The Status of Public Transportation in unplanned suburbs of Kisumu Municipality, Kenya.

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ABSTRACT

The paper examined public transportation in three unplanned suburbs of Kisumu Municipality namely Nyamasaria, Otonglo and Mamboleo based on Mixed Method Approach. Data was collected from both secondary and primary sources. The study population was 16250 households and a sample of 400 household heads was selected. The study covered road network, means of transport and the transportation challenges in the suburbs. The findings were that their road networks are not coordinated but they continue to attract mixture of means of transport. The operation of the existing public means of transport like the matatus is controlled by the profit margins rather than passenger comfort. The study recommended development of suitable public transport model that integrates the unplanned suburbs into the overall public transport system of Kisumu Municipality.

Key words: public transport, *matatus*, unplanned suburbs.

1. INTRODUCTION

During the industrial revolution, the faster transportation modes started encouraging decentralization of many of the urban functions and land uses from the central area to the extended areas (Barke, 1986). Fisher (1984) pointed out that this led to the creation of the suburbs which were seen to be environmental friendly. According to Betrand (1981) and Lawless and Brown (1986)), the growth of suburbs led to the emergence of many land uses that started creating complexities in movement pattern in

them. Larkham (1999), Parsons and Douglas (1998) and Spiekermann and Wegener (2009), further confirmed that changes in land use encouraged shift in travel patterns but this was harnessed from beginning of twentieth century progressed and the suburbs developed in order with good transport system.

Baldassare (1986), pointed out that suburbs in developing countries have not attained this level of development. This situation has diminished the Municipal councils' ability to handle bothe their land use and public transport challenges (Nabavi, 2009; Campbell, 2007). According to Kadiri (2006), in Africa, most suburbs grow in unplanned manner complicating the transport situation in them. This has led to excessive attraction for both motorized and non-motorised transport, traffic congestion, increasing accidents and increased inaccessibility (GOK, 2006; UN-Habitat, 2005). According to Catanese and Snyder (1988) the major factor in transportation planning has always been the interplay between the travel means and urban development. Since most of the suburbs in developing countries grow in unplanned manner, the operation of an organised public transport system has been a challenge due to inadequate facilities.

In Kenya, the suburbs develop in peri-urban estates with freehold titles whose land uses and public transport are not guided by any planning principles (Wafula, 2004). They are therefore considered as the unplanned suburbs. The main objective of this study was to explore the status of public transportation in the unplanned suburbs in Kisumu Municipality. The investigation concentrated on the status of the road network, means used and transportation challenges in the three unplanned suburb namely; Nyamasaria, Mamboleo and Otonglo.

1.1 The Study area

Kisumu Municipality is the third largest town in Kenya and the principal town in the Western part of the country. It stands on the shores of Lake Victoria, the second largest fresh water lake in the world, at an altitude of 1160m above sea level. Kisumu Municipality is situated approximately $00^0$06' South of the Equator and $34^0$45' east of Greenwich. The town covers an area of approximately 417 Km², with a total population estimated to be 500,000 people(GOK, 2009). The three suburbs are located outside the old town boundary but along the major transport corridors radiating from the CBD including Kisumu-Nairobi road, Kisumu-Kakamega road and Kisumu-Busia road (Figure 1).

1.2 Methodology

The study applied the Mixed Methods Approach since it incorporated the use of qualitative and quantitative methods simultaneously. This approach was found to be relevant in developing the suitable research instruments and in data analysis where one method was used to inform another (Collins *et al*., 2006). The study involved various sampling techniques, focused group discussions and interviews of the key respondents. Multistage sampling technique was used in order to select the unplanned suburbs and households to interview in them. In stage one cluster sampling was first used to choose clusters (unplanned suburbs) then in stage two simple random sampling was used to select the households in the three unplanned suburbs. The sample frame consisted of all the projected number Households within the study areas according to the Kenya Population Census report of 2009 (GOK, 2009). The total number of the households in

the three unplanned suburbs was projected to be16250 and a sample of 400 representing 2.5% of all the households was chosen.

The following formula was used to determine the sample size:

$$n = \frac{N}{1+N(e)^2}$$ Yamane (1967)

Where n is the sample size, *N* is the population size, and *e* is the P = .05 confidence level of precision.

$$n = \frac{16250}{1+16250(0.05)^2} = 400$$

Each suburb was allocated the number of households based on the population density. The survey instruments used in the study included study area and land use maps, Focused Group Discussions (FGDs) schedules and questionnaires. Participant observation was also used throughout the study to get some information on the public transportation that could not be got from the questionnaires administered to the respondents. Interviews and focus group discussions were used to get clear understanding of the relevant issues on public transport situation as viewed by the suburb residents. The household questionnaire as quantitative research instrument was used to build on information obtained from the two qualitative techniques.

The descriptive statistics used in the data analysis included the frequency distribution, percentages and cross tabulations. In order to analyze the road network pattern in the unplanned suburbs, the tools used included; the survey plans, part development plans, Principle Index Diagrams and land use regulations. These tools provided information on the types of roads and parking in the unplanned suburbs.

2. RESULTS AND DISCUSSIONS

It was in the interest of this study to assess the status of public transportation in the unplanned suburbs. The focus was on the state of the road network and its related facilitiess, means of transport and the transportion challenges the residents experience as they move between activity zones in the unplanned suburbs.

2.1 The Status of Road network.

The study revealed that the roads in the unplanned suburbs do not conform to the set standrads in terms of design the condition. The three suburbs are traversed by three major transportation arterials (primary distributor) emanating from the central business district namely the Kisumu–Busia, Kisumu-Nairobi and Kisumu-Kakamega roads. These are the major streets that are tarmacked in the unplanned suburbs experiencing huge volumes of traffic at various times of the day. Analysis of the existing plans and maps covering the unplanned suburbs showed that these roads are joined by several collector and local streets from residential areas and other small land-uses but without any design considerations. The results showed that these roads do not follow any form of standard urban road classification. According to the Kisumu Municipal Engineer, most of these roads were provided for during the land adjudication for agricultural use and there was no anticipation of future change in land use and travel pattern. They were to purely serve pedestrian traffic with minimal motorised goods transport.

A review of the set planning standards for the urban roads in Kenya revealed that neighbourhoods like suburbs in Kisumu Municipality should have four major categories of roads ranked into; primary distributors, secondary distributors, local distributors or

feeder roads and the access roads (GOK 2005). The roads should have set reserve standards depending on the trunk services they ought to offer including the traffic flow, water and sewerage netrwork and underground cables among others. According to the Municipal engineer, this hierrarchical arrangement is not feasible in the unplanned suburbs.

The study also revealed that some of the official roads that were set a side during land adjudication in the unplanned suburbs have not been openned while others have been blocked by the developers due to poor development control. This was confirmed by one of the practicing land surveyor in Kisumu Municipality during the interviews who stated in his words that:

There is a serious problem of blocked roads particularly in Nyamasaria and Mamboleo that sometimes gives us a hard time during our routine survey work. When carrying out land subdivisions we must provide the roads accessing the new parcels but it is not surprising to find that some buildings have been constructed on it later and it has an approved building plan. You wonder whether the council staff verifies the ground before and after the approval of the plans.(Practicing Land Surveyorin Kisumu).

The expansion of the existing road network in terms of lenth and reserves is also a challenge due to lack of transport plans. A search for the transportation plans both from the Director of Town Planning of MCK and the District Physical Planning Officer of Kisumu East District showed that none of the three suburbs studied had any form of plans. Most of the new roads have been provided by the land surveyors during the land subdivision process most of which do not conform to the urban roads hierrachy. An interview with the surveyors practicing in the Municipality and information from the

Kisumu District Survey office revealed that the standard size of the road reserve they provide during land subdivisions in the unplanned suburbs is 6m to serve only the resultant plots. However, all these subdivisions are not subjected to the planning regulations. Salingaros (2006) pointed out that the transportation infrastructure of suburbs in most cases lack efficient levels of network connectivity but healthy urban fabric requires better networking, nodes, and pedestrian pathways. Considering the changing composition of means and travel in the suburbs, more pathways, lanes and pedestrian routes, as well as connecting residential alleys and streets, need to be created to improve accessibility in the suburban areas (Mulongo, 2005).

The study further revealed that even data on road network in the unplanned suburbs was lacking. Kisumu Municipal engineer confirmed that no proper study had been conducted on the road network that could yield adequate data for planning purposes. This has been on the assumption that transportation in the unplanned suburbs is not worse off that could warrant such a study. Deakin (1990) cautioned that this is an underestimation of the real transportation problem in the unplanned suburbs because if the trend is left unchecked, then the authorities will in future not keep pace with increasing transportation problems in them. Deakin (1990) further pointed out that transportation in sprawling suburbanization without proper planning may lead to several transportation problems like uncontrolled traffic volumes, mixed means and uncoordinated road network. For example, result in *Plate 1* potray the increasing poor condition of roads within the unplanned suburbs. Similarly, these roads lack traffic sieving or calming mechanisms. Hence, huge and erratic traffic joins the main arterials and roads at different points at the

same time aprticularly during peak periods. They also lack other provisions like adequate parking spaces both for the motorized and non-motorized public means of transport.

2.2 Means of Tansport in the unplanned suburbs

The study also examined the status of public transportation system within the unplanned suburbs. The household survey results in figure 2 indicated that the main public transport means serving the suburb residents to and from the CBD is the [1]*matatu* which caters for 45%. This is followed by the [2]*boda bodas* 35% , Walking 15% and others respectively while others include upcountry buses, private cars. Otonglo residents lead in the use of *matatus* with 54% followed by Mamboleo 45% and Nyamasaria 30% respectively. In terms of the use of *boda bodas*, Nyamasaria is leading with 47% followed by Otonglo 33% and Mamboleo 20% respectively. Private cars were also found to be used but mostly by the Mamboleo residents 55%.

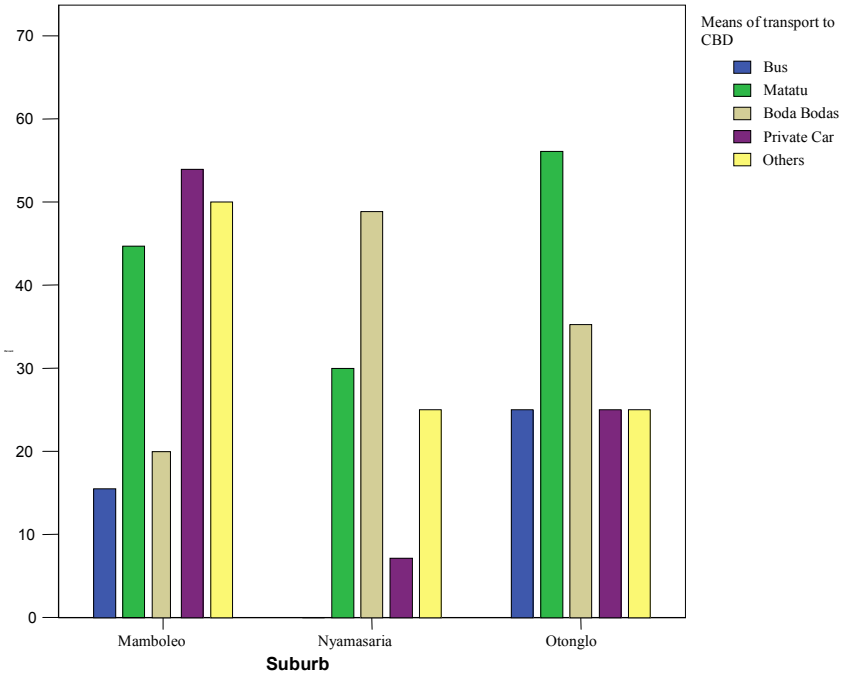

Figure 2: Means of transport used to the CBD

The modal preference from various suburbs to the CBD was found to be dictated by their reliability, fastness, ability to carry small goods, comfort and waiting period.

[1]*Matatu- This is a fourteen seater vehicle used in passenger transport*
[2]*Boda Boda-These are motorcycles and bicycles used in passenger transport*

The Director of Town Planning and the Town Clerk of Kisumu Municipality had the same view that the *matatus* which are the main public means of transportation to the CBD, still fall below the required standard of public transportation means recommended for towns like Kisumu Municipality. The two officials cited a case where the *matatus* drop and pick passengers at any point without using the normal designated stages(*Plate 2*). However, an observation on the demand for passenger drop-off points in the unplanned suburbs showed that the provided public parking points for that *matatus* is also is far below the demand. In each of the suburb studied, there were only two designated parking one on each side of the main highway. This provision is against the estimated four passenger drop-off points required on both sides of the road within each suburb. This implies that to some extent, the *matatu* operators are not to blame.

The *matatus* were also observed to rarely obey the traffic rules and in some cases cause the traffic accidents frequently. They are characterized by in-vehicle congestion, and indiscipline. The in-vehicle congestion is experienced because in some cases they are few and people rush to board them in order to meet their schedules. The key informant interviews also stated that the *matatus'* service is not well spread to serve the overall suburban populace but they only serve some parts having better roads. This leaves other areas not well served but the council cannot regulate this because these are private

business and not public buses that they have control on (Scalar, *et al.,* 2007). They, in most cases, respond to business demand and maximization of profit. This view was confirmed from the *matatu* operators interviewed as presented in table 2.1. It showed that on average, the factors determining the *matatus* operation on different routes in the unplanned suburbs in Kisumu Municipality include; routes they are registered in 51.6%, road conditions 44.6% and the set daily income targets 76%. Most of the *matatu* operators try to operate within the routes they are registered in but at times change in cases when some routes promise higher returns.

Table 21. Factors determining the *matatus* routes of operation

Suburb	**Route Operation Determinants**		
	Registered in	Road Condition	Set daily income targets
Mamboleo	50%	65%	75%
Nyamasaria	60%	35%	73%
Otonglo	45%	34%	80%
Average	51.6%	44.6%	76%

In most cases the *matatu* owners set daily income targets that the operators must attain. The operators stated that this is the main driving force that makes them operate on routes with high travel demand and good road conditions. To some extent it is one of the reasons that make them flout the traffic rules like not parking within the designated parking area when they are competing to meet their targets. The results showed that it is only in Mamboleo that the operators reported that road conditions in the subursb

determine their route of operation.

The rising demand for travel in the unplanned suburbs and the gaps left by the *matatus* has attracted the operation of *tuk tuks* and the *boda bodas* into the public transportation service (UN-HABITAT/IHE/ITDG, 2005). However, the choice of public means of transport within the suburbs was found to be dependant on their work places. Results in figure 3, below shows that over 50% of the residents work within the suburbs while approximately 30% work within the CBD. Nyamasaria is leading with 58% of its residents working within it followed by Otonlgo and Mamboleo with 53% and 48% respectively.

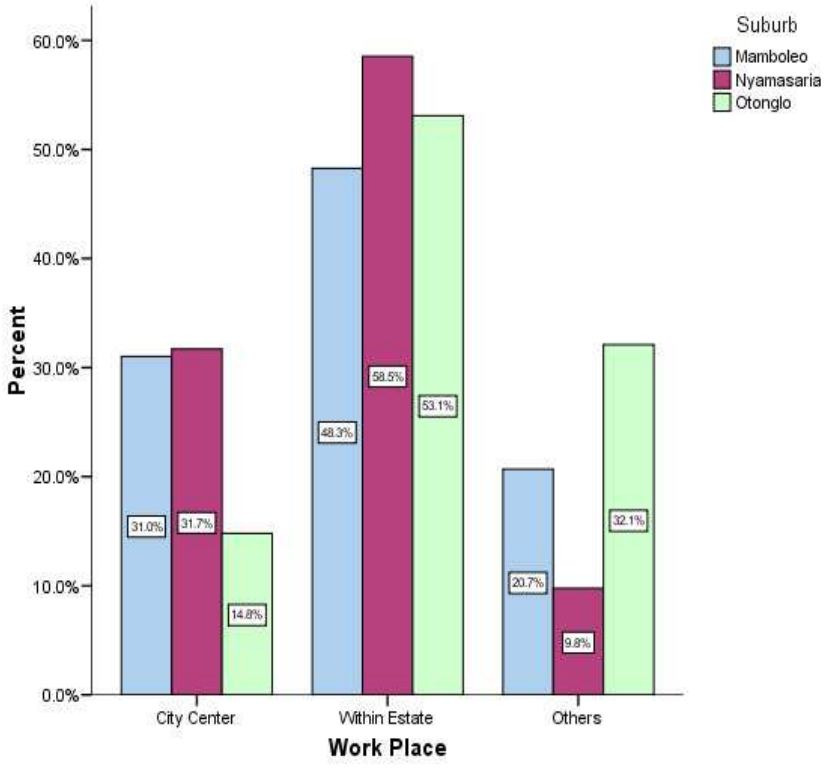

Figure 3: Residents work places

The results also showed that on average, the percentage of the residents working in other areas (21%) and that working at the CBD (25%) centre is quite minimal compared to those working within the suburbs.

Results in figure 4 showed that the prevalent means of transport to places of work are walking 46%, followed by *boda bodas* 33%, *matatus* 20% and others 11%(Plate 3). Mamboleo is leading with 56% of its residents walking to work followed by Nyamasaria 30% and Otonglo 24% respectively.

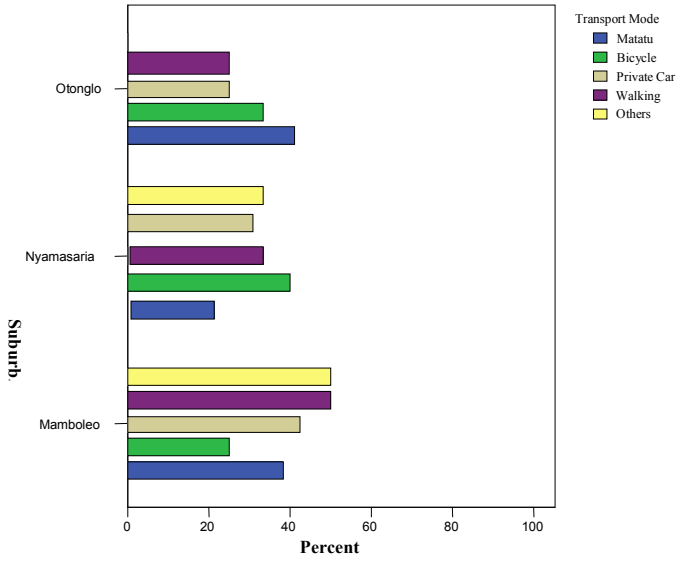

Figure 4: Prevalent Means used to work

However, Nyamasaria is leading in the use of *boda bodas* to work by 42% followed by Otonglo 32% and Mamboleo 26% respectively. The other forms of public transport apart from private cars include the *tuk tuks* and privately owned bicycles and motorcycles. These results demonstrated that the suburbs' residents movement pattern

concentrate within the suburbs mostly using of non-motorised forms of transport. Similarly, there is an emerging mixture of public means of transport which includes *matatus*, walking, boda bodas(bicycles and motorcycles), private cars and tuk tuks. This type of mixture have ignited the rise in demand for various facilities. Peeters, D., *et al.* (1998) asserted that continued and fast expansion of the suburbs attracts an increased number of trips within the locations. This creates a new suburb structure that attracts different type of modes and means suiting the residents. Key informant interview with the Town Clerk of Kisumu Municipality and the Director of Town Planning revealed that the public transportation system in the unplanned suburbs is still disorganized with continued mixture of variuos means of transport. The Town Clerk of MCK further revealed that the council is experiencing a lot of pressure from the suburb residents who wants more roads and lanes to be opened and properly maintained for use by all means of transport.

2.3 Challenges to public transportation in the unplanned suburbs

According to GOK, 2006 settlements like the unplanned suburbs that are characterized by mixed means of transportation, narrow roads, poor land management and control, inadequate provision of infrastructural facilities generally experience several public transportation problems. This is because they continue to attract new land uses that also ignites the rise in demand and opportunities for varied public transportation (World Bank, 2000).

According to the Kisumu Municipal Engineer, the incoming of these new means of transport in the suburbs have created another problem in the public transportation

system. First of all, the MCK had not developed a policy governing their operation as public transportation means and provided the necessary infrastructure that accommodates them within the Municipality. The only means whose policy was being developed is the *boda boda* bicycles that had operated as public means in the Municipality for some period. He further asserted that, public transportation policy that is being developed should only be profitable if it will have a great positive effect on the suburbs form and the way they develops. According to McEldowney *et al.* (2002), land use and transportation policies that have been adopted in developing countries are automobile-oriented and only promotes accommodation of the motorcar, including the road network and car parks and not motorised and non-motorised means like the *boda bodas*.

Previous studies have confirmed that what is happening in Kisumu Municipality is a common characteristic of state of public transportation in the towns of the developing countries which are mostly characterised by mixture of means of transport with inadequate facilities (Even *et al*. (2003). This is quite contrary to what is happening in developed countries where adequate facilities are initially provided for all the recommended public vehicles to be used according to the identified travel needs (Litman 2009). The unplanned mixture of public means including motorized and non-motorized ones together with indiscipline in the existing *matatu* means of transportation continues to complicate public transportation system in unplanned suburbs.

The suburbs are also characterised by inadequacy and poor condtion of the necessary facilities like that roads, lanes, road markings and signs. It is also important to note that apart from some of the single off-street parking along the main primary distributors connecting the suburbs and the built up areas, the suburbs do not have other

internal public parking spaces for vehicles serving them. Kuzmyak *et al*. 2003 pointed out that these problems makes it very difficult to control traffic and in most cases increases immobility and accidents.

Previous studies have shown that the operation of unplanned mixed means of transport with uncoordinated network generally leads to congestion and immobility as currently being experienced in the unplanned suburbs of Kisumu Municipality (Litman, 2009; GOK, 2005). The main aim of public transportation planning is to facilitate the improvement of best possible movement of people and services while on the other hand respecting the complementarily and compatibility of land uses. According to Jarabi (1982) and Huong (2000), transportation planning process also seek to match the accessibility with the mobility in such a way to meet the basic accessibility requirements.

3.0 Conclusion and Recommendation

The findings of the study demonstrated that public transportion in the unplanned suburbs in Kisumu Municipality is charactersed by disorganisation. The road network in them are not coordinated while they continue to attract mixture of means of transport including the both the motorised and nonmotorised ones. The operation of the existing public means of transport like the *matatus* is controlled by the profit margins rather than passenger comfort. The suburb residents movement is also concentrated within them unlike between them and the CBD. Despite these challenges and emerging movement trends in the unplanned suburbs, there are no policy guidelines to regulate the public transport system in them.

The study recommends the need to develope and adopt proactive public transport planning model with specific strategies that can guide public transportation in the suburbs. The model should enable the planning authorities to integrate the unplanned suburbs into the overall public transport system of Kisumu Municipality.

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ILLUSTRATIONS AND PHOTOGRAPHS

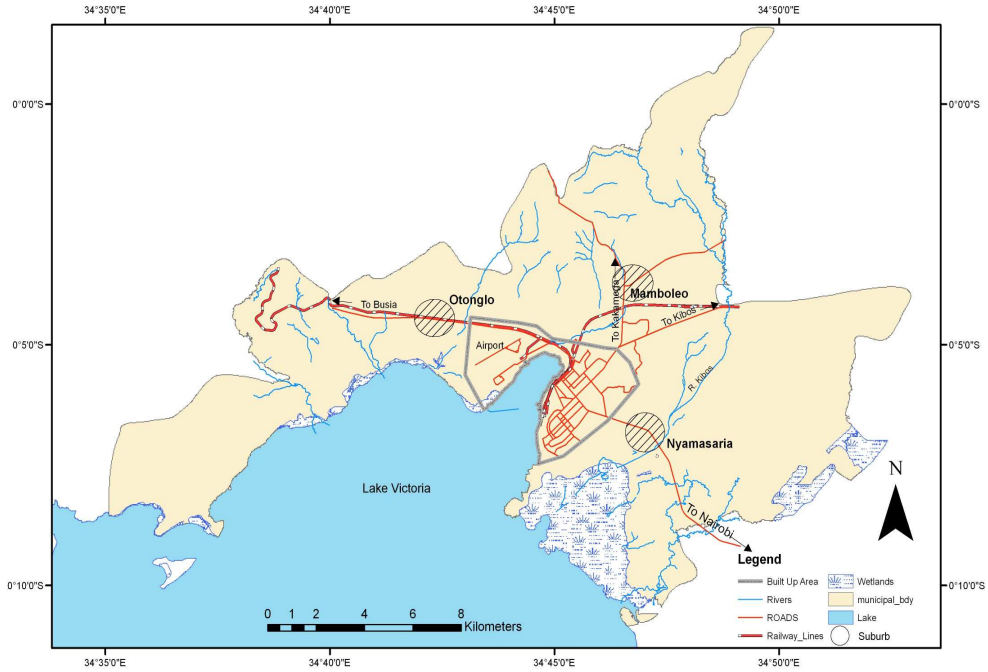

Figure 1: The Study Area

Plate 1: Road condition in Mamboleo suburb

Plate 2: Non designated parking used by matatus

Plate 3: Matatu and Boda Bodas