide information on the number of people directly involved in the bicycle operations and those indirectly employed in the support services.

2.6.4.2 Impacts on the environment

A study (2001, sample size unknown) carried out on 'boda boda' bicycle taxi operation in Uganda showed that the bicycle taxis provided an environmentally friendly transport services because bicycles do not use fossil fuels (Odeke, 2001). According to the study bicycle taxi transport services require less road space and emit no harmful fumes to the atmosphere which makes them environmentally friendly. This report provided information on the benefits of the bicycle transportation to the environment but failed to investigate on the impact of bicycle repair workshops in the environment.

2.6.5 Regulations and associations

2.6.5.1 Regulation

A study (2007, sample size unknown) carried out in Uganda showed that the Kampala City Council formulated regulations aimed at enhancing the safety of the 'boda boda' bicycle taxi operations (Aanyu, 2007). According to the study the regulations required all the 'boda boda' cyclists to have

third party insurance cover, a road license, a driving permit, a helmet, to pay the fee for a parking license and a passengers' service vehicle license from the Ministry of Transport. This report provided detailed information on the regulatory measures but no specific details on enforcement of the regulatory measures and the penalties involved.



Figure 2.20: 'Boda boda' bicycle (Nairobi road), Kisumu



Figure 2.21: 'Boda boda' bicycle garage (near Summit stage), Nakuru

2.6.5.2 Associations

A study (2004, sample size unknown) carried out in Uganda, showed that most of the 'boda boda' operators were members of 'boda boda' associations, some of which were registered with the local authorities (Howe *et al*, 2004). According to the study, members paid to the association an annual fee of between three and six dollars. This fee secured an operating license from the municipality and annual membership of the association. In some areas associations also collected the operating fees on behalf of the local authorities. This report provided information on the functions the associations but provided no information on the benefits of the association to its members.

A survey (2009, sample size unknown) conducted in Uganda, showed that associations were founded wherever 'boda boda' bicycles started their operations (Schindler, 2009). According to the survey the associations helped to minimize the risk associated with the 'boda boda' bicycle taxi operation such as dangerous riding, the use of poorly maintained bicycles and molestation of female passengers. This report provided information on the benefits of the association to its members but failed to provide any information on membership fees and how the association helps the members.

Another study (2001, sample size unknown) carried out in Uganda showed that most of the 'boda boda' operators were members of an association to which they pay an annual fee of between USD 3.30 and USD 5.60 (Howe, 2001). According to the study the association represented members in all types of disputes relating to their operations, enforced some operational discipline and traced members' relatives in the event of accidents. This report provided information on the functions of the association but provided no information on how the associations enforced the operational discipline.

Similarly another study (2006, sample size unknown) carried out in some parts of Uganda showed that most 'boda boda' bicycle operators belonged to an association to which they paid some fees either on a daily or monthly basis (Muhumuza, 2006). For new operators to be accepted at a given stage they were required to pay a 'goodwill' sum of Ushs 50,000 (USD 28) which was shared out among the existing members. Although this report provided information on the amount of goodwill paid to the association by new members it failed to provide any information on the amount of money paid by the members to the association daily or monthly.

2.7 Review of literature regarding the rest of the world.

This section presents a review of studies carried out in the rest of the world by various organisations and persons, particularly in Asia where several major studies were carried out. These major studies were carried out by Replogle M in 1991, Whitelegg J and Williams N in 1998, Hodgkinson D and Walton-Ellery S in 2007, Wipperman T and Sowula T in 2007, Tiwari G in 1999 and 2002, Guitink P in 1996, Gwillian G in 2002, Mitra S in 2002, Pendakur S in 2000, Pucher J *et al* in 2005 and Rahman M *et al* in 2008, 2009 and 2010 as well as pedicab operating policies prepared by London pedicab association in 2004 and Orange County Convention Centre in 2009. The other studies were carried out by various persons for articles published in newspapers and magazines. These include: Suitana I for "Bangladesh News" in 2008, Madhu P in 2006, Ali M for "Bangladesh channel RSS" in 2007.

2.7.1 Operating characteristics of 'for hire' bicycle taxi operations

2.7.1.1 Nature of trips

In some Asian countries, cycle rickshaws were used to provide low cost and non-polluting transport services using renewable energy or human power. According to a study (1991, sample size unknown) carried out in some cities in India, China, Pakistan and Bangladesh, rickshaws were used to provide transport for short distance trips in urban areas regardless of income levels (Replogle, 1991). The study showed that rickshaw services were used in some countries in Asia as part of local strategies dealing with poverty alleviation, air pollution, traffic problems and in the provision of service complementary to high capacity public transport system. This report provided detailed information on the types of service provided by rickshaws in Asia but none on the lengths of the trips covered by the rickshaws

Another study (1998, sample size unknown) carried out in Calcutta showed that rickshaws provide cheap, reliable, non-polluting and user friendly transport services where the alternative means of transport are dirty, crowded and unsafe for the passengers (Whitelegg *et al*, 1998). According to the study, rickshaws provide twenty-four hour transport services in the city as an alternative to the conventional modes of the transport. Although this report provided information on the nature of

transport services that are provided by the rickshaws it failed to give information on the type of trips made by the rickshaws.

Another study (2006, sample size unknown) carried out in New Delhi showed that rickshaws provide cheap transport services for domestic and commercial purposes (Kishwar, 2006). According to the study the rickshaws were used commercially to provide feeder services for the city's bus transport service, the metro rail and for transportation of goods. For domestic transportation they were used to take children to and from school, take housewives shopping and to collect garbage. This report provided information on the nature of service provided by the rickshaws but not on the type of trips made and weight of goods carried by the rickshaws.

2.7.1.2 Number of operators and hours worked

In Asian cities rickshaw taxis provide direct employment to many people. A study (1991, sample size unknown) carried out in Dhaka showed that there were about 380,000 rickshaw taxi operators in the city. (Replogle, 1991). This report provided information on the number of people employed by the rickshaw industry in Dhaka but none on the number of hours worked by the rickshaw operators per day.

Another study (2007, sample size unknown) carried out in Bangladesh showed the number of rickshaw taxi operators in the country to be between two and four million (Ali, 2007). According to the study the operators worked for 12 hours per day in order to make enough money for their daily needs. This report provided clear information on the number of hours worked by rickshaw operators per day but no realistic estimate on the number of rickshaw operators.

Another study (2007, sample size unknown) carried out in Dhaka showed the number of operators in the city to be about 1,600,000 (Hodgkinson *et al*, 2007). According to the study each rickshaw was operated by two pullers working in two shifts. Although this report provided information on the number of operators in Dhaka it failed to provide information on the number of hours worked by the operators.

Another study (2007, sample size unknown), also carried out in Bangladesh, showed that the number of rickshaw operators in the country was about 2,000,000 (Wipperman, 2007). According to the study most of them worked for long hours without breaks. This report provided information on the number rickshaw operators in the country. However it failed to provide information on the exact number of hours worked by the operators.

Another study (2006, sample size unknown) carried out in New Delhi, showed that there were over six million operators in the city (Kishwar, 2006). According to the study, each rickshaw operator covered a distance of 20 to 25 kilometres per day. This report provided information on the number of rickshaw operators in the city and the distance they cover per day but not on the number of hours worked per day.

Another study (1998, sample size unknown) carried in Calcutta showed the estimated number of rickshaw operators in the city to be over 80,000 (Whitelegg *et al*, 1998). According to the study, each operator made between 10 and 20 trips per day each usually not exceeding three kilometres long. Although this report provided information on the number of operators in the city it failed to provide information on the number of hours worked by the operators per day.

2.7.1.3 Fares charged and operator earnings

A study (2008, sample size unknown) carried out in Dhaka, showed that the fares ranged between 10 and 15 takas for short to medium trips (Suitana, 2008). In Dhaka alone, pullers earned a combined amount of 20 million takas per month. According to the study the profits of all rickshaws in Bangladesh out-earned all the earnings of bus, rail, boats and airlines combined. This report provides information on the fares charged per trip by the operators but failed to provide information on the operators' earnings per day.

Another study (2007, sample size unknown) carried out in Bangladesh, showed that the fares charged by rickshaw operators were negotiable and varied from one place to another (Ali, 2007). For short distances of up to one kilometre however, the charges ranged between eight and 10 takas. According to the study, rickshaw operators earned an average of 300 takas per day. Although this report provided information on the fare charged by the operators for short distance trips it failed to provide information on the fares charged by rickshaw operators for medium and long distance trips.

Another study (2007, sample size unknown), also carried out in Bangladesh, showed that the fares charged by rickshaw operators varied depending on the place, length of the journey and the operator (Wipperman, 2007). According to the study, on average rickshaw operators earned about 150 takas (USD 2.0) per day. After deducting about 50 takas (USD 0.67) per day for food, rent for the rickshaw and lodging they were left with about 100 takas (USD 1.33) per day. The study showed that approximately USD 4,100,000 flowed into the country's economy everyday from the rickshaw operation and out of this amount; USD 2,900,000 remained in the hands of the operators. This report provided information on the amount of money each operator earned per day but failed to provide information on the fares charged by the operators for the various trips.

Another study (2006, sample size unknown) carried out in New Delhi, showed that the fares charged by rickshaw operators varied from one place to another (Kishwar, 2006). According to the study an operator earned an average of between 95 and 230 rupees per day. After paying the rickshaw owner between 20 and 30 rupees per day an operator was left with a daily earning of between 75 and 200 rupees. Although this report provided information on the average earnings of rickshaw operators per day it failed to provide information on the fares charged by the operator for the various trips.

Elsewhere in Calcutta city, the fares charged by rickshaw operators were almost uniform in most of the areas. A survey (1998, sample size unknown) conducted in various parts of the city

showed that operators earned an average of 60 to 80 rupees per day after deducting the rickshaw rent (Whitelegg *et al*, 1998). This report provided information on the amount of money earned by the operator daily but it failed to provide information on the fares charged by the operators for the various trips.

2.7.1.4 Rickshaw operators

A study (2007, sample size unknown) carried out in Bangladesh showed that rickshaw operators in the country were economically marginalized, considered to be of low human value and most of them had no basic education (Wipperman *et al*, 2007). The study showed that 38% did not know how to read and write and a further 30% could only write their names. Additionally the study showed that most of the operators died early, mostly between the ages of 14 and 30, and very few of them lived to 60. This report provided detailed information on the rickshaw operators but not on the age at which operators join the trade.

2.7.1.5 Rickshaw users

A study (1991, sample size unknown) carried out in Dhaka showed that 78% of the rickshaw trips were made while carrying passenger and 22% of the trips were made while carrying goods (Replogle, 1991). According to the study men use rickshaws more than women and children. Although this report provided information on the nature of trips made by rickshaws it failed to provide information on the purpose of trips.

Another study (1998, sample size unknown) carried out in Calcutta showed that rickshaws provide essential transport services to disadvantaged people such as the poor, women, the elderly, children, the frail and the disabled (Whitelegg *et al*, 1998). Rickshaws were used during the monsoon, when the streets were flooded to carry passengers through the flooded areas to various destinations. The study also showed that the rickshaws were used by parents to take their children to and from school. This report provided information on the users of rickshaw transport but failed to provide information on the lengths of trips made by the users.

2.7.1.6 Problems faced

2.7.1.6.1 Problems faced by operators

A study (1991, sample size unknown) carried out in Bangladesh, showed that most local authorities were trying to reduce the number of rickshaws operating in cities (Replogle, 1991). According to the study the local authorities confiscated and destroyed the rickshaws for minor reasons thus robbing the operators of their livelihood. This report shows the kind of treatment awarded to the rickshaw operators by some local authorities but failed to provide information on the reason used by the local authorities to destroy the rickshaw and how such a situation could be changed.

Another study (2007, sample size unknown) carried out in Dhaka showed that the local authorities in the city sometimes banned rickshaw operations in the major streets, lowering the income of thousands of rickshaw operators who depended on them for their livelihood (Hodgkinson *et al*, 2007). According to the study local authorities also confiscated and destroyed the rickshaws for minor reasons. This report confirms the problems faced by many rickshaw operators but failed to provide information on the reason used by the local authorities to destroy the rickshaws.

Another study (2007, sample size unknown) also carried out in Bangladesh showed that rickshaw operators were faced with various problems, including poor economic and social conditions, abuse by the hirers and daily discrimination (Wipperman *et al*, 2007). According to the study the police beat them, punctured their rickshaw tyres and sometimes prevented them from carrying passengers. This report highlighted some of the problems faced by the rickshaw operators while earning a living. However it failed to investigate the measures required to improve the working conditions of the rickshaw operators

Elsewhere in New Delhi, a study (2006, sample size unknown) carried out on rickshaw operations showed that there was a web of illegality surrounding the rickshaw industry in the city which provided avenues for extortion (Kishwar, 2006). According to the study police and municipal officials obtained bribes from the unlicensed operators using threats of impounding and destroying the rickshaws. This report confirms the problem faced by the rickshaw operators in the course of doing their work but it failed to provide suggestions on how those problems could be solved.

2.7.1.6.2 Problems faced by prospective operators

A study (2006, sample size unknown) carried out in New Delhi showed that the licensing of rickshaws had been stopped in the areas governed by the New Delhi Municipal Council (Kishwar, 2006). In the areas governed by Municipal Corporation of Delhi, only 99,000 licenses were authorized although the whole city had over 6,000,000 rickshaws which required licensing. This report shows clearly how difficult it was for rickshaw operators to obtain operating licenses but it failed to investigate the criteria used by the local authorities to issue the licenses.

2.7.1.6.3 Problems faced by other road users

A study (2007, sample size unknown) carried in Dhaka, showed that the rickshaws were a source of traffic congestion in the city due to their numbers (Hodgkinson *et al*, 2007). According to the study, lack of general awareness of traffic rules by the rickshaw operators, insufficient numbers of police and high incidences of police corruption, all combined, increased the congestion caused by rickshaws. This report showed the causes of traffic congestion associated with rickshaws but it failed to investigate the measures required to minimize the problem.

2.7.2 Types of transport services provided by 'for hire' bicycles

A study (2006, sample size unknown) carried out on rickshaw operations in Bangladesh showed that many commuters in the country depended on rickshaws for their daily travel needs (Suitana, 2006). According to the study, the rickshaws provide cheap transport services to various places for short to medium distance trips using human power thus making them safe and environmentally friendly. This report provided information on the type of service provided by rickshaws but failed to provide information on the lengths of trips made by the rickshaws.

Another study (2007, sample size unknown), also carried out on rickshaw operations in Bangladesh showed that rickshaws provides efficient door to door transport services for short distance trips to many places in the major cities, utilising renewable and non-polluting resources (Hodgkinson *et al*, 2007). According to the study, the rickshaws makes short distance trips because the operators are discouraged from making long distance trips by worn-out tires, rough roads and repeated stopping and starting in heavy traffic. During the seasonal flooding of the monsoon, rickshaws are the only vehicles that operate in Dhaka's flooded streets. This report provided information on the types of services and the market served by the rickshaws but failed to provide information on the purpose of trips typically made by the rickshaws.

Another study (2007, sample size unknown) carried out in Dhaka showed that rickshaws provided short to medium distance trips on minor roads which were mostly inaccessible to larger transport and other areas off the main roads (Wipperman *et al*, 2007). According to the study rickshaws avoided major roads because they lacked capacity to compete for passengers and road space with the major transport service providers. The study also showed that rickshaws transported many things from passengers to animals, plastic flowers and machinery. To people with low incomes rickshaws were the only means of transport available to them other than walking. This report provided information on the type of services provided by rickshaws but not on the relationship between the services provided by rickshaws and those provided by other available modes of transport.

2.7.3 Market niche

A study (1991, sample size unknown) carried out in Bangladesh showed that rickshaws operated efficiently for distances between 0.65 and seven kilometres but their utility reduced in hilly terrain (Replogle, 1991). According to the study, each cycle rickshaw in Bangladesh accounted for about 30,000 passenger miles and 100 ton-miles of goods movement per year. Although this report provided information on the distance covered and goods transported by the rickshaws in Bangladesh it failed to provide information on the types of services provided by the rickshaws in relation to those provided by other transport modes.

Another study (2007, sample size unknown) carried out in Dhaka, showed that most of the rickshaw trips were between one and five kilometres (Hodgkinson *et al*, 2007). The study showed that

the rickshaws rarely made trips of less than one kilometre or more than five kilometres. Typically, rickshaws in the city worked for two shifts per day and made between 14 and 15 trips per shift thus giving a daily output of about 117 passenger-kilometres per day. This report provided information on the length of the trips made by the rickshaw but failed to provide information on the type of service provided by the rickshaws in the relation to the other modes of transport and areas served.

Another study (2006, sample size unknown) carried out in New Delhi showed that cycle rickshaws provided transport services for short distance trips. In the city they were commonly used to transport passengers, goods and garbage (Kishwar, 2006). Each rickshaw covered a minimum distance of between 20 and 25 kilometres per day. Although this report provided the average distances covered by the rickshaws, it failed to provide information on the types of transportation services provided by the rickshaws.

Another study (1998, sample size unknown) carried out in Calcutta showed that cycle rickshaw provided transport services for short distances usually not exceeding three kilometres (Whitelegg, 1998). Most of the trips had averages of one kilometre for pulled rickshaws and 1.5 kilometres for cycle rickshaws. This report provided information on the types of trips made by the rickshaws but failed to provide information on the types of transport services provided by the rickshaws in relation to other modes.

2.7.4 Impacts on socio-economics: employment opportunities

Rickshaws provide direct and indirect employment to many people in India and Bangladesh. A study (1991, sample size unknown) carried out in Dhaka showed that over 380,000 people were directly employed as rickshaw operators and another 80,000 people were employed in ancillary services related to the rickshaws (Replogle, 1991). The people employed directly and those employed indirectly by the rickshaw industry accounted for 25% of all employment in metropolitan Dhaka. Over 1,000,000 people were employed by the rickshaw industry in Bangladesh. This report provided information on the number of people employed by the rickshaw industry in Dhaka but it provided no specifics about the types of ancillary service connected to the rickshaw industry.

Another study (2008, sample size unknown) carried out in Bangladesh, showed that rickshaw operators supported a large proportion of the countrys' population (Suitana, 2008). This proportion includes the operators, their families, mechanics who repair the rickshaws and the street hawkers who sell food to the operators. According to the study the rickshaw industry employed 38 different professionals from manufacturing of raw materials used to fabricate rickshaws to the rickshaws. This report shows that rickshaws provide employment to many people directly and indirectly but did not establish the number of people who were directly and indirectly employed by the industry.

Another study (2007, sample size unknown) carried out in 2006 in Dhaka, showed that the number of rickshaws operating in the city was about 800,000 (Hodgkinson *et al*, 2007). According to

the study, the rickshaw industry in Dhaka alone supported the livelihood of over 5,000,000 people from the rickshaw operators, rickshaw owners, mechanics, and spare parts traders to their dependants. This study shows that the rickshaw industry supported many families. However it failed to provide information on the actual number of people who were indirectly employed by the industry in the city.

Another study (2007, sample size unknown) also carried out in Bangladesh, showed that the rickshaw industry directly provided employment for 2,000,000 operators each with an average family of about 5.2 persons (Wipperman *et al*, 2007). According to the study about 14% of the population of Bangladesh relied on the rickshaw industry for their livelihood. In Dhaka alone about USD300,000 was estimated to change hands between operators and passenger per year. This report confirms that the rickshaw industry is among the biggest employers in Bangladesh. The report failed, however, to provide information on the number of people employed indirectly by the industry.

Elsewhere in New Delhi, the rickshaw industry supported the livelihood of over 7,000,000 people directly and indirectly (Kishwar, 2006). According to a study (2006, sample size unknown) carried out in the city, this number included the rickshaw operators, owners, employees of small scale industries that produce spare parts for the rickshaws, repair mechanics and rickshaw assemblers. This report shows that the rickshaw industry is a major employer in New Delhi but failed to provide information on the actual number of rickshaws operators.

Another study (1998, sample size unknown) carried out in Calcutta, showed that the rickshaw industry in the city provided employment for about 100,000 operators (Whitelegg, 1998). The industry directly supported about 60,000 people excluding the rickshaw owners, mechanics, garage owners and their dependants. This report shows that the rickshaw industry is a major employer and supports the livelihood of many people but it failed to provide information on the number of people employed by rickshaw support services.

2.7.5 Regulations

A study (1991, sample size unknown) carried out on rickshaw operations showed that regulations in most Asian countries required the rickshaws operating in the urban areas to be licensed (Replogle, 1991). According to the study, a number of cities in India, Indonesia and Bangladesh had imposed restrictions on the number of rickshaws licensed to operate within the cities by limiting the number of licenses issued per year, sometimes even stopping issuing the licenses for a number of years. These restrictions sometimes led to black market in falsified licenses and extortion of operators and owners of the rickshaw by police threatening to seize or destroy the unlicensed rickshaws. This report highlighted some of the regulations formulated by local authorities to manage the rickshaws but failed to investigate measures required to minimize the extortion and harassment of operators.

Another study (2007, sample size unknown) carried out in Dhaka showed that the City Council required all rickshaws operating within the city to be licensed but it provided a limited number of licenses which were far below the number of rickshaws operating in the city (Hodgkinson,

2007). According to the study this resulted in violent competition for the operations between the licensed minority and the unlicensed majority. This report shows clearly the problems faced by rickshaw operators in their attempt to earn an honest living but failed to investigate measures required to minimize the problems.

Another study (2006, sample size unknown) carried out in New Delhi showed that the local authorities required all rickshaws operating within the city to be licensed and that the regulations required that each operator own only one rickshaw (Kishwar, 2006). The study showed that the city authorities permitted only 89,429 licenses to be issued to the operators but that there were approximately 6,000,000 rickshaws operating in the city. This report confirms how unrealistic most of those local authorities were in licensing policies but it failed to investigate the criteria used to license the rickshaws

Another study (1998, sample size unknown) carried out in Calcutta showed that the City Council required owners of rickshaws operating within the city to obtain operating licenses (Whitelegg *et al*, 1998). According to the study the licensing system was abused by the council officials making it almost impossible for most of the rickshaw owners to acquire licenses. Most rickshaws in the city thus operated without the license but this exposed them to exploitation by police and council officials. This report shows some of problems caused by bad policies and regulation in licensing mechanisms. However it failed to investigate the measures required to address the licensing problem.

Non-motorised transport projects require comprehensive policy measures to be incorporated at the planning stage according to a study (2002, sample size unknown) carried out in Columbia (Gwillian, 2002). The study showed that in 2000 the municipal council of Bogota published a master plan for bicycle transportation in the city. The objective of the policy document was to separate bicycle transport from vehicular traffic. The plan included construction of 320 kilometres of cycle paths together with the ancillary infrastructure such as bicycle and related street furniture over a period of nine years. The project was intended to provide a modal split to the bicycle of 2.5% and an economic return of 15%. To achieve this, four major policy issues had to be addressed in order to support non-motorised transport. These included clear provision of rights and responsibilities of bicycles and pedestrians in traffic law, formulation of a national strategy for non-motorised transport as a facilitating framework for local plans, formulation of local plans for non-motorised transport as part of the planning procedures of municipal authorities and provision of separate infrastructure where appropriate. This report clearly shows the benefits of clear policy measures but it failed to provide the specific policies which were required for the smooth functioning of non-motorised transportation systems.

A survey (2005, sample size unknown) conducted in some major cities in India showed that transportation authorities and planners placed little emphasis on non-motorized transport despite the fact that about 50% of the commuters in the country relied on it for their daily transport needs (Pucher

et al., 2005). The situation was worsened by lack of funding and by government priorities that favoured motorised transport. However in 2004 the national government, through its ministry of urban affairs and poverty alleviation, issued a draft urban transport policy document that recommended 50% national government funding for both bicycle tracks and pedestrian paths in large cities. In the first phase the government was to finance 50 kilometres of tracks and paths for cities with at least 50 million people and 100 kilometres of paths and tracks for cities with at least 100 million people. This paper identified the problems faced by the bicycle users and pedestrians in major cities in India as well as the approach adopted by authorities to address the problem. However it failed to provide or suggest the specific regulatory measures that were required to manage the facilities.

A paper prepared for the World Bank (Guitink, 1996) showed that proper planning and the setting of correct objectives was important to the success of non-motorised projects. The paper suggested that non-motorised transportation policies be developed and that there be three power levels to devolve the management of the systems. The suggested levels of management include national, regional and local levels each of which was required to formulate its own policies with different objectives. According to the paper the national non-motorised transport policy was to provide the framework and direction for the development and coordination of non-motorised transport at all levels of the government. This would facilitate integration of non-motorised transport within planning and design activities. The paper proposed measures to promote non-motorised transport which include integration of non-motorised transport modes in transport systems, provision of non-motorised transport infrastructure as well as the development of non-motorised transport policies and plans at regional and local levels. Further the paper proposed development of strategic non-motorised transport plans at local, urban and rural areas tailored to encourage all stakeholders in the industry to take an active role in the promotion of non-motorised transport. This paper provided important proposals of the policy measures required to manage non-motorised transport at the various levels of government but it failed to provide details on the mechanisms required to implement and enforce the policies at various administration levels.

A study (2008, sample size unknown) carried out on rickshaws in Dhaka showed that the authorities in the city considered them inefficient, backwards, slow, and congestion creators (Rahman *et al.*, 2008). To support this perception, the government of Bangladesh formulated policies to remove the rickshaws from the major areas in Dhaka but later revised the policies to allow them back in the streets with restrictions on number of licenses. This paper clearly explained the circumstances that led to the banning of the rickshaw operations in some cities but failed to provide information on the suggested criteria for licensing the rickshaws.

Another study (1999, sample size unknown) carried out in New Delhi showed that most low income people in the city either walked or cycled to their places of work because they were unable to afford the fares charged by motorised transport and pointed out that the existing policies had not taken adequate measures to guarantee the safety of pedestrians and bicyclists in the road environment

(Tiwari, 1999). It proposed that policies be formulated to protect them from vehicular traffic by physical separation of roadways from bicycle tracks and pedestrian paths as well as formulation of policies to allow pedestrian and bicycle routes to pass through parks, green belts and narrow city streets. This study clearly shows the measures required to be implemented to promote the use of bicycle and walking but it failed to specify the policy measures that need to promote walking and use of bicycles.

Another study (2009, sample size unknown) carried out in Bangladesh showed that the transport authorities had a negative attitude towards rickshaw operations and hurriedly formulated and implemented policies aimed to bar rickshaw operations within the cities without providing alternative means of transport to the rickshaw users (Rahman *et al*, 2009). In most cases this failed to work but they responded by reducing the number of licenses issued to rickshaws owners. This paper clearly shows the approach taken by the transport authorities in Bangladesh in respect to rickshaw operations but failed to suggest the specific policy measures which were required to address the problem.

In Orange County in the United States of America, pedicabs were used to provide transport services to visitors at the Orange County Convention Centre. Effective from 1st January 2009, the centre management formulated operating policies to regulate the pedicabs operation at the centre. The regulations were classified into two categories which include, regulations relating to application procedures for pedicab (rickshaw) services and the regulations relating to the pedicab standard operating procedures. The regulations relating to application procedures for pedicab (rickshaw) services included rules relating to licensing, payable operating fees, condition of the pedicabs, adherence to the operating rules, insurance for the pedicab operations and the consequences of not following the laid down regulations. The regulations relating to standard operating procedures included passenger pick-up and drop-off areas, wearing of uniform with an identity logo, work ethics, use of drugs and the consequences of contravening the operating rules. Additional documents required to be provided by the pedicab operators to the centre management include a completed pedicab application form with full details of the applicant, pedicab form with all information on the pedicab including the insurance details and pedicab reference form consisting of details of three referees not related to the applicant together with pedicab inspection details (Orange County Convention Centre, 2009). This policy document provided a detailed account of policy measures used to manage pedicab operations but it failed to provide information on the extent of the pedicabs operations.

2.8 Conclusion

The aim of this literature review was to determine:

- (i) The role played by 'boda boda' (for hire) bicycle taxis in urban transport systems.
- (ii) Problems encountered in operations.
- (iii) Gaps in knowledge of 'boda boda' operations.

- (iv) Methods that were used previously to study bicycle taxi operations with or without success.
- (v) Regulatory and support measures that warrant consideration by the relevant transport authorities.

The review of literature on '*boda boda*' bicycle taxis shows that they started their operations at the Kenya-Uganda border in the 1960's (Malmberg-Calvo, 1994) but they spread more rapidly on the Ugandan side than the Kenyan side. The literature search in this study revealed that most of the major studies on the bicycle taxis were carried out in Uganda possibly because they established their services earlier.

The literature review of studies carried out in Kisumu, Nakuru and the rest of Kenya showed that few major studies were carried out on '*boda boda*' bicycle taxis operations in Kenya but several minor studies were carried out for articles published in popular media. These studies could not, however provide enough information to gauge the role played by the bicycle taxis in urban transport systems because they focused on specific aspects of the bicycle taxis and rarely involved comprehensive studies to provide in-depth information. Therefore it was concluded that there was a need for a comprehensive study to be carried out on the '*boda boda*' bicycle taxi operations in Kenya.

Despite the bicycles taxis having been in operation in some parts of Kenya for over ten years, only a few studies appear to have been carried out in the country. Therefore this indicates that there are gaps in knowledge of the '*boda boda*' bicycle operations relating to the operating characteristics, types of transport services provided by the bicycle taxis, market niche served by the bicycles, their impact on socio-economics and regulatory and support measures required to manage the bicycle taxis. Most of the previous studies carried out on bicycle taxis did not indicate the methods used to obtain the information, the sources of information, the reliability of the information and how successful they were in respect to the number of operators interviewed.

Based on the literature reviewed it appears that Kenya lacks comprehensive policies relating to non-motorised transportation in general and '*boda boda*' bicycle taxis in particular. The review of the proposed regulatory frameworks obtained from Nakuru, Kisumu and Busia towns showed significant differences in addressing the same operations and deficiencies with respect to bicycle support mechanisms. Absence of bicycle taxi operation policies exposes the operators to various problems which include harassment by local authority officials, dangers associated with vehicles in the roads, high costs of spare parts and poor fare charging mechanisms. This suggests that there is a need for a national non-motorised transport policy to be formulated to provide harmonized direction to the various local authorities. This would assist in regulating the '*boda boda*' bicycle taxi operations in order to make their services user friendly and minimize conflicts with other stakeholders. The policy can borrow from countries which have national non-motorised transport policies in place such as South Africa, America, Columbia and many European countries. The criteria for licensing the '*boda boda*' bicycle taxis should however be formulated to suit local conditions.

3. RESEARCH METHODS

3.1 Introduction

This chapter presents the research method followed in this study. The purpose of the study was to determine the role of '*boda boda*' bicycle taxis in the urban transport systems in Kenya, and to investigate what measures were in place to manage them. Further, the study aimed to establish the policy measures that would be required to be formulated by the relevant transport authorities in response to the information revealed about bicycle taxi operations. In order to achieve the aims of the research, the following five questions guided the study:

- What are the '*boda boda*' bicycles' operating characteristics?
- What types of transport services do '*boda boda*' bicycle taxis provide?
- What market niche do the '*boda boda*' bicycle taxis serve?
- What is the impact of '*boda boda*' bicycle taxis on socio-economics?
- What '*boda boda*' bicycle taxi regulations and supports are in place, and what are required?

In order to answer these questions, a two step strategy was used. The first step involved a comprehensive literature review of previous studies carried out on 'for hire' bicycles. The second step involved carrying out empirical research in selected places in Kenya.

This chapter opens with a description of the role of the researcher, literature review strategy and instrument design. This is followed by a description of the research design, data collection and analysis.

3.2 Role of the researcher

The role of the research varied at different stages of the study. At the initial stage the researcher developed the research instruments in line with the research objectives and then piloted them. During the survey the researcher, together with two assistants, applied the survey instruments to obtain the required information from the bicycle taxi operators. The researcher also carried out all the interviews with the local authorities' officials. The final task involved data analysis, compilation and presentation of the findings of the study.

3.3 Literature review strategy

The literature review obtained information to assist in the design of the survey instruments, and established what was known about the '*boda boda*' bicycle taxis in relation to operating characteristics, types of services, market niche served by the taxis, the impact of bicycles taxis on socio-economics and the regulatory and support measures that were in place. An extensive search for information was carried out through the internet and through an exchange of emails with experts in

the non-motorised transport field. A search for '*boda boda*' bicycle information yielded a few studies in Kenya but most academic papers and reports were obtained from studies carried out on the bicycle taxis in Uganda. Additional information was obtained from studies carried out on rickshaws in Asia; particularly India and Bangladesh. Further research on the internet was carried out to establish regulatory measures used to manage 'for hire' bicycles and information was obtained from sources in Europe and America. The information obtained from the literature review informed the design of the survey instruments (questionnaires).

3.4 Instrument design

This study involved collection of both qualitative and quantitative data. Various methods of obtaining the required information were considered and compared to establish the most suitable one. The methods considered included telephone interviews, face-to-face personal interviews, web-based surveys, interviews of small groups, and self-completion mail-back questionnaires. After assessment of these various methods, the face-to-face personal interview was found to be the most appropriate for this study. The other methods would have either been too expensive, too unreliable, or would have taken a long time to obtain the information.

Two approaches were adopted to obtain the required information from the operators as well as the local authorities' officials requiring two sets of questionnaires to be developed, one for interviewing operators and the other one for interviewing officials from local authorities. The questionnaires were designed based on the information that was required from the various respondents. Three subsets of questionnaires were prepared for the different categories of operator; owner operator, hiring operator and hiring owners. The three operator survey instruments were intended to obtain information from operators who owned the bicycles they were using, operators who hired the bicycle they were using and owners who were not operating the bicycles but were hiring them to the operators. Appendix B presents the instruments used in data collection (in English and Swahili).



Figure 3.1: A '*boda boda*' bicycle carrying goods and *Matatus* (Likoni road), Mombasa



Figure 3.2: '*Boda boda bicycles*', Head office stage: Nakuru.

3.5 Research design

3.5.1 Pilot survey

A pilot survey was carried out at various survey stations during typical peak and off-peak periods. The main aim of the pilot study was to test the survey instruments (questionnaires) to establish whether they were able to serve the purpose for which they were intended before they were used for the main survey. The study was carried out in selected areas in both urban and rural areas. The survey stations were randomly selected from five provinces where '*boda boda*' bicycle taxis are commonly used. The selected provinces include Rift Valley, Nyanza, Western, Central and Coast. A total of nine survey stations were selected, six in urban areas and three in rural areas. The data for this survey was obtained by interviewing 42 '*boda boda*' bicycle operators and one hiring owner. Data obtained was then transferred from the questionnaires to a database and then was analysed using Microsoft Excel. Based on the results obtained from the pilot survey it was concluded that the survey instruments worked as required but some questions were reframed to reflect the findings of pilot survey. The pilot survey established that there were few people in the hiring owner category and therefore this part of the survey was done away with.

3.5.2 Selection of survey areas

The information obtained from the pilot survey was used to select the study areas. It was established that carrying out a study on the bicycle taxi operations in the country was unfeasible because of the time and costs involved. Therefore it was decided that use of case studies was the most appropriate method to carry out the study. Based on the pilot survey, Kisumu city and Nakuru town were the most suitable areas to carry out the study because of the following reasons:

- (i) Kisumu city and Nakuru town both had high numbers of '*boda boda*' bicycle taxis operating in their streets.
- (ii) '*Boda boda*' bicycle taxis operations and management in Nakuru town were better organised than those in Kisumu city, offering possibilities for interesting comparisons.

3.5.3 Ethics form and survey instrument approval

The pilot survey established that there were two main categories of '*boda boda*' bicycle taxi operators which include operators who were operating their own bicycles and operators who were operating hired bicycles. Copies of questionnaires for each category of operators together with the questionnaires for sourcing information from the local authorities' officials were submitted for approval to the Faculty of Engineering and the Built Environment Ethics Committee. They were all approved in October 2009 before commencement of the main survey. Appendix A presents the ethics clearance obtained.

3.5.4 Sample design

This research involved collection of both quantitative and qualitative data in Nakuru town and Kisumu city. A search carried out during the pilot survey to determine the number of bicycle taxis operating in the study areas failed to provide reliable information. This was because the concerned authorities did not maintain an inventory of the bicycle taxi operating in their areas of jurisdiction. However visual assessment (not supported by rigorous numerical data) carried out in both towns gave an estimate of 5,000 bicycles in each town. A sample of 250 responded which represented about 5% of the operators was chosen for each case study area. Dawson (2002) discusses appropriate sample sizes for statistical research. According to that text, factors that influence the sample size for a given piece of research include the time available, cost, type and purpose of the research, but that the sample should be proportional to the population. This position was supported by Scott *et al* (2009) who suggested a minimum of 100 samples for population exceeding 1,000 which cannot accurately be determined. At a 95% confidence level, and assuming a target population of 5,000, a sample size of 250 results in an estimated margin of error of 6.04%. While it would have been desirable to have had the resources to survey a larger sample in order to reduce the margin of error to 5% (which would have required a random sample of 357 respondents in each town), the sample used was deemed to adequately represent the estimated population of bicycle taxis in both towns for the purposes of this study.

3.5.5 Data sources

The data for this study was obtained from both primary and secondary sources. The primary sources include interviews with the 'boda boda' bicycle taxi operators and local authorities' officials using the questionnaires. The secondary sources include government publications such as by-laws, other policy documents and technical reports. The secondary data helped to understand the official attitudes of the relevant authorities towards the 'boda boda' bicycle taxi operations, roles played by the various stakeholders in the industry and the consequences of not complying with the applicable rules. They were also used to cross check some of the responses obtained from the 'boda boda' bicycle taxi operators and those of the local officials. Other relevant information relating to the study was obtained from reviews of various studies carried out in the study areas and elsewhere.

3.5.6 Data coding

This study involved collection of quantitative data from 500 respondents. All the survey questions and the responses were required to be entered into a flatline database for analysis. Coded responses needed to be captured in 116 data fields for each respondent. The database was analysed using Microsoft Excel. Figure 3.3 shows coding in an extract of the database.

Number	Questionnaire number	1=Rift Valley	1=Nakuru	name	name	1=Male
		2=Nyanza	2=Kisumu			2=Female
		Province	Town	Neighbourhood	Stage	Gender
		Q1.1	Q1.2	Q1.3	Q1.4	Q2.1
Record ID#	Questionnaire number	Province	Town	Neighbourhood	Stage	Gender
1	BB001	1	1	CBD	Head office	2
2	BB002	1	1	CBD	Head office	1
3	BB003	1	1	CBD	Head office	1
4	BB004	1	1	CBD	Head office	1
5	BB005	1	1	CBD	Head office	1

Figure 3.3: Example of database coding (Source: data base)

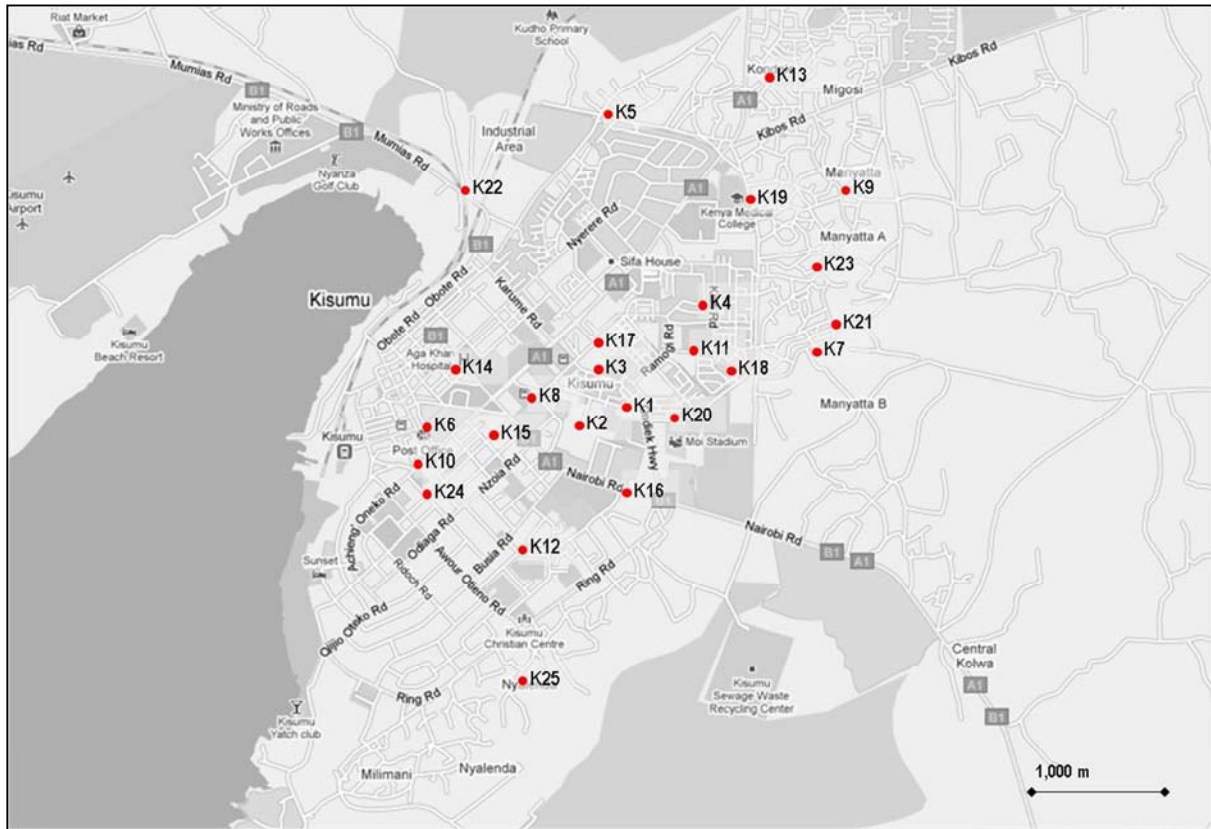
3.6 Data collection and analysis

This research entailed collection of both qualitative and quantitative data. Quantitative data was collected from the *'boda boda'* bicycle taxi operators and qualitative data was collected from the local authorities' officials. The purpose of the qualitative data was to provide an in-depth understanding of any regulatory framework that was in place to manage the bicycle taxis as well as the attitude of the local authorities towards the bicycle taxi operations.

In order to obtain representative data the stages and the operators interviewed were randomly selected during the survey process. A refusal rate of about 20% was encountered. The sampling bias this introduced is likely to have taken the form of the omission of some of the busier operators.

3.6.1 Data collection

The quantitative data was obtained through on-site personal interviews with the operators and a total of 500 samples were collected, 250 in Nakuru town and 250 in Kisumu city. In each town 25 neighbourhoods were randomly selected and in each neighbourhood one stage was randomly selected. A 'stage' is an informal ranking facility, typically adopting its name from a nearby landmark. In each stage 10 operators were interviewed.

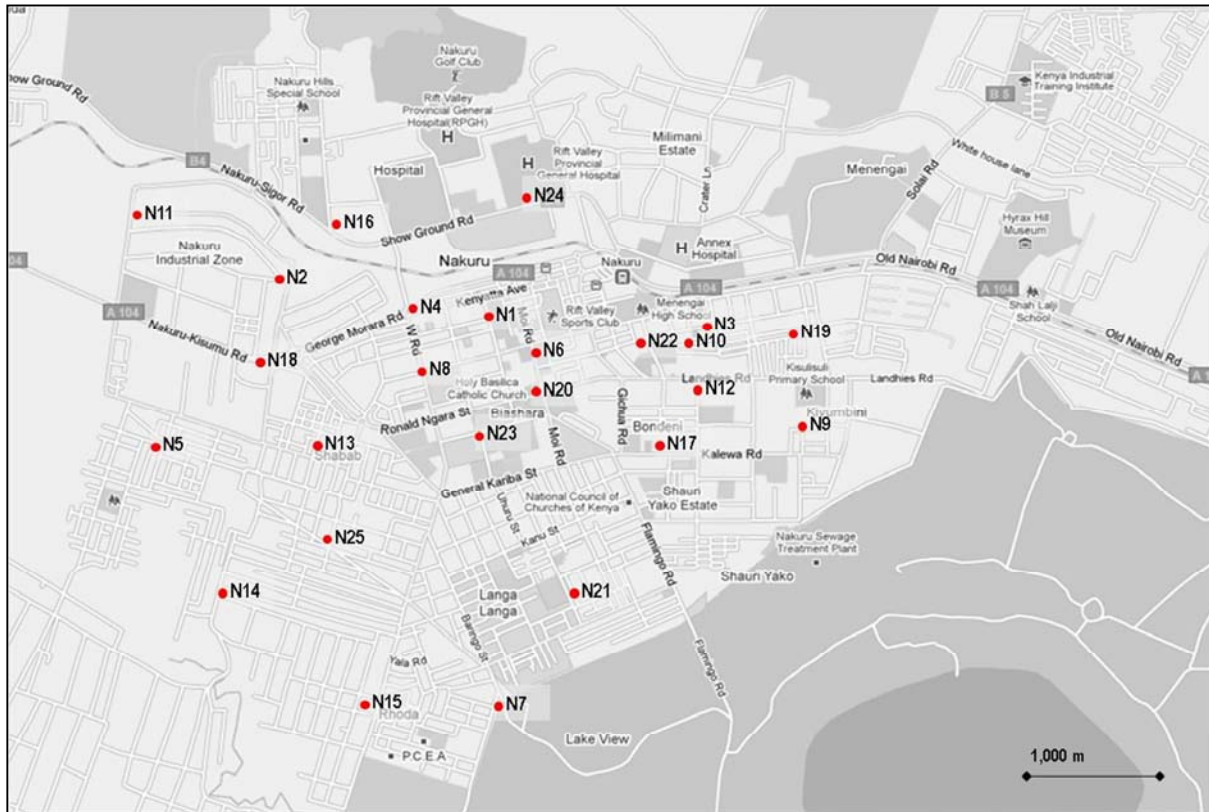


Notes:

K1	Kboys	K6	KCB	K11	Ouko	K16	Sai	K21	Makasembo
K2	Social	K7	Mtejula	K12	Abunga	K17	Swan	K22	Kicomi
K3	KCC	K8	Fanana	K13	Kondele	K18	Harina	K23	Kibuye
K4	Tuskys	K9	Manyata	K14	Aga Khan	K19	Rassia	K24	Kilimani
K5	Jua Kali	K10	Nakumatt	K15	Crescent	K20	Ondiek	K25	Nyaori

Figure 3.4: Surveyed 'boda boda' 'stages' in Kisumu (<http://maps.google.co.za>)

All the interviews were carried out by the researcher and two assistants who were sourced and coached by the researcher on the modalities of conducting the survey prior to commencement of the work.



Notes:

N1	Securicor	N6	CID	N11	Waterbuck	N16	Show Ground	N21	Zakayos
N2	KFA	N7	Summit	N12	Evans	N17	Bondana	N22	Taidys
N3	Menengai	N8	Gilanis	N13	Weavers	N18	Akamba	N23	Kolen
N4	Total	N9	Kivumbini	N14	Laken	N19	Maindi Choma	N24	Medical
N5	Check Point	N10	Head Office	N15	Topten	N20	Holy Cross	N25	Gulf

Figure 3.5: Surveyed 'boda boda' stages in Nakuru (<http://maps.google.co.za>)

The main data collection technique used in this study was structured interviews with 'boda boda' bicycle taxi operators as well as city/municipal officials using questionnaires. Interviews were conducted in English and Swahili, depending on the preferred language of the respondent. The time taken to complete one questionnaire varied from one operator to another but the minimum time taken was about 40 minutes, and the maximum 60 minutes. .

The qualitative data was obtained by the researcher through personal interviews with local authorities' officials using questionnaires. The questionnaires were given to the officials one day before the interview and the responses were recorded by the researcher as the interview progressed. The questionnaires for the local authorities' officials contained open ended questions. Interviews with the officials took between one and two hours to complete. Other relevant data was obtained from analysis of information from secondary sources such as technical report and government publications.

Photographs of bicycle taxi operations were taken in all areas. Additional information on proposed bicycle taxi regulatory measures was obtained from Busia and Kakamega towns for comparison purposes.

3.6.2 Data editing and correction

In order to ensure the accuracy of the data collected all the completed questionnaires were checked at the end of each survey day to identify, and where possible, correct entry errors and other anomalies. Questionnaires found with minor entry errors were rectified but those found with major errors were discarded and replaced. After capturing the data from the questionnaires to the database each individual data record was checked to identify out of range responses or coding errors. All entry errors in the database were corrected before analysing the data.

3.6.3 Data analysis

In this study quantitative and qualitative data was obtained which required different analytical approaches. Each questionnaire in the quantitative survey of operators contained about 112 questions and Microsoft Excel was used in analyzing the data obtained. The qualitative data however involved few respondents and the data was analysed manually. As indicated earlier, all the data was analysed based on the following questions:

- What are the '*boda boda*' bicycles operating characteristics?
- What types of transport services do '*boda boda*' bicycle taxis provide?
- What market niche do the '*boda boda*' bicycle taxis serve?
- What is the impact of '*boda boda*' bicycle taxis on socio-economics?
- What '*boda boda*' bicycle taxi regulations and supports are in place, and what are required?

The results were presented using tables and bar charts. The results of the data analysis are presented in chapter four and discussed in chapter five of this document. These results together with the review of previous studies provided a basis on which conclusions and recommendations are made.

3.6.4 Limitations of the method

The aim of this study was to determine the role played by '*boda boda*' bicycle taxis in Kenyan urban transport systems. This objective required, ideally, that the study be carried in many parts of the country where the bicycle taxis are operating. However, this would have required large investments in terms of money and time, beyond available resources. Therefore the use of case studies was identified as the most appropriate method. Case studies limited the variety of information collected, and thus may not capture some important details that may have been missing in the study areas.

The data obtained in this study focused on the operations of '*boda boda*' bicycle taxis. The results of this study therefore do not relate to the operations of the motorcycle taxis which are also commonly referred to as '*boda boda*'. The data obtained in this study was mainly sourced from the bicycle taxi operators and the local authorities' officials. All the information referred to in this study

relating bicycle taxi users was obtained from the bicycle taxi operators. It is therefore based on the perception of the operators and may not accurately reflect the users' responses.

3.7 Conclusion

This chapter presented a detailed account of the strategy and methods used to obtain and analyse data in this study. A literature review was the primary method used to obtain information that was required to assist in the design of the survey instruments. The approach adopted in the study of *'boda boda'* bicycle taxi operation and regulations was based on case studies, for which Nakuru town and Kisumu city were chosen. The research technique used to obtain the required data involved using questionnaires. Structured interviews using the questionnaires were carried out with the *'boda boda'* bicycle taxi operators to obtain quantitative data and local authorities' officials to obtain the qualitative information. The quantitative data obtained was analysed using Microsoft Office Excel software and the results were presented using tables and charts.

In this study inadequate finances and time were identified as limitations that influenced the selection of the 'case study' method of obtaining data. The study relied heavily on the responses of the operators and the local authorities' officials as the only source of information in areas where few major studies had been previously conducted. Figure 3.6 shows the *'boda boda'* bicycle taxi operations survey process. Chapter 4 presents the results obtained from data analysis.

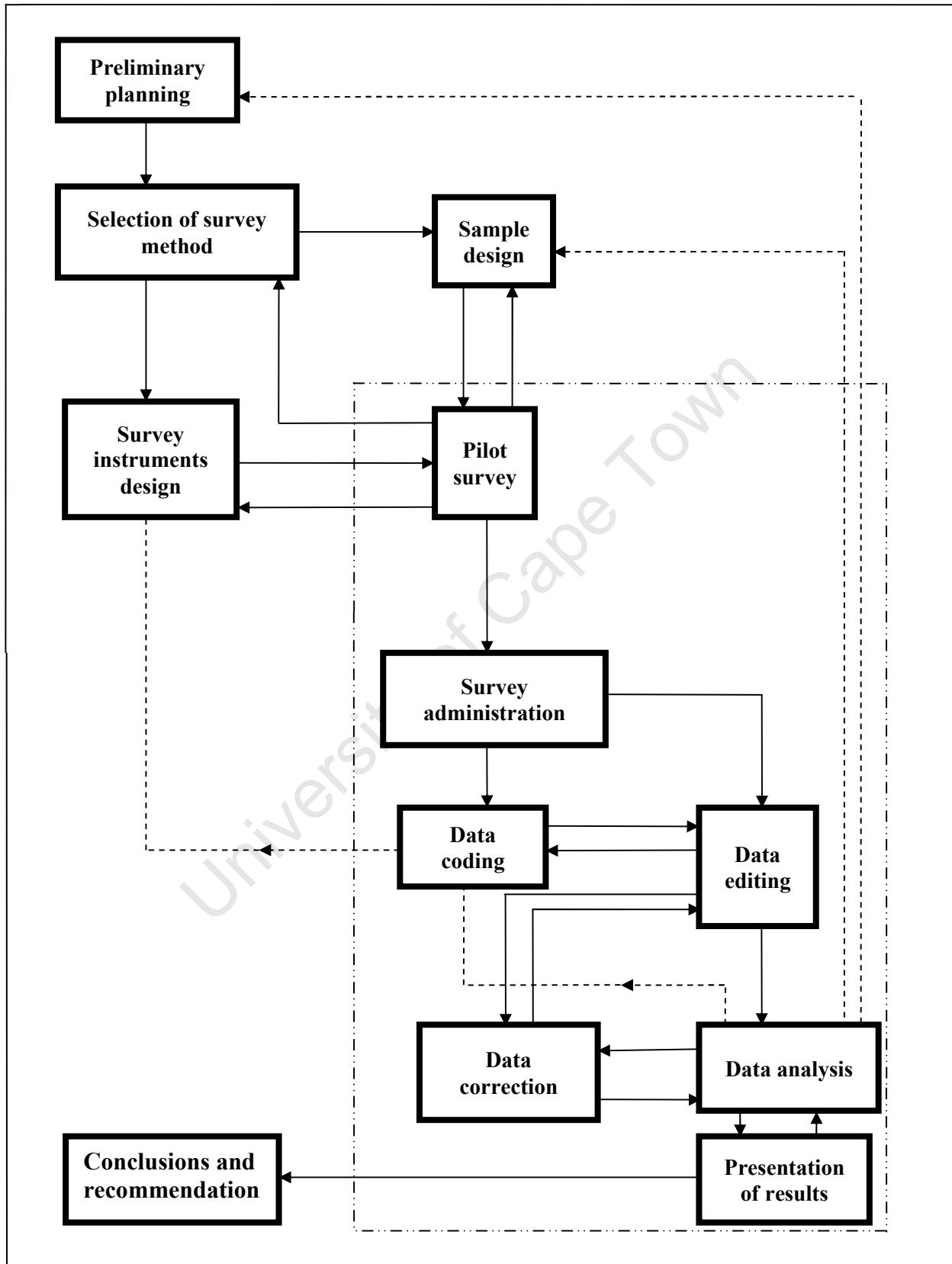


Figure 3.6 *Bodaboda* bicycle taxi operations survey process.

4. RESULTS

4.1 Introduction

The purpose of this chapter is to present the results obtained from the analysis of data collected in the surveys carried out in Nakuru town and Kisumu city. It provides the output of the data analysis process based the various attributes of the '*boda boda*' bicycle taxis as determined from the review of previous studies carried out in Kenya and elsewhere in line with the research objectives. Owing to the nature of the results they are mainly presented using tables.

This chapter opens with a presentation of findings with respect to '*boda boda*' bicycle taxi operating characteristics and types of transport services provided by '*boda boda*' bicycle taxis. These are followed by a presentation of findings with respect to the market niche served by '*boda boda*' bicycle taxis, the impact of '*boda boda*' bicycle taxis on socio-economics, and the regulations and supports for '*boda boda*' bicycle taxis that were in place.



Figure 4.1: '*Boda boda*' and *tuk tuk*. (near swan stage), Kisumu.



Figure 4.2: '*Boda boda*' stage (Taidys), Nakuru.

4.2 '*Boda boda*' bicycle taxi operating characteristics

4.2.1 Nature of Trips

4.2.1.1 Number of passenger trips per day

The number of passenger trips made by '*boda boda*' bicycle taxis per day varies from one operator to another and one area to another. The data obtained from this study shows that the average number of trips made by the '*boda boda*' bicycle taxis varied between different days of the week, different weeks of the month and different months of the year. In Nakuru between Monday and Thursday operators made an average of 14.43 trips per day with a minimum of seven and a maximum of 20. The standard deviation was 2.57. The average number of trips made on Friday was 15.89 with a minimum of 10 and a maximum of 25. The standard deviation was 2.88. The average number of trips

made on Saturday was 16.94 with a minimum of zero, a maximum of 25 and a standard deviation of 3.62. The average for Sunday was 9.30 trips with a minimum of zero, a maximum of 22 and a standard deviation of 7.65. Overall the average number of daily trips in Nakuru town was 14.16.

In Kisumu city the average number of trips made by the *'boda boda'* bicycle taxis per day between Monday and Thursday was 15.58 with a minimum of seven, a maximum of 22 and a standard deviation of 2.22. On Friday the average was 17.47 with a minimum of 10, a maximum of 25 and a standard deviation of 2.39. The average number of trips made on Saturday was 18.22 with a minimum of eight, a maximum of 25 and a standard deviation of 3.02. The average number of trips made on Sunday was 10.50 with a minimum of zero, a maximum of 25 and a standard deviation of 7.96. Overall, the number of daily trips in Kisumu city averaged 15.44.

Table 4.1: Daily passenger trips.

	Kisumu city (n=250)				Nakuru town (n=250)			
	Mean	Sdev.	Min.	Max.	Mean	Sdev.	Min.	Max.
Monday to Thursday	15.58	2.22	7.00	22.00	14.43	2.57	7.00	20.00
Friday	17.47	2.39	10.00	25.00	15.89	2.88	10.00	25.00
Saturday	18.22	3.02	8.00	25.00	16.94	3.62	0.00	25.00
Sunday	10.50	7.96	0.00	25.00	9.30	7.65	0.00	22.00

4.2.1.2 Types of trips

The data obtained from this study shows that most of the trips made *'boda boda'* bicycle taxis operators were short trips. In Nakuru town, 77% of the trips made by the *'boda boda'* bicycle taxi operators in the town were short trips not perceived by respondents to exceed one kilometre in length, 13% were medium trips of between one and three kilometres and 10% were long distance trips of over three kilometres. The average number of trips less than one kilometre long made by each operator per day was 11.30 with a minimum of three, a maximum of 18 and a standard deviation of three. The average number of trips between one and three kilometres made by each operator per day was 1.92 with a minimum of zero, a maximum of eight and a standard deviation one of 0.90. The average number of trips over three kilometres long made by each operator per day was 1.39 with a minimum of zero, a maximum of seven and a standard deviation of 0.80.

In Kisumu city, 81% of the trips made by the *'boda boda'* bicycle taxi operators in the town were short trips not exceeding one kilometre in length, 11% were medium trips of between one and three kilometres long and 8% were long distance trips of over three kilometres in length. The average number of trips of less than one kilometre made by each operator was 12.69 per day with a minimum of three, a maximum of 20 and a standard deviation of two. The average number of trips made by each operator of between one and three kilometres was 1.69 per day with a minimum of one, a

maximum of three and a standard deviation one of one. The average number of trips made by each operator per day over three kilometres in length was 1.26 with a minimum of zero, a maximum of three and a standard deviation of 0.50.

Table 4.2: Nature of passenger trips (average daily trips).

	Kisumu (n=250)				Nakuru town (n=250)			
	Mean	Sdev.	Min.	Max.	Mean	Sdev.	Min.	Max.
Trips less than 1km long	12.69	2.00	3.00	20.00	11.30	3.00	3.00	18.00
Trips between 1 and 3km long	1.69	1.00	1.00	3.00	1.92	0.90	0.00	8.00
Trips over 3km long	1.26	0.50	0.00	3.00	1.39	0.80	0.00	7.00

4.2.1.3 Trips variations

4.2.1.3.1 Monthly variations

The data obtained from this study shows that the number of passenger trips made by the 'boda boda' bicycle operators varied at different times of the month. According to the data obtained in this study 93% of the 'boda boda' operators in Nakuru town carried more passengers than normal between the 1st and 7th of each month and 7% carried more passenger than normal between 24th and 31st of each month.

In Kisumu city, 96% of the 'boda boda' operators carried more passengers than normal between the 1st and 7th of each month and 4% carried more passengers than normal between the 24th and 31st of each month. No 'boda boda' operator in either Kisumu city or Nakuru town carried more passengers than normal between the 8th and 23rd of every month.

4.2.1.3.2 Yearly variations

The number of passengers carried by 'boda boda' bicycle taxis per month varied from one month to another in both Nakuru town and Kisumu city. In Nakuru town, 22% of 'boda boda' operators carried more passengers than normal in January, 0.33% carried more passengers than normal in April, 0.33% carried more passengers than normal in May, 0.33% carried more passengers than normal in June, 6% carried more passengers than normal in August and 71 % carried more passengers than normal December.

In Kisumu city 30% of 'boda boda' operators carried more passengers than normal in January, 0.4% per cent carried more passengers than normal in June, 1% carried more passengers than normal in August, 0.5% carried more passengers than normal in September, 0.5% per cent carried

more passengers than normal in November and 68% carried more passengers than normal in December.

4.2.1.4 Trip purposes



Figure 4.3: 'Boda boda' bicycles: (Odinga Odinga road), Nakuru.



Figure 4.4: 'Boda boda' carrying goods (Industrial zone), Nakuru

The data obtained from this study shows that operator perceptions of the main purposes of the trips made by 'boda boda' bicycle taxi users include work, market visits, education and healthcare trips. In Nakuru town, work trips comprised 67% of use, market trips 23%, education trips was 8% and healthcare trips comprised 2% of the total.

In Kisumu city, work trips comprised 65% of the total, market trips 24%, education 9% and healthcare trips comprised 2%.

4.2.2 Hours worked per day by the operators

The survey found that 'boda boda' bicycle taxi operators in both Kisumu city and Nakuru town work between eight and 14 hours per day. The average number of hours worked by each operator per day in Nakuru town was 11.54 hours with a minimum of eight and a maximum of 14 hours. The standard deviation was 1.32. Four percent of the operators in Nakuru worked for eight hours, two percent worked for nine hours, 15% for 10 hours, 10% for 11 hours, 52% for 12 hours, 10% for 13 hours and 7% worked for 14 hours.

The average number of hours worked by each operator per day in Kisumu city was 11.92 hours with a minimum of eight, a maximum of 14 and a standard deviation of 1.15. One percent of the operators in Kisumu worked for eight hours, 15% for 10 hours, 10% for 11 hours, 50% for 12 hours, 14% for 13 hours and 10% for 14 hours.

Table 4.3: Hours worked by operators per day.

	Kisumu (n=250)				Nakuru (n=250)			
	mean	std. dev.	min.	max.	mean	std. dev.	min.	max.
Owner operator	11.90	1.30	8.00	14.00	11.60	1.30	8.00	14.00
Hiring operator	12.10	0.90	10.0	14.00	11.90	1.20	8.00	14.00

4.2.3 Fare charged

4.2.3.1 Fare charged by 'boda boda' bicycle taxis

The fare charged by 'boda boda' bicycle taxis in Nakuru town was Kshs 20 (USD 0.25) for short distance trips (those not exceeding one kilometre), Kshs 25 (USD 0.31) for those between one and three kilometres and Kshs 30 (USD 0.38) for trips exceeding three kilometres in length.

The fare charged by 'boda boda' bicycle taxis in Kisumu city was Kshs 10 (USD 0.13) for short trips not exceeding one kilometre, Kshs 20 (USD 0.25) for those between one and three kilometres and Kshs 30 (USD 0.38) trips exceeding three kilometres.

Table 4.4: Fares charged by 'boda boda' bicycle taxis (Kshs).

	Kisumu city	Nakuru town
Trips less than 1km long	10.00	20.00
Trips between 1 and 3km long	20.00	25.00
Trips over 3km long	30.00	30.00

4.2.3.2 Fare charged by alternative modes

The main modes that compete for passengers with the 'boda boda' bicycle taxis in Nakuru town are minibus taxis (*matatus*) and motorcycle taxis. Tricycle taxis (*tuk tuk*) also provide transport services in some areas within Nakuru town but they were not operating from the stages where this study was carried out. The fares charged by minibus taxis in Nakuru town were Kshs 20 (USD 0.25) for trips not exceeding one kilometre in length, Kshs 20 (USD 0.25) for trips between one and three kilometres and Kshs 25 (USD 0.31) for trips of more than three kilometres. The fare charged by motorcycle taxis in Nakuru town was Kshs 40 (USD 0.50) for trips not exceeding one kilometre, Kshs 40 (USD 0.50) for trips between one and three kilometres and Kshs 50 (USD 0.63) for trips over three kilometres in length.



Figure 4.5: 'Boda boda' stage (Kivumbini), Nakuru.



Figure 4.6: 'Boda boda' stage (Abunga), Kisumu.

The main alternative modes of transport that compete for passengers with the 'boda boda' bicycle taxis in Kisumu city are minibus taxis (*matatus*), motorcycle taxis and tricycle taxis (*tuk tuk*). The fares charged by minibus taxis in Kisumu city were Kshs 20 (USD 0.25) for trips not exceeding one kilometre, Kshs 25 (USD 0.31) for trips between one and three and Kshs 30 (USD 0.38) for trips of more than three kilometres. The fare charged by motorcycle taxis in Kisumu city were Kshs 40 (USD 0.5) for trips not exceeding one kilometre, Kshs 50 (USD 0.63) for trips between one and three kilometres and Kshs 50 (USD 0.63) for trips of more than three kilometres. The fare charged by tricycle taxis (*tuk tuk*) in Kisumu city was Kshs 50 (USD 0.63) for all trip lengths.

Table 4.5: Fares charged by alternative modes.

	Kisumu city				Nakuru town			
	<i>Boda boda</i>	<i>Matatu</i>	Motor cycles	<i>Tuk tuk</i>	<i>'Boda boda'</i>	<i>Matatu</i>	Motor cycles	<i>Tuk tuk</i>
Trips less than 1km long	10.00	20.00	40.00	50.00	20.00	20.00	40.00	Nil
Trips between 1 and 3km long	20.00	25.00	50.00	50.00	25.00	20.00	40.00	Nil
Trips over 3km long	30.00	30.00	50.00	50.00	30.00	25.00	50.00	Nil

4.2.4 Operating costs

4.2.4.1 Owner operator: maintenance costs

The data obtained from this study shows that the cost of maintenance of the bicycles varied between Kisumu city and Nakuru town. In Nakuru town the average cost of maintenance for various

components per month was Kshs 39.75 (USD 0.50) for chain, Kshs 158.34 (USD 1.98) for tyres and tubes, Kshs 55.73 (USD 0.70) for braking system, Kshs 132.67 (USD 1.66) for bearings, Kshs 176.71 (USD 2.21) for the rims and spokes and Kshs 53.88 (USD 0.67) for miscellaneous items. Overall the average cost of maintenance of one bicycle per month was Kshs 679.04 (USD 8.49) with a minimum of Kshs 470.00 (USD 5.88), maximum of Kshs 840.00 (USD 10.50) and a standard deviation of Kshs 81.06 (USD 1.01).

In Kisumu city the average cost of maintenance for various components per month was Kshs 56.11 (USD 0.70) for chain, Kshs 192.28 9 (USD 2.40) for tyres and tubes, Kshs 59.44 (USD 0.74) for the braking system, Kshs 198.44 (USD 2.48) for bearings, Kshs 188.02 (USD 2.35) for spokes and rims and Kshs 54.75 (USD 0.68) for miscellaneous items. Overall the average cost of maintenance of one bicycle per month in Kisumu was Kshs 745.53 (USD 9.32) with a minimum of Kshs 525.00 (USD 6.56), a maximum of Kshs 865.00 (USD 10.81) and a standard deviation of Kshs 46.84.(USD 0.59).

Table 4.6: Operating costs per month.

	Kisumu (n=250)				Nakuru (n=250)			
	Mean	Sdev.	Min.	Max.	Mean	Sdev.	Min.	Max.
Maintenance costs	745.53	46.84	525.00	865.00	679.04	81.06	470.00	840.00
Hiring costs	1,528.98	91.28	1,350.00	1,575.00	1,495.83	108.46	1,350.00	1,575.00

4.2.4.2 Hiring operator: hiring costs

The hiring cost of a 'boda boda' bicycle taxi per month depended on the number of days worked per week. In both Kisumu city and Nakuru town the cost hiring a 'boda boda' bicycle was Kshs 50.00 (USD 0.63) per day. According to the data obtained in this study the average hiring cost for one 'boda boda' bicycle in Nakuru town was Kshs 1,495.83 (USD 18.70) per month with a minimum of Kshs 1,350.00 (USD 16.88), a maximum of Kshs 1,575.00 (USD 19.69) and a standard deviation of Kshs 108.46. (USD 1.36)

The average hiring cost for one 'boda boda' bicycle in Kisumu city was Kshs 1,528.98 (USD 19.11) per month with a minimum of Kshs 1,350.00 (USD 16.88), a maximum of Kshs 1,575.00 (USD 16.69) and a standard deviation of Kshs shillings 91.28 (USD 1.14).

4.2.5 Operator earnings

4.2.5.1 Owner operator

The money earned by the owner operators per month varied significantly from one operator to another. Also a significant variation was noted between 'boda boda' bicycle taxi operators in Nakuru

town and operators in Kisumu city. In Nakuru town the average amount earned by each operator per month was Kshs 8,616.50 (USD 107.70) with a minimum of Kshs 3,655.71(USD 45.69), a maximum of Kshs 13,080.00 (USD 163.50) and a standard deviation of Kshs 1,735.62. (USD 21.70)

In Kisumu city the average amount earned by each operator per month was Kshs 5,209.89 (USD 65.12) with a minimum of Kshs 2,260.00 (USD 28.25), a maximum of Kshs 9,832.50 (USD 122.91) and a standard deviation of Kshs 1,000.10. (USD 12.50)

Table 4.7: Owner operator earnings.

	Kisumu (n=250)			Nakuru (n=250)		
	Mean	Min.	Max.	Mean	Min.	Max.
Gross income	5,966.37	2,970.00	10,553.00	9,307.95	4,366.00	13,345.00
Operating costs	745.00	525.00	865.00	679.04	470.00	840.00
Nett earning.	5,209.89	2,260.00	9,832.50	8,116.50	3,655.71	13,080.00

4.2.5.2 Hiring operator

The money earned by the hiring operators varied significantly among operators and also between hiring operators in Nakuru town and those in Kisumu city. In Nakuru town the average amount earned by each operator per month was Kshs 8,102.50 (USD 101.28) with a minimum of Kshs 3,375.00 (USD 42.19), a maximum of Kshs 12,285.00 and a standard deviation of Kshs 108.46 (USD 1.36).

In Kisumu city the average amount earned by each operator per month was Kshs 4,491.72 (USD 56.15) with a minimum of Kshs 2,520.00 (USD 31.50), a maximum of Kshs 6,300.00 (USD 78.75) and a standard deviation of Kshs 992.96 (USD 12.40).

Table 4.8: Hiring operator earnings.

	Kisumu (n=250)			Nakuru (n=250)		
	Mean	Min.	Max.	Mean	Min.	Max.
Gross income	5,967.54	4,050.00	7,560.00	9,498.63	4,725.00	13,345.00
Operating costs	1,528.00	1,350.00	1,575.00	1,495.83	1,350.00	1,575.00
Nett earning.	4,491.72	2,520.72	6,300.00	8,102.50	3,375.00	12,285.00

4.2.6 'Boda boda' bicycle taxi users

'Boda boda' bicycle taxi users belong to various age groups with some age groups using the bicycle taxis services more than others. The data obtained from this study shows that in Nakuru town 5% of the 'boda boda' bicycle taxi users were perceived by operators to be under 10 years old, 16% were between 10 and 20 years old, 28% were between 21 and 30 years, 44% were between 31 and 55 years old and 7% were over 55 years old.

In Kisumu city 7% of the users were perceived by operators to be under 10 years, 17% were between 10 and 20 years old, 27% were between 21 and 30 years old, 41 % were between 31 and 55 years and 8% were over 55 years old.



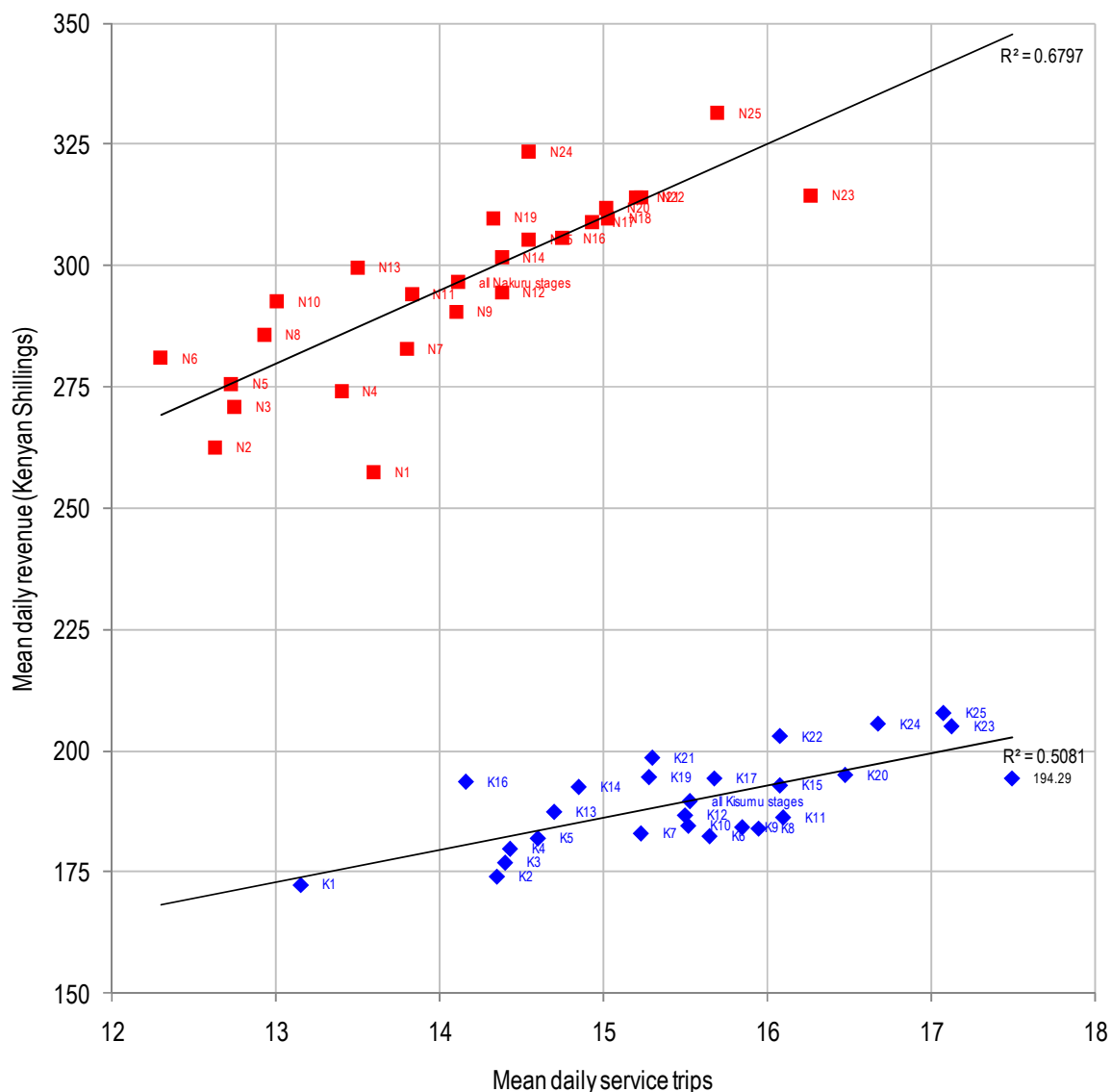
Figure 4.7: *Boda boda* bicycle taxi (along Odinga Odinga road), Nakuru



Figure 4.8: *Boda boda* bicycle (near CID stage), Nakuru

4.2.7 Goods carried by 'boda boda' bicycle taxis

The data obtained in this study shows that most 'boda boda' bicycle taxis carried packaged goods of medium weight. Such goods include five to six crates of bottled soda, one sack of potatoes, four to five bundles of flour and similar items. Sometimes they are used to carry one or two sacks of maize. The weight carried varies with the nature of goods but usually totals to between 50 kg and 150 kg.



Notes:

1. Kisumu stage names

- K1 Kboys
- K2 Social
- K3 KCC
- K4 Tuskys
- K5 Jua Kali
- K6 KCB
- K7 Mtejula
- K8 Fanana
- K9 Manyata

- K10 Nakumatt
- K11 Ouko
- K12 Abunga
- K13 Kondole
- K14 Aga Khan
- K15 Crescent
- K16 Sai
- K17 Swan
- K18 Harina

2. Nakuru stage names

- K19 Rassia
- K20 Ondiek
- K21 Makasembo
- K22 Kicomio
- K23 Kibuye
- K24 Kilimani
- K25 Nyaori

- N1 Securicor
- N2 KFA
- N3 Menengai
- N4 Total
- N5 Check Point
- N6 CID
- N7 Summit
- N8 Gilanis
- N9 Kivumbini

- N10 Head Office
- N11 Waterbuck
- N12 Evans
- N13 Weavers
- N14 Laken
- N15 Topten
- N16 Show Ground
- N17 Bondana
- N18 Akamba

- N19 Maindi Choma
- N20 Holy Cross
- N21 Zakayos
- N22 Taidys
- N23 Kolen
- N24 Medical
- N25 Gulf

Figure 4.9. Mean daily service trips vs. mean daily revenue (Kenyan Shillings), by stage and town (n=500).

Figure 4.9 illustrates the considerable discrepancy between imputed operator revenue in the two towns, for owner and hiring operators combined.

4.2.8 Operational problems

The nature and type of operational problems faced by *'boda boda'* bicycle taxi operators varies from town to town depending on the operational dynamics within the town. The data obtained from this study shows that *'boda boda'* bicycle taxi operators in Nakuru were faced with more operational problems than their counterparts in Kisumu city. According to the data obtained in Nakuru town 34% of the operators were faced with problems relating to 'picking up and dropping off areas', 57% were faced with problems relating to 'no go zones' and 9% were faced with problems relating to 'conflicts with vehicular traffic' on the roadways.

In Kisumu city 99% of the operators were faced with problems relating to 'conflicts with vehicular traffic' on the roadways and 1% were faced with problems relating to 'no go zones'



Figure 4.10: *Boda boda* carrying a mother and a baby (near Menengai stage), Nakuru.



Figure 4.11: *Boda boda* carrying a female passenger (near weavers' stage), Nakuru

4.3 '*Boda boda*' bicycle taxi transportation service

4.3.1 Types of service

'Boda boda' bicycle taxis provide 'area wide' transport services. This is a 'for hire' transport services where the bicycles operate from particular places commonly known as 'stages' and are hired from that particular stage to take passengers to any place within the town. On their way back to their base stage they can pick passengers and take them to other places within the town. *'Boda boda'* bicycle taxis in both Nakuru town and Kisumu city provide the transport services alongside the other available alternative modes by competing with them for passengers. They also provide feeder services to other high capacity transport modes as well as transport services in areas which are inaccessible to motorised transport.



Figure 4.12 'Boda boda' bicycle riding close to a bus (near head office stage), Nakuru.



Figure 4.13 A 'boda boda' bicycle taxis (near Tuskys supermarket), Kisumu

4.3.2 Attitudes towards 'boda boda' bicycles

4.3.2.1 Attitude of traffic police

The attitudes of different parties towards 'boda boda' bicycle taxis vary depending on how they interact with them. The data obtained from this study shows that the way the 'boda boda' bicycle taxi operators perceive the attitude of traffic police towards them varies significantly from one operator to another. In Nakuru town 33% of the 'boda boda' bicycle taxi operators interviewed said the traffic police were friendly, 49% said they were indifferent and 18 % said they were hostile to them.

In Kisumu city 29 % of the 'boda boda' bicycle taxi operators interviewed said the traffic police were friendly to them, 57% said they were indifferent and 14 % said they were hostile to them.

4.3.2.2 Attitude of minibus operators

Similarly the way 'boda boda' bicycle taxi operators perceive the attitude of minibus taxi operators towards them varies significantly from one operator to another. In Nakuru town 10% of the 'boda boda' bicycle taxi operators interviewed said they were friendly to them, 29% said they were indifferent, 61% said they were hostile to them.

In Kisumu city 4% of the 'boda boda' bicycle taxi operators interviewed said they were friendly to them, 42% said they were indifferent and 54% said they were hostile to them.

4.3.2.3 Attitude of bus operators

The way the 'boda boda' bicycle taxi operators perceive the attitude of bus operators towards them also varies significantly from one operator to another. In Nakuru town 52% of the 'boda boda' bicycle

operators interviewed said the bus operators were friendly to them, 46% said they were indifferent and 2% said they were hostile to them.

In Kisumu city 46 % of the 'boda boda' bicycle taxi operators interviewed said they were friendly to them, 53% said they were indifferent and 1% said they were hostile to them.

Table 4.9: Attitudes towards 'boda boda' bicycles

	Kisumu (n=250)			Nakuru (n=250)		
	Friendly %	Indifferent %	Hostile%	Friendly %	Indifferent %	Hostile%
Traffic police	29	57	14	33	49	18
Minibus taxi operators	4	42	54	10	29	61
Bus operators	46	53	1	52	46	2

4.4 Market niche

4.4.1 Age of 'boda boda' users

'Boda boda' bicycle taxis provide transport services to users of various age groups. However some age groups utilise the bicycle taxis' services more than the others. According to the data obtained in this study operators perceived that the age group that utilised 'boda boda' bicycle service the most in both Kisumu city and Nakuru town was 31-55 years. In Nakuru town 44% of the 'boda boda' users were perceived to be 31-55 years old while in Kisumu city 41% of the users were perceived to be 31-55 years old.

Table 4.10: Perceived age of users.

	Kisumu (n=250)	Nakuru (n=250)
Under 10 years.	7%	5%
10 to 20 years.	17%	16%
21 to 30 years.	27%	28%
31 to 55 years.	41%	44%
Over 55 years.	8%	7%

4.4.2 Gender

In Nakuru town and Kisumu city the 'boda boda' bicycle taxi services were used by both men and women. However the level of utilisation varied between the two groups. According to the data obtained from this study women utilised 'boda boda' bicycle taxi transport services slightly more than

men in both Nakuru and Kisumu towns. In Nakuru town 51% the '*boda boda*' bicycle taxi users were women and in Kisumu city 57% of the '*boda boda*' bicycle taxi users were women.

Table 4.11: Gender.

	Kisumu (n=250)	Nakuru (n=250)
Male.	43%	49%
Female.	57%	51%

4.4.3 Off - road trips

'*Boda boda*' bicycle taxis provide transport services for on-road and off-road trips. Because of their design characteristics the '*boda boda*' bicycle taxis are capable of travel on routes where some other modes of transport such as tricycle and minibus taxis cannot pass. According to the data obtained in this study 38% of the trips made by '*boda boda*' bicycle taxis in Nakuru town were on off-road routes where minibuses and tricycles could not pass. In Kisumu city 36% of the trips made by '*boda boda*' bicycle taxis were on routes where minibus taxis and tricycles could not pass.

Table 4.12: Off road trips where vehicles cannot pass.

	Kisumu (n=250)	Nakuru (n=250)
On road trips.	64%	62%
Off road trips where vehicles cannot pass.	36%	38%



Figure 4.14: '*Boda boda*' garage, (near CID stage), Nakuru



Figure 4.15: '*Boda boda*' bicycles (Securicor stage), Nakuru

4.4.4 Types of trip purposes

'Boda boda' bicycles provide a transport service for various trip purposes. The data obtained in this study shows that operators perceived that their 'boda boda' bicycle taxi services are utilised more for work trips than the others in both Nakuru town and Kisumu city. As indicated earlier, in Nakuru town 67% of the trips made by the 'boda boda' bicycle taxis were work trips and in Kisumu city 65% of the trips made by the bicycle taxis were work trips.

Table 4.13: Types of trip purposes.

	Kisumu (n=250)	Nakuru (n=250)
Work trips.	65%	67%
Market trips.	24%	23%
Education trips.	9%	8%
Healthcare trips.	2%	2%

4.4.5 Trip lengths

'Boda boda' bicycle taxis provide transport services for predominantly short trips. The data obtained in Nakuru town shows that 77% of the trips made by the bicycle taxis were short trips of less than one kilometre. In Kisumu city 81% of the trips made by the 'boda boda' bicycle taxis were short distance trips. This shows that commuters making short distance trips provide the largest customer base for the services of 'boda boda' bicycle taxis.

Table 4.14: Trip lengths.

	Kisumu (n=250)	Nakuru (n=250)
Trips not exceeding one kilometer long.	81%	77%
Trips between one and three kilometers long.	11%	13%
Trips over three kilometers long.	8%	10%



Figure 4.16: Maindi choma stage, Nakuru



Figure 4.17: 'Boda boda' bicycles(near Moi Flats), Nakuru

4.5 Impact of 'boda boda' bicycle taxis on socio-economics

4.5.1 Characteristic of 'boda boda' bicycles operators

4.5.1.1 Age of the operators

'Boda boda' bicycle taxis can be operated by anybody who possesses the required determination and energy to pedal the bicycle. However the average age of operators in Nakuru town was 27 years with the youngest operator being 18 years old and the oldest operator being 44 years old. The standard deviation in the town was 5.6 years. According to the data obtained in Nakuru 24% of the operator were 18-22 years old, 35% were 23-27 years old, 26% were 28-32 years old, 11% were 33-37 years old, 3% were 38-42 years old and 1% were 43-47 years old.

The average age of operators in Kisumu city was 24 years with the youngest operator being 18 years old and the oldest operator being 45 years old. The standard deviation in Kisumu was 4.5 years. According to the data obtained in the city 42% were 18-22 years old, 32% were 23-27 years old, 22% were 28-32 years old, 2% were 33-37 years old, 1% were 38-42 years old and 1% were 43-47 years old.

Table 4.15: Age of operators.

	Kisumu (n=250)				Nakuru (n=250)			
	Mean	Sdev.	Min.	Max.	Mean	Sdev.	Min.	Max.
Age of operators	24.39	4.66	18	45	26.95	5.58	18	44

4.5.1.2 Level of education of operators

Most of the *'boda boda'* bicycle taxis operators had undergone some type of formal education but the level of education varied significantly among the operators interviewed in this study. In Nakuru town 16% of the *'boda boda'* bicycle taxi operators had less than a standard (grade) eight level of education, 52% had standard (grade) eight certificates, 31% had form four (grade 12) certificates and 1% had National Diploma certificates.

In Kisumu city 34% of the *'boda boda'* bicycle taxi operators had less than a standard (grade) eight level of education, 42% had standard (grade) eight certificates, 24% had form four (grade 12) certificates and none of the operators in Kisumu city had a National Diploma.

Table 4.16: Level of education of operators.

	Kisumu (n=250)	Nakuru (n=250)
Less than grade 8	34%	16%
Grade 8	42%	52%
Grade 12	24%	31%
National Diploma	0%	1%

4.5.2 Welfare of *'boda boda'* operators

4.5.2.1 Employment opportunity

'Boda boda' bicycle taxis provide direct and indirect employment opportunities to many people wherever they are in operation. According to the data obtained in this study there were over 10,000 *'boda boda'* bicycle taxis operating in Kisumu city streets (Kisumu City Engineer, 2009). Therefore the bicycle taxis provided direct employment to over 10,000 people in the city. In Nakuru town the number of *'boda boda'* bicycle taxis operating was about 6,000 (Omondi, 2007). Thus the *'boda boda'* industry in Nakuru town provided direct employment for about 6,000 people.

4.5.2.2 Number of dependants

Most of the *'boda boda'* bicycle taxis had dependants but the number of dependants varied from one operator to another. In Nakuru town 91% of the operators had dependants and 9% had no dependants. The average number of dependants in the town was 3.22 with a minimum of 0, a maximum of eight dependants and a standard deviation of 1.73 dependants. The number of operators with dependants earning an income also varied among the operators. In Nakuru town 4% of the operators had dependants who had an income and 96% had dependants who had no income.

In Kisumu city 89% of the operators had dependants and 11% had no dependants. The average number of dependants in the town was 2.47 with a minimum of 0 dependants, a maximum of

seven dependants and a standard deviation was 1.55 dependants. In Kisumu city 2% of the operators had dependants who had an income and 98% had dependants who had no income.

Table 4.17: Number of dependants.

	Kisumu (n=250)				Nakuru (n=250)			
	Mean	Sdev.	Min.	Max.	Mean	Sdev.	Min.	Max.
Number of dependants	2.47	1.55	0	7	3.22	1.73	0	8

4.5.3 Women operators

'Boda boda' bicycle taxi operations, was found to be a male dominated business but women have started venturing into the trade. According to data obtained in this study three women in Nakuru town had joined 'boda boda' bicycle taxis operations on a full time basis. In Kisumu city however there were no women operators in any of the neighbourhoods where the study was carried out.



Figure 4.18 Female 'boda boda' operator carrying a passenger near head office (Odinga Odinga road), Nakuru

4.5.4 'Boda boda' bicycle support services

Apart from the direct operations of the 'boda boda' bicycle taxis, the industry supports other employment enterprises. According to the information obtained from this study, in both Kisumu city and Nakuru town most of the neighbourhoods had at least one bicycle repair garage with one or more mechanics. Additionally each neighbourhood had several kiosks and shops selling a variety of foodstuffs and other necessities to the 'boda boda' bicycle taxi operators. Several hardware shops stocking bicycle spare parts were also found in both Nakuru town and Kisumu city. Thus all those enterprises supported by the 'boda boda' bicycle taxi industry combined, created indirect employment opportunities to many people.

4.6 'Boda boda' bicycle taxi regulations and support

4.6.1 'Boda boda' bicycle taxi associations

4.6.1.1 Structure of the associations

In Nakuru town there is a registered 'boda boda' operators association known as 'Nakuru Boda boda Group' to which most of the 'boda boda' bicycle taxi operators in the town belong. The association is managed by a committee selected by the members and consists of a chairman, secretary treasurer, security officer and four other committee members. The 'boda boda' bicycle taxi association in Nakuru town is recognized by the Nakuru Municipal Council. The work of the association is to enforce 'operational discipline' amongst its members and defend its members when arrested by council officials. Additionally it also negotiates with the Municipal Council in the case of disputes. The association operates from an office located outside the central business district in a space provided by the Nakuru Municipal Council.

Although the literature reviewed indicated that there were 'boda boda' bicycle taxi associations in Kisumu city (the Kibis-Ngware Bicycle Taxi Association, and the Kisumu Nguare Transport Group), this study did not find any evidence on the existence of a bicycle taxi operators association in all the neighbourhoods where this study was carried out. None of the 250 'boda boda' bicycle taxi operators interviewed in this study in Kisumu city belonged to any registered association.

4.6.1.2 Fees paid to the association

The 'boda boda' association in Nakuru town charges each prospective member a membership fee of Kshs 500 (USD 6.25). Upon payment of the membership fee to the association the member is given a membership number which must be displayed on the bicycle at all times. The membership fee is a once-off payment and no monthly fees are charged by the association. However the association fines the operators for various operational offences such as theft from passengers, use of abusive language to customers and other offences.

In Kisumu city the *'boda boda'* bicycle taxi operators did not belong to any bicycle taxi operators association and therefore they did not pay any fee to an association. However most of the neighbourhoods had some form of informal cooperative savings society. The operators contributed a given amount of money each either on daily or weekly basis. The total amount contributed each time was given to one member on a rotational basis until all of them receive money, and then the process is repeated.

4.6.1.3 Operational rules set and enforced by associations

In Nakuru town the association formulated various operational rules which are given to each member before joining the association. The Nakuru *Boda boda* Group has 21 operating rules covering the operators' code of conduct when providing transportation services to passengers. The rules cover operator discipline, cleanliness, drunkenness, theft and display of membership numbers on the bicycles. The rules also show the fines charged for various offences.

In Kisumu city there were no rules set and enforced by associations.

4.6.2 Local authorities regulations

4.6.2.1 Fees paid to local authorities

The amount of fees charged by the local authorities to the *'boda boda'* bicycle taxis operators varied between Kisumu city and Nakuru town. In Nakuru town the operators were required to pay Kshs 360 (USD 4.50) per month to the Nakuru Municipal Council as an operating fee. However they refused to pay this when they were denied permission by the Council to operate within the central business district. This created a standoff between the two parties but whenever operators are arrested by the council officials for different offences they are forced to pay the operating fees for that month first before they can settle the second case.

In Kisumu city the operators were required to pay Kshs 300 (USD 3.75) per month to the City Council as operating fees. However they refused to pay and always rioted whenever the Council demanded the payment until the Council gave up. Thus in Kisumu city the *'boda boda'* bicycle taxi operators did not pay the required fees to the council under any circumstances.

4.6.2.2 Operational rules set and enforced by local authorities

In Nakuru town *'boda boda'* bicycle taxis were banned from operating within the central business district. However they were allowed to cross from one side of the town to another side while pushing the bicycle. Riding a *'boda boda'* bicycle in the central business district was prohibited even when the bicycle was not carrying a passenger.

In Kisumu city the *'boda boda'* bicycle taxis were allowed to go everywhere within the city.

4.6.2.3 Impact of the regulation

The regulations in Nakuru town had various impacts on the *'boda boda'* operations which affected both the users and the operators. According to the data obtained in this study 95% of the *'boda boda'* bicycle taxis in Nakuru town said the regulations reduced the number of passengers carried per day. This in turn reduced the amount of money earned by the operators per day. Five percent of the operators in the town said the regulations gave rise to conflicts between them and the Municipal Council law enforcement officials.

In Kisumu city no regulatory measures were enforced by the City Council and therefore there were no regulatory measures impacting in any way on the *'boda boda'* bicycle taxis operations.

4.7 Support for *'boda boda'* bicycle taxis operations

4.7.1 Support by the government

The perceived support required by *'boda boda'* bicycle taxi operators from the government varied significantly in Kisumu city and Nakuru town. The data obtained in this study shows that in Nakuru town 49% of the operators required the government to offer support in the form of loans to buy bicycles or motorcycles, designated stages and operating policies, 3% required government support in the form of loans to buy bicycles or motorcycles and operating policies, 5% required support in the form of loans to buy bicycles or motorcycles and designated stages, 1% required support in the form of loans to buy bicycles or motorcycles, 3% required support in the form of operating policies and 31% required designated stages.

In Kisumu city 84% of respondents required government support in the form of loans to buy bicycles or motorcycles, designated stages and operating policies, 1% required supported in the form of loans to buy bicycles or motorcycles and designated stages, 1% required support in the form of designated stages and 14% required operating policies.

4.7.2 Support by non-governmental organisation or private sector

Required support for *'boda boda'* bicycle taxis operations by the non-governmental organisation and private sector varied slightly among the *'boda boda'* bicycle taxi operators in Kisumu city and Nakuru town. According to the data obtained in this study 96% of the operators in Nakuru town said they required the non-governmental organisation or private sector to support them with loans and instruction in management skills, 2% required loans and 2% required instruction in management skills.

In Kisumu city 100% of the *'boda boda'* bicycle taxi operators said they required the non-governmental organisations or private sector to support them with loans and instruction in management skills.

4.8 Conclusions

This chapter presents the results obtained from the analysis of data obtained in the research. The aim of this chapter was to analyse the data in order to understand what was revealed about 'boda boda' bicycle taxi operations. In order to achieve this the data was analysed based on the research objectives to determine the operating characteristics of the bicycle taxis, types of transport services provided by the bicycle taxis, the market niche served by the bicycles, the impact of the bicycle taxis on socio-economics as well as regulatory and support structures that were in place or required to manage them.

The results indicate that there was no significant difference in the operating characteristics of the bicycle taxis in Kisumu and Nakuru town. Although the number of trips made by each bicycle taxi operator per day varied in both towns there was no significant difference in the average trips made per day. In both towns the bicycle taxis provided services for predominantly short distance trips and on average charged lower fares than the alternative modes for equivalent trips. However the results showed that operators in Kisumu city on average earned less per day than their counterparts in Nakuru town.

The study revealed that the bicycle taxis provide area-wide transport services. This is a 'for hire' service operating from a 'stage' but not operating along a fixed route. The services are available to all parties that are willing to pay the stipulated fares.

Although the bicycle taxis provided services for various trips the results showed that the bicycle taxis serve a niche market. The niche served includes short distance trips not exceeding one kilometre long, off-road trips where vehicles cannot pass, and work trips.

The results also revealed that there were a large number of bicycles taxis operating in Nakuru and Kisumu towns. This implies that a large number of people were directly employed by the industry. Additional people were employed by the support services.

It was also established that there were no bicycle taxi regulatory and support measures in place in either Nakuru or Kisumu towns. The operators however felt that the government, non-governmental organisation and private sector needed to support their operations through formulations of operating policies and financially. Chapter 5 presents a discussion of these results.

5. DISCUSSION OF RESULTS

5.1 Introduction

The purpose of this chapter is to provide an in-depth discussion of the results presented in chapter 4. It aims to provide answers to the research question: what role do 'boda boda' bicycles taxis provide in urban transport systems in Kenya and what policy measures should the transport authorities in the country formulate in response to the revealed operations of the 'boda boda' bicycle taxis? In order to answer this question this chapter explores the implications of the results for bicycle taxi operations based on the various aspects of analysis used in the study in line with the research objectives. Further, the chapter compares the results obtained in this study with the findings of other studies carried out in Kenya and other parts of the world, which were obtained in the literature review.

The chapter opens with a discussion of results with respect to 'boda boda' bicycle taxi operating characteristics and types of transport services provided by 'boda boda' bicycle taxis. These are followed by discussions on results with respect to market niche served by 'boda boda' bicycle taxis, the impact of 'boda boda' bicycle on socio-economics and 'boda boda' bicycle taxi regulations and supports that are in place.

5.2 'Boda boda' operating characteristics

5.2.1 Passenger trips

5.2.1.1 Number of passengers trips per day

The results obtained from data analysis in this study shows that 'boda boda' bicycle taxis accounts for a significant share of the passenger transport market in areas where they are in operation. In Nakuru town the 'boda boda' bicycle taxis carried an average of 14.2 passengers per day. The number of bicycle taxis that were operating in Nakuru town was estimated to be about 6,000 bicycles (Omondi, 2007). Therefore the total number passenger trips made by the 'boda boda' bicycle taxis in Nakuru town was about 85,080 trips serving the towns' population of about 360,000 people (UN-Habitat, 2003). Thus a large number of passengers in the town utilise the 'boda boda' bicycle taxi services on a daily basis.

In Kisumu city the 'boda boda' bicycle taxis carried an average of 15.4 trips per day. The number of 'boda boda' bicycle taxis that were operating in the city was estimated to be about 10,000 bicycles (City Engineer, 2009). Therefore the total number of passenger trips made in the city by the bicycle taxis was about 154,400 trips serving the city population of about 360,000 people (Central Bureau of Statistics, 2001). Thus a large number of people utilise 'boda boda' bicycle taxi services daily for their transport needs.

The previous studies carried out on bicycle taxis reviewed in this study had not obtained information relating to the number of passenger trips made by the bicycle taxis per day.

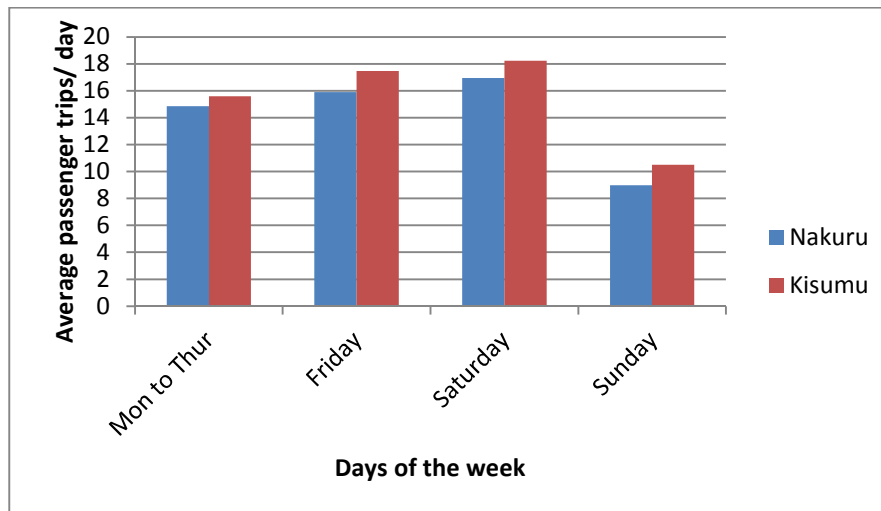


Figure 5.1 Average passenger trips per day (n=500).

5.2.1.2 Nature of the trips

Most of the trips made by the *'boda boda'* bicycle taxi operators are predominantly short trips of less than one kilometre long with medium and long distance trips representing lower percentages of the daily trips. The data obtained in this study shows that 77 % of all the trips made by the *'boda boda'* bicycle taxis in Nakuru town were short trips less than one kilometre long while medium and long distance trips comprised 13% and 10% respectively. This indicates that the majority of the *'boda boda'* bicycle taxi users in the town utilise the bicycle taxis mostly for short distance trips.

In Kisumu city 81% of all the trips made by the *'boda boda'* bicycle taxis were short trips of less than one kilometre long while medium and long distance trips comprised 11% and 8% respectively. Again this indicates that most of the trips made by the *'boda boda'* bicycle taxi users in the city were mostly short trips less than one kilometre long.

The proportion of short trips in the two towns is somewhat surprising, given that trips of up to one kilometre would normally be regarded as a reasonable walking distance. This suggests that *'boda boda'* bicycle taxis often provide a convenience service to passengers with sufficient means to choose between walking and a bicycle taxi. The prevalence of short trips could also be attributed to the availability of the *'boda boda'* bicycle taxi stages at every street and neighbourhood as opposed to some of their major competitors who operate from designated stages which may be located away from the destinations of most commuters. Additionally the bicycle can drop passengers anywhere along the routes without being booked by traffic police for obstruction of traffic. Therefore flexibility and convenience may be the reason why the user utilises the bicycle taxis for short distance trips. It should be noted, however, that the trip distance data collected were the perceptions of operators, and it may be that operators routinely underestimated distances.

Other previous studies carried out on *'boda boda'* bicycle taxis in Uganda (Howe, 2003) and rickshaws in Asia (Replogle, 1991) found that the cycle taxis provided services for mostly short distance trips. Thus the findings of the said studies are consistent with the findings of this study.

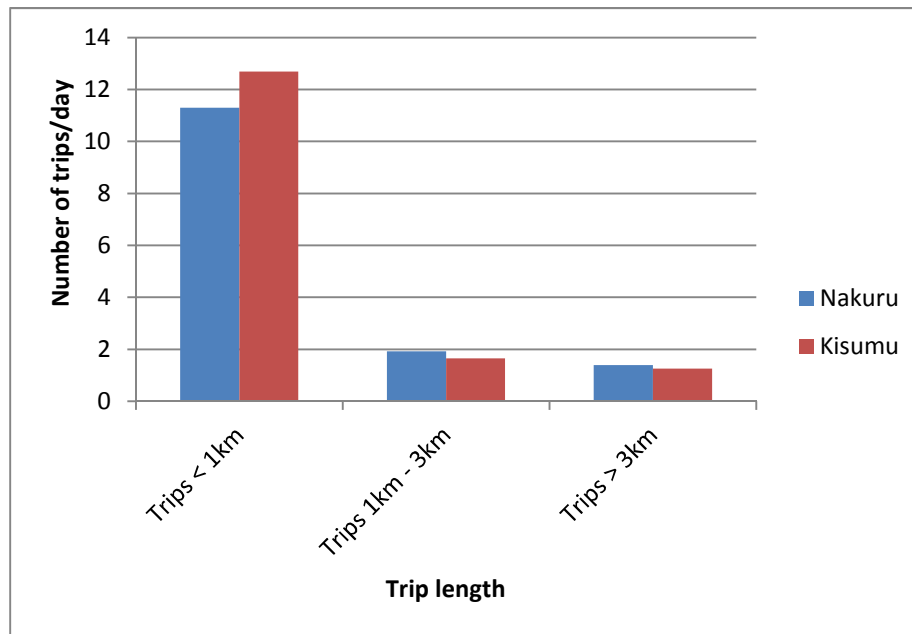


Figure 5.2 Average daily trips: Trip length (n=500).

5.2.1.3 Trip variations

5.2.1.3.1 Monthly variation

The number of passenger trips made by *'boda boda'* bicycle taxis varied at different times of the month and different months of the year as shown in the data obtained from the survey. In Nakuru town 93% of the operators carried more passengers than normal between 1st and 7th of every month. 7% of the operators carried more passenger than normal between 24th and 31st of every month. Similarly in Kisumu city 96% of the operators carried more passengers than normal between 1st and 7th of every month. 4% of the operators carried more passenger than normal between 24th and 31st of every month. This indicates that *'boda boda'* bicycle taxis users in both Nakuru town and Kisumu city utilise the bicycle taxi services more than normal between the 24th and the 7th of every month. This is consistent with the salary payment patterns in Kenya where salaried workers are paid at the end of the month. Since the *'boda boda'* bicycle taxis provides transport services to a high number of workers the utilisation possibly increases when the workers are paid. Hence there is circumstantial information to link the increase in *'boda boda'* bicycle taxis utilisation at month ends to payment of workers. Additionally the other people who depend on workers such small scale traders also get money when salaried people are paid and this probably translates to an increase in travel

The previous studies carried out on the bicycle taxis and reviewed in this study had not obtained information relating to the monthly trip variations.

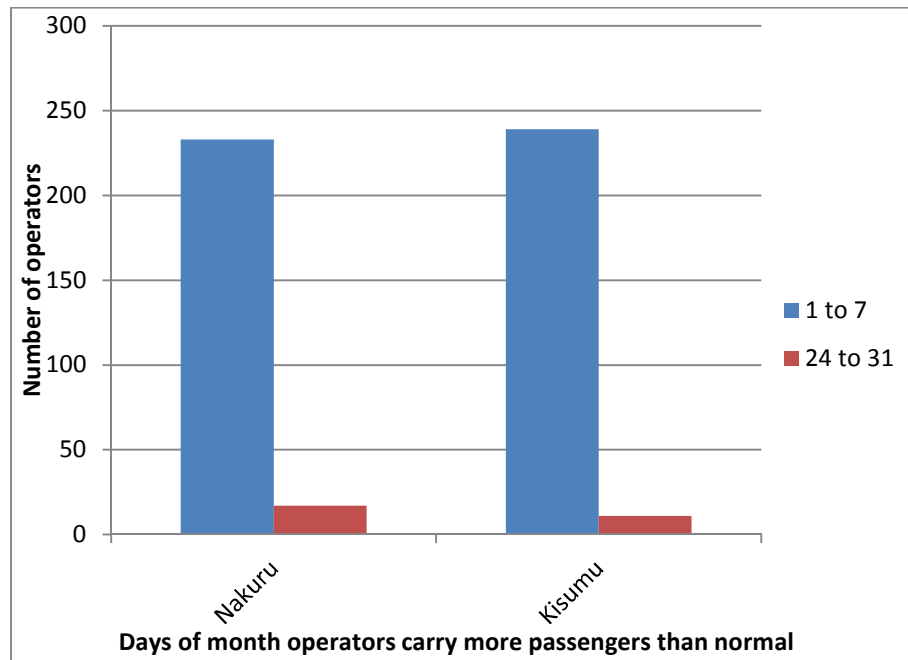


Figure 5.3 Monthly trip variations (respondents) (n=500).

5.2.1.3.2 Yearly variation

The data obtained in this study show that the number of passenger trips made by 'boda boda' bicycle taxi operators varies at different months of the year. In Nakuru town the majority of the 'boda boda' bicycle taxi operators carried more passengers than normal in the months of December and January. Seventy-one percent carried more passengers than normal in December while 22% carried more passengers than normal in January. The remaining 7% carried more passengers than normal in June, August, September and November. However some significant utilisation was noted in August which could be associated with activities during the August school holidays and other community activities.

Similarly in Kisumu city the majority of the 'boda boda' bicycle taxi operators carried more passengers than normal in the months of December and January. Sixty-eight percent carried more passengers than normal in December while 30% carried more passengers than normal in January. The remaining 2% carried more passengers than normal in April, May and June. Again some significant utilisation was noted in August which could be associated with activities during the August school holidays and other community activities. The results of the survey show that there is a lot of travelling during the months of December and January in both Nakuru town and Kisumu City. The increase in utilisation of the 'boda boda' bicycle taxi services is consistent with the activities that take place in these two months. The month of December in the Kenyan calendar has three public holidays which provide opportunities for many people to move about. In urban areas people move around shopping and others travel upcountry to join their families in rural areas. The results demonstrate that the 'boda boda' bicycles are used by shoppers within the towns and also provide feeder services to bus and railway stations for people travelling upcountry. The Christmas holiday usually extends up to early

January when the majority resume their work duties. Additionally the schools open for the New Year in January and a lot of movement relating to the school activities takes place in January. Therefore the increase in utilisation of the bicycle taxis shows that the demand for their services varies in different months of the year depending on activities in the given months.

The previous studies carried out on the bicycle taxis reviewed in this study had not obtained information relating to the yearly trip variations based on the demand.

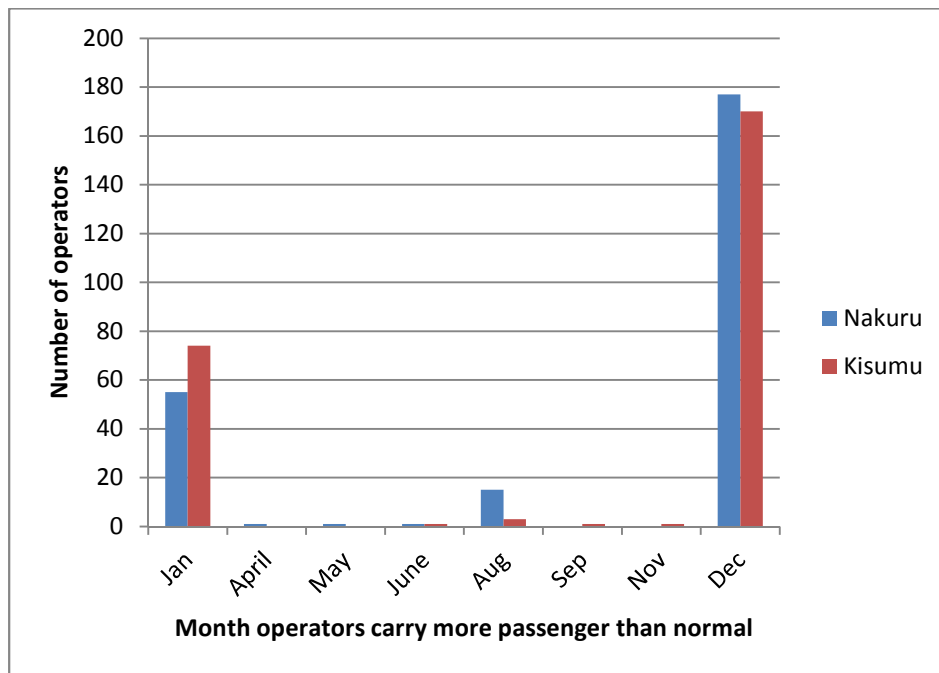


Figure 5.4 Yearly trip variations (respondents) (n=500).

5.2.1.4 Trip purposes

'Boda boda' bicycle taxis provide transport services for various trip purposes. The data obtained in the survey shows that the majority of the trips made by *'boda boda'* bicycle taxis are work and market trips. In Nakuru town 67% of all the trips made by the *'boda boda'* bicycle taxis were work trips while 23% of the trips were market trips. Ten percent was shared between education and healthcare trips.

In Kisumu city 65% of the trips made by the *'boda boda'* bicycle taxis were work trips while 24% were market trips. Eleven percent was shared between education and healthcare trips. This indicates that although the *'boda boda'* bicycle taxis provide services to passengers making trips for various purposes, the majority of users utilises them for to go to work places or market.

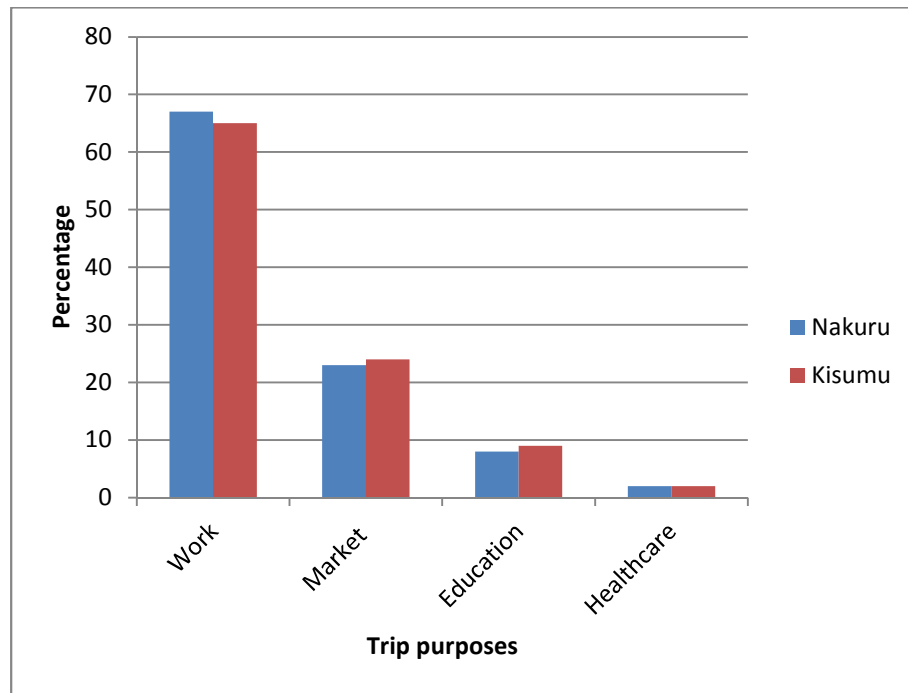


Figure 5.5 Trip purposes (percentage) (n=500).

5.2.2 Hours worked per day by the operators

The number of hours worked by the *'boda boda'* bicycle taxi operators per day varied from one operator to another. In both Nakuru town and Kisumu city the minimum number of hours worked by the operators per day was eight hours and the maximum was 14 hours. The average number of hours worked by each *'boda boda'* bicycle taxi operator per day in Nakuru town was 11.6 hours while the average number of hours worked by each *'boda boda'* bicycle taxi operator per day in Kisumu city was 11.9 hours. Since this survey was conducted during the day this indicates that the bicycle taxis were available to provide the transport services from early in the morning to evening. Hence the results demonstrate clearly that the bicycle taxis are highly available to provide transport services.

Previous studies carried out on *'boda boda'* bicycle taxis in Uganda (Muhumuza, 2006) and rickshaws in Bangladesh (Ali, 2007) found that the operators worked for 12 hours per day. Thus the findings of those studies are consistent with the findings of this study.

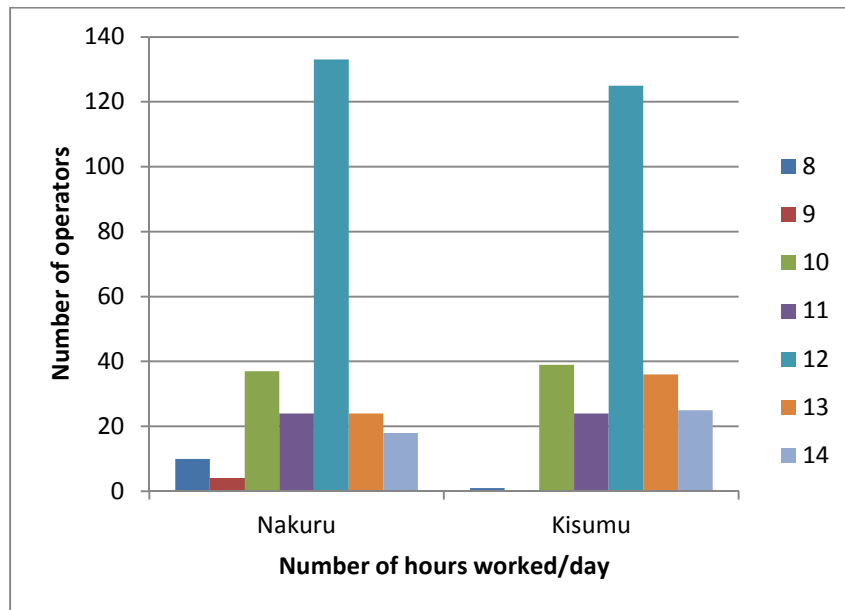


Figure 5.6 Hours worked per day (respondents) (n=500).

5.2.3 Fares charged

The fares charged by *'boda boda'* bicycle taxis and alternative modes of transport varied between Kisumu city and Nakuru town. In Nakuru town the average fare (rounded to the nearest whole number) charged by *'boda boda'* bicycle taxis for the various trips was Kshs 25 (USD 0.31) while the average fare charged by alternative modes was Kshs 23 (USD 0.29) for minibus taxis and Kshs 44 (USD 0.55) for motorcycle taxis. This shows that on average the bicycle taxis charged less than the alternative modes except minibus taxis which charged marginally lower. The difference between the average fares charged by minibus and bicycle taxis was two Kenya shillings.

In Kisumu city the average fare (rounded to the nearest whole number) charged by *'boda boda'* bicycle taxis for the various trips was Kshs 20 (USD 0.25) while the average fare charged by alternative modes was Kshs 25 (USD 0.31) for minibus taxis, Kshs 44 (USD 0.55) for motorcycle taxis and Kshs 50 (USD 0.63) for tricycle taxis. This shows that on average the bicycle taxis charged less than the alternative modes. Considering the low fares and the added advantages of the *'boda boda'* bicycle taxis it can be argued that the bicycle taxis provides lower fares than the alternative modes.

It is posited that the observed difference in the short distance fare in the two towns is due to the superior operator self-organisation in Nakuru, which facilitates collusion in fare setting. In the absence of strong operator self-organisation, the consistency of (lower) fares in Kisumu is posited to be result of an equilibrium price arising from free competition.

Other studies carried out on *'boda boda'* bicycle taxis in Kisumu city (Kisumu City Council, 2005), in Nakuru town (Ngige, 2005) and in Uganda (Howe *et al*, 2003) (Malmberg-Calvo, 1994) found that the bicycle taxis charged lower fares than the alternative modes for equivalent trip lengths. Thus the findings of the said studies are consistent with the findings of this study.

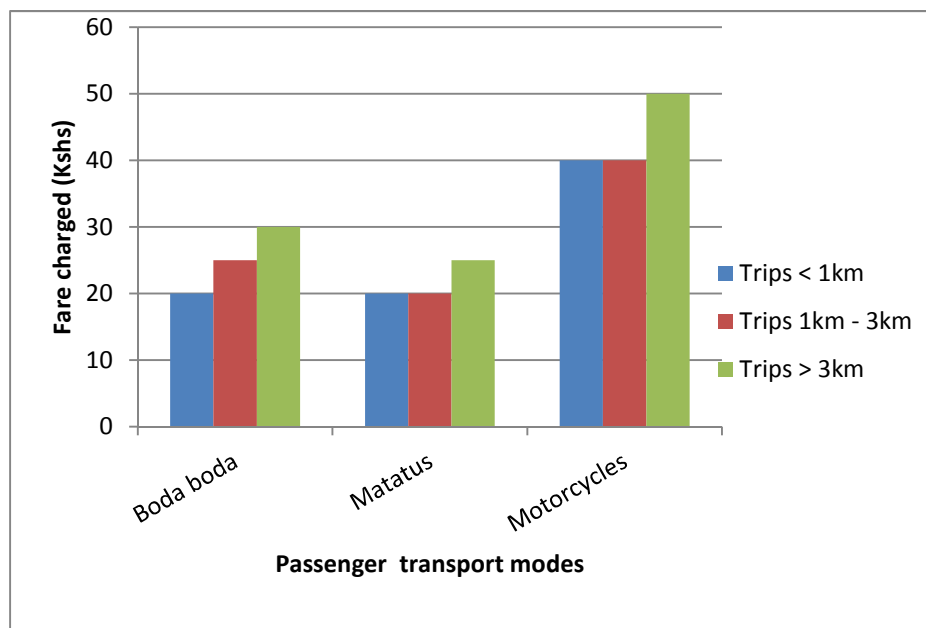


Figure 5.7 Average fares for various trips in Nakuru and Kisumu (Kenyan shillings) (n=500).

5.2.4 Operating costs and operator earning

5.2.4.1 Owner operators

The bicycle operating cost varied between Nakuru town and Kisumu city. In Nakuru town the average gross earning for owner operator was Kshs 9,732.20 (USD 121.65) per month. On the other hand the average cost of maintenance of the bicycle was Kshs 617.08 (USD 7.71) per month. Therefore the average nett earning for the owner operators in Nakuru town was Kshs 9,115.12 (USD 113.94) per month or Kshs 303.84 (USD 37.98) per day. This shows that on average owner operators in the town spend about 6% of their monthly gross income on bicycle maintenance, which can be assumed to be a reasonable amount if one considers the total number of passenger trips made by the bicycle taxis per month.

In Kisumu city the average gross income for owner operators was Kshs 6,063.80 (USD 75.80) per month. The average cost of maintenance of the bicycle was Kshs 715.48 (USD 8.94) per month. Therefore the average nett income for owner operators in Kisumu city was Kshs 5,348.32 (USD 66.85) per month or Kshs 202.13 (USD 2.53) per day. This shows that owner operators in the city spend about 13% of their income on bicycle maintenance. The amount of money spent on the bicycle maintenance in Kisumu city can be considered as reasonable considering the number of trips made by the bicycle taxis per month.

The average nett earning per month for the operators in Kisumu city was very low compared to average nett earning for operators in Nakuru town. Operator earning in Kisumu city was affected by the fare setting mechanisms among the operators in the city, particularly the fares charged for short

distance trips which comprise the majority in the 'boda boda' bicycle services. Such problems could be successfully addressed if there was a strong 'boda boda' association in the city.

Other previous studies carried out on 'boda boda' bicycle taxis in Kisumu city (Taylor, 2006), in Nakuru town (Ngige, 2005), on rickshaws in Bangladesh (Wipperman, 2007) and India (Whitelegg, 1998) found that the operating costs significantly affected the operator earnings. Thus the findings of the said studies are consistent with the findings of this study.

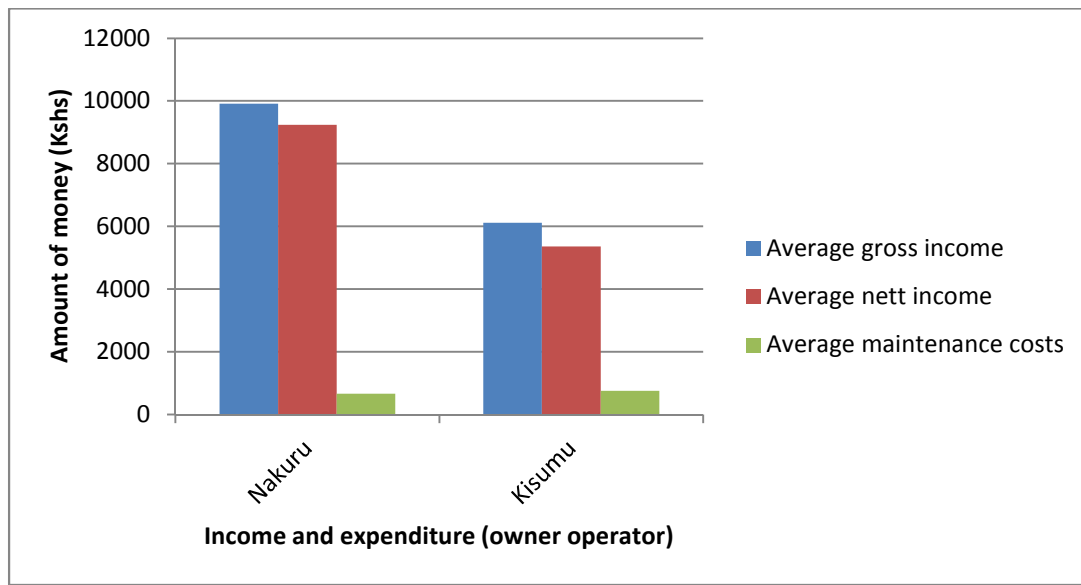


Figure 5.8 Operating costs and operator earning (Kenyan shillings) (n=500).

5.2.4.2 Hiring operators

In Nakuru town the average gross income for hiring operator was Kshs 9,732.20 (USD 121.65) per month. The average hiring cost of the bicycle was Kshs 1,493.83 (USD 18.67) per month. Therefore the average nett income for hiring operator in Nakuru town was Kshs 8,238.37(USD 102.98) per month or Kshs 271.61 (USD 3.40) per day. This indicates that hiring operators in the town spend about 15% of their monthly earning to hire the bicycle which is high compared to their monthly income.

The average gross income for hiring operator in Kisumu city was Kshs 6,063.80 (USD 75.80) per month. The average cost of hiring the bicycle was Kshs 1,529.98 (USD 19.12) per month. Therefore the average nett income for hiring operators in Kisumu city was Kshs 4,533.82 (USD 56.67) per month or Kshs 151.12 (USD 1.89) per day. This shows that hiring operators in Kisumu city spend about 25% of their gross income to hire the bicycles which is too high compared to the monthly income of the operators. Similarly the average nett earning per month for the operators in Kisumu city was very low compared to average nett earning for operators in Nakuru town.

The previous studies carried out on the bicycle taxis and obtained in this study had not obtained information relating to the earnings of hiring operators.

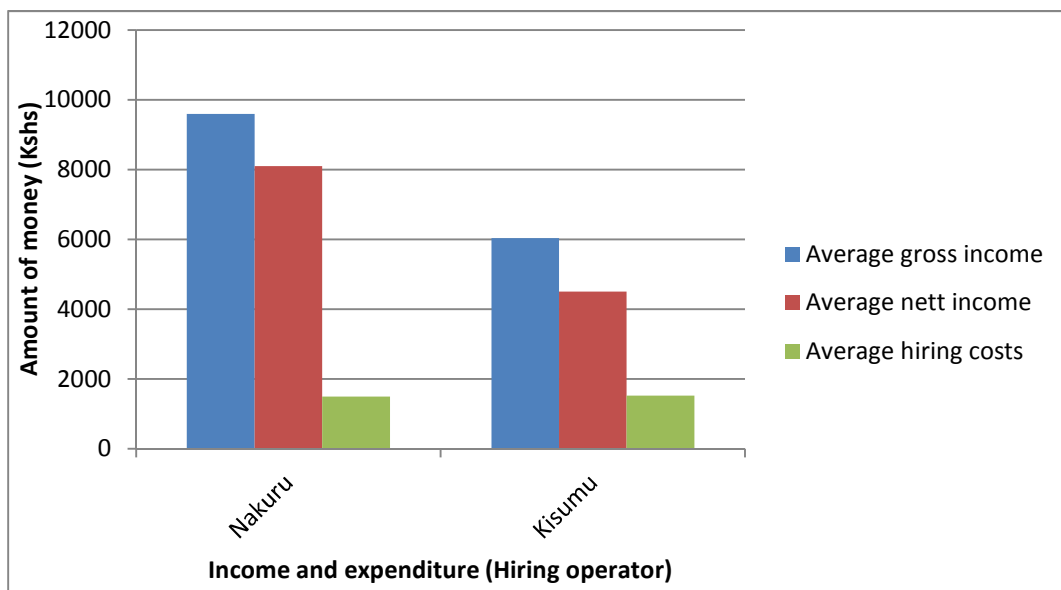


Figure 5.9 Hiring costs and operator earning (Kenyan shillings) (n=500).

5.2.5 'Boda boda' bicycle taxi users

'Boda boda' bicycle taxis provide transport services to people of all ages. The data obtained in this survey in both Kisumu and Nakuru towns show that an average of 6% of the 'boda boda' bicycle taxi users was children under 10 years old. This shows that the bicycle taxis provide transport services to children going to school or to other facilities. An average of 16.5 % of the bicycle taxi users in both towns town were between 10 and 20 years old. People in this age bracket are usually children in primary school at the lower range and high school or college at the upper range. This shows that the bicycle taxis provides a 'school van' type of service to the children going to school or young adults going to college. An average of 27.5% of the bicycle taxi users in both towns were between 21 and 30 years old. People in this age group are college students, workers and business people. This indicates that 'boda boda' bicycle taxis provide transport services to people going to various social and economic activities. An average of 42.5% in both towns was between 31 and 55 years old. People in this age group are usually workers and business people which again show that 'boda boda' bicycle taxis provide transport services to people going for various social and economic activities. An average of 7.5% of the bicycle taxi users in both towns were over 55 years old. People in this age group are usually workers on the lower end of the age bracket and pensioners at the upper end. This confirms that the bicycle taxis are used by people of all ages who use them to access various social and economic activities. Hence the results of this survey reveal that 'boda boda' bicycle taxi services are utilised by people of all ages.

Other previous studies carried out on 'boda boda' bicycle taxis in Kisumu city (Taylor, 2006) and another one also in Kisumu (Kisumu City Council, 2005) and in Uganda (Howe, 2001) found that

the bicycle taxis were utilised by people of various ages. Thus the findings of the said studies are consistent with the findings of this study.

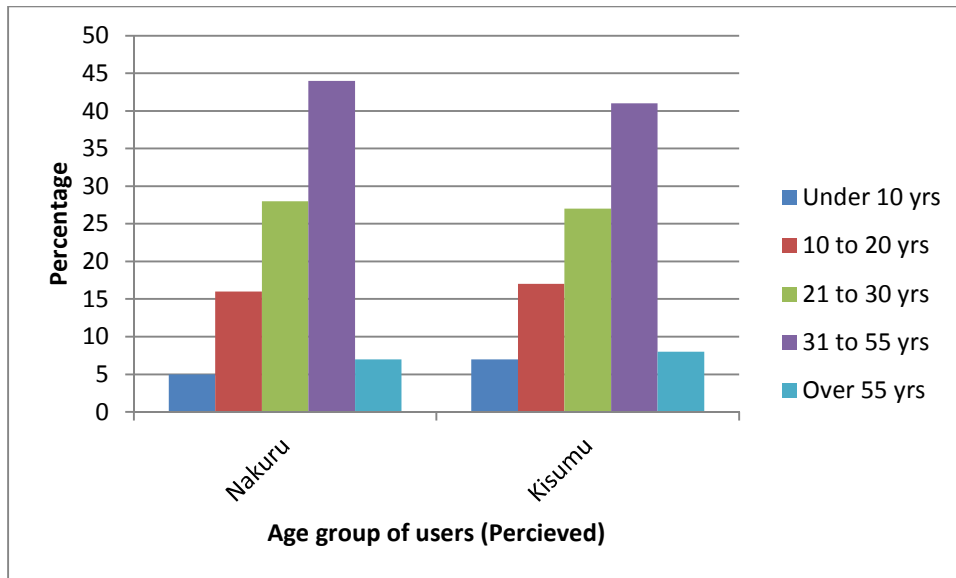


Figure 5.10 'Boda boda' bicycle taxi users (percentage) (n=500).

5.2.6 Goods carried by 'boda boda' bicycle taxis

Apart from providing passenger transport services 'boda boda' bicycle taxis also provide transportation services for goods. In order to carry goods, the padded seat on the rear carrier of the 'boda boda' bicycle is removed. The bicycles carry packed goods of medium weight such as six crates of bottled soda with a total weight of approximately 80 kg. The bicycles are also used to transport one to two bags of dry maize with standard weight of 90kgs, six bundles of maize floor with a total weight of 150kg. This shows that 'boda boda' bicycle taxis have the capacity to provide various types of transport services.

Other previous studies carried out on 'boda boda' bicycle taxis in Uganda (Heyen-Perschon, 2004) (Abili, 2007) and in Bangladesh (Wipperman, 2007) found that the bicycle (tricycle) taxis provided transport services for various types of goods ranging from farm produce to manufactured goods. Thus the findings of the said studies are consistent with the findings of this study.



Figure 5.11: 'Boda boda' bicycles (Sai stage), Kisumu



Figure 5.12 Boda boda bicycle carrying two bags of maize (border point): Busia

5.2.7 Operational problems

In Nakuru town the 'boda boda' bicycle taxis were banned from operating in the town's central business district and therefore the main problems that faced the bicycle taxi operators in the town include 'no go zones', 'pick-up and drop-off' areas and conflicts with vehicular traffic. Other modes of transport such as minibus taxis and tricycles were allowed to operate in the central business district. The bicycle taxis were not even allowed to pick passengers up or drop them off at the bus park, which was common destination of many 'boda boda' bicycle taxi users, forcing the bicycle taxis to drop the passenger some distance away from their final destination to complete their journey on foot. This resulted to the bicycle taxi losing their attractiveness to customers. This shows that the transport authorities in the town were not supportive of 'boda boda' bicycle taxi operations or that they assumed the bicycle taxi services were not important enough to warrant access to the bus park.

Another operational problem that was raised by 'boda boda' bicycle taxis in Nakuru town was conflicts with vehicular traffic. In the town no dedicated space had been provided by the municipal council on either side of the roadways for use by the 'boda boda' bicycles despite the high prevalence of the bicycles in the town streets. The bicycles were forced to compete for space in the roads with vehicles which sometimes resulted to fatal crashes. This indicates that the authorities were insufficiently concerned with the problems faced by 'boda boda' bicycle taxi operators or users. With such a high number of bicycle taxis providing essential services to the rate-paying residents, the council had an obligation to provide the necessary mechanisms to ensure the safety of the bicycle taxi users and operators.

The only operational problem that was faced by 'boda boda' bicycle taxi operators in Kisumu city was conflicts with vehicular traffic. Although the City Council allowed the bicycle taxis to operate in all areas within the city, no space was provided on the roadway for the bicycle taxis. They were forced to compete with vehicular traffic for space on the roadways which exposed the bicycle

taxi users and operators to dangers arising from vehicles. Again this demonstrates the insensitivity of the local authorities to the welfare of bicycle taxi users and operators. This clearly shows that the relevant transport authorities need to formulate measures to enhance the safety of the users and operators and to promote '*boda boda*' bicycle taxi operations.

Previous studies carried out on '*boda boda*' bicycle taxis in Nakuru town (Omondi, 2007), in Uganda (Howe, 2001), in Rwanda (The new times, 2009), in India (Kishwar, 2006), in Bangladesh (Replogle, 1991) and another one also in Bangladesh (Wipperman, 2007) found that the bicycle taxi and rickshaw operators were faced with various operational problems such as a lack of operating polices, corruption in licensing and safety on the roadways, all of which were under the control of the local authorities. Thus the findings in Nakuru and Kisumu are not unique.

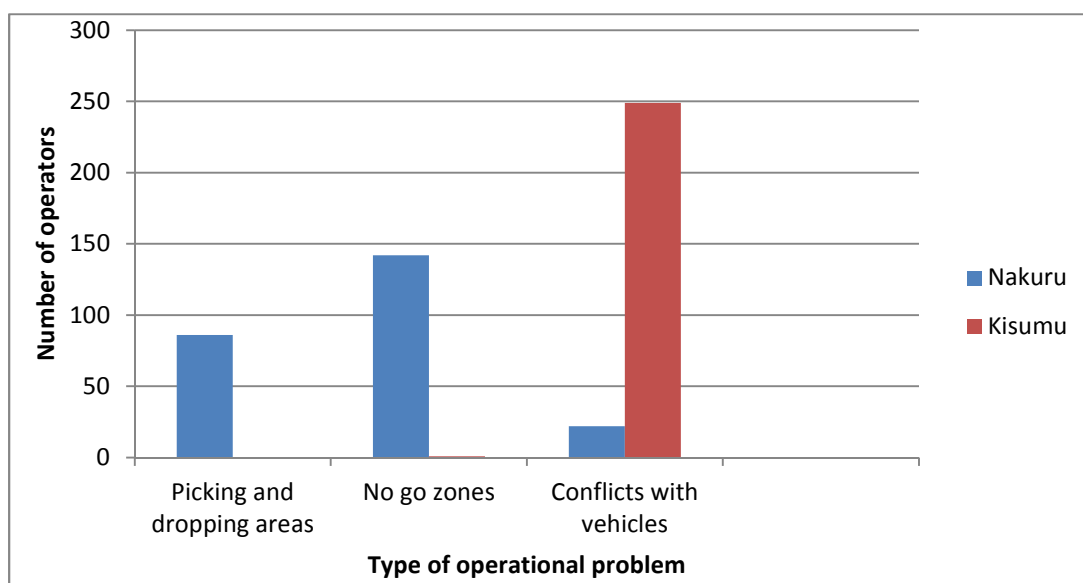


Figure 5.13 Operational problems (respondents) (n=500).

5.3 '*Boda boda*' bicycle taxi transport services

5.3.1 Type of services

'*Boda boda*' bicycle taxis provide area-wide transportation services. This implies that '*boda boda*' bicycle taxis are not confined to specific routes but can be hired to take passengers to any place within the town in which they operate. Each bicycle, however, operates from a specific place known as a 'stage'. '*Boda boda*' bicycles pick their passengers from the stage and take them to their destinations. Once they drop their passenger they are allowed to pick another passenger on their way back and take them to any other place within the town. This shows that the bicycle taxis provide flexible and accessible transport services because they can change routes at short notice.

Within the areas of operations the bicycle taxis operate alongside other, motorised modes of transport and complement them by providing feeder services to areas which are inaccessible by vehicular transport as well as to major roads with high capacity modes and bus and railway stations.

They also provide personalized services to small scale traders who purchase a few items at different wholesale outlets by making several stops or change routes to buy supplies. The operators sometimes wait without extra charges. This reveals how accessible and convenient 'boda boda' bicycle taxi services are to their users.

Other previous studies carried out on 'boda boda' bicycle taxis in Kisumu city (Limbe, 2006), in rest of Kenya (Maino, 2002) and in Bangladesh (Hodgkinson, 2007) found that the cycle taxi operators provided transport services without fixed routes which were able to be adjusted according to demand. Thus the findings of the said studies are consistent with the findings of this study.

5.3.2 Attitudes towards 'boda boda' bicycle taxis

5.3.2.1 Attitudes of traffic police

In Nakuru town 82% of the 'boda boda' operators interviewed said that traffic police were either friendly or indifferent. This shows that the majority of the bicycle taxi operators in the town related well with the law enforcement agents possibly because they operated within the limits of the traffic laws and therefore traffic police had no reason to be hostile to them. Within the roadways a 'boda boda' bicycle takes up minimal space and also rides on the sides of the roadways where the shoulders are good. Thus the possibility of the bicycle taxis causing obstruction or traffic congestion is very low and therefore this minimizes the possibility of hostility between the police and the bicycle taxi operators.

In Kisumu city 86% of the 'boda boda' bicycle taxi operators said the traffic police were either friendly or indifferent. Again this demonstrates the bicycle taxi operators had good relations with the traffic police. The lack of hostility possibly results from the 'boda boda' bicycle taxi operators providing their transport services within the laid down traffic regulations.

Other studies carried out on 'boda boda' bicycle taxis in Uganda (Howe, 2001), on rickshaws in India (Kishwar, 2006) and in Bangladesh (Wipperman, 2007) (Hodgkinson, *et al*, 2007) found that the attitude of police and local authorities towards 'boda boda' and rickshaw operators was hostile. They often arrested them and sometimes destroyed the rickshaws for minor reasons. Thus the findings of the said studies differed with the findings of this study.

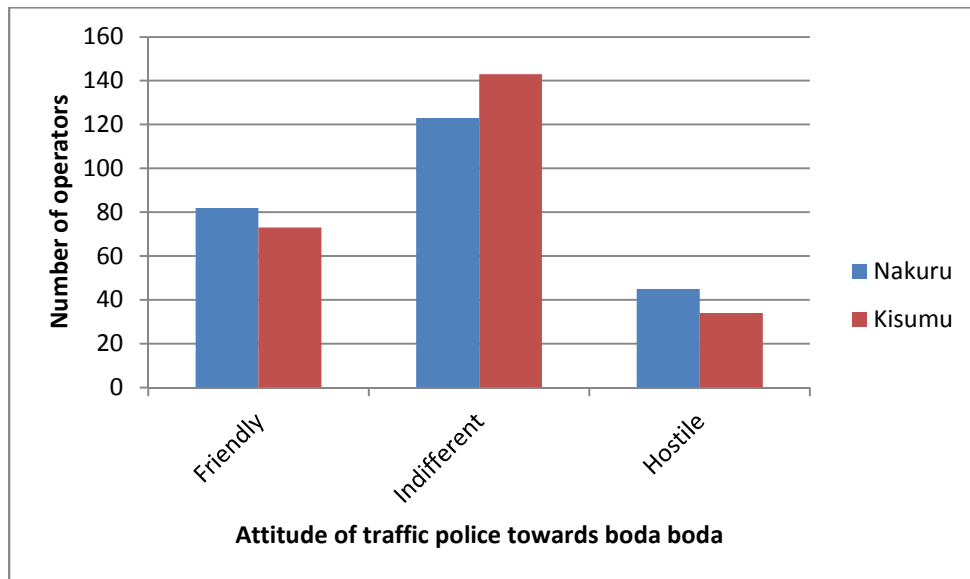


Figure 5.14 Attitude of traffic police (respondents) (n=500).

5.3.2.2 Attitudes of minibus taxi operators (*matatus*)

In Nakuru town 61% of the 'boda boda' bicycle taxi operators interviewed said the minibus taxi operators were hostile to them. In Kisumu city 54% of the 'boda boda' bicycle taxi operators interviewed said that the minibus taxi operators were hostile to them. This shows that the bicycle taxis do not have good working relations with the minibus taxi operators. The bad relations probably arise from competition in the transport market because the two sometimes operate alongside each other as competitors targeting the some passengers.

A previous study carried out on 'boda boda' bicycle taxis in Uganda (Howe, 2001) showed that there was hostility between the 'boda boda' bicycle taxi operators and the minibus operators. Thus the findings of the said studies are consistent with the findings of this study.

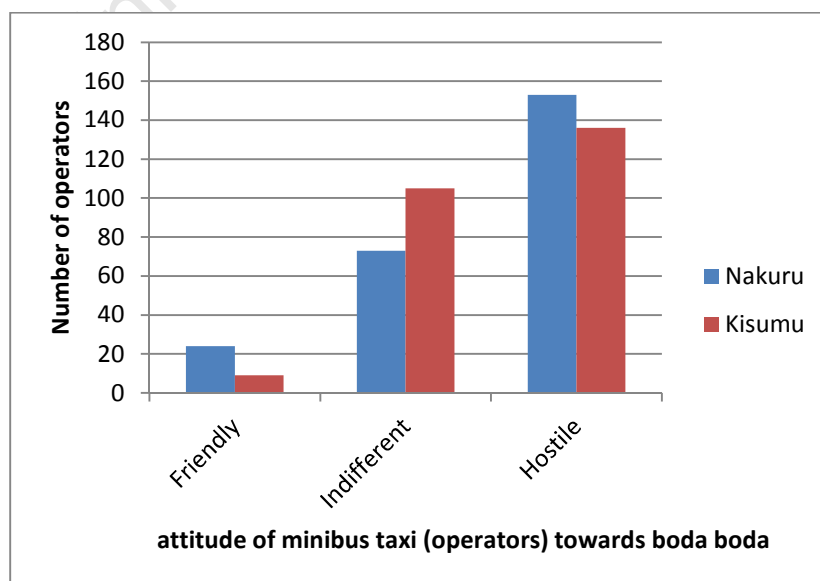


Figure 5.15 Attitude of minibus taxi operators (respondents) (n=500).

5.3.2.3 Attitude of bus operators

In Nakuru town 98% of the bicycle taxi operators interviewed said the bus operators were either friendly or indifferent. In Kisumu city 99% of the 'boda boda' bicycle taxi operators interviewed said the bus operators were either friendly or indifferent. This shows that there was no hostility between bus operators and the 'boda boda' bicycle taxi operators. This is probably because the buses do not provide town transport services and therefore they do not compete with bicycle taxis in the provision of passenger transport services within the town. 'Boda boda' bicycle taxis in Nakuru and Kisumu towns support the bus transport services by providing feeder services and this contributes to the good working relations.

The previous studies carried out on the bicycle taxis and obtained in this study had not obtained information relating to the attitude of bus operators towards 'boda boda' bicycle operators.

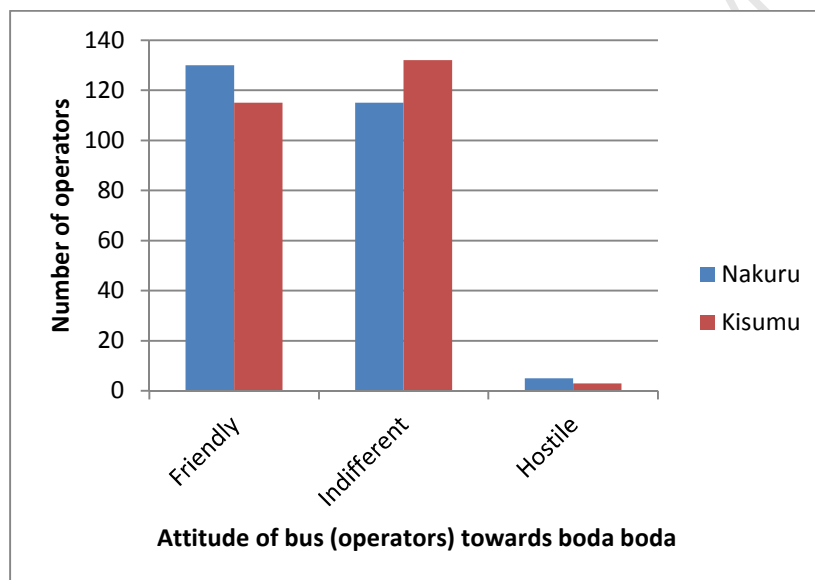


Figure 5.16 Attitude of bus operators (respondents) (n=500).

5.4 Market niche

5.4.1 'Boda boda' bicycle users

'Boda boda' bicycle taxis provide transport service to users of various age groups but some age groups utilise their service more than others. According to the data obtained in the survey the age group which utilises the 'boda boda' bicycle taxi services more than the others in Nakuru town was the 31-55 year' age group with 44% utilisation. The age group which utilises the 'boda boda' bicycle taxi services more than the others in Kisumu city was also the 31-55 year age group with 41% utilisation. This age group consists of people who are involved in various social and economic activities. This shows that the bicycle taxis are actively involved in the provision of transport services contributing to the economic development of the country.

A previous study carried out on 'boda boda' bicycle taxis in Uganda (Howe, 2001) showed that the average age of most of the users was over 30 years. Thus the findings of that study are consistent with the findings of this study.

5.4.2 Gender

Women utilise 'boda boda' bicycle taxi services more than men according to the data obtained from this survey. In Nakuru town 51% of the bicycle taxi users were women and in Kisumu city 57% of the users were women. This shows that women are marginally more involved in activities that require 'boda boda' bicycle taxi transport services than men. This is possibly because apart from being actively involved in running of small business enterprises in both towns such as hair salons, food kiosks, green groceries and many others they also use the bicycle taxis to take their babies to hospitals or clinics.

Other previous studies carried out on 'boda boda' bicycle taxis in Uganda (Howe *et al*, 2003) and rickshaws in Bangladesh (Replogle, 1991) showed that men utilised the bicycle taxi services more than women. Thus the findings of the said studies differ somewhat with the findings of this study.

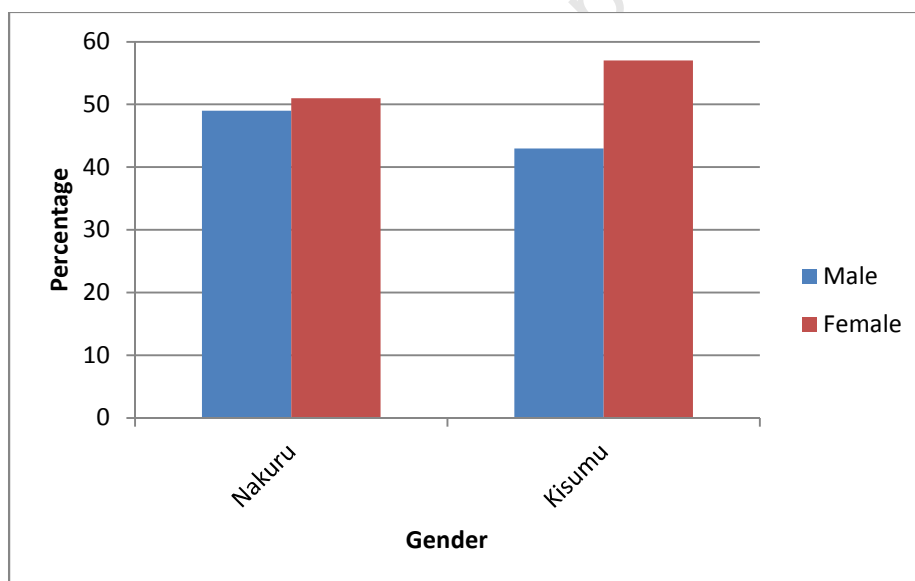


Figure 5.17 'Boda boda' users by gender (percentage) (n=500).

5.4.3 Off- road trips

'Boda boda' bicycle taxis provide transport services on roads and on paths where vehicular traffic cannot pass. In Nakuru town 36% of the trips made by 'boda boda' bicycle taxis per day were on paths where minibus taxis (*matatus*) and tricycle taxis (*tuk tuk*) could not pass. In Kisumu city 38% of the trips made by the 'boda boda' bicycle taxis per day were on paths where minibus taxis and tricycle taxis could not pass. This shows that the bicycle taxis provides flexible transport services

which are not confined to the roadways. This is mainly because the bicycle is mechanically designed to occupy a narrow area which allows them to comfortably travel on road and paths. In particular they provide transport services to areas which are not accessible by minibuses (*matatus*) and tricycles (*tuk tuk*) because of poor road networks and high density of houses.

Other previous studies carried out on '*boda boda*' bicycle taxis in Uganda (Howe, 2001, Howe *et al*, 2004) showed that bicycle taxis provide transport services in areas which are impassable by vehicles because of poor roads. Thus the findings of the said studies are consistent with the findings of this study.

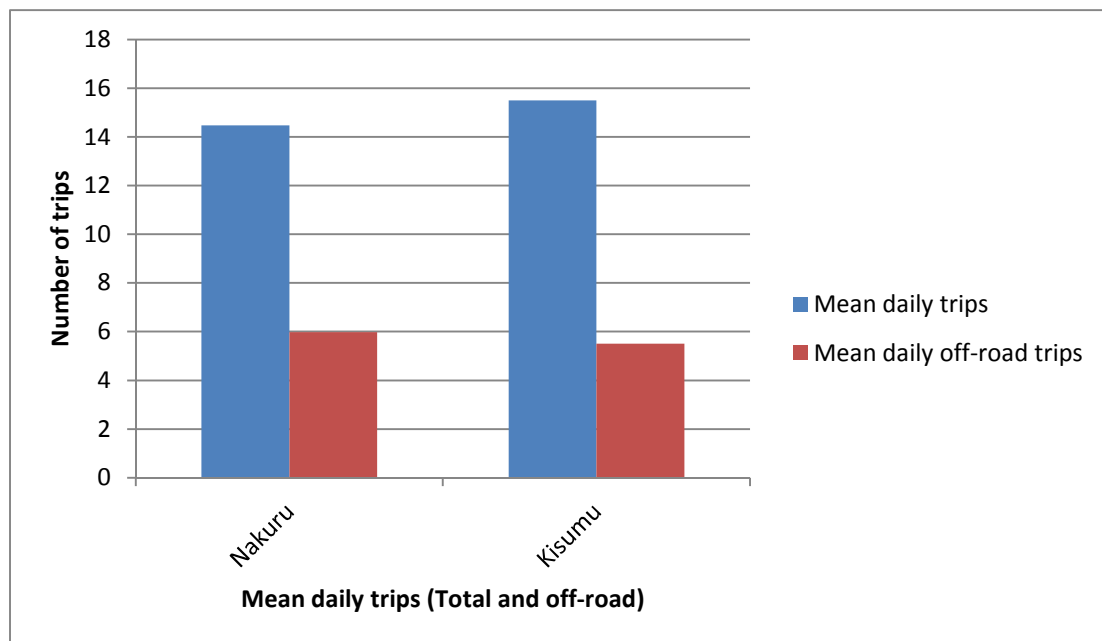


Figure 5.18 Off-road trips (percentage) (n=500).

5.4.4 Trip purposes

'*Boda boda*' bicycles provide a transport service for various trip purposes but the level of utilisation varies from one trip purpose to another. In Nakuru town 67% of the trips made by the '*boda boda*' bicycle taxis were work trips. In Kisumu city 65% of the trips made by the '*boda boda*' bicycle taxis were work trips. This indicates that most of the '*boda boda*' users in both towns use the bicycle taxis to commute to work. The workers possibly prefer to use the bicycle taxis because they do not get stuck in traffic congestion and therefore they are able to get them to their work places on time as opposed to vehicular modes which are delayed by traffic congestion on the roadways.

The previous studies carried out on the bicycle taxis and obtained in this study had not obtained information relating to the trip purposes of the '*boda boda*' bicycle taxis.

5.4.5 Trip lengths

'Boda boda' bicycle taxis provide transport services predominantly for short trips. In Nakuru town 77% of the trips made by the bicycle taxis were short trips less than one kilometre long. In Kisumu city 81% of the trips made by the 'boda boda' bicycle taxis were similarly short distance trips. This shows that most of the 'boda boda' bicycle taxi users in both towns usually make short trips. The bicycle taxis are easily available in many places along the streets of both towns and are possibly preferred by people commuting for short distances because accessing the alternative modes may involve walking to the stages which may be some distance away. Additionally the bicycles charge lower or the same fare as the alternative modes but are able to provide services where the alternative modes are unable to. On the other hand long distance trips may not be economical for the 'boda boda' bicycle taxi operators in terms of time and fare charged which may explain why the bicycles make short distance trips preferentially.

Other studies carried out on 'boda boda' bicycle taxis in Uganda (Howe, 2003) and in Bangladesh (Wipperman *et al*, 2007) showed that the cycle taxis provides transport mostly for short distance trips. Thus the findings of those studies are broadly consistent with the findings of this study.

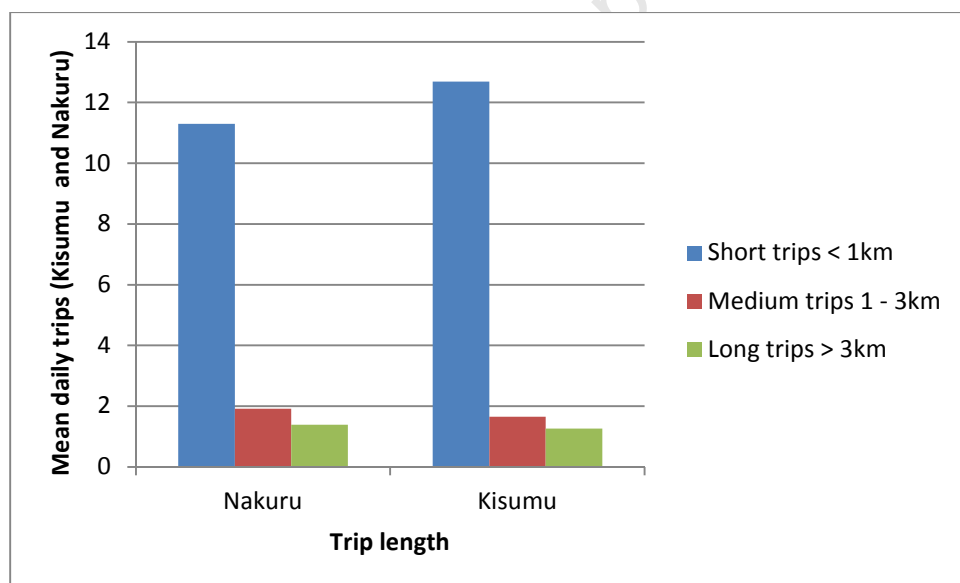


Figure 5.19 Trip lengths (mean number of trips) (n=500).

5.5 Impacts of 'boda boda' bicycle taxis on socio-economics

5.5.1 Characteristic of 'boda boda' bicycle taxi operators

5.5.1.1 Age of the operators

'Boda boda' bicycle taxis are operated by people of various age groups. In Nakuru town the age of the bicycle operators ranged from 18 years to 44 years with 85% of the operators aged between 18 years and 32 years. Only 15 % of the operators in Nakuru town were older than 32 years. In Kisumu city the age of the operators ranged from 18 years to 45 years with 96% of the operators aged between 18

years to 32 years. This shows that most of the *'boda boda'* operators are young people. This is probably because the *'boda boda'* bicycle taxi operations involve a lot of physical work which may not be suitable for older people.

Previous studies carried out on *'boda boda'* bicycle taxis in Uganda (Howe, 2003, Malmberg-Calvo, 1994) and another study carried out on rickshaws in Bangladesh (Wipperman *et al*, 2007) showed that the majority of bicycle taxi operators were below 32 years old. Thus the findings of those studies are consistent with the findings of this study.

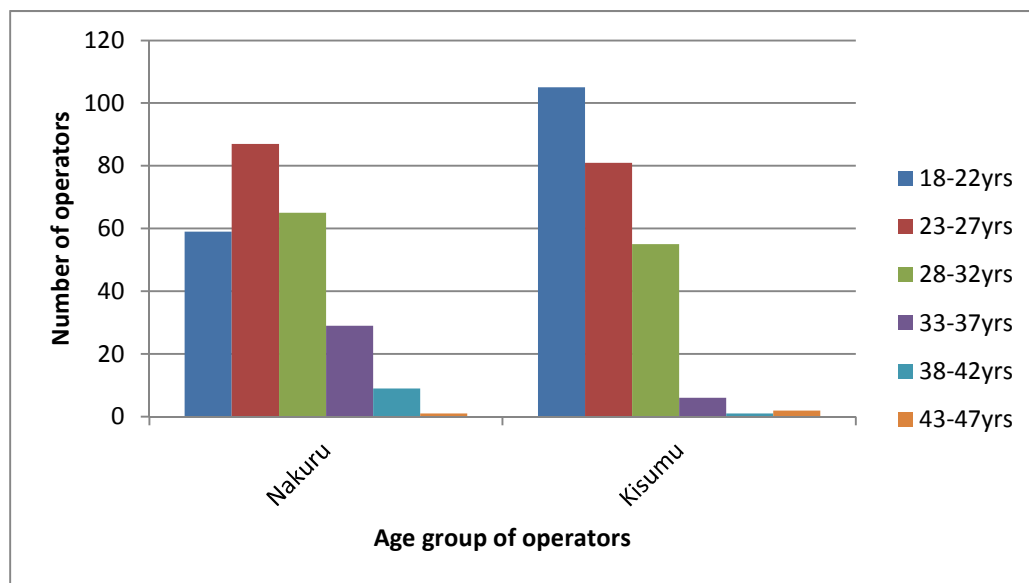


Figure 5.20 Operator ages (respondents) (n=500).

5.5.1.2 Level of education

Most of the *'boda boda'* bicycle taxi operators had gone through formal education to various levels. In Nakuru town 84% of the operators had standard (grade) eight certificates and above. In Kisumu city 66% of the operators had standard (grade) eight certificates and above. This shows that most of the *'boda boda'* operators in the town had basic education. All the operators interviewed in both Nakuru and Kisumu towns were able to read and write. Therefore it can be seen that *'boda boda'* bicycle taxi operations did not belong to people who lacked basic education. Most of the operators, despite having some formal education, had taken the bicycle taxi operation as their source of income possibly because of lack of employment opportunities elsewhere.

Other previous studies carried out on *'boda boda'* bicycle taxis in Kenya (Mwiti *et al*, 2007) and in Uganda (Muhumuza, 2006) showed that the majority of the *'boda boda'* bicycle taxi operators had basic education. This is consistent with this study. However a study carried out in Bangladesh on rickshaw operators (Wipperman *et al*, 2007) showed that the majority lacked basic education which differs with the findings of this study.

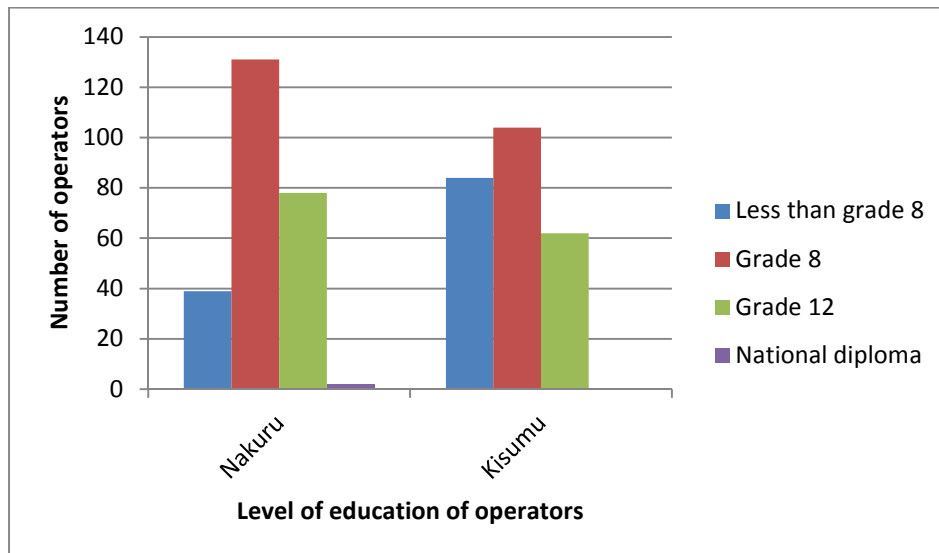


Figure 5.21 Level of education (respondents) (n=500).

5.5.2 Welfare of 'boda boda' operators

5.5.2.1 Employment opportunities

In Nakuru town there were about 6,000 'boda boda' bicycle taxis (Omondi, 2007) operating in the town, and in Kisumu city there were over 10,000 'boda boda' bicycle taxis (Kisumu City Engineer, 2010) operating in the city. This shows that the bicycle taxi operations directly provided employment to over 16,000 people in both Nakuru and Kisumu. The number would, however, be more if the owners of the bicycles which are hired to the operators are considered since they directly benefit from the bicycle taxi operations. Some bicycles are also shared by two operators which adds to the number of people directly employed by the industry. In addition to direct employment, the 'boda boda' industry supports various linked enterprises which provide income generation opportunities. It was established that most neighbourhoods of the towns had at least one bicycle repair garage with one or more mechanics (which in turn are linked to hardware shops stocking bicycle parts). In addition, 'stages' often host kiosks and shops which sell a variety of foodstuffs and merchandise. It is therefore clear that the 'boda boda' bicycle taxi industry provides direct and indirect employment opportunities to many people in areas where the bicycles are in operation.

Other previous studies carried out on 'boda boda' bicycle taxis in Uganda (Howe, 2003) (Heyen-Perschon, 2004), Bangladesh (Suitana, 2008, Replogle, 1998) and India (Whitellegg, 1998) showed that the cycle taxis provided employment opportunities to many people directly and indirectly in areas where they were operating. Thus the findings of the said studies are consistent with the findings of this study.

5.5.2.2 Number of dependants

Most of the 'boda boda' bicycle taxis operators had dependants but the number of dependants varied from one operator to another. In Nakuru town 91% of the operators had dependents. The average number of dependants in the town was 3.2 per bicycle operator. This shows that on average each bicycle supported the livelihood of 4.2 people, including the operator. Considering that Nakuru town had about 6,000 bicycles (Omondi, 2007) the total number of people in Nakuru town who directly depended on the bicycle taxis in the town was about 25,320. In Kisumu city 89% of the operators had dependants. The average number of dependants in the city was 2.5 per operator. This indicates that on average each bicycle in the city supported the livelihood of 3.5 people, including the operator. Considering that Kisumu city had over 10,000 bicycles (City engineer, 2010) the total number of people who directly depended on the bicycle taxis were over 35,000. Therefore the results clearly show that the 'boda boda' bicycle taxis directly support the livelihood of many people. The number would be more if the people who are indirectly supported by the bicycle taxi operations such as the bicycle mechanics and their families as well as other people who provide support services to the bicycle taxi operators are considered together with their families.

Other previous studies carried out on 'boda boda' bicycle taxis in Uganda (Howe, 2003), Bangladesh (Hedgkinson, 2007) and India (Whitellegg, 1998) showed that cycle taxis support many people directly and indirectly in areas where they were operating. Thus the findings of the said studies are consistent with the findings of this study.

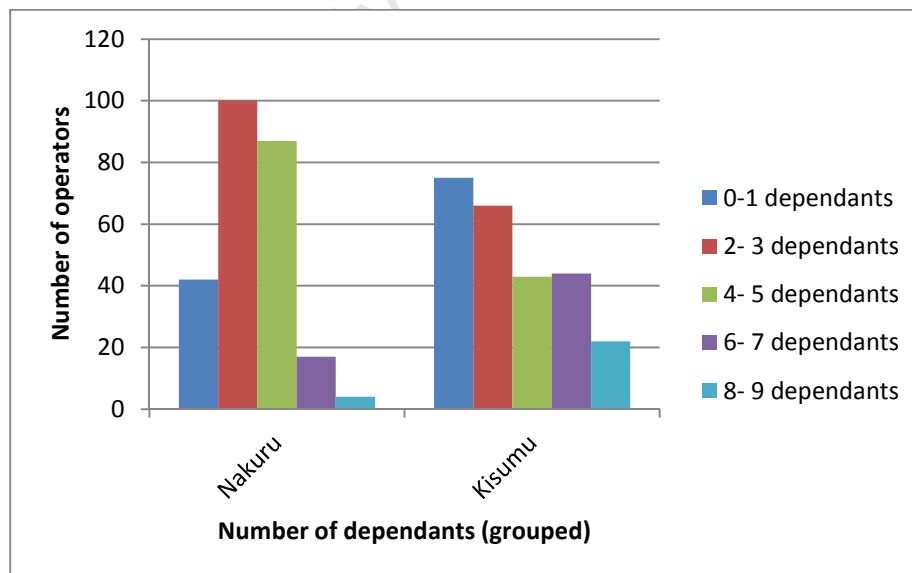


Figure 5.22 Number of dependants (respondents) (n=500).

5.5.3 Women Operators

The numbers of female 'boda boda' bicycle taxi operators were very low compared to their male counterparts. In Nakuru town there were three women operators among over 6,000 operators while in

Kisumu city there were no women operators among over 10,000 operators. This indicates that bicycle taxi operations are not necessarily solely the preserve of male operators.

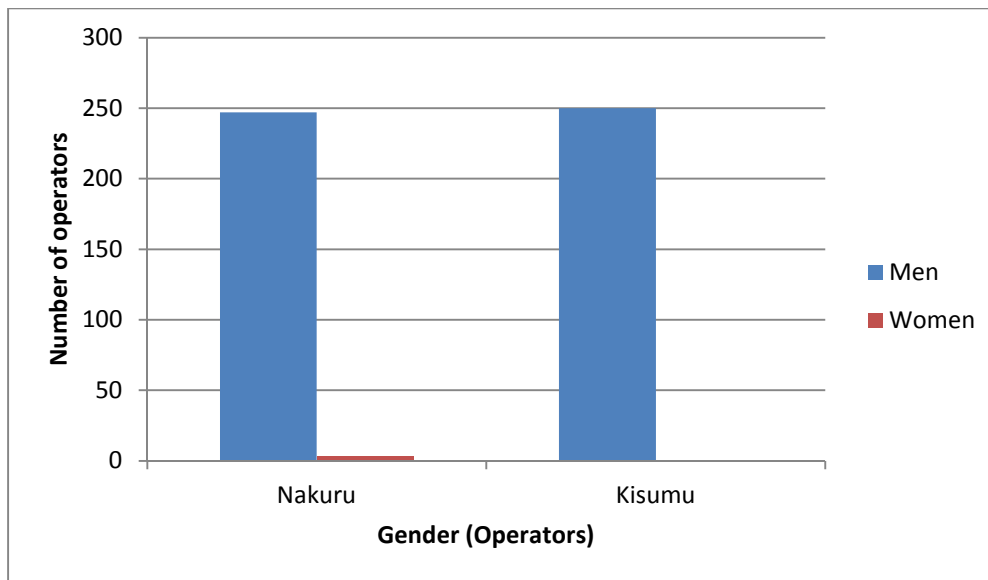


Figure 5.23 Women operators (respondents) (n=500).

5.6 'Boda boda' bicycle taxis regulations

5.6.1 'Boda boda' bicycle taxi associations

5.6.1.1 Role of the Associations

In Nakuru town most of the 'boda boda' operators were members of an association whose major function includes:

- Enforcement of operational discipline on its members.
- Representing members in negotiating with the Nakuru Municipal Council in cases of disputes.
- Bailing out operators when they are arrested by the municipal council wardens for various offences.
- Setting fares to be charged by the operators in order to safeguard the interests of the operators and users.

Thus in Nakuru town the 'boda boda' bicycles taxi operations were fairly well organised because each operator was aware of the operating rules and the consequences of not following the rules. Fare guidelines were set by the association together with the operating rules and regulations. (21 rules formulated by Nakuru *Boda boda* Group). Thus in Nakuru town the bicycle taxi operators were able to earn a mean daily income above the minimum wages paid to casual labourers in Kenya (Kshs 150 [USD 1.88]). This demonstrates the benefits of a strong 'boda boda' bicycle taxi association to both the local authorities and the operators.

On the other hand all the 'boda boda' bicycle taxi operators interviewed in Kisumu city were not members of any association. It was clear they lacked the benefits of being members of a strong

association because their monthly income was generally low compared to their Nakuru counterparts despite the average number of trips made by the operators in Kisumu being higher. This was probably because the operators in Kisumu city had no forum to address matters relating to their work. An example is the short distance trips which operators in Nakuru charged Kshs 20 (USD 0.25) and Kisumu operators charged Kshs 10 (USD 0.13). Since most of the trips made by the '*boda boda*' bicycles per day are short trips this lowered the overall earnings for the operators in Kisumu city. Hence this illustrates the benefits of being members of a strong '*boda boda*' bicycle taxi association.

Other studies carried out on '*boda boda*' bicycle taxis in Uganda (Muhumuza, 2006, Howe *et al*, 2004, Schindler, 2009) showed that the bicycle taxi associations assisted in the promotion of the welfare of their members such as bailing them once arrested by the local authorities for various offences and setting of fares charged by the operators. Thus the findings of the said studies are consistent with the findings of this study.

5.6.1.2 Fees paid to the association

A new member joining the Nakuru '*boda boda*' association pays Kshs 500 (USD 6.25). This is once-off payment. No other charges are levied from the operators in respect to membership but members who contravene the association rules are charged fines in line with the association's regulations. The money obtained from membership fees and fines is used by the association officials in matters relating to office maintenance. The association officials are not paid any salary by the '*boda boda*' association and therefore they provide transport services to passengers like the other members but are entitled to some allowance when they meet to discuss matters relating to new members or for disciplinary cases. This money is obtained from the membership fees or the fines.

Other studies carried out on '*boda boda*' bicycle taxis in Uganda (Muhumuza, 2006, Howe *et al*, 2004) showed that the bicycle taxi operators paid various membership fees depending on the association rules. Some associations charged the fees on monthly basis while others charged them on yearly basis. Thus the findings of the said studies are consistent with the findings of this study

5.6.1.3 Operational rules set and enforced by the association

One of the main tasks of the '*boda boda*' bicycle taxi association is to enforce operational discipline on its members. In Nakuru town the '*boda boda*' bicycle association formulated a total of 21 rules to assist the committee in enforcing operational discipline. The rules set and enforced by the association cover various aspects relating to the operations but generally include operators' discipline while providing the transport services, the mechanical conditions of the bicycles, registration of new members, consequences of not following the rules and fines chargeable to members. The rules are given to new members before joining the association and are also displayed on a board in the association's office. The fines charged vary with the offence involved but the amount payable has

been pre-determined by the committee and all prospective members are notified of them before joining the association. This clearly shows the usefulness of a strong 'boda boda' bicycle taxi association in running the affairs of its members.

The previous studies carried out on the bicycle taxis and obtained in this study had not obtained information relating to operational rules set and enforced by associations.

5.6.2 Local authorities' regulations

5.6.2.1 Fees paid to local authorities

In Nakuru town each 'boda boda' bicycle taxi operator was required to pay a Kshs 360 (USD 4.50) operating fee per month to the Nakuru Municipal Council but they declined to pay because they were denied permission to operate in central business district. They are however forced by the municipal council to pay the monthly fee first whenever they are fined for any other offence. This shows the lack of capacity in the Nakuru Municipal Council to collect fees from bicycle taxi operators. The town had about 6,000 bicycles (Omondi, 2007) operating in its streets and therefore the council loses about Kshs 2.16 million (USD 27,000) monthly.

In Kisumu city 'boda boda' bicycle taxi operators were required to pay Kshs 300 (USD 3.75) per month each to the Kisumu City Council. However they refused to pay and whenever they were asked to pay they protested until the City Council gave up. This shows the lack of capacity in the Kisumu City Council to collect fees from 'boda boda' operators. The city had over 10,000 (City Engineer, 2010) bicycles operating in its streets and therefore the City Council loses over Kshs 3.0 million (USD 37,500) per month.

A previous study carried out on 'boda boda' bicycle taxis in Uganda (Howe *et al*, 2004) showed that the local authorities charged the bicycle taxi operators various fees which sometimes were collected on their behalf by the bicycle taxis associations. However the study did not indicate clearly how the associations collected the fees on behalf of the local authorities.

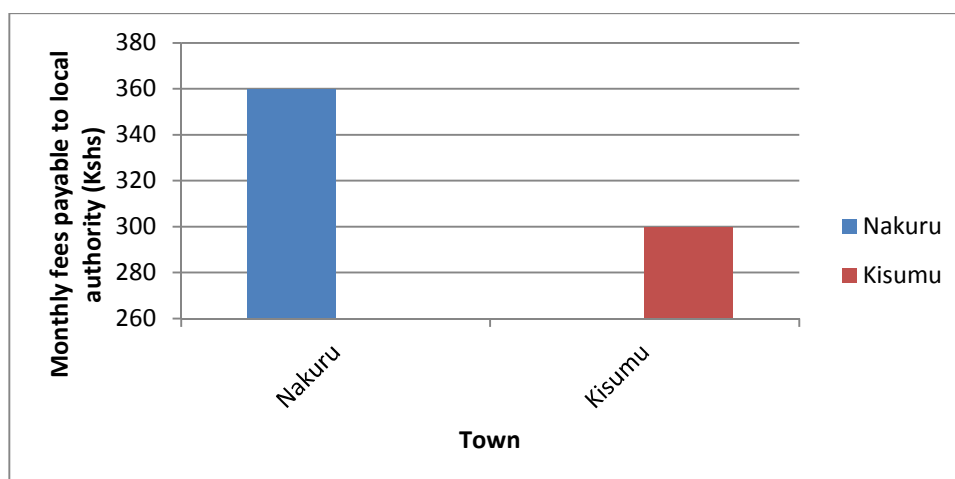


Figure 5.24 Fees payable to local authorities (Kenyan shillings) (n=500).

5.6.2.2 Operational rules set and enforced by the council

In Nakuru town the Municipal Council banned '*boda boda*' bicycle taxis from operating within the central business district. The Council also proposed new by-laws relating to '*boda boda*' bicycle taxi operations in the town to the Ministry of Local Government in 2008 and were approved by the Minister in October 2008 but up to the time of preparation of this report the new by-laws had not been implemented. The by-laws consist of a set rules which detail what the '*boda boda*' bicycle taxis are supposed to do or not to do and what they are supposed to pay. They did not deal with measures that the council should put in place to promote the bicycle taxi operations. The reasons for not implementing the '*boda boda*' bicycle taxi by-laws are unclear. Implementing them would have gone a long way in addressing some of the issues which were causing friction between the Municipal Council and the '*boda boda*' bicycle taxi operators.

In Kisumu city the '*boda boda*' bicycle taxis were allowed to operate everywhere within the city. New by-laws relating to '*boda boda*' operations within the city were proposed by the City Council (then municipal council) to the Ministry of Local Government in 2008, and were approved by the Minister in January 2009, but up to the time of preparation of this report the new by-laws had not been implemented. Again the by-laws proposed by the Kisumu City Council consist of a set rules focusing on what the '*boda boda*' bicycle taxis are supposed to do or not to do and what they are supposed to pay, but neglecting any measures that the council ought to put in place to promote bicycle taxi operations. The reasons for not implementing the '*boda boda*' bicycle taxi by-laws are unclear. Implementing the new by-laws could have partly solved some of the problems faced by both the City Council and the bicycle taxi operators in the city.

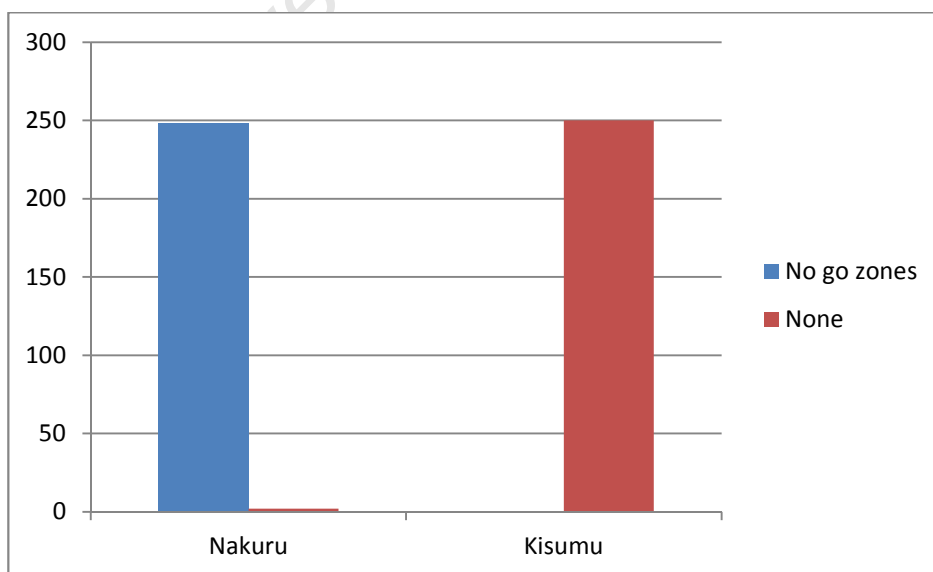


Figure 5.25 Operational rules (respondents) (n=500).

5.7 Support for 'boda boda' bicycle taxi operators

5.7.1 Support by the government

The support required by the 'boda boda' bicycle taxi operators from the government varied significantly in both Nakuru town and Kisumu city. In Nakuru town 49% of the operators said they required the government to support them with loans to buy good bicycles or motorcycles, with construction of designated stages and implementation of operating policies. In Kisumu city 84% of the 'boda boda' operators said they required the government to support them with low interest loans to buy good bicycles or motorcycles, construction of designated stages and implementation of operating policies. This shows that most of the 'boda boda' bicycle operators in both towns had taken 'boda boda' bicycle taxi operation as an occupation and would have liked it to be promoted like any other profession. The operators who owned the bicycles they were using felt that if the government supported them with cheap loans they would acquire better quality bicycles or motorcycles. On the other hand those operators who hired the bicycles they were using felt that if the government supported them with cheap loans they would acquire their own bicycles because this would increase their daily earnings. The operators also would have liked the government or the local authorities to provide them with designated stages and to formulate operating policies with the interests of all parties in mind. This clearly shows that the bicycle taxi operators were willing to operate within the law but the local authorities were reluctant, or did not have the capacity, to implement policies to regulate and promote the 'boda boda' bicycle taxi industry.

The previous studies carried out on the bicycle taxis and obtained in this study had not obtained information relating to regulation and support of bicycle taxi operations by the government.

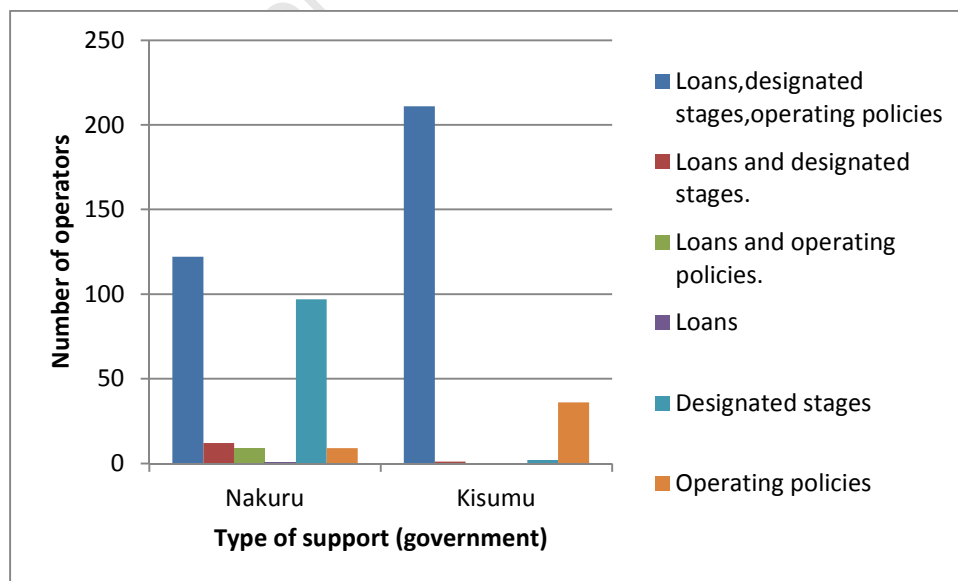


Figure 5.26 Support by the government (respondents) (n=500).

5.7.2 Support by non-governmental organisation or private sector

In Nakuru town 96% of the *'boda boda'* bicycle taxi operators interviewed said they required non-governmental organisation or private sector to support them with loans to buy good quality bicycle or motorcycles, and business skills training to run their *'boda boda'* business. Similarly in Kisumu city 100% of the *'boda boda'* bicycle taxi operators interviewed said they required the non-governmental organisation or private sector to support them with loans to buy good quality bicycles or motorcycles, and business skills training to run their *'boda boda'* businesses. This shows that the bicycle taxi operators in Nakuru town and Kisumu city were determined to promote *'boda boda'* operations in both towns. However it is clear that most of the bicycle taxi operators lack financial support and business skills.

The previous studies carried out on the bicycle taxis and obtained in this study had not obtained information relating to support of *'boda boda'* operations by non-governmental organisation.

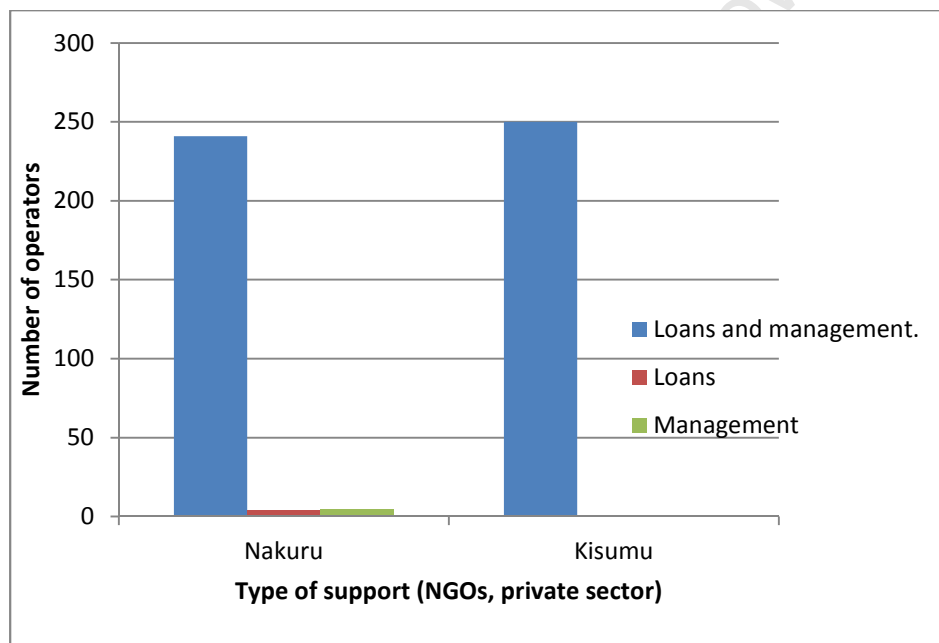


Figure 5.27 Support by non-governmental organisation (respondents) (n=500).

5.8 Conclusions

This chapter presented a detailed discussion of results obtained in the study. It aimed to investigate what the results revealed in order to establish their implications for the research problem, based on the research objectives. To achieve this end the discussion needed to provide answers to the research question: What role do *'boda boda'* bicycle taxis play in urban transport systems in Kenya and what policy measures should transport authorities in the country formulate in response to the revealed operations. In order to achieve this it was found necessary to break the question into two parts.

The first part was: What role do *'boda boda'* bicycle taxis play in urban transport systems in Kenya? To answer this question the chapter discussed the results regarding the operating characteristics of *'boda boda'* bicycle taxis. The results revealed that they provide various readily available types of transport services which include long, medium and short distance trips operating for long periods each day. The results also revealed that the bicycle taxis provided area-wide transport services in mixed traffic conditions. Although they provided low capacity transport services the study established that the bicycle taxis served market niches which included short distance trips not exceeding one kilometre long, off-road trips where vehicular transport could not pass, and carriage of people going to work. Based on the number of bicycles operating in Kisumu and Nakuru towns the results revealed that bicycle taxis provided employment to many people directly in the bicycle operations, and indirectly in the industry support services. Thus the foregoing provided answers to the first part of the research question.

The second part of the research question was: What policy measures should transport authorities in the country formulate in response to the operational information revealed? To answer this question the study investigated the policy measures that were in place to manage the operations of *'boda boda'* bicycle taxis in Kisumu and Nakuru towns. The results revealed that, apart from city centre ban in Nakuru, there were no policy measures implemented in either town to manage the operations of the bicycle taxis, despite the high number of bicycle taxis operating in both towns. Further investigation showed that Kenya lacked a national non-motorised transport policy to provide harmonized directives at local level. It was also established that in both Kisumu and Nakuru towns the local authorities had formulated some bicycle taxi operating policies which were approved by the minister in charge of local government more than one year before this study but that they were yet to be implemented. A careful analysis of those policies showed that they focused on what was required to be done by the operators but totally ignored the measures that the local authorities could formulate to support bicycle taxi operations.

In summary this study established that the *'boda boda'* bicycle taxis provide essential services in Kisumu and Nakuru towns but appear to have been ignored by the relevant transport authorities. Chapter six provides conclusions to the research process and proposes recommendations on the measures that require to be put in place to manage and support the bicycle taxi operations based on the research findings, and identifies further research needs.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents conclusions drawn from the data analysis and suggests recommendations based on the finding of the study. The research project was motivated by the need to promote *'boda boda'* bicycle taxis which appeared to provide a unique, accessible and sustainable form of intermediate transport services but seemed to have been ignored by the relevant transport authorities. The research aimed, firstly, to understand the operating characteristics of, and challenges facing, *'boda boda'* services, and secondly, to explore the measures that might be formulated by the concerned authorities to manage and support them. With regard to the latter aim, given the growth in motorcycle taxis at the expense of bicycle taxis elsewhere in the region, the research sought to make a recommendation on whether authorities should embrace or resist this trend. In order to achieve those aims the study sought to establish the following:

- *'Boda boda'* bicycle taxis operating characteristics.
- Types of transport services provided by *'boda boda'* bicycle taxis.
- Market niche served by *'boda boda'* bicycle taxis.
- Socio-economic impact of *'boda boda'* bicycle taxis.
- Regulations of and supports for *'boda boda'* bicycle taxi that were in place.

This chapter provides an overview of the line of argument based on the research questions presented in chapter 1 of this dissertation, which formed the basis on which this project was compiled. Section 6.2 presents the conclusions drawn from the literature review as well as conclusions drawn from the data analysed in the study. This is followed by section 6.3 which presents the recommendations arising from the findings of the literature review and analysis of the data collected in this study. Section 6.4 closes with suggestions for further research in related subjects.

6.2 Conclusions

6.2.1 Conclusions drawn from literature review

The review of literature from Nakuru, Kisumu, the rest of Kenya, the rest of Africa and the rest of the world shows that 'for hire' bicycle taxis provide unique demand responsive transportation services for passengers and goods in urban areas. They operate alongside the conventional transport modes by competing for passengers, or providing feeder services to higher capacity modes. The literature review also showed that Kenya lacked a national non-motorised transport policy. Some by-laws relating to *'boda boda'* bicycle taxi operations were developed by some of the local authorities where the bicycle taxis operate such as Kisumu, Nakuru, Kakamega and Busia. The literature review showed that those by-laws concentrated on the measures required to control the bicycle taxi operations and ignored measures required to promote non-motorised transportation in general and *'boda boda'*

bicycle taxis in particular. It was also apparent from the literature review that ‘for hire’ bicycles (and tricycles) provide a livelihood to many people directly and indirectly. The literature review showed that most of the towns where the bicycle (or tricycle) taxis were operating had not developed comprehensive policies to manage and support them.

6.2.2 Conclusions drawn from the research

The data was analysed in line with research question to meet the objectives of the study. This subsection presents the conclusions drawn from analysis of data obtained from the study. The research question was made up of two components. The first component of the research question was:

(a) What role do ‘*boda boda*’ bicycle taxis play in urban transport systems in Kenya?

Due to their design characteristics, ‘*boda boda*’ bicycle taxis provide low capacity transport services for the transportation of passengers and goods. In areas where there is low demand for transport services and where access by high capacity modes is restricted by density of houses, the bicycle taxis provide feeder and distribution services to high capacity modes of transport operating along major roads. They also provide feeder and distributor services to inter-city bus and railway stations. The bicycles transport packed goods from wholesale markets and shops such as bales of flour, crates of soda, bags of maize, potatoes and other farm produce weighing up to about 150kg.

Within the streets ‘*boda boda*’ bicycle taxis operate alongside the motorised modes. The study showed that the bicycle taxis provide competitive transport services in terms of cost and availability. The study also revealed that the average fares charged by the ‘*boda boda*’ bicycle taxis were generally lower than the alternative modes except the fare charged by minibus taxi for medium and long distance trips in Nakuru which was marginally lower. Motorcycle taxis which provided similar services to the bicycles charged about double the fares charged by the bicycles for equivalent trip lengths. It was found that the bicycle taxis operated in all areas within the two towns except Nakuru central business district where they were banned from operating by the local authority. On average each operator in both towns worked for about 12 hours per day. This implies that the bicycles are available to provide transport services from morning to evening. Therefore the number of hours worked and availability of many bicycle taxi stages in the streets makes them more accessible to users than most of the alternative modes which operate in the same area.

In socio-economic terms ‘*boda boda*’ bicycle taxis provide direct and indirect employment opportunities in the towns where they are operating. The study found that the ‘*boda boda*’ bicycle taxis directly employed over 16,000 people in both Nakuru and Kisumu towns. The number is much more if the people indirectly employed by the industry’s support services are considered.

Within the urban transport system, the bicycle taxis provide personalised transport services similar to those provided by metered taxis. Users with several tasks to attend to in different places

sometimes hire the bicycle taxis to transport them from one place to another and the operator waits as the user goes about with his or her business. This type of service is particularly useful to small scale traders who purchase various items from different wholesales.

'*Boda boda*' bicycle taxis also serve a particular passenger niche market. This niche takes the form of relatively inexpensive and short 'for hire' service trips largely for the purposes of accessing work activities (directly, or as a feeder and distribution service within a multi-mode trip), and off-road trips in high density unplanned settlements where higher capacity *matatu* and *tuk tuk* vehicles cannot pass. Their small road space requirements and ability to pass slow-moving or stopped motor vehicles enable them to operate efficiently and competitively in congested networks. This shows that the users in these services would be disadvantaged if the bicycle taxis ceased to function.

In Nakuru town and Kisumu city no provision was made for bicycle lanes on the roadways. The emergence and subsequent increase in the number of '*boda boda*' bicycle taxis in both towns appeared to have increased the burden on the transport infrastructure. The bicycle taxis are forced to compete for space in the roadways with vehicular traffic thus exposing both the passengers and operators to dangers associated with vehicular traffic. This effectively lowers the safety of '*boda boda*' bicycle taxi transportation services.

High entry costs, lack of credit and high taxation prevent prospective operators from joining the trade. The high cost of bicycle spare parts and labour, as well as the poor state of the roadways increases bicycle operating costs. This significantly reduces operators' nett earnings. The problem is further compounded by a lack of proper fare setting mechanisms, particularly where there was no '*boda boda*' operators association.

In both Kisumu and Nakuru towns, the '*boda boda*' bicycle industry operated without proper regulatory structures and this was one of the major problems faced by the operators. High levels of corruption not only discouraged prospective operators from joining the trade but also affected the daily earnings of the operators. The lack of comprehensive non-motorised transport policies exposed the operators to harassment by the local authorities' officials. It also allowed operators with little knowledge of traffic rules and poor training to operate the bicycle taxis. This can result in reckless riding which endangers the lives of bicycle taxi users and other road users. The absence of operating policies also prevents insurance firms from providing insurance cover for the bicycle taxi passengers and operators.

6.3 Recommendations



Figure 6.1: Two bicycle taxi operators wearing uniform (border point), Busia.



Figure 6.2: One bicycle taxi operator wearing uniform (border point), Busia.

The second component of the research question was:

(b) What are the measures required to be formulated by the relevant transport authorities in response to the revealed operations?

Section (a) presented an account of the findings of this study based on the research question and the objectives of the study. This section presents the recommendations arising from the revealed responses. In chapter two, a review of the available literature on ‘for hire’ bicycle (and tricycle) taxis was carried out. Based on the conclusions drawn from this research it was found that ‘*boda boda*’ bicycle transport services plays an important role in urban transport systems and therefore need to be promoted. In view of the research findings the following recommendations are suggested:

(i) Formulation of a National non-motorised transport policy.

The results of the literature review show that Kenya lacked a national policy relating on non-motorised transport in general and ‘*boda boda*’ bicycle taxis in particular at the time of preparation of this report. This was confirmed through exchange of emails with experts in non-motorised transportation in the country. Based on those findings this study recommends the formulation of a comprehensive national transport policy on non-motorised transport by the concerned transport authorities. An example where such policy has been formulated and implemented is in South Africa. The Department of Transport formulated a national non-motorised transport policy (DoT, 2008) which provides guidance to transport authorities at provincial and municipal levels as well as in rural areas on the modalities of implementing non-motorised transport projects. This study therefore proposes the formulation of such a national non-motorised policy for Kenya. The policy should

specifically recognize '*boda boda*' bicycle taxis as a mode of urban transport. The recognition of the bicycle taxis by the national policy could limit corruption in the industry which results in exploitation of the operators by the local authorities' officials and sometimes the police as revealed in the literature review in Uganda (Howe, 2001) and in India (Kishwar, 2006). Another problem that would be addressed by the recognition of bicycle taxis as a mode of transport in national policy would be accessibility to credit, which was identified in this study as one of the main problems faced by the operators. Previous studies (Khayesi *et al*, 2004) showed that major financial institutions consider the bicycle taxis as high risk businesses, and they rarely qualified for financial support from such institutions. However if the policy recognises them as legally recognised transport service providers this would enable major financial institutions as well as micro finance institutions to develop innovative measures to include the bicycle taxi operators in their financial support schemes as suggested in previous studies (Khayesi *et al*, 2004).

The main purpose of the national non-motorised policy would be, however, to provide harmonized guidance to the local authorities in urban and rural areas on the modalities of implementing local policies. Information obtained in this study from Kisumu city, Nakuru and Busia towns (shown in appendix C) shows that some regulatory measures were proposed and approved by the relevant authorities but were yet to be implemented. However a critical analysis of the by-laws showed that they lacked measures required to support the bicycle taxi operations and therefore appeared not to satisfactorily address the findings of this study. This shows that there is need to re-examine those documents before implementing them in order to accommodate the findings of this study. The items that would be addressed include the facilities required to be provided such as walkways and cycle lanes, whether they are required in all roads or selected roads, sizes and even surface finishes. The policy would ensure that the facilities are provided as required thus ensuring the safety of all stakeholders such as pedestrians, bicycle taxi users and operators.

(ii) Local authorities to formulate their own by-laws.

Results obtained from this study showed that over 50% of the '*boda boda*' bicycle taxi operators in Nakuru and over 90% of the bicycle taxi operators in Kisumu city wanted, among other things, the government to support their operations with operating policies. This shows that even the operators would like to formalize their operations. Based on the findings from the literature review with respect to the appropriate nature of pedicab (rickshaw) regulatory regimes elsewhere (Replogle, 1991, Hodgkinson, 2007, Kishwar, 2006), and the findings of this study, it is recommended that the local authorities prepare all-inclusive by-laws to manage and support bicycle taxi operations in their respective areas. Measures similar to those used to manage pedicabs (rickshaws) can be applied to license '*boda boda*' bicycle taxis with some modification to suit the local conditions. The regulatory measures should focus on quality of service, particularly previous records of prospective operators before they are permitted to operate. This would prevent people with criminal records from joining

the trade. The mechanical conditions of the bicycles should also be established before commencement of operations to ensure the safety of the users and should be repeated every 12 months. The operations should however be open to everybody who qualifies. The quality inspections could use, as a measure, the modalities used to inspect pedicabs in Orange County (Orange County Convention Centre, 2009).



Figure 6.3: Dedicated cycle lane (left), Kakamega town



Figure 6.4: Dedicated cycle lane (right), Kakamega town

The recent observed (but largely unquantified) increase in motorcycle *'boda boda'* operations in the case towns, at the expense of *'boda boda'* market share, is a cause for concern, and it is recommended that the local authorities adopt a clear policy position in this regard. On the basis of available evidence, it would appear that this trend should be resisted; at least with respect to the niche market *'boda boda'* taxis currently serve. Motorcycle *'boda boda'* operations may be less physically demanding and enable a greater number of daily service trips, but they introduce or worsen negative air quality and road safety externalities relative to bicycle *'boda boda'*. The increased velocity associated with motorcycle collisions increases safety risks, and the poor safety record of motorcycle taxis is well documented elsewhere (Cervero 2000, Ngim and Udosen, 2007). The impact of motorcycles on air quality is also well documented (see figure 6.5), generally found to produce more harmful emissions per kilometre than cars (McDonald *et al* 2005). The distribution of poverty alleviation benefits can also be argued to be less than that of bicycle *'boda boda'*, on the grounds that market entry costs are so much lower – the cost of the cheapest motorcycle in Kenya is more than ten times that of a bicycle. Further research is required in Kisumu and Nakuru to better understand motorcycle *'boda boda'* operations, externalities and poverty alleviation impacts relative to bicycle *'boda boda'*, to provide a sound evidence base upon which a clear policy position can be taken.

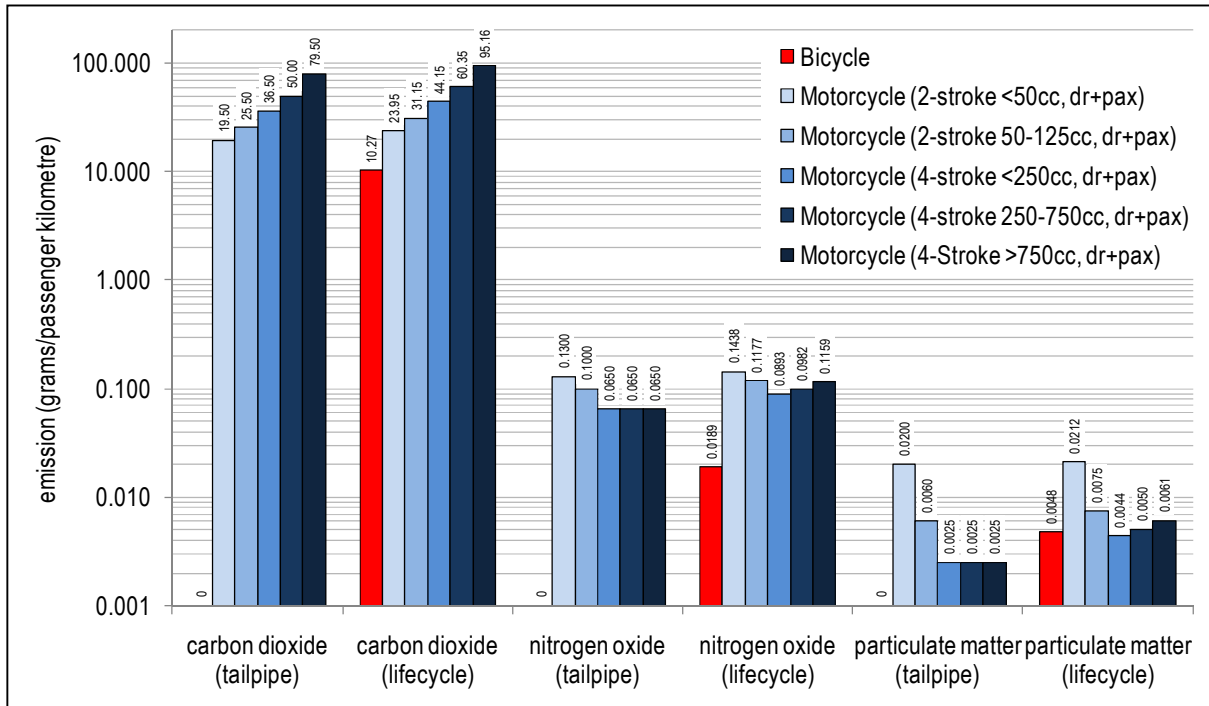


Figure 6.5: Emissions per kilometre - bicycles and motorcycles (Data source: www.travelfootprint.org).

(iii) Provision of dedicated bicycle lanes.

As stated in the conclusions, ‘*boda boda*’ bicycle taxis operate in mixed traffic conditions where they compete for road space with vehicles, thus reducing the safety of the bicycle taxi users and operators. In order to increase the safety of the bicycle taxi users and operators there is a need to separate bicycles from vehicular traffic. Review of the available literature showed that some local authorities in Columbia formulated policies to separate bicycle traffic from vehicles. A study carried out in Bogota (Gwillian, 2002) showed that the city authorities published a master plan for bicycle transportation in the city. The objective of the policy document was to separate bicycle transport from vehicular traffic by providing separate bicycle lanes complete with the ancillary infrastructure such as bicycle and related street furniture. Kakamega town, one of the urban areas with a similar number of ‘*boda boda*’ bicycles operating in its streets as the study areas, has designed and implemented dedicated bicycle lanes in one of the main roads in town. Information obtained in this study indicated that the bicycle lanes were well utilised.

In view of these findings, this study recommends that dedicated bicycle paths for use by the ‘*boda boda*’ bicycle taxis as well as the other bicycles in urban areas be provided. The lanes can be a class 2 bicycle road raised 150mm above the level of the adjacent road and a with a width of about 1.8m to allow one bicycle carrying a passenger to overtake another bicycle. The surface of the bicycle road should have a concrete or asphalt finish.

In Nakuru town each operator was required to pay to the local authority an operating fee of Kshs 360 (USD 4.50) per month but they never paid until arrested for a different offence as stated earlier. This shows that if the 6,000 bicycle taxi operators in the town paid the fees due to the local authority, the total amount would be Kshs 2.16 million (USD 27,000) per month. In Kisumu city each operator was required to pay to the local authority operating fee of Kshs 300 (USD 3.75) per month but they never paid. This shows that if the 10,000 bicycle taxi operators in the city paid the fees due to the local authority the total amount would be Kshs 3.0 million (USD 37,500) per month. If this money was paid as required it could be used to construct a portion of the bicycle lane infrastructure network every month. In time every strategic road would have bicycle lanes thus minimizing conflicts between the bicycle taxis and vehicles. Based on this information this study recommends that the local authorities commence development of bicycle lane infrastructures, and apply this as leverage in collecting hypothecated operating fees.

(iv) Insurance.

Information obtained in this study (Town Planner, Nakuru, 2009) and (Municipal Engineer, Kisumu, 2010) showed that the bicycle taxis operators and users were not insured. A previous study carried out in Uganda (Aanyu, 2007) showed that the Kampala City Council transport policies required every '*boda boda*' operator to possess a third party insurance cover for their operations. A personal interview with associates of Kantey and Templer, consulting engineers who operated pedicab services in Cape Town also revealed that the passengers were insured by a third party cover. The pedicabs were insured under all risks policies but the operators were not insured. Based on these findings this study recommends that the local authorities formulate measures to ensure that the all '*boda boda*' bicycle taxis have a third party insurance cover. Operators who can afford comprehensive insurance would also be permitted to do so. To ensure that each bicycle operator has insurance cover the bicycle taxi associations can arrange with insurance firms to provide the cover through the local authorities and the cost can then be added to the license fee payable by the operators. Alternatively, the local authorities can replicate the modalities used in Cape Town pedicab operations where the passengers can be insurance separately from bicycle by a third party cover.

(v) Membership of '*boda boda*' associations.

This study established that most of the '*boda boda*' bicycle taxi operators in Nakuru town were members of a registered association while those in Kisumu city were not. Studies carried out in Uganda (Howe, 2001, Muhumuza, 2006) showed that most of the bicycle taxi operators in the country belonged to an association. The function of the association was to represent the members in all types of dispute relating to their operations, enforcement of some matters of operational discipline and tracing of members relatives in case of accidents. In view of these findings this study recommends that all '*boda boda*' operators in Kenya belong to a registered association which would ensure they

co-operate, particularly in negotiating matters relating to their work with the local authorities, negotiating for financial support by non-governmental organisation or private sector and even the setting of fares. This study clearly revealed the benefits of the associations in running the affairs of its members geared towards improving their income and working conditions. Other functions of associations which could be beneficial to all parties in the industry include the maintenance of a register of members with all the details such as membership number, physical address, telephone number and other necessary information. Such information would help to increase safety and security for the users.

The literature review showed that one of the problems faced by the bicycle operators was a high entry cost to business (Howe, 2003). Kenya increased duties on bicycles and bicycle spare parts in 2007 (Omondi, 2007). This effectively made them unaffordable to many prospective operators. Some of those costs could be lowered by negotiating with the governments but this can only be achieved if the operators were members of a strong '*boda boda*' association which can represent them in negotiating with the government.

(vii) High capacity vehicles.



Figure 6.6: Pedicab in Cape Town



Figure 6.7: Pedicab in Cape Town

The amount of money earned by the operators per day depends on the number of trips made. That is to say the more trips they made the more money they earned. Relating this to the information obtained in this study on pedicab operations in Cape Town (Phillips, 2010) which showed that a pedicab provided transport services to at least two people per trip it can be seen the bicycle taxi operators could make more money per day if they switched to pedicabs. At the Orange County Convention Centre (Orange County Convention Centre, 2009) pedicabs also carried a minimum of two persons per trip which implies that one operator provides services to two or more people per trip.

Given that the bicycle taxi operators charge per person this translates to more income to the operators. Based on these findings this study recommends that '*boda boda*' bicycle taxi operators, supported by government, venture into higher capacity modes such as cycle pedicabs where the terrain and infrastructure allows. This would increase their earnings significantly if they made the same number of trips as they do and also increase in the comfort of passengers.

6.4 Further research

In the course of carrying out this study a significant presence of motorcycle taxis was noted in areas where the study was carried out. The motorcycle taxis which are commonly known as '*boda boda*' like the bicycle taxis operate together with the bicycle taxis from the same 'stages'. They operate alongside each other by competing for the same passengers. It was not clear whether the '*boda boda*' motorcycle taxis had established their own market share within the urban transport system or they were replacing the '*boda boda*' bicycle taxis. Due to limited resources and already set objectives it was not possible to obtain any information relating to the motorcycle taxis in this study. This study therefore proposes that further research is required to determine what role they are playing, whether they were replacing the bicycle taxis or they have established their own market niche, and their externalities and poverty alleviation impacts relative to bicycle '*boda boda*'.

It is also proposed that further research is conducted to better understand the attitudes of '*boda boda*' users, who represent an important stakeholder in the formulation of policy and regulations.

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APPENDIX A: Ethics form

EBE Faculty: Assessment of Ethics in Research Projects

Any person planning to undertake research in the Faculty of Engineering and the Built Environment at the University of Cape Town is required to complete this form before collecting or analysing data. When completed it should be submitted to the supervisor (where applicable) and from there to the Head of Department. If any of the questions below have been answered YES, and the applicant is NOT a fourth year student, the Head should forward this form for approval by the Faculty EIR committee: submit to Ms Zulpha Geyer (Zulpha.Geyer@uct.ac.za; Chem Eng Building, Ph 021 650 4791). Students must include a copy of the completed form with the thesis when it is submitted for examination.

Name of Principal Researcher/Student: Wilson K. Mutiso Department: Civil Engineering

If a Student: Degree: MSc in Engineering Supervisor: A/Prof. Roger Behrens

If a Research Contract indicate source of funding/sponsorship: Partly sponsored by Mombasa polytechnic university college and partly sponsored by University of cape town.

Research Project Title: Boda boda bicycle taxis and their role in urban transport systems: Case studies of Nakuru and Kisumu, Kenya.

Overview of ethics issues in your research project:

Question 1: Is there a possibility that your research could cause harm to a third party (i.e. a person not involved in your project)?	YES	<input type="radio"/> NO
Question 2: Is your research making use of human subjects as sources of data? If your answer is YES, please complete Addendum 2.	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Question 3: Does your research involve the participation of or provision of services to communities? If your answer is YES, please complete Addendum 3.	YES	<input type="radio"/> NO
Question 4: If your research is sponsored, is there any potential for conflicts of interest? If your answer is YES, please complete Addendum 4.	YES	<input type="radio"/> NO

If you have answered YES to any of the above questions, please append a copy of your research proposal, as well as any interview schedules or questionnaires (Addendum 1) and please complete further addenda as appropriate.

I hereby undertake to carry out my research in such a way that

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

Signed by:

	Full name and signature	Date
Principal Researcher/Student:	Wilson Kasyoki Mutiso Signature Removed	16 - 10 - 2009

This application is approved by:

Supervisor (if applicable):	A/Prof. Roger Behrens Signature Removed	16 OCT 09
HOD (or delegated nominee): Final authority for all assessments with ND to all questions and for all undergraduate research. Chair: Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above questions.	Signature Removed	19/10/09
	Signature Removed	27/10/09

ADDENDUM 1:

Please append a copy of the research proposal here, as well as any interview schedules or questionnaires:

ADDENDUM 2: To be completed if you answered YES to Question 2:

It is assumed that you have read the UCT Code for Research involving Human Subjects (available at <http://web.uct.ac.za/depts/educate/download/uctcodeforresearchinvolvinghumansubjects.pdf>) in order to be able to answer the questions in this addendum.

2.1 Does the research discriminate against participation by individuals, or differentiate between participants, on the grounds of gender, race or ethnic group, age range, religion, income, handicap, illness or any similar classification?	YES	<input checked="" type="radio"/> NO
2.2 Does the research require the participation of socially or physically vulnerable people (children, aged, disabled, etc) or legally restricted groups?	YES	<input type="radio"/> NO
2.3 Will you not be able to secure the informed consent of all participants in the research? (In the case of children, will you not be able to obtain the consent of their guardians or parents?)	<input checked="" type="radio"/> YES	<input type="radio"/> NO
2.4 Will any confidential data be collected or will identifiable records of individuals be kept?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
2.5 In reporting on this research is there any possibility that you will not be able to keep the identities of the individuals involved anonymous?	YES	<input type="radio"/> NO
2.6 Are there any foreseeable risks of physical, psychological or social harm to participants that might occur in the course of the research?	YES	<input type="radio"/> NO
2.7 Does the research include making payments or giving gifts to any participants?	YES	<input type="radio"/> NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

2.3 The purpose of the survey will clearly be explained to the respondents before asking them the questions as shown in the questionnaires.

ADDENDUM 3: To be completed if you answered YES to Question 3:

3.1 Is the community expected to make decisions for, during or based on the research?	YES	NO
3.2 At the end of the research will any economic or social process be terminated or left unsupported, or equipment or facilities used in the research be recovered from the participants or community?	YES	NO
3.3 Will any service be provided at a level below the generally accepted standards?	YES	NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

ADDENDUM 4: To be completed if you answered YES to Question 4

4.1 Is there any existing or potential conflict of interest between a research sponsor, academic supervisor, other researchers or participants?	YES	NO
4.2 Will information that reveals the identity of participants be supplied to a research sponsor, other than with the permission of the individuals?	YES	NO
4.3 Does the proposed research potentially conflict with the research of any other individual or group within the University?	YES	NO

If you have answered YES to any of these questions, please describe below how you plan to address these issues:

APPENDIX B: Survey instruments and Introduction letter:
BODA BODA OPERATOR SURVEY



ON-SITE INTERVIEW

PART A: GENERAL

Questionnaire identification number:

--	--	--	--	--

Date of interview:

D	D	M	M	Y	Y
---	---	---	---	---	---

Confidentiality

The purpose of this research is to investigate the role played by *boda boda* bicycle taxis in urban transport systems in Kenya. The survey is for academic purpose only. All data will be kept strictly confidential. All possible care will be taken to avoid the linking of specific feedback statements to individual participants. No individuals will be identified in any publication. The survey should take between 20 and 40 minutes to complete.

Do you provide your consent to participate in this study? Yes No

1. INTERVIEW INFORMATION

1.1 Province _____

1.2 Town (urban areas), or District (rural areas) _____

1.3 Neighbourhood _____

1.4 Name of stage, or route: Stage: _____ Route: _____

2 RESPONDENT INFORMATION

2.1 Gender

male female

2.2 Do you own the bicycle you are using?

yes no – jump to Q2.4

2.3 How many bicycles do you own? _____ bicycles

2.4 Do you intend to acquire more bicycles in future?

yes No

2.5 How old are you? _____ years

2.6 What is your highest education qualification?

less than grade 8 national diploma
 grade 8 university degree
 grade 12 other, specify:

2.7 How many years have you been operating a boda boda? _____ years

2.8 Do you earn money from other sources other than boda boda?

yes no – jump to Q3.1

2.9 What type of work is this? _____

3 HOUSEHOLD INFORMATION

3.1 Do you live with other people?

Yes no – jump to part B

3.2 How many people do you live with? _____ persons

3.3 How many of the people you live with are employed or earn some income? _____ persons

BODA BODA OPERATOR SURVEY



ON-SITE INTERVIEW

PART B1: OWNER OPERATOR/WITH OTHER BICYCLES

Questionnaire identification number:

--	--	--	--	--

Date of interview:

D	D	M	M	Y	Y
---	---	---	---	---	---

4. TYPICAL DAILY OPERATIONS

4.1 Do your bicycles operate on a fixed route or they are hired to take passengers to any place?

- fixed route service area-wide service

4.2 Are there significant variations in the number of trips you make in one day?

- yes no – jump to Q4.4

4.3 How many passengers do you usually serve per day on:

Monday – Thursday _____ passenger trips
 Friday _____ passenger trips
 Saturday _____ passenger trips
 Sunday _____ passenger trips

4.4 Why do you think the number of trips varies? _____

4.5 Does the number of passengers you usually serve vary significantly at different times of the month?

- yes no – jump to Q4.8

4.6 On what days of the month do you carry more passengers than normal?

- 1 to 7
 8 to 15
 16 to 23
 24 to 31

4.7 Why do you think the number of trips varies? _____

4.8 Does the number of passengers you usually serve vary significantly at different times of the year?

- yes no – jump to Q4.10

4.9 Why do you think the number of trips varies? _____

4.10 In which months do you carry more or less passengers than normal?

- | | |
|-----------------------------------|------------------------------------|
| <input type="checkbox"/> January | <input type="checkbox"/> July |
| <input type="checkbox"/> February | <input type="checkbox"/> August |
| <input type="checkbox"/> March | <input type="checkbox"/> September |
| <input type="checkbox"/> April | <input type="checkbox"/> October |
| <input type="checkbox"/> May | <input type="checkbox"/> November |
| <input type="checkbox"/> June | <input type="checkbox"/> December |

4.11 Why do think the number of trips varies? _____

4.12 How many trips do you usually make in the following categories per day?

Short distance trip not exceeding 1km _____ trips

Medium distance trip over 1km but not exceeding 3km _____ trips

Long distance trips exceeding 3 km _____ trips

4.13 How many hours do you usually work in one day? _____ hours

4.14 How much do you usually charge for the following trips?

Short distance trip not exceeding 1km _____ Kshs

Medium distance trip over 1km but not exceeding 3km _____ Kshs

Medium distance trip exceeding 3 km _____ Kshs

4.15 How many bicycles operate from this stage/route? _____

4.16 How many of these bicycles are owned by the operator? _____

4.17 Are there women/other women operating the bicycle taxis from this stage/route?

yes

no – jump to Q4.19

4.18 How many women are operating boda boda from this stage/route? _____ Women

4.19 What other transport modes do you compete with?

Buses

Matatus

Motorcycles

Walking

Other: _____

4.20 How much will the following modes charge for equivalent distances?

(i) Buses _____ Kshs

(ii) *Matatus* _____ Kshs

(iii) Motorcycles _____ Kshs

4.21 How much do you spend on maintenance of the following?

(i) Chain _____ Kshs/month

(ii) Tyres and tubes _____ Kshs/month

(iii) Breaking systems. _____ Kshs/month

(iv) Bearings _____ Kshs/month

(v) Rims and spokes _____ Kshs/month

(vi) Others _____ Kshs/month

5. MARKET NICHE.

5.1 When is your busiest time of the day?

- | | |
|--|--|
| <input type="checkbox"/> 5.00 – 6.00 | <input type="checkbox"/> 13.00 -14.00 |
| <input type="checkbox"/> 6.00 – 7.00 | <input type="checkbox"/> 14.00 – 15.00 |
| <input type="checkbox"/> 7.00 – 8.00 | <input type="checkbox"/> 15.00 – 16.00 |
| <input type="checkbox"/> 8.00 – 9.00 | <input type="checkbox"/> 6.00 – 17.00 |
| <input type="checkbox"/> 9.00 – 10.00 | <input type="checkbox"/> 17.00 – 18.00 |
| <input type="checkbox"/> 10.00 – 11.00 | <input type="checkbox"/> 18.00 – 19.00 |
| <input type="checkbox"/> 11.00 – 12.00 | <input type="checkbox"/> 19.00 – 20.00 |
| <input type="checkbox"/> 12.00 – 13.00 | <input type="checkbox"/> 20.00 – 21.00 |

5.2 How many passengers do you typically carry during the following periods?

- | | | |
|--|------------------|-------------------|
| <input type="checkbox"/> 5.00 – 7.00 | _____ Passengers | _____ Goods trips |
| <input type="checkbox"/> 7.00 – 9.00 | _____ Passengers | _____ Goods trips |
| <input type="checkbox"/> 9.00 – 11.00 | _____ Passengers | _____ Goods trips |
| <input type="checkbox"/> 11.00 – 13.00 | _____ Passengers | _____ Goods trips |
| <input type="checkbox"/> 13.00 – 15.00 | _____ Passengers | _____ Goods trips |
| <input type="checkbox"/> 15.00 – 17.00 | _____ Passengers | _____ Goods trips |
| <input type="checkbox"/> 17.00 – 19.00 | _____ Passengers | _____ Goods trips |
| <input type="checkbox"/> 19.00 – 21.00 | _____ Passengers | _____ Goods trips |

5.3 Among the passengers you carry, what proportions are:

Male _____

Female _____

5.4 In relation to age of passengers, what proportion would you give to the following?

Under 10 years _____

10 to 20 years _____

21 to 30 years _____

31 to 55 years _____

Over 55 years _____

5.5 What are the purposes of the trips your passenger make?

- Work
- Market
- Education
- Health care
- Public transport feeder/distribution services
- Other: _____

5.6 What proportion can you give to each of the following trip purposes?

- Work
- Market
- Education
- Health care
- Public transport feeder/distribution services
- Other: _____

5.7 What is the nature of goods that you typically carry?

- Loose goods
- Packaged goods
- None

5.8 What type of goods do you typically carry?

- Light goods
- Medium goods
- Heavy goods

5.9 What type of roads do you operate on? _____ roads

5.10 How many off road trips do you usually make in one day? _____ trips

6. BODA BODA BICYCLE TAXI ASSOCIATIONS AND LICENCING.

6.1 Are you a member of any *boda boda* bicycle taxi association?

- yes
- no – jump to Q6.6 8

6.2 Do you pay any fees to the association?

- yes
- no – jump to Q6.5

6.3 How much do you pay the association _____ Kshs

6.4 What is the purpose of this fee? _____

6.5 Are there operational rules set and enforced by the association?

- yes
- no – jump to Q6.8

6.6 What are the operational rules? _____

6.7 How do they enforce the rules?

- Fines
- Detaining the bicycle
- Ban operator from the stage
- Others

6.8 Do you pay fees to the local authorities for an operating licence?

- yes
- no – jump to 7.1

6.9 How much fees do you pay to the local authorities? _____ Kshs

6.10 What is the purpose of this fee? _____

7. ATTITUDES TOWARDS BODA BODA TAXIS

7.1 What is the attitude of Traffic Police towards *boda boda* taxis?

- Friendly
- Indifferent
- Hostile

7.2 What is the attitude of *matatus* towards *boda boda* taxis?

- Friendly
- Indifferent
- Hostile

7.3 What is the attitude of buses towards *boda boda* taxis

- Friendly
- Indifferent
- Hostile

7.4 What other operational problems do you commonly face?

- Picking and dropping areas
- No go areas
- Conflicts with vehicular traffic
- Others

8. POLICIES RELATING TO OPERATIONS OF BODA BODA TAXIS.

8.1 Are there policies regulating your operations?

- yes
- no – jump to Q8.4

8.2 What are the policies that regulate your operations?

- No go zones
- Picking and dropping areas
- Wearing a uniform
- Others

8.3 What are the impacts of those policies on your operations?

- Fewer customers
- More customers
- Conflicts with council officials or police
- Conflicts with other motorists
- Others

8.4 Do you think the government and private sector or NGOs should support *boda boda* operations?

- yes
- no

8.5 In which way do you think the Government should support *boda boda* operations

- Loans to purchase bicycles/motorcycles
- Designated stages
- Operating policies
- Others

8.6 In which way do you think the private sector or NGOs should support *boda boda* operations?

- Loans to purchase bicycles/motorcycles
- Organisational management
- Others

BODA BODA OPERATOR SURVEY



ON-SITE INTERVIEW

PART A: GENERAL

Questionnaire identification number:

--	--	--	--	--

Date of interview:

D	D	M	M	Y	Y
---	---	---	---	---	---

Confidentiality

The purpose of this research is to investigate the role played by *boda boda* bicycle taxis in urban transport systems in Kenya. The survey is for academic purpose only. All data will be kept strictly confidential. All possible care will be taken to avoid the linking of specific feedback statements to individual participants. No individuals will be identified in any publication. The survey should take between 20 and 40 minutes to complete.

Do you provide your consent to participate in this study:

- yes No

1. INTERVIEW INFORMATION

1.1 Province _____

1.2 Town (urban areas), or District (rural areas) _____

1.3 Neighbourhood _____

1.4 Name of stage, or route: Stage: _____ Route: _____

2 RESPONDENT INFORMATION

2.1 Gender male female

2.2 Do you own the bicycle you are using? yes no – jump to Q2.4

2.3 How many bicycles do you own? _____ bicycles

2.4 Do you intend to acquire more bicycles in future? yes No

2.5 How old are you? _____ years

2.6 What is your highest education qualification?

less than grade 8 national diploma

grade 8 university degree

grade 12 other, specify: _____

2.7 How many years have you been operating a boda boda? _____ years

2.8 Do you earn money from other sources other than boda boda? yes no – jump to Q3.1

2.9 What type of work is this? _____

3 HOUSEHOLD INFORMATION

3.1 Do you live with other people? Yes no – jump to part B

3.2 How many people do you live with? _____ persons

3.3 How many of the people you live with are employed or earn some income? _____ persons

BODA BODA OPERATOR SURVEY

Questionnaire

--	--	--	--	--



ON-SITE INTERVIEW

Date of interview:

D	D	M	M	Y	Y
---	---	---	---	---	---

PART B2: HIRING OPERATOR

4. TYPICAL DAILY OPERATIONS

4.1 Do your bicycles operate on a fixed route or they are hired to take passengers to any place?

- fixed route service area-wide service

4.2. Are there significant variations in the number of trips you make in one day?

- yes no – jump to Q4.4

4.3 How many passengers do you usually serve per day on:

Monday – Thursday _____ passenger trips

Friday _____ passenger trips

Saturday _____ passenger trips

Sunday _____ passenger trips

4.4 Why do you think the number of trips varies? _____

4.5 Does the number of passengers you usually serve vary significantly at different times of the month?

- yes no – jump to Q4.8

4.6 On what days of the month do you carry more passengers than normal?

- 1 to 7
 8 to 15
 16 to 23
 24 to 31

4.7 Why do you think the number of trips varies? _____

4.8 Does the number of passengers you usually serve vary significantly at different times of the year?

- yes no – jump to Q4.10

4.9 Why do you think the number of trips varies? _____

4.10 In which months do you carry more or less passengers than normal?

- | | |
|-----------------------------------|------------------------------------|
| <input type="checkbox"/> January | <input type="checkbox"/> July |
| <input type="checkbox"/> February | <input type="checkbox"/> August |
| <input type="checkbox"/> March | <input type="checkbox"/> September |
| <input type="checkbox"/> April | <input type="checkbox"/> October |
| <input type="checkbox"/> May | <input type="checkbox"/> November |
| <input type="checkbox"/> June | <input type="checkbox"/> December |

4.11 Why do think the number of trips varies? _____

4.12 How many trips do you usually make in the following categories per day?

Short distance trip not exceeding 1km _____ trips

Medium distance trip over 1km but not exceeding 3km _____ trips

Long distance trips exceeding 3 km _____ trips

4.13 How many hours do you usually work in one day? _____ hours

4.14 How much do you usually charge for the following trips?

Short distance trip not exceeding 1km _____ Kshs

Medium distance trip over 1km but not exceeding 3km _____ Kshs

Medium distance trip exceeding 3 km _____ Kshs

4.15 How many bicycles operate from this stage/route? _____

4.16 How many of these bicycles are owned by the operator? _____

4.17 Are there women/other women operating the bicycle taxis from this stage/route?

yes

no – jump to Q4.19

4.18 How many women are operating boda boda from this stage/route? _____ Women

4.19 What other transport modes do you compete with?

Buses

Matatus

Motorcycles

Walking

Other: _____

4.22 Do you hire the bicycle per day or per trip?

Per day

Per trip

4.23 How much do you pay for hiring the bicycle per day/trip? _____ Kshs

5. MARKET NICHE.

5.1 When is your busiest time of the day?

5.00 – 6.00

6.00 – 7.00

7.00 – 8.00

8.00 – 9.00

9.00 – 10.00

10.00 – 11.00

11.00 – 12.00

12.00 – 13.00

13.00 -14.00

14.00 – 15.00

15.00 – 16.00

16.00 – 17.00

17.00 – 18.00

18.00 – 19.00

19.00 – 20.00

20.00 – 21.00

5.2 How many passengers do you typically carry during the following periods?

- | | | | | | |
|--------------------------|---------------|-------|------------|-------|-------------|
| <input type="checkbox"/> | 5.00 – 7.00 | _____ | Passengers | _____ | Goods trips |
| <input type="checkbox"/> | 7.00 – 9.00 | _____ | Passengers | _____ | Goods trips |
| <input type="checkbox"/> | 9.00 – 11.00 | _____ | Passengers | _____ | Goods trips |
| <input type="checkbox"/> | 11.00 – 13.00 | _____ | Passengers | _____ | Goods trips |
| <input type="checkbox"/> | 13.00 – 15.00 | _____ | Passengers | _____ | Goods trips |
| <input type="checkbox"/> | 15.00 – 17.00 | _____ | Passengers | _____ | Goods trips |
| <input type="checkbox"/> | 17.00 – 19.00 | _____ | Passengers | _____ | Goods trips |
| <input type="checkbox"/> | 19.00 – 21.00 | _____ | Passengers | _____ | Goods trips |

5.3 Among the passengers you carry, what proportions are:

Male _____

Female _____

5.4 In relation to age of passengers, what proportion would you give to the following?

Under 10 years _____

10 to 20 years _____

21 to 30 years _____

31 to 55 _____

Over 55 years _____

5.5 What are the purposes of the trips your passenger make?

- Work
- Market
- Education
- Health care
- Public transport feeder/distribution services
- Other: _____

5.6 What proportion can you give to each of the following trip purposes?

- Work
- Market
- Education
- Health care
- Public transport feeder/distribution services
- Other: _____

5.7 What is the nature of goods that you typically carry?

- Loose goods
- Packaged goods
- None

5.8 What type of goods do you typically carry?

- Light goods
- Medium goods
- Heavy goods

5.9 What type of roads do you operate on? _____ roads

5.10 How many off road trips do you usually make in one day? _____ trips

6. BODA BODA BICYCLE TAXI ASSOCIATIONS AND LICENCING.

6.1 Are you a member of any *boda boda* bicycle taxi association? yes no – jump to Q6.6 8

6.2 Do you pay any fees to the association? yes no – jump to Q6.5

6.3 How much do you pay the association _____ Kshs

6.4 What is the purpose of this fee? _____

6.5 Are there operational rules set and enforced by the association? yes no – jump to Q6.8

6.6 What are the operational rules? _____

6.7 How do they enforce the rules?

- Fines
- Detaining the bicycle
- Ban operator from the stage
- Others

6.8 Do you pay fees to the local authorities for an operating licence? yes no – jump to 7.1

6.9 How much fees do you pay to the local authorities? _____ Kshs

6.10 What is the purpose of this fee? _____

7. ATTITUDES TOWARDS BODA BODA TAXIS

7.1 What is the attitude of Traffic Police towards *boda boda* taxis?

- Friendly
- Indifferent
- Hostile

7.2 What is the attitude of *matatus* towards *boda boda* taxis?

- Friendly
- Indifferent
- Hostile

7.3 What is the attitude of buses towards *boda boda* taxis

- Friendly
- Indifferent
- Hostile

7.4 What other operational problems do you commonly face?

- Picking and dropping areas
- No go areas
- Conflicts with vehicular traffic
- Others

8. POLICIES RELATING TO OPERATIONS OF BODA BODA TAXIS.

8.1 Are there policies regulating your operations?

- yes
- no – jump to Q8.4

8.2 What are the policies that regulate your operations?

- No go zones
- Picking and dropping areas
- Wearing a uniform
- Others

8.3 What are the impacts of those policies on your operations?

- Fewer customers
- More customers
- Conflicts with council officials or police
- Conflicts with other motorists
- Others

8.4 Do you think the government and private sector or NGOs should support *boda boda* operations?

- yes
- no

8.5 In which way do you think the Government should support *boda boda* operations?

- Loans to purchase bicycles/motorcycles
- Designated stages
- Operating policies
- Others

8.6 In which way do you think the private sector or NGOs should support *boda boda* operations?

- Loans to purchase bicycles/motorcycles
- Organisational management
- Others



UCHUGUZI WA WANAOFANYA KAZI YA BODA BODA.



MAOJIANO KAZINI.

SEHEMU YA A:
KAWAIDA.

Nambari ya karatasi ya maswari:

--	--	--	--	--

Taree ya maojiano:

D	D	M	M	Y	Y
---	---	---	---	---	---

Mambo ya siri na ruhusa.

Madhumuni ya uchunguzi u ni kuchunguza kipenga kinachochangiwa na baisikeli za *boda boda* katika uchukuzi wa habilia katika miji nchini Kenya. Huu uchunguzi ni wa kimasomo pekee na majina ya watakapo shiriki hayatajwa kamwe. Mahojiano yatachukua katikati ya dakika 20 na 40 kuisha. Je utakubali kuojiwa:

Ndio La

1. HABARI KUHUSU UCHUNGUZI

1.1 Mkoa _____

1.2 Mji (Mijini), au Wilaya (Mashambani) _____

1.3 Kijiji _____

1.4 Jina la kituo au Njia: Kituo: _____ Njia: _____

2 HABARI KUHUSU WANAHOJIWA.

2.1 MaumBILE mume mke

2.2 Je hii baisikeli unayotumia ni yako? Ndio La – nenda S2.4

2.3 Unamiliki baisikeli ngapi? Baisikeli _____

2.4 Ungependa kumiliki baisikeli zingine karibuni? Ndio La

2.5 Umri wako ni miaka mingapi? miaka _____

2.6 Una kiwango kipi cha juu cha elimu? Chini ya darasa la 8 cheti
 Darasa la 8 shahada
 Kindato cha mne zingine, elezea:

2.7 Umekua ukiendesha biashara ya *boda boda* kwa miaka mingapi? Miaka _____

2.8 Unapata mapato zaidi kwa kazi zingine kando ya ? Ndio La – nenda S3.1

2.9 Hii ni kazi ya aina gani? _____

3 MASWALA KUHUSU JAMII

3.1 Unaishi na watu wengine? Ndio La – nenda sehemu ya B

3.2 Unaishi na watu wangapi? Watu _____

3.3 Ni watu wangapi unaoishi nao wameajiliwa au wanamapato? Watu _____

UCHUGUZI WA WANAOFANYA KAZI YA BODA BODA.



MAOJIANO KAZINI.

SEHEMU YA B1: WANAOTUMIA BAISIKELI ZAO/ WENYE BAISIKELI ZINGIINE

Nambari ya karatasi ya maswari:

--	--	--	--	--

Taree ya maojiano:

D	D	M	M	Y	Y
---	---	---	---	---	---

4. JINSI KAZI YA BODA BODA INAVYOFANYA SIKU BAADA YA SIKU

4.1 Baisikeli yako hutumia tariki moja ama hulingana na matakwa ya abiria?

Tariki moja

Matakwa ya abiria

4.2 Kuna mabadiliko makubwa kwa nambari ya misafara unayoenda kwa siku moja?

Ndio

La –nenda S4.4

4.3 Unahudumia abiria wagapi kwa siku moja:

Jumatatu – Alhamisi: safari za abiria _____

Ijumaa: safari za abiria _____

Jumamosi: safari za abiria _____

Jumapili : safari za abiria _____

4.4 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.5 Abiria unahudumia hutofautiana sana katika nyakati tofauti za mwezi?

Ndio

La – nenda S4.8

4.6 Ni siku gani za mwezi abiria huzidi kupita kiasi?

1 hadi 7

8 hadi 15

16 hadi 23

24 hadi 31

4.7 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.8 Abiria unahudumia hutofautiana sana katika nyakati tofauti za mwaka?

Ndio

La – nenda S4.10

4.9 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.10 Ni mwezi gani abiria huzidi au hupungua kupita kiasi?

January

February

March

April

May

June

July

August

September

October

November

December

4.11 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.12 Ni misafara migapi unayofanya kwa siku?

Ubali mfupi usizidi kilomita moja; misafara _____

Ubali wastani unaozidi kilomita moja lakini hauzidi kilomita tatu: Misafara _____

Ubali wastani unaozidi kilomita tatu: Misafara _____

4.13 Unafanya kazi masaa magapi kwa siku? _____ hours

4.14 Unatoza nauli gani kwa misafara ifuatayo?

Ubali mfupi usizidi kilomita moja: Kshs _____

Ubali wastani unaozidi kilomita moja lakini hauzidi kilomita tatu: Kshs _____

Ubali wastani uliozidi kilomita tatu: Kshs _____

4.15 Ni baisikeli ngapi hudumu kutoka kituo hiki? Nn _____

4.16 Ni baisikeli ngapi humilikiwa na muhudumu? _____

4.17 Kuna wanawake? Wanawake wengine wanaohudumia tariki hii?

Ndio

La – nenda S4.19

4.18 Ni wanawake wangapi wanohudumuboda boda kwa tariki hii? Wanawake _____

4.19 Kuna aina gani za uchukuzi mnazoshindana nazo?

Busi

Matatu

Pikipiki

Kutembea

Zingine _____

4.20 Ni nauli ngani zinazolipishwa kwa safari sawa na :

(i) Busi Kshs _____

(ii) Matatu _____

(iii) Pikipiki _____

4.21 Unatumia kiwango kipi cha pesa kwa mwezi kutengeneza:

(I)Nyororo: Shilingi _____

(ii) Magurudumu: Shilingi _____

(iii) Mbureki: Shilingi _____

(iv) Marisau: Shilingi _____

(v) Limu na waya: Shilingi _____

(vi) Zingine: Shilingi _____

5. SOKO MAALUM.

5.1 Ni masaa ngani kwa siku unayokuwa na kazi zaidi?

- | | |
|--|--|
| <input type="checkbox"/> 5.00 – 6.00 | <input type="checkbox"/> 13.00 - 14.00 |
| <input type="checkbox"/> 6.00 – 7.00 | <input type="checkbox"/> 14.00 –15.00 |
| <input type="checkbox"/> 7.00 – 8.00 | <input type="checkbox"/> 15.00 – 16.00 |
| <input type="checkbox"/> 8.00 – 9.00 | <input type="checkbox"/> 16.00 –17.00 |
| <input type="checkbox"/> 9.00 – 10.00 | <input type="checkbox"/> 17.00 –18.00 |
| <input type="checkbox"/> 10.00 – 11.00 | <input type="checkbox"/> 18.00 –19.00 |
| <input type="checkbox"/> 11.00 – 12.00 | <input type="checkbox"/> 19.00 – 20.00 |
| <input type="checkbox"/> 12.00 – 13.00 | <input type="checkbox"/> 20.00 – 21.00 |

5.2 How many passengers do you typically carry during the following periods?

- | | | |
|--|--------------|--------------|
| <input type="checkbox"/> 5.00 – 7.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> 7.00 – 9.00 | Abira _____ | Mizigo _____ |
| <input type="checkbox"/> 9.00 – 11.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> 11.00 – 13.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> 13.00 – 15.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> 15.00 – 17.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> 17.00 – 19.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> 19.00 – 21.00 | Abiria _____ | Mizigo _____ |

5.3 Katika abiria unaobeba nikiwango gani huwa:

Wanaume _____

Wanawake _____

5.4 Ukizingatia mri ni kiwango gani cha abiria huwa ni:

Chini ya miaka 10 _____

Miaka 10 hadi 20 _____

Miaka 21 hadi 30 _____

Miaka 31 hadi 55 _____

Zaidi ya miaka 55 _____

5.5 Ni kwa sababu gani abiria huenda misafara yao?

- Kazi
- Soko
- Masomo
- Huduma za afya
- Kupata au kutoka kwa magari ya abiria
- Zingine: _____

5.6 Ni kiwango gani cha abiria hutumia boda boda kwa misafara ifuatayo?

- Kazi
- Soko
- Masomo
- Huduma za afya
- Kupata au kutoka kwa magari ya abiria
- Zingine: _____

5.7 Mizigo unayobeba ni ya aina gani?

- Mizigo hainjawekwa kwa mifuko
- Mizigo iliyowekwa kwa mifuko
- Sibebi mziyo yoyote

5.8 Mizigo unayobeba ni ya uzito gani?

- Uzito wa chini
- Uzito wa kadri
- Uzito mwa juu

5.9 Barabara unazotumia ni za aina gani? _____

5.10 Ni misafara gapi unayoenda kwa siku kupitia barabara za mchanga? _____

6. SHIRIKA LA WANA BODA BODA NA LESENI.

6.1 Wewe ni mwanachama wa chama chochote cha boda boda?

- Ndio La – nenda S6.8

6.2 Unalipa pesa zozote kwa chama kama mwanachama?

- Ndio La – nenda S6.5

6.3 Ni kiwango gani cha pesa unacholipa kwa chama? Kshs _____

6.4 Pesa hizo ni za kazi gani? _____

6.5 Kuna matekelezo yoyote yanayowekwa na kutekelezwa na chama?

- Ndio La – Nenda S6.8

6.6 Matekelezo hayo ni gani? _____

6.7 Matekelezo hayo hutimizwa haji?

- Kutozwa faini
- Kuzuia baisikeli kwa muda
- Kufukuza kutoka sitenji
- Fingine

6.8 Je unalipa pesa zozote kwa serikali ya mtaa kupata leseni?

- Ndio La – nenda S7.1

6.9 Unalipa kiwango gani cha pesa kwa serikali ya mtaa kupata leseni? Kshs _____

6.10 Pesa hizo ni za kazi gani? _____

7. MITAZAMO KUHUZU BODA BODA

7.1 Askari wa mambo ya magari wanamtazamo gani kwa boda boda?

- Kirafiki
- Hawana
- Kiandui

7.2 Wenye matatu wanamtazamo gani kwa boda boda?

- Kirafiki
- Hawana
- Kiandui

7.3 Wenye mabasi wanamtazamo gani kwa boda boda?

- Kirafiki
- Hawana
- Kiandui

7.4 Kuna shida gani zingine za kikazi mnazokabiliana nazo?

- Mahari pa kubebea na kushukisha abiria
- Schema zinazokatazwa kwenda
- Shida za magari barabarani
- Shida zingine

8. ZERA KUHUZU KUFANYA KAZI YA BODA BODA.

8.1 Kunazo zera zinazowazuia kufanya kazi mara kwa mara?

- Ndio
- La – nenda S8.4

8.2 Ni zera gani zinazowazuia kufanya kazi mara kwa mara?

- Mahari pa kubebea na kushukisha abiria
- Schema zinazokatazwa kwenda
- Shida za magari barabarani
- Shida zingine

8.3 Zera hizo zinawahadhiri au kuwasaidia haje kibiashara?

- Hupunguza wateja
- Huangezea wateja
- Makabiliano na askari ya munisipali au polisi
- Makabiliano na magari
- Shida zingine

8.4 Unafikiri serikali na mashirika isiyo ya serikali zinafaa kusaidia mipango ya boda boda?

- Ndio
- La

8.5 Ni kwa njia gani serikali inafaa kutoa usaidizi kwa boda boda?

- Mikopo ya kununua baisikeli au pikipiki
- Vituo maalum za boda boda
- Zera za kufanya kazi
- Vingine

8.6 Ni kwa njia gani mashirikayasiyo ya kiselikali yainafaa kutoa usaidizi kwa boda boda?

- Mikopo ya kununua baisikeli au pikipiki
- Usimamizi wa kazi
- Vingine

UCHUGUZI WA WANAOFANYA KAZI YA BODA BODA.

Nambari ya karatasi ya
maswari:

--	--	--	--	--



MAOJIANO KAZINI.

Taree ya mac

D	D
---	---

WANAOTUMIA BAISIKELI ZA
KUKONDISHA
SEHEMU YA A: KAWAIDA.

Mambo ya siri na ruhusa.

Madhumuni ya uchunguzi u ni kuchunguza kipenga kinachochangiwa na baisikeli za *boda boda* katika uchukuzi wa habilia katika miji nchini Kenya. Huu uchunguzi ni wa kimasomo pekee na majina ya watakapo shiriki hayatajwa kamwe. Mahojiano yatachukua katikati ya dakika 20 na 40 kuisha. Je utakubali kuojiwa:

Ndio La

1. HABARI KUHUSU UCHUNGZI

1.1 Mkoa _____

1.2 Mji (*Mijini*), au Wilaya (*Mashambani*) _____

1.3 Kijiji _____

1.4 Jina la kituo au Njia: Kituo: _____ Njia: _____

2 HABARI KUHUSU WANAHOJIWA.

2.1 Maumbile

mume mke

2.2 Je hii baisikeli unayotumia ni yako?

Ndio La – nenda S2.4

2.3 Unamiliki baisikeli ngapi? Baisikeli _____

2.4 Ungependa kumiliki baisikeli zingine karibuni?

Ndio La

2.5 Umri wako ni miaka mingapi? miaka _____

2.6 Una kiwango kipi cha juu cha elimu?

Chini ya darasa la 8 cheti
 Darasa la 8 shahada
 Kindato cha nne zingine, elezea:

2.7 Umekua ukiendesha biashara ya *boda boda* kwa miaka mingapi? Miaka _____

2.8 Unapata mapato zaidi kwa kazi zingine kando ya ?

Ndio La – nenda S3.1

2.9 Hii ni kazi ya aina gani? _____

3 MASWALA KUHUSU JAMII

3.1 Unaishi na watu wengine?

Ndio La – nenda sehemu ya B

3.2 Unaishi na watu wangapi? Watu _____

3.3 Ni watu wangapi unaoishi nao wameajiliwa au wanamapato? Watu _____

UCHUGUZI WA WANAOFANYA KAZI YA BODA BODA.

Nambari ya karatasi ya
maswari:

--	--	--	--	--



MAOJIANO KAZINI.

Taree ya mac

D	D
---	---

SEHEMU YA B2: WANAOTUMIA
BAISIKELI ZA KUKONDISHA

4. JINSI KAZI YA BODA BODA INAVYOFANYA SIKU BAADA YA SIKU

4.1 Baisikeli yako hutumia tariki moja ama hulingana na matakwa ya abiria?

- Tariki moja Matakwa ya abiria

4.2 Kuna mabadiliko makubwa kwa nambari ya misafara unayoenda kwa siku moja?

- Ndio La –nenda S4.4

4.3 Unahudumia abiria wagapi kwa siku moja:

Jumatatu – Alhamisi: safari za abiria _____

Ijumaa: safari za abiria _____

Jumamosi: safari za abiria _____

Jumapili : safari za abiria _____

4.4 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.5 Abiria unaohudumia hutofautiana sana katika nyakati tofauti za mwezi?

- Ndio La – nenda S4.8

4.6 Ni siku gani za mwezi abiria huzidi kupita kiasi?

- 1 hadi 7
 8 hadi 15
 16 hadi 23
 24 hadi 31

4.7 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.8 Abiria unaohudumia hutofautiana sana katika nyakati tofauti za mwaka?

- Ndio La – nenda S4.10

4.9 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.10 Ni mwezi gani abiria huzidi au hupungua kupita kiasi?

- | | |
|-----------------------------------|------------------------------------|
| <input type="checkbox"/> January | <input type="checkbox"/> July |
| <input type="checkbox"/> February | <input type="checkbox"/> August |
| <input type="checkbox"/> March | <input type="checkbox"/> September |
| <input type="checkbox"/> April | <input type="checkbox"/> October |
| <input type="checkbox"/> May | <input type="checkbox"/> November |
| <input type="checkbox"/> June | <input type="checkbox"/> December |

4.11 Unafikiri ni kwa nini nambari ya safari hutofautiana? _____

4.12 Ni misafara migapi unayofanya kwa siku?

Ubali mfupi usiozidi kilomita moja; misafara _____

Ubali wastani unaozidi kilomita moja lakini hauzidi kilomita tatu: Misafara _____

Ubali wastani uanaozidi kilomita tatu: Misafara _____

4.13 Unafanya kazi masaa magapi kwa siku? _____ hours

4.14 Unatoza nauli gani kwa misafara ifuatayo?

Ubali mfupi usizidi kilomita moja: Kshs _____

Ubali wastani unaozidi kilomita moja lakini hauzidi kilomita tatu: Kshs _____

Ubali wastani uliozidi kilomita tatu: Kshs _____

4.15 Ni baisikeli ngapi hudumu kotoka kituo hiki? Nn _____

4.16 Ni baisikeli ngapi humilikiwa na muhudumu? _____

4.17 Kuna wanawake? Wanawake wengine wanaohudumia tariki hii?

Ndio

La – nenda S4.19

4.18 Ni wanawake wangapi wanohudumuboda boda kwa tariki hii? Wanawake _____

4.19 Kuna aina gani za uchukuzi mnazoshindana nazo?

- Basi
- Matatu
- Pikipiki
- Kutembea
- Zingine

4.20 Ni nauli ngani zinazolipishwa kwa safari sawa na :

(i) Busi Kshs _____

(ii) Matatu _____

(iii) Pikipiki _____

4.22 Je unakodisha hii baisikeli kwa siku au kwa safara?

Kwa siku

Kwa safara

4.23 Unalipa pesa ngapi kwa siku au safara? Kshs _____

5. SOKO MAALUM.

5.1 Ni masaa ngani kwa siku unayokuwa na kazi zaidi?

- | | |
|--|--|
| <input type="checkbox"/> 5.00 – 6.00 | <input type="checkbox"/> 13.00 – 14.00 |
| <input type="checkbox"/> 6.00 – 7.00 | <input type="checkbox"/> 14.00 – 15.00 |
| <input type="checkbox"/> 7.00 – 8.00 | <input type="checkbox"/> 15.00 – 16.00 |
| <input type="checkbox"/> 8.00 – 9.00 | <input type="checkbox"/> 16.00 – 17.00 |
| <input type="checkbox"/> 9.00 – 10.00 | <input type="checkbox"/> 17.00 – 18.00 |
| <input type="checkbox"/> 10.00 – 11.00 | <input type="checkbox"/> 18.00 – 19.00 |
| <input type="checkbox"/> 11.00 – 12.00 | <input type="checkbox"/> 19.00 – 20.00 |
| <input type="checkbox"/> 12.00 – 13.00 | <input type="checkbox"/> 20.00 – 21.00 |

5.2 How many passengers do you typically carry during the following periods?

- | | | | |
|--------------------------|---------------|--------------|--------------|
| <input type="checkbox"/> | 5.00 – 7.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> | 7.00 – 9.00 | Abira _____ | Mizigo _____ |
| <input type="checkbox"/> | 9.00 – 11.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> | 11.00 – 13.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> | 13.00 – 15.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> | 15.00 – 17.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> | 17.00 – 19.00 | Abiria _____ | Mizigo _____ |
| <input type="checkbox"/> | 19.00 – 21.00 | Abiria _____ | Mizigo _____ |

5.3 Katika abiria unaobeba nikiwango gani huwa:

Wanaume _____

Wanawake _____

5.4 Ukizingatia mri ni kiwango gani cha abiria huwa ni:

Chini ya miaka 10 _____

Miaka 10 hadi 20 _____

Miaka 21 hadi 30 _____

Miaka 31 hadi 55 _____

Zaidi ya miaka 55 _____

5.5 Ni kwa sababu gani abiria huenda misafara yao?

- Kazi
- Soko
- Masomo
- Huduma za afya
- Kupata au kutoka kwa magari ya abiria
- Zingine: _____

5.6 Ni kiwango gani cha abiria hutumia boda boda kwa misafara ifuatayo?

- Kazi
- Soko
- Masomo
- Huduma za afya
- Kupata au kutoka kwa magari ya abiria
- Zingine: _____

5.7 Mizigo unayobeba ni ya aina gani?

- Mizigo hainjawekwa kwa mifuko
- Mizigo iliyowekwa kwa mifuko
- Sibebi mizigo yoyote

5.8 Mizigo unayobeba ni ya uzito gani?

- Uzito wa chini
 Uzito wa kadri
 Uzito wa juu

5.9 Barabara unazotumia ni za aina gani? _____

5.10 Ni misafara gapi unayoenda kwa siku kupitia barabara za mchanga? _____

6. SHIRIKA LA WANA BODA BODA NA LESENI.

6.1 Wewe ni mwanachama wa chama chochote cha *boda boda*?

- Ndio La – nenda S6.8

6.2 Unalipa pesa zozote kwa chama kama mwanachama?

- Ndio La – nenda S6.5

6.3 Ni kiwango gani cha pesa unacholipa kwa chama? Kshs _____

6.4 Pesa hizo ni za kazi gani? _____

6.5 Kuna matekelezo yoyote yanayowekwa na kutekelezwa na chama?

- Ndio La – Nenda S6.8

6.6 Matekelezo hayo ni gani? _____

6.7 Matekelezo hayo hutimizwa haji?

- Kutozwa faini
 Kuzuia baisikeli kwa muda
 Kufukuza kutoka sitenji
 Fingine

6.8 Je unalipa pesa zozote kwa serikali ya mtaa kupata leseni?

- Ndio La – nenda S7.1

6.9 Unalipa kiwango gani cha pesa kwa serikali ya mtaa kupata leseni? Kshs _____

6.10 Pesa hizo ni za kazi gani? _____

7. MITAZAMO KUHUZU BODA BODA

7.1 Askari wa mambo ya magari wanamtazamo gani kwa *boda boda*?

- Kirafiki
 Hawana
 Kiandui

7.2 Wenye *matatu* wanamtazamo gani kwa *boda boda*?

- Kirafiki
 Hawana
 Kiandui

7.3 Wenye mabasi wanamtazamo gani kwa *boda boda*?

- Kirafiki
 Hawana
 Kiandui

7.4 Kuna shida gani zingine za kikazi mnazokabiliana nazo?

- Mahari pa kubebea na kushukisha abiria
- Sehemu zinazokatazwa kwenda
- Shida za magari barabarani
- Shida zingine

8. ZERA KUHUZU KUFANYA KAZI YA BODA BODA.

8.1 Kunazo zera zinazowazuia kufanya kazi mara kwa mara?

- Ndio La – nenda S8.4

8.2 Ni zera gani zinazowazuia kufanya kazi mara kwa mara?

- Mahari pa kubebea na kushukisha abiria
- Sehemu zinazokatazwa kwenda
- Shida za magari barabarani
- Shida zingine

8.3 Zera hizo zinawahadhiri au kuwasaidia haje kibiashara?

- Hupunguza wateja
- Huangezea wateja
- Makabiliano na askari ya munisipali au polisi
- Makabiliano na magari
- Shida zingine

8.4 Unafikiri serikali na mashirika isiyo ya serikali zinafaa kusaidia mipango ya boda boda?

- Ndio La

8.5 Ni kwa njia gani serikali inafaa kutoa usaidizi kwa boda boda?

- Mikopo ya kununua baisikeli au pikipiki
- Vituo maalum za boda boda
- Zera za kufanya kazi
- Vingine

8.6 Ni kwa njia gani mashirikayasiyo ya kiselikali yainafaa kutoa usaidizi kwa boda boda?

- Mikopo ya kununua baisikeli au pikipiki
- Usimanuzi wa kazi
- Vingine

Univer

BODA BODA OPERATOR SURVEY



ON-SITE INTERVIEW

Questionnaire identification number:

--	--	--	--	--

Date of interview:

D	D	M	M	Y	Y
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POLICY MEASURES.

Confidentiality

The purpose of this research is to investigate the role played by *boda boda* bicycle taxis in urban transport systems in Kenya. The survey is for academic purpose only. All data will be kept strictly confidential. All possible care will be taken to avoid the linking of specific feedback statements to individual participants. No individuals will be identified in any publication. The survey should take between 20 and 40 minutes to complete.

Do you provide your consent to participate in this study?

yes

No

1. INTERVIEW INFORMATION

1.1 Name of officer _____

1.2 Position held _____

1.3 City/Town _____

2 POLICIES RELATNG TO OPERATION OF BODA BODA BICYCLE TAXIS

2.1 What are the policy requirements for licensing *boda boda* bicycle operators?

2.2 What are the rules used to determine the number of licences?

2.3 What infrastructure have you provided for the bicycle taxis?

2.4 What are the rules that regulate *boda boda* bicycle taxi operations?

2.5 How are the operational rules enforced?

2.6 What are the rules that relate to safety of passengers?

2.7 How do they enforce the rules relating to safety of users?

2.8 What is the official perception of the *boda boda* bicycle taxis?

3 BODA BODA REGULATIONS

3.1 What are the regulations used manage *boda boda* operations?

3.2 Do they adequately serve that purpose?

3.3 If no do you think the existing ones should be revised or new ones formulated?

3.4 Who should implement the revision or formulation?

4 PROBLEMS RELATNG TO OPERATION OF BODA BODA BICYCLE TAXIS

4.1 What are the problems created by the *boda boda* bicycle taxi operators?

4.2 What are the problems experienced by the *boda boda* bicycle taxi operators?

4.3 What are the problems experienced by other road users arising from *boda boda* taxis?

5 PREVIOUS STUDIES

5.1 Are there studies previously carried on the transportation systems in this town/city?

5.2 What were the passenger volumes?

5.3 What were the modal splits?

University of Cape



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



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Centre for Transport Studies

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16 October 2009

To Whom It May Concern

BODA BODA OPERATOR SURVEY

This letter serves to confirm that Mr Wilson Kasyoki Mutiso is a registered student at the University of Cape Town. He is undertaking dissertation research for a Master of Science in Engineering degree.

His research concerns the role of *boda boda* bicycle taxis in transportation systems in Kenya. The research aims to understand how *boda boda* bicycle taxis operate, the services they provide to the Kenyan public, and what policies might be considered to support them.

As part of this research Mr Mutiso is undertaking a survey of *boda boda* operators. Your consent to participate in this survey would be very much appreciated. The information collected will provide valuable insight into *boda boda* operations. Please note that any information provided will be treated in the strictest of confidence. Respondents will remain anonymous in the database, and the data will not be made available to third parties.

Should you require any further information, please contact me in my capacity as Mr Mutiso's research supervisor.

Signature Removed

A/Prof Roger Behrens

APPENDIX C: Regulatory measures

1. Proposed regulatory measures-Kisumu city (Then Municipal).

LAWS OF KENYA



THE LOCAL GOVERNMENT ACT CHAPTER 265

THE MUNICIPAL COUNCIL OF
KISUMU (NON-MOTORISED AND
MOTORISED CYCLES) BY-LAWS 2008

Legal Notice No:

**THE LOCAL GOVERNMENT ACT
(CAP.265)**

IN EXERCISE of powers conferred by Section 201 of the Local Government Act, the city council of Kisumu hereby makes the following By-laws;

**THE CITY COUNCIL OF KISUMU (NON-
MOTORISED AND MOTORISED COMMERCIAL
CYCLES) BY-LAWS 2008**

- 1) These By-laws may cited as Municipal Council of Kisumu (Non- motorized and Motorised Commercial Cycles) By-laws, 2008 *Citation*
- 2) In these By-laws except where the context otherwise requires: *Interpretation*

"Chairman" means a person elected as chairman by members of a group registered by the District Social Development Officer.

"Commercial Cycle" means a standard bicycle, or tricycle, or any similar machine by whichever name called and shall include boda boda and tuk tuk.

"Council" means the Municipal Council of Kisumu and has its meaning assigned in the Local Government Act Cap 265

"Designated parking places" shall mean spaces as the Council, by resolution, shall have or shall designate for parking of passenger cycles from time to time.

"Director of Social Services and Housing" shall mean the Director of Social Services and Housing for the time being and his Deputy or any other officer of the Council duly authorized by the Town Clerk in writing to act on behalf of the Director of Social Services and Housing.

"Director of Town Planning" shall mean the Director of Town Planning for the time being and his Deputy or any other officer of the Council duly authorized by the Town Clerk in

writing to act on behalf of the Director of Town Planning.

"Inspector" shall mean any officer of the council appointed and authorized by the Town Clerk in writing to monitor, oversee, control and supervise designated parking places and the manner, way, method and mode of operation and includes any authorized assistant.

"License" the documented permission, leave, let from Municipal Council of Kisumu to an operator for the purpose of these By-laws.

"Municipality" means the area of jurisdiction of the Municipal Council of Kisumu.

"Operator" means a commercial cycle operator and includes but is not limited to individuals, corporate bodies, associations and companies.

"Passengers" means a person other than the cyclist, travelling on a cycle.

"Receipt" means the official receipt of Municipal Council of Kisumu.

"Town Clerk" shall mean the Town Clerk of the Municipal Council of Kisumu for the time being, his deputy, or any other officer of the Council authorized by the Town Clerk in writing to act on his behalf.

"Town Engineer" shall mean the Town Engineer of the Municipal Council of Kisumu for the time being, his deputy, or any other officer of the Council duly authorized by the Town Clerk in writing to act on behalf of the Town Engineer.

"Treasurer" means a person elected as Treasurer by members of a group duly registered by the District Social Development Officer.

➤3) Any person wishing to commence or engage in operation of a Commercial Cycle in the municipality shall first obtain the permission of the Town Clerk in writing subject to the conditions that:

Authority to operate

a) He shall be a registered member of an active group duly registered by the District Social Services Officer and, such group shall have an operational office consisting of a Chairman, a Secretary, a Treasurer and such other

Group Membership

officer bearer(s) as shall be necessary for the operation of the group.

b) He shall first be vetted and approved, by the Town Engineer, as to his fitness and knowledge and ability to comply with the requirements of the operation before commencement of his operation.

c) He shall have specific and ascertainable identity in terms of uniform as shall be approved by the Director of Social Services and Housing, the uniform so approved visibly displaying such identification marks as shall be capable of describing the registration mark of the cycle and route(s) assigned to it by the Director of Town Planning, prior to being registered by the Director of Social Services and Housing as an operator.

Condition for registration

d) he shall be assigned and only ply, on and along the routes designated by the Council.

Designated routes and parking

e) he shall park his cycle, only at designated parking areas as shall be assigned by the Council.

Provided that this condition shall not be construed to apply without restriction as shall be specified, by the Council from time to time, on the operator to operate within the jurisdiction of the council.

4) Every operator, excepting the approved Motorised Commercial Cycle operator, shall operate between the hours of 5. 00 a.m. and 10. 00 p.m. within their respective and designated routes.

Operating hours

a) Any operator who operates before sunrise and after sunset shall wear clothing with bright reflective material as to make him easily visible to other road users.

b) A non-motorised operator who operates outside the hours specified herein above in this By-law shall be in contravention of this By-law and shall be liable, on conviction,

i) to a fine of Kenya Shillings One Thousand or to a term of imprisonment not exceeding Two Months or to both such fine and imprisonment on first conviction and,

- ii) to a fine of Kenya Shillings Two Thousand, or to imprisonment for a term not exceeding Four months or to such fine and imprisonment on subsequent convictions.
- 5) Every operator shall observe and adhere to the traffic Regulations and rules provided for in the Traffic Act (Cap. 403), the Highway Traffic Code, and such other rules and regulations as shall become applicable from time to time.
- 6) Any operator who while in the course of his business uses, utters, gestures or in any other way communicates to and or addresses a passenger using any abusive, derogatory and or offensive language shall, on conviction, be guilty of an offence.
- 7) Every operator shall at all times, service and keep his cycle in good working condition.
- 8) No operator shall be issued with a license unless his cycle is properly serviced and maintained in a good working condition and, any license so issued may be suspended, revoked or cancelled by the Council if the operator's cycle falls into a state of disrepair, is unserviceable, becomes of poor mechanical condition as to be a potential danger to the passenger, other traffic on the road, or the operator thereof.
- 9) The operator:
 - a) shall have his cycle inspected after every calendar month by the Council or persons duly authorised by the Council to act on its behalf for the purposes of these By-laws, as to the working condition and fitness thereof. *Routine inspection*
 - b) Shall, upon his cycle passing the test of inspection, be issued with a sticker to be displayed on the cycle showing the date of inspection, the period of validity and the inspecting authority.
- 10) An operator shall be in contravention of this By-law and liable, on conviction, to a fine of Kenya Shillings One Thousand Five Hundred only or to imprisonment for a term not exceeding two months or to both such fine and imprisonment if he who uses or permits to be used on a public road his cycle: *Non roadworthy cycle prohibited*

- a) knowing it to be defective or not roadworthy
 - b) which does not bear an inspection sticker
 - c) which has not been licensed
 - d) which in any way poses or is likely to pose danger to passengers or other traffic
 - e) in a state of intoxication
- 11) The Council shall levy a daily operation fee which shall be receipted, which receipt the operator shall be required to produce and show to an inspector, as and when asked so to do. *Fee and User charge*
- a) Any cycle operator who fails to pay the requisite daily operation fee levied by the Council shall be in contravention of this By-law and liable, on conviction, to a fine of Kenya Shillings One Thousand Only or to imprisonment for a term of one month or to both such fine and imprisonment.
- 12) The Inspector shall at his discretion either personally or through his duly authorized agent carry out spot inspection on any cycle at any time and place. *Spot inspection*
- 13) Any person who while operating causes any obstruction on the road or on any pavement, walkway, veranda, or any other area ordinarily used by other traffic shall be in contravention of this By-law. *Obstruction forbidden*
- a) An offender under this section shall on first conviction be liable to a fine not exceeding Kenya Shillings Three Thousand only or to imprisonment for a term not exceeding one year or to both such fine and imprisonment and,
- b) on a second or subsequent convictions, to a fine not exceeding Kenya Shillings Five Thousand only or to imprisonment for a term of two years or both such fine and imprisonment.
- 14) An inspector or persons performing the duties of an inspector under his direction shall have powers to impound and detain any cycle and arrest any operator who is in breach of any part of these By-laws. *Powers to impound or detain cycle*
- 15) Any operator who unreasonably and without justification

resists arrest, or the detention of a cycle, or in any way obstructs and inspector from the exercise of his duties shall be in contravention of this By-laws.

- a) An offender under this section is liable to a fine not exceeding Kenya shillings two thousand only or to imprisonment for a period of one year or to both such fine and imprisonment.
- b) Any person who is guilty of an offence in which the punishment is not expressly provided for in these By-laws shall be liable to a fine not exceeding Kenya Shillings five hundred only or to imprisonment for a term not exceeding nine months or to both such fine and imprisonment.

Made this ^{9th}.....day of January.....2009

By order of the Municipal Council of Kisumu

Signature Removed

TOWN CLERK
MUNICIPAL COUNCIL OF KISUMU

Approved this.....^{19th}.....day of June.....2009

Signature Removed

HON. ~~MUSALIA MUDA VADI~~

DEPUTY PRIME MINISTER
AND
MINISTER FOR LOCAL GOVERNMENT

2. Proposed regulatory measures-Nakuru town

THE MUNICIPAL COUNCIL OF NAKURU

(BICYCLE TAXI)

BY - LAWS 2008.

GAZETTE NOTICE No.....

LOCAL GOVERNMENT ACT
(CAP 265)

IN EXERCISE of the powers conferred by section 162(h) and Section 201 of The Local Government Act Cap 265 Laws of Kenya, the Municipal Council of Nakuru hereby make the following By-laws:

THE MUNICIPAL OF NAKURU (BICYCLE TAXI) BY- LAWS 2008

1. These by-laws may be cited as the Municipal Nakuru (BICYCLE TAXI) By-laws, 2008.
2. In these By-Laws unless the context other:-
 - “*Clerk*” means the Town Clerk, Deputy or his assistant.
 - “*Council*” means the Municipal Council of Nakuru;
 - “*Municipality*” means the Municipality of Nakuru;
 - “*Permit*” means a permit issued under these By -laws;
 - “*Parking place*” means a parking designated by the Council as such;
 - “*Town Engineer*” means the person holding the office of the Town Engineer or his deputy;
 - “*Medical Officer of Health*” means the person holding the offices of Health or his deputy;
 - “*Bicycle Taxi*” means a bicycle, motor-cycle, 'tuktuk', tricycle whether petrol or otherwise driven, used for hire for purpose of transportation of persons or goods.
 - “*Inspector*” means and officer of the Council authorized in writing to carry out inspections to bond, arrest or detain any person who contravenes this by-laws.
3. No person shall carry out the Bicycle Taxi without first paying to the Council in advance the charges prescribed in the second schedule to these by-laws.
4. Every person in the trade of Bicycle Taxi shall produce on demand a permit issued under this By - laws.
5. It shall be an offence under this By -laws to refuse to produce a permit on demand.
6. (a) Any person who contravenes these by-laws shall have his Bicycle Taxi detained in safe custody by a duly authorized officer;
- (b) The owner of a bicycle detained in pursuance of these By-Laws shall not be entitled to recover the same until they have paid to the Council the prescribed

pound fee as set out in the second schedule to these by-laws for each day the bicycle is in custody.

7. Any person wishing to carry out the business of Bicycle Taxi shall apply to the Town Clerk in the form shown in the first schedule of these By-laws.
8. The Town Engineer shall certify that the Bicycle Taxi is in good working condition.
9. The Medical Officer of Health shall examine the health of the person carrying on the business of Bicycle Taxi.
10. Every person carrying out the business of Bicycle Taxi shall comply with and obey all lawful instruction, directions and orders given by the inspector.
11. No person shall:
 - (a) Interfere with or obstruct an inspector acting in the performance of his duties;
 - (b) Behave in a disorderly manner;
 - (c) Except for public advertisement, solicit for hire, custom or patronage;
 - (d) For the purpose of taking up or depositing a passenger or load, stop at an area not designated;
 - (e) Smoke or drink while carrying a fare – paying passenger on such a bicycle;
 - (f) Ride a Bicycle Taxi without a permit and its official number.
12. Every person shall:-
 - (a) Have a training Certificate letter from Base Traffic Commander;
 - (b) Be clean in person and in clothing and be in official uniform;
 - (c) Conduct himself with civility and sobriety towards every person who is seeking to hire or who is being conveyed in such bicycle;
 - (d) The bicycle shall be clean and in good running condition;
 - (e) Have a crash helmet for the driver and passenger.
13. Any person suffering from an infectious or contagious disease shall not engage in the business of Bicycle Taxi.
14. Any person who contravenes the provision of these By-Laws shall be guilty of an offence.
15. Any person who is guilty of an offence under these By-Laws shall be liable to a fine of Kenya Shillings Three Thousand or to imprisonment for a term not exceeding six months or both such fine and imprisonment.
16. Offence under these By-Laws shall be cognizable to the police.
17. It shall be an offence under these By-Laws to operate from an area not designated for Bicycle Taxi operations, as prescribed under the forth schedule to these by-laws.
18. (1) The court convicting any person under these by-laws may, in addition to or lieu of imposing any other punishment authorized by law, order that the Bicycle taxi in respect of which the breach was committed, shall be forfeited.

- (2) Where the taxi is forfeited under paragraph (1), it shall be sold or otherwise dealt with as the court may direct.
19. It shall be an offence under these By-Laws for a passenger to be carried in or along an area not designated for Bicycle taxi operation.
20. A motorcycle taxi and tuktuk drivers shall have all items in the Fifth Schedule. It shall be an offence under these By-Laws not to have any item as stated in the Fifth Schedule.
21. It shall be an offence under these By-Laws for a rider or passenger on a Bicycle Taxi not having put on a crash helmet.
22. It shall be an offence under these By-Laws for an operator of Bicycle Taxi to operate without putting on a reflective and illuminating jacket.
23. It shall be an offence under these By-Laws for an operator of Bicycle Taxi to operate without fixed and working headlamps.
24. A Bicycle Taxi (motorcycle/bicycle) shall not carry more than one passenger.
25. A Bicycle Taxi shall have a spare helmet for use by the passenger.
26. It shall be an offence under these By-Laws to ride as an extra and overloaded passenger.
27. It shall be an offence under these By-Laws to operate a Bicycle Taxi which is not in good working condition.
28. It shall be an offence under these By-Laws to operate a Bicycle Taxi without Hand Gloves.

FIRST SCHEDULE

Serial No.

Application for permit to practice as a licensed Bicycle Taxi.

A. APPLICATION

I (Surname)	FOR OFFICIAL USE ONLY
(Other Names)	Serial Number of Permit and
	Badge
ID No.	Bicycle make
Postal Address	Frame no.
Hereby apply for a Bicycle Taxi Permit prepared By:	

DATE STAMP

Permit: Sh

B. I Certify that the applicant is a fit and proper person to hold a Bicycle Taxi permit.

.....
(to be signed by the Senior Enforcement
Officer or above rank)

SECOND SCHEDULE

ITEM	FEES
A. 1. Application	200
2. Permit	2,000
3. Pound fee (per day)	100

NB The Council may by resolution prescribe new fees from time to time.

THIRD SCHEDULE

BICYCLE TAXI BADGE



FOURTH SCHEDULE

Areas designated for Bicycle Taxi operations.

1. Menengai Stage
2. Aziz Stage
3. St. Xavier Stage
4. Evans Sunrise Stage
5. Western (areas beyond West Road towards MCN Soil Boundary)
6. Lenana (Ravine Road)
7. Taidy's Stage

Other areas designated shall be through Council's resolutions from time to time.

NB: No Bicycle Taxi shall operate within the CBD, between Geoffrey Kamau way Lower Factory Road and beyond Oginga Odinga Road towards the CBD.

FIFTH SCHEDULE

All applicants for Bicycle Taxi permit under these By-Laws shall:-

1. Have a thorough knowledge of routes, places and distance within the municipality, traffic act and relevant rules and By-Laws.
2. Be able to understand English or Swahili and read and write numbers in English and Swahili.
3. Be at least 18 years of age.
4. Produce testimonials of Good Conduct from the Kenya Police.
5. Produce two copies of passports size photograph as means of identification and a copy of National Identification Card.
6. Produce a current Kenyan driving license valid of motorcycle / vehicle to be used.

Made this 2nd day of October 2008.

By order Municipal Council of Nakuru.

Signature Removed

I.F. OLWERO
Town Clerk

Approved this 16th day of October 2008

Signature Removed

WYCLIFFE MUSALIA MUDAVADI

DEPUTY PRIME MINISTER
AND
MINISTER FOR LOCAL GOVERNMENT.

3. Proposed regulatory measures- Busia town

17

MUNICIPAL COUNCIL OF BUSIA

**PERMITTING OF BICYCLES AND
MOTOR BICYCLES**

BYLAWS 2009

MUNICIPAL COUNCIL OF BUSIA

THE LOCAL GOVERNMENT ACT.

(Cap 265)

IN EXERCISE of the powers conferred by the section 162 and 201 of the Local Government Act, MUNICIPAL COUNCIL OF BUSIA makes the following By-Laws:-

THE MUNICIPAL COUNCIL OF BUSIA
(PERMITTING OF BICYCLES) BY-LAWS 2009

- | | | |
|----|--|------------------------------------|
| 1. | These By-Laws may be cited as the MUNICIPAL (PERMITTING OF BICYCLES) by laws, 2009 | CITATION |
| 2. | These by-Laws unless the context otherwise requires:-

"Bicycle" means a bicycle or tricycle, which is not equipped with mechanical means of propellation and is used for hire.
"A motor bicycle means a motor bicycle or motor tricycle including Tuktuk which is equipped with mechanical means of propellation and is used for hire.
" Council" means the MUNICIPAL COUNCIL of BUSIA.
"Council Officer" means a person appointed by the council for the purpose of enforcing enforcing these By-Laws. | Interpretation |
| 3. | No person, Group of person or association, shall ride a bicycle or motorcycle on any street within the area under the Council's Jurisdiction, unless there is in force in respect thereof a valid permit issue under the provisions of these By-Laws.
Provided that a bicycle or motor bicycle permitted by any other local authority other than the council may be ridden within the area of jurisdiction of the council for so long as it is Permitted. | Unpemitted bicycles

Proviso |
| 4. | (i) Application for permitting of a bicycle of motor bicycle shall be made to the council in Prescribed form by the owner/rider thereof provided a permit. Badge required proof of ownership of the bicycle or motorcycle and may require to examine the same.

(ii)Where the council is satisfied that any bicycle in respect of which an application for permit has been made to the council is not equipped with efficient brakes or is for any other reason not roadworthy it may refuse to permit that bicycle. | Application for a permit |
| 5. | The council shall not be held liable or compelled to indemnify the owner/rider of bicycle incase of an accident, breakdown, loss of a permitted bicycle. | Liability |

Municipal Council of Busia

6. All bicycles in respect of which a permit has been issued shall be parked in designated places allocated by the Council. Permit
Bicycle
7. (i) Where a bicycle has been with a permit, the council shall issue to the owner/rider, upon payment by his of a fee prescribed in the schedule a permit and a reflective badge bearing the serial number under which the bicycle is permitted and the year during which the permit is to be valid. condition
(ii) The Council shall maintain a register in which it shall record the names and Address of the owner of every bicycle for in respect of which an application for The issue of a permit is made; the make and trade number of the bicycle and the Number of the permitted badge if any issued in respect thereof.
(iii) Permits issued under these By-laws shall expire on the 31st day of December each Year. expiry
8. A duplicate permit/badge shall be issued upon:- duplicate
(a) Proof that the original permit has been lost and
(b) Payment of a fee shown in the schedule for each duplicate or reflective chevron so issued.
9. A reflective badge issued under these By-laws shall be worn by this bicycle owner/rider in respect of which it is issued in such manner that the figures face outward and are not hidden or put as a striker on the bike.
10. (i) On and after the 21st day of January in each year any Police Officer of Council Officer may seize and detain any bicycle without a permit being ridden for hire in the area within the jurisdiction of the council. Seizure of
Un-permi
Bicycles
(ii) Any bicycle for hire seized and detained under paragraph (i) of these By-Laws Shall be brought as soon as possible before a magistrate, who may order that the same be Returned thereof or may order the same be sold and the proceeds thereof paid to the council, or to the owner or to both the council and the owner in such proportions as we may determine.
1. Any person who:- Penalty
(i) Rides for hire within the area of jurisdiction of the council a bicycle or motor bicycle In respect of which there is not in force a valid permit, badge issued under these By-Laws OR
(ii) Rides for hire within the area of jurisdiction of the council a bicycle to which there is not a affixed in the manner prescribed by these By-laws a valid reflective badge granted as aforesaid which is in force OR
(iii) Rides for hire within the area of jurisdiction of the council a bicycle when he has not Affixed thereto a reflective badge which was not issued in respect of that bicycle OR
(iv) Has in his possession or uses any counterfeit permit, badge shall be guilty of an offence and liable to a fine not exceeding two thousand shillings only or to imprisonment for a term not Exceeding two months or to both such fine and imprisonment. counterfeit
permit
- Offences under these By-Laws shall be cognizable offences. Cognizable
Offences

SCHEDULE

(By-Law 4,8,9 & 10)

1. Issue of bicycle permit and Reflective badge

2. Issue of duplicate permit and reflective badge

Made this Day of 2009

TOWN CLERK

Approved this Day of 2009

HON. MUSALIA MUDAVADI
DEPUTY PRIME MINISTER AND MINISTER FOR LOCAL GOVERNMENT