

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
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**SATISFACTION OF ROAD TOLLING BY ROAD USERS: A CASE STUDY OF
ACCRA – TEMA MOTORWAY**

By

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**A thesis submitted to the Department of Construction Technology and Management,
College of Arts and Built Environment,
in partial fulfilment for the requirements for the award of**

MASTER OF SCIENCE

NOVEMBER, 2018

DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other institution, except where due knowledge has been made in the thesis.

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ABSTRACT

Tolls are implemented on road infrastructures for purposes such as revenue generation and mitigation. They are basically aimed to increase accessibility and meet transportation needs of the citizens and business organizations. The government in the quest to improve road

infrastructure deficits with its general limited budget may lease the construction of roads to private entities to build and operate to cover the cost of construction by charging tariffs on the road users before transferring back to the state, or the government may construct a public road and charge a private entity to operate manage and maintain them. The aim of the study is to determine the perceived satisfaction of end users of toll roads on Tema Motorway. The study also has its objectives to find out the level of satisfaction of road users regarding the tolling system, the study also tries to ascertain how road users perceive and understand tolling system, it tries to know how revenues generated from tolling are used as well as find out whether or not users encounter challenges in plying the road. Purposive sampling and interviews were used to gather information from respondents. The data was analyzed qualitatively by using thematic analysis of various themes that emerged out of the data, there are various services expected to be provided while commuters pay tariffs for using the road infrastructure which include available road markings and signage, proper drainage system along the roads, improved lightings and smooth surface of roads. The extents of these services of toll roads are directly related to the level of satisfaction expected by road users. This study uses Accra Tema motorway as a case study to analyze the level of road users Satisfaction and understanding of road tolling by interviewing various user groups, namely commercial users, private and corporate users to find out how they feel about the tariffs they pay accessing the motorway. The review identified that there is a gap between the actual services offered by toll road operators and expected service by road users. The study recommends that revenues from the tolling system on the motorway should not only be used as the basis of evaluating the performance of the road but also the satisfaction of the road users should be a concern to the government or operators.

Keywords: Toll roads, satisfaction, stakeholders, Road users, Tema motorway

ACKNOWLEDGEMENT

I would first like to express my heartfelt gratitude to my thesis supervisor, Dr. Godwin Acquah for his meaningful assistance guidance, patience and useful suggestions on matters relating to the topic to ensure that I involve myself to make the work my own.

I am equally grateful to Professor Bernard K. Baiden for always availing himself to address all issues found challenging in the cause of completing this program.

I must express a profound appreciation to my mother Madam Victoria Mensah and my siblings, Mr. Emmanuel Gyamfi, Madam Joyce Agyemang –Duah and Miss Agnes Oforiwaa and my entire family for their inspiration, encouragement, financial and moral support offered me throughout my academic pursuits.

Am also indebted to the staff of Kenya Airways - Accra, who concerns and deliberations informed the topic and also led to successful discussions on the topic.

I would also like to thank all my course mates, group members and study partners whose discussions and suggestions contributed immensely to successfully sail through this program.

I duly appreciate all the efforts made by my respondents who provided information for executing this research.



DEDICATION

This work is dedicated to my mother, Madam Victoria Mensah who has endlessly work to ensure the development of my potential to become useful to society

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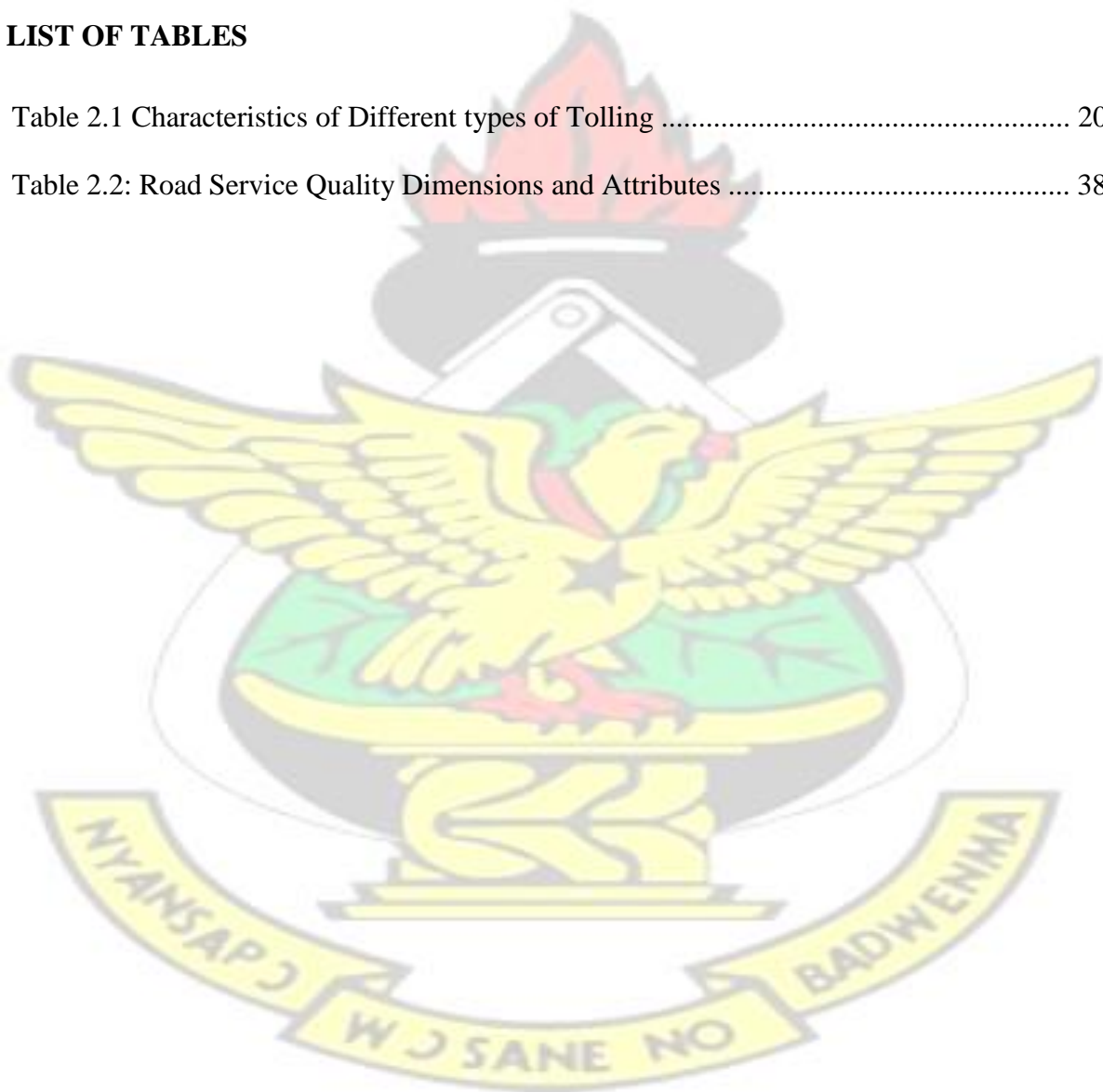
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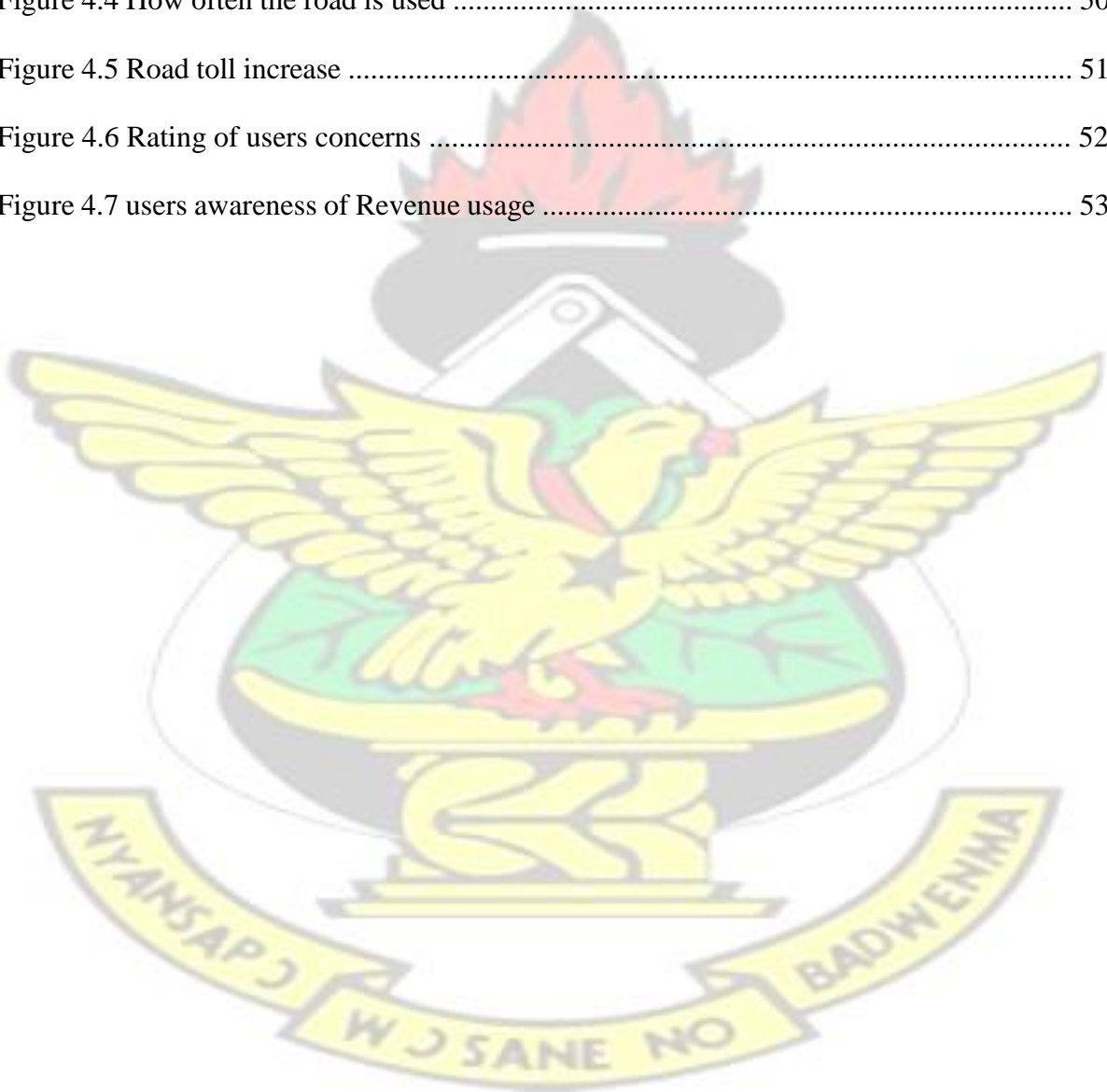
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ABBREVIATIONS

The logo of Kwame Nkrumah University of Science and Technology (KNUST) is centered in the background. It features a shield with a red and white design, topped with a red and white flame-like element. The shield is flanked by two yellow wings. Below the shield is a yellow banner with the text 'NYANSAPƆ WƆ SANE NO BADWENMA' in black. The entire logo is set against a light gray background.

BLO	Build –Lease Own
BOO	Build- Own -Transfer
BOT	Built- Operate - Transfer
BOOT	Built-Own-Operate-Transfer
BLO	Build –Lease- Own
BROT	Build- Rehabilitate-operate-Transfer
DBO	Design-Build-Operate
DBFO	Design-Build-Finance-Operate
GPRS	Ghana Poverty Reduction Strategy
MRS	Marginal Rate of Substitution
MSB	Marginal Social Benefits
ROT	Rehabilitate-Operate-Transfer
SD	Sustainable Development
PPP	Public Private Partnership TBL
Triples Bottom Line	

CHAPTER ONE

INTRODUCTION

1.1 Background

Road infrastructure is a resource vital for today's economic and social activities, road infrastructure development is one of the major programs being implemented toward Ghana poverty reduction (GPRS, 2003). Roads have become more than linking channels between towns or cities; they have become a tool for development (Heggie & Vickers, 1998). With road transport being the dominant form of transport for movement of freight and passengers globally, coupled with the fact that the demand for road infrastructure has increase enormously in Ghana and many countries around the world. (Heggie & Vickers, 1998).

In spite of the dramatic rise in the demand for road infrastructures, governments face the challenge of providing new facilities, their maintenance as well as rehabilitation of existing on (Heggie & Vickers, 1998). Governments are mostly faced with budget shortfall, financing the costs of these facilities up-front are difficult for governments (Badu, et al 2011) . To increase sector specific revenue and to cut costs, commercializing of privately financed toll road projects are becoming increasingly more popular as a sustainable solution, with the private sector given concessions to build and operate roads infrastructure for a specified period of time before the government inherits these assets at the end of the contract mostly at a zero cost (Beato, 1997). Toll road is a transport infrastructure publicly or privately owned that charges fees from road users with the aim to offer improved travel time (Jonathan & Stephen, 2016). Revenues from tolls are either spent on operating activities, maintenance activities or financing road infrastructure (Jonathan & Stephen, 2016). Toll projects have unique considerations that are not found in the general transport infrastructure items that are toll free.

For instance the fact that road user is directly charged for accessing the road, tolling influences the benefits that users receive. Road users accept payment of charges with anticipation of improved mobility, reduced congestion and enhanced quality of life. Since toll roads are mostly pre financed for tolls to be collected, a more complete analysis need to be considered on how toll revenues are used and how they benefit the road users ((Tan, Yang, & Guo, 2010). Using Washington DC as a test case, (Safarova et al, 2005) examine the benefits of Cardon tolls and link-based tolls, it was identified that both provide net benefits to road users. However, to realize the net benefits the revenues have to be used to pay for road or other public goods. Users expect toll revenues to be devoted to the construction, improvement, maintenance of toll facilities, curbing transportation related problems and if there is a surplus fund it can be used for other transport projects (Franklin 2007, Richardson and Bae 1996, Weinstein and Seira, 2004).

These objectives are almost impossible to achieve concurrently. For instance there is a conflict between profit maximization and welfare maximization(Tan et al 2010). Attaining profitability and welfare improvement of toll roads pricing scheme depends largely on individual project characteristics (Tsekeris&Voß, 2008). Private operator set a toll road price depending on the power of the market exercised by the road user and the private operator(Tan et al.2010). The operator imposes any convenient price when there is a single monopoly operator and numerous road users (Button, 2010). Roads pricing are traditionally treated as financial transfer between government and road user, however when road infrastructures are constructed under Public Private Partnership scheme and tolls are collected by private operators whose aim is to recoup their investment and maximize profit it is unclear to whether to consider the toll as financial transfers (Krause et al, 2017). Also toll roads like other PPP

projects have complex risk sharing mechanisms which part of it is shifted to private operators who indirectly pass on indirectly to be borne by road users (de los Angeles Baeza & Vassallo, 2010)

1.2 Problem Statement

Road infrastructures possess conditions of public goods and are therefore possible to be classified as such with features as no-excludability and non-rival in consumption (Rosen, 1995). Also roads have features of private goods which make it possible for user charges to be set on them. These charges are either set by government or private operator who may have invested in the construction or maintenance of a road. Tolls are charged mainly for solving the problem of shortage of funds. It aims to raise adequate revenue for building, maintenance, rehabilitation and operation of a tolled road (Beato, 1997). Achieving all these objectives of maximizing users welfare coupled with recouping invested capital by private operators are always in conflict (Tan et al, 2010). Also privatized road infrastructures are prone to a number of risks such as political, operating risk, revenue risks among others (Suseno, 2015). To overcome these challenges associated with the operation of a toll road, there is a tendency of operators overlooking the welfare of road users (Beato, 1997). This is as a result of host government and operators who usually measure the performance of a toll road by the revenues it generates without considering how the road impacts on others (Rouhani et al, 2016). The use of value for money as a basis to analyze and evaluate the successful performance of toll road is mostly inappropriate as it ignores the welfare of road users (Booardman and Vining, 2012). Regardless of the number of literatures that have commented on the likely benefits associated with toll roads, little efforts have been made to investigate whether such benefits are actually

realized in implementation of toll road projects. (Cooper and Schiddler, 1998) stressed that problems cannot be adequately addressed in a study when they are too broad. Thus this study specifies and limits the statement of the problem to satisfaction of road users in road tolling.

1.3 Aim of the Study

The study will determine the perceived satisfaction of end-users of toll roads on Tema Motorway

1.4 Specific Objectives

- To find out the level of satisfaction of road users regarding the tolling system
- To ascertain how road users, perceive and understand the tolling system
- To find out how toll revenues are used
- To find whether or not users encounter challenges in using Tema motorway

1.5 Research Questions

The research is geared towards finding answers to the following questions; □

Do road users get value for the charges they pay for using toll roads?

- Do road users know why tolls are charged on Tema motorway?
- Do road users know what the revenues generated from tolling are used?
- Do road users face challenges in plying Tema motoway?

1.6 Research Methodology

The study explored a case study that was used to compile useful information about road users.

The sampling method for this study will be purposive sampling; interview formed an important part of the study. A sample big enough to be representative of all road users affected

by tolling system was chosen. Secondary information from relevant documents such as journals, articles etc were reviewed.

Data was analyzed qualitatively using thematic analysis to identify the various themes that arose from user's responses to determine their level of understanding and satisfaction

1.7 Scope of the Study

The study is limited to Ghana, Greater Accra Region where data was collected from users of a toll road that is in operation. The toll road under consideration is Accra Tema motorway. The respondents involved in this study consist of commercial vehicle users, private vehicle users and corporate vehicle users. These respondents must be regular users of Accra Tema motorway who have experienced the conditions of the road. The research focuses on stakeholder's perceptions and satisfaction regarding toll roads; road markings, lightening, maintenance, drainage etc.

Purposive sampling was selected as the data collection technique because the target respondents are the road users that have very specific characteristics. Currently the data on road users who patronize toll roads are not easy to obtain, as such purposive sampling technique is used in this research by selecting the respondents who meet the requirement.

1.8 Justification of the Study

Road tolling has become a significant alternative source of financing Ghana's road infrastructural projects; it comes along with quite a number of benefits for the society to meet its road infrastructural needs, but key to this system is how it impacts on the welfare of road users in the country which has not been adequately researched into. Toll road projects have unique characteristics compared with non-toll road projects. Welfare expectations of toll road

users are different from non-toll roads because road users are responsible in paying to use the road. The difference should be reflected in how toll roads are constructed, treated and managed in the area of quality, toll rates, road markings, maintenance, drainage, congestion control and lightening along the toll roads. The study investigates road users perceptions related to road user charges which is a critical element that must be considered in implementation of toll road projects to assess users willingness to accept and willingness to pay especially in developing countries which Ghana is not exception where there is lack of trust in public institution as to how toll revenues will be used. Analyzing toll road projects to reflect the net impact on user welfare is essential in the decision making about a public good.

1.9 Significance of Study

The outcome of the study will be user satisfaction in road tolling, which will give an insight into how toll roads should be managed and maintained to realize their benefits and purpose of their implementation.

The study will provide information to institutions responsible for road infrastructures to realize the lapses in management and maintenance of toll roads in the country.

The study will inform road users on the potential benefits that toll roads stand to provide so as to influence their level of acceptability.

1.10 Limitations of the Study

The study will be conducted within the time allocated for the completion and submission of the thesis. The main constraints of the study are the population size and the number of people to be interviewed. The sample size that will be interviewed is 130 users of Tema Motorway.

The number of vehicles that ply the road is not known and does not repeat itself daily. The 130 people were chosen because of repeat responses from the respondents.

1.11 Structure of the Report

The study has been organized into five chapters:

The chapter one is the introductory chapter which gives an overview of the study, it explains the topic and what the study intends to achieve, the problem statement, research aim and objectives, research questions, significance of the study, justification of the study, scope, limitations and the organization of the report.

Chapter Two contains literature review which provides the theoretical framework and reviews the existing literature on the subject matter.

Chapter three focuses on methodology used for the study. This chapter covers the various methods the study used in collecting data, sampling techniques and how data was analyzed to meet the intended objectives of the work.

Chapter four contains the analysis of the collected data to assess whether or not the stated objectives of the study have been achieved

Chapter five captures the summary of findings, conclusions and any relevant recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The demand for road infrastructure has risen enormously in Ghana and many countries around the world. Modern civilization, work sharing and economic integration have increased the

demand for transportation above the supply (Heggie & Vickers, 1998). Excessive use of road infrastructure, additional costs of construction, operating, rehabilitation and maintenance which are challenge to government considering inadequate resources(Krause et al., 2017) . The steps that have been taken to counter this increased demand for road infrastructure are enormous, range from charging vehicles and fuel with extra tax to charging for the actual use of the road ((Badu et al., 2011). This system of charging for the actual use of the road often raises questions about the welfare of the commuters who pay for the use of the road ((Parry & Bento, 2001). In doing this the government enters into arrangement with a private entity and lease existing road for the entity to maintain and charge a fee or construct entirely new road manage, operate and charge for its use (Beato, 1997). However, the failure on the part of government to ensure quality control cause operators to keep providing unsatisfactory service to users (Financing, 2015). In addition government and operators do not take into consideration the perspectives of road users so there is always a discrepancy with respect to the anticipated service quality level between government, operators and users (Zeithaml & Berry, 1985). Aside the travel time benefits as the main factor which drive users to use toll roads, other factors also influence users' decision such as highway quality. For instance, a study developed a toll road service quality concept in Indonesia based on user perspectives (Indonesia, 2016).

Another study was also conducted based on quality of service usually found in other dimensions such as airline, rail, and public transport (Eboli& Mazzulla, 2008). This study focuses on quality of service in the tolling system to road users, users understanding and perception in order to enhance their decision to accept and use toll roads.

2.2 Toll Road as Transport Projects

In recent years governments have implemented tolls on their highways, bridges or tunnel infrastructures for purposes that include revenue generation and mitigation (J Chi & Waugaman, 2010). Toll roads are publicly or privately managed road infrastructure that charges toll from road users with the intention of improving travel time. Revenues generated are used on operating activities, investing activities and financing activities (Heggie & Vickers, 1998). Toll infrastructures usually have unique characteristics that are different from the general transport facilities (Jonathan & Stephen, 2016). Tolling system has been perceived as an essential alternative for financing road infrastructure projects and they provide many benefits in terms of user fairness and cost repayments (Jonathan & Stephen 2016)

Aside the benefits tolling system promise to provide the public also have doubt about certain aspects of the system and sometimes oppose to its implementation based on the arguments that;

- Tolling is a form of double taxation
- tolling enriches the private investor at the expense of the citizenry and
- applying tolls promote inequality in the country (J Chi & Waugaman, 2010). When the government leave road management entirely to private investors only tolled roads that serve the interest of road operators will be constructed and maintained, nontolled roads will be allowed to deteriorate raising the market power of tolled roads (Staff research, & Planning (1989). These arguments increase the need to justify the possible benefits tolling system promise to provide. Road infrastructure project implementation according to Pareto optimality supposed to increase the wellbeing of individuals without reducing the well-being of other individuals. Pareto optimality can

only be attained at a point where the marginal rate of substitution (MRS) is equal to the marginal rate of transformation (Raub et al., 2013). In public projects like toll roads their effect on road users are to be taken into account as a result Pareto optimality will be attained when the marginal social benefits (MSB) will be equal to marginal social cost (Baye & Prince, 1994). Road users anticipate quality road services that commensurate the charges being imposed on them for using the infrastructure

2.3 Toll Roads as an Infrastructure PPP Projects

Toll roads form part of infrastructure projects that are mainly delivered using public private partnership (PPP) scheme (de los Angeles Baeza & Vassallo, 2010). Traditionally, until later part of twentieth century, public infrastructures were provided by the government or public sector and were sole owners and responsible for such infrastructures (Rohman, 2017). These public infrastructures are mostly provided through design-bid-build procurement system (Aziz, 2007). However a typical public approach may lead to problems such as delay and ineffective decision-making, inefficient institutional and organizational frameworks and lack of competition and efficiency (Heggie & Vickers, 1998). In addition, experience has shown that delivering of construction projects usually mega-projects through traditional procurement system results in projects being over budgeted and over time (S. Chi, 2018). Contrary to the argument against the purely public sector provision of infrastructure project, extreme privatization of entire infrastructure provision may also cause problems such as inequalities in the distribution of infrastructure project, over charging beyond welfare maximizing price (Tan et al., 2010).

PPPs are instituted as a system to cooperate between public and private sectors to deal with these limitations associated with both capacities in infrastructure provision ((Rouhani et al., 2016)

In the year 1980s and 1990s PPP was initially introduced in the United Kingdom in the form of Private Finance Initiative ((Smyth & Whitfield, 2017) . PPP model is assumed to be a means to engage the private sector in infrastructure project development due to limited government's budget or to ensure best value principle ((Baeza & Vassallo, 2008).

The term PPP has not been clearly defined even though it has been widely used as an infrastructure procurement scheme internationally ((Rohman, 2017).

PPP is a concept that is situated in the middle of traditional public service and pure privatization. In privatization the government does not directly involved in the operation but in the PPP concept the government has a major responsibility(Baeza & Vassallo, 2008). (Kwak et al, 2009) also described PPP as located between a typical public and private system of delivering infrastructure projects and are therefore divided into Design-Build-

Operate(DBO), Build-Operate-Transfer(BOT), Operational maintenance(OM), Design-Build-Finance-Operate(DBFO) and Build-Own-Operate.

PPP is a long arrangement between a public sector and private entity where the government engages private consortium to provide infrastructure and any related service or support government in its broader infrastructure provision responsibilities which makes the private entity a party who builds infrastructure and be responsible for its condition and performance(Baxandall, 2009). PPP in principle intends to derive maximum benefits (best value) for providing public infrastructure services leveraging on private sector and transferring some risk and responsibilities to them simultaneously ((Ke, Wang, Chan, & Lam, 2010)

Public Private Investment of the World Bank or PPI (2013) divided PPP into four

categories;

- Management and lease contract where the management of a state-owned entity is taken over by a private entity for a fixed period while the state is still in charge of ownership and investment decision. This type of is made up of management and lease contracts. With management contracts the government pays a private operator to manage the facility while the government remains the bearer of operational risks but with the lease contract the assets is lease out to private operator for a fee who is responsible for the operational risk.

- Concession which involves transferring the design, construction, maintenance and operation of the facility to a private entity, the entity has the right to charge a user fee for a period contractually agreed during which it assumes all the related risks.

Concession can be classified into Rehabilitate- Operate-Transfer(ROT), Rehabilitate-Lease-Transfer(RLT) and Build-Rehabilitate-Operate-Transfer (BROT)

- Greenfield projects are types of PPP where a private entity solely or the state together with a private entity jointly build and operate a facility for a period specified in the contract. The facility may be handed over to the state upon expiration of the contract duration. This type of PPP is categorized into five types: Build-Lease-Own (BLO), Build-Own-Operate (BOO), Build-Own-Transfer (BOT) or Build-OwnOperate-Transfer (BOOT), Merchant, where a facility is built by a private entity in a free market where government provides no revenue guarantee. The private developer takes the risks in construction and operation of the\ project, Rental is a type where the private sponsor places a new facility at its own risks in management and operation
- Divestiture is another form of PPP where a private company buys an equity stake in a state owned entity via public offering, an asset sale or mass privatization program, this

can be full sale where the government transfer part of the states owned equity to private entity

PPPs provide benefits and also have limitations as well in the perspectives of both the government and to private investor, the public perceive PPP implementation to give an improved program performance, cost efficiencies, better service provision and appropriate risk allocation and responsibilities(Baeza & Vassallo, 2008).

The private investor also sets better investment potential and can make responsible profits and has enough opportunity to expand ((Rohman, 2017)

PPPs release government budgetary limit by supplementing with the private sector resources, promoting innovation, enhancing productivity, allowing better risk allocation, increase value for money and improving cost effectiveness(Ke et al., 2010).

Some countries have used PPPs as a panacea to budgetary pressure, demand and supply discrepancy, fiscal deficits and inefficient public service delivery of infrastructure project, others also adopt the concept for operational efficiency, more active involvement of private prayers in public services technological innovation and managerial skills ((Heggie & Vickers, 1998).

PPP arrangements are not only beneficial without criticisms, for instance, BOT project are connected with several challenges of cost overruns, unrealistic prices and income projections, legal disputes between private operator and government due to political obstacles ((Suseno et al., 2015). In comparing traditional procurement scheme with PPP concept, PPPs are associated with high risks and if these risks are not well managed they may hinder the success of PPP projects ((Ke et al., 2010)

Most PPP projects are criticized as not considering the plight and perspectives of end-user as criteria for evaluating the decision-making process (Majamaa et al, 2008). The end user needs and interest of key stakeholders are not much of a concern to private developer but rather the performance criteria ((Baxandall, 2009). To have the end user in mind there is a proposal for Public Private People Partnership (4P) to include end user stakeholder from the initial of project life cycle in any public private arrangement for provision of infrastructure (Majamaa et al, 2008). Community participation process in the context of PPP project improvement is a framework that has been proposed to support the idea of 4Pconcept ((Rohman, 2017). The framework has four key features namely; inclusiveness, continuity, instruction and transparency(Rohman, 2017). To ensure resilience, improved and sustainable project implementation mainly depends on a formal integration of end users of a project through the implementation of the 4Pconcept. Ensuring resilience of a project is imperative in PPP concept as PPP project are more prone to very high risk business compared to traditional procurement(Rohman, 2017).

Regardless of people's involvement ensuring partly the success of a project it also makes decision-making process more complex which may results in project team disputes or project delay therefore is very important to select key stakeholders to engage and subsequently manage their expectation in 4P (Zhan et al ,2015)

2.4 Sustainable Development

The concept of sustainable development is determined by a number of indicators which are realistically difficult to practice(Mitchell, 1996). Sustainability is a particular relationship that exists between mankind and nature and is and is determine through the activities of man.

Sustainable development is the type of development that caters for the needs of the present generation without compromising the future generation's ability to also meet their needs ((Mebratu, 1998). Many societies these days want to achieve economic development to gain higher standard of living for present and future generations (Mebratu, 1998). They aim to enhance and protect their environment now and for generations to come. Thus the concept of sustainable development aims to reconcile the present and future generations' needs ((Giddings, Hopwood, & O'Brien, 2002). Therefore all the actions and activities on a project should not limit the quality of life of now and future.

(Elkington, 1998) identified three pillars; Economic performance, Environmental sustainability and social justice which are all related and depend on each other and are slightly different from some other components. According to (Elkington, 1998) an entity will be sustainable when it depends on the three pillars called Triple Bottom Line (TBL). This concept has been criticized by (Littig & Grießler, 2005) for not using sufficient bottom approaches but rather limits it to only three pillars despite it been in line with United Nations Brundtland Commission which advocates for integration of economic, social, ecological, and institutional aspects of social development. Therefore it is much appropriate to use multiple bottom approach to include other components. For instance, (Lucas and Stanley, 2013) included four dimensions in their definition of sustainable development which are; Environmental, Economic, Social and Governance performance.

Others also proposed cultural aspect as component to be added to determine sustainable development (Axelsson et al, 2013). Environmental destruction has been a fundamental problem has been experience from implementation of sustainable development and is directly related to hunger, poverty and social inequality. Therefore to be appropriately deal with the

problems of poverty and underdevelopment, there is a need to move from a ‘green agenda’ which only concern about environment and focus on ‘brown agenda’ that addresses the issues of underdevelopment and poverty ((Du Plessis, 2007). This suggests that a more attention should be given to other micro level components in order to comprehensively improve peoples’ well-being.

2.5 Toll Road Sustainability

Road infrastructures are part of the development activities that contributes to economic growth and improved quality of life therefore the practice of sustainability is more critical in road infrastructure as part of sustainable development agenda ((Spiekermann & Wegener, 2003)

For a toll road to be sustainable the focus should be on three perspectives; sustainable infrastructure, construction and transport projects (Presley and meade, 2010).

Toll roads as an infrastructure projects form part of sustainable development agenda that seek to improve peoples’ infrastructure needs. According to World Bank (1994) poverty alleviation, growth of economy and environmental sustainability are all benefits that can be received from infrastructure provision especially when they are effectively managed to provide the needed services.

Toll roads as sustainable transport infrastructure is viewed as the use of a more comprehensive area of sustainable development in the transport industry which brings a balance in stakeholders’ economic performance, environmental quality and social justice needs as well as conserving the environment for future generation(Presley and meade, 2010) Toll road as construction project cover a wider scope and has great impact on the environment as compared to other industrial products (Presley and Meade, 2010). For instance construction of road has impacts on peoples’ health and surroundings. Construction activities changes the conditions

of an area from its original state which influence peoples' lifestyle now and next generation. Therefore it is necessary to ensure that toll road project is developed by using construction activities that are more sustainable

(Du Plessis, 2002) suggested that sustainable construction can be attained by practicing the principle of sustainable development in the overall construction process from planning, design materials acquisition and building until the stage of completion and beyond as well as waste management. This maintains harmony between the construction and the natural environment that ensures economic equity and human dignity (Presley and Meade, 2010). Consideration of sustainable development in construction reduces material waste pollutions such as water, soil, noise, vehicle emissions and release of harmful substances.

Toll roads have the potential to contribute to the general economic development, for instance toll roads which are supposed to managed well to meet users demand as they pay tariffs for using them has the capacity to increase efficiency and effectiveness which in the long run ensures economic sustainability (Handiyani, 2008). For instance one of the reasons for imposing tariffs on roads is to generate revenue from the infrastructure to ensure maintenance and other developments. As a result the government does not include the maintenance of the road in question in the general budget as the revenues accruing from the operation are reused on the road maintenance which shifts the attention to the development of other sections of the economy which in the end ensures general economic sustainability (Handiyani, 2008).

With respect to environmental sustainability toll roads contribute positively by reducing congestion and emissions (Handayani, 2008). The social sustainability is realized when toll road ease congestion and provide a smoother surface for faster and incidence safety driving.

2.6 Road Concession

The most common legal vehicle for private sector involvement in road projects is the concession system ((Beato, 1997). Under road concession system franchise is granted by the state to private entities the right to finance, construct, own, operate and maintain a public road infrastructure for a stipulated period and charge a toll for a period of time contractually agreed in advance ((de los Ángeles Baeza & Vassallo, 2010). Road concession regulations usually require a fixed term for concession agreement that is long enough to recover the investment cost usually between twenty and thirty years ((Beato, 1997). The entities are mostly stand-alone or single purpose firms that are to finance themselves without recourse to the shareholders ((Beato, 1997). To ensure a successful concession, the granting authority must be clearly defined and the road that needs to be constructed is approved as part of national road development plan ((Beato, 1997)

2.7 Types of Tolling

- **Fixed tolling:** This is a flat toll rate mostly paid by vehicle at the facility entrance. The toll rate may vary by vehicle class. This tolling type is particularly implemented for well defined, special and relatively costly infrastructure, examples are; a bridge, tunnel, mountain pass etc. Is the most common type of tolling ((Ukkusuri, Labi, Zhu, Le, & Sagir, 2017)
- **Time- of- day tolling:** This type of tolling charges various rates at different times of day and various days of week depending on the demand for the facility. High rates are charged especially during peak hours and lower rates during off- peak hours. In addition to the revenue generation for managing roadways, the goal of this strategy is

to allow users who need the roadway to use it and are willing to pay for it ((Santos, Button, & Noll, 2008)

- **Distance/zone based tolling:** with this type of tolling the total distance covered or specific areas entered are used as the basis of charging. Distance based tolling is used to minimize the use of the facility while zone based tolling is to reduce the number of vehicle that enter specific area. This was seen in 1998 in Singapore when Electronic Road Pricing (ERP) scheme was introduced to charge congestion fee anytime a user crosses the Cardon ((Toh, 2018)
- **Congestion pricing:** this charges road users with regards to the level of the transport system. This concept aims to charge commuters who use overcrowded facilities to maximize social benefits it helps reduce traffic congestion in the specified area or zonal based and rate vary over time. For instance zonal congestion pricing scheme was launched in 2003 in London where daily fee is charged for each vehicle within congestion charge zone(Santos et al., 2008)

Table 2.1 Characteristics of Different types of Tolling

TYPES	OBJECTIVES	SCOPE	IMPLEMENTATION COMPLEXITY
Fixed tolling	compensation of the facility	Corridor	Low
Time-of-day tolling	compensation of the facility and traffic demand management	Corridor	Medium
Distance based tolling	compensation of the facility and traffic demand management	Corridor	Medium
Zone based tolling	Traffic demand management	Area	High
Congestion pricing	Congestion alleviation	Area	High

2.8 Toll Collection Technology

Tolls are traditionally collected at tollbooths; in current era tollbooth still exist to allow manual cash payments. However, the emerging technology allows more efficient and low cost toll collection. Some of these toll technologies are described below;

- **Electronic toll collection system:** With these drivers equipped with responders pass through tollbooths without reducing their speed. The Dedicated Short Range Communication technology is used in the automated vehicle identification system to collect tolls(Ukkusuri et al., 2017)
- **Video tolling:** this refers to the use of overhead cameras for identification of vehicle. The overhead cameras capture the license plate of the vehicle when it passes through the tolling station. The optical character recognition technology extracts the licensed number from the picture and check against the database of the registered drivers. Video tolling is usually used together with other technology such as Electronic Toll Collection(Ukkusuri et al., 2017)
- **Connected vehicle technology:** With this a wireless communication devices are installed in the vehicle together with the infrastructure, vehicles are able to communicate with the infrastructure and the tollbooth remotely and automatically bills the driver.

2.9 Importance of User Perspective in the Success of PPP Toll Projects

Road users are one of the stakeholders that influence the success of toll roads projects greatly, therefore failure to respond to and meet their needs can cause stakeholder opposition and may cause project failure (Majamaa et al, 2008)

Stakeholders should be engaged from the design until implementation so that the interest of government and private sector do not override the aspirations of users (Lucas and Stanley, 2013). It is important for user interest to be considered in transport project development and the success criteria should be user satisfaction ((Alizadeh & Kianfar, 2013). A toll road should reduce negative impacts on users and increase the benefits. For example, a toll road should improve the quality of life of users in their transport needs by reducing traffic density especially in regular adjacent arterial roads. Also the presence of toll road should minimize other adverse effects on the community in the form of pollution, dust, noise vibration and flooding ((J. Chi & Waugaman, 2010).

It is therefore imperative to consider the perspective of road users as part of the success of toll road project to deliver satisfaction

2.10 Financing Road Infrastructure in Ghana

The government of Ghana until recently has been the main financier of road infrastructure development before the introduction of road fund established by Act 536 in 1997. Revenues generated through Road fund are mainly used for maintenance and rehabilitation works, as a result of insufficient inflow from other sources, reduction in donor support there is a large road infrastructure deficit (Heggie & Vickers 1998)

An absurd condition in infrastructure delivery in Ghana is the huge gap between infrastructure provision and funding (Amoa-gyarteng, 2015). Successive governments have faced the challenge of inadequate funds to embark on infrastructure projects. This in effect creates delays in project delivery which in the long run increase project cost. A known example is Achomota –Ofankor road project which started in November 2006, it is 5.7km which is part

of the highway that joins Accra –Kumasi and other six regions of Ghana. According to Auditors general report 2013 the project commenced in November 2006 at an estimated cost of GHS C40.4million at a scheduled completing date of November 2009. Due to unavailable funds as at December 2011 two extra years after scheduled completed date the project was still at 88% complete and the cost has shot to GHC128 million. This delay did not only increase the project cost but also stressed commuters. Unfortunately this scenario transcends to various public funded road infrastructure projects and this can adequately minimized if not eliminate through government arrangement with private entities to finance, construct, manage and eventually transfer back to the state(Amoa-gyarteng, 2015).

2.11 Stakeholders of Toll Roads

A stakeholder is an individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project (PMI, 2017). According to project management Institute, project stakeholders are the individuals and organizations that are actively involved in the project or whose interest may be affected as a result of the project execution or project completion. Stakeholders are individuals or groups who have significant interests in the project outcomes (Cleland, 1985). Freeman defines stakeholder as a 'group or individual who's the achievement of an organization's objective can affect or is affected by (Freeman, 1984). (Boddy & Paton, 2004) borrowed the idea of PMI and defined stakeholders as individuals, groups or institutions with an interest in the project, and who can affect the outcome'

In stakeholder management, stakeholder satisfaction relates to the results as well as to the project process ((Zeithaml & Berry, 1985). Due to the dynamic nature of public projects it is always necessary to include process approach aside project approach ((Hietbrink, Hartmann, & Dewulf, 2012). Large projects cannot be carried out without informing and persuading a large number of extremely difficult sorts of people to understand the importance of what is being done and to work together ((Rohman, 2017)

In a starting point of a project the dynamic and complex interests and perspective of actors involved should be factored, the interaction between the stakeholders and the project creates added value for all the actors involved to enhance problem solving in project implementation.(Hietbrink et al, 2012). Defining stakeholders' expectations based on their perception of the project's objectives and determining whether they are fulfilled or not can predict the success of a project, therefore is essential for stakeholders to form judgment about the project through the process ((Hietbrink et al., 2012). Under the expectancy disconfirmation theory stakeholders in forming judgment about a project originally have expectations regarding the characteristics or benefits that a particular project will provide (Oliver, 1980) Stakeholders form their satisfaction judgment after they have experienced the actual performance of a project ((Zeithaml & Berry, 1985). This discrepancy between their expectation and project performance can either be positive or negative meaning better or worse than anticipated ((Hietbrink et al., 2012)

Therefore is worth noting that stakeholders of toll roads projects particularly the commuters will definitely have expectations about the tolling system and therefore compare them with the actual performance of the system ((Hietbrink et al., 2012). This suggests that road users have to be managed well by toll road operators to be able to build consensus and deliver

services actually needed by them (Yang, Shen, Ho, Drew, & Xue, 2011). To do this road operators and agencies responsible for road management need to understand the expectations of road users so that their benefit management can be taken into consideration in the planning process of the tolling system (Hietbrink et al., 2012). Road users have a relationship among their expectation, experience and satisfaction of the tolling system, the more they perceive their travelling system has improved and the more this continues the more they are satisfied. Stakeholders should be managed so well that they do not have very high expectation which non- fulfillment of it will mean failure of the project ((Hietbrink et al., 2012). The project should rather ensure that situations are highly improved especially for the directly affected stakeholders (commuters)

2.12 Stakeholder Identification

Every project has varied stakeholders who have diverse expectation, abilities and influences in the project life cycle ((Bourne & Walker, 2006). Therefore it would be necessary to identify which particular stakeholder group to deal with at each stage of the project life cycle ((Bourne & Walker, 2006). The identification of stakeholder begins from stakeholders' analysis ((Rowlinson & Cheung, 2008). Stakeholders are classified on the basis of how they contribute and affect a project as well as their association and legal relationship (Nguyen et al, 2009). Project managers are supposed to group stakeholder into four; stakeholders who champion the project, community participants, activity participants and parasitic participants (Tuman (2006). (Tuman, 2006) opine that project champions are the people who conceive the idea of bringing the project into reality such as project developers and financiers, project participants are the groups or individuals whose responsibilities are to

plan and implement the project, community participants are the people who are directly affected by the project operation while parasitic participant are the individual or groups who do not have direct relationship in the project but have potential to affect the project, an example is the media. Stakeholders can be categorized into internal and external ((Bryson, 2004). Internal stakeholders are owners of a project who have ultimate power and responsible for the project and can delegate significant management responsibilities to others ((Bryson, 2004). Internal stakeholders comprise of project managers, accountant, project team members and functional management ((Rowlinson & Cheung, 2008). External stakeholders are the individual or groups who affect a project positively or negatively and may influence project operation through regulations, indirect action or lobbying and campaigning. Typical external stakeholders may include project prospective clients, local community, politicians, environment group, competitors and media ((Mendelow, 1981) (Mitchell et al, 1997) identified seven groups of stakeholders; dormant stakeholders, discretionary stakeholders, demanding stakeholders, dangerous stakeholders, dominant stakeholders, dependent stakeholders and definitive stakeholders, all depending on the power, legitimacy and urgency of the stakeholder. The dormant stakeholders are the people who have power but do not have legitimate relationship or interest in the in the organization, they only have a minimal communication with organization but their powers are unused (Mitchell, 1997). According to (Mitchell et al, 1997) discretionary stakeholders do not have powers or urgent claim on the organization but can only oppose legitimate needs; Managers are not necessarily required to maintain close relationship with them, although they can do so at their own wish. Demanding stakeholders on the other hand do not have powers or legitimacy but possess urgent claims, they draw managers' attention only ((Mitchell et al., 1997). Dominant

stakeholders are powerful and have legitimacy, their needs and requests are to be addressed promptly, as they have the abilities to shape the operations of an organization and oppose legitimate request on a firm(Mitchell et al., 1997). Dangerous stakeholders have urgency and power but do not legitimacy in an organization; they can become aggressive and violent in organization's operations(Mitchell et al., 1997). Stakeholders are considered to be dependent when they have urgency and legitimate claims, they do not possess the powers to oppose any decision, they only need to leverage on the powers of other stakeholders to achieve their wills ((Mitchell et al., 1997). Definitive stakeholders however are those who have power, legitimacy and urgency, their requests and demands are to be responded immediately by managers ((Mitchell et al., 1997)

2.13 Power Interest Model

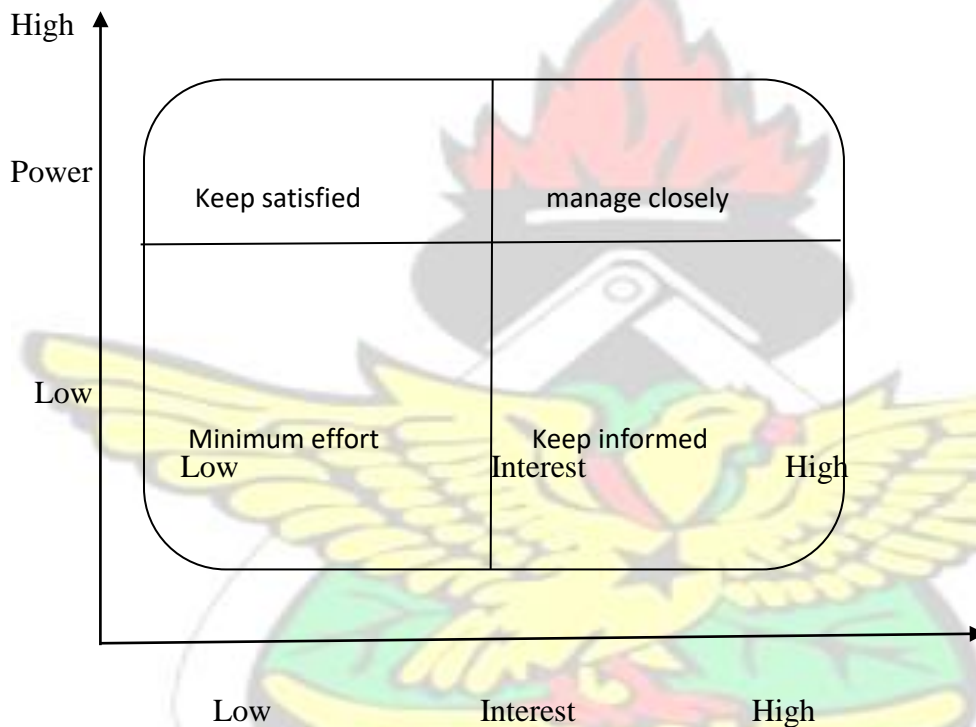
With power interest matrix model, there is a connection between stakeholders' power and work environment, as well as stakeholders' power and organizational dynamism which are useful factors in project management ((Mendelow, 1981). Stakeholders powers ranges from low to high while that of organization dynamism also changes from static to dynamic(Mendelow, 1981). Stakeholder' power remains unchanged if the organization's environment is stable while in a dynamic environment existing stakeholders more often than not extend their powers ((Mendelow, 1981).

Power interest matrix indicates how project stakeholder groups promotes their expectations in the project decision making process and their reasons and motivations to do so((Mendelow, 1981).The matrix provides the desired communication strategies that will enable project manager handle stakeholders differently based on their power and interest(Bryson, 2004).

Stakeholders who have vested interest and dominant power are more likely to affect project delivery using their attributes(Bourne & Walker, 2006). It is therefore essential for project managers to pay particular attention to such groups

An example Power Interest Matrix Model

Figure 2.1 Power Interest Matrix Model



The power interest model is helpful as it simplifies and assesses project stakeholders' influence. Apart from it been oversimplified in practice it is also suggested that the model only canters around stakeholders' power and interest ignoring other attributes of stakeholders such as urgency, interest, attitude, legitimacy and knowledge(Bryson, 2004). A more advance study is required to develop a holistic and comprehensive model which will include other attributes of stakeholders.

2.14 Project Stakeholders Attributes and Influences

Stakeholders influence projects purposefully to achieve their needs and desires (Li et al, 2013). Stakeholders impact significantly on project objective, delivery and evaluation processes. Stakeholders have seven attributes that influence their behavior toward a project. They include; power, which is the ability that helps people to achieve their desires while disregarding the resistance of or opposition of others (Webber, 1947). Power is seen when one controls the activities of another and can compel them to do a task even against their wish (Freeman, 1994). Stakeholders' powers are in the form of punishment, reward, communication abilities, professional knowledge and experience and ability to access useful information (Greene & Eiffrers, 1999). Stakeholders have different levels of power to influence other stakeholders to behave in certain ways towards a project (Vries, 2013). Agencies under government more often have unique powers which they use to solve problems or conflicts in institutions (Freeman, 1994). Legitimacy is another important characteristic of stakeholders which can be legal or emotional contract (Mitchell et al, 1997). Legitimacy is an assumption or established perception that the actions of an entity are appropriate and desirable and conform to the norms, values, beliefs and systems of a society (Suchman, 2014). Stakeholders' legitimacy can be grouped into normative and derivative. With normative legitimacy stakeholders have moral obligation while with derivative legitimacy stakeholders' behavior and needs are regarded by project manager promptly as a result of their ability to impact on stakeholders (Philip, 2003). Urgency is the degree and how prompt an attention is given to stakeholder's claim. (Brugha, 2000) How important a stakeholder is depends largely on an organization's needs and requirement of that stakeholder,

hence some stakeholders are regarded more than others by the organization at a particular point in time (Bryson, 2004). For instance, a project financier might be more useful to a project in the funding application process while the project clients might have more urgent demand during a project delivery as they influence project output directly. As an organization progresses the interest and priorities gradually change, new class and groups of stakeholders emerge to meet the project needs (Bourne & Walker, 2006). Stakeholders' knowledge about project differs from each other in terms of responsiveness and awareness. Responsive stakeholders usually search relevant project knowledge and use to obtain their own needs while unaware stakeholders prefer to gain knowledge through gossip or assumptions rather than a prove (MacElroy & Mills, 2000). Affected stakeholders knowledge is essential in solving management challenge. Stakeholders are obviously able to influence a project when they have adequate knowledge about a project (Nalewaik & Mills, 2015). Some stakeholders have significant power and high interest and are capable of accomplishing their targets and expectations if they have sufficient knowledge about the project (MacElroy & Mills, 2000). Attitude is another attribute of stakeholders which can either be positive or negative toward a project, their attitudes may decide their support or rejection of project (MacElroy & Mills, 2000). Stakeholders' attitudes can be passive support, passive opposition, active support or active opposition without dedication to the project (McElroy & Mills, 2000). The power possessed by stakeholders to influence a project determines the kind of attitude they portray towards a project (varies, 2013). Proximity indicates the extent to which stakeholders are engaged on a project (Mitchell et al, 1997). The level of stakeholder engagement is essential in stakeholder management. This

means that stakeholders who have strong power and influence in the project but are not directly attached should be first dealt with (Mitchell et al, 1997).

The interest of stakeholders of a particular project varies for various reasons. They may have common objective, political support, legal right, economic interest, health and safety (Vries et al, 2003). Stakeholders from different level have diverse motivation and expectations, for instance what a financier of a road project thinks about a road might differ from the interest expectation of road users. In order to enhance effective communication between project (Aronson, 1995) stakeholder groups, management need to understand different stakeholders interest in the first place.

2.15 Stakeholders' Expectation and Satisfaction in Road Infrastructure Project

Stakeholder consideration is important throughout the planning process of infrastructure projects since their evaluation defines project success or otherwise (Bryson, 2004). Recently, more attention is given to road construction works to determine the experiences and expectations of road users, road neighbors and other stakeholders with governmental service provisions and decision making (Hietbrink et al, 2012). For instance the Dutch road agencies measure the performance of road construction and maintenance works every year with national user satisfaction surveys (Hietbrink et al, 2012). Stakeholder satisfaction with government services or projects are mostly measured by asking citizens to grade the quality of projects or services from 'very satisfaction to very dissatisfaction (Roch and Poiter, 2006). This measurement fails to take into account stakeholders' expectation about the performance of the project in question. For example, stakeholder expectation is well researched in marketing studies to influence customer satisfaction with goods and services.

After consuming a product or services the feedback serves as a comparative reference to form a satisfaction judgment (Van Rzin, 2004). In analyzing customer behavior, the difference between actual performance of a product and prior customer expectation is termed as expectancy disconfirmation. This presupposes that this disconfirmation is associated to the process of forming satisfaction (Van Ryzin, 2004). The expectancy disconfirmation theory indicates that individual has a number of expectations regarding the qualities or benefits in forming judgment about particular product or service (Olive, 1980).

Also, in Public administration it is imperative to understand the process of stakeholders' satisfaction forming and its connection with stakeholders' expectation so as to improve stakeholder management and decision-making in public sector (Van Ryzin, 2005). However only few authors have used expectancy disconfirmation to investigate overall customer satisfaction related to road construction and maintenance (Hietbrink et al, 2012). It is therefore an ideal to find out the relationship between stakeholders' expectation and satisfaction in road infrastructure projects. By emphasizing on road user expectation, attention is paid particularly to the relationship between the stakeholder's expectations about road construction projects, the stakeholders' perception about the performance of the project and final satisfaction of the stakeholders with the project. This enhances the understanding on how stakeholders form satisfaction judgments in public projects and sheds more light on the conditions that determine stakeholder satisfaction ((Hietbrink et al., 2012). Since road users' satisfaction and the level of service offered by the toll roads are largely connected, users after paying for the price anticipate traffic distribution and equitable development by enhancing access. Aside saving travel time toll roads are expected to provide better services in the form of convenience,

comfort and driving safety (Indonesia, 2016). The gap created between commuters' expectation and actual service provided by toll roads is a common challenge (Zeithaml et al, 1990)

Road users have expectations before they pay to use a road in anticipation of peculiar services, but the operators are not always able to provide the services that match these expectations which create discrepancy as user satisfaction. User satisfaction is the difference between expected service and perceived service (Kotler, 1995). Thus, satisfaction is what a customer feels after receiving a form or service. European Committee for Standardization (2002) posited that customer dissatisfaction is as a result of the disparity between quality of service sought by customer and the service quality targeted by provider. Perceived service quality that go beyond expected quality leads to customer satisfaction. Poor service that does not match expected quality results in customer dissatisfaction (Cronin & Taylor, 1994). User satisfaction is not used as an indicator of service quality for toll roads condition because toll roads do not have competitive market, hence, users have no option than to use them despite their dissatisfaction ((Phang & Toh, 1997). Satisfaction of users has now gained attention in various sectors such as public transportation, communication, Banking and tourism (Hietbrink et al., 2012). In this study road user satisfaction is related to the quality of service provided by toll roads with respect to the charges imposed on their use.

2.16 Project Stakeholders Expectation Management

The background of every of every stakeholder varies from each other. The concerns of some stakeholders are not equal, some have their concerns on output and outcomes and others have theirs centered on partner's expectations such as international organizations and local

government. The various stakeholders Endeavour to champion their respective interest, objectives and needs of a project((Hietbrink et al., 2012). However is usually different for the diverse needs and expectations of stakeholders to be fulfilled, although, project stakeholders continuously have agitation among them(Bourne & Walker, 2006). Their varied interests and expectations hinder their corporate relationship. Is more important for road managers, government or toll road operators to understand road users and maintain effective and collaborative relationship with them. Thus to count a project as successful it must be able to address the expectation of its various stakeholders(Larsen & Harty, 2009). Stakeholders expectation management tries to maximize their positive contributions to a project and minimize their negative impacts(Hietbrink et al., 2012)

2.17Service Quality and User Satisfaction

Toll roads aside been considered as public good is also a service with users haven initial perception regarding the kind of services to be offered. The fulfillment of individuals' initial perceptions is very significant and influential to project success ((Hietbrink et al., 2012). Users concerns and suggestions while patronizing toll roads should also be considered as a measure of the quality of services been offered by toll road. Users' involvement in value creation process in the service sector should not be ignored as they are inseparable (Gronroos, 2011).

(Parasumaraman et al, 1985) proposed SERVQUAL model which is usually used by authors to measure service quality. SERVQUAL model is a survey instrument developed along five service dimensions namely; Reliability, Assurance, Tangibility, Empathy and Responsiveness (Parasumaraman et al, 1990)

- Reliability: the ability of the service provider to perform the services accurately and reliably
- Assurance: which comprises of; Competence which means possessing a required knowledge and skills to perform a task as well as Courtesy, which involves being polite, respectful, considerate and cordial relationship with colleagues and also Security – freedom from danger, risk or doubt
- Tangibility: this is how a service provider appears to the user, for instance, the caliber of workforce, equipment's, the size and quality of other physical facilities personnel.
- Empathy: communicating to explain issues to customers and listening to their views and concerns and addressing them to meet their needs
- Responsiveness: The willingness to assist customers and provide a prompt service

The difference between expected service and perceived service by user was measured to complete this model by adding measurement of disconfirmation paradigm, which explains that if the kind of service perceived by user is less than what is exactly provided a discrepancy will create and will be considered as dissatisfaction (Zeithaml, 1990). The model points out five gaps namely;

- The gap between expectation of customers and management: The difference between actual customer expectation and management idea or perception of customer expectations due to reasons such as not knowing what customers expect, too many levels of management or inadequate upward communication from contact staff to management.
- The gap between perception of management and service quality perception: The difference between management expectations of service quality and service quality

specifications, thus, wrong quality standard. This gap arises when companies identify what the customer want but the means to deliver to expectation does not exist. Some reasons to this gap could be resource constraints, inadequate management commitment to service quality and inadequate task standardization.

- The gap between actual service quality and service quality specifications: the difference between service delivery and service quality specifications. Thus service performance gap. Companies could have guidelines for performing service well and treating customers correctly but these do not guarantee high service quality performance.
- The gap between service delivery and external communication: the difference between service delivery and external communications with the customer. Thus when the promises made do not much actual delivery. This may be the tendency of over promise.
- The gap between perceived and expected service: the key to ensuring good service quality is meeting or exceeding what consumers expect from the services. The assessment of high and low quality depends on how customer perceives the actual performance in the context of what they expected. Reason for this gap is that expectations are made up of past experience, word- of mouth and needs or wants of customers.

Service quality model has been largely applied in various sectors such as; health care(Saleh & Ryan, 1991) Banking service to determine service quality (Ariff et al, 2013) etc.

Aside these sectors this model has been used in various public and transport researches (Financing, 2015).

2.18 Toll Road Quality

An improved travel time and good access are mostly the expectation of users of toll roads (Rhoman, 2017). In addition toll roads are supposed to offer better services by way of comfort and safe driving compared with the traditional non toll roads due to the tariffs paid by users (Indonesia,2016).

Aside all these, the usual challenge that exist between users and toll road operators is the kind of service been provided and expected service from users which are mostly not at par and as a results makes motorists unsatisfied (Zeithaml, 1990). These problems mostly stems from the fact that government and road operators issue toll road operational standard which may not be in line with all the expectations of users, as a result user satisfaction may not be an indicator for service quality for toll roads (J Chi & Waugaman, 2010). This occurs due to non-competitiveness of most toll roads. It would be appropriate to study user satisfaction in relation with toll road service quality and survey the dimension and attributes of the kind of service quality that determine user's satisfaction.

Service quality is an attribute that concerns the overall future assessment (Cronin & Taylor, 1994). (Heide and John, 1992) opined that service quality is from the perceptions and views of customers. This suggests that the quality of service subjective depending on the kind of service expected by user. The quality of a service depends on the experience of customers after a service is received (Cronin & Taylor,1994).

Table 2.2: Road Service Quality Dimensions and Attributes

DIMENSIONS	ATTRIBUTES

1.Responsiveness	i. Accident handling ii. Fast emergency response units iii. Road maintenance
2. Information	Information boards and signage
3. Reliability	i. Road surface smoothness ii. Road lightings iii. Road markings iv. Proper drainage
4. Mobility	Road free from traffic congestion
5. Security and Safety	i. Security from crime ii. Safe driving
6. Accessibility	i. Smart tollgate attendant ii. Honest tollgate officer

2.19 Attributes for Project Social Benefits in Toll Roads

Project social benefits are the opportunities that are perceived by those who reside around toll roads and road users due to the project's existence and overall project life cycle that can leads to a harmonious living environment, reduced inequality maintained social cohesion and improved general condition of life (Rohman,2017).

Toll roads provide economic benefits or welfare to the local citizen, this can come from an increase land prices due to the toll road development or a simulation of business centers close to toll booth (Rohman, 2017). This is typically seen around toll booths in Ghana where

hawkers sell various items around toll booths to make earnings meet. More so the construction phase can also boost economic activity within a local area from material and equipment production as well as job creation, job opportunities can potentially reduce several social problems such as poverty, social exclusions and poor welfare (Zhai et al, 2009)

Toll road provides a sense of belonging to the communities along which the roads are built, there is likelihood for toll roads to present pride and a sense of place to the community because they have unique design that shows local character and identity (Rohman, 2017) Toll road infrastructures are convenient public facilities whose service quality is mostly felt by the road users. One reason for developing toll road especially under PPP is achieving value for money which ensures that the quality of service provided by the project is better compared with using traditional scheme to develop the facility (Rouhani et al, 2016). Therefore, as users have pay tolls for using the facility their concerns are mostly considered than that of public road. Toll roads are mostly smoother than ordinary roads and therefore reduce dust and air pollution. They are usually designed to reduce negative environmental impacts such as flooding, erosion, and landslide. Failure to address these types of project negative impacts might cause dissatisfaction and increase the chance of stakeholders' opposition (Doloi, 2012).

Privately developed toll roads ensure regulation compliance condition, for example users follow the traffic rules so it makes the toll roads safer and more convenient. The regulatory compliance environment encourages smooth traffic along the toll roads and its connecting roads (Rohman, 2017).

2.20 Overview of Tema Motorway

Accra Tema Motorway, the 18-kilometre stretch of highway linking Accra with Ghana's industrial and manufacturing hub, Tema, was one of the numerous prestigious projects conceived and built by the first President of Ghana, Osagyefo Dr Kwame Nkrumah. The Convention People's Party (CPP), which was in government in the First Republic, built modern harbor and a township in Tema which needed an excellent highway to facilitate trade and commerce between the new town and the rest of the country through Accra. The project formed part of the Seven-Year Development Plan (1963-1970) of the CPP government intended to transform the economic and material conditions of the country.

The motorway project, which was started in 1964 and opened to traffic in 1965, was labeled 'prestigious' by the erstwhile National Liberation Movement (NLM), an amalgam of parties opposed to the CPP, which saw the project as a complete waste of the taxpayers' money. According to the NLM, the money earmarked for the construction of the Tema Motorway, which still remains the only motorway in the country, 56 years after self-rule, could have been used to provide the basic necessities of life for the broad masses of the people.

The motorway was fashioned after the autobahn in Germany and was purposed to be the first motorway system that would link the major cities and towns across the country.

There are three categories of vehicles that ply the motorway namely commercial vehicles (Trotro, Cargo, Okada motorbikes, Taxi Drivers), private and corporate vehicles. The motorway has 12 toll booths.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology employed in arriving at the findings for this study. It seeks to establish sound reasoning in linking the steps employed to answer the research question and achieve the objectives of the research. The research design, sample and sampling techniques, data collection instruments and finally an overview of variable studies are presented in this chapter.

3.2 Interview

Interview is the verbal conversation between two people with the objective of collecting relevant information for the purpose of research. According to McNamara(1999), interviews are particularly useful for getting the story behind a participant's experiences. The main types of an interview are personal, telephone, focus group, depth and projective technique interviews (Sgier, 2014).

3.3 Research Design

The qualitative research design is used in this study. Although the qualitative approach is subjective in nature, it is essential to explore and understand views opinion and have indepth understanding of a problem and respondents are clear source of information (Zikmund, 2000). Yin (2003) claims that qualitative methods are often related to case studies were the aim is to receive information and thereby obtain a deeper understanding of research problems. The qualitative method was the most appropriate method for this study, as the purpose of this study

is to gain a better understanding of satisfaction of Toll Road Projects by Stakeholders with Specific Emphasis on Road Users. The study makes use of qualitative approach combined with descriptive presentation of the data. (Robson, 2002) defines case as a strategy for doing research which involves an empirical investigation of particular contemporary phenomenon within its real life context using sources of evidence. The case study in this instance is the satisfaction of the tolling system on Tema motorway to the users of the road

3.4 Target Population

The target groups interviewed were the Commercial Drivers which comprises (Trotro, Cargo, Okada and Taxi Drivers), Private car owners and Corporate Vehicles. Interviews will be conducted on the Accra Tema Motorway to solicit the views of the various users indicated above. However, due to non repetitive number of users who uses the road, a sample size of 130 drivers comprising commercial, private and corporate vehicles was drawn from the population for the study.

3.5 Sampling size

The population for this project is solely based on road users who have had enough experience and have used Accra Tema motorway for number of years

They are 3 primary states in design

- Commercial Drivers (Trotro, Cargo, Taxi and Okada Drivers)
- Private Drivers
- Company Cars

These categories were chosen because members of each category contributed significantly to the use and processing of this work. Grouping them in this way improves precision of the

estimates. A sample size of 130 road users was used for the study, thus most of the information used in the research come from this respondents. The sample size of 130 was chosen based on the repetitiveness of the responses from the various users of the motorway. The researcher got a point where there were similarities in the responses of the various users groups. Thus the researcher got to a saturation point. The selection of the road users for the purpose of this study was dependant on the willingness of the respondents. The respondents are made up of Private user 40, commercial users 65 and corporate users 25.

3.6 Sampling Procedure

A non-probability sampling technique was employed in the study. Under this sampling technique purposive sampling was used. The purposive sampling technique was used to obtain information from respondents who are knowledgeable and abreast with the subject matter. Drivers will be the sample frame which will be contacted to participate in the study.

3.7 Data and Sources

Data for the study will be collected for both primary and secondary source. This will be based on the answering by Blialcie (2000), who argued that using multiple source Data reduces the peculiar bias of each one.

3.8 Data Collection Instrument

Interviews will be used to collect primary data for the study. This will be done following through literature that will be conducted to be determined in category concept variables that have been used in similar passed studies. Interviews will also be conducted at the toll booth with each participant to focus on the objectives.

3.9 Data Analysis

Data collected from the field will be analysed using descriptive statistics. Prior to the analyses, the data will be edited and coded to ensure consistency. Thematic analysis will be used.

This is a qualitative method that identifies, analyze and report patterns or themes within data(Aronson,1995). It basically organizes, minimizes and describes data in a more detail manner and further interprets various aspects of the research topic. The themes across the data that useful are selected to be describe to reflect the phenomenon at hand

Analytical methods such as frequencies, percentages, problems will be used to analyse the data collector from the field. The results will then be presented in tables, charts, and graphs.



CHAPTER FOUR

DATA ANALYSIS AND DISCUSSIONS

4.1Introduction

This chapter examines the responses provided by the representatives of Commercial Drivers (Trotro, Taxi, Okada and Cargo Drivers), Private and Corporate Cars users who participated in the study. The responses are summarised into charts and tables where appropriate. The qualitative data obtained are also summarised and used to further provide explanation for some

of the responses obtained. The chapter is organised based on the objective set out at the commencement of the study.

4.2 General Information of the Respondents

The interview was based on three main objectives namely the level of satisfaction of road users in regards to the tolling system, to ascertain how road users perceive and understand the tolling system and the challenges they encounter as road users. The purpose was to provide the understanding of the background of the targeted respondents. The profile of respondents is to generate confidence in the reliability of data collected.

4.3 Respondents Years of Using Tema Motorway

Figure 4.1 below indicates 21% (27 out of 130) of the respondents have less than five years of experience in using Tema Motorway, 24% (31 out of 130) of the respondents have experience between six and ten years. Also 33% (43 out of 130) of the respondents from the total sample have years of experience between 11 and fifteen years. 22% (29 out of 130) of the respondents have between 16 and 20 years of experience. This profile signifies the high level of experience on which the results of this survey was based. It gives good indication that the respondents had some level of experience

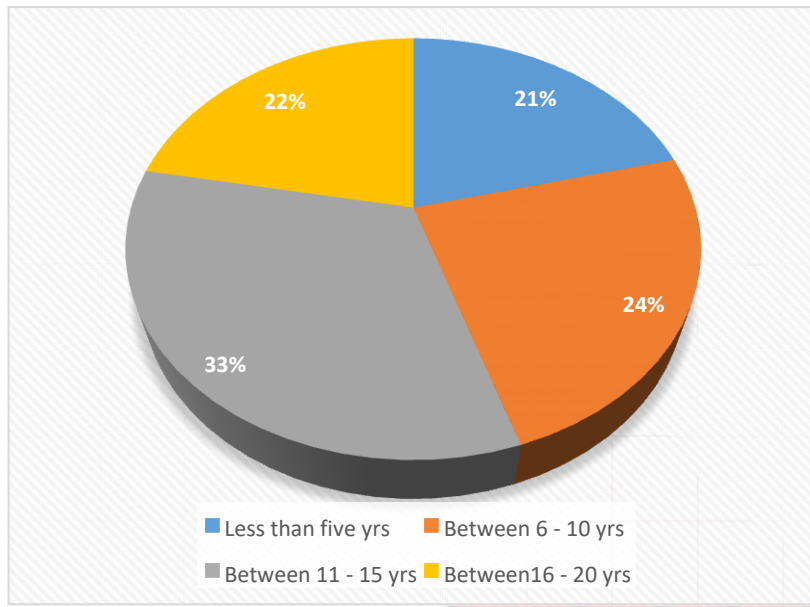


Figure 4.1 Respondents years of using Tema Motorway

Source: Field Survey, Sept 2018

4.4 Importance of Road Toll Payment

Figure 4.2 shows 95% (120 out of 130) said the payment of road toll is in the right order, the respondents said it helps to put the road in a right shape which reduces their regular visits to mechanical shops for maintenance of their cars as compared to when they use other alternative roads. The few respondents which is 5% (10 out of 130) said the toll payment is not of any use to them as drivers, because the road is in bad shape with potholes, due to these many cars get accidents on the road and it is assumed that the money goes to the operators instead of using it to repair the roads.

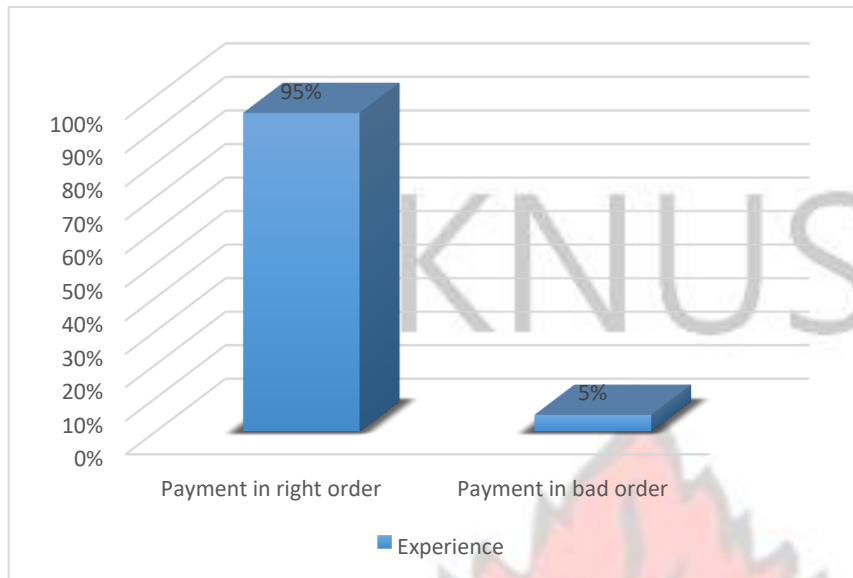


Figure 4.2 Importance of road toll payments

Source: Field Survey, Sept 2018

4.5 Road Toll Satisfaction

Due to the challenges on the motorway, figure 4.3 shows 85% (110 out of 130) of the road users said they are not satisfied in using the Tema motorway due to bad services they receive. The other 15% (20 out of 130) of the respondents indicated their satisfaction with the road as it offers them a faster travel time in relation with other routes.

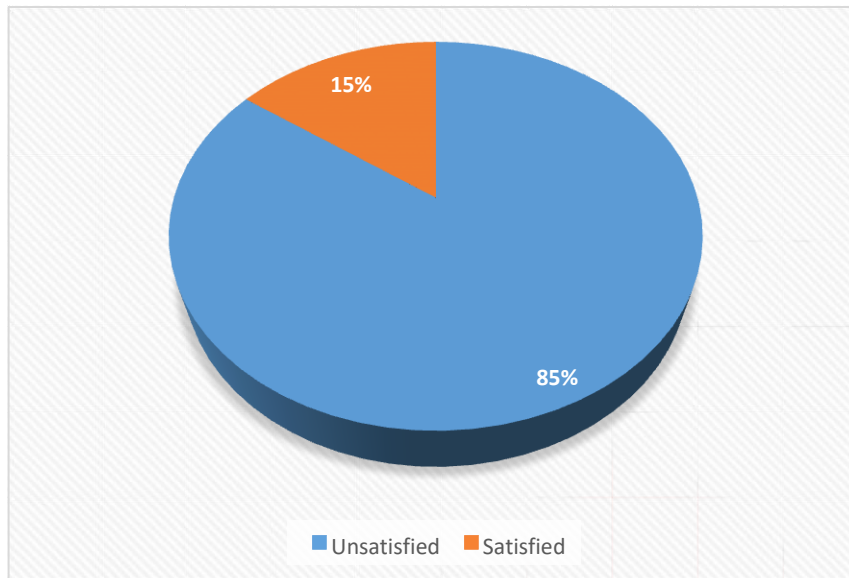


Figure 4.3 Road toll payment satisfaction

Source: Field Survey, Sept 2018

4.6 How Often the Road is used

In the diagram below which is figure 4.7, it indicates how the three users of the road namely Commercial Drivers (Okada, Cargo, Troto and Taxi Drivers), Company Drivers and Private Car Owners. Out of the 100% (130 out of 130), 60% (78 out of 130) who makes up the Commercial Drivers said they use the road not less three times in a day from Tema-Accra, 37, Circle Lapaz, Achimota etc. 30% (39 out of 130) which make up the private users also said they use the road at most twice in a day, that's from Tema-Accra and Accra-Tema. 10% of the respondents (13 out of 130) also said they use the road two times from Accra to Tema daily to work.

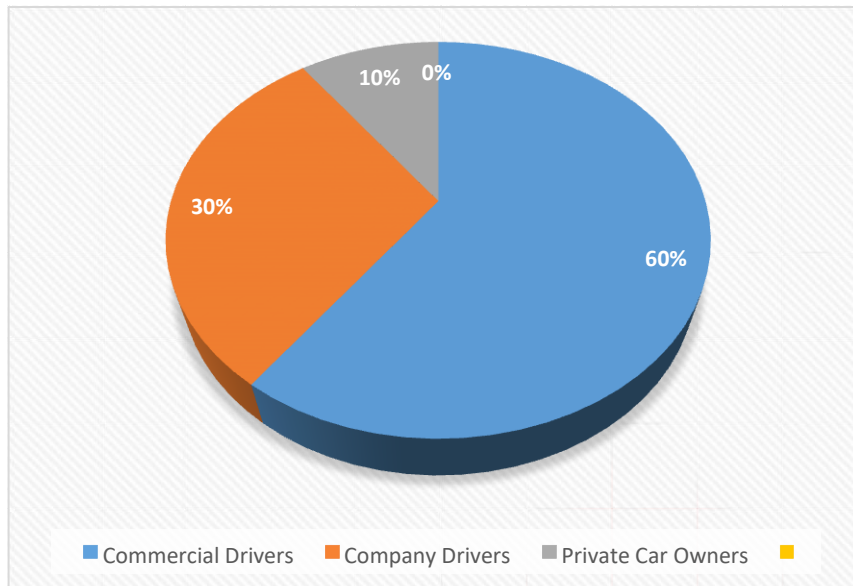


Figure 4.4 How often the road is used

Source: Field Survey, Sept 2018

4.7 Road Toll Increase

Out of the respondents, figure 4.8 (130 out of 130) which makes the Commercial, Private and Company cars, the Commercial Drivers which makes up 30% (39 out of 130) indicated that they don't see any benefits of paying the toll and is not likely they will pay any increase. 30% (39 out of 130) also said they don't have any problem to pay because is a major road that leads to Accra or Tema and its easier and shorter for them so they will pay if there's any increase, but pleaded that the road be put in a good shape for them.

30% (39 out of 130) which makes up the Company cars also indicated that they don't have any problem in paying any increase of the road toll, because it enhances their work to and fro Accra and Tema.

The 10% (13 out of 130) which makes up the Private Car owners said they do not have any problem if Government increases the toll because it is shorter for them to use to work and other social activities than other alternative routes.

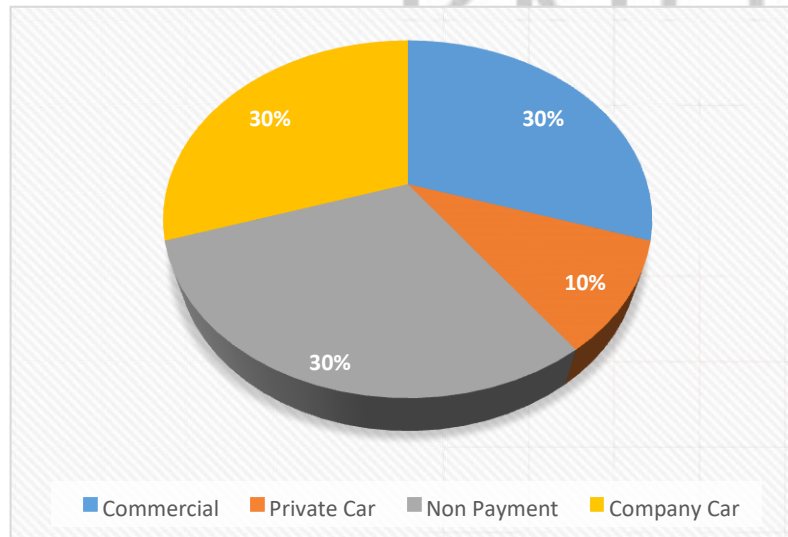


Figure 4.5 Road toll increase

Source: Field Survey, Sept 2018

4.8 Ratings of Users' Concerns

Major issues that were raised by the respondents were rated which include faulty vehicle that are not towed immediately, the potholes which are found on certain portions of the road, lack of road markings found on sections of the motorway, unavailable lightings at some portions of the road and the drainage system of the road.

Potholes was rated at 63.6% as the most worrying issue to road users especially respondents who have had experience from other jurisdictions that charge user fee on major roads that one does not pay a toll without having a smooth drive. Towing of faulty vehicle and road markings were equally rated at 13.6% each. Respondents were concerned that heavy duty vehicles that

develop fault are not towed; they can be in the middle of the motorway for a number of days before they are taken away, respondent also stressed inadequate road markings on certain portions of the motorway. 6.8% of the respondent is also worried about the unavailable street lights on some portions of the road and lastly 2.3% of the respondents complained about poor drainage system along the motorway

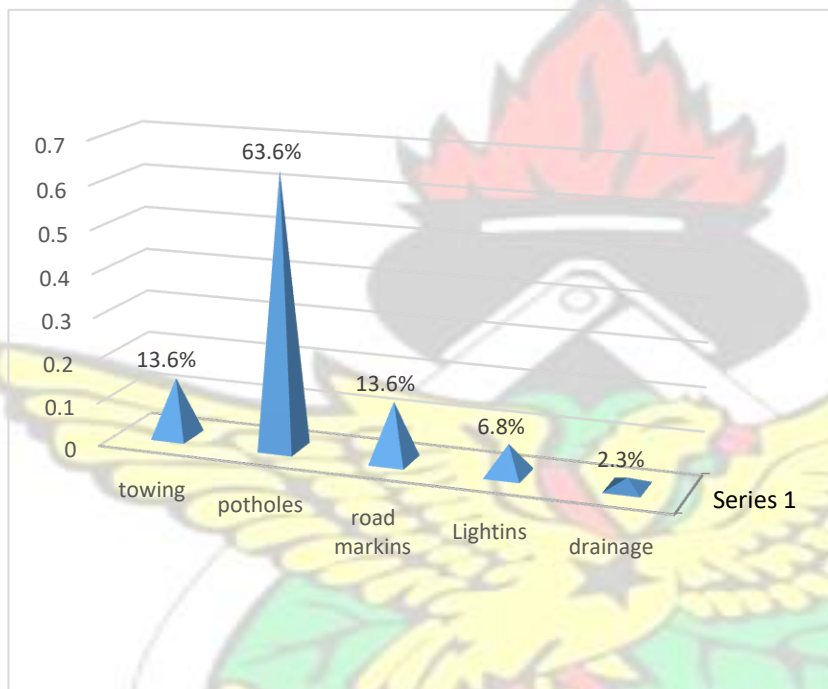


Figure 4.6 Rating of users concerns

Source: Field survey 2018.

4.9Users awareness of how revenues are used

The figure below indicates road users knowledge about how the tariffs they pay are used for, 82.3% (107 out of 130) Of the sampled population do not have any idea on how the revenues

generated from the tolling are used for. 17.7% (23 out of 130) are aware of the use of the revenue from the tolling which been for the maintenance of the road and part been put into a consolidated fund

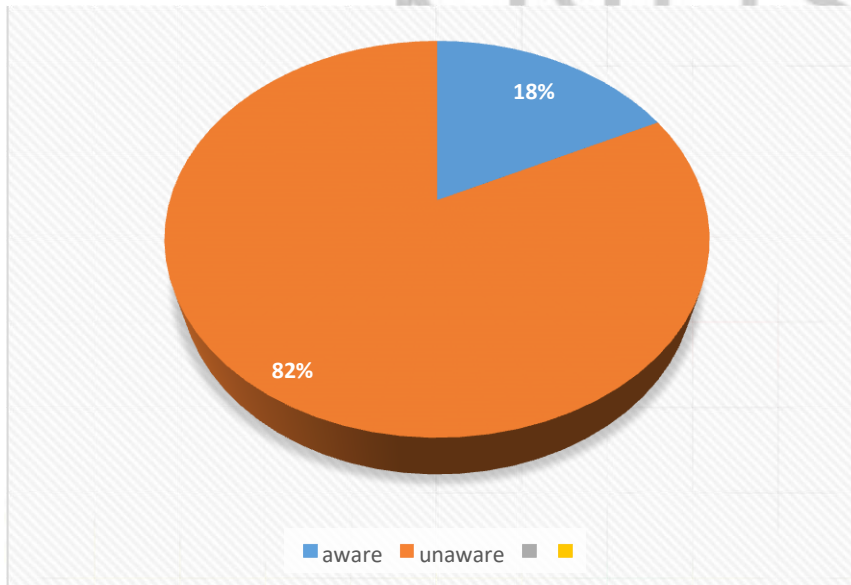


Figure 4.7 users awareness of Revenue usage

Source: Field survey 2018.

4.10DISCUSSIONS

From the interview the characteristics of road users of Tema motorway can be seen that most respondents use the road for work or business purposes because it has travel time benefits compared to non toll roads. The notion that toll road is to reduce travel time is one benefit every user seeks to derive after paying the tariffs which depends largely on the smoothness of

road surface, no congestion and good road signs etc. However users of Tema motorway feel that all services are delivered below their expectation level

In this study the satisfaction of road user with respect to tolling system is the main focus to determine whether or not the tariffs they pay for accessing the road commensurate to the expected satisfaction they receive from. This confirms a study conducted by Alizadeh & Kianfar (2013) in Tehran Municipality on developing a model for citizens' satisfaction with public sector services, it found out that one major issue regarding providing public service is identifying and defining the service scope and the citizens' satisfaction. In the study there is conclusive evidence that users are not satisfied by services they receive, the quality of services offered them do not much their perceived satisfaction. In the study 110 respondents representing 85% indicated that they are not satisfied with the services they receive as against 20 respondents representing 15% who are satisfied with the services they receive Users are supposed to be aware of the importance and need to pay for tolls, such as regular maintenance to keep the road in good shape and form to ensure a sustained quality and fast movement of vehicles. Tolling ensure regular income generation. According to Austin & Kockelman (2009), Toll Roads in Texas: Traffic and Welfare Impact facing fund shortfalls for infrastructure construction and maintenance, many urban Regions in Texas set up Regional Mobility Authorities to build, manage and own new toll roads. From the study 120 respondents representing 95% support that toll payment is in right order as against 10 respondents representing 5% who do not support and do not see the need to charge road users for using a road.

Regarding respondents' awareness of how their monies are spent or used for, majority of respondents who have used the road for many years register their displeasure that they have

paid tolls for long but have not been seeing any significant improvement in the condition of the road and are therefore not aware of how the revenues are used, this is evidence in the fact that significant number of users have patronize the road between 11 to 15 years. From the data 82% of the respondents is unaware of how the revenues are used while 18% of the respondents has an idea on how the revenues are used in the area of maintenance and rehabilitation of the road. The greater population who have no clue to how the revenues are spent are of the view that tolling is a means the government raise funds to the consolidated fund and other purposes rather than reinvesting in the road in question.

There were enormous challenges which are being encountered by the motorists on the Tema motorway according to Rhoman (2017) Stakeholders perspectives on Achieving Project Social Benefits from Indonesia Toll Road, he posited that embarking on tolling should come to alleviate the hardships motorists pass through in on the non toll roads, users must experience different dimension of treatment in relation to elsewhere where there is no charge. In this study, Out of the 130 respondents in the respective user groups that were interviewed, all agreed that there are so many challenges on the Tema Motorway. They stressed on undulating nature of the road, as the road is not maintained with material which were originally used in constructing the road. The road was originally made with concrete but maintenances are made with asphalt. Certain portions of the road lack foot bridges to prevent pedestrians from been knocked down by vehicles whose speed limits are usually beyond that of other roads due to the nature of the motorway. The motorway is not properly demarcated signage and markings are lacking on certain portions of the road. Faulty vehicles are left in the middle of the road for long time before they are towed which sometimes cause accidents and limits fastness. Response to emergency on the road delays which sometimes cause heavy congestion on the

road due to the huge volume of vehicles that patronize the road. Majority of the sections of Tema motorway do not have street lights which makes commuters prone to armed robbery, car high jacking etc

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CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The main objective of this study was to determine the perceived satisfaction of end users of toll roads and their understanding of the tolling system.

The study examines the willingness to pay, importance of road toll to the drivers as a major stakeholder, how satisfied they are and the challenges they encounter in using the Accra Tema

Motorway and also provides some recommendations to policy makers on the impact on stakeholders with main emphasis on road users.

The study approach used thematic descriptive analyses. The study made use of qualitative multiple interview approach with descriptive presentation of some qualitative data. Based on this methodology, a discussion of the findings of the study was presented in the fourth chapter of the study. Notable among the significant findings of the study is the fact that the Drivers that participated in the study affirmed their dissatisfaction in using Tema Motorway. The study found out that in spite of Tema Motorway, providing faster travelling time in relation with other alternative routes the respective user groups are not satisfied with the kind of services they receive from the operators. There are quite number of users who have used the road and have paid for the tariffs for so many years without seeing any improvement in the condition of the motorway and therefore suggest that they do not see the need to continue to pay the tariffs while the roads continue to be in its deplorable condition. This is evident in the responses which respondents who have used the road for significant number of years provided. The research also found out that the maintenance of the motorway is not done to meet the original quality, as asphalts are used to make patches at some portions of the road instead of concretes which the original road is made of which results in undulating nature on some sections.

Commercial users mainly Trotro and Taxi users felt been cheated as they are charged various taxes with the same purpose and yet still pay tolls for using a public road, therefore they see tolling as additional taxes. They feel their concerns are not considered in the general transportation fare adjustments. It is also perceived that the road tolls do not go to the appropriate authorities for proper supervision and repair of the road.

5.2 Conclusion

This study seeks to determine the perceived satisfaction of Tema Motorway. Road users of Tema Motorway have high expectations on the toll fees they pay for accessing the road but are of the view that the revenue accruing from the tolling system are not reused into proper maintenance and management of the road as a result, their benefits do not commensurate the charges. For the purpose of efficiency, the operators of Tema Motorway should focus on the most essential attributes expected by road users which include the road surface, security from crime, fast emergency response unit, accidents handling, road lightening, proper road marking and demarcation.

5.3 Recommendations

The purpose of instituting a tolling system should be properly communicated to road users. The maintenance on the motorway should always be concrete to match the original state instead asphalt in order to prevent the undulating.

Revenues accruing from the tolling system on the motorway should not only be used as the basis of measuring the best performance of the road but also the satisfaction of the services of road users should be concern to the government or operators.

According to the literature review, roads that are managed by private operators perform creditably inspite of their quest to maximise their profit. The management of Tema motorway has over the years been done by the government, however, it would be appropriate to leave it in hands of private entities to manage, maintain, monitored and account to the government on the performance of the road.

With the numerous challenges that the road users of Tema Motorway go through, it is recommended that the Ministry of Roads and Transport and Ghana Highway Authority takes keen interest in repairing the fast deteriorating main highway which links Accra to so many parts of the country. There should be a great will to close or exit roads on the road to prevent accidents.

Poor land-use development, excessive axle loading, and substandard maintenance practices are pushing the motorway into irreversible destructive spiral, posing major treat to productivity and national security, authorities also need to check on it.

It is recommended that the MTTD of Ghana Police Service also deploy some of its staff on the road to check on reckless driving by some of the Drivers and those who stop at any time and at the wrong places.

The government need to make sure that a percentage of the road toll collected are put in use in the road to repair the potholes, lighting to create evidence of the system.

The research focused on road or motorist which ignoring other stakeholders such as the government, road operators and communities along the road. A more comprehensive study could be done to include the various stakeholders to find out the level of their satisfaction about performance of tolling on the Tema Motorway.

There are significant differences in the number of the respondents in the user group. The commercial drivers were dominant in the respondents' numbers than those in the private and corporate groups. Though the research tried to choose a balanced proportion among the users in the sample by the end of the data collection but equal composition could not be obtained. As a result, the outcome of the study may represent more of the perception of the commercial users than private and corporate users. Despite the population of commercial users been the

largest among other users which makes the results irrational, it would be better if the sample can be balanced among other group of users to obtain a more perception. Therefore, a more subsequent study would help to obtain a balanced sample of three user groups. However, given the limitations above the results still could provide a comprehensive understanding of the overall road users.

This study was done on Tema Motorway which is already in its operational state in future, a similar study could be done with similar objectives or minor modifications by expanding the study area or the scope to generalise the results.

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APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

RESEARCH INTERVIEW SCHEDULE

The Purpose of this questionnaire is to collect data for study on satisfaction of road user with tolling system on Accra Tema motorway with Specific Emphasis on Road Users. The data being collected for this study would be used solely for academic purposes. All respondents are assured that strict confidentiality would be observed in handling data provided.

INTERVIEW SCHEDULE

1. How many years have you been using Tema Motorway
2. Do you think is important to pay road toll?
3. Are you satisfied with the service you receive based on the toll you pay?
 - a) If you are satisfied why?
 - b) If you are not why?
4. How often do you use Motorway in a day?
5. Will you continue to pay the toll if it is increased?
6. What are your concerns in using Tema Motorway?
7. What are the challenges you face in using Tema Motorway?
8. Do you have any idea on how your money is used for?

