QUALITY OF PUBLIC TRANSPORT SERVICE IN THE CITY OF LUSAKA: A CASE STUDY OF THE MINIBUS SERVICE ON THE GREAT EAST ROAD.

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DECLARATION

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CERTIFICATE OF APPROVAL

The dissertation of Benson Choongo has been approved as fulfilling the requirements for award of the Masters of Science in Spatial Planning by the University of Zambia.

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DEDICATION

This work is dedicated to my wife Gift, my children Kelvin, Haclain, Joshua, Mutinta, Moses, Esther and Samuel. I have set the pace and I encourage them to follow.

ABSTRACT

Public transport is important for the well-being of any country in the world. Having a well-planned and efficiently managed transportation system brings many benefits to the people. Public transport is adversely affected by rising incomes, urban sprawl, and undeveloped road systems, spatial-development mismatches which worsens traffic conditions in the developing countries. Traffic congestion can contribute to poor quality of public transport service in the City of Lusaka. Service quality needs to be assessed to establish whether it meets the needs of the service users. Customers' assessments of quality of service include perceptions of multiple dimensions of the service. The research was done to assess the quality of public transport service on the Great East Road which had the second highest traffic volume of 31,000 vehicles per day in the City of Lusaka in the year 2009. The Independence Avenue had the highest at 47,000 vehicles per day. Primary and secondary data collection methods were used. The primary data was collected from key informants using interview guides and questionnaires while secondary data was collected through review of documents such as books, journals and others related to the topic.

Two methods of sampling namely Purposive Sampling and Convenience Sampling were used to determine the samples. A total of 20 minibuses, 20 minibus drivers and 20 commuters were therefore used in assessing quality of the public transport service on the study route. Five (5) institutions namely Departments of Physical Planning and Housing (DPPH) and Housing and Infrastructure Development (DHID), Lusaka City Council, (LCC), Road Traffic and Safety Agency (RTSA) and the Ministry of Transport, Works Supply and Communications (MTWSC) were used to provide information regarding the quality of public transport service on the study route and the City of Lusaka as a whole. Direct observations by the researcher was another method used for data collection to capture the actual prevailing situation regarding the subject matter. Observations were also made to achieve material truth and inductive reasoning. To assess the quality of service, The Reliability, Extent of Service, Comfort, Safety and Affordability (RECSA) approach which has five dimensions of quality of service was used. Findings showed that public transport service quality was unreliable, inadequate, uncomfortable, unsafe and unaffordable to service users. Recommendations such as the introduction of a Bus Rapid Transit (BRT) were made towards improvement of quality of public transport service according to the five dimensions of service quality assessment of RECSA.

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BRT	Bus Rapid Transit
CBD	Central Business District
CSO	Central Statistical Office
DHID	Department of Housing and Infrastructural Development
DPPH	Department of Physical Planning and Housing
ECMT	European Conference of Ministers on Transport
GIS	Geographical Information Systems
GIZ	Germany International Aid to Zambia
GPS	Geographical Positioning System
GRE	Great East Road
IDP	Integrated Development Plan
JICA	Japanese International Corporation to Africa
LCC	Lusaka City Council
MTWS	Ministry of Transport, Works, Supply and Communications
MLGH	Ministry of Local Government and Housing
NRDC	Natural Resources Development College
PPP	Public private partnerships
RATER	Reliability, Assurance, Tangibles, Empathy, Responsiveness
RECSA	Reliability, Extent of Service, Comfort, Safety and Affordability.
RTSA	Road Traffic and Safety Agency.
SACCOS	Savings and Credit Societies
SERVQUAL	Service Quality
UBZ	United Bus Company of Zambia.
UNZA	University of Zambia
USA	United States of America
ZESCO	Zambia Electricity Supply Company

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Public transport is important for the well-being of any country in the world. There are many benefits that come from having a well-planned and efficiently managed transportation system. The benefits go beyond the transport field itself to benefiting industry, people's mobility and good communications (Mistro, 2010). Urban transport can contribute to poverty reduction both indirectly through its impact on the city economy and hence non-economic growth, and directly through its impact on the daily needs of poor people *(*Carruthers et al., 2005). However, rising incomes, urban sprawl, undeveloped road systems, and spatial-development mismatches have worsened traffic conditions in cities of the developing world such that public transport is adversely affected (Chin, 2011). The worsened traffic conditions have contributed to unreliable, unsafe, uncomfortable and unaffordable public transport system. According to Mokonyama (2012), public transport is important to so many people thus quality of service cannot be overlooked. Quality of public transport services in most sub-Saharan African cities is poor, mainly as a consequence of inadequate institutional, financial and regulatory arrangements **(**Adam Smith International, 2005). In the year 2005 research in Kenya revealed that in the cities of Dakar, Douala, Kampala and Nairobi, there is a serious problem of traffic congestion. The problem was exacerbated by poor quality roads and lack of effective traffic management (Adam Smith International, 2005). The quality of public transport service provided has remained a challenge for most public transport organizations partly because of the challenge of measuring service quality and partly because commuters do not perceive quality as a uni-dimensional concept. Customers' assessments of quality include perceptions of multiple dimensions of the service (Govender, 2014).

Zambia being a Third World country in Africa, needs to have a viable economy through an effective transport sector that will convey goods and labour from one point to the other (Mubita, 2010). To achieve this end there is need to improve the quality of public transport service in urban areas especially in the City of Lusaka, which is the capital city of Zambia, particularly on the study route which is a major road artery in the City. Improving the quality of service means making the service more responsive to the needs of the service users since the quality of public transport service determines the level of its usage. The City of Lusaka has not been exempted from the public transport woes facing other cities in Africa and elsewhere. According

to Chikuba (2014), the people of Lusaka have for a long time endured serious public transportation failures which have complicated their mobility. Lusaka's population in 2014 was 1,747,152 and the city was the fastest growing in Sub- Saharan Africa, ranked second on the MasterCard African Cities Growth Index 2012 – 2017 in terms of growth potential, Accra in Ghana topped the list. Lusaka is the largest city in Zambia and the seat of Government. However the mass transit system in Lusaka is in chaotic (Chikuba, 2014). According to JICA (2009), the Great East Road (GER), one of the major trunk roads in the city, was the second most congested road in the year 2009, with traffic volume of 31,000 vehicles per day. The most congested road in the city was the Independence Avenue with a traffic volume of about 47,000 vehicles per day (JICA, 2009). Among the types of motor vehicles that use the GER are minibuses and taxis which convey passengers to and from the City Centre (Mubita, 2010). Minibuses are the major public transport mode on the study route. The focus of this study is on the quality of the minibus service as the major public transport mode in the City of Lusaka and the Great East Road in particular**.** Section 1 gives an introduction and the background to the study, aim of the study, the problem statement, research objectives and the research questions. Section 2 provides a review of the literature on the subject. Section 3 deals with the research methodology and describes the study area. It also outlines data collection and data analysis methods. Section 4 provides the research findings. Section 5 discusses the findings. Section 6 provides conclusions and recommendations.

1.2 Statement of the Problem

Just like it is in Cape Town, and other cities in South Africa where public transport is inadequate and ineffective in meeting users' needs (University of Cape Town, 2011), the current provision of the public transport service in Lusaka leaves much to be desired. Public transport service in Lusaka is inadequate and ineffective. Among the factors that contribute to this situation is traffic congestion which causes delays in the movement of the public transport vehicles. Increased traffic congestion can reduce economic productivity, increase pollution, increase costs to society, compromise with road safety, cause stress and can lead to urban inefficiency (Government of Ireland, 2006). There are a number of factors inherent in public transport service that influence quality of service that need to be improved if quality of service is to be enhanced. These factors include reliability, extent of service, comfort, safety, and affordability. These factors have the potential to influence the quality of public transport service provided in any city (Nolan, 2007).

The City of Lusaka is faced with the challenge of traffic congestion, especially during peak hours of the day on working days from 07: 00 to 08:30 hours, 13:00 to 14:30 hours and 16:30 to 18:00 hours. The Great East Road in particular faces the serious challenge of traffic congestion. Although the study route stretching from Zambia Electricity Supply Corporation (ZESCO) Bus Stop to Chelstone Bus Station (Water Tower) has been expanded from a two-lane road to a four-lane dual - carriageway, traffic congestion has persisted (JICA, 2009). Since traffic congestion can compromise safety and the quality of public transport service (Nolan, 2007), the purpose of the study was to assess the quality of public transport service on the study route as perceived by commuters, minibus drivers and to get the views of public institutions responsible for public transport service management in Zambia and the researcher to make observations related to the study. Eboli and Mazzulla (2007), asserts that the quality of public transport service must be satisfying to customers if it is to be appreciated. Churched, et al. (2012), also assert that customer satisfaction is the most important factor when assessing the acceptability of a product or a service. A public transport service which satisfies the needs of customers must be sought in order to improve the welfare of the people.

1.3 Significance of the study

The study will provide an insight into the quality of the local bus service on the study route. The study will also show the effect of traffic congestion on the public transport service. It will also show how reliability, extent of service, comfort, safety and affordability can affect the quality of public transport service. The study will provide an insight into traffic congestion and current quality of public transport service on similarly congested roads in the city of Lusaka such as the independence Avenue, Chilumbulu, Burma and Kafue roads thereby providing a useful feedback to institutions involved in public transport services management, such as Road Transport Safety Agency(RTSA), Ministry of Transport Works Supply and Communications (MTWSC), Ministry of Local Government and Housing (MLGH), and the Lusaka City Council (LCC). The information will also help in traffic management in the City and inform the planning and policy formulation processes. The study will also contribute to existing literature on public transport service quality in the city of Lusaka and Zambia as a whole.

1.4 Aim

The aim of the study is to examine the quality of public transport service on the Great East Road between ZESCO Bus Stop and Chelstone Bus Station in the City of Lusaka.

1.5 Objectives

The objectives of the study are;

1) To assess the reliability of public transport service on the study route.

2) To assess the extent of public transport service on the study route

3) To assess the comfort of public transport service on the study route.

4) To assess the safety of public transport service on the study route.

5) To assess the affordability of the public transport service on the study route.

1.6 Research Questions

The research questions posed in the study were;

1) What is the travel time on the study route?

2) What is the extent of public transport service on the study route?

3) How comfortable is the public transport on the study route?

4) What are the risks of using public transport on this route?

5) What are the fares of the public transport service on the study route?

1.7 The Study Route

The route studied is the Great East Road, a stretch of 11.6 km from ZESCO Bus Stop to Chelstone Bus Station (Water Tower). The study route is located in the City of Lusaka. Lusaka is the Capital City of Zambia and seat of the government (Central Statistical Office, 2012). The study route was selected because of heavy traffic congestion especially during peak hours. The route had the second highest traffic volume in the City in the year 2009, after the Independence Avenue (JICA, 2009).

The Great East Road was also selected as the study route because it is a very important access road to several important facilities such as North mead shopping centre, Manda Hill, Arcades and East Park Malls, Levy Mwanawasa Hospital, National Assembly (Parliament), National Show grounds, the highest Institution of learning in the Country, the University of Zambia as well as residential areas of Rhode spark, Olympia Park, Kalundu, Chudlegh, Chainama, Avondale, Chelstone just to mention a few. It is also the access road to Kenneth Kaunda

International Airport the main entry and exit point into and out Zambia for those who use air transport. The major mode of accessibility to these public and private facilities is public transport using minibuses. The study route was identified using Geographical Positioning System (GPS) and data processed using Geographic Information System (GIS) a computer based software. The map of the study route showing locations of Minibus Stations and Bus Stops from ZESCO Bus Stop to Chelstone is shown in Figure 1.1.

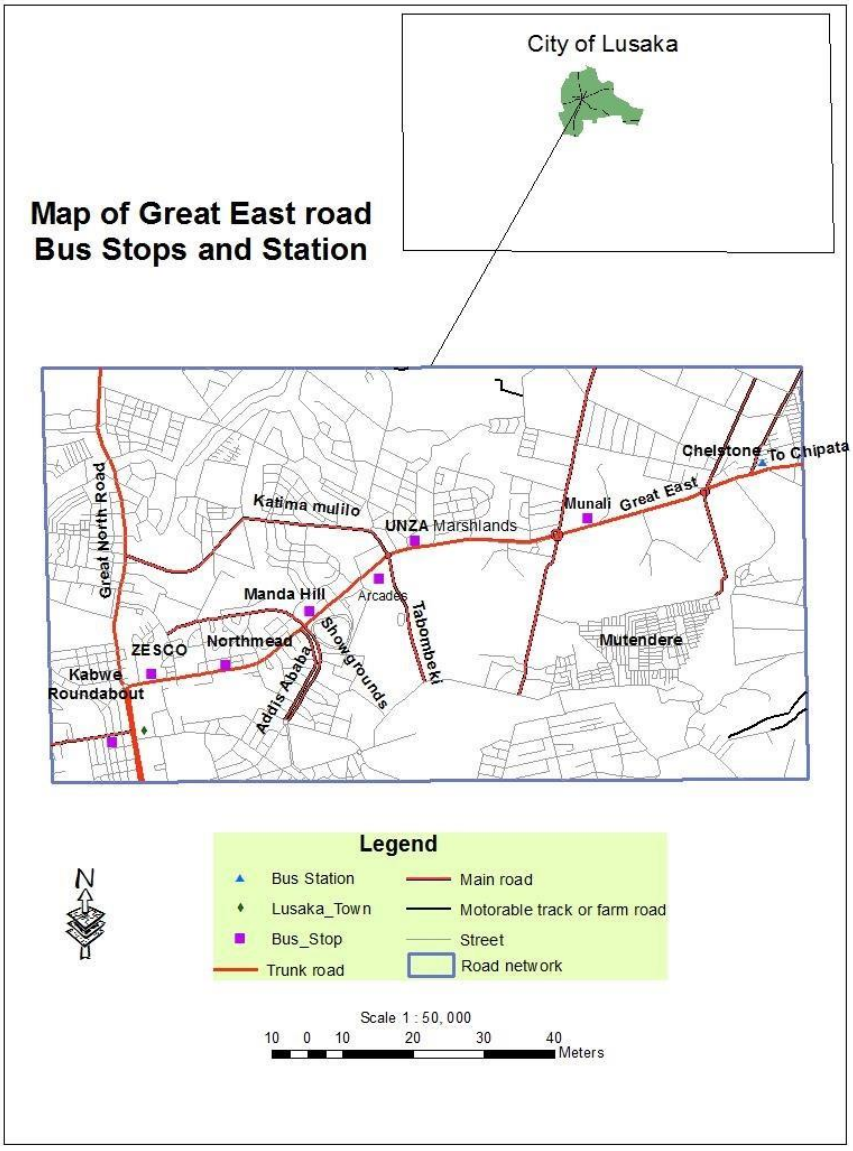

Figure 1.1 Location of Bus Station and Bus Stops on the Study Route
Source: Moola Akafumbe, Department of City Planning, Lusaka City Council (2019).

Figure 1.1 shows major minibus bus stops and station on the study route from Kabwe round about to Chelstone. These include ZESCO Bus Stop, Northmead, Manda Hill, Arcades, University of Zambia (UNZA), Marshlands, Munali, Chainama and Chelstone Bus Station

among others. These bus stops and bus station are spread over a distance of about 11.6 km. The major roundabout such as Kabwe round about, East Park Mall, Munali and Natural Resources Development College (NRDC) have been included on the map. Major cross roads along the study route have been shown on the map. Traffic lights are used at some of these places such as the one near ZESCO Bus Stop, Bwinjimfumu and Manda Hill and East Park Mall. These crossroads during peak hours fail to manage traffic situation. This attracts police officers who stand on the road and controlling traffic flow, a situation that shows that traffic congestion is a problem. To make crossing of the study route by pedestrians two foot bridges have been constructed at Manda Hill and UNZA. However, few people use these bridges because of the complexity of climbing and descending when crossing of the road.

1.8 Organisation of the Dissertation

This dissertation has five chapters. Chapter one introduces the study. It also covers the statement of the problem where the main reason for the study is given, main objectives, the research questions and the nature of the study area. Chapter one is followed by chapter two which covers literature review. This is where written information on the subject matter is provided. Public transport service in cities generally is discussed followed by public transport service in Zambia. Attributes and measurement of quality of public transport service and case studies are also covered under this heading. Chapter three discusses the research methodologies under which the sampling techniques, data collection methods and data analysis are discussed. This is followed by chapter four which provides information about the research findings and discussions on the results. The last part of this study is chapter five and provides the conclusions and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Providing a quality public transport service for citizens is the quest that governments around the world find themselves involved in in order to enhance people's mobility and thereby improve productivity. According to Mudzengerere and Madiro (2013), urban transport is crucial for the movement of goods and people which is the backbone of the economy and sustainable development. Public transport therefore should be improved to meet the required standards in order to improve the quality of life of communities. In the context of the study public transport will be discussed under three headings namely, an overview of public transport service, public transport service in cities and public transport service in Zambia.

2.2 Public Transport Service Overview

Public transport service quality refers to how well the system achieves its intended goals and objectives (Carrasco, 2011). Public transport service enhances people's mobility and thereby contributes to the wellbeing of commuters. Among the World Bank's goals of economic development, growth and poverty reduction are the Bank's interventions to maintain or increase transport access and affordability for the poor (Amos, 2004). Increase of access to public transport for the poor is necessary because public transport is generally the mode used by the poorer members of the community, who depend on it for their daily commuting, while the private motor car is reserved for the privileged few who are able afford (Mashiri et al., 2010**;** Govender, 2014). A poor quality public transport service constitutes a substantial financial burden to the people in the low income group and has negative implications for socioeconomic equality (Barter, 1999; Booth *et al.*, 2000; Diaz *et al.*, 2007). When a public transport service fails to address the concerns of the community especially those of the poor, then it ceases to be relevant to the needs of the people.

2.3 Public Transport Service in African Cities

Public transport service offered in many cities in the world face many challenges. In Africa public transport service consists of large number of minibuses, taxis and motorcycle operators. Cities such as Dakar in in Senegal, Kampala in Uganda, and Nairobi in Kenya and Douala in Cameroon are served mainly by minibuses ranging in size from 14 to 25 seater capacity. In Douala, the minibus sector was effectively suppressed in order to protect the conventional bus operator and its place has been taken by shared taxis and motorcycle taxis (Adam Smith

International, 2005). In the four cities mentioned above, minibus and taxi drivers normally hire their vehicles from the owners, though there are still some owner's drivers. Drivers are responsible for fuel purchases while owners of minibuses are responsible for all maintenance work (Adam Smith International, 2005). They are the get the money made in the minibus service business. In the Cities of Douala and Dakar, the custom is for the day's work to be split between two drivers, each working around eight hours, while in Nairobi and Kampala, there is normally only one driver, working a daily 12 hour shift (Adam Smith International, 2005). It is clearly seen therefore that what is prevailing in Lusaka's public transport sector is similar to other cities affirming that the public transport challenges the city of Lusaka is facing are not unique to Lusaka alone. The City has a public transport service that is dominated by privately owned minibuses and taxes whose quality of service is of great concern to commuters and other service users.

Providing a service which is adequate and appropriate is the challenge that is encountered in almost all cities in the world (Wijaya, 2000). The provision of quality public transport service is a challenge in many countries including countries in the developed North. In Ireland studies have revealed that although there has been little change in the average distance to the workplaces since the year 2002, yet the time taken to and from work has increased (Government of Ireland, 2007). Road traffic congestion is also evident in many other different regions of Europe although traffic congestion levels, growth rates and distributions differ widely between countries and regions (European Conference of Ministers on Transport, 1999).The increased time taken to work in European cities is as a result of traffic congestion, clearly demonstrating that traffic congestion challenges are not unique to the Global South alone. Lessons on how to improve the quality of public transport service can therefore be drawn from cities both in the global South and the global North.

The reliability of the public transport service is critical to the wellbeing of the transport system. When public transport service is improved, reliability has the potential to enhance the mobility of the public transport vehicles and induce private car users to switch mode to the public transport and reducing waiting time and travel time results in more commuters being attracted to use public transport (Carrasco, 2011). There is therefore need for public transport operators to improve the reliability of the service in order to attract new passengers, retain existing ones,

and garner as much support as possible for their service (McKnight et al. 1986; Zeithaml and Bitner, 2000).

2.4 History of Public Transport Service in Zambia

The public transport service quality problem in Zambia came about because of the European settler community who only looked at their interests at the expense of the indigenous people's interests. The settler community did not envisage an emergent African population. The mining of copper led to increased rural – urban migration resulting in increased urban settlements of Africans This increased the number of urban settlements resulted in high demand for public transport to easy movements within cities and towns in the 1980s and 1990s.

The economic recession of the 1980s and 1990s led to an increase in privately owned minibuses which provided the much needed public transport service. The liberalisation of the economy from the year 1991 to 2000, saw the liberalisation of public transport (Chikuba, 2014). The parastatal public transport company, UBZ collapsed. The government in an effort to resolve the matter merged the United Bus of Zambia with Contract Haulage to improve quality of service but nothing much was achieved (Chikuba, 2014). Duty on imported buses was removed and more and more buses came into the economy without accompanying policy direction resulting in the public transport situation existing today. The liberalisation of the public transport sector has come with it new challenges especially related to the quality of service provided.

2.5 Minibuses as Mode of Public Transport Service in Zambia

A minibus is a small bus with sitting capacity of between 8 to 30 passengers. The minibuses in Zambia comprise mainly the 14 seater, 16 seater and 30 seater buses. They usually operate on local routes within a city. Minibus ridership in Lusaka in 2014 was estimated at 453,000 passenger trips per day on over 10,000 vehicle trips for the city with over 1,747,152 people, which represents low minibus ridership (Chikuba, 2014). On average a minibus covered 72 km a day. This was significantly lower than the international benchmark of 200-300 km per day.

2.5.1 Minibus Service in the City of Lusaka

The minibus service in Lusaka is the main mode of public transport in the city mainly providing transport to commuters on local routes within the City. Figure 2.2 shows a picture of 14 seater minibuses.

Figure 2.1 Sixteen (16) Seater Minibus Lusaka, Zambia
Source: Google 2015

2.6 Traffic Congestion in Zambia

Traffic congestion in Zambia has been increasing over the years, particularly after 1991 when the economy was liberalized and individuals were allowed to import motor vehicles into the country (RTSA, 2015). In 2015 traffic congestion was increasing at 210 registered vehicles per day. In Lusaka, the increased flow of motor vehicles into the country has resulted into traffic congestion and traffic jams on all major routes leading into the Central Business District (CBD) (JICA, 2009).

The Great East Road in particular experiences heavy traffic congestion during peak hours of the day. The area close to Kabwe Roundabout, Flyover Bridge and Addis Ababa traffic lights at Manda hill Shopping Mall experience the worst traffic congestion on the study route since the traffic volume on the study route was 31,000 vehicles per day in 2009 (JICA, 2009). Table 2.2 shows the cumulative increase in the number in the number of motor vehicles registered in the country from 2009 to 2014.

Table 2.1 Motor Vehicles Registered, 2009 - 2013

Year	Cumulative motor vehicle population	Vehicles Registered	Total No of Vehicles in Zambia Each Year	Percentage of vehicle registered %
2009	307,241	29,371	331,612	9%
2010	337,513	30,272	367,785	8.2%
2011	381,948	44,435	426,383	10.4%
2012	452,574	70,626	523,200	13.5%
2013	534,532	81,958	616,490	13.3%

Source: RTSA (2015)

Table 2.1, shows clearly that the number of vehicles in Zambia has been increasing over the years. The increase in the number of vehicles each year entails that corresponding infrastructure services must be provided in order to mitigate against the increase in traffic congestion in large cities and Lusaka in particular. The Great East Road (GER) being one of the most traffic congested roads in the City.

2.7 The Number of Motor Vehicles Registered by RTSA per Province 2009 to 2013

Table 3 shows the vehicle population in Zambia by geographical locations between the years 2009 and 2013 in each province of Zambia. Table 2.3 Number of Vehicles Registered per Province 2009 – 2013.

Table 2.2 Number of Motor Vehicles Registered by RTSA per Province 2009 to 2013

Province	2009	2010	2011	2012	2013	Total	Percentage of gross total
Southern	2,114	2,179	3,199	5,085	5,900	18477	7.21
Luapula	176	242	355	424	492	1689	0.66
Northern	441	454	667	1,059	1,229	3860	1.51
Eastern	29	30	44	71	82	256	0.10
North Western	234	242	355	565	656	2052	0.80
Western	27	28	41	66	77	239	0.09
Central	476	490	719	1,144	1,327	4156	1.62
Copper belt	8,106	8,355	12,264	19,493	22,620	70838	27.63
Lusaka	17,711	18,254	26,794	42,587	49,420	154766	60.38
TOTAL	29314	30274	44438	70494	81803	256333	100

Source: RTSA (2015)

The figures in Table 2.3 shows that the number of vehicles has been increasing over the years from 29314 in the year 2009 to 256333 in 2013. An increment of this nature in the ownership of vehicles requires an equivalent provision of road infrastructure. A mismatch between the two can result in road traffic congestion as evidenced in the City of Lusaka today. In all the provinces the population of vehicles has been increasing at a fast rate such that traffic congestion problem may be expected to increase in every province of Zambia. Traffic congestion in the Cities such as Kitwe and Lusaka, Copper-belt and Lusaka provinces respectively may become a serious problem as can be observed from the Table 2.3. This information can help us to plan how the mobility of goods and people could be managed to ensure that the number of vehicles entering the country does not become hindrance to socioeconomic development but assets.

Table 2.3 Public Transport Service Motor Vehicles Registered 2009 - 2013

	2009	2010	2011	2012	2013	Total	Percentage of the total
Light passenger Vehicles	19,384	19,979	29,327	46,613	54,092	169394	98
Heavy Passenger Vehicles	481	496	728	1,158	1,344	4207	2
TOTAL	19,865	20,475	30,055	4,7,771	55,436	173601	100

Source: RTSA, 2015.

2.7.1 Public Transport Service Motor Vehicles Registered 2009 - 2013

According to RTSA (2015) 98 percent of public transport vehicles in Zambia were light passenger vehicles during the period 2009 and 2013 while only two percent were heavy passenger vehicles. The population of light passenger vehicles or minibuses over the years has been on the increase. In the year 2009 the number stood at 19,384 but by 2013 the number had increased to 54,092. The number of heavy passenger vehicles also has been increasing from 481 in 2009 to 1,344 in the year 2013.

2.7.2 Traffic Congestion and Construction of New Roads

Traffic congestion has been one of the major problems affecting the liveability of cities not only in Africa but world over. Many nations have sought to resolve this problem by constructing new roads and expanding existing ones. In Lusaka the Great East Road is one of the most congested road. This road was expanded from two lanes road to a four lane duo carriage way in order to ease the traffic congestion. Mbara (2006) asserts that income increments and public welfare improvements, raise the people's ability to buy vehicles resulting into increased road traffic congestion resulting into serious traffic situations. The problem of traffic congestion is usually is resolved by increasing the number of roads lanes. However adding highway lanes to deal with traffic congestion is like loosening your belt to cure obesity (Carruthers, et al. 2005). As new roads are constructed and old roads expanded, more cars are bought and fill the roads. There is a vicious cycle; the more cars there are, the

more the congestion, the more the demand for roads, the more the number of cars. The cycle is illustrated in Figure 2.3.

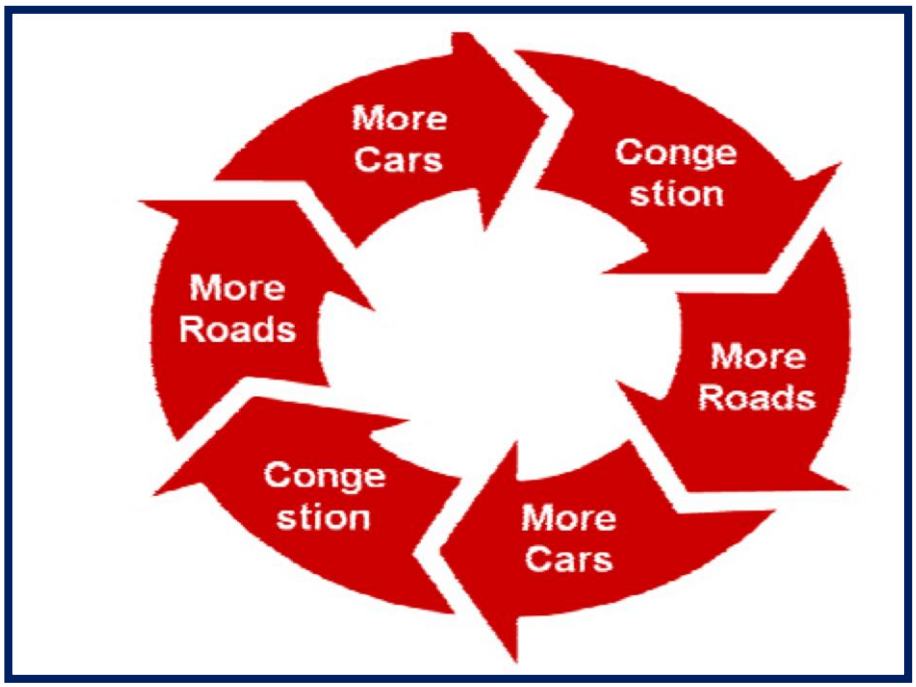

Figure 2.2 Concept of More Cars, More Congestion and More Roads.
Source: (Mbala, 2002).

2.7.3 Effects of Traffic Congestion

Traffic congestion affects people and the environment. According to Mudzengerere and Madiro (2013), rapid urbanisation in developing countries has resulted in high demand for transport facilities which in turn has led to infrastructure failing to cope up with the huge demand. As a result there are delays in movement, high travel costs, noise and air pollution and road carnage which negatively affected not only the rate of economic development but also quality of life of communities. However congestion levels, differ widely between countries and regions (ECMT, 1999). Traffic congestion is evident in both the developing and developed world and causes many problems to human life. Brierley (1962) states that traffic congestion is like a disease which if not treated will bring death to the heart of the city (Brierley, 1962). This is because the number of vehicles keep on increasing in cities and unless solutions are sought, traffic situations will only become worse. Mudzengerere and Madiro (2013), state that, “traffic has to a greater extent contributed to global warming and this is causing climate change. Traffic congestion is a challenge that needs resolution in order to improve the quality of life of communities now and in the future.

2.7.4 Traffic Congestion and Parking Space

Parking plays a significant role in easing the traffic situation in a city. Mudzengerere and Madiro (2013), assert that, during working hours most car owners will need parking spaces. Lack of parking facilities can result into traffic congestion in the CBD which is referred to as City decay and is associated with poor traffic management measures. Traffic congestion also brings negative effects on people's emotional state (Mudzengerere and Madiro, 2013).

2.7.5 Traffic Congestion and Sustainable Development

Traffic congestion does not only affect people today but also future generations. Sustainable Development means that we should presently enjoy the environment without compromising the ability of the future generations to enjoy it. According to UN-Habitat (2006), traffic congestion contributes to environmental pollution in cities and towns which is a health hazard to human beings and animals. Pollution undermines the use of resources for the benefit of future generations (Mudzengerere and Madiro, 2013).Traffic congestion should be managed well in order to promote sustainable development. Public transport use should be promoted in the place of private cars to promote modal shift from private car use and thereby promote sustainable development. Traffic congestion affects future generations due to slow speeds which allow longer hours of pollution of the environment resulting in environmental degradation.

2.8 Attributes and Measurement of Quality of Public Transport Service

Public transport service quality is influenced by several factors. These factors can promote positive or negative effects on the performance of the public transport service in a community. Travel time of buses is an important attribute of a public transport system. A reduction in travel time variability, increases quality and quantity of service. In most cases traffic congestion is responsible for an ineffective and inefficient public transport service. According to Parasuraman *et al.* (1986), both academics and practitioners argue that measuring quality of service is an abstract and elusive construct because of its intangibility, heterogeneity and inseparability of production and consumption in contrast to the quality of goods, which can be measured objectively by such indicators as durability and number of defects. Therefore, in the absence of objective measures, a useful and appropriate approach to assessing the quality of service in the public transport sector, would be to measure the commuters' perceptions of quality (Dodds and Monroe, 1985 cited by Govender, 2014).

In assessing the quality of service a number of methods have been used. These methods are SERVQUAL, RATER and RECSA. The SERVQUAL method assesses eight performance categories of public transport service, namely, availability, service delivery, safety and security, maintenance and construction. Economic factors include community, capacity and travel time (Carrasco, 2011). The RATER approach reduced the variables that constitute service quality from eight to five, namely, Reliability, Assurance, Tangibles, Empathy, Responsiveness (Parasuraman *et al.* 1988). The RECSA approach model also has five dimensions of service quality though these are different from those of RATER. However, in order to avoid the complexities of analysing performance which SERVQUAL and RATER entailed, RECSA is preferred over the other two models (Govender, 2014). The five dimensions in RECSA are Reliability, Extent of service, Comfort, Safety and Affordability. These models seems more practical in developed countries. However African countries such as Kenya and South Africa have started implementing these same models as they provide much simpler way of resolving public transport challenges. According to the RECSA approach, reliability refers to departure time, travelling time and arrival time; extent of service refers to service availability during the day, evenings, holidays and weekends; comfort refers to guaranteed seat, smooth ride, air conditioning and sheltered waiting areas; safety refers to low risk of accidents, falling and theft while affordability refers to cheap affordable fares and value for money. Govender (2014) and Adam Smith International (2005) state that, it is important that the transport system is as safe as can reasonably be and expected to attract more users. Perceptions of the Public Transport service in this study will be evaluated using RECSA.

2.8.1 The Dimensions of Quality of the Public Transport Service

The dimensions of quality of the public transport service according to the RECSA approach are reliability, Extent of Service, Comfort, Safety and Affordability. These are discussed here below.

2.8.2 Reliability of the Public Transport Service

Public transport service reliability refers to the ability of the transport system to perform the service dependably and accurately in terms of service punctuality, adherence to timetable (including arrival at destination, journey length, and communications) and adherence to scheduled routes (McKnight *et al.,* 1986; Govender, 2014). People using public and private transport will be concerned that journey times are not excessively extended because of congestion (Adam Smith International, 2005). This is why travel time of buses becomes

important for the wellbeing of the public transport system as well as commuters. Travel time variability refers to the variation in travel time of public transport from point of origin to destination. Public Service reliability is therefore the ability of the public transport system to arrive on time, notification of delays, waiting away from home and delays en-route (Govender, 2014).

In regulated markets, public transport is usually the responsibility and monopoly of state financed local authorities, who are in charge of organizing a service of quality at low fares. According to Guihaire and Hao (2008), where the private sector is in charge of the public transport service, social objectives such as the inclusion of captive users (the part of the population dependent on public transport) are predominant and services are ensured even though they are unprofitable. A subsidy of the public transport service would be required to make the service affordable by poor people.

2.8.2.1 Extent of Service of the Public Transport Service

Govender (2014), defines extent of service as service availability, the extent to which a public transport mode takes commuters to their exact destinations, and the friendliness of the frontline staff (McKnight *et al.*, 1986). The extent of service refers to the availability of the Service on working days, evenings, weekends and public holidays. Scheduling is an important factor in the extent of service (Govender, 2014). Service users require that the service provided should enable them to use it whenever they need. Customers believe that a good public transport service should be available much of the day and all days of the week.

2.8.2.2 Comfortability of the Public Transport Service

Service comfort involves the availability of service aesthetics, and includes the availability of seats and space (often referred to as passenger density), smooth journeys, the availability of air conditioning and the conditions of shelters (Litman, 2008). Research has revealed that travel time values (the cost people place on time they spend traveling) are affected by comfort and convenience. Transit travel time values are particularly sensitive to waiting area conditions (Todd, 2015). Comfort of the public transport system is required to make service users satisfied as these are key to the sustainability of the industry. Modern accessible buses in good repair must be used to provide service. Bus interiors and exteriors must be clean and well-maintained and buses must be operated safely (Todd, 2015). These attributes tend to attract new users to the public transport service and even to keep the existing customers to itself. The bus service

users sometimes choose slower but more pleasant travel options and are sometimes willing to pay extra for more comfortable seats, air conditioning, and traveller information among others. Increasing comfort, such as adequate space, comfortable temperature, cleanliness, quiet, and smooth vehicle movement has capacity to attract more users. This action would reduce dependence on private vehicles to using public transport and thereby reduce congestion, air pollution among other negative impacts. In a modern, affluent society consumers are accustomed to high quality goods and services. Most travellers place a high value on comfort, convenience and reliability. Motorists are able to express these values by paying extra for more luxurious vehicles, more convenient parking, and sometimes higher quality toll roads (Todd, 2015).

2.8.2.3 Safety of the Public transport Service

Safety is important to travellers every time they undertake their journeys. There is not a single person who would wish that their journey should be undertaken in a risky manner. A mode of transport that does not guarantee safety of the travellers would be less attractive and less preferred. Nowadays travellers choose the mode of transport they consider safer than others. According to McGovern, (2005), households are becoming more particular about how secure they were when undertaking day-to-day journeys The goal of service safety is to reduce vehicle fatalities and injuries and the associated costs by ensuring that transport operators maintain the minimum standards for both their drivers and their vehicles (McGovern, 2005).

Safety of the public transport service, according to Govender (2014), refers to the low probability of accidents, low probability of falling when boarding and disembarking and low probability of assault. The safety of a public transport service may be defined as the number of accidents involving a transport mode and refers to the passengers' fears that they are more likely to be involved in an accident as a result of using a particular transportation mode, the condition of vehicles, driving behaviour and not obeying the rules of the road (McKnight et al. 1986). Service safety is viewed from three, equally important angles, namely, safety of passengers, safety of drivers and safety of buses (McKnight *et al*. 1986). World-wide, there are estimated to be approximately one million road accident fatalities and 10 million people injured annually, many with long term disabilities (World Health Report, 1999).

The chances of accidents occurring in Zambia are high due to behaviour of some of the actors in the industry. Although it is a legal requirement for all minibuses in Zambia to have certificates of fitness from RTSA however the ease with which such certificates are obtainable implies that not all motor vehicles are road worthy even when they display a road worthiness certificate. There is therefore need to assess the safety of the public transport service to find out the quality of service offered by minibuses on the study route. This research focussed on one safety aspect only namely the probability of accidents occurring through observance of road traffic signs and speed limits.

2.8.2.4 Affordability of Public Transport Service

Affordability, according to Govender (2014), refers to cheap fares and value for the money paid in relation to the service being provided. Service affordability involves value for money and thus, includes fares charged by the public transport modes (McKnight *et al.,* 1986). Affordability is also defined cheap fares and value for money (Govender, 2014). Cervero (2013) assert that many potential passengers cannot afford to use public transport and are forced to walk long distances to work. A quality service therefore should be accessible by all income groups if is to contribute positively to the welfare of the community and the economy of the city.

In the developed nations like the United Kingdom (UK) public transport is also subsidized for certain categories of citizens. The government of the United Kingdom had undertaken and commissioned many studies on urban public transport with a view to making it more affordable, available and accessible (Carruthers *et al*., 2005). These studies revealed that a national scheme for providing subsidies to people in low incomes was important to make urban transport more affordable. Bus pass schemes in that country were limited to students and retired people. In some cities bus passes were given to the unemployed to make them mobile while looking for work. The largest subsidy, a rebate on the tax on fuel consumed by public transport vehicles, bears no relation to income or any other indicator of need (Carruthers *et al.,* 2005).

2.9 Case Studies of the Public Transport Service

Public transport service provision is quite a challenge not only in Zambia but world over. A case of the public transport service in Kenya and in Curitiba, Brazil, provide some interesting studies.

2.9.1 Public Transport Service in the City of Nairobi, Kenya

The City of Nairobi in Kenya like other cities in the developing world and elsewhere face serious challenges in the area of providing quality public transport service. The city of Nairobi like Lusaka, is the capital city of Kenya and houses government ministries and diplomatic offices. Nairobi is also a commercial, industrial, tourist and communications centre for the Eastern African region (Chitere *et al*., 2012). The dominant public transport system in Nairobi is the matatu industry that provides public transport service from town centre to areas of residence within the city. Figure 2.3 is a picture of the matatu minibuses.

Figure 2.3 Matatu Public Transport Service in Kenya
Source: Google (2015)

Figure 2.3 shows the matatu minibuses in action. The Matatu minibus service is similar in nature to the Zambian minibus service. It began as a quick and easy response to unmet travel demand in the late 1950s in the areas occupied by the local, usually too poor people who could not afford private vehicles. The main goal was to facilitate movement of these people and also make financial gains. The matatus are largely owned by middle-income people and offer public transport service from rural areas and informal settlements into the city (Chitere *et al*., 2012). They mostly use 30 seater minibus to do their business. These are well ventilated with large windows and provided with seats. They are designed to carry passengers as opposed to welded seats a situation common to the 14 and 16 seater minibuses commonly used in Zambia.

The Matatu industry has played a central role in the mobility, politics and economics of Nairobi. Nairobi finally became dependent upon the matatus for transport. The matatus comprise mini-buses and vans which are managed by individuals and various types of groups such as Savings and Credit Societies (SACCOs) and route associations (Chitere *et al*., 2012). An Integrated National Transport Policy was formulated in 2003 to improve quality of public transport service. This policy recommended the need to concession routes to SACCOs and bus

companies capable of operating efficiently and in affordable and safe manner (Chitere et al. 2012). The Policy recognized that public road transport services was mainly the matatus with a large number of smaller, 14 seater occupancy vehicles (Chitere et al., 2012).There was therefore need for a shift from the smaller to high occupancy vehicles which were more economical, able to reduce congestion and eliminate reckless driving that compromises safety in the city. There was also need to create infrastructure for the exclusive use of public transport vehicles. There was also need for concessioning or contracting of routes to established firms on a competitive basis in order to make public transport service effective and efficient (Chitere *et al.,* 2012).

The challenges of public transport services such as those in Kenya have led to reforms of public transport systems occurring all over Africa, most notably in the form of Bus Rapid Transit (BRT) in Tanzania, South Africa, and Nairobi, Kenya among others to shift to BRT system. BRT is an attractive option for cities in the Developing World as is the case in Bogotá and Colombia (Chitere et al. 2012). The BRT is a formal mode of transport operated by established firm(s) using large buses and trams running on dedicated bus lanes. This system offers off board fare payments, has limited number of stops and is efficient and reliable. However this kind of service is not yet operating in the City of Nairobi but efforts are already being made (Chitere et al. 2012).

2.9.2 Public Transport Service in the City of Curitiba, Brazil

The City of Curitiba in Brazil is a best practice model of a successful public transport system in the world. The bus system uses Bus Rapid Transit (BRT) service which is a backbone to public transport service and plays a large role in making Curitiba a liveable city (Goodman et al. 2007). Buses in this City run frequently, some as often as every 90 seconds between stations. Stations are convenient, well-designed, comfortable, and attractive (Goodman et al. 2007). This city has the most heavily used, yet low-cost, transit systems in the world. It offers many of the features of a subway rail system with vehicle movements unimpeded by traffic signals and congestion. The fares are collected prior to boarding enabling quick passenger loading and unloading. As opposed to underground trains, the system is above the ground and visible.

Around 70 percent of Curitiba's commuters use the BRT to travel to work, resulting in congestion-free streets and pollution-free air for the 2.2 million people. The system is hierarchical. Minibuses routed through residential neighbourhoods feed passengers to

conventional buses running on 5 routes around the central city and on inter-district routes (Goodman et al. 2007). Buses run in dedicated lanes, stop at cylindrical, clear-walled tube stations with turnstiles, steps, and wheelchair lifts. The system of same-level bus boarding, plus the pre-boarding fare payment, results in a typical dwell time of no more than 15 to 19 seconds at a stop (Goodman et al. 2007). To achieve a high quality public transport service Curitiba developed a comprehensive plan in 1943 to deal with envisioned exponential growth in automobile traffic. Then in 1965 due to rapid growth fears of unchecked development and congested streets, a new Master Plan was adopted which provided for adequate, well planned infrastructure which favoured smooth flow of public transport vehicles.

Curitiba is just one example of successful public transport projects in the world and lessons can be learnt a lot from these systems. These lessons are invaluable because Lusaka's population is increasing at a fast rate and demand for social services such as public transport has also increased. The Curitiba experience though it seems to be too advanced to compare with the Zambian public transport system is suitable case to learn from because it is cheaper to construct than ground railway system that is used in most developed countries such as the United States of America (USA), Britain among others. A number of countries like South Africa and Kenya are already moving towards use of the Bus Rapid Transit (BRT) system.
This system could be used to develop an effective public transport in Zambia.

2.9.3 Lessons Learnt from the Nairobi and Curitiba

There are a lot of lessons that can be learnt from the public transport service experience from the two Cities mentioned above to improve quality of service. The following are some of the lessons.

i. need for the introduction of the BRT system of public transport which is known for its efficiency, effectiveness and cheaper to construct compared to subway rail systems as demonstrated in Bogotá, Colombia, Brazil among others.
ii. Provision of infrastructure for exclusively bus use such as dedicated lanes for buses not interrupted by road traffic signs or police. iii. Replacing or intergrading smaller buses with large capacity buses to reduce congestion and eliminate recklessness of drivers.
iv. Introduction of pre-boarding fare payment, results in reduction in typical dwell time.

v. Preparation of a Master Plan which provides for adequate, well planned infrastructure which favoured smooth flow of public transport vehicles.

vi. The stations and bus stops that are convenient, well-designed, comfortable, and attractive.

vii. A hierarchical system of public transport is needed in which minibuses are routed through residential neighbourhoods to feed passengers to conventional buses which links these areas to the town centre.

viii. An Integrated National Transport Policy such as one formulated in Kenya is a requirement to address many transport challenges.

2.9.4 Conclusion

Public transport is very important component in the development of a country or region. It provides opportunity for all citizens to move to and from place of residence to work places. Literature has shown that public transport service quality is of great importance because it contributes positively towards socio – economic development of a country. The active population of a country is a greater resource to economic growth and relies more on the ability to get to work on time and back home. Literature has shown that without a vibrant transportation system in a country, movement of goods and people would be greatly affected which in turn would affect quality of life of the citizens. Public transport service quality in the world varies from country to country. The City of Curitiba for example enjoys the best practice form of service using large buses running on dedicated lanes. This system makes mobility of citizens easier as they undertake developmental activities in that country. However most developing countries such as Kenya and South Africa have public transport service quality which does not really meet the customer expectations. These countries have since started employing new measures towards improving their public transport systems. The two countries for example have started working towards introducing the Bus Rapid Transit (BRT) system that has worked effectively in other countries.

The City of Lusaka in Zambia and the Great East Road (GER) in particular which is experiencing rapid growth in the number of vehicles needs a better public transport service to beat transport congestion. A better transportation service would lure not only medium income people but all income groups in the economy and thereby reducing the number of people who will choose to be using private cars for business errands.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The study used qualitative approaches to collect and analyze data. Convenience sampling was used to select respondents both commuters and drivers of minibuses. Purposive sampling was used to select respondents from institutions. Primary data collection method was used to collect data from commuters and minibus drivers using questionnaires and interview guides for institutions. This data had to be collected in order to have an understanding on how the commuters, minibus drivers and institutions viewed the quality of public transport service offered on the study route. Secondary data collection method was done through literature review of books and other written materials. This was because no one events the will in the modern world. A lot of authors would have written materials on the subject before. It then becomes necessary to review what others have written about the matter under study before one could do further study on the matter.

The service quality dimensions (RECSA), originally developed by McKnight et al., (1986), were utilised in the development of the questionnaires in line with, Govender, (2014). The questionnaires were prepared based on RECSA model which takes into consideration five dimensions of service quality namely Reliability Extent of service, Comfort, Safety and Affordability. RECSA assesses perceptions of respondents to determine quality of service. This is because there is no one single formula that can be used to measure service quality since it is intangible. Other approaches include SERVQUAL and RATER. The SERVQUAL method assesses eight performance categories of public transport service, namely, availability, service delivery, safety and security, maintenance and construction. Economic factors include community capacity and travel time (Carrasco, 2011). The RATER approach reduced the variables that constitute service quality from eight under SARVICAL to five, namely, Reliability, Assurance, Tangibles, Empathy, Responsiveness, (Parasuraman et al. 1988). Although the RECSA approach model also has five dimensions of service quality they are different from those of RATER and in order to avoid the complexities of analysing performance which SERVQUAL and RATER entailed, RECSA was preferred over the other two models (Govender, 2014).

3.2 Sampling Techniques

Sampling according to (Chosh, 1992; 229), means that, "*only a part of the population or only a group of units is taken into consideration. Under this kind of enquiry, a part of the aggregate is selected to represent the whole universe*." Two main methods of sampling were used in this research. These were Convenience sampling and Purposive sampling. In addition, Observations were made to achieve material truth and inductive reasoning.

Convenience sampling is used where the, "*investigator selects certain items according to his convenience. There is no pre planning necessary for the selection of items. The method is applicable in those cases where the universe is not well defined, sampling unit is not clear and a complete source list is not available,"* (Chosh, 1992; 235). The researcher was not able to know in advance which of the commuters or drivers was going to be willing to be interviewed. This kind of information was only established after a person was approached and cooperated with the interviewer. In some cases commuters and drivers walked away on the interviewer, showing that they were not interested in the interview or were too busy for the interview. In this case the interviewer would leave those but approach some more people for the interview until the required sample was attained. This exercise was time consuming and required patience on the part of the researcher. Convenience Sampling was used for respondents who were picked based on convenience including those who were willing and had time to be interviewed. A sample of 20 bus drivers and 20 commuters were interviewed. Drivers were interviewed at bus stations and bus stops while waiting to load their minibuses. Some were interviewed at Chelstone Bus Station and while others at ZESCO Bus Stop. Commuters were interviewed while travelling on minibuses on the study route.

Purposive sampling was used to collect data from institutions. Purposive sampling is "*where certain units are selected purposively for judgement by researchers. In this selection, the researchers try to make the selection as representatives. The selector should select the relevant and representative samples as far as possible,"* (Chosh, 1992; 234). Five institutions, namely, Department of Physical Planning and Housing (DPPH), Department of Housing and Infrastructure Development (DHID), Lusaka City Council (LCC), Ministry of Transport, Works, Supply and Communications (MTWSC) and Road Transport and Safety Agency (RTSA) were selected under this method because they were relevant and key to the subject under discussion. The Department of Physical Planning and Housing is responsible for land use planning to ensure that there is orderliness, harmony and coordination in the development

of land. Land use planning ensures that road infrastructure is well planned so that there is convenience in movement of goods and services in the City. The Department of Housing and Infrastructure Development is responsible for the actual works putting up the infrastructure such as roads and markets in line with land use plans produced under the Department of Physical Planning and Housing. The Lusaka City Council is the Planning Authority for the City of Lusaka and has the mandate of land use planning as well as ensuring that the right kind of development goes in the right place at the right time in the City. The Council does this through the implementation of the Integrated Development Plan (IDP) the plan that provides basis for all kinds of socio economic development. The Ministry of Transport, Works, Supply and Communications is responsible for policy formulation in the management of transport to ensure that there is orderliness in the transportation of goods, services and people in the City of Lusaka and Zambia as whole. Lastly Road Transport and Safety Agency is an agency under the Ministry of Transport, Works, Supply and Communications to implement the policies under this Ministry. The Road Transport and Safety Agency ensures that all aspects of transport is regulated and that service providers and service users operate according to the Law. The five institutions therefore needed to be consulted as they play a key role in the management of public transport in Zambia. Purposive sampling was used to select interviewees from the above mentioned institutions. This method of sampling focuses on those respondents who have knowledge, information and experience in relation to the subject matter being investigated (Bryman, 2008). The researcher conducted the interviews by visiting the institutions and interviewing key personnel at their work premises. An interview guide was used for the interview simply to guide the discussion related to quality of the public transport service offered on the Great East Road.

3.3 Data collection

The study used questionnaires and interview guide to collect primary data from commuters and minibus drivers and institutions respectively (Patton, 2002). Primary data collection method is where the researcher goes out to collect data related to the study in order establish the understanding of the subject matter. In this study commuters, minibus drivers and institutions were the source of such data. The perceptions regarding the quality of public transport service from commuters and minibus drivers and views from institutions which manage the public transport service respectively were collected (See Appendices A, B and C). Secondary data is data contained in books, journals and other written materials. This data was collected through review of documents such as books, journals and others related to the topic. Direct observations

by the researcher was used not only to appreciate the study area and to personally establish the public transport quality situation on the study route. The researcher observed the reliability of public transport service which was unsatisfactory due to numerous delays. He also observed availability of service during working hours, holidays, weekends and evenings which was inadequate. The comfort of the public transport service such as availability of seats, smooth journeys and air conditioning were unsatisfactory. He also found that drivers do not observe road traffic signs, reckless and did not observe pedestrian crossings in most cases while the minibus fares were high for commuters travelling both short and long distances on the study route.

The researcher interviewed commuters and drivers over the quality of the public transport service offered on the Great East Road from ZESCO Bus Stop to Chelstone Bus Station. Questionnaires were used to capture this data from drivers and commuters'. The questionnaires were directly given the commuters during travelling from ZESCO Bus Stop to Chelstone Bus Station or on their return journey. The drivers were interviewed at their minibus station and bus stops. The researcher also visited the five institutions that were involved in the administration of public transport service to obtain their views on the quality of service. These institutions were the departments; Physical Planning and Housing and Infrastructure Development both under the Ministry of Local Government and Housing, Ministry of Transport, Works, Supply and Communications, Lusaka City Council and the Road Transport and Safety Agency. The researcher asked questions that were prepared in advance in the interview guide to obtain the information from these institutions and interviewees were probed further in the case where the researcher needed more clarifications.

In addition direct observations were made by the researcher as he moved on the study route. The researcher made the observations in line with the RECSA elements that constitute service quality which are reliability of service, extent of service, comfort of service, safety and affordability of service. Direct Observations are defined as follows; "*Observations and experiment are the basis or the material grounds of induction. The material truth and inductive reasoning can be established by the processes observation and experiment*, observation *means seeing things with a purpose. It consists of collecting the facts which are in the direct knowledge of the investigators,"* (Chosh, 1992; 64). In response to this the researcher made the observations during the field work on the study route. The five dimensions of service quality that uses the RECSA approach were observed. These include the reliability of the minibus

service in terms of travelling on time and minimising delays, Extent of service in terms of public transport service during working hours, holidays, weekends, and holidays and in the evenings. The comfort of the public transport service in terms of Availability of seat on the minibuses, having smooth journeys and having air conditioning. The fourth aspect that was observed was Safety of the public transport service on the study route. Safety referred to observation of minibus drivers on the observation of pedestrian crossings, observance of road signs and recklessness during driving on the study route. The last aspect that was observed was affordability of the public transport service to establish whether the minibus fares were affordable or not, whether they were high or fair. These observations were done when the researcher travelled with the passengers on the minibuses to establish what was prevailing on the ground. A total number of 20 trips were conducted from ZESCO Bus Stop to Chelstone Bus Station and return to starting point. Eleven (11) of the 20 minibuses that were studied had welded seats that made safety of passengers compromised in the event that there was an accident. The results showed that the public transport service was unreliable, inadequate, lacks comfort, unsafe and unaffordable. This information was compared with the perceptions of commuters and minibus drivers together with responses from the institutions to develop the fuller understanding of the matter.

3.4 Data Analysis

Data analysis is important for any research. If data collected was not subjected to an analysis then the whole purpose of collecting it would be defeated. After the collection of data, an analysis of data and the interpretation of the results are necessary. The analysis of data for the research was done using Content analysis. "*Content analysis is a systematic analysis and description of the content of communication media and is a specialized application of coding techniques in books, journals, newspapers,"* (Chosh, 1992; 270). "*Content analysis consists of analysing the contents of documentary materials such as books, magazines, newspapers and the contents of all other verbal materials which can be either spoken or printed*" (Kothari; Garg, 2014; 107). In the 1940s content analysis was mostly quantitative while in the 1950s it became mostly qualitative analysis concerning the general import or message of the existing documents (Kothari and Garg, 2014). Content analysis is further defined as a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the context of their use (Krippendorff, 2009)

The responses from the interviewees who were 20 commuters and 20 minibus drivers was coded according to the themes under each research question to make analysis of this data easier. The research questions were on travel time on the study route, extent of public transport service, comfort, risks and fares of the public transport service on the study route. Travel time was assessed to establish the reliability of the public transport service, extent of service assessment was to establish whether public transport service was available the day, evening, weekends and holidays. Comfort was assessed to establish whether minibuses had seats for every passenger on the minibus, having smooth journeys and having air conditioning on the minibus. Risk was assessed to establish the minibus crew behaviour in terms of recklessness in driving, observation of road traffic signs and stopping pedestrian crossings. This was a matter of safety concerns by the commuters and other road users. Lastly the assessment of minibus fares was to establish whether the fares were affordable buy commuters on the study route. These aspects of the study are critical to the determination of the quality of the public transport service offered not only on the study route but also in other localities. These codes were quantified or summed up using Microsoft Excel 2013 and Minitab 14, the commuter based soft wares to produce graphs and pie charts which showed clearly the percentages of the coded data. This is the data that was analyzed in the study to come up with findings and discussions. It is from these discussions that recommendations were drawn and conclusions made.

3.5 Limitations

This study was done from January to June 2015. There were limitations however in the study of the quality of the public transport in Zambia and the Great East Road in particular. These limitations were mainly time constraints and inadequate resources to warrant investigations of larger samples of the population under study. This kind of research would require a lot of money to cover a large variety of service users such as various employees and marketers and shift workers. Adequate time to do the research was also required in order to manage every aspect of the study well.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter first presents results under the major theme on quality of the public transport service followed by results on perception of reliability, extent of service, comfort, safety and finally affordability. The findings of the study with regard to commuters and drivers perceptions of the quality of the public transport service on the study route and views from institutions and observations by the researcher are discussed in detail under this chapter. The quality of the public transport service requires serious attention as it contributes to socioeconomic development of a nation or region. Generally the results of this study pointed to the fact that the actors in this industry such as Ministry of Local government (MLGH), Ministry of Transport Works, Supply and Communications (MTWSC), Road Transport Safety Agency (RTSA) and Lusaka City Council (LCC) have work to do in ensuring that the quality of service meets required standards. This is to improve the quality of life not only of commuters on the study route but Lusaka City as a whole. In the study the commuter's perceptions on the quality of public transport service on the study route were sought. Other perceptions were from drivers and the institutions while the researcher made direct observations on the quality of service offered. RECSA which constitutes the dimensions of the quality of service was employed to determine the quality of the public transport service on the study route. RECSA stands for Reliability, Extent of service, Comfort, Safety and Affordability of the service provided and in this particular case the public transport service. Through the dimensions of RECSA, the study was done and the findings of the study and the discussions are covered in this chapter.

4.2 Commuters' Perception on the Travel Time from ZESCO Bus Stop to Chelstone Bus Station (Peak Hours)

The study focussed mainly on the perceptions of the commuters and drivers the two main actors in public transport service. According to Govender (2014) the quality of service can only be measured by assessing perceptions of service users. Perceived travel time is therefore how the commuters view the public transport service quality, based on their past experiences. In this study, the commuters were asked to indicate how long it took them to travel the distance of 11.6 km between ZESCO Bus Stop and Chelstone during peak hours 07:00 to 08:30 hours, 12:30 to 14: 30 hours and from 16: 30 to 18:00 hours. They were further asked to indicate how

long it took them to travel the same distance during off peak hours 09:00 to 12:00 hours and 14:30 to 16: 30 hours. The results of the survey are shown in Figure 4.1.

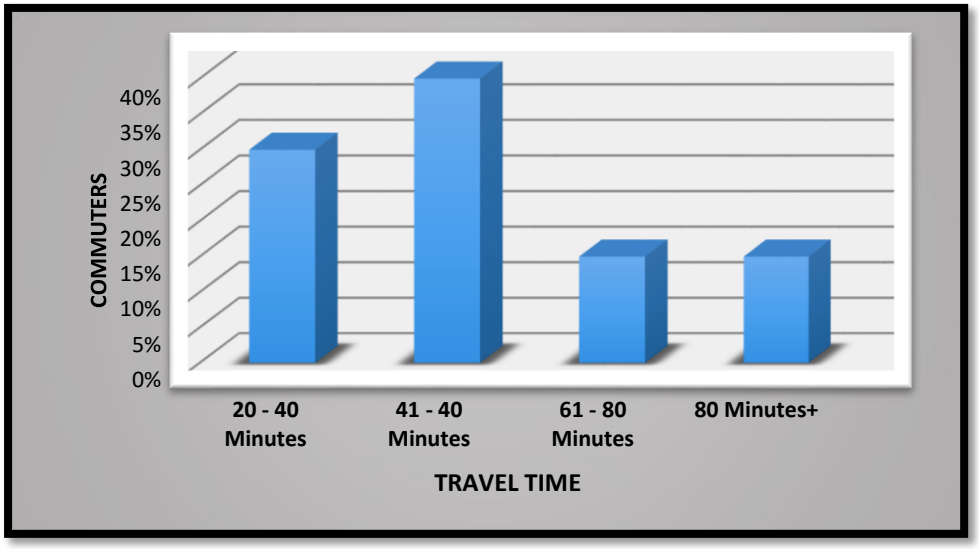

Figure 4.1 Commuters Perceived Travel Time (Peak Hours)
Source: Field Data, 2015.

Figure 4.1 shows that commuters view that the minibuses take longer time to travel on the study route during peak hours. A calculation can be done to establish the actual travel speed on the study route during peak hours. The average perceived travel time was 50 minutes calculated through adding 41 plus 60 minutes divided by two. The ideal travel speed during peak hours was about 14 kilometres per hour calculated as follows;

$$\text{Travel speed} = \frac{\text{Distance}}{\text{Travel time}} = \frac{11.6 \text{ Km}}{50 \text{ Minutes}} = 13.9 \text{ km per hour}$$

The average posted travel speed on the study route from ZESCO Bus Stop to Chelstone Bus Station was 60 Km/h. If we use the posted speed by the Road transport Safety Agency (RTSA) the ideal travel time would be 12 minutes. However the study revealed that instead of the trip taking the ideal 12 minutes, it actually took an average of 50 minutes during peak hours. The study also revealed that instead of the minibuses travelling at 60 km/h the posted speed on the study route, they actually travelled at the speed of about 14 Km/h during peak hours which is four times slower than the permitted speed of the road.

4.2.1 Commuters' Perception on Travel Time from Chelstone Bus Station to ZESCO Bus Stop (Peak hours)

The results of the return journey from Chelstone Bus Station to ZESCO Bus Stop showed a similar pattern. Forty eight percent (48 %) of respondents took an average 52 minutes to travel the 11.6 Km distance during peak hours. However in the morning 07:00 and 08:30 hour's research revealed that travel time in some portions of the road reduced to as low as 10 Km/h and even below in some places. This showed that travel speed of minibuses was affected by traffic congestion and some other factors the model of RECSA highlighted in the study.

4.2.2 Commuters Perceptions on the Travel Time from ZESCO Bus Stop to Chelstone Bus Station (Off Peak Hours)

The commuters were asked how long it took them to travel from ZESCO Bus Stop to Chelstone Bus Station during off peak hours (09:00 to 12:00 hours and 14:30 to 16:30 hours). Figure 4.2 shows the results.

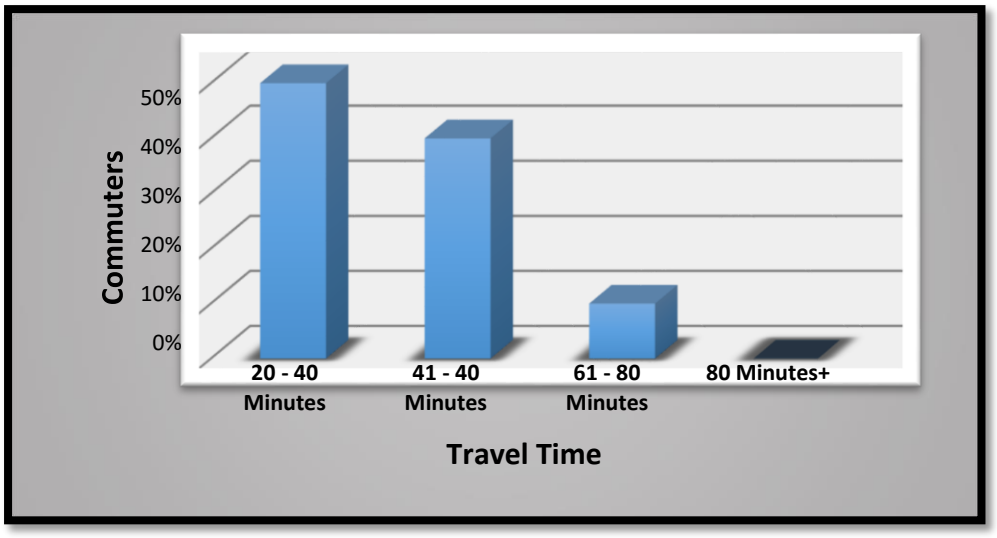

Figure 4.2 Commuters Perceived Travel Time (Off Peak Hours

Source: Field Data, 2015.

Figure 4.2 shows that it took shorter time to travel during off peak hours compared to travelling during peak hours in Figure 4.1. The results also show that as travel time increases during off peak hours fewer people want to use public transport. Based on the travel time, the travel speed was worked out to be 23.2 Km/h. However the study revealed that instead of the trip taking 12 minutes, it actually took 30 minutes during off peak hours. The study also showed that instead of vehicles travelling at 60 Km /h on the study route, the actual speed was worked out to be 23

Km/h. Therefore it took a shorter time to travel the distance during off peak hours even though travel time and travel speed are still greater than the permitted ones for the route. This clearly shows that traffic congestion affects travel time of vehicles including minibuses on the study route.

4.2.3 Summary of Travel Time by Commuters

The travel time on the study route is greater than the worked out travel time and speed. This can be attributed to road traffic congestion during peak hours which also reduces travel time and increases travel speed during off peak hours. The commuter's desire is to spend less time during travelling from place of origin to his destination.

4.2.4 Drivers' Perceived Travel Time from ZESCO Bus Stop to Chelstone (Peak Hours)

Drivers were also asked to indicate how much time it took them to travel on the study route during peak hours. The responses were as shown in Figure 4.3.

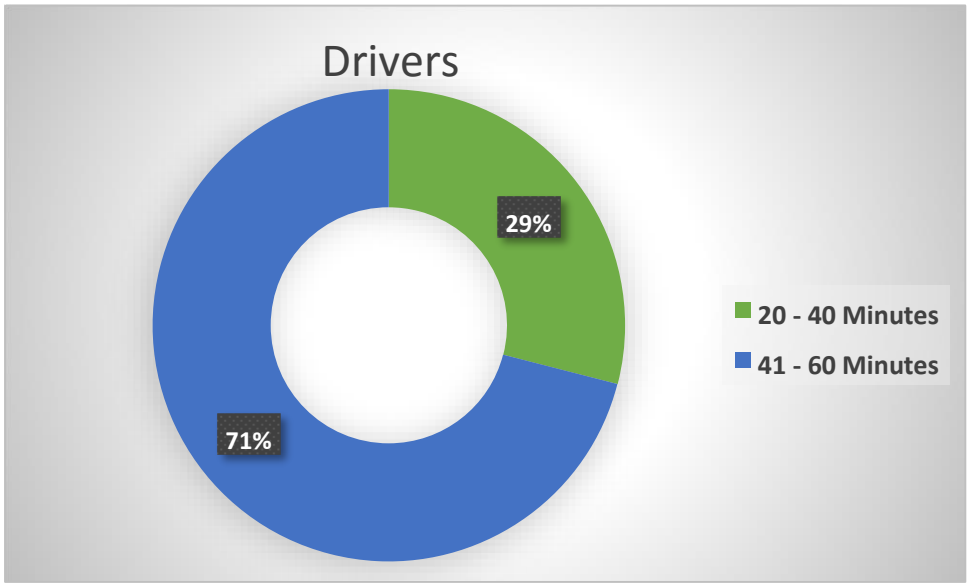

Figure 4.3 Minibus Drivers' Perceived Travel Time (Peak Hours)
Source: Field Data, 2015.

Figure 4.3 shows that minibus drivers' views were that it took longer time to travel the distance of 11.6 km on the study route during peak hours. The travel time was between 41 and 60 minutes with the average 46 minutes calculated 41 + 60 divided by two (2) gives the ideal travel speed at 15.1 Km/h or 15 Km/h. While the ideal (worked out) travel time was 12 minutes. It actually took average travel time of 46 minutes. Therefore it took four times longer to travel on the study route during peak hours. It is also worth noting that all responses from minibus

drivers were for two travel periods of between 20 and 60 minutes which shows that any travel time beyond 60 minutes was not applicable to the study route.

4.2.5 Minibus Drivers Perceived Travel Time from ZESCO Bus Stop to Chelstone (off Peak Hours)

The drivers were asked to indicate how much time it took them to drive a minibus on the study route during off peak hours 09:00 to 12:00 hours and 14:30 to 16:30 hours. The responses were as shown in Figure 4.4.

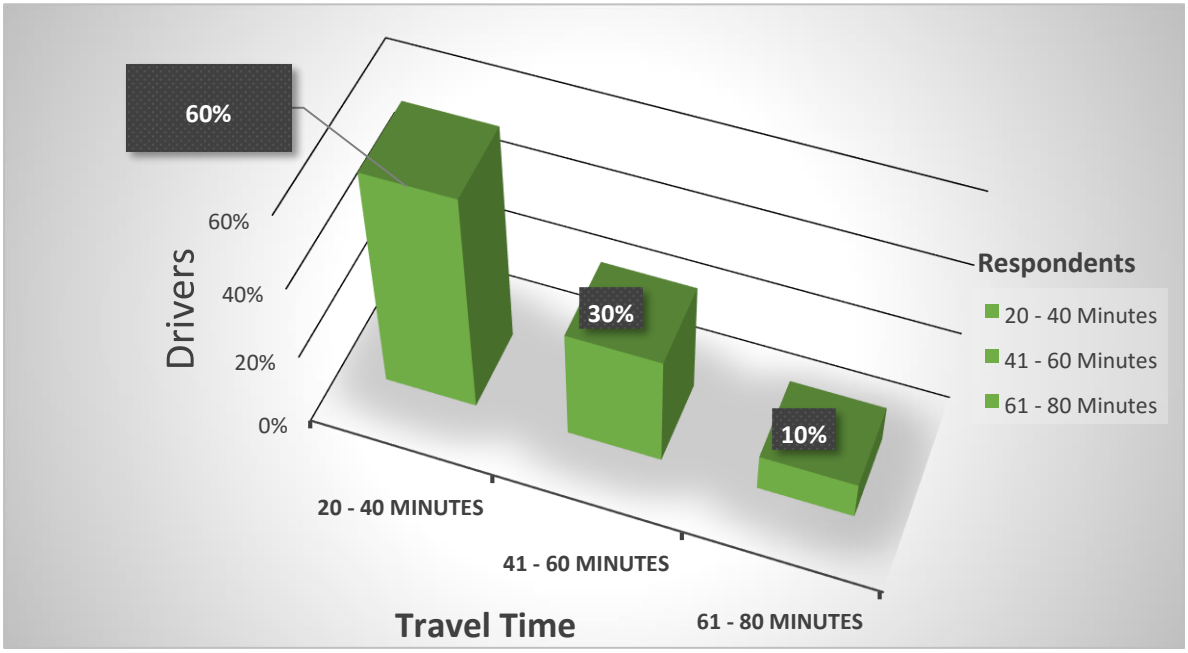

Figure 4.4 Minibus Drivers' Perceived Travel Time (Off Peak Hours)
Source: Field Data, 2015.

Figure 4.4 shows that it took shorter time to travel the distance of 11.6 Km on the study route during off peak hours. The results confirms the commuters' perceptions that it takes shorter time to travel on the study during off peak hours. This shows that minibus drivers took average travel time of 26 minutes during off peak hours at the ideal travel speed of about 54 Km/h. The study shows that when perceived travel times between commuters and drivers are compared, commuters perceive that the trip took 10 minutes longer than the drivers. The disparity could be as a result of different levels of experience between the two where minibus drivers keep moving on the study route while commuters spend less time.

4.2.6 Summary of Travel Time by Minibus Drivers

The travel time on the study route from the minibus drivers' perceptions is greater than the ideal travel time and speed. This could be attributed to road traffic congestion during peak hours which also reduces travel time and increases travel speed during off peak hours. The minibus driver's desire is to spend less time during travelling from place of origin to final destination and back. This is important for them to maximise the returns per trip. In this study, it shows that it is not only commuters who are affected by traffic congestion on the study route but also the minibus drivers.

4.3 Institutions Views on Reliability of Public Transport on the Study Route

The five institutions namely Department of Physical Planning and Housing (DPPH), Department of Housing and Infrastructure Development (DHID), Lusaka City Council (LCC), Ministry of Transport, Works, Supply and Communications (MTWSC) and Road Transport and Safety Agency (RTSA) were asked to state whether the public transport service in Lusaka was reliable or not. The five institutions responded that the public transport service was unreliable especially during peak hours. One key respondent stated that, "*The minibuses were not time bound and that they waited until the bus was full and could stop anywhere any time without notification and without giving reasons".* Another key respondent stated that, "*the service was unreliable because buses took too long to travel short distances due to traffic congestion delays*". The third responded that, "*the service is unreliable because minibuses do not keep time and suffer from political interference at bus stations and bus stops*". The fourth responded that, "*the public transport service is unreliable because it takes longer time to reach destinations due to delays at bus stations and bus stops where buses wait to be full and also delays along the way*," while the fifth responded that, "*the service was unreliable because there was so much inefficiency in the bus operations*". All the institutions however said that during off peak hours travel time reduced due to the reduction in traffic congestion but increases during peak hours. Although the institutions did not give the exact time it took to travel on the study route due to not having the exact figures relating to travel time, they clearly stated that the public transport service was unreliable especially during peak hours. Therefore the quality of the public transport service on the study route according to institutions was unsatisfactory.

4.4 Researcher's Observations on Reliability of the Public Transport Service on the Study Route

The researcher made the observations during the field trips he made during the study period to confirm the perceptions of commuters, drivers and institutions 'views on the quality of the public transport service.. The researcher observed that minibuses did not have pre-determined travel time tables as they convey passengers from areas of residence to the City Centre. The minibuses did not have established travel time timetable, making it difficult to predict arrival time. In addition commuters were not notified of delays, there were no travelling schedules of minibuses. The journey durations were unpredictable and this was compounded by heavy traffic congestion during peak hours. The researcher observed that minibuses did not start off from stations and bus stops until they were fully loaded. The unpredictability of travel time made passengers who needed to rush for work or other errands arrive late for these assignments. There were also delays on the way as minibuses were stopping anywhere any time to pick passengers at places not designated as bus stops. The researcher also observed that it took about 45 minutes to travel from ZESCO Bus Stop to Chelstone Bus Station during peak hours and 25 minutes during off peak hours. It was also observed that the return journey from Chelstone Bus Station to ZESCO Bus Stop during peak hours took travel time of about 55 minutes and 27 minutes during off peak hours. The results confirm clearly that traffic congestion affects the quality of the public transport service on the study route as it causes minibuses to take longer time to travel during peak hours and less time during off peak hours. This result show that public transport service on the study route is not reliable.

4.5 Discussions on the Reliability of the Public Transport Service

The following is the discussion on the reliability of the public transport service;

4.5.1 Commuters and Drivers' Perceptions on Travel Time of Minibuses

The study showed that a larger number of commuters perceive that it took longer time to travel on the study route during peak hours compared to the time taken during off peak hours. The minibus drivers, institutions and the researcher's findings all confirmed that it took longer time to travel on the study route during peak hours. These findings show that traffic congestion seriously affects travel time of minibuses and if left unaddressed a lot of man hours will be lost in the economy of the City of Lusaka and the areas served by the Great East Road and the study route in particular. Further the researcher observed that although the minibus service was unreliable mainly due to traffic congestion there were other elements that compounded the

situation such as the reliability of the public transport service. This minibus service lacks notification of delays, no travelling schedules provided at Bus stations and Bus Stops. The service is also unpredictable with longer journey times. These elements made the quality of public transport service unreliable and unsatisfactory to users. When a public transport service becomes unreliable many motorists would opt to drive their own vehicles or use other modes of transport to reach their work places on time. This situation finally can result in more vehicles on the road and increased road traffic congestion. Solving the problem of public transport reliability alone can result in reduced road traffic congestion. This comes as a result of increased ridership on public transport by the active population that plies between their place of residence and work places. An improved public transport system is a greater asset to socio-economic development of the country.

There are possible solutions to the problem of reliability of the public transport service in the city of Lusaka and the areas served by the Great East Road. These solutions are founded on the literature review that was done and the study findings. The results from commuters, drivers and institutions are in line with the researcher's observations. The results confirm clearly that traffic congestion affects the public transport service on the study route as it takes longer time to travel the distance during peak hours and less time during off peak hours. This study revealed that there are several ways of resolving such problems. Some of these include the establishment of dedicated lanes for buses, this had worked well in Brazil and other places in the world. Traffic lights is another way of controlling traffic although these have not helped matters during peak hours on the study route. Traffic police officers were seen taking over of traffic control where lights were working well. Curitiba, Brazil is an example of a successful public transport system which uses the Bus Rapid Transit (BRT) which employs both smaller buses and larger ones with the local public transport system. This was working very well in that City. The BRT system is also being implemented in South Africa as a way of resolving public transport reliability challenges in that country. This method is also used in the United States Of America (USA) and other Countries in the world. Kenya is already working towards implementing a BRT system though there are some challenges that country is facing which needs to be resolved before they can have a successful BRT system. The system has proved to be cheaper to develop worldwide compared to underground rail system which operates in almost similar way but very expensive to construct. BRT is cheaper, fast and efficient. In addition public transport reliability could be improved by building capacity of minibus drivers and conductors in the management of vehicles and passengers. Drivers and conductors need capacity building to enable them learn

the importance of the industry and the service they offer to the public. The other method that can help reduce traffic congestion is introduction of toll gates on the study route. Toll gates can reduce traffic congestion, offers choice of transport mode as motorists will opt to use public transport to avoid toll fees, and supports a vibrant economy. Toll gates by limiting number of vehicles on the road, limits emissions and waste within the planet's ability to absorb them. They also minimize consumption of non-renewable resources, limits consumption of renewable resources to the sustainable yield level (Centre for sustainable transportation, 2002). The other requirement towards the improvement of the public transport reliability is to develop a policy on the operations of public transport in the City of Lusaka and Zambia as a whole. This policy should compel bus operators and managers to adhere to guidelines such as bus time schedules that will show arrival and departure time of buses at a particular station. This again can be learned from Curitiba transport system. This can cause ridership to go up since many people who drive to and from work worry more on time of arriving and missing appointments. Any assurance on a public transport service that passengers will board the bus on time and arrive at their destination at predicted time will cause more ridership on public transport and reduced private car use on the road. These suggestions if implemented and managed well can result into improvement in the travel time of minibuses from 30 minutes during peak hours and 50 minutes during off peak hours and travel speed of minibuses of 14 Km/h during peak hours and 23 Km/h during off peak hours respectively on the study route to travel times closer to the actual worked out travel time of 12 minutes designed for the study route. This would lead to improvement not only in the quality of the public transport service offered but also the quality of life of the Commuters and other service users.

4.6 Perceptions on the Extent of Service of the Public Transport on the Study Route

The extent of service is service availability, the extent to which a public transport mode takes commuters to their exact destinations, and the friendliness of the frontline staff (Govender, 2014, McKnight et al., 1986). Extent of service demands that the public transport service is available to members of public irrespective of period of the day. It is about total number of hours of the service during working and non-working days, including evenings, holidays and weekends. Evening in this case refers to the period of day before midnight. The availability of the service refers to the availability of the service on working days, evenings, weekends and public holidays. A service provider should plan the daily schedule of buses irrespective of the demand, since scheduling was a potentially important operator service strategy (Govender, 2014).

4.6.1 Commuters Perceptions on the Extent of the Public Transport Service Availability

Commuters were asked to indicate the extent of the public transport service during working days, evenings, weekends and holidays. Their responses are as shown in Figure 4.5.

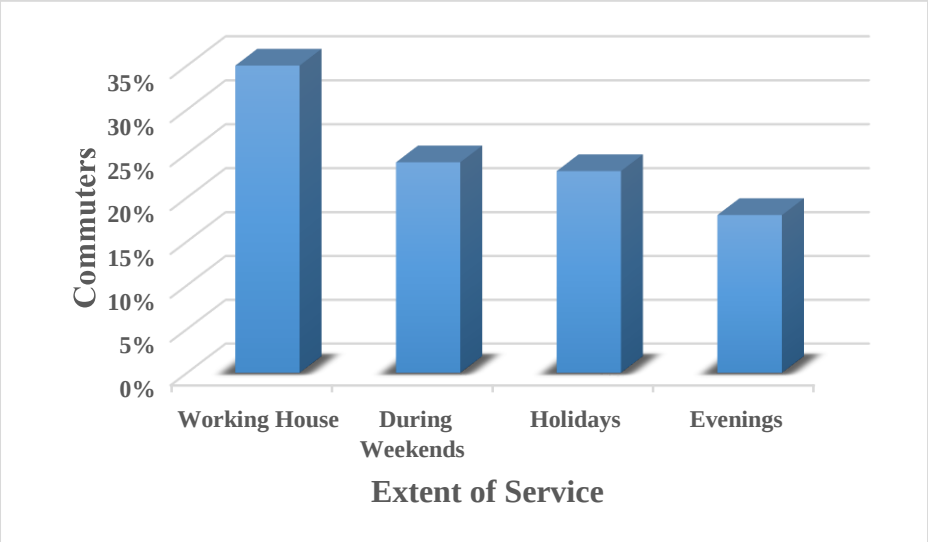

Figure 4.5 Commuters Perceived Extent of Service Availability

Source: Field Data, 2015.

Figure 4.5 shows that commuters view the public transport service to be more available during the normal working hours than any other period, followed by the service during weekends, service during holidays with the least being the service during. These results show that the public transport service availability varies according to the period of the day including morning to midnight. According to commuters, the quality of public transport service with regard to extent of service is unsatisfactory during public holidays and evenings.

4.6.2 Drivers Perceptions on the Extent of Public Transport Service Availability

Drivers were asked whether the public transport service was adequate during the working hours, evenings, holidays and weekends. The results of the research are shown in Figure 4.6.

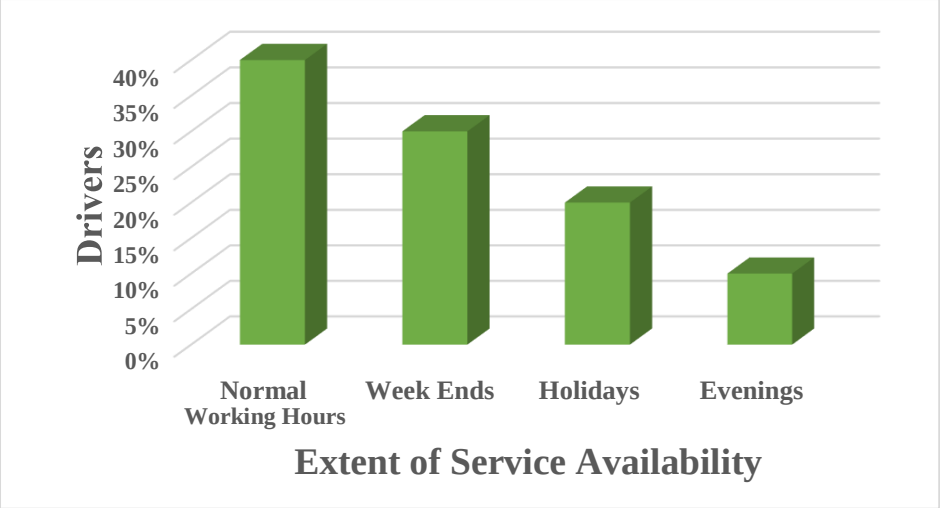

Figure 4.6 Minibus Drivers' Perception on Extent of Service

Source: Field Data, 2015.

Figure 4.6 shows that minibus drivers perceive that the public transport service was more during the normal working hours, followed by during weekends and service during holidays came third and service during the evenings was the least. The findings from the drivers confirm the commuters' perceptions that the quality of the public transport service in terms of Extent of Service during holidays and evenings was inadequate. These results agree with those of commuters that the public transport service is adequate during working hours than any other period. There is therefore need to improve the extent of the public transport service availability during less profitable hours of the week such as holidays , weekends and evenings.

4.6.3 Institutions Views on Extent of Public Transport Service Availability

The five institutions namely Department of Physical Planning and Housing (DPPH), Department of Housing and Infrastructure Development (DHID), Lusaka City Council (LCC), Ministry of Transport, Works, Supply and Communications (MTWSC) and Road Transport and Safety Agency (RTSA) were asked to state whether the public transport service in the Lusaka was adequate or not. The institutions stated that the public transport service was adequate during working days and non-working days. This position was different from the commuters and drivers 'who stated that the service was more during the working days and less on other periods of the day and week. The actual responses from the institutions are given here One institution stated that, "*the public transport service was provided as per the demand by commuters while another key respondent* stated that, "*there is no need to worry about the quantity of service as no one has ever complained about it*".. The other key respondent stated that, "*the extent of service is well managed by the ministry.* The fourth institution stated that,

"*public transport extent of service may not be easy to determine due to its poor state at that moment, the service was poor and had led to increased private car use and only people in the low income bracket used it while the well to do use other modes*". Lastly the fifth respondent stated that, "*the service was adequate because minibuses were privately owned and operate according to the demand for the services*. The institutions position on this matter differed with commuters' and drivers' perceptions that the service provided on the study route was inadequate. Therefore the quality of the public transport service from the institutions point of view in terms of extent of service being provided was satisfactory.

4.6.4 Researcher's Observations on Extent of Public Transport Service Availability

The researcher observed that the extent of the public transport service during evenings, holidays was inadequate to meet the customer demands. The service was adequate during working days but inadequate during holidays and evenings. During the working hours minibuses provided service for about 15 hours. The operations started around 05:00 hours in the morning and ended about 20:30 hours each working day. However the service was observed to be low during weekends and holidays as the service was reduced during the day and worse during the night. The service was inadequate in the evening as some passengers did not board minibuses as early as 21:00 hours.

4.6.4.1 Service in the Evenings

In the evenings between 18:00 hours and 12:00 hours midnight, minibuses stopped around 20:30 hours while the Intercity Bus Station remained busy and continued receiving passengers from other cities as late as 12:00 pm hours in the night. These buses brought in more passengers into the City during the night but there was no corresponding local public transport service in the form of minibuses to complete the journeys of the travellers to their final destinations in residential areas. The passengers were seen booking taxes while some who had relatives were seen being picked by private vehicles. Some who had less or no money to book taxes were seen looking for space where to spend the night within the Bus Station to allow morning time when they could manage to catch a minibus to get home with. Most of the taxes could not be easily identified to establish their genuineness as they were seen packed outside the Bus Station. The taxes were expensive and some did not have licence to operate as taxes and avoided going inside the Bus Station to evade paying appropriate fees. These were difficult to identify their genuineness and the fear of being picked by crooks was quite high. Some passengers talked to

actually stated that some of the passengers in the past had ended up booking taxes for crooked men who later robbed them of their goods and money. The quality of service therefore during the evenings in terms of extent of service was inadequate to meet client demand and therefore was unsatisfactory.

4.6.4.2 Service on Public Holidays and Weekends

The minibus service during holidays was inadequate to meet the needs of the customers. There were fewer minibuses on the road during the day as compared to working days and the situation got worse during the evenings (time between 18.00 hours and 12:00 hours PM). The minibuses stopped their operations around 20:30 hours and caused many travellers to be stranded. Therefore the quality of the public transport service on the study route in terms of extent of service, during the holidays was inadequate and therefore unsatisfactory.

The public transport service during the weekends depended on the day under reference and this can be divided into parts namely service on Saturdays and service on Sundays.

The service during Saturdays was adequate during the day as many travellers moved to and from town on the study route. Public transport was busy and adequate during the day but in the evenings service again was not adequate as minibus operations stopped between 20:00 and 21:00 hours. It was also observed that there was a large number of people that were using public transport to go to places of worship on Saturday. The quality of the public transport service in terms of extent of service on Saturdays was therefore satisfactory.

There were relatively fewer minibuses on the road on Sundays and people were seen waiting for minibuses at the bus station bus stops longer time than they did on Saturdays. Sunday evenings were worse as minibus operations ceased operations at about 20:00 hours. Taxes were seen rushing to and from town picking passengers as many travellers had no choice but to book taxis to get to their destinations. The quality of public transport service on Sundays in terms of extent of service was therefore unsatisfactory.

4.6.4.3 Institutions and Researcher's Observations on the Extent of Service

The Institutions namely Ministry of Local Government and Housing (MLGH), Ministry of Transport, Works, Supply and Communications (MTWSC), Road Transport Safety Agency (RTSA) and the Lusaka City Council (LCC) stated that the quality of the public transport

service in terms of Extent of Service was adequate to meet commuters' needs. They gave reasons that commuters had not complained about the service provided and that the service provided should match the demand such that during the holidays, weekends and evenings, less demand by commuters attracted fewer minibuses. They also stated that it is difficult to assess the quality of service offered to the public because of poor quality. However generally the institutions position was that the quantity of service provided was adequate as demand and supply determined the amount service needed. This position however differed from that of the researcher who observed that the quality of the public transport service on the study route during holidays, weekends and evenings was inadequate. While this position is different from that of institutions, the researcher agreed with the commuters and minibus drivers that the service quality needed to improve in terms of quantity during the holidays, weekends and evenings

Following the study on both literature review and findings, certain solutions were possible in an effort to resolve the problem of inadequate service during evenings, holidays and weekends. The Extent of the public transport service is critical to the socio – economic development of the country. More than 50 % of the people in Zambia do not own private cars and depend on public transport for their daily movements. Depriving them of accessibility to this service at any point during the day or night would be hostile. There is therefore need to find ways how this problem could be resolved based on the literature studied and the study findings.

4.6.4.4 Discussions on the Extent of the Public Transport Service Availability

The availability of service in the evenings, holidays and weekends and during working hours is important for smooth movement of passengers to and from work. There are different kinds of employees such as shift workers and security personnel who need public transport during the periods outside normal working hours. This category of employees and people who arrive into the city from other places outside normal working hours need the minibus service when required. This is because public transport is cheaper compared to other modes of transport. One way of resolving extent of service problem is by government giving incentives to minibus operators who will be offering distinguishable service during evenings, holidays and weekends is desirable. This could cover all minibus operators who continue to offer service during the non-profitable periods of the day to make life of ordinary citizens easier. This method is being tried in other cities such as Dakar where the independent operators are often reluctant to change

and require a mix of compulsion and incentives to corporate (Cervero, 2013).This method could enable operators keep their minibuses on the road during non-profitable hours such as during the holidays and evenings. The government also could subsidise the public transport service in order to make it more accessible. This could lead to improvement in the welfare of the people since government has the responsibility to provide such services for the public. The services that are less profitable or not profitable at all but critical to the welfare of the citizens have in other countries been funded by the government hence the suggestion. This is possible in countries where public transport operations are in the hands of private companies using large buses for local travelling. The government has a moral responsibility to provide services to its citizens that the private sector may not be willing to provide due to them not being profitable. Extent of service during the night would benefit travellers arriving late by city to city buses who usually get stranded at the Intercity Main Bus Station due to early stoppage of minibus operations. The advantage of this would be the availability of public transport service to members of the public from morning till evening and also during holidays and weekends. Incentives in the public transport industry can also be used to enable minibuses start their trips on time without waiting for the buses to be loaded fully. The delays at bus stations and bus stops where journeys start from can be eliminated using this method. The government can also formulate and implement public transport policies to ensure that the service provided is adequate and efficient. Such a policy would be directed to addressing and regulating bus driver conduct and the manner minibus operations could be conducted to maximise benefits to both bus operators and service users. The policies also could promote the relationships between bus operators, members of public and the government in the day to day management of public transport system.

4.7 Comfort of the Public Transport Service

The comfort of the public transport service is important if service users are to be attracted to using public transport. The perceptions of commuters and minibus drivers on the comfort of public transport service on the study route are discussed here below.

4.7.1 Commuters' Perception on Availability of Seats on the Bus

The availability of seat and space on the bus constitute one aspect of comfort. The commuters were asked to indicate whether they were able to find seat on the minibus. The results are as shown in Figure 4.7.

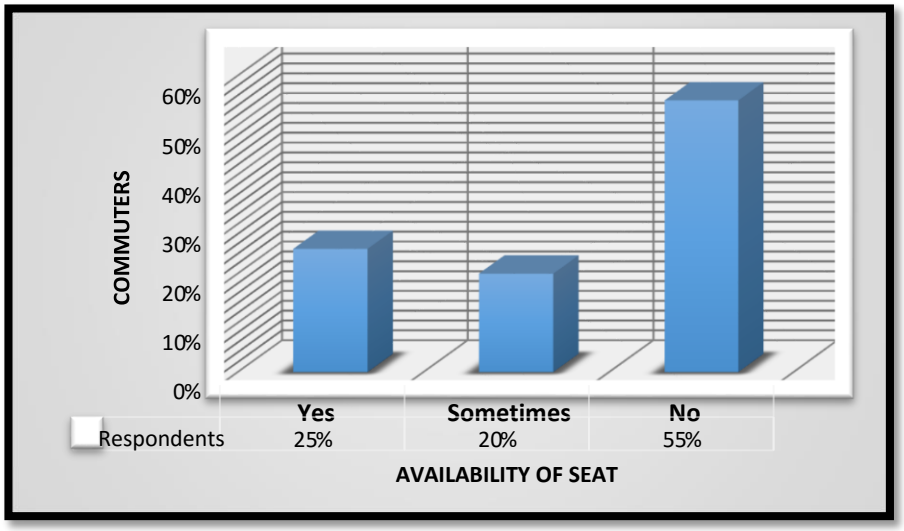

Figure 4.7 Commuters' Perception on Availability of Seats on the Minibuses

Source: Field Data, 2015.

Figure 4.7 shows that the majority of commuters did not find seats on the minibus. This response was followed by those who stated that they were able to find seats while the rest stated sometimes they were able to find seats. The results show that the quality of service being provided according to commuters in terms of availability of seats on the study route was perceived to be unsatisfactory.

The observations about the minibus seats on the 20 minibuses that were studied revealed that 30 % of the minibuses had torn seats, 60% had welded seats while 10% minibuses had seats with metals protruding. On a seat for one person two or more passengers were squeezed by non-compromising conductors while the driver's ignored complaints from passengers. It was also observed that it was difficult to reach seats that were behind the minibus and at the same time very difficult to disembark as the passage was occupied by other passengers. The conductors also faced challenge of reaching passengers in the rear seats to collect fares. They were actually asking passengers in the middle rows to collect on their behalf. This according to the researcher was an inconvenience to passengers who had nothing to do with that the business of collecting funds and whose main priority was to get home or work in time.

The availability of seats on the minibus according to the study can be interpreted to mean that despite all passengers seated when travelling a larger number did not have seats and space. A careful analysis of this matter implies that although the pass angers were seated during travelling, they shared one seat for two or more people depending on their body sizes. There was no comfort throughout the journey as passengers were squeezed in order for the crew to

make maximum profit on every trip. This issue was observed by the researcher too who also travelled on the minibuses and had the feel of this discomfort.

4.7.2 Commuters Perception on Having Smooth Journey on the Minibus

A smooth journey on the minibus involves good driving tendencies and politeness of the crew to passengers. This aspect of public transport is critical to the wellbeing of the transport service and can hinder many from using that transport mode if not checked. The commuters were asked whether they enjoyed smooth journeys on minibuses. The responses results are shown in Figure 4.8.

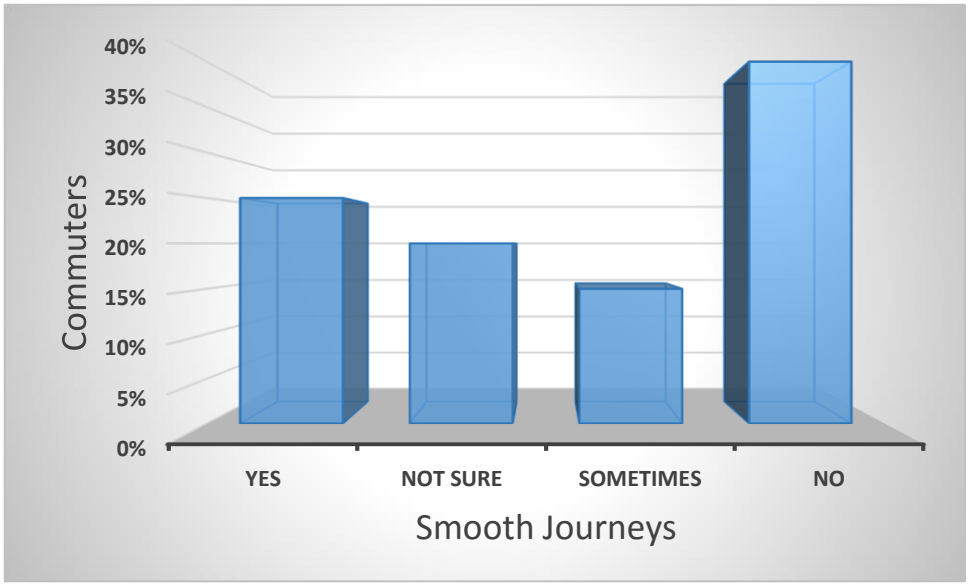

Figure 4.8 Commuters Perceived Having of a Smooth Journey

Source: Field Data, 2015.

Figure 4.8 shows that the Commuters did not enjoy smooth journey on public transport. The results show that only about half of the respondents enjoyed smooth journeys on the study route. The rest of the respondents were either not sure or stated sometimes. When a public transporter fails to provide smooth journeys to his customers, the service users can opt to go for a modal shift to private car use, cycling, using motor cycle or walking. It was not very clear from the results why some respondents were not sure or indicated sometimes. However the reason could be the manner passengers have been treated by the minibus drivers and conductors in the past whereby no real respect is given to them despite paying for the service. The quality of public transport service therefore in terms of comfort on minibuses was perceived to be unsatisfactory. The researcher in addition observed that there was no smooth ride on the minibuses. The sample of 20 minibuses showed that 55 percent had rude, and reckless drivers

making travelling very uncomfortable. The minibuses stopped anywhere along the road at places not designated as bus stops, without notification. The minibuses spent 30 percent of the travelling time was spent on diverting off the route to either look for other passengers or avoid police check and no apologies were made for this act. To the amazement of the researcher the minibuses in trying to beat traffic were overtaking other vehicles from the left in a right hand drive (RHD) City and country, putting their passengers' lives at risk. The High Way Code for Zambia clearly states that overtaking should be done from the right side when the road is clear of obstruction. There were no apologies or notifications for this behaviour whatsoever. Here again there was no smooth journey except that passengers had no alternative transport to use. Given choice minibus industry would be avoided and would be shut for good due to this crew behaviour. Introduction of complete change in this business could lead to right conduct on the part of the crew. There was need to introduce something in this business that could compel the crew to have respect for their clients such that failure to do so could result in some form of punitive consequences.

4.7.3 Commuters Perception on Availability of Air Conditioning on Minibuses

Air Conditioning on the minibus refers to minibuses having air conditioning facility that is in working condition and used to provide comfort to travellers. Air conditioning is important to keep the interior temperatures of the minibus within normal temperature of range. This means that the temperature should neither be too cold nor too hot. Zambia's weather ranges between 29°°F and 84° F during the month of September and between 31°F and 88°F during October the hottest month of the year. Air conditioning on the bus therefore is not a luxury under these circumstances but a need. To assess the Air Conditioning on the minibus, commuters were asked whether there was Air Conditioning on the minibuses. The results of the survey are shown in Figure 4.9.

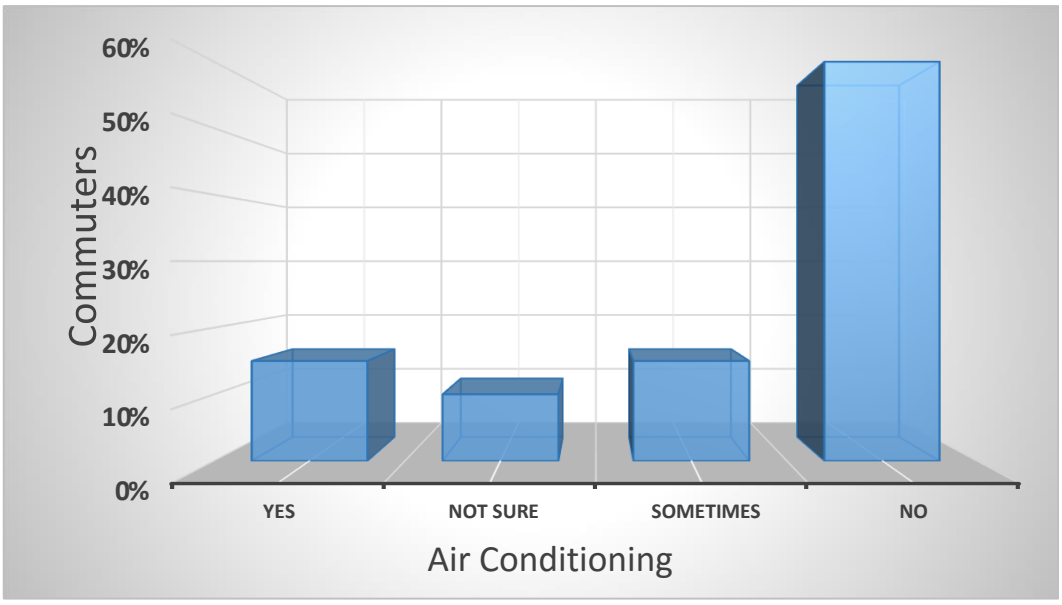

Figure 4.9 Commuters Perception on Availability of Air Conditioning on Minibuses

Source: Field Data, 2015.

Figure 4.9 shows that Commuters did not have air conditioning on the minibuses. The interior of minibuses usually becomes hot because of hot air people breathe out and also because of limited ventilation through the minibus windows. The results show that commuters view the quality of Air Conditioning of minibuses on the study route as unsatisfactory. The researcher also made similar observations of the minibuses that were studied. He found that 90% did not have a working air conditioning system while 10% had. The minibuses were very hot during the afternoon compounded by poor ventilation for 14 and 16 seater minibuses. These minibuses were originally not designed for this purpose but as cargo vehicles. The owners had to weld seats in them so that they could be used for public transport. The windows provided on these vehicles were not designed to ventilate space occupied by humans but goods. There was very small openable spaces for windows such that even natural ventilation was poor. The absence of the air conditioning on the minibuses made travelling uncomfortable.

4.7.4 Drivers Perceived Air Conditioning of the Minibuses

The drivers' were also asked whether their Air Conditioning facility on the bus was working and used to provide comfort their customers. The responses were as shown Figure 4.12.

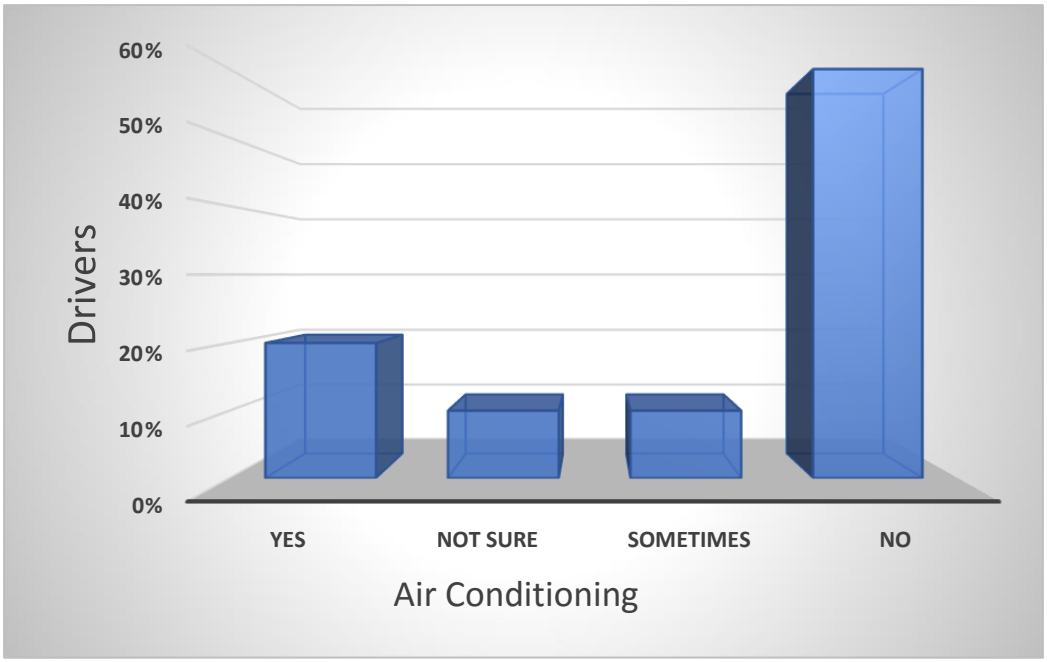

Figure 4.10 Drivers Perceived Air Conditioning on the Minibus

Source: Field Data, 2015.

Figure 4.12 shows that drivers' views are that there was *no* Air Conditioning service on the study route. A smaller percentage said *there was* while a few said *sometimes* and another *not sure*... The minibus drivers who said they offered this service said they were able to lure more passengers to themselves due to such services such that despite minibuses following the que to load, passengers would avoid minibuses that offered poor service. Those would take long to fill as passengers would rather wait for famous and comfortable buses. The results show that the quality of the public transport service according to drivers in terms of providing Air Conditioning service on the study route was unsatisfactory. The position of drivers confirmed commuters' perceptions that the air conditioning service on the study route was unsatisfactory.

4.7.5 Minibus Drivers' Perceptions on the Availability of Seats on the Minibuses

Public service comfort involves the availability of service aesthetics, and includes the availability of seats and space. The study focussed on the aspect of *availability of seats* on the minibuses on the study route. The availability of seats refers to passengers on the bus each having their own seats and *space* on the minibus. The drivers were asked whether there were adequate seats on the minibus for every passenger while travelling on the study route. This is because a seat and space for a passenger makes the traveller relax and enjoy the journey. When going for work you need to travel well so that you reach the working place fresh to start work.

When knocking off one is exhausted and looks forward to getting home and resting. A minibus seat after a tiresome day provides comfort to passengers. The results are shown in Figure 4.10.

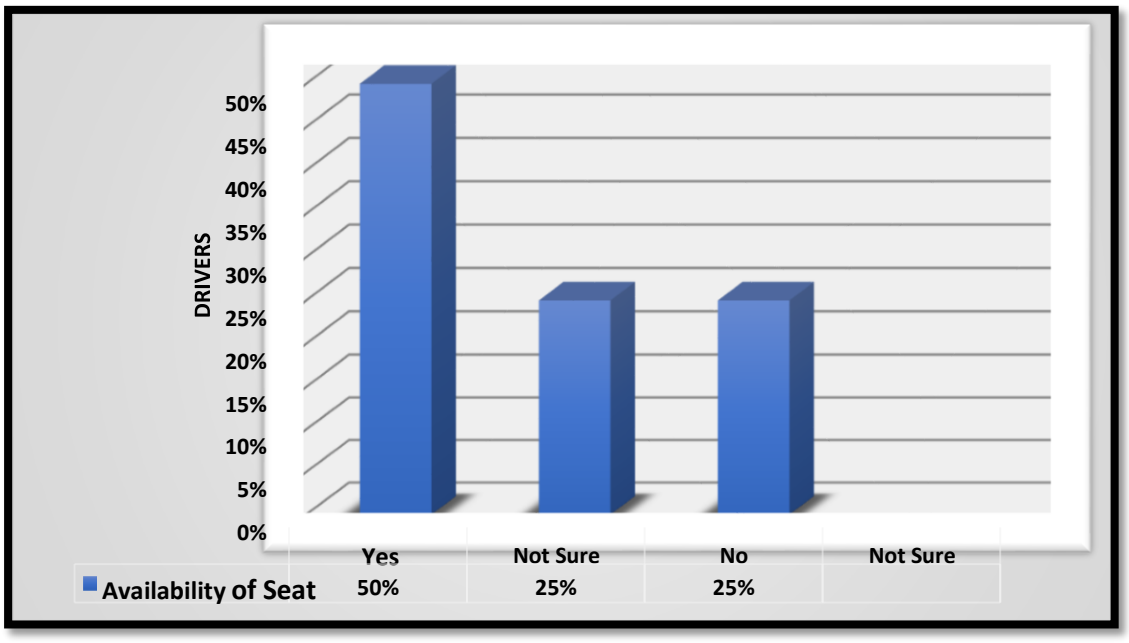

Figure 4.11 Minibus Drivers' Perceptions on the Availability of Seats on the Minibuses.
Source: Field Data, 2015.

Figure 4.10 shows that minibus drivers' view regarding the availability of seats was that there were seats on the minibus for all the passengers. However about one quarter of them were not sure while another one quarter said no there was not. The results show that the quality of public transport service according to the minibus drivers in terms of availability of seats was satisfactory.

4.7.6 Drivers' Perceived Smooth Journey on the Minibus

A smooth journey is determined by the behaviour of the crew comprising minibus drivers and minibus conductors. Drivers were asked if they provided smooth journeys to their customers on the study route. The responses are shown in Figure 4.11.

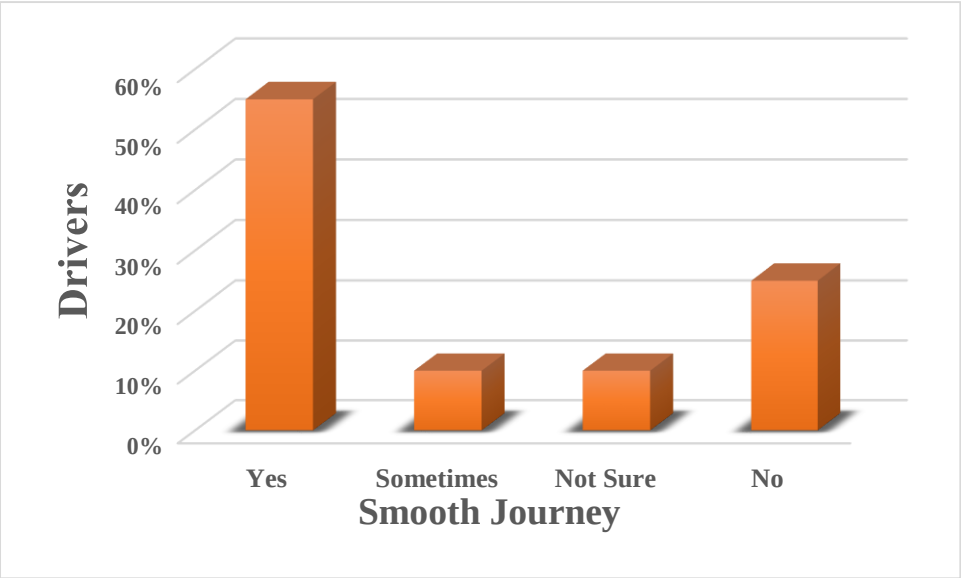

Figure 4.12 Drivers Perceived Occurrence of Smooth Journeys
Source: Field Data, 2015.

Figure 4.11 shows that the drivers *did provide* smooth journeys to their passengers on the study route on the study route. A smaller number of responses, said they *did not*, *sometimes* and *not sure*. However this position differs from that of commuters which revealed that the journeys were characterised by reckless driving and rudeness of the bus crew to passengers. The results also show that the quality of public transport service according to drivers in terms of providing smooth ride on the study route was satisfactory. The minibus drivers in the last three categories viewed passengers as difficult to manage as some show unwillingness to pay, some rude and disrespectful to the crew while still another category of passengers are fond of intimidating the members of the crew. In order to show their authority and to manage the situation properly they are sometimes a little hard on their passengers, and sometimes it was merely by human mistakes, something that should not be the case.

4.8 Researcher's Observations on the Comfort of the Public Transport Service

The researcher travelled from ZESCO Bus Stop to Chelstone Bus Station and back ten times during and after peak hours. It was during these trips that the following observations were made.

4.8.1 Availability of Seats

The comfort of the bus can attract many bus users. In the case of the 14 seater minibuses poor quality seats were observed. Eleven (11) out of the 20 minibuses that were scrutinised had improvised seats fitted in order to convert these vehicles to public transport use. The eleven with welded seats had five with metals protruding from seats. In addition these minibuses were

loaded beyond their capacity such that passengers squeezed on few stats on the minibus. The body size of a passenger did not matter as the instructions from the conductor were heard, to squeeze. It seemed that this business was only booming because of lack of an alternative cheaper mode of public transport for the travellers. It was clear that in an event of an accident a lot of passengers would be injured or die due to congestion on the minibus. In an event of an accident very few would escape as the 14 and 16 seater minibuses clearly looked like death trap. An accident that results into fire could cause almost all passengers to perish especially those on rear seats. These results have confirmed the commuters' views that the public transport service in terms of seat availability was unsatisfactory.

4.8.2 Having Smooth Journeys on the Minibus

The researcher observed that travelling on the study route was not smooth because minibuses crew attitude both from the bus drivers and conductors was not good. 52 percent of the crew was rude to passengers while 48 percent were not and 75 percent of the drivers were very reckless while driving while only 25 percent drove well. Twenty eight percent (28 percent) of the drivers were young and looked inexperienced while 72 percent were not. These were over speeding and overtaking other vehicles even when the road signs, road conditions and situations did not permit. The rest of the minibus drivers were middle aged but most of these still conducted themselves in ways similar to those of young ones. Another 10 percent of the drivers looked drunk and could not entertain any questions. Only 30 percent of the minibus drivers showed good driving tendencies. The rest of the crew left a lot to be desired. Journeys were characterised by arguments and abrupt stoppages without any warning or notification. These observations show that commuters did not enjoy smooth ride on the study route. The quality of public transport service therefore from observations in terms of having smooth ride was unsatisfactory.

4.9 Discussions Regarding Comfort of Public Transport Service

Travelling on comfortable seats and air conditioned buses, with a pleasant crew is what every traveller would like to experience. Comfort in a public transport system must be taken into consideration seriously. Comfort of public transport service is not just a requirement but a necessity. Three aspects of comfort of public transport service were studied under this topic that constitute quality of service in terms of comfort. These included availability of seats on the minibus, having a smooth ride and having air conditioning service. These aspects of public transport are discussed in detail here below.

4.9.1 Perception on the Availability of Seats on the Minibuses

The results show that more than half of the respondents did not find seats on the minibus on the study route. This could be attributed to the observed situation where although seats were there for most of the travellers on minibuses, passengers were squeezed together and one or two passengers did not find a seat of their own but shared with others. The drivers however disagreed with the commuters over seat availability saying seats were adequate to meet all travellers' needs. However the researcher observed that the seats though available were not comfortable as passengers were squeezed. The quality of the public transport service in this case was unsatisfactory.

4.9.2 Perception on the Assurance of a Smooth Ride on the Minibuses

A smooth ride among other aspects of public transport is what makes a passenger continue using a particular mode of transport. In the study it was found that the minibus service does not offer comfort to its clients on the study route. This was attributed to minibus drivers and Conductors behaviour during travelling on the study route. This crew was usually rude to passengers and was reckless in the manner they drove their minibuses on the study route. However the results from the Drivers were quite different as they stated that they provided smooth ride to passengers. However some drivers stated that they behaved that way to express some authority on the passengers who in some cases were equally rude to the crew to the extent of not willing to pay the fare. Commuters and the researcher observed recklessness on the part of drivers. A better public transport system that commands comfort and respect for passengers was required. There is a saying that says, "A customer is always right". Therefore there is need for respect of passengers by the minibus crew irrespective of their behaviour.

4.9.3 Perceptions of Air Conditioning on the Minibuses

A public transport service can be described as comfortable when air conditioning among other aspects of service are provided to passengers. The study revealed that the air conditioning service on minibuses on the study route from the commuters, drivers and the researcher views was not available. It is important to find a way of ensuring that the service provided on the study route has air conditioning system due to varying weather conditions in the country.

4.9.4 Discussions on the Comfort of the Public Transport Service

Comfort of the public transport service is defined as the availability of seats on the bus, having a smooth ride and air conditioning on the bus. This problem from literature review and study could be resolves by introducing a completely new system of public transport service on the study route which instead of using small buses, could use large capacity buses such as those used between cities and like those used in Curitiba, Brazil. Large buses in that city ferry passengers from town to residential areas on well designed and roads, making boarding and offloading easier. Minibus are only used to ferry passengers from deep in residential areas and bringing them to the main roads where large buses will complete the process by taking them to town centre and bringing other passengers back. This undertaking would require either completely banning use of smaller buses with low capacity or using them as suggested earlier. The big buses are capable of carrying a large number of people per trip thereby reducing the number of trips per day. These buses have usually got comfortable seats and provide smooth rides. The buses due their size are usually difficulty to abuse by drivers compared to minibuses and can be reasonably cheaper in terms of fares. It would be also easier to regulate operations of these buses and to control because they would be fewer in number than minibuses. The comfort of luxurious big buses that is enjoyed by travellers between cities can also be enjoyed on local routes. Introducing such buses on local routes can significantly lead to improvement in the reliability of the public transport service and thereby reducing traffic congestion on the study route. The other problem that has been observed from the study was that bus drivers and Conductors had very poor public relations in the area of public transport management. This may require policies that could compel drivers and operators to provide high quality public transport service on the study route.

4.9.5 Perceptions of the Comfort of the Public Transport Service

Travelling in cooled air conditioning vehicles, with comfortable seats and with a pleasant crew is what every traveller would be happy with. Comfort in a public transport system must be taken into consideration seriously. Three aspects of service were discussed. These included availability of seats on the minibus, having a smooth ride and having an air conditioning system.

4.9.5.1 Perceptions on the Availability of Seats on the Minibuses

The Commuters were asked to indicate whether they were able to find seats on the bus. The results revealed that the Commuters viewed that the minibus transport service did not have

adequate seats. This could be attributed to the observed situation where although seats were there for most of the travellers on the minibus, passengers were squeezed together passengers did not find a seat and space for themselves but somehow squeezed against one another in the minibus. The drivers however disagreed with the commuters over seat availability saying seats were adequate arguing that it was not possible for a public transporter to offer a service without providing seats. However, the researcher observed that the seats though available on 14 and 16 seater buses loading did not actually depend on the number of seats but space. The situation was a little different on the 30 seater buses where passengers had more space and seats.

4.9.6.2 Perceptions on having Smooth journey on the Minibuses

The results show Commuters did not enjoy smooth ride of minibuses on the study route. This could be attributed to Drivers and Conductors behaviour whereby they were usually rude to passengers and were reckless in the manner they drove passengers on the study route. However the results from the Drivers were quite different as they stated that they provide smooth ride to passengers. Commuters and the researcher observed recklessness on the part of drivers. Both the commuters and the researcher stated that the minibus drivers were rude to passengers. A better public transport system that commands comfort and respect for passengers was required.

4.9.6.3 Perception on the Air Conditioning Service on the Minibuses

The research revealed that the air conditioning service on the minibus on the study route from the commuters, drivers and the researcher was not available. Despite these facilities existing in these minibuses they are never switched on. The reasons could be area of further researcher. It is important to find a way of ensuring that the service provided on the study route has air conditioning system due to varying weather conditions for the comfort of the service users.

The solution to the problem public transport service comfort could be to introduce a completely new system of public transport on the study route which instead of using minibuses, could use large capacity buses such as those used between cities. Large buses like those used in Curitiba, Brazil could reduce or eliminate poor quality service. This would be accompanied by either completely banning use of smaller buses with low capacity or using them to bring passengers from the main residential areas to the main public transport routes which are covered by large capacity buses. The big buses are capable of carrying a large number of people per trip thereby reducing the number of trips per day. These buses have usually got comfortable seats and driven in sober manner. Who said that the comfort of luxurious big buses could not be enjoyed on

local routes? The use of large capacity buses could just significantly improve the reliability of the public transport service and thereby reducing traffic congestion on the study route. The other solution could be capacity building for Drivers and Conductors in the area of public transport management which could include care for passengers. The government can also come up with policies that could compel drivers and operators to provide air conditioning, provide smooth ride with adequate seats to passengers.

Introduction of large and high quality buses which have good loading and offloading facilities such as those used in Brazil, on the study route would add value to the public transport service. Large buses such as those found on intercity routes in the City of Lusaka can offer high quality service to commuters. They usually have high quality seats, Air Conditioning and offers smooth ride to their customers. If these kinds of buses were introduced on the study route more people would be attracted to the bus service leading to reduction in private car use and less traffic congestion which will in turn contribute to socio-economic development of the areas served by the study route and the City of Lusaka. There was also need training programmes for drivers and conductors that could be introduced to ensure that there is proper public relations during travelling. The government can formulate policies that should compel bus drivers and conductors to go to school before allowing them to drive passengers on the study route. It can also be done at the time of obtaining driving licences so that everyone who obtains driving licences goes through such training first. The bus stations and bus stops are key to the improvement of the public transport service. In the City of Curitiba these facilities are well planned, safe, convenient, well designed, comfortable and attractive to the customer (Goodman et al., 2007). These should be user friendly to all kinds of commuters including those who are physically challenged, such as people on wheel chairs, the blind among others. This would result in the attraction of more public transport service users and thereby benefiting a larger group of people who would desire or be compelled to use public transport due to pleasant atmosphere in the system.

4.10 Perceptions of Safety of the Public Transport Service

Public transport safety is an important attribute that commuters consider before choosing a transport mode. Safety refers to the low probability of accidents, low probability of falling and low probability of assault. Safety of the public transport service may be defined further as the number of accidents involving on a transport mode and refers to the passengers' fears that they are more likely to be involved in an accident as a result of using a particular transportation

mode, the condition of vehicles, driving behaviour and not obeying the traffic rules. The study focussed on one aspect only namely, the probability of accidents occurring. Safety of the public transport service is key to the encouragement of Commuters to use a particular public transport mode. This is because no human being want to die despite the age or status. Public transport service therefore must be safe in order to attract passengers to itself or risk being ignored in favour of other transport modes.

4.10.1 Commuters' Perceptions on the Safety of the Minibus Service

To assess the perception of safety among commuters, a question was asked as to how safe they generally felt when using public transport. The responses were as shown in Figure 4.13.

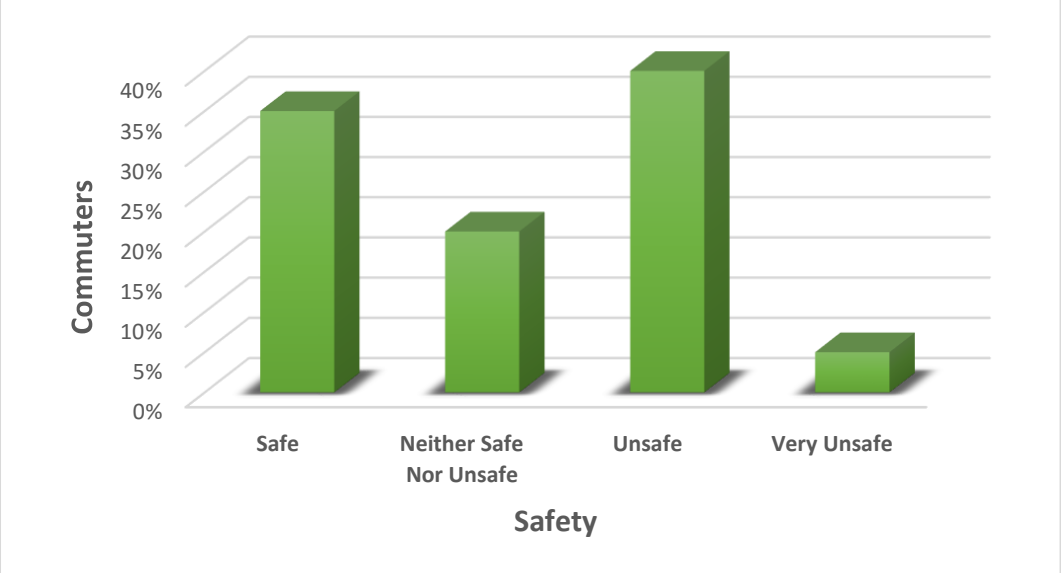

Figure 4.13 Commuters General Perception of Public Transport Safety
Source: Field Data, 2015

Figure 4.13 shows that most commuters view public transport service as *unsafe*. However some still feel that the public transport service is *safe* while a number of them view the public transport service as *very unsafe*. The rest were *neither safe nor unsafe* category. The total number of those in the *unsafe* and *very unsafe* categories accounted for the largest score compared with the rest, which clearly shows that the public transport service on the study route was unsafe. The quality of public transport service therefore, from the commuters' point of view, in terms of safety, was therefore perceived to be unsatisfactory. The results showed that some commuters could have continued using public transport on the study route, probably because they did not have an alternative way of commuting to and from work or other errands.

This is because one wonders how they were using a public transport mode where they felt they were risking their lives. However this could also explain the reason why the public transport industry in Zambia is not so developed such that only a section of society use it. This can be explained when you look at high cost residential areas such as Ibex hill and new kasama in Lusaka among others. Public transport service is not provided in these areas because the residents of these areas prefer using private cars. Most of the people who could have otherwise travelled on public transport might have ended up walking or driving their own vehicles on the study route despite the latter being more expensive. There is therefore serious need to address the issues of public transport safety on the study route to ensure the safety of passengers

4.11 Institutions Perceived Safety of the Public Transport Service

The results showed that four of the institutions namely Department of Physical Planning and Housing (DPPH), the Lusaka City Council (LCC), Road Transport Safety Agency (RTSA) and Ministry Transport Works, Supply and Communications (MTWSC) viewed the public transport service to have been safe while one institution namely Department of Housing and Infrastructure Development (DHID) stated that the public transport service was not safe on the study route. The DPPH stated that, "*the minibus service was generally safe for commuters.*" The LCC stated that, "*the minibus service was generally safe as there were institutions like RTSA and MTWSC which managed them*" The RTSA, stated that, "*the service was very safe as public transport vehicles were certified fit by RTSA before licence to operate was given. This action made sure that only fit vehicles were allowed to carry passengers on the study route*" The MTWSC stated that, "the *minibuses were safe for commuters as the Ministry had not received any complaints from the public*"). However DHID stated that, "*the quality of minibuses and the crew* (front line staff) *behaviour makes the service to be unsafe, that the service was characterised by rude staff, reckless driving and uncomfortable sitting arrangements especially for smaller 14 seater minibuses*" The research revealed that the safety of the public transport service from the institutions point of view in terms of safety was therefore satisfactory. It was clear from the institutions that provide public transport service the quality of service was viewed as safe.

4.12 Researcher's Observations on Safety of the Public Transport Service on the Study Route

The researcher made the observations during the field work on the study route. He travelled on the minibuses to get the actual situation of public transport service on the ground. The findings were as follows.

4.12.1 Observance of Pedestrian Crossings

The researcher observed 20 minibuses concerning observance of pedestrian crossings provided on the study route. The researcher sat on front seats close to the minibus drivers and made observations on minibus drivers 'driving tendencies. It was observed that 60 percent of minibus drivers did not observe pedestrian crossings while 40 percent did. In the 30 seater minibuses however, the situation was a bit different as 80 percent of them observed pedestrian crossings.

4.12.2 Observance of Speed Limits by Bus Drivers

The researcher observed 20 minibuses and these were 14 and 16 seater minibuses. He observed this while travelling on the minibuses and seated next to the minibus drivers. The speed meter was observed against the posted speed limit. Minibuses were driven above posted speed of 60 Km /h especially during off peak hours. The 14 and 16 seater minibuses did not satisfy the researcher as they did not observe speed limit. The results showed that 60 percent did not observe speed limits while 40 percent did. The other five minibuses were the 30 seater minibuses. It was observed that 40 percent did not observe speed limits while 60 percent did. The results shows that minibus drivers who drove large capacity minibuses were less reckless while those who drive smaller minibuses were**.** The results shows that the smaller the minibus the more easily it becomes to be reckless on the study route. The researcher concluded that the safety of passengers using 14 and 16 seater capacity minibuses had higher risk of getting involved in road traffic accident than those using the 30 seater capacity minibuses. The researcher felt that if larger capacity buses such as those of 71 seater capacity, were to be introduced on the study route it would be expected that recklessness of minibus drivers would be reduced or completely eliminated.

4.12.3 Discussions Regarding Safety of Public Transport Service on the Study Route

The discussion regarding the safety of public transport service according to commuters on the study is hereby given below;

4.12.3.1 Commuters' Perceptions on the Observance of Road Traffic Signs

The results showed that commuters perceive that their safety on the public transport was inadequate. The minibus drivers according to commuters did not observe pedestrian crossings, did not observe speed limits and also they did not observe road signs. However the drivers stated that they observed safety rules as provided for in the Highway Code. This position is not supported by the researcher's findings. In addition the researcher's observations fortified the commuters' position that drivers did not observe road traffic rules which included stopping at pedestrian crossings to give way for people crossing the road on foot. Minibus drivers did not observe road signs which enhances road safety and were reckless while driving which put passengers at risk of getting involved in a road traffic accident. Pedestrian crossings and road signs form the basic requirements for harmony and safety among road users. This is according to the Highway Code the book that provides rules for safe driving and safety of all road users. Failure to observe these rules constitute serious misconduct on the part of minibus drivers.

Safety is an important attribute of the public transport service. Improving the safety of public transport service can attract more users of the service and thereby reduce traffic congestion. Consistent efforts to enforce existing regulations could greatly ease traffic situation in the City of Lusaka and the Great East Road in particular. Recent experience in Nairobi, Kenya showed that, with political will, effective enforcement of traffic rules was possible (Cervero, 2013). The City of Nairobi is the capital city and is the largest city in Kenya with a population of about 3,500,000. Though traffic congestion remains one of the challenges facing the city enforcement of traffic rules had helped improve the safety of road users. In the City of Lusaka which had a population of about 2,500,000 in the year 2015, lack of effective enforcement of road traffic rules had resulted in the misconduct of the minibus conductors and drivers resulting in many accidents. Safety of public transport service would be enhanced by introduction of a completely new system of public transport on the study route which instead of using small minibuses, large capacity buses could be used. The buses such as those used in Curitiba, Brazil could be introduced while at the same time completely banning use of smaller minibuses with low capacity. The big buses are capable of carrying a large number of people per trip thereby reducing the number of trips per day resulting into less traffic congestion.

The High Way Code needs to be fully enforced by RTSA and the police to ensure that offenders are brought to book through stiff punishments. The government also through RTSA could ensure that speed limit signs on the study route are made more clear and visible to all motorists.

The bus stations and bus stops shelters could also be made safer and attractive to minibus users. These could be provided with proper lighting during the night, adequate and comfortable seats for the passengers waiting to board. The shelters could be fitted with well managed toilet facilities and simple shopping facilitates where the people waiting could buy some snacks, drinks and simple groceries even as they disembark to go home. The Anticorruption Commission should continue ensuring that there is no corruption in the issuance of certificates of fitness from RTSA so that only fit vehicles could be allowed to carry passengers (World Bank 2006).

4.13 Perceptions of Affordability of the Public Transport Service

Purchasing of a commodity requires that one is willing to spend on the commodity. However willingness to buy a commodity alone, is not enough, but also the power to spend, the money itself must be available. In the similar manner offering public transport service alone is not enough but also making it accessible and affordable to users. The views regarding the quality of the public transport service by commuters, minibus drivers and institutions are covered under this section.

4.13.1 Commuters Perceptions of Minibus Fares on the Study Route

This study assessed affordability of the public transport service through obtaining the perceptions of the service users. The Commuters were asked how much they paid to travel on the study route. They were asked whether the amount they paid was low, fair, high or very high. The results are shown in Figure 4.14.

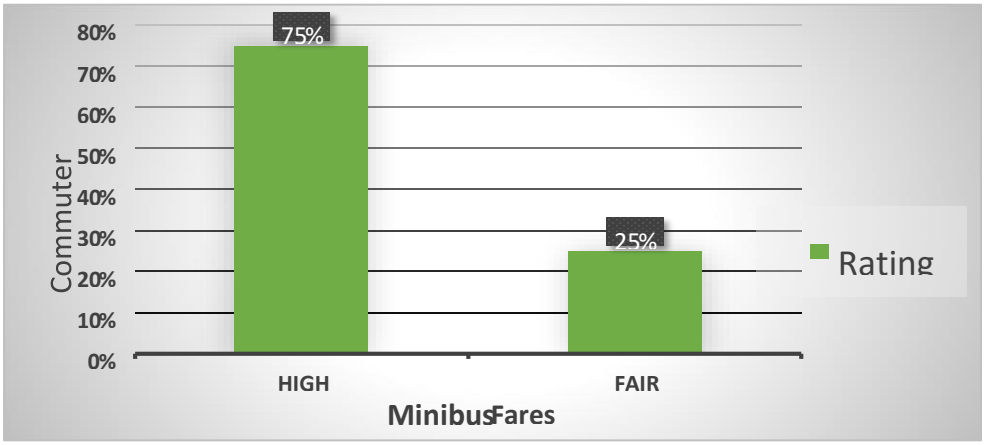

Figure 4.14 Commuters Perceived Minibus Fares on the Study Route

Source: Field Data, 2015.

Figure 4.14 shows that the Commuters view the current minibus fare of K5.50 on the study route as high while others view the fares as *fair*. The results show that fares were high for commuters. The quality of the public transport service in terms of fares was therefore unsatisfactory.

4.13.2 Minibus Drivers Perceptions on Bus Fares on the Study Route

The minibus drivers were asked whether the minibus fares on the study route were low, fair, high or very high for commuters. A very big difference from the responses of commuters was observed. While the majority of commuters said the fares were high. The results of minibus drivers showed that the majority of them view the minibus fares as *fair* while the rest view the fares as *low*. The results show that drivers consider the current fares of K5.50 on the study route as fair. Therefore the quality of public transport service according to minibus drivers in terms of affordability of service was satisfactory.

4.13.3 Summary of Affordability of the Public Transport Service

The perceptions of the commuters showed that the public transport service was not affordable to users while minibus drivers viewed the public transport service as fair. Though the minibus drivers' point of view was that the fares were fair, this could only be attributed to commuters who boarded a minibus' ability to paying the fare. It might not have represented many other potential service users who could not even manage to board the minibus and possibly opt to use other modes of transport to get to their destinations. The situation could have been probably different if a study was done to establish the number of potential service users who did not use the minibus for public transport.

4.13.4 Institutions Views Regarding the Affordability of Minibus Service

The institutions were asked to state their positions regarding the quality of public transport service on the study route in terms of affordability of minibus fares. The DPPH stated that "*the fares were high because most of the poor people could not afford them and walk long distances to and from work".* Department of Housing and Infrastructure Development (DHID) stated that "*The fares were fair because the people had not complained about them"* The other three institutions also said that the fares were fair though they gave different reasons. The Lusaka City Council (LCC) stated that, "*fares were fair because operators could only do business if that business was reasonably profitable and viable*" The Ministry of Transport Works, Supply and Communication (MTWSC) stated that, "the *fares were fair because the decision to come*

up with fares was consultative and that fares were finally arrived at through mutual agreement between RTSA, minibus operators and other stakeholders while the Road Traffic Safety Agency (RTSA) stated that, "the *fares were fair because fares were revised based on the price of fuel in order to make business worth an undertaking by operators* The results show that from the institutions point of view, the minibus fares were *fair* and affordable by service users. The quality of public transport service therefore in terms of affordability from the institutions point of view was satisfactory.

4.13.5 Researchers Observations on Affordability of Public Transport Service

The researcher observed that in terms of affordability passengers freely paid their fares to the conductors though in some cases there were incidences of difficulties in securing change for passengers travelling shorter distances on the study route. Tickets are the official means of receipts for payment of fares globally. However there were no tickets given in exchange for the fare payments on the study route. In all the 10 minibuses that were studied, there were no tickets given for the fare paid. The money was either collected by the conductor directly from passengers or passed through other passengers, something the researcher viewed as inconveniencing to passengers. A better method of paying fares was required if the public transport service was going to be satisfying to its users. More over the fares for shorter distance were not *fair* because they did not make sense in most cases. Below is Table 4.1 showing fares from ZESCO Bus Stop to Chelstone Bus Station.

Table 4.1 Fares from some Minibus Bus Stops and Bus Station on the Study Route

	Stations from ZESCO Bus Stop to Chelstone	Approx. Distance (km) from ZESCO Bus Stop	Fares
1	North mead	2	K4.00
2	Manda Hill	3	K4.00
3	Arcades	4	K5.00
4	UNZA	5	K5.00
5	Marshland	7	K5.00
6	Munali	8	K5.00
7	Chainama	9	K5.50
8	NRDC	10	K5.50
9	Chelstone	12	K5.50

Source: Field Data (2015).

Table 4.1 shows that fares are higher for shorter distances than for longer ones. The fares therefore according to the researcher were high especially for shorter distances thus the quality of service was unsatisfactory.

4.13.6 Minibus Fares in Selected Cities in Africa

The cities were picked at random to establish comparison between the minibus fares in the city of Lusaka and other cities in Africa. The results showed that the minibus fares in the City of Lusaka were high compared with other cities in Africa. It was found that the Cities of Pretoria in South Africa and Harare in Zimbabwe had the highest minibus fares while the cities of Nairobi Kenya and Lilongwe in Malawi had the lowest. Figure 4.15 helps us to understand that although the minibus fares in Lusaka are not the highest in Africa, they are still high when compared with other cities within the same region. This shows that the quality of public transport in the city of Lusaka in terms of affordability of minibus fares is unsatisfactory.

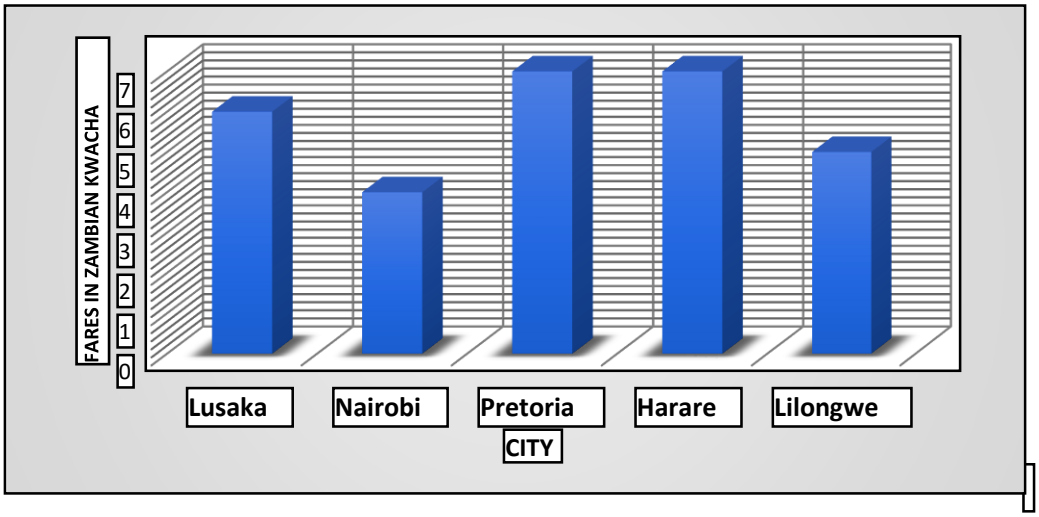

Figure 4.15 Minibus Fares in Selected Cities in Africa in 2015
Source**:** Google 2019

Figure 4.15 shows that minibus fares vary in different countries and cities. In the above mentioned cities which were picked at random minibus fares are higher in the Cities Pretoria and Harare, followed by Lusaka and Lilongwe while the City of Nairobi scored the lowest fares. The results show that the City of Lusaka is among the cities that have high fares.

4.14 Perceptions on Affordability of the Public Transport Service

Public transport service is key not only to the development of the industry but also meeting the welfare of the people. Those who provide such services must always remember that, while they

have to operate their businesses to make profit, sight of the people's ability to pay must not be lost. They should therefore seek to provide a service which is not too expensive such that they price themselves out of business and not too low such that they start failing to offer the service. An affordable fare therefore would be required for the benefit of both parties. According to Guihaire and Hao (2008), asserts that the users' perspective of the system is that it should meet the demand by providing cheap and direct service to passengers.

4.14.1 Commuters' Perceptions on the affordability of the Public transport Service

The study showed that Commuters view the current minibus fare of K5.50 on the study route as high. The implications of this is that poor people who could otherwise have afforded to pay the fares were cut off. This situation is unacceptable because public transport service provision is intended to benefit all categories of income groups including poor people. Failure to realise this goal would defeat the very purpose that the public transport serve is trying to achieve. Public transport service should target among others those who have less capacity to own their own vehicles.

4.14.2 Affordability of Fares by Commuters, Drivers and Institutions

The Commuters consider the current bus fare of K5.50 on the study route as high. A very big difference from the responses of drivers observed. While the commuters stated that fares were high, the drivers stated that the fares were fair. However the researcher observed that the fares for complete distance was reasonable while the fares for short distances were not fair to commuters. A person travelling a distance of about 3 km was made to pay an amount close to the full fare for the complete distance on the study route. This made those in low income groups avoid using public transport and walk to and from work. However the institutions point of view was similar to that of minibus drivers who stated that the fares were fair to users. The quality of public transport service therefore in terms of affordability from the institutions and minibus drivers differed from that of commuters and the researcher. The exact coordinates some of the Bus Stops and Bus Station are as shown Table 4.2.

Table 4.2 Geographical Locations of Minibus Station and some Bus Stops

Terminus/ Bus stops	Eastings	Northings	Distance from ZESCO Bus Stop to Chelstone (Km)
ZESCO Bus Stop	637987.14	8296201.61	0.0
North Mead	637980.43	8297134.21	2.1
Manda hill Bus Stop	640473.57	8297273.79	3.1
Arcades Bus Stop	641248.54	8291975.78	4.4
UNZA Bus Stop	642235.49	8298332.02	5.5
Marshlands Bus Stop	643278.86	8298393.75	6.5
Munali Bus Stop	644345.91	8298541.44	7.6
Chainama Bus Stop	645732.47	8298916.19	9.0
NRDC Bus Stop	646973.10	8299394.77	10.2
Chelstone Terminal	648175.65	8299651.21	11.6

Source: Field Data, 2015.

Table 4.3 shows that the exact distance of the study route from ZESCO Bus Stop to Chelstone as measured using the GPS is 11.6 Km. The exact distance to Manda hill Bus Stop is 3.1 Km, 4.4 Km to Arcades, 5.5 Km to UNZA, 6.5 Km to Marshlands, 7.6 Km to Munali, 9.0 Km to Chainama, 10.2 Km to NRDC and finally 11.6 Km to Chelstone Bus Station. The fare from Town to Chelstone according to research was K5.50. If the distance was divided by the full amount paid for the journey, the average fare per kilometre would be determined using cross multiplication. Distance is 11.6 Km and fare is K5.50.The cost of travelling would be K0. 47 per kilometre. The calculation implies that at the cost of K0.47 per Km the fare for Manda hill would be K1.45, Arcades at K2.06 and so on. This calculation shows that the fares for short distances on the study route do not provide value for money in terms of the service offered.

The full report is provided on the next page.

Table 4.3 Fares Commuters Pay on the Study Route against Actual Distances

Origin of Journey	Bus Stop	Distance in Km	Cost of service/Km	Perceived Fares	Actual Fares	Extra Amount Paid
ZESCO Bus Stop	Northmead					
	Manda Hill	3.1	K0.47	K1.45	K4.00	K 2.55
	Arcades	4.4	K0.47	K 2.06	K5.00	K 2.94
	UNZA	5.5	K0.47	K2.59	K 5.00	K 2.41
	Marshlands	6.5	K0.47	K3.06	K5.00	K1.94
	Munali	7.6	K0.47	K3.57	K5.50	K1.93
	Chainama	9.0	K0.47	K4.23	K5.50	K1.27
	NRDC	10.2	K0.47	K4.79	K 5.50	K0.71
	Chelstone Bus Station	11.6	-	-	K5.50	K0.00

Source: Field Data, 2015.

Table 4.4 shows clearly that all public transport service users for short distances pay more than they are supposed to pay on the study route. The fares for short distances for example Manda hill actual fare is K1.45 which was less than the fare paid of K4.00. The same for Arcade's actual fare was K2.06 which was less than the fare paid of K5.00. The picture is same for all short distances. The scenario is similar for fares under all the other bus stops. However even the full fare of K5.50 was described as high by commuters. The quality of public transport service therefore in terms of affordability was unsatisfactory. This information is critical for those who determine the rate of fares of the public transport service on the GER in the City of Lusaka. These includes RTSA and other stakeholders who should ensure that fares were based on distance such that there is a clear difference between fares for short distances and fares for longer distances. Consumers must be given chance to pay the correct actual fare as calculated by the researcher to ensure that the quantity of service they pay for is actually the one they have enjoyed and not paying extra money for the sake of subsidising the service provider.

The two columns *perceived fares* versus the *actual fares* in table 4.3 show the difference between them is clear. However no one seems to query the criteria used to arrive at the fare a passenger pays. Let us take foe example the fares to Chelstone from ZESCO Bus Stop. The

distance from ZESCO Bus Stop to Manda Hill is 3.1 Km and the cost of travelling per Km as calculated above as K0. 47 per Km. The worked out fare is K1.45 that is the fare a customer was supposed to pay for the 3.1 Km distance but a customer according to research was paying K4.00 which was K 2.55 more than the worked out fare. The explanation for this is that the customer is made to pay more money for the service costing less. Many poor people who could have afforded to use public transport end up failing resulting into walking long distances to and from work. This situation is counterproductive as people reach their working places already tired. The issue of fares needs to be addressed immediately to make fares affordable to all income groups.

4.14.3 Minibus Fares and Issuance of Tickets

Tickets do not form part of the transaction when travelling on the minibus on the study route. A ticket is the sign that a correct fare has been paid and the holder can use it to make a claim from the employer or for records purpose. In Curitiba, Brazil for example where the BRT system had been introduced and had become one of the best practice public transport system in the world, a pre-paid ticketing system was used where passengers buy tickets prior to boarding on the bus. This enabled the system to manage loading and offloading of passengers' in a quick manner and the facility enables quick movements of vehicles and reduced delays. However in Kenya pre-paid ticketing system is not yet practiced but there are efforts towards implementing the same. Lessons can be learnt from Curitiba BRT which offers its clients one of the cheapest and quickest public transport service in the world.

4.14.4 Discussions on the Affordability of the Public Transport Service

The commuters and the researcher consider fares to be high while institutions and drivers consider fares to be fair. However fares for shorter distances were clearly higher than the worked out fares as demonstrated by the calculation. On the other hand the response by the drivers that the fares were fair may not really be something to go by since they are an interested party being the ones on the receiving end. A businessman would be willing to price his goods at a higher price in order to maximise on profits. The Commuters in this matter speak louder as they are the ones bearing the burden to pay for the service provided. The solution to this problem could be the possibility of the government to subsidise the service or to provide incentives to minibus operators to enable them lower the fares below the market value so as to make the public transport service affordable to all members of public served by the study route. There is also need for RTSA and other stakeholders to consult widely before coming up with

new fares so that fares arrived at would represent the will of all the parties involved. There is also need to introduce a ticketing system on the study route that is pre-paid in order to avoid delays. In some cities in the world introduction of government fare controls protects citizens from exorbitant fares though this rarely keep pace with cost of living increases (Cervero, 2013). The consequent drain on Bus Company finances in Kenya meant that vehicles could not be maintained or replaced, and service quality deteriorated (Cervero, 2013). These innovations help in making cities smarter and greener, by improving the quality and reliability of the public transport service (Avoinea et. al.2014).

Governments around the world suffer mainly from the challenge of meeting the citizens' need of social services such as good medical care, education among other competing needs. There is usually inadequate resources to meet these obligations, even though some funds are generated through taxes. Therefore partnering with the private sector becomes necessary since the private sector has adequate resources but no political power while the government has the power but with little resources. It becomes therefore necessary to work together so that those who have power provide power and those with resources provide resources in the similar manner. To achieve this policies need to be formulated to promote this public private Partnerships (PPPs). This would help improve the quality of service offered. Other government policies could be formulated to ensure there is safety and security in all transport systems, whether operated by the public or private sectors (Amos, 2004).This is because public transport is important to all income groups in the country especially those in the low income category and the poor (Barter, 1999). Public transport is normally cheaper and could help carry a large number of people at a time and therefore avoiding use of too many vehicles. The next Chapter is continuation of the study of the public transport service quality and it provides possible solutions to the current service challenges in form of recommendations.

4.15 Summary of the Research Findings

The research findings covered by RECSA is covered by Table 7. It is very clear from the table that commuters and the researcher view the quality of public transport service offered on the study route as unsatisfactory. The commuters and the researcher view all the aspects of service quality of the public transport service as unsatisfactory. The drivers and institutions on the other hand view the public transport service as satisfactory. In general the service provided by the minibus is satisfactory according to the table 4.4. However the recipient of the service is neither

the minibus driver, institutions nor researcher but the commuters. Therefore there is still need to work towards improving the quality of the public transport service offered on the study route. The researcher's observations cannot be also ignored because they were directly made on the prevailing situation on the ground to fortify the other study findings.

Table 4.4 Summary of Research Findings

Item	RECSA	Commuter Perception	Driver Views	Institution Views	Researcher observation	Service quality
1	Reliability	○	○	○	○	unsatisfactory
2	Extent of Service	○	✓	✓	○	satisfactory
3	Comfort	○	✓	○	○	unsatisfactory
4	Safety	○	✓	✓	○	satisfactory
5	Affordability	○	✓	✓	○	satisfactory

Source: Field Data (2015).

Where;

✓ = Satisfied (Acceptable quality of service)

○ = Dissatisfied (Unacceptable quality of service

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the conclusions from the research findings as well as recommendations. The study of the Literature review and the processing of the field data revealed gaps that need to be addressed to improve the quality of the public transport service.

5.2 Conclusions

The study objectives were to assess the quality of the public transport service on the study route. These objectives were according to RECSA the model that uses five dimensions of service quality in determining the quality of service offered in a locality. These objectives were to assess the reliability, extent of service, comfort, safety and affordability of the public transport service on the study route. The research questions were also in line with these objectives. The objectives of the research at the end of the study were all achieved.

The research revealed that the service offered to users on the study route was generally unreliable, inadequate, uncomfortable, unsafe and unaffordable. The reliability of the public transport service in particular from the commuters, drivers, and institutions was found to be compromised by the service providers. However improving the reliability of the public transport service should be done along with the improvement of other factors that influence quality of the service such as extent of service, comfort, safety and affordability. The number of hours the service is available to the members of the public is critical. The quantity and quality of service, a service provider provides during the working days, holidays and weekends entails quality of service. Research revealed that there was adequate public transport during working hours from Monday to Friday though during the evening service reduced. There was inadequate service during holidays and weekends. The understanding of how much service is required by commuters is a matter requiring serious attention on the part of service providers as well as the government. Comfort of the public transport service is another area that needs attention as revealed by the study. Commuters desire to travel on a bus with adequate seats, providing smooth journeys and with air conditioning system. Commuters also need to be safe when travelling and must be able to afford cost of travelling. The challenges that study has revealed must be addressed so as to improve the quality of the public transport service provided on the study route. A high quality public transport service would attract many people to start using public transport as opposed to using other transport modes.

Public transport then should be made to operate in an orderly and efficient manner as opposed to the current situation. This requires involvement of stakeholders such as commuters, drivers, operators and others to work towards finding solutions for the betterment of the public transport service provided. In this way public transport service quality can be improved and made to positively contribute towards the socio-economic development of the country and areas served by the Great East Road in particular.

5.2 Recommendations

The whole discussion of this study would be meaningless without providing means by which the public transport service could be improved on the study route. The recommendations would provide action points that could lead to high quality public transport service on the study route. This chapter has provided recommendations presented according to the five dimensions of service quality of RECSA. The following are the recommendations.

i. Introduce Dedicated Lanes for Buses on the study route. A dedicated lane enables minibuses to travel faster in such a manner that they are not affected by either traffic congestion or traffic lights. This can be achieved through expansion of existing road to include a lane for buses only. Central government through the Lusaka City Council (LCC) and Road Development Agency (RDA) would be key to the implementation of this activity. The Ministry of Finance and National Planning (MFNP) is also key in the area of finances and other donors such as JICA could assist with technical and material support to this project. The cooperating partners such as donors namely JICA and GIZ can also help with both technical and financial assistance to ensure the implementation of the activity.

ii. Introduce Bus Rapid Transit (BRT) system on the study route to ensure smooth movement of passengers to and from work. This facility has proved itself to be offering an exclusive service to commuters in cities like Curitiba in Brazil and Dublin in Ireland. The BRT was cheaper than other modes of public transport, Reliable due to minimum delays, lower initial capital cost compared to underground rail system. This activity implementation can be undertaken by the Ministry of transport Works Supply and Communication (MTWSC), Ministry of Finance and National Planning (MFNP) and the Ministry of Commerce Trade and Industry (MCTI) which is responsible for promoting and managing social economic activities through policy formulation and implementation can take the lead in the project by directly getting involved or through

Public Private Partnerships (PPP) or better still encourage the Private Sector to get involved. The JICA) and GIZ can assist with both technical and financial requirements. iii. Extend service to late hours in the evening through government incentives to minibus operators who will be offering distinguishable service during evenings, holidays and weekends. This could cover all minibus operators who continue to offer service during the non-profitable periods of the day to make life of ordinary citizen's easier. This is possible where public transport operations are private hands through private companies and using large buses for local travelling. The government has a moral responsibility to provide services to its citizens that the private sector may not be willing to provide due to them not being profitable. The MTWSC and MFNP would undertake this task. iv. Capacity building for minibus drivers and bus conductors aimed at improving the performance of minibus drivers and conductors in public relations issues. A policy deliberately formulated to compel this category of workers could go a long way in improving the quality of the minibus service on the study route. This can be done by Central Government through Road Transport and Safety Agency (RTSA) who could ensure that a driving licence is not issued to bus drivers who have not been trained in the public transport management issues and RTSA itself can provide this training program which can be a short course for two to three months.

v. Introduce large capacity buses on the Study Route to improve quality of service. This will not only improve the quality of service in terms of capacity but also reducing traffic congestion on the study route caused by use of numerous minibuses. This will lead the attraction of user's private cars who will be compelled by circumstances to switch mode. The Government of the Republic of Zambia (GRZ), the private sector or both of them through Public Private Partnerships (PPPs) can provide this service. The resources coming from donors and Ministry of Finance and National Planning (MFNP).

vi. Consult widely when introducing New Bus Fares to ensure that the service true value is achieved. All the key stakeholders must be consulted so that there is consensus on the matter before any decision is to be implemented. This would result in fares that meet the needs of both operators and users. The Road Transport Service Agency (RTSA) and the Lusaka City Council (LCC) can lead the consultative process.

The above recommendations are critical to the development of an efficient, attractive and effective public transport system which would lead not only to reduced traffic congestion but

improved welfare of the people. This will finally culminate into socio-economic development at both individual and community levels. The areas for further research include a study on how the minibus operators 'views the quality of service they offer and also to research on how the members of public who walk, cycle, use motor bikes and those who use private cars view the quality of the public transport service on the study route.

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APPENDICES

Appendix A: Commuters' Questionnaire on Perceptions of Quality of Public Transport Service

Part 0ne

What is the travel time of public transport on the study route?

1. How long does it take you to travel from Town to Chelstone during Peak Hours?

a. 20 to 40 minutes b. 41 to 60 minutes c. 61 to 80 minutes d**.** 81 minutes and above

b. How satisfied are you with the travel time in question 1a above?

a. Very satisfied; b. Satisfied; d. Neither Satisfied nor Dissatisfied; 4. Dissatisfied; e. Very Dissatisfied

2. How long does it take you to travel from Chelstone to Town during Peak Hours?

a. 20 to 40 minutes b. 41 to 60 minutes c. 60 to 80 minute; d**.** 81 minutes and above

3. How long does it take you to travel from Town to Chelstone during off Peak Hours?

a. 20 to 40 minutes b. 41 to 60 minutes c. 60 to 80 minute; d**.** 81 minutes and above

4. How satisfied are you with the travel time in question number 4 above?

a. Very satisfied b. satisfied c. Neither Satisfied nor Dissatisfied d. Dissatisfied **e**. Very Dissatisfied

Part two

What is the extent of service of the public transport service on the study route?

1. How adequate is the public transport service during the working days?

2. How adequate is the public transport service during evenings, holidays and weekends

Part Three

How comfortable is the public transport service on the study route?

1. Do you find adequate seats on the minibus on the study route?

2. Do you enjoy a smooth ride when travelling by minibus on the study route?

3. Do minibuses have air conditioning system on the study route?

Part Four

What is the safety of the public transport service on the study route?

1. Generally how safe do you feel when travelling on the study route?

a. Very Safe; b. Safe c. Neither Safe nor Unsafe; d. Unsafe; e. Very Unsafe

2. Do the minibus drivers observe road traffic signs?

a. Yes b. No c. Does not know d. Not sure

3. Do the minibus drivers over speed on the study route?

a. Yes b. No c. Does not know d. Not sure

Part Five

What are the bus fares on the study route?

1. How much do you pay for travelling between Town and Chelstone?

a. K1.00 – K1.99; b. K2.00 – K2.99; c. K4.00 – K4.99; d. K5.00 and above

b. How would you describe the bus fares in question 1 above?

a. Too high; b. High; c. Fair; d. Low; e. Very Low

2. Does the bus fare much with the service provided

Appendix B: Minibus Drivers Questionnaire on Perceptions of Quality of Public Transport

Part One

How reliable is the public transport service on the study route?

1. How long does it take you to drive from Town to Chelstone during Peak Hours??

a. 20 to 40 minutes b. 41 to 60 minutes c. 61 to 80 minutes d. 81 minutes and above

☐

2. How long does it take you to drive from Chelstone to Town during Peak Hours?

a. 20 to 40 minutes b. 41 to 60 minutes c. 61 to 80 minutes d. 81 minutes and above

☐

3. How long does it take you to drive from Town to Chelstone during off- peak hours?

a. 20 to 40 minutes b. 41 to 60 minute's c. 61 to 80 minute's d. 81 minutes and above.

☐

Part Two

What is the extent of service of public transport on the study route?

1. How much of the public transport service do you offer during working days?
2. How much of the public transport service do you offer during evenings, holidays and weekends?

Part Three

How comfortable is the public transport service on the study route?

1. Do you provide adequate seats to all your passengers on the minibus on the study route?
2. Do you provide smooth ride to passengers on the study route?
3. Do you provide air conditioning service to passengers on the study route?

Part Four

How safe is the public transport service on the study route?

1. Do you observe road traffic signs as you drive on the study route?

2. Do you observe speed limits when driving minibuses on the study route?

Part Five

How affordable is the public transport service on the study route?

1. How would you describe the minibus fares paid on the study route?

a. Very high b. High c. Fair d. Low e. Very low

☐

2. Do people complain about the rate of fares in question number 1 above?

a. Yes b. No c. Not sure d. Does not know

☐

Appendix C: Institutions' Interview Guide on Quality of Public Transport Service

1. Name Institution

……

2. Institution Roles

What role does your institution play in the public transport service provision?

…….

……..…

3. Is the public transport service reliable on the study route?

Explain your answer

……

…….....

4. What is the extent of service of the public transport system on the study route?

Do buses offer adequate public transport service on the study route?

……'

…….....

5. How comfortable is the public transport service on the study route?

Do you think that the public transport service is comfortable on the study route?

…….....

6. How safe is the public transport service on the study route?

Do you think that the public transport service is safe for travellers?

…….....

7. How affordable is the public transport service on the study route?

How would you describe the minibus fares in Lusaka?