UNIVERSITY OF GHANA

URBAN TRANSPORTATION CHALLENGES IN ACCRA: IS THE BRT A SOLUTION?

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DECLARATION

I hereby declare that this long essay is the results of my own effort and original work and that no part of this work has been submitted in this University or any other institution for any degree whatsoever.

…… ……..

BARBARA ESSANDOH **DATE**

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CERTIFICATION

I certify hereby that this long essay was supervised in accordance with the procedures, rules and regulations of this University.

…… ….....

DR. ALBERT AHENKAN **DATE**

(SUPERVISOR)

DEDICATION

This Long Essay is dedicated to My Husband, David Essandoh, and my two lovely children, Aaron Paa Kwasi Essandoh, and Janice Ewurabena Essandoh.

ACKNOWLEDGEMENT

It has empirically been established that this long essay is exclusively the work of the student. I therefore, wish to take this opportunity to express my sincere appreciation to my supervisor, Dr. Albert Ahenkan and to all those who contributed in one way or the other to make this work a success. God bless you all.

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Abstract

This study set out to examine the role of the Bus Rapid Transit (BRT) in Ghana in resolving the transportation challenges in Accra. The study employed qualitative research approach with semi-structured interviews as its main instrument of data collection. In all, a sample size of thirty includes policy makers of Bus Rapid Transit affectionately called Ayalolo at the Ministry of Transport, management members of the BRT. The study was conducted only in Accra, where the BRT has been piloted. The study found out that, traffic congestion in the city of Accra occurs within the peak hours of 6:00am- 10:30 and 4:30 pm-7:30 and is caused by lack of effective public transport system, limited road network, ever increasing population growth, and over concentration of businesses and activities at the central business district and

The study reveals that, the Bus Rapid Transport System is the best remedy for the excessive traffic congestion within the city due to its ability to carry large volumes of passengers, dedicated lane and possibility of ceasing the increasing and constant use of private cars on the roads.

Despite these great advantages associated with the system, the study found that, there are financial, political, and infrastructural challenges impeding the effectiveness of the BRT system.

The study recommends that, management and government should develop an alternative system that seeks to secure government support in managing the system as well as develop adequate infrastructure for the system's operation.

CHAPTER ONE

BACKGROUND TO THE STUDY

1.0 Introduction

The first chapter of the study discusses the background to the study and problem statement. The chapter also presents the aim and objectives of the study, research questions and significance of the study, theoretical perspective and the organization of the study.

1.1 Background to the study

A well developed and progressive transportation system is essential to the growth and development of every society, both in the advanced and developing countries. To this end, studies have identified the essential role of transportation to the economic and social development to society, which is often regarded to not be overemphasized. For instance, Intikhab et al. (2008), indicated that, a well built and efficient transportation system is a recipe to the effective and efficient management of the daily transportation and economic needs of people in a country. Access to employment centers, education, health centers, individual private homes and other essential social services makes the use of transportation very essential as it links people to the various service centers in their daily routines.

Principal among users of transportation is the inhabitants of city. Growing population makes city dwellers and urban transportation an issue of critical concern to the individual and city managers as the ever-increasing population rate puts pressure on transportation. As a result, urban cities, globally, have witnessed an increasing rate of motorization, since the 1988 global car population exceeded 400 million (Walsh, 1990). The ever-increasing rate of individual motorization, according to Dimitriou (1991) has been occasioned by the inability of most countries, both

developed and developing to manage efficiently urban transportation needs. I n the United Kingdom for instance, a study entitled the "Mobility 20130 report" by the World Business Council for Sustainable Development in 2004 indicate that nearly 700 million light-duty vehicles. The report also indicated that individual vehicular usages was increasing at 2% annually and most likely will reach 1.3 billion by 2030 and almost over 2 billion by 2050. Accordingly, at least, 99% of such increases will happen in various cities around the world, according to the report.

The recent increasing rate of individual motorization coupled with the ever-increasing population growth particularly in the urban centers of developing countries has led, greatly to traffic congestion. According to Taylor et al. (2000;18), "traffic congestion presents a common, if not inevitable, facet of traffic activity in a region, particularly in urban areas and this has resulted in, longer travel times, additional fuel consumption, high pollution levels, vehicle wear and tear, disutility from crowding; and (in the longer run) the costs of relocating jobs and residences and a deteriorating urban environment that has a direct bearing on sustainable development" (Intikhab et al., 2008; Palma & Lindsey, 2002). Traffic congestion has thus become central to policy makers and the policy development process in both developed and developing countries as it has debilitating impact on development effort in the country. Economically, Schrank & Lomax, (1999), reported that, in the USA traffic congestion has led to a loss in revenue to the tune of $72 billion in 1997. Similarly, in Europe Prud'homme (1997) reported that European Commission estimated that traffic congestion had taken a swipe of 2% of the Gross Domestic Product in the area.

This situation is not peculiar to only the advanced economies of the world but also to developing societies like Ghana, South Africa, and Nigeria amongst others with the economic impact more

intriguing in the developing world than the advanced society (Carisma & Lowder, 2008). Socially, traffic congestion affects the ability of commuters to reach people on time whereas impacting the quality of the environment as well through the release of gases and energy consumption into the atmosphere increasing the rate of global warming. Considering the rate of congestion and debilitating impacts associated with traffic congestion, several policies and measures have been introduced in most countries like Ghana. In the case of Ghana for instance, traffic congestion measures in urban centers like Accra has included but not limited to maintaining the current road and bridge system; constructing new roads, bridges, and non-highway infrastructure; encouraging an appropriate balance between different modes, especially by developing alternatives such as public transportation, and finally, employing transportation systems management and operations strategies to maximize the capacity of the infrastructure already in place (Paniati, 2004). An important addition to the numerous traffic combustion strategies in Ghana, has been the introduction of the Bus Rapid Transport system (hereafter known as BRT) to salvage the transportation and traffic congestion situation in the country. The focus of this study thus is to examine whether the BRT is a solution to the traffic congestion and transportation problem in Accra, one of the main urban congested cities in the country.

1.2 Problem statement

Urban transportation challenge is one such a critical issue to the bane of transportation needs and development effort of Ghana's largest city, Accra. The current transportation challenge in Ghana's largest city has been occasioned by the ever-increasing population growth of migrant to the city.

Until relatively recently and in the last decades, the population rate of the city was not as high as the current situation and the city in the last decades as well, had a well efficient public transportation system that catered for the needs of the small size population. However, a sudden collapse of the public transportation system caused a stir to the urban transportation needs of the city (Yankson & Grant, 2003; Addo, 2002; GSS, 2002). Despite this, the quest by the government to reinstate the efficacy of public urban transportation saw the introduction of the Metro Mass Transport System (MMTS) with a component of the system designed to specifically provide urban and intra city transportation needs of the largest city in the country (Addo, 2002), however, the situation took a new turn as the MMTS could not provide the intra city transport needs of the urban centers causing a rather huge transportation needs for the city of Accra.

This led to the private sector taking a central stage to the transportation quest of the city through the infamous "trotro system", a popular means of urban transportation system controlled and managed by individual car owners in the country. Again, individual car owners also meet their transportation needs in the city through privately owned family and individual cars. This situation has led to a rather an upsurge in the number of cars on the city's roads coupled with the ever-increasing population rate of the city in the country as individuals in meeting their transportation needs have resorted to buying cars.

Again, private urban buses have quadrupled more than ever expected and this has been a bane to the urban transportation needs in the city of Accra causing a more than proportionate and necessary rate of traffic congestion in the city leaving commuters stranded in the early hours of the day striving to reach their work places, school and access other socially important services. The government and the urban transportation management agency has thus introduced a system of Bus

Rapid Transfer otherwise commonly referred to as “Ayalolo” in the capital city to deal with the menace. The focal point of this study is to examine how and whether the introduction of BRT is a solution to the urban transportation challenge in Accra.

1.3 Research Aim

- The overall aim of the study is to examine the role of the BRT in Ghana in resolving the transportation challenges in Accra.

1.4 Research Objectives

- To examine the various causes of traffic congestion in Accra
- To examine how the BRT system can help minimize the transportation and traffic challenge in Accra
- To assess the challenges of the BRT in Accra
- To recommend the most appropriate measures that can be adopted to minimize traffic congestion in Accra.

1.5 Research Questions

- What are the various causes of traffic congestion in Accra?
- What role has the BRT in resolving the transportation challenges in Accra?
- What are the challenges of BRT in Accra

  What likely measures can be adopted to deal with the challenge of transportation in Accra?

1.6 Significance of the study

The conduct of this study will serve the following importance.

First, the findings of this research work will aid in unearthing the various urban transportation challenges in the city of Accra, Ghana. Data on the challenges of Accra's transportation will help various urban transport management agencies and the government in dealing with the challenge over a period of time.

Secondly, the study will help in examining the various appropriate means of resolving the urban traffic congestion in the city of Accra. This is possible as the study will examine various options of urban traffic congestion resolution across other countries in Africa and the world. Moreover, through the study, the agencies in charge of urban traffic management will help fashion out how this menace can either be minimized and/or eliminated if possible from the city.

Finally, the findings of the study will aid in examining how the BRT system commonly known as the "Ayalolo" in Accra is either helping ease the transportation challenge or not. Through this study, data will be gathered on the role and/or effectiveness or otherwise of the BRT system in meeting the traffic congestion and urban transportation needs of the city of Accra. By this, a more than concrete and definite decision as regards the role of the BRT will be established. This will go a long a way to help managers of the BRT and urban traffic managers as to how the system has and/or is helping resolve the traffic situation in the city.

1.7 Organization of the study

The study is organized into five chapters. Chapter one details the background, problem statement, research goal and objectives, research questions and significance of the study. The chapter also discusses how the research work is organized. Chapter two on the other hand takes on the literature review with chapter three taking on the methodology of the research work. Chapter four details the discussion and analysis of findings with chapter five taking on the summary, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter of the study discusses the empirical review of related literature. The chapter is organized under the following sub-headings, urban transport and development, urban transport and accessibility, transportation challenges in developing countries, development of public transport

system, basic component of BRT, the success and failures of BRT system, as well as the Ghanaian BRT system.

2.1 Urban Transportation and Development

According to *Hoyle and Smith (1992), transport serves as the annals of the relationships existing between the various patterns of environment and sectors of the economy like the physical environment, political activity and patterns of social life as well as the levels of economic development. Transportation serves as a pillar to the socio-economic and political development of every society and people alike* (Musekene 2010).

This is particularly so as the major function of urban transportation networks is to link people, groups and residence to their various places of employment, services and goods provision (Johannes 1983 cited in Tiawoun, 2000). Transport infrastructures have a positive relationship with development as they serve as the catalyst for the delivery and attainment of economic development (Knowles and Smith 1992, Taaffe et al 1996, Tiawoun 2000). Studies on transportation and development suggest that, economic development thrives highly on transportation by creating new opportunities for investment and offering higher levels of employment and through the efficient transportation of goods and services to various areas (Fourace et al 2006, McGaffin and Gavera 2012). Efficient transportation system impact on the time spent to work, expenditure made on transportation savings on vehicle operating cost, reduced traffic, portable and safer roads, urban regeneration and transit orientated development (Musekene 2010, McGaffin and Gavera 2012). Similarly, a well efficient urban transportation networks is an avenue for job creation for the teeming urban population (Button 1993, Banister and Lichfield 1995, Tiawoun 2000). For instance, in the UK, a study conducted by Banister and Lichfield (1995) on the employability rate of good transportation network using the Heathrow airport as a case

study, intimated that, the facility provides 40, 000 direct and 100,000 indirect jobs for citizens as at the time. Similarly, Rodrigue et al 2006:76) identified that most developing countries depend largely on the transportation sector as it accounts for approximately "6 to 12 percent" of their economies GDP.

Efficient urban transportation system is inextricably linked to social development as it promotes access to resources, and demands (Button, 1993) which has the propensity to improve people's lifestyles. Where there is lack of efficient transportation system, mobility of persons' becomes restricted thus resulting in social exclusion as transport facilities provides access to various essential things in life (Chakwizira *et al* 2011). Efficient transportation system results in an increased mobility of persons thus resulting in people staying as far away as possible and going to work, attending social functions amongst such other things in far distant places. An examination of the above argument and literature on the relationship between transportation and development, showcase that, transportation and development are inextricably linked even though such argument could be challenge. It is also noteworthy that, the lack of efficient transportation system largely impact on the pace of growth and development in several facets, since accessibility is one of key ingredients for socio-economic development (Musekene 2010).

2.2 Urban Transport and Accessibility

Transport and accessibility is defined as "the extent to which land use and transport system enable individuals to reach activities or a destination by means of transport modes" (Geurs and Wee 2004:127). The definition above explains the concept of urban transportation accessibility as transport and accessibility have direct positive relationship. This is particularly so as transport, particularly public means of transportation which is sometimes cheaper and easy to obtain provides

access to essential life services education, health care, entertainment, work and many such other things (Sohail, Maunder & Cavill 2006).

Accessibility plays important role in the development of countries as workers and all citizens require means of transport to undertake various life and income generating activities. Rodriguez *et al* (2006) states that "all locations have some level of accessibility, however, there are some locations that are more accessible than others and because of transport these locations will have higher land values". Additionally, efficient means of transportation creates avenues for employment which thus paves way for income generation and national economic development. (Tiawoun 2000, Sohail *et al*. 2006). "Inaccessibility emerges as a major cause of social exclusion in studies of the poor in urban areas" (Gwilliam 2002:1*).*

Lack of accessibility to transport will cause most vulnerable and poor people from having access to available services and goods like employment opportunities, education and many other such things. *"Limited mobility of non-drivers contributes to several social problems, including incomplete education, unemployment, social isolation and ill health, which impose economic as well as other cost"* (Pacetti and Trittipo 2010:6). Inferring from this, accessibility could be regarded as the benchmark of development of land (Deng and Nelson 2013). Accessibility of transport also determines the pace of economic opportunities and development as well as the time required to embark on these opportunities these opportunities (Geurs and Wee 2004) whereas the nature or mode of transport one applies is a product of the distance to transport network. Crevero (2004) submitted in his study that, that *"the further the distance from the railway station, the lower the proportion of journeys made"* (cited in Banister 2005:117).

2.3 Transport Challenges in Developing Countries

Urban transportation challenges are issues of both developed and developing economies around the world, largely. However, differences exist in the pace of urban transportation in both developed and developing countries, respectively. Whereas it is reported that, challenges in urban transportation in developing countries is high, much other investigations speak positively for the world's advanced economies like UK, Germany and US. Differences in urban transportation in these two largely different economies of the world has been explained as issues of differences in priorities such that, most advanced economies of the world are not faced by large magnitudes of developmental challenges in the areas of economy, social and environmental problems as experienced by the developing world. The seeming high rate of challenges of transportation in developing countries could be attributed to factors like Lack of finance, and other resources and infrastructure.

Again, most developing economies are battling with increased population growth, lack of financial resources, and high rate of poverty both in the rural and urban centers, lack of infrastructure and increasing rate of urbanization (Mpofu 2008) .Largely, urban centers in developing countries, serve as cities of trade, central governmental organizations outfit, with most economic activities happening in such centers. Following this, often, the rate at which people in the hinterlands move to such urban centers is high resulting in gradually increasing population in the urban centers (Mpofu 2008). The ever increasing population rate in the urban centers often results in traffic congestion, limited number of vehicles and accidents thus resulting in inaccessibility for majority of such peoples. Studies on transportation in developing countries, per se indicates of factors like congestion, unplanned and poorly maintained roads, and un-roadworthy. Whitelegg & Haq (2010) reported that, for instance, between 1999 and 2010 at least 6 million people have died through road

accidents with a greater majority of such figures coming in from developing countries. Specifically in Ghana, data of the National Road and Safety Commission (NRSC) indicates a total number of 2, 076 death in 2017 with 2016 been 2,084 all through road accidents (NRSC, 2018).

The increasing number of road accidents is as a result of poorly maintained and unplanned roads network (Gwilliam 2003). Developing countries transport system is commonly characterized by the variety of transport system which includes but not limited to buses, cars, motorcycles and bicycles, taxis, mini-buses, pedi-cabs amongs others (Heraty, 2013). Barret (2012) reported that majority of citizens in developing countries rely on public transport as they cannot afford to buy their private cars. Thus far, in most of such developing countries with inefficient public transport system, there are always long queues. The quest for reliable transportation services has thus led to an increment in the usage of private cars in developing countries thus resulting in a substantial growth in car ownership (Barrister, 2005).

Even though ownership of cars as means of personal transport has substantial advantage to the individual owner, it causes various forms of societal challenges such as transportation issues, of traffic congestion, environmental, air and noise population, accordingly (Banister 2005). The car infrastructure provides a critical means in meeting urban transportation needs. In African countries, similar to other developing countries, a larger portion of transportation challenges emanates from the poor state of roads and other roads infrastructure thus resulting in less mobility which in turn impacts on the economic fortunes of the countries (Kumar and Barrett 2008). For instance, "*Bangkok loses 35% of its gross city product just due to congestion*" (Gakenheimer 2011:673) as congestion leads to delays at work due to excess time spent on the road during working days. Gwilliam (2003:576) explains that in 2006, in "*Bangkok travelling speeds were 4.8 km/hr with congestion been the main architect of this situation*".

2.4 Theoretical Framework

This section takes on the theories underpinning this study. Two main theories of human geography underscore the conduct of this research work; the time - geography theory and the General systems theory.

2.4.1 Time Geography Theory

The time geography framework seeks to examine the relationship between human activities and various constraints in space-time context (Golledge and Stimson, 1997; Yu and Shaw, 2007; Ellegård, 1999). The time-geography theory assumes that, activities undertaken by individuals are limited by various constraints particularly in relation to space and time. These constraints have a relationship with the ability of people to undertake various activities in a timely manner. (Yu and Shaw, 2007; Golledge & Stimson, 1997; ibid) outlined the constraints in three forms; "*capability constraints, authority constraints*, and *coupling constraints*". Physiological necessities (e.g. sleeping, eating) and available resources (e.g., auto ownership) that can constrain prevent someone form undertaking certain forms of activities are regarded capability constraints a person from participating in activities are recognized as *capability constraints*. On the other hand, all forms of laws and rules that could prevents or constraint an individual from accessing certain locations or locations (eg, military camp) or time related periods (closed or open periods of a given facility like library). In the case of coupling constraints, they allow individual people to only spend time with others at a given place over a particular period of time (access to conference hall for a meeting at 12pm).

Among all the three major constraints, as coupling constraints deals with relationship and interactions among different people at a time, the remaining to relates to individual personal issues. Coupling constraints critically forms the locus of the time geography framework. The

theory examines the various factors that affect the early arrival and travelling of a passenger using any means of transport particularly, buses. The theory assumes that transportation challenges of all sort impact on the pace of travelling of a passenger as regards the time, for travelling. Challenges that comes with time-geography concept relates to issues of traffic congestion, poor transportation network, overcrowding, distance to of residence and distance of the particular activity undertaken among such others. The theory examines the hours and time spent in travelling as against the various challenges involved. The theory says that, a person cannot participate in an activity unless its space-time patch intersects the potential time space to a sufficient degree. Further, the projection of the potential path space to geo-space provides the *potential path area* i.e. all spatial locations that the person could occupy. A person cannot participate in an activity unless its location falls within the potential path area (ignoring the temporal duration of activities). In particular, this theory relates the concept of BRT in Ghana which seeks to address the transportation challenges of Ghana by introducing rapid transport systems that will limit the time of travelling for undertaking any activity once an individual gets on board any BRT bus. Since this system will follow a new order of using different routes, special buses, time for moving, traffic-less transportation network and management system all of which seeks to ease and the time for travelling.

2.4.2 General Systems Theory

The general systems theory postulates that, a system or object constitutes a group of elements where each elements or components are interdependent (either directly or indirectly) with other element of the system. Again, the theory postulate that, every system have a function, purpose or goal (Johnston et al, 2000). The general systems theory according to Jonhson et al., (2000; 18)

addresses four main issues, namely, first, "whether a system is *closed* (i.e. has no links to or from a surrounding environment) or *open* (i.e. have and interact with the milieux); secondly, whether the system can be divided into *subsystems*, or clusters of interdependent elements which are only weakly-linked to the remainder of the system; thirdly, whether the links involve *flows, causal relationships* or '*black-box' relationship* (in which the consequence of the link is known but the causal factors are not) and lastly, whether there is a *feedback* in the system such that change in *x* may stimulate change in *y,* and this will in turn have an impact on *x,* either positive or negative". Disharmony occurs when there is no positive feedback among various component of the system and this has the propensity to result in inefficiencies or "*entropy" or "disorder"* in the entire system (Bertalanffy, 1968). However, the problem with the systems thinking is that systems may be embedded in systems, and that what we choose to regard as an element at one level of analysis may itself constitute a system at a lower level of analysis. However, these difficulties in the notion of systems embedded within systems *ad infinitum,* according to Harvey (1969, p. 453), is an attractive one. It is important to mention that, transport systems and the BRT is a fully fletched system with various components, parts and systems of management and operations. Components of the BRT system of Ghana and other countries include but not limited to government and other policy makers, management of the BRT, roads, traffic, buses, and passengers, among others. The study will employ both the time geography theory and the systems theory under the objective of seeking to examine the various components, systems and procedures, actors, operationalization among such other things of the BRT system of Ghana as well as how the BRT solves geography time issue associated with traffic congestion and delay of passengers to their various places of work and destinations alike.

2.5 Developments of Public Transport Systems, the BRT System

2.5.1 What is a Bus Rapid Transit (BRT) System?

The concept of BRT has been defined variously by researchers in the field as well as organizations alike. The US General Accounting Office defines BRT as a;

"*A set of elements that includes exclusive bus highways and lanes, High Occupancy Vehicle (HOV) lanes, technological and street design improvements, traffic signal prioritization, better stations and or bus shelters, fewer stops, faster service, cleaner, quieter and more attractive vehicles*" (Cabrera 2010:2). Similarly, BRT has been explained to mean a "*Bus-based rapid transit service that attempts to emulate the high quality service of rail-based transit modes at a fraction of the capital cost*" (Cain, Flynn, McCourt & Reyes 2009:1).

BRT is also defined as "a form of mass transit that is reliable and flexible and more cost effective than conventional buses" (Deng & Nelson 2010). A careful examination of the above definitions suggests that, BRT entails the development of a public system of transportation which designated lanes and roads in some cases and which operates quite differently from the streams and modes of private transportation operation structures and systems as well as even some other public transport systems. Hess (2008) argues that most definitions of BRT indicates a positive image of the concept just so to create an identity as efficient system of transportation, makes it attractive to the public and as a world class transportation system. Most definitions of the BRT promote this positive image is to create an identity as a world class, efficient transport system, and sell this to the public. The overall aim of the system of BRT according to the definitions expressed above is to provide convenient, fast and reliable transport services to the general masses so as to solve the growing transportation problems. Judging from the above analysis, this research thoroughly has examined the definition of BRT and as provided for by the US General Accounting Office and thus adopts

its definition for the study as regards its analysis, discussions and subsequent conclusion as the definition seems to fit the description of the Ghanaian BRT system.

2.5.2 Basic Components of a BRT System

According to Cabrera (2010; 8) "BRT systems differ from city to city because the system's design is dependent on the needs of the commuters in that city; the road networks, patterns, routes and the governments of cities where the BRT is available have policies in place as well as available financial resources The literature on BRT systems indicate that although systems may differ in design, route and size, the basic components of BRT systems are similar in each city".

Based on the factors identified above by Cabrera (2010), BRT systems could range from "BRT-Lite to full service BRT systems, and that a fully fletched BRT system is ranked as the highest in BRT systems development around the world" (Thole Samus, 2009). A basic characteristic of full BRT system is a designated bus lane, most usually in the middle of the read with various connected routes, bus stations, pre-board collection system, corridors of operations and prescribed operators as well as operations system (Wright and Hook 2007). Again, a BRT system features a park and ride facilities but this is not always associated with all BRT systems across the globe (Levinson, Zimmerman, Clinger, Rutherford, Smith, Cracknell and Soberman, 2003). For instance, in South Africa, Johannesburg's BRT system does not have a pack and ride feature whereas that of Cape Town has (MyCiti 2014). The park and ride feature allow commuters to employ different transportation means in relation to the BRT (Levinson *et al* 2003; Cabrera 2010)

2.6 The Success and Failures of BRT Systems, Globally

Globally, several forms of BRT systems have been developed. Notably, countries like Brazil, Columbia, Los Angeles, India and Nigeria have all developed such systems of BRT. BRT first

begun in 1937 in Chiciago, USA with the first full BRT system being introduced in Brazil in 1974 (Wright and Hook 2007). The evolution of BRT system was in response to the weak transportation system in the private sector of most BRT led countries in the world. BRT was in response to the high cost of transportation charges as been led by the private sector (Wright and Hook 2007). The first BRT system had several range of buses with different colors and routes. According to Pienaar et al, (2005), red buses were line haul routes, with feeder busses containing the orange color and green buses were used for ring routes. Again, BRT systems have their fare fixed such that there are no adjustments with regards to the point at which a passenger will alight. Passengers are also not to pay additional money when they want to transfer from one bus to another along the same route.

" Same level boarding combined with pre-boarding fare payment results in typical dwell time of no more than 15-19 seconds at a stop" (Wirasinghe, Kattan, Rahman, Hubbell, Thilakarathe and Anowar 2013:11). Another country with the first system of BRT was Columbia. Columbia's first BRT system was called the Bogota's public transport system This new BRT system in Columbia came to eradicate the traditional transportation system of mini buses with mostly poor ventilation, old stricken buses that could not transport passengers faster considering the long distances necessary to be covered. Again, the old system witnessed the collection of transport fares on board the bus of which aggravated the already challenge of delayance on board the bus (Leal and Bertini 2003). Bogotá used the BRT system to develop and enhance its transportation system in Columbia.

According to the BRT Planning Guide (Wright & Hook 2007:24) the "*Bogotá system has transformed the perception of BRT around the world*". Following the success of the Columbia's Bogota's BRT system, several countries have replicated the BRT system in their respective regions and countries as a means to solving the transportation challenges facing them owing to the

dedication of bus lanes, level boarding facilities, smart card fare collection, elevated stations, and wide vehicle doors which allow for easy and convenient passenger movement (Czegledy 2004, Replogle & Kodransky, 2010). BRT stations have side and bike walks as well as overpass for passengers who connect most stations along the route thus offering convenience for passengers (Pacetti & Trittipo, 2010). Again, the Bogota BRT system was far cheaper in terms of transportation cost compared to already existing private transportation networks. All these factors contributed to the overwhelming success recorded by the system (Replogle & Kodransky, 2010).

Some of the major advantages derived from the introduction of BRT system in Columbia included but not limited to "reduced travel time, reduced pollution and a reduced number of accidents" (Pacetti & Trittipo 2010, Wirasinghe *et al,* 2013). Among the successes of the Columbian system is "*It decreased the average travel time by 32%, increased property values along the main line by 15-20%, enhanced tax revenues, created jobs, and improved the health and safety of the community*" (Turner, Kooshian & Winkelman 2012:6). The number of commuters has increased to "1 750 000 passengers daily", by 2011 (Turner *et al,* 2012:10).

Initially, the proposal of BRT system in Columbia was met with resistance from private bus companies that feared the presence of the system was going to collapse their transport businesses. As a results, such companies were incorporated into the BRT system with majority of them about fifty –nine (59) out of the sixty-four companies being made a part of this new system (Turner *et al*. 2012). A similar system was adopted in the implementation of BRT system in Johannesburg known as the Rea Vaya System. However, the private troski system of transportation in Johannesburg still is waging war against the implementation of the BRT system.

Another country that has successfully implemented a BRT system is Nigeria specifically Lagos state. Owing to the large size of the city and high population rate, Lagos state faces extreme traffic

congestion, long and unreliable journey times, collection of fees on board the bus etc (Mobereola 2009) . Again, due to the overcrowding coupled with poor transportation planning, there is high pace of traffic and passenger as well as transportation challenges in the city. The ever-increasing population and the challenges of transportation has resulted in most people employing private transportation means by buying their own private cars and this has rather worsened the situation. Lagos 'state first BRT system which use a 'BRT Lite 'was launched in 2008 to wipe of the usage of public mini buses, taxi and other troski for transporting passengers on long journey with short distances being covered by motorbikes (Cavero, 2013; Mobereola , 2009). The Lagos BRT system consist of a 22km route with dedicated bus lanes running from the center of the city to other various areas outside the main city with at least 65% of the bus lanes separated from the main city traffic (Mobereola 2009). One of the advantages of this type of lane is that it" has reduced traffic congestion caused by broken down vehicles that occur in bus lanes and also broken vehicles could be easily towed away as lanes are not continuous and approaching BRT buses may also avoid the blockage by going around, similarly, the government introduced a corporate taxi scheme and this helped with integration of the different modes of transport in Nigeria" (Filani 2012; Mobereola 2009).

The BRT of Lagos presents similar characteristics like off-board fare system and improved stations whereas operating for longer hours through the day especially during week days that of some other countries well verse in the management of BRT and (Mobereola 2009). In terms of participation of the public in the management affairs of the BRT the Lagos Metropolitan Area Transport Authority (LAMATA) offered opportunity for the local community to participate in the management affairs of the system (Mobereola 2009). Groups of people from the community were identified (Mobereola 2009). *"When each group was consulted the scheme was explained as a*

means of solving their problems rather than those problems identified by others" (Mobereola 2009:24).

The Lagos BRT was advertised within the corridor in newspapers and on radio and television. *"Television advertisements educated the public on the system, as well as how to use the system"* (Mobereola 2009:24). Various positive advantages for Nigeria have been recognized, because of the Lagos BRT. Mobereola (2009) states that the accomplishment of the Nigerian BRT framework is because of an all-encompassing methodology, which has revamped the whole transport industry in Nigeria. Moreover, to the rebuilding of the transport business, the BRT has lessened travel times and passages. Despite the fact that lines of around 200 individuals have been recorded the normal lining time was just ten minutes (Mobereola, 2009). The lessened travel time was because of the expansion in speed from under 15 km a hour to 25 km/hour (Mobereola, 2009). The Lagbus has additionally energized monetary advancement and utilizes 2000 laborers and in addition decreased carbon emanations (Filani 2012).

Another nation that accomplished accomplishment from the dispatch of the BRT is India. India has propelled various BRT frameworks; the main BRT framework in India was propelled on the 14 October 2009 (Replogle & Kodransky, 2010). The name of the BRT 'Janmarg' implies the people groups way, is the BRT framework in Ahmadabad and was propelled in 2009 as a way to address a portion of the city's movement issues (Replogle & Kodransky, 2010). The Janmarg is a shut framework, which makes utilization of devoted paths (Kost, 2010). The primary period of the BRT kept running along the western ring street. BRT transports go through both low and center pay regions in Ahmadabad (Replogle & Kodransky, 2010).

This framework utilizes devoted transport paths, with its stations a short separation from fundamental crossing points (Unfcc, 2014). Ahmadabad has presented 'square-about' to conquer

the issue of turning in thin roads. The square about is like a circuitous yet has two stage activity signals (Kost, 2010). The Ahmadabad organizers attempted to manufacture cycle tracks parallel to the BRT paths; be that as it may, this made difficulties for the city on account of the uneven street surface (Kost, 2009). Cycle tracks are found at the lower rise in the road which results in water gathering in these tracks and are being utilized by peddlers and as stopping narrows (Kost, 2009). Support checks of the transports are directed day by day and drivers who neglect to keep up their transports or who damage any of the models that are set up are fined. Janmarg is likewise one of the main BRT transports in India to utilize a GPS which transfers constant data to travelers (Kost, 2009).

A portion of the triumphs of this framework incorporate, quicker speeds, natural advantages, battling clog and the advancement of foundation around the framework. Ahmadabad has seen a decrease in engine cycle use by 20-22 percent, the review directed in Ahmadabad, additionally demonstrates that 65 percent of individuals who utilize the Janmarg stroll to and from the transport station (Unfccc, 2014). Infrastructural achievement incorporates the augmenting of streets, which has brought about the advancement of extensions which interfaces the city. Some portion of the passage goes through empty previous plant handles that presently are being produced. This incorporates new lodging and shopping zones for the urban poor. Old diesel transports have been supplanted with compacted petroleum gas transports. The courses of these transports presently work as feeder administrations for Janmarg (Unfccc, 2014).

The Los Angeles BRT framework is one of the numerous BRT frameworks found in the United States. Los Angeles has a 'BRT-Lite' framework which was created as an approach to enhance transport benefits in the region. The Orange line BRT was just propelled in 2005 on a deserted railroad hallway (Niles and Jerram 1999; Wirasinghe et al. 2013). "It is worked by the Los Angeles

County Metropolitan Transportation Authority (METRO) and interfaces the San Fernando Valley toward the west" (Vincent and Callaghan 2007:3).

The Orange Line BRT framework is exceptionally effective as it utilizes a flag need framework which enables transports to have a more extended green stage or notwithstanding shortening the red stage. This flag need can result in up to ten seconds of extra green time, when a transport is at a convergence (Deng and Nelson 2011 and Levinson et al 2003). The BRT framework works in 28 passages and spreads a separation of 450 Miles (Deng et al., 2011). The Metro Orange line is a devoted busway that is worked by the Los Angeles Metropolitan Transportation Authority (Thole and Samus 2009). The Orange line full administration BRT highlights include: off-board charge installment, progress based calendars, Community focused stations that are dispersed around a mile separated, bike stopping and wheel seat access on to the transport (Deng & Nelson 2011; Thole & Samus, 2009). The course for the Orange line happens on the rail framework delineates. Stations have ticket candy machines that take into consideration off-load up toll installment that decreases loading up time (Deng and Nelson 2011). The Los Angeles BRT stations have appealing shelters; stations likewise have continuous transport entry data accessible for suburbanites (Deng and Nelson 2011).

Los Angeles metro is the third biggest travel office in the United States with around 495 million yearly drives (Niles and Jerram 1999). This BRT framework is earth neighborly as it is fueled by flammable gas. A few offices found are ready video screens, dispersing for two bicycles, two wheelchairs and three additional wide entryways (Deng and Nelson 2011). The aggregate expense of the Los Angeles Orange Line was around $350 Million (Niles and Jerram 1999). "The office serves a 1 688 square miles territory with a populace of 11.8 million" (Niles and Jerram 1999:42). A portion of the upsides of the Orange line BRT framework are that it works seven days seven

days 22 hours per day; the framework has diminished sitting tight occasions for suburbanites, decreased movement and mishaps on streets (Vincent and Callaghan 2007). "The Orange line interfaces with the Metro Rapid Ventura Line and various nearby transport lines (Vincent and Callaghan 2007:5).

2.7 BRT In Ghana

The Ghanaian BRT system also known as Ayalolo was introduced in 2016 by the previous administration. The objective of the system was to provide fast and affordable moving buses with high carriage capacity with dedicated lanes on highly traffic congested areas in Accra and other cities.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter of the study presents the research methodology which discussed how the study was conducted. The research methodology section was organized under the following sub-sections; research approach, sources of data, sampling procedures and data collection methods, data analysis and ethical considerations.

3.1 Research Approach

The study adopted a qualitative research approach for this research work. Qualitative approach is a research design employed often to gain greater understanding of issues, opinions and factors

relating to a particular object of study as its creates room for a proper understanding of various issues involved. It usually includes either structured or semi-structured techniques. Usually, qualitative methods include focus group discussions, individual interviews, and participatory observations and often employ smaller sample size. This research study employed qualitative design using a descriptive approach to narrate the transportation related challenges, the system of BRT, and how the BRT is being operationalized and serving as a solution to the high rate of urban transportation challenges in the capital city of Accra. In support, Cresswell (2014:183) indicated that, qualitative design is where "the inquirer often makes knowledge claims based primarily on the multiple meanings of individual experiences socially and historically constructed, with an intent of developing a theory or pattern or advocacy/participatory perspectives (i.e., political, issue-oriented, collaborative, or change oriented) or both. It uses strategies of inquiry such as narratives, phenomenologies, ethnographies, grounded theory studies, or case studies". The study sought to explore and thus understand how the BRT system is serving as a catalyst for solving the urban transportation challenges in Accra. The approach helped offer ample avenue to the researcher to probe and ask compelling questions as regards the topic of the study since questions like "why", "how", and, "what" were posed. By this, the research was better positioned to ask deeper questions which aided in an examination of whether the BRT is solution oriented to the numerous traffic challenges in the city.

3.2 Sources of data

The study employed both primary and secondary data. Primary data are those collected by first-hand experience by a researcher. It usually includes data gathered from experiments, survey and interviews. Primary data source were employed as it afforded the researcher the chance to develop questions which were needed to achieve the various objectives set out in the study. Again, the

consideration for primary data in this study is due to the fact that, it served as the main approach through which data and objectives of the study was attained. Primary data were arrived at by means of conducting interviews with the various respondents in the study. On the other hand, secondary data connotes information derived from already existing materials and people. Stated differently, it refers to data gathered by other people aside the main researcher in a given study. Sources usually include organization records, academic literature, internet sources amongst others. In this study, secondary data were obtained from books, reports, newspapers, articles, journals, and past thesis. The choice for a possible inclusion of secondary materials is due to the fact that, it offered the researcher prior knowledge on the topic of investigation.

3.3 Target Population

Target population according to Wilson (2010) is "the entire set of cases from which a sample is drawn". The target population for this study was passengers who have boarded the BRT buses before, as well as management staff and policy makers of the BRT. These groups of respondents were targeted as they served as the actual beneficiaries and managers of the BRT and thus have better knowledge and understanding of the traffic situation in the city and the contribution of the BRT system towards managing transportation and traffic related issues in Accra.

3.4 Sample Size

According to Onwuegbuzie, and Collins, (2007) sample size is "a critical element of any experimental study in which the objective is to make derivations around a populace from a sample and that the decision of sample size is as critical as the decision of sampling plan on the grounds that it likewise decides the degree to which the researcher can make factual and/or expository speculations. In reality, the sample size is subject to the expense of data gathering and the need to

have enough data". For the purpose of this research, the sample size included thirty respondents (30) respondents drawn from managers of the BRT system, passengers of the BRT who at first of the non-introduction of the BRT were passengers of other commercial vehicles and policy makers at the Ministry Transport (MoT). Specifically, the sample size contained fifteen (15) BRT management members, ten (10) policy makers and five (5) previous passengers who have an experience and understanding of the BRT system.

3.5 Sample Technique

Purposive and Convenient sampling technique were adopted for this study. Purposive sampling is a non-probability sampling technique which ensures that only people or respondents who have knowledge or are relevant to a particular subject are considered for a given study. Purposive sampling technique was used to ensure that only respondents or passengers who are affected by the high rate of traffic congestion formed part of the study as well as managers and policy makers of the BRT who have ample knowledge on the contribution of the new transportation system towards traffic decongestion. Moreover, convenient sampling was considered for this study to ensure that, respondents are not forced in the quest of the researcher to gather data.

3.6 Instrumentation and Data Collection Procedure

Data for the study was obtained using in-depth interview guide with the aim to offer the researcher the opportunity of communicating effectively and efficiently with the respondents by means of having a personal interaction with the various respondents' groups in the study. Moreover, the choice of questionnaire and interview method was informed by the quest of the research to adjust various questions of the study to the understanding and explanations of the interviewee.

3.7 Data Analysis

According to Boeije (2010), qualitative analysis includes "disassembling, fragmenting and reassembling information to shape significant discoveries so as to draw relevant conclusions". Data analysis is thus the interpretation of information gathered for a given study. For the purpose of this research work, data gathered were analyzed and discussed based on the objectives of the study by means of employing thematic analysis methods. Data gathered on a particular research objective was discussed under such and accompanied by previous findings and literature. In particular, analysis was accompanied with simple tables and percentages where necessary.

3.8 Ethical Considerations in the Study

According to Saunders et al, (2007), ethical issues in research relate to "getting access, gathering data, processing, data management and writing up the findings of the study in an ethical and responsible way". In this study, an introductory letter was obtained from university of Ghana. Again, letter of introduction was sought from management of the BRT to formalize the researcher's position and presence in the organization as well as pre-informing them on the objective of the study.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

The fourth chapter of this dissertation details the presentation of data and analysis as well as subsequent discussions on the topic "Urban Transportation Challenges in Accra: Is the BRT a Solution? Data presentation takes into account the objectives and purpose of the study. The data for the study was gathered from respondents who serve as key stakeholders in the management affairs of BRT in Accra and Ghana as a whole. Respondents for the study numbered thirty (30) and were drawn from policy makers of BRT, management of BRT and passengers who have boarded the BRT before.

The study employed semi-structured interviews for its data collection process. All respondents earmarked participated in the data collection process and this shows an increasing participation rate as well as a more than proportionate responses for the conduct of the study and subsequent examination of the role of BRT in traffic decongestion in the capital city. The discussion of the study's findings followed a thematic analysis model with detailed exploratory and descriptive examination in which the objectives of the study were employed as headings for the discussion and analysis. The findings of the study are discussed under four main areas; background information of respondents, causes of traffic congestion in Accra, role of BRT in resolving the transportation challenges in Accra, challenges of BRT in Accra, and measures in dealing with the challenge of transportation in Accra.

4. 1 Background Information of Respondents in the Study

Table 4.1 Background Information of Respondents in the Study

Features	Frequency	Percentage (%)
Sex		
Male	25	83.3
Female	5	16.7
Total	30	100.0
Age		
25-35	5	16.7
36-46	10	33.3
47-60	15	50
Total	30	100.0
Marital Status		
Single	3	80
Married	27	10
Total	30	100.0
Educational Qualification		
SSS	1	3.3
Polytechnic	2	6.7

BA	10	33.3
PG	17	56.7
Total	30	100

Unit of Respondents

Ministry Of Transport	10	33.3
BRT Management	15	50
Passengers	5	16.7
Total	30	100.0

Task In relation to BRT

Monitoring and Evaluation	6	20
Procurement	3	10
Contract Management	3	10
Engineering	4	13.3
Driving	5	16.7
Inspection and Supervision	2	6.7
Controls	2	6.7
Passengers	5	16.7
Total	30	100

Source: Field data, 2019.

The table 4.1 presents the background information of respondents in this long essay. Background information of various respondents captures items like sexual composition, age, marital status, educational status, unit of respondents and task in relation to the management affairs of BRT in Accra. In relation to the background information of gender of respondents in the study, primary data shows that, the study was composed of twenty-five (25) males taking up a greater percentage of 83.3% as against female of five (5) of 16.7%. These figures above indicate that, male respondents dominated the sexual composition of respondents in the study as against females. This vast percentage difference in terms of gender of respondents resulted from the availability of employees in the ministry of roads and highways as well as management and passengers of the BRT who were readily available to participate in the study. Even though male category of respondents outnumbered their female component greatly, respondent's gender did not in any way influence the data generated in the study.

Concerning the characteristics of age, table 4.1 indicates that, respondents with the ratio of fifteen (15) and a percentage of 50% fall within the age bracket of 47-60 whereas another age bracket of 36-46 received a ratio of 10 representing 33.3%. The last group of age bracket of 25-35 had a ratio of 5 and representing 16.7%. Information on the age bracket shows that, respondents cut across different ages and that were better poisoned to view the traffic situation in Accra for several years.

In terms of the characteristics of marital status, table 1.1 shows that, 90% of respondents are both married men and women whereas 10% of the respondents were single. The next time on the characteristics of respondents is educational qualification. It is interesting to note that respondents in the study are highly educated with different educational background. For instance, as seventeen (17) representing 56.7% are post graduate degree holders, ten (10) with 33.3% being degree holders and two (2) of 6.7% as HND holders whereas WASSCE holder was only one (1) and made

up 3.3%. Differences in the educational status of respondents contributed to the vast array of information gathered in the study as they understood the objective of the research work whiles being able to understand all the related questions posed to them. Differences in the educational status of respondents were not influenced in anyway by the researcher.

In addition to the above is the characteristic of unit of respondents which details the various groups of stakeholders in relation to the BRT in Accra. On the various units of respondents, the Ministry of Transport contributed ten (10) different people representing 33.3% in the study with actual managers of the BRT contributing fifteen (15) and making 50% of respondents whereas passengers were five with 16.7%. It could be seen that respondents for the study cut across different unit management sections that seeks to the welfare and development of the BRT in Ghana. By this vast array of units of respondents that deals with the BRT in Ghana, data for the study was representative of the entire issues surrounding the management affairs of the BRT in the country.

Finally, on the background information of task of respondents towards the management affairs of BRT, as six (6) of them came from the monitoring and evaluation unit, ten (10) with five each came from the passengers and driving task of BRT whereas, six (6) also with three (3) each came from procurement and contract management as four (4) with two each came from the control, and inspection and supervision unit whereas four (4) respondents were engineers.

4.2 Cause of Traffic Congestion on the Corridors of Accra

The first objective set out for achievement in the study was to examine the causes of traffic congestion on the corridors of Accra. It is interesting to note that all respondents answered in the

positive to this particular objective. First, for the purpose of examining what causes traffic congestion and other related issues, respondents were asked to first share their views on what traffic congestion is. Of all the thirty respondents, they all shared different but similar views on what constitutes traffic congestion both in Accra and world as a whole. On the part of eleven (11) respondents representing 36.7%, traffic congestion "*constitutes the inability of vehicles to move freely to their destinations due to blockage by other vehicles"*. This they explained occurs in a situation in which most vehicles compound the road such that vehicular movement becomes difficult and they become trapped.

Moreover, on the part of twelve (12) others taking up 40%, the concept of traffic congestion refers to the "*slow movement of vehicles on road network caused by bottlenecks or lack of road capacity or both*". In the views of this respondent group, various bottle necks like limited road capacity and not necessarily the excess of vehicular movement could also cause traffic congestions. This is partly so as the limited access to road network means that vehicles will cannot easily move in and out of the city easily.

Finally, the remaining group with the ratio of seven (7) identified traffic congestion to be "a situation in which vehicles move slowly than the optimum trip time resulting in queuing on road network thus resulting in lower productivity particularly among workforce". A critical examination of this particular definition shows a rather new direction to the impact of traffic congestion. This definition introduces the dimension of traffic congestion impact on productivity of workforce.

Even though these definitions seem different, they all point to the fact that, traffic congestion entails the difficulty of access to road by vehicles and which thus prolongs their travelling time.

In relation to the causes of traffic congestion in Accra, respondents explained giving various factors resulting in the ever increasing traffic congestion rate in the capital city. Respondents listed factors included but not limited to limited road capacity, poor city planning, lack of high capacity buses and public transport system, singular route for business and residence, increased population with increased private transport.

As regards limited road capacity as a causal factor to traffic congestion in Accra, participant in the study explained that considering the size of the city, rate of organizations, both government and private as well as residents, roads in the city is too limited to carry passengers all the time for their various businesses and other social activities. Limited road capacity thus prevents many vehicles from plying other possible routes that could take them to their various business centers and homes. By this, vehicles spend considerable and unimaginable hours on the road as against the normal time which should have been able to take passengers to their usual places.

On the issue of poor city planning, respondent indicated that, the city lacks modern city planning that takes into account the growing population coupled with the ever increasing private vehicles rate and as such no such roads either in the form of dual carriage, flyovers and many such other things are being done to meet the growing transportation needs of the city.

Moreover, concerning lack of high capacity buses and public transport system, respondent indicated that, currently, there is the absence of any good public transport system that contains high capacity to transport as many as possible passengers even on just one round of transport. However, there is an increasing population rate with the city being the primary destination point for all major individual and national assignment with regards to almost everything. As a result, people travel to the city each now and then with transportation needs. However, the growing urban

transportation needs is not supported with any such public transportation system that would meet such demands. Private transportation system (commonly known as “troski” or “trotro” do not have much carriage capacity to transport as many as possible passengers on a single route and this forces many more cars to be on the road thus leading to a more than proportionate traffic congestion.

Barret (2012) reported that majority of citizens in developing countries rely on public transport as they cannot afford to buy their private cars. Thus far, in most such developing countries with inefficient public transport system, there are always long queues. The quest for reliable transportation services has thus led to an increment in the usage of private cars in developing countries thus resulting in a substantial growth in car ownership (Barrister, 2005). Barret (2012) agrees with the findings in this study to the point that, lack of any sound and efficient public transportation system with huge bus carriage ability results in traffic congestion. The findings in this study do not therefore stand in isolation and several other empirical literature supports such.

Further to this is the over concentration of business activities and residential place at one side of the city as against limited road capacity. This respondent explained that, the city of Accra has congested business and corporate buildings at one side of the city with residential apartment and locations based at the other side of the city. Owing to the over concentration of business and offices at one side of the city, between Mondays and Fridays which are the official working days, passengers are stranded as to how to get on board the limited private transport to and from their work place. This situation force workers to struggle for transport with transport operators being choked on the roads.

Finally, respondent identified increased population in the city as one of the major reasons to urban transportation challenge. According to them, the city is witnessing an increasing pace of population

growth coupled with limited transport sources, and fewer roads network. These situations imply that, population rate of the city outnumbers the rate of vehicles and transportation networks resulting in people not getting access to transport for their individual business. As a result, individuals are forced to purchase their vehicles and this increase the number and rate of private transport networks in the city thus pushing more cars on the road. This account tally's that by Mpofu (2008), on his examination of transportation challenges in developing countries when he presented, one causal factor to this growing phenomenon is the ever increasing population rate among developing countries. This situation results in cities battling with how to provide transport with additional birth in terms of how to expand road network and providing buses for such increased numbers.

In furtherance to these cause of traffic congestion, respondents indicated that the routes of Accra-Kasoa, Adenta-Accra, Lapaz-Tema, Cricle –Pokuasi, Independence-Nungua Barrier, Kaneshie-Kasoa, Achimota- Amasaman, are the most traffic congested areas within the city of Accra in most instances. Congestion on these stretches of road within the city largely occurs between the hours of 6:00am-10:30 usually referred to as the morning peak and 4:30-7:00pm known as the evening peak among urban transport managers, and passengers alike. Traffic congestion on these stretches of roads in the city of Accra are recurrent such that, there is no such time within these indicated zones without such high pace of traffic congestion. Some respondents similarly remarked as;

"Usually these stretches of roads, experience the most pace of traffic congestion within the enclave of Accra. More especially when workers are going to their places of work in the morning. You usually would see several thousands of people choked at bus terminal awaiting troski to go to work

and this is not different in the evening time after closure of work when people are returning home. This situation does not apply to only some days or weeks but has been in existence for several years running. Government both past and present have done little to address the situation largely, even though some measures have been adopted and which has reduced the situation to some extent" (BRT Driver, Management Member and Ministry of Transport Respondent, 2019).

4.3 Bus Rapid Transit and Traffic Congestion Minimization in Accra

The first objective for this research work was to examine the management of BRT in Ghana and its role in minimizing or ending urban transportation challenges within the city of Accra. In other that this objective could be attained to the fullest, respondent were examined on several issues pertaining to BRT and its management in Ghana in particular. On the examination of what actually constitutes the concept of BRT, responses generated from the thirty participated showed highly similar rate. Specifically, a group of participant numbering seventeen (17) and representing 56.7% explained BRT to be "*a bus public transport system with dedicated route for buses to move mass people at a time so as to reduce the number of vehicles on the road and environmental pollution"*. On the other hand, the remaining thirteen (13) respondents explained BRT as "*a public transport system with dedicated lanes and high occupancy buses which is intended to provide comfortable factors of (time and cost) transport service to the masses*".

Considering these two different but similar views of the concept of BRT as put forward by respondents, it is pretty clear that, they greatly understand the concept and how it operate. These two definitions put forward similar view of what constitutes BRT system by the respondents. The above definitions and understanding of BRT by respondents in Ghana agrees with the notion of

BRT Cabrera (2010; 12) when he defined BRT as a "*set of elements that includes exclusive bus highways and lanes, High Occupancy Vehicle (HOV) lanes, technological and street design improvements, traffic signal prioritization, better stations and or bus shelters, fewer stops, faster service, cleaner, quieter and more attractive vehicles*". Having established respondents understanding and knowledge of BRT, it was important to examine how the Ghanaian BRT operates.

According to respondents, the current BRT service also known commonly as "Ayalolo" began operation in 2016. The concept of the Ghanaian BRT according to respondents is the dedication of particular lane to BRT buses to carry passengers on selected routes across the city of Accra which has huge traffic congestion. The BRT was designed to carry commuters from various dedicated stations to other destinations which have been earmarked to form part of the BRT destinations. According to the plan of implementation, buses have specific times of operation and stoppage at each station and in which passengers were required to either board or alight at their respective stations with less costive ticket sales and purchasing scheme as the means of boarding and payment for the service. The BRT seeks to provide public good of subsidized and speedily transport services to road users within the Accra enclave and beyond. Ayalolo BRT provides the service of general transport boarding, hiring services, long term ticketing sales, time schedules services, disability friendly bus services among such other things. Ghanaian BRT also known as Ayalolo was targeted at the general public and extend its services to organizations, groups, associations and other such corporate world that may need transport to assists in their operations.

The Ghanaian BRT service was selected for traffic congested routes like Amasaman-Tudu, Adenta-Accra, Kasoa-Tudu, Kasoa-Tema etc. Despite these vast arrays of routes selected for the operationalization of BRT in Accra, it is interested to note that only one route, namely the

Amasaman-Tudu route was operational as at December 2018, the last period in which the service was put on a halt. Even though only one route was operating the BRT, it had as many as 65 buses dedicated daily.

4.3.1 Is the BRT/Ayalolo Bus Service A Solution to Urban Transportation Challenge in Accra?

With regards to the examination of whether BRT is a solution to the perpetual traffic congestion in the city of Accra and beyond, all respondents answered in the positive to the question of whether the BRT is a panacea to easing the urban transport challenge. This partly due is to the reasons discussed as follows;

First, respondents identified the BRT services ability to provide buses with huge carriage capacity as remarkable to either reducing or ending the transportation challenges in the city of Accra. Explaining further, respondent, particularly management of BRT presented that, the BRT buses carries 86 passengers at a go six times that of "trotro". This huge carriage capacity of BRT buses can thus aid in the reduction of the number of private transport on the roads of Accra and which can ease urban traffic congestion. In the view of one driver, he remarked as;

"*For these buses you see, each takes at least 86 passengers on board. This is like 4-6 times of trotro on the road. One BRT bus can thus take away 5 or 6 more trotro from traffic congestion. If we have such a system it is prudent enough, I think traffic congestion on the roads of Accra will reduce to the barest minimum. The BRT is the only solution for traffic congestion. If government do not support and even expand the road to any number of lanes at all, there still will be traffic congestion in this city*" (BRT Bus Driver, 2019).

In a related study on BRT, Replogle & Kodransky, (2010); Pacetti & Trittipo, (2010) presented the success of BRT in Brazil is largely dependent on the huge carriage buses capacity associated with the system. For instance, larger population size implies that people will need access to transport for their various activities. Access to transport in Brazil's cities thus depended on bicycles and private transport means traditionally to the point that people struggled for transport. This situation, according to them resulted in huge crumbles for vehicles and people owning vehicles. The presence of BRT in Brazil, according to them led to most people joining public transport for their businesses. BRT resulted in the carriage of a large chunk of such passengers daily and this reduced the traffic situation, they lamented. Juxtaposing this with the findings in this study, it could be posited that, Ghana's BRT system with high carriage buses capacity will result in reducing the number of passengers at bus terminals seeking for buses particularly during peak hours and thus resolving traffic congestion.

Secondly, respondent identified dedicated lanes associated with the BRT as one main strength in minimizing urban transportation challenge and traffic congestion. According to respondents in the study, the Ghanaian BRT system just like all other countries operates under dedicated bus lanes that do not usually follow long traffic queues during passage. Absence of long queues in transporting passengers to work and there various homes, functions and other individual purposes means a greater reduction in the time spent for transportation. With such a BRT system, many people will be willing to board the buses and as result reach their homes early as possible. Replogle & Kodransky, (2010) and Czegledy (2004) submitted in Columbia that, BRT had been used to resolve urban traffic congestion due to its dedicated lanes which ensures that buses do not follow normal traffic congested lanes on the road and thus do not have many other vehicles in their lanes which could affect the speedily and earlier ability of reaching their destinations. This he further

intimated that, the presence of dedicated ensures workers and other commuter's reached their destinations as early as possible whilst on board the BRT buses. BRT thus was the solution to Colombia's weak private sector led transportation system. It is obvious that if Ghana's BRT system has dedicated lanes, urban congestion resulting from traffic would come to the barest minimum. This account on Ghana's BRT is thus not far-fetched from history makers of the BRT concept.

In a related examination of the role of Ghanaian BRT in reducing traffic congestion and urban transportation challenges in Accra, all respondents named the reduction of the number of private cars and trotro on the road as the most direct benefit of the BRT to traffic congestion reduction. On the part of respondents, the presence of BRT which has huge carriage capacity, dedicated bus lanes and cheaper in terms of cost compared to other private buses implies that commuters will develop much more confidence and motivation for the service. This will mean that most private cars owners, who are required to join long queues, pay for fuel at higher cost will be required largely to join BRT buses so as to reduce cost, cut down hours of transportation and get to work early. With this largely, the BRT will aid in easing the urban transportation challenges in Accra and beyond. In my quest to probe further on this, one driver intimated as;

"You see, normally, there are too many cars on the street due to lack of a good public transportation system. Individual people are struggling to purchase private cars because of the poor trotro system that we have. The presence of a good BRT service will ultimately result in most commuters craving to buy private cars as well as those who have already to pack theirs and join public transport which is comfortable, cheap and efficient as well as traffic free. This is very common when you go to Europe" (BRT Passenger, 2019).

Wright and Hook (2007:24); Leal and Bertini (2003) presented that there were vast majority of privately owned vehicles in Columbia partly resulting from high cost of private sector managed buses, poor ventilation, delay on board the buses and many such other things. These factors thus led to the city of Bogota being flooded with several cars owned by individual thus compounding the traffic. The evolution of Bogota's public transportation system thus led to most private car owners packing their cars and joining public transportation system. The success of traffic decongestion in the city thus resulted from the BRT package, they added. A critical examination of these findings as well as the Ghanaian BRT indicates BRT in Ghana largely could contribute to the traffic congestion problem in the city. Thus, the findings in this study have long been collaborated by earlier studies and practitioners of BRT around the world.

Table 4.2 Solution of BRT to Urban Transportation Challenges

Solution	Ratio of Respondent (30)	Percentage (%)
Huge Buses Carriage Ability	30	100
Presence of Dedicated Lanes	30	100

Reduction in the Number of Private Cars Use	30	100

Source: Field data (2009)

Table 4.2 presents the response generated for the solution of BRT to Urban transportation challenge in Accra. It is indicated on the table that all respondents outlined the same role for of BRT towards traffic reduction. They included huge buses carriage ability, presence of dedicated lanes and reduction in the number of private cars use.

4.4 Challenges Facing the Management Affairs of BRT/Ayalolo

One core specific objective set out for this research work was to examine the challenges facing the operationalization of the BRT service in Accra. Owing to this, respondent were first asked whether there exist any major form of challenge confronting the service. Of the thirty respondents who made up the study, they all indicated of the service having numerous challenges which needs critical attention. Respondents listed challenges like inadequate financial support, poor implementation plan, poor leadership, inadequate infrastructure, limited route, and lack of education on the BRT. Explaining further on these challenges respondent indicated as follows;

In the case of inadequate financial support, respondent explained that, the BRT service was financed by a company in Sweden known as Scania and Marcapolo as regards the purchasing of the buses and financial arrangement towards repayment. As a public business entity, the governments were required to subsidize the operationalization of the system. However, since its inception no such financial support has been received forcing the service to rely heavily on income generated from ticket sales for the management of the service. Revenue generated are spent on all areas of operations of the service. By this, the service hardly is able to secure the needed finances

to manage the service particularly as regards fuel purchasing, payment of salaries. Largely, the service needs financial support from the government since returns on sales is not enough to manage its affairs. In an emphasis of this challenge, the public relations of service indicated as;

"Under normal circumstance, the government of Ghana has been requested on several subvention programs towards the management of the service. But this has never materialized and the BRT runs on its own volition. The service buys fuel without any tax exemption just like any individual and private transport company. In short, the service is being run like a private entity and this reduces the rate of returns made from the service. The service invests all returns from ticket sales and this affects it management. We use sales from ticket to pay drivers, buy fuel and do other management related task" (Public Relations Officer, BRT, 2019).

Again, respondent identified limited infrastructure as a bane to the success of the BRT service. One the part of all respondent, BRT service is required of a dedicated bus lane in which no other cars ply the same lane with the BRT buses. This is to afford the bus enough space and opportunity to beat traffic and offer fast and early services to commuters. However in the case of the Ghanaian BRT service, the story is different as buses do not have dedicated lanes to offer such speedily service to beat traffic congestion. Moreover, the BRT in Ghana have limited dedicated route. Route for the implementation of the service has only linked to some major roads and traffic congested avenues in the capital whereas other areas were not earmarked for such a service. Dedicated route in the whole of the capital city is less than even ten (10). Even though the dedicated areas have high traffic congestion, other roads in the city are not spared from this and the sudden relegation from this project largely frowns on the attempt to minimize traffic congestion.

Further, there is the challenge of poor implementation and leadership associated with the BRT system in Accra. According to respondents, the BRT has so far non-functional board management team headed by the Accra Mayor and deputy ministers from the roads sector among such others. Despite the high profile people involved in the management of the BRT, little attention has been paid to the management of the service. Leadership have not been able to steer the affairs of the service to attain its full benefit and this have impacted on the effectiveness of the service.

In addition, respondent mentioned of politicization as a major challenge of the service. Politicization and its adverse effect according to respondents have largely led to the sudden halt of the BRT service. The BRT service was introduced under the immediate past government during the electioneering year. Upon assumption of office of the new government which change in leadership in the management affairs of the BRT scheme, current officials lack the political will to invest in the BRT service all with the idea that it was introduced by the previous government and that any major intervention in the sector means the extension of glory to the former government. Thus, new officials particularly board members who largely are politicians' are not willing to invest in the sector. This particular was expressed by one respondent as;

"The management scheme of the BRT system is that, it is led by a board of directors, headed by the AMA boss and ministers as well as others from the transport ministry. With the change in government and the project started by the previous administration, leadership has changed and the new leadership coming from the current government are not willing to support the project of their main political rival forgetting that, it is the country that benefits and not political parties. Currently, as you can see, the BRT has halted operations and the service is not working. All buses have been grounded. All these happenings are occurring just because of political unwillingness on the part of the new government" (BRT Control Room Respondent, 2019).

Finally, a section of respondents numbering nine (9) and representing 30% spoke of low level of education on the passengers on the availability and system of operations of the BRT service in Accra. On the part of this group of respondents, most residents in Accra do not have much knowledge of the presence of BRT to the point that, some think it is Metro Mass system. As a result, majority of such people do not even know the dedicated bus stop, the timing for the arrival and departure of the BRT service. As a result, people continue to board their private and other trotro cars leaving the BRT buses with less patronage.

Table 4.3 Challenges of BRT/Ayalolo Management

Challenge	Ratio (30)	Percentage (%)
Inadequate Financial Support,	30	100
Limited Infrastructure	30	100
Poor Leadership and Implementation plan	30	100s

Politicization	30	100
Low level of Education	9	30
Total	30	100

Source: Field data (2009)

Table 4.3 presents the challenges of BRT management in Accra. Respondents identified five major challenges to confront the effectiveness of the system. Of the thirty respondents who formed the study size, as nine (9) representing 30% spoke of low level of education as a major challenge to the system, the entire 30 others with the percentage of 100 indicated the challenge of limited infrastructure, poor leadership and implementation plan, politicization of operations of BRT and inadequate financial support as the major bottlenecks to the system.

4.5 Critical Success Measures for the Management of the BRT/Ayalolo System

The final objective of the study was to identify the critical success factors for the improvement and efficiency of the BRT service in Accra. It is important to respondents earnestly outlined a dozen of measures for the management and improvement of the service. Among the listed factors are; strong political will to implement plan, subsidize fuel price, audit of operations to reduce operational cost, dedicated bus lane and more bus stops, public education, and reliable operational schedule.

One, respondent indicated the presence of adequate infrastructure like dedicated bus lanes, and bust stops as well as ride and park services as necessary prerequisite for the success, efficiency

and management of the BRT service in Accra. These respondents implied that, there are no dedicated service and that buses of BRT usually are caught in traffic. Thus far, to provide exceptional service that will ease the traffic congestion hurdle, there should dedicated lanes coupled with adequate stoppage joint which allow majority of the people have access to the BRT. More, there should be ride and pack avenues which will aid people to join such buses from different locations.

Two, the presence of political will aid in the effective management of the system. According to management of the service, the foremost conditionality of the BRT service is the political will on the part of politicians who are the core managers of the service. This is particularly so as such a will ensure that resources are allocated with good policies and management decision being made for the steering affairs of the system.

Three, the presence of a reliable operational schedule is critical to winning greatly, public confidence and purchasing of the service of the BRT. On their part, for the service to be effective and efficient, it depends largely on how good management of the scheme is made. Winning public patronage and participation in the effectiveness and success of depends on the extent to which service provision meets the timely need and commuters. As a result, and for the purpose of securing adequate commuters for the BRT, there should timely and reliable operational schedule in which commuters easily get on board as and when they are present at the various stoppage points. This will go a long way to increase public confidence and acquisition of the BRT service thus resulting in much more gains.

Again, respondents identified subsidized fuel price as critical for the successful management of the BRT service. This they explained that, the BRT is a public service rendered for the benefit of the entire country. As a result government should have some form of subvention for their operations. Particularly, subventions should focus on the cost of fuel and taxation for the fuel purchase since fuel cost much for the running of the BRT.

Finally, the regular conduct of audit of operations of BRT is necessary to attaining maximum efficiency. Respondents in the study submitted that, as an organization, it is important that their operations are audited to check their returns and investment as well as how well they tally and how the service is either making gains or loosing. Regular audit of their operations will result in the possibility of examining operational cost and which will help avoid losses whilst increasing operational gains.

CHAPTER FIVE

SUMAMARY, CONCLSUION AND RECOMMENDATIONS

5.0 Introduction

The fifth and final chapter of the study presents the summary, conclusion and recommendations with emphasis on the data gathered and discussions conducted on the topic “Urban Transportation Challenges in Accra: Is the BRT a Solution? The chapter is organized into three different sub-sections namely summary of findings, conclusion and recommendations. As the

first sub-section details the summary of the findings, the second and third respectively takes on the conclusion to the study and recommendations appropriately.

5.1 Summary of Essential Research Findings

The study's findings are summarized taking into account the objectives set out for accomplishment. Specifically, summary of findings are discussed under;

- Cause of Traffic Congestion on the Corridors of Accra
- Is the BRT/Ayalolo Bus Service A Solution to Urban Transportation Challenge in Accra?
- Challenges Facing the Management Affairs of BRT/Ayalolo
- Critical Success Measures for the Management of BRT/Ayalolo System

5.1.1 Cause of Traffic Congestion on the Corridors of Accra

On the issue of the first objective of identifying the various causal factors of traffic congestion in Accra, causes like limited road capacity, poor city planning, malfunctioning traffic signals, lack of high capacity buses and public transport system, singular route for business and residence, increased population with increased private transport were enumerated as the major causes of traffic congestion in Accra.

Concerning the factor of limited road capacity, respondent indicated that, there are not enough roads in the city of Accra considering the fast rate of city expansion and increasing population growth. As a result, vehicles do not have alternative route and will all have to crumble on the main roads for various activities.

On poor city planning, it was indicated that the city lacks major flyovers and direct access to road networks with various different routes which vehicles could have used in making access to numerous destinations. This poor city planning of centralizing almost every state and private sector activity forces all vehicles to ply the same route at a time.

Regarding the data on lack of public transport and huge carriage buses, respondents explained that, the city lacks any major governmental public transport system with high speed and huge passenger carriage abilities that could transport as many commuters as possible on a single entry as against the numerous private vehicles with less carriage capacity and speed rate visa-vie the growing population rate.

Again, the ever-increasing population rate in the capital city due to the centralization of government business as well as those in the private sector has resulted in huge traffic congestion in the capital city. This is more so as there continue to be increasing pace of travellers to secure various businesses and services in the capital city thereby resulting in continuous increase in the number of commuters seeking transport as well as private vehicles plying the road at the same.

Finally, respondents indicated that, high traffic congestion in the capital city is particularly witnessed on the Accra-Kasoa, Adenta-Accra, Lapaz-Tema, Cricle –Pokuasi, Independence-Nungua Barrier, Kaneshie-Kasoa, Achimota- Amasaman routes of the city particularly at the morning and evening peak hours of 6:00am-10:30am and 4:30-7:00pm respectively.

5.1.2 Is the BRT/Ayalolo Bus Service A Solution to Urban Transportation Challenge in Accra?

Regarding the data gathered on the second objective of the study, respondents indicated that a well-managed BRT service is the ultimate solution to the wanton transportation and traffic challenge in Accra owing to the these factors;

First, the presence of an effective BRT system with huge carriage bus capacity will ensure that many commuters are taken of the road at a ago and this will minimize the rate at which people will be stranded at bus terminals seeking transportation to and from their various places of work and households.

Secondly, respondents spoke of dedicated bus lanes as a major advantage of the BRT system to aid in reducing traffic congestion in the city of Accra. This they explained is partly so as the buses would move fast and reach various destinations whilst going on several errands to clear people from the road thus reducing traffic congestion.

Finally, respondent mentioned the ability of BRT to take off several private vehicles which are in use due to transportation challenges from the road to aid in minimizing traffic situation in Accra.

This they added that, there are numerous private vehicles plying the roads and compounding traffic situation with majority of them being workers all because they have no workable public transport system. Effective BRT system will see to the reduction of such private cars usages.

5.1.3 Challenges Facing the Management Affairs of BRT/Ayalolo

With regards to the challenges confronting the effectiveness of the system, the study revealed the following; inadequate financial support, poor implementation plan, poor leadership, inadequate infrastructure, limited route, and lack of education on the BRT.

Concerning the challenge of inadequate finance, data shows that BRT service does not receive any form of financial support and subvention from the government although they render public service. As a result, they rely on proceeds generated from ticket sales for all activities like purchase of fuel, payment of salaries and other engineering activities much of which generated revenue cannot provide.

Moreover, there is the challenge of lack of dedicated bus lane, ride and park centers and bus terminals for the BRT. This respondent explained further that, for ensuring effective BRT service which would be different from the ordinary traffic congested transportation culture in the country, there should be dedicated bus lane, ride and park centers where people from far afar could ride bicycles as well as park their cars and join the BRT buses with enough terminals in which passengers will be waiting. However, the Ghanaian BRT system lacks these things greatly and this is an affront to the effectiveness of the system.

Again, on poor leadership and implementation plan, primary data shows that the BRT in Ghana has only limited route as against the numerous traffic congested lanes currently even though some other routes have been earmarked for operation. Also, there is lack of effective leadership due to politicization which results in regular change of leadership and lack of political will, direction and management systems for the bus service.

Finally, the BRT is challenged due to low level of education of the general public about the service. This respondent indicated has resulted in less patronage as majority of the people do not know much about the system and thus the system suffers less patronage resulting in less returns.

5.1.4 Critical Success Measures for the Management of the BRT/Ayalolo System

With regards to the critical success factors to attaining effective BRT system, respondent listed them as, strong political will to implement plan, subsidize fuel price, audit of operations to reduce operational cost, dedicated bus lane and more bus stops, public education, and reliable operational schedule.

Concerning data on adequate infrastructure, participant in the study mentioned the presence of dedicated bus lane, ride and part centers, buses, and terminals as necessary pre-conditions for the effectiveness of the Ghanaian BRT system.

Secondly, there was the mention of strong political will as essential to ensuring that the service attains the needed resources, decision making and support from both government and private sector. This is more so as such political will results in the continuous management of BRT in the country.

Again, the presence of an effective and reliable operational schedule is necessary to winning public confidence and support for the BRT service. This is particularly the case as such an efficient system will realize the public doing business with the BRT scheme all time resulting in many gains.

Further, participant indicated of the availability of subvention scheme from the government which will ensure reduction in the cost of fuel for the buses as necessary for the continuous operationalization of the scheme. The presence of such a system will ensure that BRT reduces operational cost which is important for the services management.

Finally, the continuous conduct of audit on the operations and activities of the BRT will go a long way to ensure that profit and loss are examined regularly whilst effectively and efficiently managing the system.

5.2 Conclusion

Literature on Traffic Congestion and Urban transportation challenges both in Africa and developed countries indicate that, BRT is one of the main annals to solving such issues. In particular and in the case of countries like Nigeria, South Africa, Brazil, Columbia, Los Angeles and India, BRT has been employed greatly to minimize urban traffic congestion. Wright and Hook (2007) submitted that, BRT was introduced in most of these countries to reduce traffic congestion as well as reduce the cost of private transportation in such societies. The first country to introduce a BRT system was Colombia and this has been replicated in several others due to its numerous successes (Replogle & Kodransky, 2010) with Ghana being one such countries. The Ghanaian BRT also known as Ayalolo was introduced in 2016 to reduce traffic congestion in Accra and beyond. This study set out to examine how the Ghanaian BRT/ Ayalalo could be a solution to the high pace traffic situation in Accra in particular. This study report that, the objectives set out has been accomplished and that the following conclusions are drawn;

First, the Ghanaian BRT exceptionally serves as the solution to the traffic congestion situation in Accra particular on high traffic based routes like Accra-Kasoa, Adenta-Accra, Lapaz-Tema, Cricle –Pokuasi, Independence-Nungua Barrier, Kaneshie-Kasoa, Achimota- Amasaman routes during the morning and evening peak hours of 6:00am-10:30am and 4:30-7:00pm respectively.

Again, despite that the BRT is a solution to transportation challenges in Accra; it is faced with challenges like inadequate financial support, poor implementation plan, poor leadership, inadequate infrastructure, limited route, and lack of education on the BRT.

Finally, the study concludes that, for the purpose of attaining effective and efficient BRT scheme conditionalities like strong political will to implement plan, fuel price subsidy, audit of operations to reduce operational cost, infrastructure, and reliable operational schedule are needed.

5.3 Recommendations

For the purpose of developing effective and cost efficient BRT system, the study recommends that;

First, government, both past, present and future should development strong political will for the implementation of the BRT system so as to avoid a situation where a new government feels the system was introduced by another government and that needed resources are not distributed for the management affairs of the system. Such a strong political will forestall future political and governance related setbacks with the system.

Secondly, government must commit adequate resource and construct additional infrastructure like dedicated bus lanes, terminals and ride and park services for BRT. The presence of such facilities will ensure that BRT operates to its full benefits whilst reducing traffic congestion in Accra.

Finally, government must together with managers of BRT develop a subvention scheme to ensure low cost fuel usage by the BRT. Such a scheme will assist largely in the BRT running less costive system which will serve the needs of commuters.

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APPENDICES

INTERVIEW GUIDE

UNIVERSITY OF GHANA

DEPARTMENT OF PUBLIC ADMINISTRATION AND HEALTH SERVICES MANAGEMENT

INTERVIEW GUIDE FOR DATA COLLECTION

OBJECTIVE

The goal of this study is to gather data for academic work on the topic; Urban transportation challenges in Accra: is the BRT a Solution?

The researcher is by name, a final year Master of Public Administration student of the University of Ghana Business School. The study is undertaken as part of the requirement for the award of **Master of Public Administration Degree**

Kindly note that your participation in this research activity as an interviewee is important and that information (data) provided for the study is purely for academic purposes and as such will be treated with the confidentiality it deserves.

APPENDIX 1 INTERVIEW GUIDE FOR KEY INFORMANTS (MANAGEMENT OF THE BRT)/ PASSENGERS AND POLICY MAKERS OF BRT/AYALOLO

1. **Background of Respondent**

Can you please start by telling me a little bit about yourself, education, position and what you do in/with the provision of BRT (Ayalolo)?

2. **Congestion on the corridors of Accra**

1. Can you share with me your thoughts about what traffic congestion is?

2. What do you think will be the cause of traffic congestion in Accra?

3. What do you think is the state of traffic congestion in Accra?

4. Which routes in Accra mostly get congested?

5. Would you say that the nature or type of traffic congestion on these corridors was/are either *recurrent (*frequently occurring*), occasional* or both? Explain.

6. When does this/these corridor usually experience traffic congestion?

3. Operations of Bus Rapid Transit System in Accra

1. Can you describe to me what a Bus Rapid Transit System is?

4. May I know when you started implementing the BRTS?

5. Can you discuss with me how the BRTS was supposed to operate?

6. May I know why the BRT decided to offer this particular kind of service?

7. Can you describe to me the kinds/types of bus services rendered by BRT/Ayalolo to the travelling public?

8. Can you show me where or which corridor(s) were selected for the BRTS?

9. What was the average number of BRTS buses that plied the selected corridor on a daily basis?

10. May I know to whom the BRTS was targeted at?

11. Would you say that the initial pilot BRTS project was a success? If so, how in terms of Economic gains/profits, Social benefits, Environmental benefits etc.

12. Do you think the BRT can help minimize the traffic congestion problem in Accra? Yes/No- Why

13. Would you say the BRT is faced with some challenges of any form? Yes/ No- Why

14. What do you think can be done to improve the performance and operations of the BRT system?