

An Assessment of Stage Bus Transit Operations in the Greater Kampala, Uganda

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ABSTRACT

Stage buses play an important and dominant role in transporting people in large cities across the globe. Buses carry more passengers than the private cars, reduce carbon emissions, alleviate traffic jam and foster urban productivity as well as connectivity. Bus operations in the large cities represent a key feature of the green mobility movement as well as smart city development. This paper aims to assess and explicate stage bus transit operations in the Greater Kampala in the view of the region's recent experience. Findings show that bus operation and performance in the Greater Kampala has been adversely affected by the wicked urban management problems such as inadequate funding, incessant traffic jam, urban sprawl, increased use of private cars, lack of public transport support infrastructure and facilities such as bus lanes and bus terminals, lack of enough experienced transport and logistics professionals as well as the continued dominance of para-transit systems such as minibus taxis (Mataus) and commercial motorcycle taxis (Boda Bodas). It also indicated that journeys to work (commuting) constitute a large proportion (over 61 percent) of trips made by buses in the Greater Kampala region. This implies that deliberate efforts must be made by the bus operators and the city authorities to popularise bus transport among those travelling to participate in other activities such as shopping, schooling and recreation. To improve the performance of the bus transit systems, it is recommended that the city authorities and bus operators adopt innovative strategies such as the diversification of the transit revenue sources to generate enough investable funds, promotion of public-private partnerships (PPPs), provision of transit support infrastructure, promotion of passenger information systems (PIS) to aid travel decision making among passengers, introduce policies to integrate land use with transport planning as well as the introduction of transport demand management (TDM) measures. Such strategies have also been adopted in various transit-dependent cities across the globe such as Seoul, Kuala Lumpur, Singapore, Hong Kong, Bogota, Curitiba, Bangkok and Manila.

KEY WORDS: *Stage Bus Transit Operations, Bus Operators, Perception of bus users and Greater Kampala.*

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I. INTRODUCTION

Stage buses (conventional buses) play a significant and dominant role in transporting people in large cities across the globe. Buses carry more passengers than private cars, reduce carbon emissions, alleviate traffic jam and foster urban productivity as well as connectivity (Jamilah, 1995; World Bank, 2017; Armstrong-Wright and Thiriez, 1987; Ministry of Works and Transport, 2009).

A study by the World Bank revealed that commuters and travelers in the Greater Kampala lose over 24,000 man hours each day due to traffic jam caused mainly by the increased use of private cars and continued dependence on low capacity systems such as the 14-seater minibus taxis (Matatus) and commercial motorcycles (Boda Bodas) (World Bank, 2017).

It is further noted that 15 percent of business firms in the Greater Kampala considered high transportation costs and traffic jam as a major or severe constraint to their operations (World Bank, 2017). The World Bank's study Report also states that 'traffic congestion is particularly troublesome for medium and large firms in the tradable sector, which rely on the transportation of goods around and outside of the city'.

Cities that are dependent on shared transport (public transport) such as stage buses and rail transit systems tend to be more inclusive, equitable and sustainable than those that foster the use of private transport such as private vehicles (Jamilah, 1995; Kiggundu, 2009).

Both the Third National Development Plan (2021-2025) and Vision 2040 recognizes the need for establishing an efficient public transport system in the Greater Kampala and proposes that high capacity

transport systems such as stage buses, Light Rail Transit (LRT) systems and Bus Rapid Transit (BRT) be introduced to improve mobility and alleviate traffic jam.

Besides, the National Transport Master Plan (2008-2023) emphasizes the need to reorganize and revitalize the passenger transport sector in the Greater Kampala. The Plan further proposes the phasing out minibus taxis and Boda Bodas and to promote high capacity systems such as stage buses (Ministry of Works and Transport, 2009).

Currently, there are two bus firms operating in the Greater Kampala region-----that is, Pioneer Easy Bus (PEB) and Awakula Ennume bus firm. PEB started its operations in March 2012 on the Western and Eastern zones of Kampala city. Awakula Ennume bus firm, which started its operations in 2011, signed a five year contract with the city authority to provide services on the Northern Corridor.

Bus operations in Kampala have however, been affected by a myriad of challenges including the lack of bus lanes, lack of passenger information systems (PIS), increased traffic jam, lack of support infrastructure (such as bus stops and modern bus terminals), failure to mobilize enough investable funds, competition from para-transit (informal transport) systems as well as increased use of private cars among commuters.

Between 2003 and 2019, the number of minibus taxis operating in Kampala increased from 7,000 to about 15,000. Minibus taxi sector remains highly unregulated in the region with no designated routes, no designated minibus taxi stops on most city roads, no clear fare controls and no market entry restrictions.

Boda Bodas operating in the GKMA region increased by 58.7 percent per year since 2007. By 2014, there were about 405,124 Boda Bodas from 15,979 motorcycles in 2007. While Boda Bodas dominate the roads, with a 42 percent share of vehicle movements made in GKMA, they account for only 9 percent of the passenger demand. In contrast, minibus taxis, with 21 percent of vehicle movements, transported 82 percent of the commuters in GKMA (See Table 1 below).

Table 1: Modal Shares (modal split) in Kampala

Types of Vehicles	% Trips	% of Passengers Transported (Commuters and Travelers)
Commercial Motorcycles (Boda-Bodas)	42	9
Private cars	37	9
Minibus Taxis (Matatus)	21	82

Source: World Bank (2017)

Changing land use patterns, existence of low density settlements and emergence of scattered employment centres in the GKMA region is a key cause of the increased use of commercial motorcycles (Boda Bodas) and minibus taxis (World Bank, 2017).

Over 50 percent of the road accidents recorded in Kampala conurbation are due to the use of Boda Bodas. Because of this, road accident-related costs have increased significantly. In 2007, the estimated costs for the road accidents were Shs558billion, corresponding to 2.7 percent of the country's Gross Domestic Product (GDP) (Ministry of Works and Transport, 2010).

Continued urban expansion and transformation within the GKMA has dispersed business firms and employment further from the urban core, reduced economic density and created a city with fragmented travel markets that are extremely difficult to serve by fixed route transport systems such as stage buses and railway transit (World Bank, 2017).

Due to poor planning as well as deficiencies in performance of transportation systems, the concentration of business firms including industries in the Kampala Central Business District (CBD) declined from 65 percent in 2002 to 55 percent in 2011 (World Bank, 2017; National Planning Authority, 2018).

This paper aims to assess and explain the operations of stage buses in the Greater Kampala in view of the region's recent experience. The paper is divided into five main sections which include background, literature review, study findings, recommendations and conclusion

1.1 Greater Kampala Metropolitan Region

In 2013, Cabinet approved a new Development Framework 2040 for Greater Kampala. Under the same framework Greater Kampala also known as the Greater Kampala Metropolitan Area (GKMA, Fig 1 below) is defined as a region covering Kampala city as stated under the Kampala Capital City Authority (KCCA) Act 2010 and portions of key districts such as Mpigi, Wakiso and Mukono. GKMA was also gazetted by the Government as a special planning area (National Planning Authority, 2018; World Bank, 2017).

GKMA is the most productive and most urbanized region in Uganda. GKMA hosts over 10 percent of the country's population. Greater Kampala also contributes over 40 percent of the Gross Domestic Product (GDP). GKMA region generates 46 percent of all formal employment in the country and hosts 70 percent of the country's manufacturing plants (World Bank, 2017).

According to the Greater Kampala Economic Development Strategy 2017-2025, 2.5million people travel each day within Greater Kampala and over 50 percent of them live in Wakiso area. It is projected that by 2040, Kampala will be a Mega city with more 10 million people (World Bank, 2017).

Meeting the future mobility needs of the people living in the GKMA region would require transport systems that are accessible, affordable, efficient and able to carry many people as opposed to systems that are inefficient and carry a few people such as private cars, minibus taxis (Matatus) and Boda Bodas. Also, low capacity transport systems such as Boda Bодas and minibus taxis incurs more costs for each passenger kilometer covered than the high capacity systems such as the stage buses (Armstrog-Wright and Thiriez, 1987).



Fig 1: Map of Greater Kampala Region (Source: Kampala Capital City Hall)

Motorized vehicle fleet in the country increased by 83 percent from 739,036 in 2012 to 1,355,090 vehicles in 2018, of which more than 50 percent are estimated to be in the Greater Kampala. Boda Bодas increased by 192 percent from 354,000 in 2010 to 1,034,000 in 2018.

Motor vehicle ownership and use among the high and middle income people in the city is also on the rise in the Greater Kampala. Besides, most of the roads in the region were constructed in the 1960s for 100, 000 vehicles. Today, over 400,000 vehicles use the same roads each day (World Bank, 2017).

Due to poor planning as well as the lack of support infrastructure such as bus lanes, bus depots (garages) and bus stops, buses in Kampala operate like the informal transport systems with no clear timetables, no designated routes and infrequent services. Bus firms also lack the capacity to provide services in all parts of the city. Besides, there are no comprehensive statistics on bus service, let alone the number of riders.

Deficiencies in performance of the bus transit systems in the GKMA therefore provides several opportunities for investigation and generation of critical information that can be used for improved policy formulation, improved decision making as well as in making relevant interventions to enhance the performance of bus transit systems in the region.

1.2 Objectives of the study

The overall aim of this study is to assess the operation and performance of stage bus transit systems in the Greater Kampala in view of the region's recent experience. Specifically, the study aims to achieve the following objectives:

- a) To investigate people's perceptions of the stage bus transit system in Greater Kampala;
- b) To assess the operations of stage buses in the Greater Kampala;
- c) To identify best practices across the globe in planning and management of stage buses;
- d) To propose strategies for improving the operation and performance of the stage bus systems in the Greater Kampala

II. LITERATURE REVIEW

Jamilah (1995) argues that the degree to which buses are used by commuters and travelers in large cities like Kampala depends on several factors including demographic trends, land use patterns, urban economic trends, and operational characteristics of the bus service as well as competing transport modes.

Studies such as the World Bank (2001), Armstrong-Wright and Thiriez (1987) as well as Kiggundu (2009) also found that the success of public transport systems including stage buses depends on factors such as: ability to recover costs, urban economic viability, urban form/structure, efficiency of transit systems, diversification of revenue sources as well as the adoption of public private partnerships (PPPs).

Urban economic viability is critical because it contributes to job creation as well as the need for commuting. Commuting or journey to work is important because it constitutes a major travel market segment for transit systems including stage buses operating in many large cities across the globe (Kiggundu, 2009; Jamilah, 1995).

Achieving financial viability and success among stage bus operators also require a fare structure that covers all the costs incurred in providing services. Similarly, transit efficiency requires that bus services are provided at the least cost possible (Kiggundu, 2009; Jamilah, 1995; Armstrong-Wright and Thiriez, 1987).

Continued dependence on fare revenue is also a risky strategy especially in cities where the middle class is rapidly expanding and the use and ownership of private cars is fast becoming a visible feature of the urban life. Bus fares should be regularly adjusted to march with the rising operating costs (Armstrong-Wright and Thiriez, 1987; Jamilah, 1995).

Armstrong-Wright and Thiriez (1987) assert that 'on routes of low demand buses need to be small if they are to be both well utilized and frequent. Buses that are too large for the route have two alternatives, that is, to operate partly empty, maintaining frequency, or to operate less frequently with a load that ensures financial viability; the latter, of course, results in excessive waiting by passengers'.

Studies such as Jamilah, (1995) as well as Jamilah and Kiggundu (2007) also found that in large cities with narrow streets as well as fragmented travel markets, small transit vehicles such as minibus taxis/matatus (paratransit systems) were often more effective in transporting people than the big buses. Also paratransit systems tend to penetrate deeper in poorly planned cities and can provide feeder services where possible (Armstrong-Wright and Thiriez, 1987).

To be attractive to commuters as well as meet their stated financial goals, public transit systems must follow regular schedules, provide accessible services, ensure safety of passengers, offer frequent services, provide high quality services as well as establish affordable fare structures (Jamilah, 1995; Real Jr, 2010; Armstrong-Wright and Thiriez, 1987; World Bank, 2001).

Public transit expansion and development in large cities should also be implemented as part of the entire urban investment policy and not as a separate intervention (Kiggundu, 2009; World Bank 2001). This is important because transport is a derived demand, derived from the people's need and desire to travel and participate in various human activities such as recreation, shopping, office work and industrial production (Jamilah, 1995; World Bank, 2001).

Adopting a holistic approach towards modernization and expansion of mass transportation in large cities is crucial because the performance of urban transit is usually influenced by factors such as the urban form, population density as well as land use patterns. Bus transit tends to flourish and perform better in high density and compact cities than in low density cities (Kiggundu, 2009).

Cities with high population densities such as Hong Kong with 301 persons per hectare, Tokyo with 71 persons per hectare and Singapore with 87 persons per hectare have been able to establish efficient and profitable transit systems and to reduce traffic jam (Barter, 2000; Kiggundu, 2009).

Direct state intervention especially through subsidies is often viewed as necessary in addressing social inequality and ensuring that the mobility needs of the urban poor are addressed.

However, while state subsidies are a popular funding strategy among policy makers and municipal managers in many cities across the globe, they may not be the best strategy for addressing the seemingly intractable and wicked urban mass transit funding challenges (Jamilah, 1995; Kiggundu, 2009).

A key weakness of subsidies (state funding) is that not many developing country cities have all the required resources to invest in expensive mass transit projects including stage buses (World Bank, 2001). Subsidies are also known to be addictive. Armstrong-Wright and Thiriez (1987) observes that 'subsidies usually lead to inefficiency, greater deficits and yet more subsidies'.

Subsidies tend to discourage transit operators from striving for success and efficiency as well as in reducing operating costs. Subsidies also remove the fear among transit operators to become bankrupt. The fear to become bankrupt is critical and serves as an incentive for the transit operators to strive for efficiency and profitability.

Besides, there is a widely shared belief among neoliberal economic proponents and experts that capitalism without bankruptcy is like Christianity without hell. That is, without bankruptcy, market capitalism ceases to exist, and without hell, there is virtually no incentive for people to be committed Christians.

Instead of introducing poorly designed subsidies, city governments should focus their efforts at establishing a conducive environment that is required for the operation of urban public transit. This can be achieved by providing shared infrastructure (such as bus stops and transit interchanges), improving road infrastructure, improving traffic flow management, introducing bus lanes where possible, fostering macroeconomic stability, improving the regulation of the transport sector and introducing a pro-public transport policy (Armstrong-Wright and Thiriez, 1987; Kiggundu, 2009; World Bank, 2001).

Transit integration is also important and can be achieved through institutional integration, operational integration, physical integration, information integration, fare integration, ticket integration and integrated public transport systems (Real Jr., 2010; Isa et al. 2013). Under transit integration each transport mode performs a complementary role rather than competing with each other. In both Singapore and Kuala Lumpur for example, buses provide feeder services to rail transit systems and this has enabled passengers to make convenient and frequent transfers at various train stations and transit interchanges (Isa et al., 2013).

Most important of all, an integrated ticketing system allows passengers and travelers to complete their journeys without any additional charge for transferring from one mode to another. Through transit integration comprehensive passenger information system (PIS) is established to provide passengers and travelers with important information on transit routes, departure times, arrival times and transit fares (Isa et al., 2013; Real Junior, 2010). This enables commuters and travelers make rational and sensible travel decisions as well as plan their journeys well.

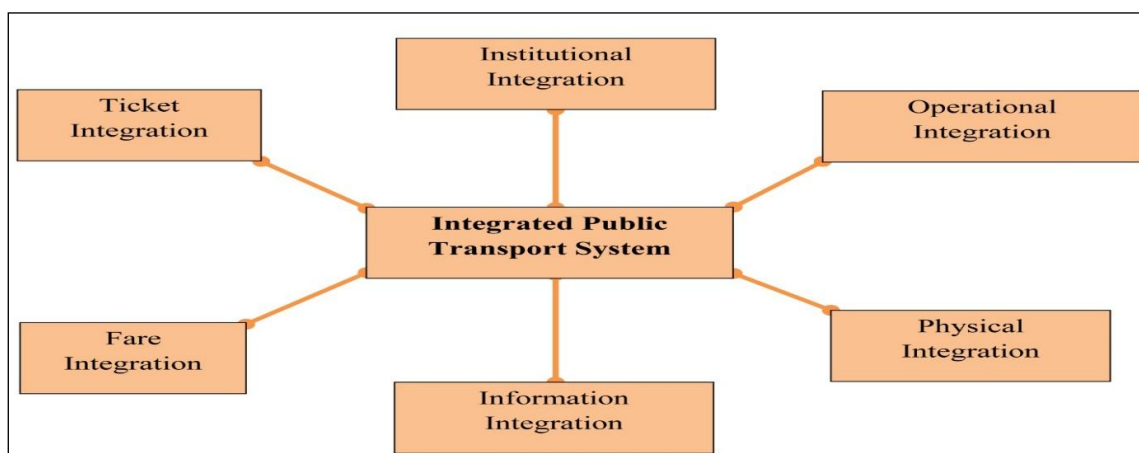


Fig 2: Transit Integration Source: Real Jr, (2010)

From the reviewed existing literature, it is clear that bus transit operation and performance in large cities like Kampala is influenced by several factors. Due the poor performance of bus transit systems in the Greater Kampala, it is critical that investigations are carried out on their operations and remedial measures proposed based on the local conditions and international experience.

III. METHODOLOGY

This paper is a result of study that was carried out to assess the operations and performance of stage bus transit systems in the Greater Kampala, Uganda. The study adopted a cross-sectional research design, employing both quantitative and qualitative data collection methods. The data and information gathered from the greater Kampala area targeted transport users (passengers) of Pioneer Easy Bus and Awakula Ennume Bus Companies who responded to the different questions as stated in the questionnaire. Face to face interviews and focus group discussions were also used as data collection methods targeting mainly key informants such as city planners, mayors, city engineers and urbanisation researchers based in the region. A range of documents including transport assessment reports from the Ministry of Works and Transport, policy documents and data records from Kampala Capital City Authority (KCCA), Wakiso, Mpigi, and Mukono districts were also reviewed.

Face to face interviews also targeted respondents from the Pioneer Easy Bus (PEB) and Awakula Ennume (AE) Bus Company Staff (Managers and Drivers), Ministry of Works and Transport, Face Technologies, Transport Licensing Board, Uganda Drivers Standards Agency, Uganda Traffic Police and the Parliamentary Committee on Physical Infrastructure. The sampling procedures that were used for this assessment included purposive sampling for the key informants and convenience sampling for the questionnaire targeting bus users (passengers).

The questionnaire used was pretested. The results of the pilot questionnaire testing were used to improve the questionnaire as a data collection tool during the assessment. For face to face interviews, an interview schedule was used as a data collection tool from the key informants' respondents.

IV. FINDINGS OF THE STUDY

Under this section, the data gathered is presented and explained. The section presents the socio-demographic characteristics of the respondents, perceptions and views of bus users/passengers, operation of buses, level of satisfaction, regulation of bus transit systems and challenges faced by stage bus operators in the Greater Kampala.

4.1 Socio-demographic characteristics of the respondents

This section evaluates the respondents' gender, household size, education, sex, occupation, nationalities, marital status, age and incomes as shown in proceeding sections.

Gender: A total of 425 respondents participated in this study through questionnaire survey. The results in Fig.3 show that, males represented the majority (53%) of the total number of respondents. This is partly due to their roles in the city in responding to daily needs of the family and making journeys to work (commuting).

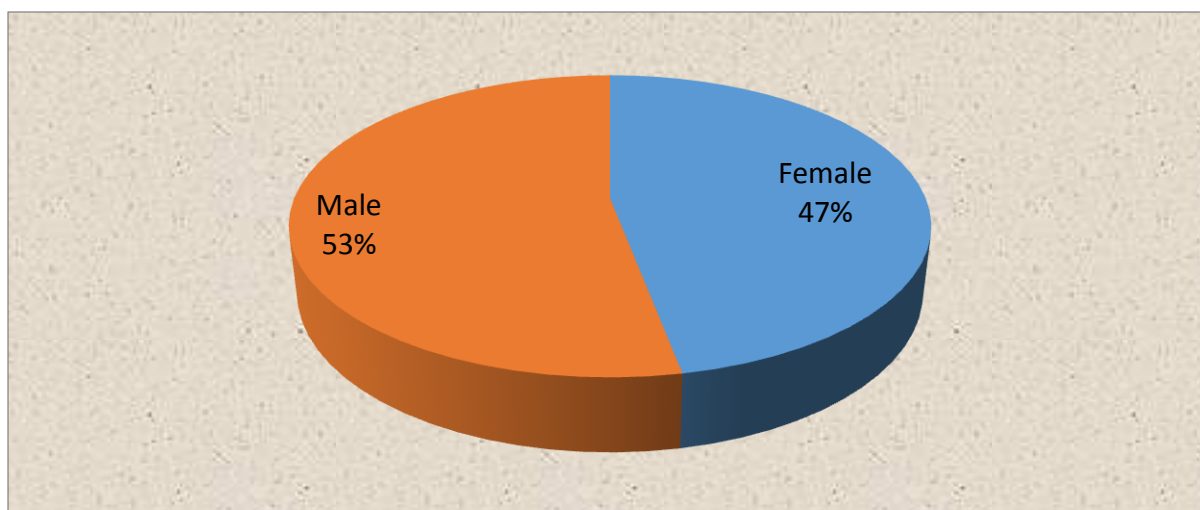


Fig 3: Gender of Respondents

Education Attainment: 28.9% of respondents had University education with degrees and 24.2% Secondary (O level). Only 6.1% did not have any qualification as shown in Fig 4 below.

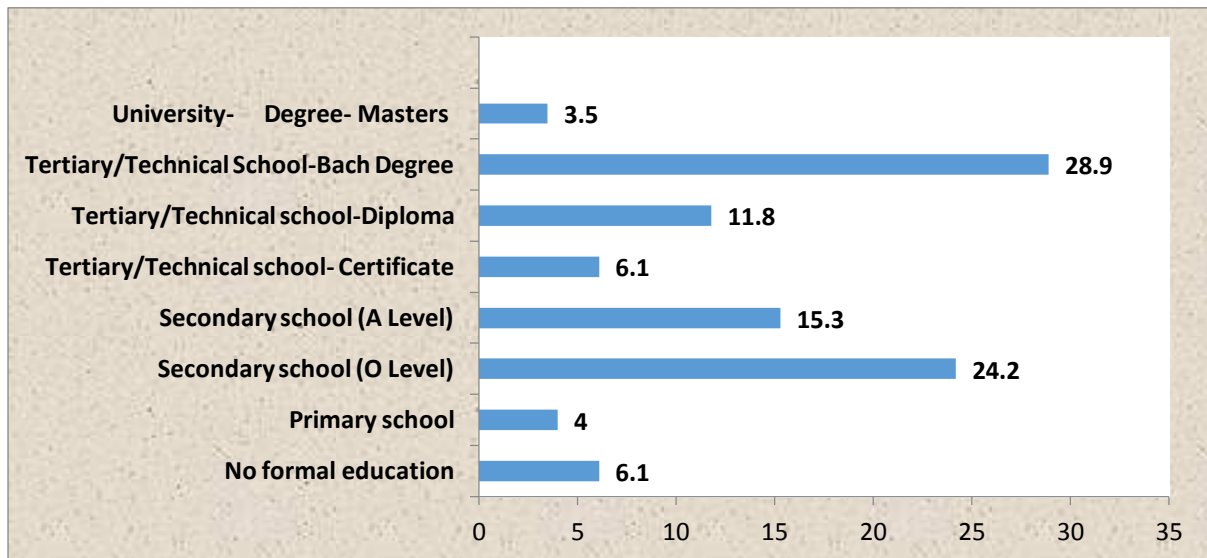


Fig 4: Education Attainment of Respondents

Table 2 shows that most respondents were self-employed business people (40.7%) followed by salaried workers such as civil servants (26.4%) and casual wageworkers (10.8%). Others included students (12.2%), house wives going for shopping or errands 4.9% and peasant farmers (1.6%) among others.

Table 2: Occupation of Respondents

Occupation	Count (n=425)	Percent
Regular Salary/ employee	112	26.4
Casual wage worker	46	10.8
Self-employed (business)	173	40.7
Unpaid family worker	1	0.2
Housewife	21	4.9
Peasant/ farmer	7	1.6
Student	52	12.2
Artisan	6	1.4
Pensioner/Retired person	4	0.9
Other (Specify)	3	0.7
Total	425	100

Source: Primary Data (March, 2020)

Age Group: The majority of respondents (70%) as shown in Fig 5 were of age group 18-35 years old. This reflects a youthful population of bus users in the greater Kampala. Generally most of those who travel by stage buses are the youth, this is because opportunities to access adequate livelihood is a critical issue faced by the youths in Uganda and considers getting employment as vital. It also reflects the current demographic trends in Uganda where over 70% of the people are below the age of 35 years.

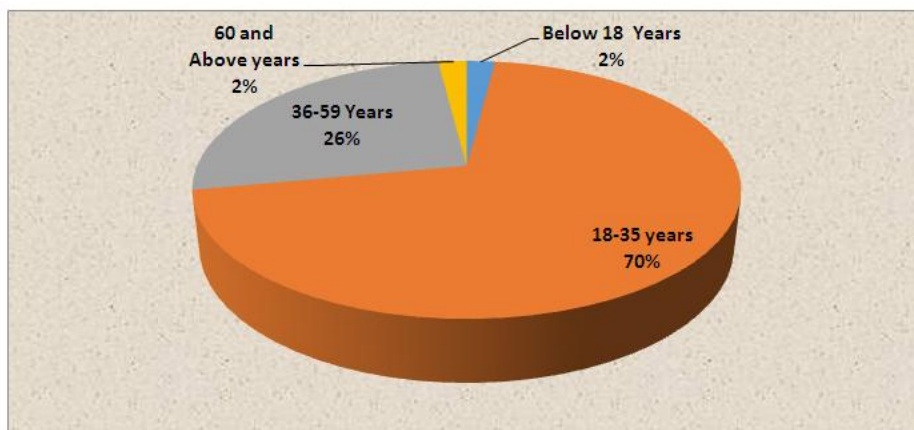


Fig 5: Age Bracket of Respondents

Marital Status: In terms of marital status, more than half (56%) of the respondents were married followed by 40% who were single as shown in table 3 below.

Some of the factors that make both the married and unmarried travel by bus include the need to provide basic needs like food, education, medication and housing/rents.

Table 3: Marital Status

Marital status	Count (n=425)	Percent
Married	238	56.0
Single	170	40.0
Separated	8	1.9
Widowed	8	1.9
Divorced	1	0.2
Total	425	100

Source: Primary Data (March, 2020)

Average Income and Expenditure: Findings show that 39.1% respondents earn an average income of UGX 200,000 –UGX 500,000 per month and 61.2% of them spends about UGX 50,000 per month on bus transport. This is mainly true of low-income earners that are prevalent in greater Kampala. There is also a large proportion of transport users (18.1%) such as students, housewives, and other dependents without any source of income. They therefore, depend mainly on the working class as a provision for their transport at times of need. Whereas, 3.5% earn above UGX 1,000,000 per month, the study found out that, only 0.7% are able to spend no more than UGX 200,000.

Survey results also support the notion that stage bus transport system is very much suited for the urban dwellers within the greater Kampala due to their limited earning capacity as shown in the Fig 6a and 6b below.

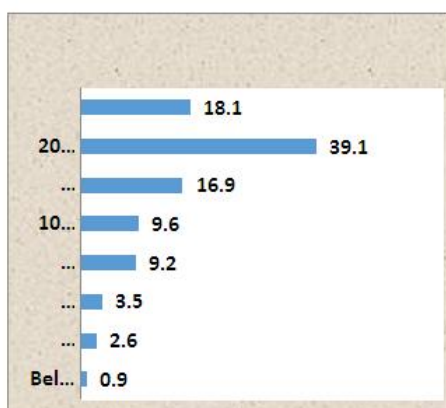


Fig 6a: Average Income (UGX) Earned by Stage Bus Transport Users per Month

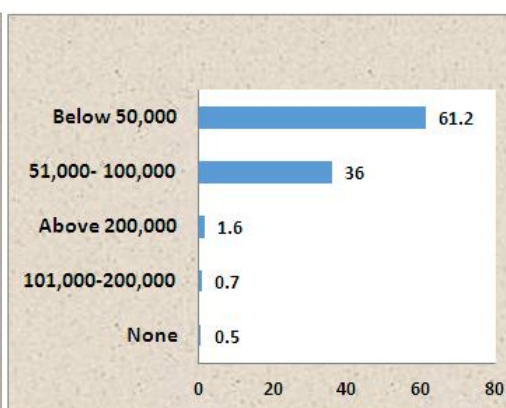


Fig 6b: Average Expenditure (UGX) Earned by Bus Users per Month (%)

4.2 Perceptions and Views of Bus Users/Passengers about Bus Services

Modal Split: Asked about their preferred mode of transport (modal split), 5.4% of the respondents indicated that they prefer to use private cars, 12.2% Boda Bodas, 32.2% Minibus taxis (Matatus), 1.6 % buses, 47.3% walking, 0.9% trains and 0.2% use bicycles (Table 4).

Table 4: Modal split (% modal share) in the Greater Kampala

Mode of Transport	Count (n=425)	% Share
Private Cars	23	5.4
Boda Bodas	52	12.2
Minibus Taxis	137	32.2
Buses	7	1.6
Walking	201	47.3
Trains	4	0.9
Bicycles	1	0.2
Total	425	100%

Source: Primary Data (March, 2020)

Usage of Stage Buses: Asked about the frequency of using buses as a mode of transport (Table 5), the majority of respondents (62%) responded that they use them on the daily basis, 20% once a week, 8% once a month, 6% twice a month and 4% never use them at all.

The fact that the majority of the respondents use buses everyday means that bus transit is an important mode of transport for commuters and travelers in the greater Kampala. It also means that bus operators need to be given all the required support to provide better services and improve urban mobility.

Table 5 Frequency of Using Stage Buses as a Mode of Transport

Period	Count (n=425)	Percent
Daily	264	62
Once a Week	85	20
Once a Month	34	8
Twice Monthly	26	6
Never use	16	4
Total	425	100

Source: Primary Data (March, 2020)

Findings also show that the majority of the respondents (61%) use buses for commuting purpose (going to work), 18% for going to school/university, 6% for recreational purpose, 11% for shopping and others 4% (Table 6)

Table 6: Purpose of Using Buses in the Greater Kampala

Purpose of using bus transit	Count (n=425)	Percent
Going to work (commuting)	259	61
Going to School/University	77	18
Recreation	25	6
Shopping	47	11
Others	17	4
Total	425	100%

Source: Primary Data (March, 2020)

A majority of the respondents (75.3%) prefer to use bus transit due to affordable bus fare. 8.9% use buses because they are comfortable to travel in and 4.5% use bus transport it is reliable. The results according to preference are recorded in Fig 7 below.

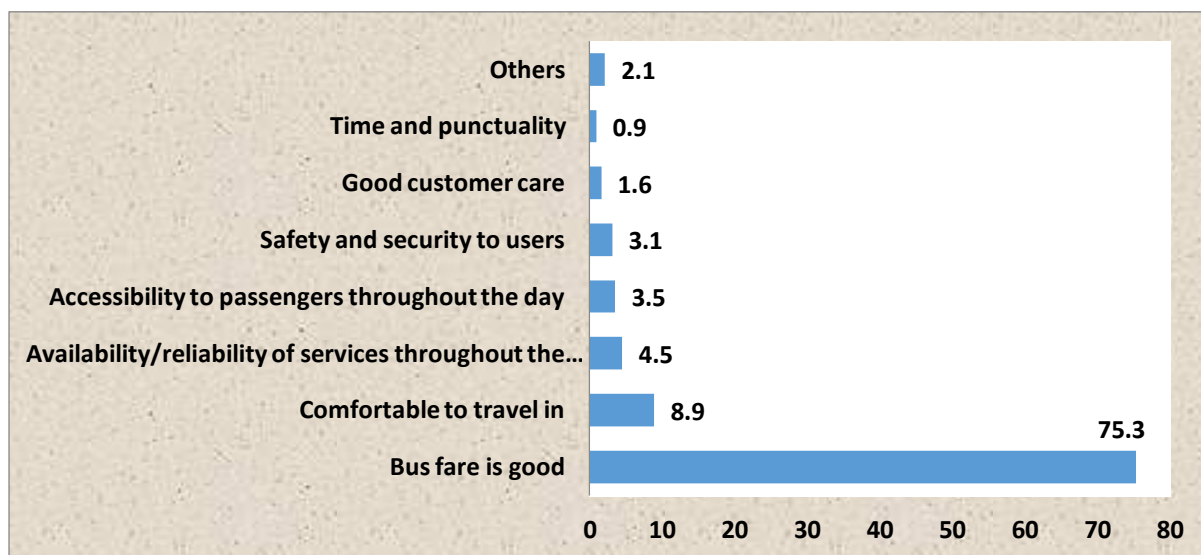


Fig 7: Major Preference for Using Stage Bus (%)

Availability of Stage Bus Services: Most respondents (63.6%) agreed that the buses are frequent on the way/road (i.e.53.2% agreed and 10.4% strongly agreed), followed by 45.4% who cited the bus services to be convenient for them. Most bus users (70.9%) disagreed on the reliability of the buses on the roads. They reported that there are usually few stage buses on the roads making it difficult for the users to get the required services in time. This is still a big gap as reported by both the users and policy makers including KCCA. On average, 45.4% agreed, 14.8% neutral and 34% disagreed with the attributes assessed in the table 7 below.

Table 7: Availability of Stage Bus Services in the surveyed area (%)

Source: Primary Data (March, 2020)

Statement/Attributes on Availability of Bus Services	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
The bus service is usually reliable with sufficient number of buses on the road	12.5	41.4	16.9	25.6	3.5	100.0
The buses offers a frequent service	4.5	34.8	17.2	41.4	2.1	100.0
The bus service is convenient for me	12.8	23.1	10.6	53.2	10.4	100.0
Average	9.9	33.1	14.9	40.1	5.3	100.0

Accessibility of Stage Bus Services: In terms of accessibility of the stage bus services in greater Kampala as shown in table 8 below, most users (64.5%) agreed that it is easy for them to get on and off the bus. About 47% of users disagreed on the statement that there is an accessible bus net -work with adequate number of bus stops/ stages.

These gaps show that, the buses are congested especially at peak hours due to overloading coupled with few numbers of buses available on each route. On average, 45.8% agreed, 16.3% neutral and 38.0% disagreed on the various attributes assessed under accessibility of stage bus services. The results are shown in table 8 below.

Table 8: Accessibility of Stage Bus Services in the surveyed area (%)

Statement /Attribute on Accessibility of Stage Bus Services	Strongly Disagree	Dis agree	Neutral	Agree	Strongly Agree	Total
It is easy to get on and off the bus	8.0	16	11.5	55.3	9.2	100
It is easy to move freely /around inside the bus	13.6	39.8	17.6	26.6	2.4	100
It is convenient to buy the ticket	2.1	25.2	10.1	42.6	20	100
There is an accessible bus network with adequate number of bus stops/ stages	4.2	42.8	25.9	22.8	4.2	100

Average	7.0	31	16.3	36.8	9.0	100
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Source: Primary Data (March, 2020)

Customer Care Services of Stage Bus Companies: About 67.6% agreed that drivers and conductors behave well most of the time and 62.8% reporting staff being helpful and kind in time of need especially the drivers and conductors. About 23.8% disagreed and instead affirmed that it is not easy to resolve problems or complaints in these buses due to lack of proper guidelines and procedures.

On average, 61.6% agreed, 21.2% were neutral; and 17.3% were in disagreement with statements on customer care services assessed of the stage buses. This is summarized in table 9 below.

Table 9: Customer Care about Stage Buses (%)

Source: Primary Data (March, 2020)

Statement/attribute on Customer care Services	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Staff are well dressed	2.8	11.3	10.8	51.1	24.0	100.0
Staff are helpful and kind (driver and staff)	4.5	12.9	19.8	44.9	17.9	100.0
It is easy to resolve problems or complaints while on board the bus	3.8	20.0	35.3	37.4	3.5	100.0
Drivers & conductors behave well most of the time	2.8	10.8	18.8	51.1	16.5	100.0
Average	3.5	13.8	21.2	46.1	15.5	100.0

4.3 Operation of Buses in Kampala

Currently, there are two firms providing bus services in the GKMA region, that is, Pioneer Easy Bus (PEB) and Awakula Ennume bus firm. Pioneer Easy Bus entered the market in 2012 while Awakula Ennume started its operations in 2014.

PEB operates on four routes, covering a distance of 55km including Kampala-Bweyogerere (12.5km); Kampala - Kajjansi (14km); Kampala - Luzira (12.5km); and Kampala - Namugongo (16km).

Awakula Ennume, which was established in 2011 also operates on the Northern corridor covering areas and routes such as Kampala-Gayaza, Kampala-Kawempe, Kampala-Nansana, Bwaise-Nabweru, Kampala-Namugongo and Kampala-Matugga.



Fig 8: Pioneer Easy Buses parked at Constitutional Square in Kampala (Source: Pioneer Easy Bus Firm)



Fig9: Routes Plied by Pioneer Easy Bus in Kampala



Fig 10: Awakula Ennume Buses parked near Pioneer Mall in Kampala (Source: Awakula Ennume Bus Firm)

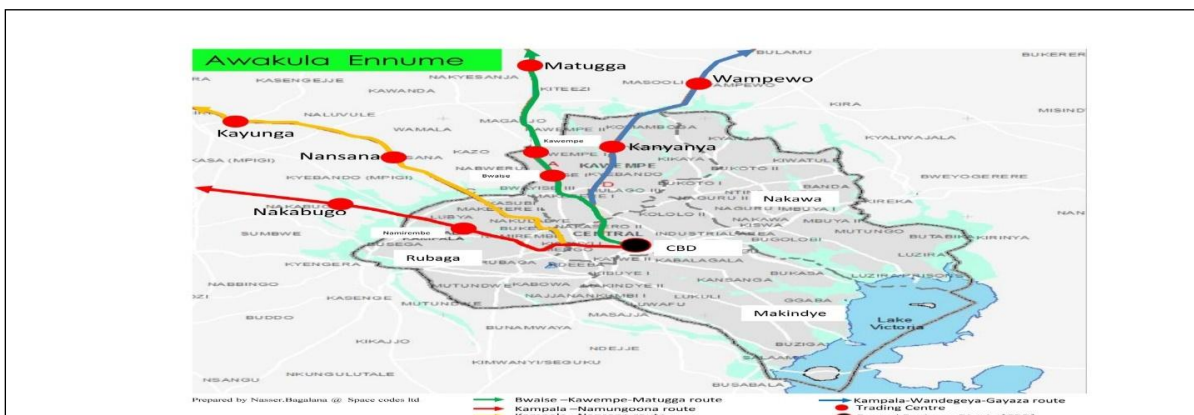


Fig 11: Routes Plied by Awakula Ennume Bus Firm

PEB has 100 buses operating on four routes (Kampala-Kajjansi; Kampala –Luzira, Kampala – Namugongo and Kampala –Bweyogerere) while Awakula Ennume Bus Company has only 18 buses on two routes (Kampala-Kasangati-Gayaza; Kampala –Kawempe-Matugga). As a result, the number passengers transported per day in greater Kampala is also unmatched.

Pioneer Easy Bus transports about 20,000 passengers compared to 7,000 – 8,000 passengers transported by Awakula Ennume Bus Company.

Pioneer Easy Bus purchased Chinese made buses while Awakula Ennume Bus Company uses Indian Tata buses. In terms of load factor, Pioneer Easy Bus has 50%, allowing 30 sitting and 30 standing passengers compared to Awakula Ennume’s 60% allowing 36 sitting and 24 standing passengers as summarized in table 10 below;

Table 10: Operation capacity of Pioneer Easy Bus and Awakula Ennume bus companies in the Greater Kampala

Category	Pioneer Easy Bus	Awakula Ennume Bus firm
Ownership	Private	Private/Cooperative Society
Date of entry in market	March 2012	2014
No. of Buses	100	22
No. of routes	4 routes: (Kampala-Kajjansi; Kampala –Luzira, Kampala – Namugongo and Kampala –Bweyogerere)	2 routes: (Kampala-Kasangati-Gayaza; Kampala –Kawempe-Matugga)
Bus technology	Chinese technology buses	Indian Tata bus technology
Passengers transported per day in greater Kampala	20,000 passengers	7,000- to- 8,000 passengers
Load factor	50% (30 sitting and 30 standing passengers)	60% (36 sitting and 24 standing passengers)
Initial capital investment	US\$61.5million	NA

Source: Field Study Data (Face to face interviews with bus operators/managers)

KCCA also plans to establish a Bus Rapid Transit (BRT) system that will provide transit services in the various parts of the greater Kampala, including areas such as Wakiso, Mpigi and Mukono. However, there are concerns about the viability of such an expensive system and its operation in a developing country city like Kampala with extremely low incomes and poor urban planning history (World Bank, 2017).

Several transit terminals will be established under the proposed BRT project in various areas in the greater Kampala such as:

- a) **Bwaise Terminal on the northern branch:** The terminus will be in the vicinity of the intersection of Bombo road and Northern Bypass. This should eventually be extended to cover Kawempe, Matuga and Kawanda.
- b) **Gayaza Road Terminal Northern By-pass (Kalerwe Market Station):** To be constructed in the vicinity of inter-section between Gayaza Road and the Northern bypass. This should be eventually extended to cover Mpererwa, Embuuzi (Kyanja Urban Agriculture Facility) and then Gayaza town. Provisions should be made for parking and shopping /market at every stop over.
- c) **Kireka Terminal:** On the eastern branch the terminus will be in the vicinity of the intersection of Jinja Road and the Northern Bypass, within one Kilometre from the last BRT station (Namugongo Station). This should be eventually extended to have station at Byogerere, Namanve, Seeta and Mukono.
- d) **Entebbe-Zana Terminal on the southern branch terminus:** This will be in the vicinity of the intersection of Entebbe Road and Suna Road, within one Kilometre from the BRT station Zana Junction. This should eventually be extended to cover Lubowa quality shopping mall/roofings, Kajansi, Abayita Abiiri, Nkumba University; and
- e) **City Circuit route:** Running from City Square, through Nakawa, Ntinda, Bukoto, Kamyokya, Mulago Hospital, Wandegaya and then back to City Square through Kampala Road.

Under the Kampala BRT investment plan, US\$394million is to be spent on the infrastructure, US\$30million on land acquisition and US\$66million on vehicle fleet. Most potential funders of the BRT project in Kampala including the World Bank, European Union and African Development Bank have however, stressed the need for a regional wide transport regulatory agency which is stated as MATA (Metropolitan Area Transport Authority) in the National Transport Master Plan (2008-2023) before funding could be provided.

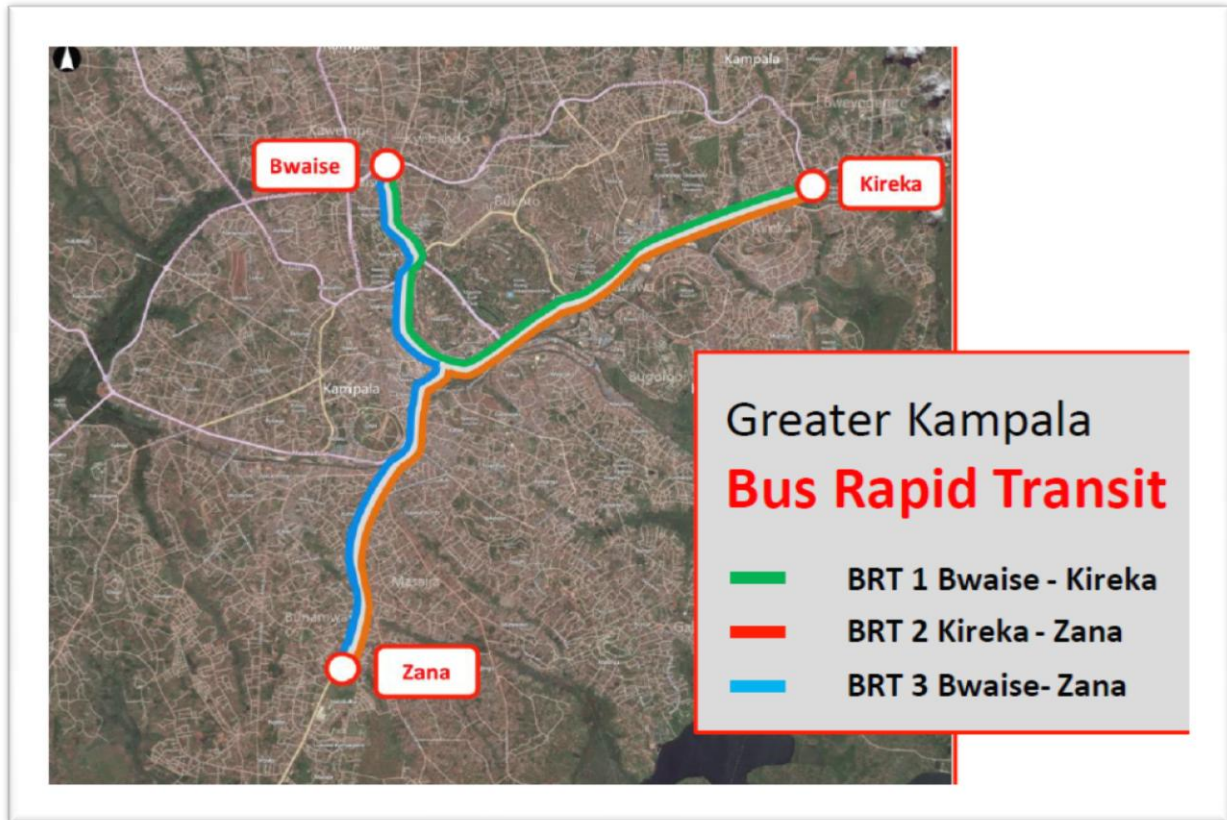


Fig 12; Proposed Bus Rapid Transit pilot project in Kampala

Tondeka Metro bus is another flagship transit project that is being promoted by some local and foreign investors in the greater Kampala region. Under the Tondeka project, bus services will be provided in areas such as Mukono, Nsangi in Mpigi, Wakiso town in Wakiso, Matugga in Wakiso, Entebbe and Ggaba. It is expected that US\$200million (Shs737Billion) will be mobilized to buy 980 buses. Tondeka’s proposed bus fare structure is as follows: Shs1, 200 (US\$.32) unlimited daily travel; weekly card travel Shs3,500 (US\$1); and Shs 55,000 (US\$15)monthly card travel. Bus fares will be collected using radio frequency identification cards to swipe with no cash payment allowed on bus. Bus operations are expected to start in September 2020 after the arrival of 400 buses as part of phase 1 of the project. However, the source of funding for the project is still not clear.

Table 11: Key Routes to Be Plied by Tondeka Metro Bus in the Greater Kampala

No.	Routes	Distance
1.	Kampala -Mukono	25 KM
2.	Kampala - Nsangi	18KM
3.	Kampala – Buloba Kiweesa	22KM
4.	Kampala – Wakiso	21KM
5.	Kampala – Matugga	19KM
6.	Kampala – Entebbe International Airport	51KM
7	Kampala – Ggaba	12KM

Source: Ministry of Works and Transport (2020)

Table 12: Future Public Transit/Mass Transport Projects in the GKMA

Project	Areas traversed	Total Length in KM	Total Cost	Status/Progress
Bus Rapid Transit (BRT) Pilot	Kampala and Wakiso	25	US\$490Million	Mobilizing funding
Tondeka Metro Bus	Kampala, Wakiso, Mpigi and Mukono	NA	US\$200Million	Mobilizing Funding
KCCA Eco- Bus Project	Kampala	NA	US\$12Million	Securing a loan from with African Development Bank

Source: Ministry of Works and Transport (2020)

As highlighted in Table 12 above, an eco-bus/Green bus service was mooted by KCCA as a new intervention to improve passenger transport services in the city. Kampala green bus service is part of the

US\$228 million five year (2020-2024) Kampala city roads rehabilitation programme (KCRRP) to be funded by the African Development Bank (AfDB). Under the project, US\$12million will be used to procure 80-100 seater capacity buses.

Green buses are expected to operate on two routes: Route 1: covers areas such as: city square, Centenary Park, Lugogo cricket ground, Kololo high secondary school, Kira road police station, Kamwokya market, Mulago hospital, Wandegaya and Watoto Church; and Route 2: will cover areas such as City square, Watoto Church, Wandegaya, Mulago Hospital, Kamwokya Market, Ntinda, Spear Motors and Nakawa Market.

Besides, the Green Bus intervention is intended to reduce the average travel time in the GKMA from 4.1minutes per kilometer to 3.5 minutes per kilometer as recommended by the Draft Third National Development Plan (2020-2025) and Vision 2040.

Travel Fares-Pricing Strategies: Findings show that the respondents were charged UGX 1,000 per trip for both companies. This has been the common market price for each trip in the greater Kampala. However, evidence from 11.8% of users reveals that, both companies at times overcharged charged UGX 1,500 especially during rush/pick hours. The outlier prices of UGX 2,000 and UGX 2,500 were charged by mainly Pioneer Easy Bus Company during unfortunate time of the Corona virus episode.

During the outbreak of corona virus in Uganda in June, 2020, city fares for stage buses increased shortly by around Shs1500-Shs2, 500 due to high public demand. The directive from government was to reduce the number of passengers per seat to curb the spread of corona virus (Covid 19). Bus operators observed that passengers and commuters had to bear with them after increasing the fares because bus operating costs had increased due to Covid 19. Additionally at the time of the onset of Covid 19, the Government had discouraged the citizens from using public transport.

Also the initial plan for Awakula-Ennume Bus Company was to introduce monthly tickets plan for passengers but was unable to implement it due to unstable fuel prices and network related issues. As a result, the company resorted to cash charges where a standard fee of UGX 1,000/= is charged to passengers to and from Kawempe and Gayaza.

KCCA authorities reported that prices for stage buses are not regulated but determined by prevailing demand and supply. Pricing of fares is still a challenge as some bus companies dictate prices during peak hours claiming to cover up the gap wasted in the traffic jam. Generally, price changes in buses and taxis are caused by fuel price variations and loading fees thus forcing them sometimes to increase the fare prices.

Level of Satisfaction with Pricing Strategy: Asked about whether they are satisfied with the quality and quantity of bus services provided, 25.7% of the respondents using Pioneer Easy Bus and 20.9% of Awakula Ennume bus users indicated that they are very satisfied with the service and bus fares (table 13). The bus users interviewed were generally satisfied with bus fares offered by Pioneer Easy Bus (60.8%) and Awakula Ennume bus (68.6%) companies. About 8.0% Pioneer Easy Bus users and 4.0% Awakula Ennume bus users had reservations (neutral) about the prices. About 2.5% users of both bus companies were very dissatisfied with prices offered by the two bus companies.

Table 13: Level of Satisfaction with the Bus Fares Paid per Trip (%) by Type of Bus

Measurement Scale	Stage Bus	
	Pioneer Easy Bus	Awakula Ennume
Very dissatisfied	2.5%	2.5%
Dissatisfied	3.0%	4.0%
Neither dissatisfied or satisfied/neutral	8.0%	4.0%
Satisfied	60.8%	68.6%
Very satisfied	25.7%	20.9%
Total	100%	100%

Source: Primary Data (March, 2020)

While 86.6% agreed that the bus fares are affordable (table 14), 83% were aware of the bus fares being collected manually (by cash/ticket). The stage bus transport users have found this mode of payment to be adequately appropriate for them to use at the time of their travel in terms of time and level of technology to use credit cards or fare ticketing.

Table 14: Contribution of Various Attributes on Level of Satisfaction on Bus Fares Paid per Trip (%)

Source: Primary Data (March, 2020)

Statement /attribute on Bus Fares	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
The bus fare is affordable to me	2.1	5.4	5.9	48.2	38.4	100.0
The bus fare prices are published in the bus notice	5.9	41.6	19.8	23.1	9.6	100.0
The bus fares are collected manually (by cash/ticket)	1.6	8.7	6.6	50.8	32.2	100.0
Average	3.2	18.6	10.8	40.7	26.7	100.0

Passenger Information System (PIS): Passenger information systems (PIS) is the area the bus companies have not paid much attention to. Findings show that, on average, 46.1% disagreed, 20.4% were neutral and 31.5% agreed about the use of passenger information systems by the two bus companies. There is need for the two companies to improve the information management and dissemination to the passengers to be able make informed travel decisions in the areas of transit fares, travel timetables and general bus services.

Table 15: Passenger Information System (%)

Statement /attributes on Passenger Information Services	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
It is easy to get information about the bus services.	4.7	37.6	19.8	35.1	2.8	100
There is available timetables and plan line	8	47.1	21.9	20.5	2.6	100
There is information on prices & tariffs in the bus	5.4	41.6	19.5	26.4	7.1	100
Average	6	42.1	20.4	27.3	4.2	100

Source: Primary Data (March, 2020)

Passenger Safety and Security: An analysis of the findings of the study revealed that 45.5% of the respondents indicated that they were satisfied with the passenger safety and security while 33.2% were dissatisfied. Major areas of dissatisfaction included poor maintenance of buses, lack of benches and shelters at bus stops, availability of pickpockets (thieves) and rampant overloading. It was also observed that bus stops are not safe enough especially at night. The results against each attribute have been summarized in table 16 below.

Table 16: Bus Passenger Safety and Security (%)

Statement/Attributes of Security and Safety of Buses and Bus Stages	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Access way to bus stop is secure from my home	1.6	19.1	16.9	56	6.4	100
It is safe to me to travel in the bus on board compared to others (minibuses, taxi, etc) i.e. there is sense of personal safety while in the bus	2.4	12.7	18.1	59.3	7.5	100
The buses are new or well serviced/maintained	13.9	30.4	23.1	30.4	2.4	100
Bus stops have enough shelters and benches to sit	19.8	52.9	15.8	9.9	1.6	100
I am not afraid of being pick-pocketed on bus	7.8	41.9	27.1	20.5	2.8	100
There is no overloading of passengers	24.5	51.8	16.2	5.6	1.9	100
Bus stops are safe enough	5.2	34.8	32	25.6	2.4	100
Average	10.7	34.8	21.3	29.6	3.6	100

Source: Primary Data (March, 2020)

Face to face interviews conducted with the key informants from the Uganda Traffic Police Department also revealed that the mechanical conditions of some buses are wanting as they at times operate with faulty breaking systems, no break lights and indicators, among others. Sometimes, some of the buses operate with expired road licenses. Besides, 79.5% of the respondents (stage bus transport users) interviewed felt safe to travel using stage buses in the greater Kampala in (table 17).

Table 17: Responses on Whether Users Feel Safe Traveling By Stage Bus

Do you feel safe using stage bus transport (%)? N=425			
Response	Name of Stage Bus		Total (%)
	Pioneer Easy Bus	Awakula Ennume	
Yes	52.2	27.3	79.5
No	6.8	6.8	13.6
I do not know	5.9	0.9	6.8
Total	64.9	35.1	100.0

Source: Primary Data (March, 2020)

Functionality of Bus Terminals and Stages/Stops: In Table 18, 32.9% of the respondents (bus users/passengers) move a distance of 500m to 1km to reach the nearest bus stop in order to catch the bus, 6.4% move more than 3Km to reach the nearest bus stop. There is therefore a need by the city government in collaboration with PEB and AE bus companies should increase the number of bus stages for improving public transport system in the greater Kampala.

Table 18: Shortest distance in KM from respondent’s residence to the nearest bus stage/stop where they can comfortably board

Shortest Distance	No of Respondents	Percent
Within 500 m	150	35.3
500m -1 km	140	32.9
1km-3km	108	25.4
More than 3km	27	6.4
Total	425	100.0

Source: Primary Data (March, 2020)

Comfort of Bus Services: In table 19, 85.2% of the bus users were appreciative of the ceiling heights of buses that are comfortable and able to accommodate any height of any person. The main aspects poorly rated by the bus users related to comfort management included overcrowded buses with inadequate seats, the bus stops that are not clean and poorly illuminated/lit and ventilated coupled with poor design of buses and bus stops. On average, 57.1% supported the statements, 26.9% disagreed and 16.15% were neutral regarding the conformability of the stage buses in general.

Table 19: Attributes for Comfort Management (%)

Statement /Attributes of Comfort Management By Bus Companies	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Bus seats are comfortable to sit on	8.5	13.6	6.6	52.7	18.6	100
Buses are driven by professional /skillful driver and gives comfortable ride	1.6	5.6	14.1	60.7	17.9	100
Buses generally have clean environment inside	3.1	11.3	16.5	62.1	7.1	100
Buses are tidy, well lit and ventilated	7.1	17.2	24.5	46.8	4.5	100
Buses are not crowded and there are enough seats	23.8	45.9	14.8	13.9	1.6	100
Bus stops are clean and well illuminated/lit	4.9	31.5	26.4	35.3	1.9	100
There is enough leg room in buses while seated	4.7	17.4	15.5	58.4	4	100
Facilities inside buses are in good condition	4.7	20	13.2	56.2	5.9	100
Ceiling heights of buses are comfortable	2.6	5.2	7.1	73.2	12	100
There is an elegant design of buses and bus stops	7.8	32	22.4	32.5	5.4	100
Average	6.9	20	16.1	49.2	7.9	100

Source: Primary Data (March, 2020)

Time Scheduling of Stage Buses: In table 20, only 55.5% of the bus users were happy about bus operation schedules. Bus operational aspects that need to be improved include frequency and punctuality of the buses,

reducing traffic jam and long waiting time at bus stop/stages. On average, 56% of the respondents disagree and dissatisfied with the current bus service scheduling and only 25 % agree with it.

Table 20: Attributes of Time Scheduling and Punctuality of the Bus Operations (%)

Statement/Attribute on Time and Punctuality of the Bus Operations	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
The bus follows the travel schedule	16	40	18.4	23.5	2.1	100
The bus takes short travel time on the way	7.3	34.6	34.6	17.6	37.9	100
The bus reduces traffic jam due to few stoppages on the way compared to mini-bus/taxi	4.9	31.3	28.7	32.2	2.8	100
Short waiting time at bus stop/stage	10.8	36.9	27.5	22.4	2.4	100
Short passenger walking distance to bus stops	4.2	26.8	35.3	31.8	1.9	100
Average	8.6	33.9	28.9	25.5	9.4	100

Source: Primary Data (March, 2020)

With respect to the above results, the study has established that stage buses still needed to do more to be able to reduce on travel time and dependence on private cars. However, there is need to provide timetables so that passengers can have a clear travel plan.

Besides, interviews conducted with the key informants from the KCCA and other local governments in the GKMA region revealed that generally stage bus services are not properly scheduled in many parts of the greater Kampala.

Some stage bus operators such as Pioneer Easy Bus (PEB) have adopted new strategies to diversify their revenue sources. For example, PEB has provided advertisement space on buses for local telecommunication companies such as MTN and Airtel as a way of increasing their visibility.

4.4 Regulation of Bus Transit Systems

Currently, the power to regulate bus operators in Kampala is scattered and located in various state agencies such as the Transport Licensing Board (TLB), Uganda Traffic Police, Kampala Capital City Authority (KCCA), Uganda Revenue Authority (URA), Face Technologies and various urban councils. These agencies are also affiliated to different ministries and coordination among them is poor and lacking in many areas (Ministry of Works and Transport, 2009; United Nations, 2018).

For example, Uganda Revenue Authority is responsible for registering all vehicles and collecting vehicles-related tax revenue, Uganda police is mandated to enforce road traffic laws and regulations and the Transport Licensing Board (TLB) is responsible for licensing public service vehicles (PSVs) such as buses, minibuses and Boda Boda. Face Technologies is contracted under a public private partnership (PPP) programme by the Ministry of Works and Transport (MoWT) to issue out driving permits on behalf of the Ministry of Works and Transport (MoWT).

Transport agencies such as the Transport Licensing Board (TLB) and Uganda Police often enforce a few road safety aspects, such as possession of a valid driving permit, vehicles being in good mechanical condition, speeding and the load capacity of vehicles. Daily operations of public passenger transport is also largely determined by the forces of demand and supply as determined by market forces, and not by any timetable or licensing system.

To operate in any part of the city, bus operators in Kampala are required to have a permit that is provided by the city authority. Only one bus firm is allowed to operate on each route or in a particular zone but para-transit systems enjoys unrestricted freedom to operate on any route in the region.

Due to the lack of support infrastructure and facilities such as bus stops, bus terminals and passenger interchanges stage buses continue operate like para-transit systems. Bus operations are also affected by the failure of the city authorities to provide bus lanes that would help address the challenge of mixed traffic.

Most buses are old and their maintenance is still a big challenge because the spare parts have to be imported from where the buses are manufactured. Bus operators are unable to renew their fleet because of the failure to mobilize enough investable funds. Bus operators have also been affected by the huge debt that was accumulated as results of commercial bank loans secured with high interest rates.

4.5 Key challenges Faced by Stage Bus Operators in the Greater Kampala

Interviews conducted with the key informants revealed that traffic jam is one of the key challenges faced by the bus operators in the Greater Kampala. Average traffic speeds for buses are extremely low especially during the peak hour periods. Bus operations are also affected by the narrow roads that are shared by various modes of transport. Levels of traffic jam are particularly high on key arterial roads leading to the central business district of Kampala city.

Bus transit operations have also been affected by the failure of the city authorities to provide public transport support facilities such as bus stops, bus lanes, bus depots, passenger interchanges and bus terminals. Without these facilities, it is difficult to improve the quality of bus services and to integrate bus transit with the other modes of transport including rail transit as well as private transport. Switching from one mode of transport to the other has also been curtailed by the lack of transit support facilities.

Inadequate funding for bus transit. Bus transit is mainly financed using individual savings, commercial bank loans and transit fare revenue. Due to high interest rates imposed on commercial bank loans bus operators have not been able to mobilize enough investable funds to buy new vehicles and expand their operations. Bus fare revenues are also insufficient to meet the operating costs. This largely due to the increased use of private cars especially among the middle class commuters as well as the dominance of para-transit systems. Bus operators have also not adopted new innovative funding strategies such as the public private partnerships (PPPs) because of the failure by the government to introduce the required guidelines as well as the formulation of a public transport policy.

Lack of a regional wide transport governance system. Face to face interviews conducted with the managers of bus firms and officials from the Transport Licensing Board (TLB) revealed that when Pioneer Easy Bus (PEB) was introduced in 2012, its main business concept was based on greater Kampala as one region. However, due to fragmented governance system as well as poor coordination among the various transport regulatory agencies, PEB was prevented from operating in areas such as Wakiso, Mpigi and Mukono by the local government leaders.

Establishing partnerships and collaborations with the leaders of the neighboring local governments in Mukono, Wakiso and Mpigi to foster bus transit operations is therefore important. Such partnerships may also focus at establishing a single metropolitan transport regulatory agency or department that is capable of coordinating important transport –related investments and development initiatives in the region.

The bus sector is also faced with a serious shortage of experienced and skilled managers, drivers and planners. For example, when Pioneer Easy Bus (PEB) was established in 2012, some its top managers were recruited from Nigeria and Kenya. This problem is largely as a result of the local training gaps, the collapse of organised passenger transport in the 1990s as well as the continued dominance of the informal transport systems. It is thus important to be build the required capacity within government agencies and systems to meet the professional expertise required at institutional and individual levels

Lack of bus service standards and regulations. Bus transit service standards and operational performance indicators are critical in ensuring that the transit systems operate efficiently and that the quality of services provided is improved. Without these standards, it is difficult to plan transit systems that are responsive to the mobility needs of the urban residents. Bus transit service standards should also help to designate transit routes, regulate market entry and control bus fare.

Bus operations and service standards should also help address issues such as vehicle specifications and load capacity, frequency of bus services, service quality, bus lanes, location and spacing of bus stops as well as location and design elements of bus terminals.

Bus transit systems continue to use fossil fuels, especially diesel and gasoline. Dependence on these fuels has contributed to carbon emissions within greater Kampala. Changing from fossil fuels to cleaner energy is critical in establishing sustainable transport systems and reducing greenhouse gases in the region.

The current public transport system in the greater Kampala is also not well- integrated. For example, buses and passenger railway continues to operate as separate systems. Bus stops, terminals, passenger interchanges and railway stations are critical in improving the attractiveness of public transport and integrating various modes of transport. Modal integration can only be effectively achieved by centralized network planning for all modes.

V. DISCUSSION OF RESEARCH FINDINGS

Findings indicate that the majority of the respondents are married (56%), often use stage buses for commuting purposes (journeys to work) (61%) and fall between 18 and 35 age bracket (70%). One reason why married people use stage buses is that they often want to share. Also, Uganda has a young population, with over 75 percent of the people below the age of 30 (Uganda Bureau of Statistics, 2014). This also explains why the majority of people using buses in the greater Kampala are young adults.

Journeys to work (commuting) constitutes a large proportion (61 percent) of trips made by bus transit and efforts must be made by both the bus operators and policy makers in the greater Kampala to popularise bus transport among those travelling to participate in activities such as shopping, education and recreation. In addition, the recent expansion of the education sector in the greater Kampala offers several opportunities for bus operators to provide school shuttle services.

An analysis of the findings on the modal split in the greater Kampala also shows that 47% of the respondents prefer walking as a mode of transport, 32 percent use minibuses and 5 percent use private cars. This particular finding is not different from the findings of previous studies. For example, Uganda Bureau of Statistics (2016) states that in Uganda public transport remains unaffordable to many urban residents and about 65 percent of the commuters walk each day to reach their work stations. It is also noted that walking trips in Kampala are as high as 70% of the total trips made (Uganda Bureau of Statistics, 2010).

Studies by Morichi (2005), Barter (1999) and United Nations (2018) also found a strong link between walking and the use of public transport in cities. In many low income cities such as Kampala, the popularity of walking provides an opportunity for policy makers and urban managers to plan and improve bus services. Also, as cities expand and travel distances increase, as already observed in Kampala, poor commuters are forced to abandon walking and use relatively fast and affordable mode of transport such as bus transit and passenger railway.

Similarly, in a survey that was carried out in selected towns, it was found that the percentage modal share for walking is, on average, above 50% for most towns in Uganda. The problem, however, is that the majority of the surveyed towns lack pedestrian facilities, and this has adversely affected the ability of these towns to foster smart and safe mobility as well as equitable transport systems (Ministry of Works and Transport, 2019).

Findings also show that 86.6 percent of the respondents view current bus fares as generally affordable. Also, 83.1 percent of the respondents says that the bus fares had remained unchanged for a long time. Contrary to the existing national development policy that favours market capitalism, government has continued to regulate bus fare to ensure affordability. However, in a situation where bus fare revenue is falling due to the increased use of private cars especially among the middle income commuters, it is critical for the city authorities to adopt a flexible approach towards transit fare control and regulation (Jamillah, 1995).

In some low income cities such as Bangkok (Thailand) and Seoul (South Korea), different transit fare systems targeting both low income and middle income commuters have also been used as a strategy to increase transit ridership and enhance transit fare revenue (Kiggundu, 2009).

Bus operators are also struggling with huge unpaid debts and continue to depend on individual savings, commercial bank loans and transit fare revenue to fund their operations. Faced with limited funding options, bus operators have not been able to buy new vehicles and improve their services. Due to mounting debt, Pioneer Easy Bus (PEB) has not been able to expand its fleet from 100 buses to 522 buses as promised under the 2010 contract signed with the city authorities.

In February 2013, Uganda Revenue Authority (URA) impounded 100 buses belonging to PEB for failing to clear a Shs8 billion import tax debt. A 2020 Friedrich-Ebert-Stiftung study on public transport in the greater Kampala also found that 49 percent of para-transit (informal transport) operators relied on commercial bank loans to fund their operations. Most paratransit operators also faced difficulties in repaying their loans due to the unfavourable economic environment, created by the Covid 19 pandemic (Friedrich-Ebert-Stiftung, 2020).

Bus transit in the greater Kampala is also characterised by low cost recovery. Cost recovery is important because it enables bus firms to make profits, buy new buses and expand their operations. In a survey that was carried out on Boda Bodas and Minibuses in the greater Kampala, it was found that the average daily take home for Boda Bodas was Shs18,800 (representing 34 percent of Boda Bodas daily earnings) and Shs52,000 for Minibus Taxis/Matatus (equivalent to 50 percent of Minibus taxi daily earnings) (Friedrich-Ebert-Stiftung, 2020).

So based on these findings it is clear that low cost recovery is a common problem faced by both formal and informal public transport systems operating in the greater Kampala.

Results of the study further indicate that 46.1 percent of the respondents are aware of the limited application of passenger information systems (PIS) in the daily bus transit operations. PIS is an important component of modern bus systems and its low applicability means that the city authorities are yet to appreciate its importance in establishing an efficient and attractive bus transit in the region. Recognised also is that, in Chicago, the use of PIS strategies such as Advanced Bus Tracker increased transit ridership by 40% (Isa et al., 2013).

Interviews conducted with the key informants from various government agencies and Ministries also revealed that state buses continue to operate without approved public transport service standards and benchmarks. Transit service standards and operational performance indicators are critical in ensuring that the transit systems operate efficiently and that the quality of services provided is improved. Without these standards and performance indicators, it is difficult to plan urban transit services. Transit service standards should also be

used to designate transit routes, regulate market entry and control bus transit fare. Bus operations and service standards should also help address issues such as vehicle specifications and load capacity, frequency of bus services, service quality, passenger safety and security, bus lanes, location and spacing of bus stops as well as location and design elements of bus terminals and bus stops.

Some stage bus operators such as Pioneer Easy Bus (PEB) have however, adopted new strategies to diversify their revenue sources. For example, PEB has signed agreements to provide advertisement space on buses for local telecommunication companies such as MTN as a way of increasing their visibility.

Continued dependence on bus transit fares, expensive commercial bank loan and individual savings by the bus operator also shows that policy makers in the greater Kampala have failed to formulate and implement a viable and replicable funding model for stage bus transit systems.

VI. INNOVATIVE STRATEGIES FOR IMPROVING BUS TRANSIT OPERATIONS

Discussion under this section focuses on innovative strategies and best practices identified from transit-dependent cities for adoption in the Greater Kampala. However, it is important to recognize the differences that exist between Kampala and the various role model cities such as Hong Kong, Singapore, Curitiba, Kuala Lumpur and Tokyo. Differences are manifested in form of urban population density, population size, level of development as well as incomes (Kiggundu, 2009).

In terms of population density for example, Tokyo has 71 persons per hectare, Singapore (87 persons per hectare), Hong Kong (301 persons per hectare), Seoul (245 persons per hectare), Curitiba (49 persons per hectare) and Kampala city (48 persons per hectare) (Barter, 2000; Kiggundu, 2009).

About 90 percent of the commuters in Hong Kong use public transport, compared to 62 percent in Tokyo, 75 percent in Seoul, 65 percent in Singapore, 37 percent in Kuala Lumpur (Malaysia), 46 percent in Curitiba and 30 percent in Kampala, see Table 21 below.

Table 21: Global Operations and Trends in Public transport in Selected Countries and Cities

Name of City	Country	Population Size (Million)	Population Density (Persons per Hectare)	Public transport as % of motorized work trips (Transit modal share)
Hong Kong	China	7	301	90
Singapore	Singapore	5.7	87	65
Seoul	South Korea	10	245	75
Curitiba	Brazil	3.5	49	46
Greater Tokyo	Japan	12	71	62
Greater Kuala Lumpur	Malaysia	4.3	60	37
Greater Kampala	Uganda	4	48	30

Source: Barter (2000); Kiggundu (2009); Smith and Raemaekers (1998)

One of the key innovative strategies adopted in some role model cities is the diversification of transit revenue sources by the bus operators. By adopting this strategy, bus operators are able to reduce their reliance on fare revenue, which is shrinking in many developing country cities due to the increased use of private cars among commuters, increased traffic jam, inflexible fare system and competition from especially para-transit (informal transport) systems.

Transit revenue diversification can be achieved by introducing bus services for different urban travel market segments. For example, in cities such as Seoul (South Korea), Bangkok (Thailand), and Buenos Aires (Argentina), bus services at different fares are already provided including air conditioned bus services targeting mostly the middle class commuters.

Bus operators can also choose to participate in real estate development (high density residential and commercial buildings) especially in areas along major transit corridors. This has been the case in some Japanese cities such as Tokyo and Kobe. In Tama New Town, which is located west of Tokyo, low priced agriculture land was used to build residential apartments and shopping malls which were later sold or rented to get the necessary capital to carry out transit projects, including bus transit (Kiggundu, 2009; World Bank, 2001).

Some cities such as Kuala Lumpur (Malaysia) have also used a public private partnerships (PPPs) strategy to promote urban transit. PPPs are critical because they help to attract funding from the private sector and other key stakeholders. PPPs also help in the efficient allocation of investment risks. Risks are allocated efficiently when they are allocated to the party that is best able to manage them.

Governments for example, have vast experience and the required capacity to carry out critical tasks such as the formulation of transport policies, management of traffic flow as well as setting and enforcing safety standards. On the other hand, the private sector is often good at mobilizing investable funds, reducing costs and ensuring that enough profits are generated by transit firms.

Partnerships between the city governments and the bus operators can be achieved through providing financial support in form of interest free loans (soft loans) as well as tax rebates and exemptions where possible.

In Malaysia for example, a US\$1.2 billion special fund called the Public Transportation Trust Fund (PTTF) was established by the government in 2006 to provide cheap credit to bus transit operators (Kiggundu, 2009).

In Tokyo, Singapore and Hong Kong, the city authorities introduced Transport Demand Management (TDM) measures. TDM is concerned with the alteration of travel behavior in order to enhance the efficient use of the existing road space and facilities. Examples of the TDM measures include: limitations on the supply of parking space, high parking fees, high fuel prices, high car ownership taxes as well as congestion charges.

TDM measures are often used to discourage the use of private vehicles and improve the performance and operation of public transit systems (Mbara, 2002; Jamilah and Kiggundu, 2007; Kiggundu, 2009). In Singapore and London, congestion charges were introduced in 1975 and 2003 respectively. Besides, in London, the money collected from congestion charges is used to fund public transport improvement projects.

Transit-dependent cities such as Hong Kong, Curitiba (Brazil), Tokyo and Singapore adopted a Transit-Oriented Development (TOD) strategy to improve the operations and performance of transit systems. TOD is characterized by high urban density, mixed use development and dependence on urban public transit. Also under TOD, high density residential and commercial buildings are constructed along transit corridors and near major transit facilities such as bus stops, train stations and bus terminals. Such developments are meant to make transit more accessible, create the required transit demand and to enhance the performance of the transit systems (Kiggundu, 2009; Barter, 2000).

Some role model cities have used intelligent transport systems (ITS) to improve the performance of transit systems including stage buses. One key element of ITS is the passenger information system (PIS). PIS has been used in many successful cities including Singapore, Hong Kong, Kuala Lumpur and Tokyo to foster transit operations and performance (Isa et al., 2013). PIS is based on technologies such as internet web sites, telephones, cellular phones television, LED displays, signboards, global positioning system (GPS), radio and smart phones (Saric, 2012).

Through PIS customer satisfaction in using public transport is easily achieved. PIS helps in ensuring that travelers and drivers are able to make informed decisions regarding trip departures, optimum routes and available modes of travel (Isa et al., 2013; Saric, 2012). In Chicago for example, the use of PIS strategies such as Advanced Bus Tracker increased transit ridership by 40% (Isa et al., 2013).

Diversification of transit revenue sources is critical in ensuring that transit firms are able to improve their performance and sustain their operations.

This has been implemented in various cities across the globe including Bangkok and Seoul (Kiggundu, 2009). In some successful cities transit firms have been involved in establishing transit shops at various bus stops and rail stations.

Transit operators have also provided advertisement space in transit vehicles including buses, invested in real estate sector especially in areas along the transit corridors and offered services that are targeting the middle class travelers such as air conditioned buses at higher transit fares.

In short, the diversification of transit revenue sources is important because it reduces the over reliance on transit fare revenue which has diminished in many cities due to the increased use of private cars among the middle class commuters as well as the emergence of para-transit systems in some developing country cities including Kampala.

VII. RECOMMENDATIONS

Based on the findings of the study as well as the experience of public transport-dependent cities or role model cities such as Hong Kong, Singapore, Bangkok, Bogota, Curitiba and Tokyo several innovative strategies can be adopted to enhance the performance stage bus systems in the Greater Kampala:

Diversify bus transit revenue sources: As earlier observed, several transit-dependent cities have been able to diversify their transit revenue sources through the introduction of bus services for different urban travel market segments. For example, in cities such as Seoul, Bangkok, and Buenos Aires, bus services with different fare structure are already provided including air conditioned bus services targeting mostly the middle class commuters. This can also enable bus operators to reduce their reliance on low income travelers and commuters who often use public transport in most cities across the globe. Bus operators can also provide advertisement space on buses for companies that need to promote their products as a strategy to generate more revenue.

Provide bus transit support infrastructure and facilities: For bus transit to flourish, it is critical that a suitable environment for its operation is provided and required support infrastructure is established. Transit support facilities such as bus stops, bus lanes and bus terminals helps to improve the operation, image and attractiveness of bus transport. Also, without these facilities, it is impossible to achieve modal integration and improve the efficiency of bus transit systems in the major cities like Kampala.

Establish public private partnerships (PPPs): PPPs are critical in attracting funding from both the government and the private sector to implement critical transit projects. PPPs also helps in allocating the investment risks more efficiently. Risks are allocated efficiently when they are given to the party best able to

manage them. In Kuala Lumpur, Tokyo, Singapore, Manila, Bogota and Bangkok, PPPs have been used by the government to provide soft loans (interest free loans) to transit firms to invest in new vehicles, expand their operations and reduce investment risks. Such partnerships and collaborations can also help the government to understand and appreciate the challenges faced by the private bus operators and to undertake the required interventions.

Promote passenger information systems (PIS): PIS has been used in many successful cities including Singapore, Hong Kong, Kuala Lumpur and Tokyo to foster bus transit operations and performance. PIS is based on technologies such as internet web sites, telephones, cellular phones television, LED displays, signboards, global positioning system (GPS), radio and smart phones. Through PIS customer satisfaction in using bus transit is easily achieved. PIS also helps in ensuring that travelers and drivers are able to make informed decisions regarding trip departures, optimum routes and available modes of travel.

Integrate the various urban transit modes including buses and rail transit systems: The current public transport system is not integrated. Currently, buses operate without bus stops, passenger interchanges and terminals which are critical in improving the attractiveness of bus transit and integrating various modes of transport. Modal integration can also be achieved by adopting a centralised network planning for all modes.

Introduce bus transit service standards and guidelines: As observed before, bus transit systems in Kampala operate without proper regulations and guidelines. Bus transit is also characterised by unscheduled services and unregulated fares. Bus services are unreliable, inaccessible and insufficient in many parts of the city. To address these challenges it is important that bus transit service standards and regulations are introduced and implemented. Introducing these standards and regulations would also help to safeguard the interests of the passengers and to monitor the performance of bus transit systems by the city authorities.

Adopt an integrated approach towards land use and transport planning: The links between land use and transport planning in the greater Kampala are still weak. As Kampala city has grown, it has also spread outward. Indeed, the lack of effective planning and land use controls has resulted in rampant sprawled development extending rapidly in all directions, far beyond old city boundaries into the distant countryside. That has greatly increased the number and length of trips for most citizens, forcing increasing reliance on motorized transport especially private vehicles. Several new housing estates have also been established by the real estate developers in the greater Kampala, without clear a strategy to provide public transport services including bus transit. Adopting an integrated approach towards land use and transport planning will therefore help increase urban densities and create required bus transit demand in the greater Kampala.

Train more transport and logistics professionals: The public transport sector in Uganda is faced with a serious shortage of experienced and skilled bus managers, regulators and drivers. Efforts to train more transport and logistics professionals in the country have also been adversely affected by the continued dominance of the informal transport systems which may not require professional knowledge to operate. Addressing this challenge will therefore require undertaking capacity building within government agencies as well as the private sector to meet the professional expertise at institutional and individual levels. Also, efforts should be made to formalise the informal transport sector as a way of creating job opportunities for the trained transport and logistics professionals.

Improve traffic flow management: Improved traffic management is critical in improving the average public transport speeds in large cities like Kampala. Frequency of buses can be achieved by providing designated bus lanes, signalling key road junctions, improving the road infrastructure and establishing a traffic control centre that will enable the coordination of traffic management activities across the region in the real time using intelligent transport systems (ITS) such as variable message signs (VMS), telecommuting and the use fixed intelligent cameras along major highways.

Promote the use of cleaner fuels: Continued dependence on fossil fuels such as gasoline and diesel means that bus transit is insufficiently contributing to the reduction of carbon emissions as well as climate change mitigation efforts. A shift from fossil fuels to cleaner fuels will also require the adoption of a strategy to popularise the use compressed natural gas (CNG), Liquefied petroleum gas (LPG), ethanol and electricity. Such fuels are already in use in some cities in Iran, Estonia, Germany, United Kingdom, Turkey, China, the U.S., Brazil and Malaysia.

VIII. CONCLUSION

The main objective of this study was to assess and explicate the operation and performance of stage bus transit in the Greater Kampala in view of the region's recent experience. Stage buses play an important role in transporting people in the major cities in Uganda and across the globe. Buses also represent a key element of urban sustainability and green mobility. Findings shows that bus operations in the Greater Kampala have been adversely affected by the obstinate urban management challenges such as inadequate funding, traffic jam, urban sprawl, increased use of private cars, lack of public transport support infrastructure and facilities such as bus

lanes, bus terminals and bus stops, lack of enough experienced transport and logistics professionals as well as the continued dominance of para-transit systems (informal transport systems) such as minibus taxis (Mataus) and commercial motorcycle taxis (Boda Bodas). Journeys to work (commuting) also constitute a large proportion (61 percent) of trips made by bus transit. This implies that efforts must be made by both the bus operators and city managers in the greater Kampala to popularise bus transport among those travelling to participate in other human activities such as shopping, schooling and recreation. In addition, the recent expansion of the education sector in the greater Kampala offers several opportunities for bus operators to provide school shuttle services at reduced bus fares for the students. It is also recommended that the urban managers and bus operators adopt innovative strategies such as the diversification of the transit revenue sources to generate enough investable funds, promotion of public-private partnerships (PPPs), provision of transit support infrastructure such as bus lanes and bus terminals, promotion of passenger information systems (PIS) to aid travel decision making among passengers, introduce policies to integrate land use with transport planning as well as the introduction of transport demand management (TDM) measures.

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REFERENCES

- [1]. Armstrong-Wright, A. and Thiriez, S. (1987) *Bus Services-----Reducing Costs, Raising Standards*, Washington DC: World Bank
- [2]. Badami, M. G. and Haider, M. (2007) An Analysis of public bus transit performance in Indian cities, *Transportation Research Part A* 41 (2007) 961-981.
- [3]. Barter, P. (1999) An International comparative perspective on urban transport and urban form in Pacific Asia: Responses to the challenge of motorization in dense cities, PhD Dissertation, Murdoch University, Australia, 1999.
- [4]. Barter, P. (2000) *Urban Transport in Asia: Problems and Prospects for Higher-Density Cities*, Asia-Pacific Development Monitor, 2,1, Pp 33-66.
- [5]. Finn, B. and Mulley, C. (2011) *Urban Bus Services in Developing Countries and Countries in Transition: A Framework for Regulatory and Institutional Developments*, *Journal of Public Transportation*, Vol.14, No.4, 2011, PP.89-106.
- [6]. Friedrich-Ebert-Stiftung (2020) *Towards Recovery and Reform: Mitigating the Impact of COVID 19 on the Public Transport Sector in the Greater Kampala Metropolitan Area*, A Rapid Survey Report, Kampala: Friedrich-Ebert-Stiftung.
- [7]. International Growth Centre (2017) *a framework for initiating public transport reform in the greater Kampala metropolitan area*, policy brief, August 2017, Kampala, : International Growth Centre, Uganda
- [8]. Isa, H.B.M. et al. (2013) *Passenger information systems for public transport in Klang Valley: An Overview*, *Malaysian Universities Research Forum* 2013, (December 23-24, 2013, Bangi, Malaysia, Pp.364-381.
- [9]. Jamilah, M. (1995) *State Bus Operations in Kuala Lumpur: The Period Before Consolidation*, *Malaysian Journal of Tropical Geography*, Vol.26, No. 2, December 1995, Pp.111-120.
- [10]. Jamilah, M. and Kiggundu, A.T. (2007) *The Rise of the private car in Kuala Lumpur, Malaysia: Assessing the policy options*, *IATSS Research*, J.31, 31, 1-9 (2007).
- [11]. Ka'bange A. et al. (2014) *Paradoxes of establishing mass rapid transit systems in African cities-----A case of Dar es Salaam Rapid Transit (DART) system, Tanzania*, *Research in Transport Economics*, 48 (2014), 176-183.
- [12]. Kampala Capital City Authority (2016) *Multimodal Urban Transport Master Plan for Greater Kampala Metropolitan Area (GKMA)*, Technical Criteria Report 2016, Kampala: KCCA.
- [13]. Kiggundu, A. T. (2009) *Financing Public Transport Systems in Kuala Lumpur, Malaysia: Challenges and Prospects*, *Transportation*, 2009, Vol.36, Pp.275-294
- [14]. Kumar, A. (2011) *Understanding the emerging role of motorcycles in African cities: A political economy perspective*, Washington DC: World Bank
- [15]. Maunder, D.A.C. and Mbara, T.C. (1996) *Liberalization of Urban Public Transport Services: What are the implications?* *Indian Journal of Transport Management*, Vol.20. No.2, February 1996, pp16-23.
- [16]. Mbara, T.C. (2002) *Transport: How have African Cities Managed the Sector? What are the possible options?*, Paper Presented at the *Urban and City Management Course for Africa*, Uganda Management Institute (UMI), Kampala, Uganda, 4-8 March 2002.
- [17]. Mbara, T.C. (2015) *Achieving Sustainable Urban Transport in Harare, Zimbabwe: What are the requirements to Reach the Milestone?*, *Energy, Climate and Air Quality Challenges: The Role of Urban Transport Policies in Developing Countries*, 2-5 February 2015, Istanbul, Turkey, ITU MACKA Campus.
- [18]. Ministry of Works and Transport (2009) *National Transport Master Plan (2008-2023)*, Kampala: Ministry of Works and Transport.
- [19]. Ministry of Works and Transport (2010) *Road Safety Management Capacity Review in Uganda*, Final Draft Report, March 2010, Kampala: Consia Consultants.
- [20]. Morichi, S. (2005) *Long Term Strategy for Transport System in Asia Mega Cities*, *Journal of East Asia Society of Transportation Studies*, 6 (1-22), 2005.
- [21]. Munzilah, M.R. et al., (2013) *Bus operation, quality service and the role of bus provider and driver*, *Procedia Engineering*, 53 (2013)167-178
- [22]. National Planning Authority (2018) *Greater Kampala Economic Development Strategy (2017-2025): United Towards Job Creation, Improved Livability and Sustainable Development in Greater Kampala*, March 2018, Kampala: National Planning Authority

- [23]. National Planning Authority (2015) The Second National Development Plan (2015-2020), Kampala: National Planning Authority
- [24]. National Planning Authority (2021) The Third National Development Plan (2021-2025), Kampala: National Planning Authority
- [25]. National Planning Authority (2013) Vision 2040, Kampala: National Planning Authority
- [26]. Real Jr. J.R.R.G. (2010) The Multi-Franchise System in Public Utility Bus Operations: Effects on Market Efficiency, MBA Thesis, Far Eastern University, 2010.
- [27]. Saric, S. (2012) Possibility of improving passenger information system in bus transport using cloud services, Development 241-249.
- [28]. Smith, H. and Raemaekers, J. (1998) Land use pattern and transport in Curitiba, Land Use Policy, Vol.15, No.3, Pp.233.
- [29]. United Nations (2018) Mobility and NMT in Sustainable Urban Development –Role of City Developers, Intergovernmental Eleventh Regional Environmentally Sustainable Transport Forum, Mongolia, 2 October 2018, United Nations Centre for Regional Development, 2018.
- [30]. Webster, F.V. (1983) The Importance of Cost Minimization in Public Transport Operations, Crowthorne: Transport and Road Research Laboratory.
- [31]. World Bank (2017) From Regulators to Enablers: The Role of City Governments in Economic Development of Greater Kampala, Washington DC: World Bank
- [32]. World Bank (2005) A Study of Institutional, Financial and Regulatory Frameworks of Urban Transport in Large Sub-Saharan African Cities, July 2005, Washington Dc: World Bank
- [33]. Uganda Bureau of Statistics (2014) National Census Main Report 2014, UboS: Kampala
- [34]. Uganda Bureau of Statistics (2016) Uganda National Household Survey 2016/2017 Report, UboS: Kampala
- [35]. World Bank (2001) Cities in the Move: A World Bank Urban Transport Strategy Review, Draft Document, Washington DC: World Bank.
- [36]. MoWT. (2018). Situation Analysis of Urban Public Transport in Uganda. Kampala: Ministry of Works and Transport.