FINANCING AND EVALUATION OF INVESTMENTS IN ROAD INFRASTRUCTURE DEVELOPMENT

By

JAMES ADU (CA Ghana, B Sc. Admin.)

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SEPTEMBER 2009
DECLARATION

I here declare that this submission is my own work towards the Commonwealth Executive Masters in Business Education (CEMBA) and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

JAMES ADU (PG 1816107)

Student Name & ID .......................................................... Signature .............................................. Date

Certified by:

Supervisor’s Name .......................................................... Signature .............................................. Date

Certified by:

Head of Dept. Name .......................................................... Signature .............................................. Date
Abstract

The role of road transportation as a catalyst for accelerated socio-economic development is not in doubt. Road Transportation facilitates the movement of people, goods and services within the country. It provides service to other sectors such as tourism, mining, health, trade, education, agriculture, energy among others. Investments in Road infrastructure development may not be evaluated using only traditional appraisal methods such as the Net Present Value (NPV), Internal Rate of Return (IRR), Accounting Rate of Return (ARR), Payback Method etc. This is due to the fact that road infrastructure comes with other social and economic benefits that are difficult to quantify in monetary terms. For example, when a locality is opened up through the construction of efficient roads, people get more access to social services like schools, health, entertainment and others. These social benefits in turn improve the well-being of the citizenry concerned. Better roads also lead to a reduction in the average travel time. This reduction in time in turn leads to savings in terms of fuel and man hours. Thus the evaluation of investments in road infrastructure development should not be based solely on the economic benefits expected from the road in question. The Government is the main financier of road infrastructure development in Ghana. This funding comes from three main sources; the Consolidated Fund, the Ghana Road Fund and Donor Funds. Because government alone does not have all the required financial resources to undertake the needed road infrastructure development, there is the need to involve the private sector in this area. Since the main aim of the private businessman is profit maximization, their involvement in road financing should be regulated to prevent them from exploiting the general public.
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<td>--------------</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>AFD</td>
<td>Agence Française de Développement</td>
<td></td>
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<td>ARR</td>
<td>Accounting Rate of Return</td>
<td></td>
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<td>BBO</td>
<td>Buy Build Operate</td>
<td></td>
</tr>
<tr>
<td>BOO</td>
<td>Build Own Operate</td>
<td></td>
</tr>
<tr>
<td>BOT</td>
<td>Build Operate Transfer</td>
<td></td>
</tr>
<tr>
<td>CBA</td>
<td>Cost Benefit Analysis</td>
<td></td>
</tr>
<tr>
<td>DANIDA</td>
<td>Danish International Development Agency</td>
<td></td>
</tr>
<tr>
<td>DBFO</td>
<td>Design, Build, Finance and Operate</td>
<td></td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development</td>
<td></td>
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<tr>
<td>DFR</td>
<td>Department of Feeder Roads</td>
<td></td>
</tr>
<tr>
<td>DPB</td>
<td>Discounted Payback Method</td>
<td></td>
</tr>
<tr>
<td>DUR</td>
<td>Department of Urban Roads</td>
<td></td>
</tr>
<tr>
<td>DVLA</td>
<td>Driver and Vehicle Licensing Authority</td>
<td></td>
</tr>
<tr>
<td>ERR</td>
<td>Economic Rate of Return</td>
<td></td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
<td></td>
</tr>
<tr>
<td>GHA</td>
<td>Ghana Highway Authority</td>
<td></td>
</tr>
<tr>
<td>GOG</td>
<td>Government of Ghana</td>
<td></td>
</tr>
<tr>
<td>GPRS</td>
<td>Growth and Poverty Reduction Strategy</td>
<td></td>
</tr>
<tr>
<td>GTTC</td>
<td>Government Technical Training Centre</td>
<td></td>
</tr>
<tr>
<td>GTZ</td>
<td>German Technical Cooperation</td>
<td></td>
</tr>
<tr>
<td>HIPC</td>
<td>Highly Indebted Poor Country</td>
<td></td>
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<td>International Development Association</td>
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CHAPTER ONE

INTRODUCTION

1. 1 Background to the Study

One of the programmes being implemented towards poverty reduction in Ghana is infrastructure development (Growth and Poverty Reduction Strategy 11, 2005). Road Transport falls under infrastructure development and has been identified as one of the catalysts in creating wealth. Development in road infrastructure creates opportunities for people to access various economic and social resources. Transportation facilitates the movement of people, goods and services within the country. It provides service to other sectors such as tourism, mining, health, trade, education, agriculture, energy among others. Lingaitiene (2006) writing on the topic “The Analysis of Road Infrastructure Development Financing in Lithuania” states as follows: “Well-run and effective transport is not only the service creating high value, but also the necessary preconditions of the successful development of other fields of economy and of the quality of human well-being. Road infrastructure is one of the fundamental factors predetermining the efficiency of transport activities.” This statement amplifies the fact that an efficient road infrastructure is a necessary requirement for an accelerated development of any economy. Specific roles of Road Transport in the development of the Ghanaian Economy can be viewed from the following perspectives:

1.1.1. Transportation and Inflation

Road transportation has a direct influence on the general price levels in the economy. The recent increases in petroleum prices and the associated increases in transportation costs have contributed to the upward trend in the prices of some basic
goods and services in the country. Furthermore, the nature of roads in Ghana is one of the determining factors of general price levels in the country. Where the roads are good it costs relatively less to transport goods from one part to another. The bad nature of some of the roads in the country contributes to the high level of prices, especially of foodstuffs. When viewed from the fact that expenditure on food constitutes a large proportion of the household expenditure, then the contribution of road transport to the rate of inflation in Ghana cannot be under-estimated.

1.1.2 Poverty Reduction

Good road infrastructure network contributes to poverty reduction. Farmers who have their farms close to good roads have easier access to markets for their produce than those who have their farms situated along bad roads. The availability of good roads in low income areas leads to improved mobility and access to employment and business. Indirectly, a reduction in transport cost releases substantial parts of the family income for other beneficial purposes. A study conducted by Vision Consult and Optimal Consultancy Limited for the Ministry of Transportation of Ghana between 2005 and 2007 shows that farm gate price of a major produce (maize) is higher along completed roads than along uncompleted roads in all the ecological zones of the country. This means that improvements in the road infrastructure network lead to improvements in the general well-being of the citizenry (Ministry of Transportation, Road Sector Development Project, 2007 Review Report).

1.2 Management of Road Infrastructure

The Ministry of Transportation of Ghana has oversight responsibility for the road transport sector. The Departments and Agencies that operate under the direct ambit of
the Ministry of Transportation are Ghana Highway Authority (GHA), Department of Feeder Roads (DFR), Department of Urban Roads (DUR), Driver and Vehicle Licensing Authority (DVLA), National Road Safety Commission (NRSC), Government Technical Training Centre (GTTC), Metro Mass Transit Limited (MMT) and the Ghana Road Fund Secretariat. Broadly speaking the Departments and Agencies under the Ministry of Transportation can be divided into two. The first is the road infrastructure sub-sector and is responsible for road infrastructure construction and maintenance. The GHA, DFR and DUR fall under this division. The other is the transport services sub-sector and consists of the DVLA, NRSC, GTTC, MMT and the Ghana Road Fund Secretariat. The second category has the duties of providing transport services and enforcing laws and orders within the sector.

1. 2.1 Road Transport Sector Objectives

Some of the sectoral objectives of the Ministry of Transportation are:

1. To enhance the operational efficiency of the road network to promote economic growth through support to industries, agriculture and delivery of social services to the rural and urban communities;

2. To reduce gender, regional and socio-economic disparities in the access to transport to help achieve poverty reduction, national integration, unity and stability;

3. To ensure sustainable funding for the road sector programmes;

4. To base road sector investment decisions on sound and sustainable socio-economic and environmental principles;
5. To institute standards to ensure safety, reliability, efficiency, equity and environmental friendliness of the urban transport system;

6. To integrate the road network with other modes of transport to achieve an efficient transport system for effective mobilization and distribution of resources to the rural and urban communities (Strategic Plan, Department of Urban Roads, 2007-2009).

1.2.2 Funding of Road Infrastructure Development

Road Transportation constitutes the major mode of transportation in Ghana. Road transport handles about 90 percent of passenger traffic and 80 percent of freight tonnage in Ghana. A review of the annual budgets of Government of Ghana shows that road construction and maintenance are allocated a large percentage of the budget every year. For example, for the two-year period 2007 to 2008 the road transport sector alone was allocated almost 35% of the wholly GOG Investment Budget. This is shown in Table 1.1 below.

<table>
<thead>
<tr>
<th>Year</th>
<th>National Budget</th>
<th>Transport Sector Budget</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>259,894,000</td>
<td>91,664,800</td>
<td>35.27</td>
</tr>
<tr>
<td>2008</td>
<td>215,371,800</td>
<td>73,331,848</td>
<td>34.05</td>
</tr>
<tr>
<td>Total</td>
<td>475,265,800</td>
<td>164,996,648</td>
<td>34.72</td>
</tr>
</tbody>
</table>


Furthermore, Government’s commitment towards improvements in the road sector is exemplified by the large annual increments in budgetary provisions that are made available to the road infrastructure sector. Table 1.2 below illustrates a comparison of the annual road infrastructure budgets with actual disbursements for the period 2002-2004.
Table 1.2 Budget and Actual Releases for Road Projects (2002-2004)

<table>
<thead>
<tr>
<th>Year</th>
<th>Budget US$M</th>
<th>Actual Disbursement US$M</th>
<th>% Disbursed US$M</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>207.75</td>
<td>127.43</td>
<td>61</td>
</tr>
<tr>
<td>2003</td>
<td>270.15</td>
<td>222.95</td>
<td>83</td>
</tr>
<tr>
<td>2004</td>
<td>189.71</td>
<td>252.77</td>
<td>133</td>
</tr>
<tr>
<td>Total</td>
<td>667.61</td>
<td>603.15</td>
<td>90</td>
</tr>
</tbody>
</table>


As can be seen from Table 1.2 above, actual disbursements increased from 61 percent in 2002 to 133% in 2004. Similarly, in absolute terms the annual road investment expenditure of the MOT and its agencies has seen appreciable increases over the last few years. A breakdown of road investment expenditure according to sources of funding for the period 2002 to 2005 is shown in Table 1.3 below.

Table 1.3 Expenditure on Road Investment in Ghana-2002-2005

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOG</td>
<td>$M</td>
<td>$M</td>
<td>$M</td>
<td>$M</td>
<td>$M</td>
</tr>
<tr>
<td></td>
<td>28.15</td>
<td>58.21</td>
<td>59.13</td>
<td>80.12</td>
<td>225.61</td>
</tr>
<tr>
<td>Ghana Road Fund</td>
<td>52.28</td>
<td>77.94</td>
<td>74.84</td>
<td>103.29</td>
<td>308.35</td>
</tr>
<tr>
<td>Donors</td>
<td>47.00</td>
<td>86.80</td>
<td>118.80</td>
<td>156.38</td>
<td>408.98</td>
</tr>
<tr>
<td>TOTAL</td>
<td>127.43</td>
<td>222.95</td>
<td>252.77</td>
<td>339.79</td>
<td>942.94</td>
</tr>
</tbody>
</table>


As shown in Table 1.3 above there was an appreciable increase in road infrastructure expenditure during the period 2002-2005. It started from an amount of US$127.4 Million in 2002 and increased to US$339.79 Million in 2005 (RSDP 2005/2006 Review Report).
Despite these huge investments in road infrastructure development in the country, road infrastructure development is lagging as compared with the rate at which settlements are expanding. This is evidenced by the presence of some bad roads in both the urban and rural areas of the country. For instance, the National Road Condition Mix as at the end of December 2006 stood at 45% good, 28% fair and 27% poor (RSDP 2005/2006 Review Report). This means that the amount of investment being made in the road sector is not adequate as compared with what the government would have wished to invest in this sector. This situation has resulted in the government over the years looking for alternative ways of funding investments in the road sector. One strategy that the government has adopted over the years is to encourage and promote private sector involvement in the construction and financing of transport infrastructure through financing schemes like “Build-Operate-and-Transfer (BOT)” or “Build-Own-Operate (BOO)” or “Buy-Build and Operate (BBO)” (Angleoha, 2003).

Under the BOT system, the private partner builds the facility in accordance with the specification of the government agency concerned. The facility is operated for a specified period and then transferred to the agency or public in accordance with the agreement. In the case of BOO, the contractor constructs and operates a facility without transferring ownership or legal title to the Agency or Public Sector. Under the BBO system, government sells the assets or facility to private investors. The Investors then develop, repair, expand or rehabilitate the assets to make them more profitable. So far there is no known facility under either the BOT, BOO or BBO system in Ghana. (Angleoha, 2003). Examples of private sector participation in road infrastructure development in some countries are presented in Table 1.4 below.
Table 1.4: Examples of Private Sector Participation in Road Development

<table>
<thead>
<tr>
<th>Location</th>
<th>Project</th>
<th>Cost (US$M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>France/United Kingdom</td>
<td>Channel Tunnel</td>
<td>19,000</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taipei Mass Rapid Transit System</td>
<td>17,000</td>
</tr>
<tr>
<td>Malaysia</td>
<td>North-South Toll Expressway</td>
<td>3,400</td>
</tr>
<tr>
<td>Thailand</td>
<td>Bangkok Elevated Road and Train System</td>
<td>2,981</td>
</tr>
</tbody>
</table>

Source: Jalaluddin, M. Build Operate Transfer (BOT) Project System (http://faculty.kfupm.edu.sa/CEM/jalas).

One other scheme that the government has adopted over the years is to look for external sources of funding. These external sources of funding have generally been grants and loans from multi-lateral Donor Agencies like the International Development Association (IDA), Agence Française de Développement (AFD), Department for International Development (DFID), German Technical Co-operation (GTZ), Danish International Development Agency (DANIDA), Saudi Fund etc. The Government of Ghana (GOG) through the Ministry of Transportation over the years has been implementing several road sector programmes and projects. Some of these are the Road Sector Development Programme (RSDP) (2002-2008) and the Urban Transport Project (2007-2012). The former ended in June 2008, whilst the latter which commenced in 2007 will end in 2012.

The government, like any other institution, considers the benefit to be derived from a project or programme before committing funds to it. This is normally done by making a comparative analysis of the expected benefits to be derived form the project as
against the funds to be committed into the project. This is done through investment appraisal techniques like the Net Present Value Method (NPV), Internal Rate of Return (IRR), Accounting Rate of Return (ARR), the Payback Method (PB) etc.

1.3. Problem Statement

The research is expected to help find answers to questions like:

1. Is government funding adequate for road infrastructure development in the country?
2. Should the government look for other sources of funding like donor support and Private-Public-Partnership (PPP)?
3. Should investments in road infrastructure development be based on purely economic/commercial factors?

1.4. Objectives of the Study

The objectives of the study are:

• To identify the various options available for financing of Road Infrastructure Development in Ghana.

• To examine the various methods available for the evaluation of investments in the Road Infrastructure Sector in Ghana.

• To draw conclusions about the best methods available for financing Road Infrastructure Development in Ghana.

• To examine the possibility of realizing the required financial/commercial returns within the macro economic environment in Ghana, and evaluation of road projects based on their socio economic impact to justify the continuous investment.
1.5. Expected Contribution from the Study

The study is expected to give an insight into the best way for the financing of road infrastructure development in the country. It is expected to help us arrive at a conclusion as to the best ways for financing road infrastructure development in Ghana. In addition, the study is expected to help us arrive at a conclusion as to whether or not evaluation of investments in road infrastructure development should be based purely on commercial motives.

1.6. Organization of the Project

The project work has been arranged in five chapters. Chapter one deals with the introduction and the background of the study. It gives an insight into the general overview of the research, the meaning of the topic and what it seeks to find. Chapter two deals with literature study. In this chapter different books and articles on the topic are reviewed. It may be stressed that the literature study actually gives the researcher a lot of ideas and insight into the topic. Chapter three deals with methodology. It clearly shows the methods used in collecting data for the project. Chapter four contains the results and findings of the study whilst the final chapter is made up of the summary of the findings, the conclusions and the needed recommendations.
CHAPTER TWO
LITERATURE REVIEW

2.1. Introduction

The purpose of evaluating road investment is to select projects with high economic returns. The decision of whether to invest in roads or in some other infrastructure development is not the primary objective of road investment appraisal since in most cases such a decision will already have been made. The purpose of economic appraisal of road projects therefore is to determine how much to invest and what economic returns to expect. The size of the investment is determined by the costs of construction and annual road maintenance. The economic returns are mainly in the form of savings in road user costs due to the provision of better road facility (Economic Analysis of Road Projects, The University of Birmingham, HDM-4 Course).

2.2. Road Investment Appraisal Models

The primary function of road investment appraisal model is to calculate the costs of road construction, road maintenance and road user costs for a specified period. A road investment appraisal model may be used to assist with the selection of appropriate road design and maintenance standards which minimize the total transport cost. When planning investments in road sector, it is necessary to evaluate all costs associated with the proposed project. Some of the commonly used methods for evaluating investments in road infrastructure development are the Net Present Value Method (NPV), Internal Rate of Return (IRR), Accounting Rate of Return (ARR) and the Payback Method (PB).
2.2.1 Net Present Value (NPV) Method

According to Francis (1992), the discounted cash flow technique of investment appraisal involves calculating the sum of the present values of all cash flows associated with a project. The sum is known as the Net Present Value of the project. The Net Present Value (NPV) is the difference between the discounted benefits and costs of a project (Francis 1992). Brealey & Myers cited by Amamoo (2000) define NPV as a project’s net contribution to wealth and that is, present values minus initial investment. It is the method of evaluating project that recognizes that the dollar received immediately is preferable to a dollar received at some future date. It discounts the cash flow to take into account the time value of money. In case the present value is positive, the project will be accepted; if negative, it should be rejected. If the projects under consideration are mutually exclusive the one with the highest net present value should be chosen.

2.2.2 Internal Rate of Return (IRR)

The IRR of a project is defined as the discount rate at which the present value of costs equals the present value of benefits i.e. when NPV is zero. According to Francis (1992), the IRR (sometimes referred to as the “yield”) of a project is the value of the discount factor that gives an NPV of zero. Projects with higher IRR values are generally preferred as this will give positive NPV at high discount rates. In general the calculated IRR should be greater than the standard discount rate used to assess government funded projects. Where the IRR is used to assess projects, the decision rule is that only projects with an IRR above a predetermined hurdle rate would be accepted: where projects are
competing, the project with the higher IRR is selected. According to Wood (1990), in the majority of cases both the NPV and the IRR methods give the same results.

2.2.3 Payback (PB) Technique

The PB Technique is used in situations where the project is able to recoup or pay back the original investment. Projects are normally selected on the basis that they will be able to pay back the original investment within a predetermined period. In the case of mutually exclusive projects the one with the shorter payback period is selected. The PB can take the form of a simple payback method which does not take into account the time value of money. A discounted payback method on the other hand takes into account the time value of money. Future cash flows are discounted and compared with the initial investment before arriving at the relevant payback period. Payback is often used as a first screening method. A company might have a target payback period, and it would reject a capital project unless its payback period is less than a certain number of years.

2.2.4 Accounting Rate of Return (ARR)

Wood (1990) defines the Accounting Rate of Return as “Average Annual Net Profit After Tax divided by Average Investment”. The ARR relates to the results shown in the Annual Accounts (Wood, 1990). A capital investment project may be assessed by calculating the ARR and comparing it with a pre-determined target level. If it exceeds a target rate of return the project should be undertaken. The ARR method however has certain drawbacks. To begin with, it does not take into account the timing of the receipt of the profits from an investment. Whenever capital is invested in a project, money is tied up until the project begins to earn profits which pay back the investment. Money
tied up in one project cannot be invested anywhere else until the profits are realized. Management should be aware of the benefits of early repayments from an investment, which will provide money for other investments.

2.3 Costs-Benefit Analysis (CBA)

Cost-benefit analysis refers to a process which involves, whether explicitly or implicitly, weighing the total expected costs against the total expected benefits of one or more actions in order to choose the best or most profitable option. A hallmark of CBA is that all benefits and all costs are expressed in money terms, and are adjusted for the time value of money (Amamoo, 2000). Cost Benefit Analysis is typically used by governments to evaluate the desirability of a given intervention. The guiding principle is to list all of the parties affected by an intervention, and place a monetary value of the effect it has on their welfare as it would be valued by them.

During cost benefit analysis, monetary values may also be assigned to less tangible effects such as the various risks which could contribute to partial or total project failure: loss of reputation, market penetration, long-term enterprise strategy alignments etc. The cost benefit principle says, for example, that we should install a guardrail on a dangerous stretch of mountain road if the dollar cost of doing so is less than the implicit dollar value of the injuries, deaths, and property damage thus prevented (Frank 2000). Cost-Benefit Analysis is mainly, but not exclusively, used to assess the value of money for very large private and public sector projects. This is because such projects tend to include costs and benefits that are less amenable to being expressed in financial or monetary terms (e.g. environmental damage), as well as those that can be expressed in

2.3.1. Social Benefits of Road Infrastructure

Hine (2003) argues that all benefits from road investment are “Social Benefits” in the sense that they accrue to, and meet the needs, of society. In fact the main framework used to evaluate roads is often referred to as “Social Cost-Benefit Analysis”. Here the adjective ‘social’ is used to emphasize the fact that the results or effects cover the whole population. This is different from a private or commercial cost-benefit analysis where costs and benefits are only analyzed from the point of view of a limited group of people. However the term ‘social benefits’ is often used to identify benefits that are non-economic in nature, left out from an economic cost-benefit analysis, or perhaps wrongly valued within an economic appraisal. (Hine, 2003).

2.3.2. Other Approaches to Social Cost Benefit Analysis

In the past it has been recognized that for low volume rural roads (often referred to as feeder roads or rural access roads) the conventional appraisal methodology did not fit well and there was a desire to adopt different approaches. In consequence there was a move to adopt the producers’ surplus approach which involved forecasting and adding agricultural benefits to transport cost savings within a cost benefit framework. However in many instances this approach became discredited as there was often no basis for the forecast increases in production. Other approaches were adopted which moved away from economic appraisal and included various forms of ranking.
In recent years there has been a desire to formally introduce social access benefits directly into a cost benefit framework for planning rural roads. The Ghana Feeder Road Prioritization procedure is an example (Hine, 2002). In this case social access benefits were perceived to be a function of population and the predicted change in unit transport costs. Under the prioritization procedure social access benefits were calculated from the reduced transport costs of every person in the area of influence of the road making five return trips per year of a given length. So the greater the change in unit transport costs and the larger the population affected the greater the rural access benefits. These benefits were then added to total benefits within the prioritization procedure (Hine, 2002).

2.3.3 The Difference between Social and Economic Benefits

The two concepts are so fundamentally linked that there cannot be a clear distinction between social and economic benefits. Resources are used and money is spent on food, schooling, and education, health care and for social trip making. The Livelihoods Analysis approach teaches us that all these activities have a long term impact on social and psychological wellbeing, long term welfare and the capacity for income generation (Carney, 1998). The main distinction is perhaps in terms of the models and professions used to help us make decisions. Any prioritization procedure requires a framework for predicting outcomes as well as a framework for evaluating the different consequences. Different professions will draw on a different body of knowledge to help predict outcomes and evaluate the consequences. Different professionals may share a similar vision or have similar long term goals but the short term consequences they identify will be different. In trying to identify what is missing
from the conventional method of appraisal it is not helpful to think of this missing component as purely “Social” in the sense of not being concerned with income generation and only being concerned with matters such as health, education and social interaction. The missing element needs to be clearly recognized; it affects all aspects of life including income generation. Within conventional transport cost-benefit analysis the problem is not a deficiency of economics as such, but more to do with the simplifications of transport planning.

2.3.4 Integrated Rural Infrastructure development

Although road transport infrastructure development is a catalyst for development in the rural areas, its effect is much felt when this is done in collaboration with development in other sectors of the economy. Inadequate transport access is typically just one of many infrastructure problems facing the poorest rural communities in Ghana. Integrated rural infrastructure development programmes can build synergies across sectors. Because they are more comprehensive, these programmes can have greater impact on the incomes and quality of life of poor communities. Multi sector approaches, combined with stakeholder participation, can let rural communities set priorities according to their own needs. (Narayan et al. (2000), World Bank (2000b), and Malmberg Calvo (1997).

2.3.5 A Study on CBA in Ghana

The Ministry of Transport (MOT) of Ghana engaged Vision Consult and Optimal Consultancy Limited to undertake a Baseline and Impact Monitoring Study aimed at establishing the baseline socio-economic conditions and benchmarking data for subsequent impact monitoring of road investment impacts. In the study emphasis was
placed on accessibility, mobility, and welfare components as well as some socio-economic characteristics. The objective of the baseline study was to gather “before” and “after” situations along project corridors to enhance the understanding of the road sector’s contribution to social and economic development of Ghana. The study, conducted between 2005 and 2007, was used to gather data on the indicators to establish differences and changes in road condition and status and relate them to accessibility and mobility as well as establish changes in accessibility and mobility and relate them to household income and other measures of welfare. (Ministry of Transportation, Road Sector Development, 2007 Review Report).

Some of the major findings of the study are presented below. Average household monthly income recorded was generally higher during the second monitoring period than the first monitoring and baseline studies. Furthermore, average monthly household income recorded was generally higher along completed road corridors than along uncompleted road corridors. In addition average household monthly income recorded was generally higher along urban roads than along trunk and feeder roads. What is more, vehicle waiting times are longer along uncompleted road corridors than along completed road corridors. In conclusion, data obtained during the second monitoring survey as well as the first monitoring and baseline surveys provide a good basic to assess the extent of road investment on poverty reduction. The data from the monitoring surveys show that there is some improvement in the socio-economic indices measured during the baseline studies. This indicates that some meaningful inferences can be made about the impact of roads on poverty reduction in all the ecological zones of Ghana. It can also be seen that there is considerable improvement in accessibility, welfare and mobility.
indicators. There is therefore the need to continually invest in road infrastructure development so as to improve upon the wellbeing of the people (Ministry of Transport, Road Sector Development Programme, 2007 Review Report).

2.4 Financing of Road Infrastructure

The Government is the main financier of road infrastructure development in Ghana. This financing comes from three main sources; the Consolidated Fund, the Ghana Road Fund and Donor Funds. The main sources of inflows into the Consolidated Fund are Taxes, Fess, Charges and government income from undertaking economic activities. Budgetary allocations and releases from the Consolidated Fund improved over the period 2002 to 2006. The disbursements under the Consolidated Fund were used mainly to clear road arrears payments and matching funds for donor funded projects. Consolidated Fund Budgetary Allocations and Releases for the period 2002 to 2006 are shown in Table 2.1 below. (Ministry of Transport, Road Sector Development Programme, 2007 Review Report).

<table>
<thead>
<tr>
<th>Year</th>
<th>Budget US$ Million</th>
<th>Releases US$ Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>6.99</td>
<td>28.85</td>
</tr>
<tr>
<td>2003</td>
<td>34.09</td>
<td>30.94</td>
</tr>
<tr>
<td>2004</td>
<td>38.32</td>
<td>41.04</td>
</tr>
<tr>
<td>2005</td>
<td>57.40</td>
<td>73.37</td>
</tr>
<tr>
<td>2006</td>
<td>120.15</td>
<td>92.73</td>
</tr>
<tr>
<td>Total</td>
<td>256.95</td>
<td>266.93</td>
</tr>
</tbody>
</table>

As part of Government Policy to develop the capacity of the Ghana Road Fund to fully recover 100% of road maintenance cost, laws have been enacted resulting in the following becoming the key sources of road maintenance funding: Fuel Levy, Vehicle Registration Fee, Road Use Fee Road, Bridge and Ferry Tolls and International Transit Fees. (Ministry of Transportation of Ghana, Road Sector Development Project, 2007 Review Report.) By the end of the year 2007, there were a total of fourteen international funding agencies supporting the Road Sector Development Programme (RSDP) of the Ministry of Transportation of Ghana. Most of the Funding from the Development Partners are for major rehabilitation, reconstruction, and institutional strengthening and road safety. According to the Ministry of Transportation of Ghana, Road Sector Development Project, 2007 Review Report, a total of US$1,561.10 million was disbursed to the road sub-sector from the three sources of funding between 2002 and 2007. The average annual disbursement is about US$260 million. The breakdown of these disbursements is shown in Table 2.2 below (Ministry of Transportation, Road Sector Development, 2007 Review Report).

<table>
<thead>
<tr>
<th>Source</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donor Funds</td>
<td>32</td>
<td>49</td>
<td>89</td>
<td>91</td>
<td>93</td>
<td>323</td>
<td>677</td>
</tr>
<tr>
<td>Ghana Road Fund</td>
<td>51</td>
<td>75</td>
<td>106</td>
<td>108</td>
<td>121</td>
<td>119</td>
<td>581</td>
</tr>
<tr>
<td>Consolidated Fund</td>
<td>26</td>
<td>31</td>
<td>41</td>
<td>73</td>
<td>93</td>
<td>40</td>
<td>304</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>155</td>
<td>236</td>
<td>272</td>
<td>307</td>
<td>482</td>
<td>1561</td>
</tr>
</tbody>
</table>

From Table 2.2 above, it can be seen that investments in road infrastructure development has seen an appreciable increase in funding from the period 2002 to 2007. Despite these huge investments in road infrastructure development in the country, road infrastructure development is lagging as compared with the rate at which settlements are expanding. This is evidenced by the presence of bad roads in both the urban and rural areas of the country. According to Hamilton (1996) one of the most important challenges facing road planners in Africa is how to mobilize sufficient funds to build, improve, and maintain a network of high capacity freeways to serve the needs of the region’s rapidly growing road transport industry. Given the acute shortage of government revenue, many governments are increasingly turning to the private sector for assistance. Why not let the private sector come in to build and operate these roads under concession agreements? In looking for other sources of finance the government may consider the possibility of inviting the private sector to partner the government in road infrastructure development.

2.4.1 Concession Systems

Under a concession system, the state grants a franchise the right to finance, build, own, operate and maintain a public infrastructure for a given period, and to charge users for that service. Concessions are normally stand-alone, single-purpose entities that are expected to finance themselves eventually, if not initially, without recourse to their shareholders. In order for a concession to be successful, the granting authority must be clearly defined and the road that needs to be built is approved as part of national road development plan. Road concessions can vary in length, averaging about thirty years. In general the concession should run for a period of time long enough to enable the
concessionaire service all debt and earn the required return on equity. But there are no hard and fast rules (Hamilton, 1995).

2.4.2 Types of Private-Public Partnerships (PPP)

There are complexities (risks, and costs) when the private sector is involved in the provision of road infrastructure. Some of these complexities coupled with the recent world-wide increases in petroleum prices culminating in financial crisis mostly in the developed countries have all come together to make project sponsors and lenders more wary. This reinforces the need for governments to get good advice and to think through their objectives for road infrastructure development and the involvement of the private sector in its provision. Depending on government objectives the method of private sector involvement may vary. The strategy setting process should identify potential roads for tolling. According to Angleoha (2003), Private-Public Partnerships in road infrastructure development may take several forms. Some of the common forms are described below.

2.4.3 Build-Operate and Transfer (BOT) or Build Transfer Operate (BTO) System

Under a Build-Operate and Transfer (BOT) system, the private partner builds the facility to the agency or public agreed specification, operates the facility for a specified period according to the terms and conditions of the agreement and transfers the facility to the agency or public in accordance with the concession agreement. In most cases, the private sector provides all the financing for the facility or substantial part in which case the length of the contract must be sufficient to enable the private partner recover a reasonable size of the return, if not all, on the investment through user charges in the form of road tolls. The BTO model is similar to the BOT model except that the transfer
to the public owner takes place at the time that construction is completed, rather than at
the end of the franchise period. (Angleoha, 2003).

2.4.4 Build-Own-Operate (BOO) System

Under a Build-Own-Operate (BOO) system of road concession the contractor
constructs and operates a facility without transferring ownership or legal title to the
agency or public. It will appear that this system may not be well acceptable to the
general Ghanaian populace since road infrastructure is generally viewed as a national
asset. As at now there is no known facility under the BOO system in Ghana. (Angleoha,
2003).

2.4.5 Buy, Build and Operate (BBO) system

Another form that a PPP may take is the Buy, Build and Operate (BBO) system.
Under this system the government sells the asset to private investors. The investors then
develop, repair, expand and rehabilitate the asset to make it more profitable. A case in
point in Ghana is the sale of the State Transport Corporation (STC) to Vanef STC, a

2.4.6. Design, Build, Finance and Operate (DBFO)

According to Hamilton (1996), the Department of Transport of the United
Kingdom has set a programme to encourage private sector involvement called Design,
Build, Finance and Operate (DBFO). Tolls are not to be collected on DBFO projects.
Instead, the government will pay an agreed amount for each vehicle that uses the road
over a period of up to thirty years. This practice is called “shadow tolling”. The trick is
to correctly estimate the traffic flows over thirty years and then to negotiate with the government on the shadow toll per vehicle. A Design, Build, Finance and Operate system serves as a point of interaction and collaboration for road design and construction. It can thus speed project completion by facilitating the overlap of the design and construction phases of road construction. In Ghana, design stages are handled by the various road sector agencies (Hamilton, 2006).

2.4.7 Turn-Key PPP Projects

Under a turn-key agreement, financing and ownership of the facility can either rest with the public or private partner. For example, the public agency might provide all the funds, with the associated costs and risks, and an independent investor handles the initial operations and later hands over for use. Alternatively, the private party might provide the financing in anticipation to operate the facility to recover the returns or for a specific payment of the financing from the public or agency over a specified agreed period or on certification of good work done. (Angleoha, 2003).

2.4.8. Views on Private-Public Partnerships (PPP)

The adoption of any of the above types of PPP will depend on a number of factors such as availability of funds, the economic viability of the project, the political condition, public interest, timing and effect of the project on the economy and other reasons. It was against this background that the government of Ghana invited the Road Maintenance Initiative (RMI) to organize a regional seminar to explore the scope for private sector involvement in toll roads. The general consensus that emerged from the seminar was that concessioning is not as easy as it seems. Briefly the seminar concluded
that in Africa, the greatest scope for private involvement in toll roads is as managers and operators of facilities owned by the government. Furthermore, with traffic volumes of over 3,500 per day, revenues will usually be sufficient to cover operating costs, and routine and periodic maintenance. Some form of government guarantee is almost essential. Moreover, revenue leakage is a major problem. The South Africans reported collecting nearly 100 percent of the revenue payable, but this cost up 30 percent of revenue. Lower collection costs lead to higher leakage and less net revenue. Finally, governments have to carefully evaluate toll road proposals since the concessionaire rarely loses out and the government often ends up having to bail out poorly designed schemes. (Hamilton, 1996).

The decision to involve the private sector in road infrastructure development requires a firm government policy. However, some may see such a policy as an indication that the government does not have the financial and human resources needed to carry out those functions traditionally expected of it. This view creates complications that can adversely affect the concession company, and therefore it is essential that government support be provided. A successful concession requires a feeling of partnership between the government and the concession company. Whenever government employees feel that their positions are threatened by the introduction of any road concession agreement they are likely to sabotage it. To overcome this potential fear, governments will have to convince their employees that such a policy is a positive step towards finding solutions to the numerous problems facing the road sector. (Hamilton, 1996).
CHAPTER THREE

METHODOLOGY FOR DATA COLLECTION

3.1. Introduction

This chapter discusses the methodology which was employed by the researcher in collecting data for the study. These include the administration of questionnaires to some of the management and other staff of the agencies of the Ministry of Transportation of Ghana. These agencies are the Ghana Highway Authority (GHA), the Department of Feeder Roads (DFR), the Department of Urban Roads (DUR) and the National Road Safety Commission (NRSC). Due to time and financial constraints, the questionnaires were administered to staff in the Accra-Tema Metropolitan Areas only. Specifically, respondents were sampled from the Head Offices of the GHA, DFR, NRSC and DUR all situated at the Ministries Area in Accra. In addition, some respondents were also sampled from Accra Metro Roads Department (Kaneshie), Tema Metro Roads Unit (Tema) and the Ga West Municipal Roads Unit at Asaman. Finally, some respondents were also sampled from the office of the Ministry of Transportation of Ghana also situated at the Ministries Area of Accra. Ten people from the general public were also interviewed to solicit their views as to whether the private sector should be involved in the financing of road infrastructure. Since there is usually not a single methodology to follow when undertaking a research, the most important thing is to identify clearly the outputs the study is expected to achieve. When this has been done, one can then begin with a clear idea as to which specific data/information to be
collected. Whatever method is chosen should be the most appropriate to assist in achieving the objectives of the study as stated below:

- To identify the various options available for financing of Road Infrastructure Development in Ghana.
- To examine the various methods available for the evaluation of investments in the Road Infrastructure Sector in Ghana.
- To draw conclusions about the best methods available for financing and evaluating Road Infrastructure Development in Ghana.
- To examine the possibility of realizing the required financial/commercial returns within the macro economic environment in Ghana, and evaluation of road projects based on their socio economic impact to justify the continuous investment.

3.2 Data Collection

The data collection stage is important since the results of the analysis of the data will depend on the quality of the data obtained. Data quality involves the reliability of the data, the validity of the data, error and bias. Reliability refers to the accuracy and consistency of the measuring instrument, which could range from a sophisticated piece of electronics to a simple questionnaire. Data are said to be reliable if the same results could be obtained if the sampling procedure were to be repeated in precisely the same way. Data are said to be valid if they are a good measure of what they are supposed to be measuring. Errors on the other hand refer to the amount by which a measurement differs from reality, whilst bias occurs when errors tend to be mostly in the same direction.
3.2.1 Self-Completing Questions

A total of 95 five-page self-completing questionnaires were distributed to people aged 18 years and above. Out of this number 90 filled and returned the questionnaires whilst the remaining 5 failed to do so. The survey was done between 20/12/2008 and 10/1/2009. To ensure that the survey was free from bias the questionnaires were given to staff in all echelons of the organizational structure of the road sector agencies: top management staff, middle management and junior staff. The breakdown of the respondents was as follows: top management (15), middle management (45) and junior staff (30). Seventy-two out of the ninety respondents were male whilst the remaining eighteen were female. Six respondents were within the age bracket 18-30, Forty two were within the age group 31-40 years, Twenty-seven were within the age bracket 41-50 years whilst the remaining fifteen were aged 51 years and above. Nine respondents had a masters degree, 20 had a first degree, and 61 had a General Certificate of Education Advanced Level or its equivalent.

The survey participants were asked about personal attributes like sex, age, profession, educational background etc. Participants were further asked to identify the main sources for financing of road projects in Ghana. They were also asked to state whether financing of road infrastructure development in Ghana was adequate or not. Participants were further asked to indicate whether tolls should be charged on more roads in Ghana. In addition they were asked to indicate their preference for the form in which private sector participation in road development should take. Furthermore, they were asked to indicate their preferred methods for the evaluation of road infrastructure
development. The participants were further asked to indicate whether road infrastructure evaluation should be based on economic benefits only or social cost benefit analysis.

There were certain challenges that the researcher encountered in the administration of the questionnaires. Among the problems encountered was the misplacement of questionnaires by some respondents. New ones had to be given out to replace the misplaced ones. Some of the respondents were demanding some incentives before responding to the questionnaires. In such a situation the researcher had to convince them that the study was only an academic exercise. Besides the administration of questionnaires, the researcher also interviewed ten people from the general public soliciting their views with regard to private sector participation in road infrastructure financing in Ghana. Their views were also sought in respect of the form that private sector participation in road financing should take.

3.2.2 Analysis of Data

The data were analyzed in a descriptive, multi-dimensional manner using Microsoft Excel, so as to illustrate various aspects of evaluation and financing of road infrastructure. All percentage figures have been rounded to the nearest whole numbers. Where appropriate, findings have been illustrated with the aid of graphs and tables.
CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1. Introduction

This chapter deals with the findings of the research. Quantitative data in the raw form convey very little meaning to most people. The data therefore have been processed to make them meaningful, that is, to turn them into information. The researcher therefore used quantitative analysis techniques such as graphs, charts, and statistics to turn the data into meaningful information. This has helped to explore, present, describe and examine relationships and trends within the data. Figures have been rounded to the nearest whole numbers. The presentation of the research findings follows a similar order as those of the research objectives, namely:

- To identify the various options available for financing of Road Infrastructure Development in Ghana.
- To examine the various methods available for the evaluation of investments in the Road Infrastructure Sector in Ghana.
- To draw conclusions about the best methods available for financing Road Infrastructure Development in Ghana.
- To examine the possibility of realizing the required financial/commercial returns within the macro economic environment in Ghana, and evaluation of road projects based on their socio economic impact to justify the continuous investment.
The findings are from two sources:

- Findings from the questionnaires administered to some staff of the Ministry of Transportation of Ghana and its agencies.
- An interview of a cross section of the general public.

4.2 Findings from Questionnaires

4.2.1 Financing of Road Infrastructure

Out of the ninety (90) respondents, 86 were of the view that the main source for financing road infrastructure development in the country should be the government. Four (4) however were of the view that the development of road infrastructure should be the responsibility of the private sector. The result of the analysis is presented in Figure 4.1 below.

Figure 4.1 above shows that 96% of the respondents were of the view that the government should be the main source for the financing of road infrastructure, whilst
4% were of the view that the private sector should be the main source for financing road infrastructure.

4.2.2. Adequacy of Road Financing

A question was designed to solicit the opinion of the respondents as to whether the financing of road projects in Ghana was adequate or not. It is interesting to note that an overwhelming 100% indicated that financing of road infrastructure in Ghana is inadequate. None of the respondents indicated that financing of road infrastructure in Ghana is adequate. The result is presented in Table 4.1 below.

**Figure 4.1: Adequacy of Road Financing**

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Inadequate</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Comment:** Twenty-two respondents commented that financing of road infrastructure projects in Ghana is not adequate because of the presence of roads in deplorable conditions in some parts of the country.

4.2.3 Upward Adjustments in Road User Charges

Again the researcher got respondents to answer a question as to whether current road user charges should be adjusted upwards or not. All the 90 respondents answered “Yes”. None of them said “No”. This indicated that respondents were of the view that road user charges should be increased. The result is shown in table 4.2 below
Table 4.2: Upward Adjustments in Road User Charges

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>No</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
</tr>
</tbody>
</table>

4.2.4 Imposition of Road User Charges on More Roads

Sixty-seven percent of the respondents said they “agreed” whilst 22% said they “strongly agreed” that road user charges should be charged on more roads in Ghana. Only 11% said that they “disagreed” that road user charges should be charged on more roads in Ghana. None of the respondents answered that he “strongly disagreed”. The result is presented in Figure 4.2 below.

Comment: Twenty respondents suggested that before tolls could be charged on more roads, the conditions of those roads should be improved considerably. Two respondents further suggested that measures should be put in place to minimize the incidents of income leakages from the tolls to be collected if the aim of making more money available for road development activities is to be achieved.
4.2.5 Involvement of the Private Sector in Road Financing in Ghana

Fifty-five percent (55%) of the survey respondents said they “agreed” that the private sector should be involved in road infrastructure development in Ghana, whilst 24% of the respondents “strongly agreed” that the private sector should be involved in road financing. Eighteen per cent answered that they “disagreed” with the fact that the private sector be involved in road financing, whilst 3% answered that they “strongly disagreed” with the involvement of the private sector in road financing. The response is shown in Figure 4.3 below.

![Figure 4.3 Involvement of the Private Sector in Road Financing](image)

**Comment:** Eight respondents were of the view that it is the responsibility of the government to provide the necessary road infrastructure to facilitate the socio-economic development of the country and as such there is no need to involve the private sector in this area.
4.2.6 Form of Private Sector Participation

A question was posed with regard to the form that private sector participation in road development should take. Thirty-two respondents answered that private sector involvement should be in the form of Build-Own-Operate, 53 said it should be in the form of Build-Operate-Transfer whilst the remaining 5 were of the view that it should take the form of Design-Build-Finance-Operate. Figure 4.4 below shows the statistics obtained from that question.

![Figure 4.4 Forms of Private Sector Participation](image)

### 4.2.7 Ranking of Investment Appraisal Methods

With regard to methods for evaluating of road investment projects the answers received in terms of ranking were as follows: Social Cost Benefit Analysis (1\textsuperscript{st}), Net Present Value (2\textsuperscript{nd}), Internal Rate of Return (3\textsuperscript{rd}), and Payback Method (4\textsuperscript{th}). The findings are presented in Figure 4.5 below.
4.2.8 Should Road Investment Decisions be based Solely on Economic Benefits?

A question was designed to solicit the opinion of the respondents as to whether road investment decisions should be based purely on economic benefits. It is interesting to know that an overwhelming 100% of the respondents indicated that such decisions should not be based solely on economic issues. The results are presented in Table 4.3 below.

Table 4.3: Should Road Investment Decisions be based on Solely Economic Benefits?

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<tr>
<td>Total</td>
<td>90</td>
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</table>
4.2.9 Best Methods for Financing Road Projects

Eighty-four percent of the respondents answered that the best method for road infrastructure financing is a combination of Government, Private Sector and Donor Financing. The remaining 16% reported that the best method for road financing is government only financing. The result is shown in figure 4.6 below.

![Figure 4.6 Best Methods for Road Infrastructure Financing](image)

4.2.10 Can Road Infrastructure Development Contribute to the General Well-being of the Citizenry?

All the 90 respondents answered that road infrastructure development can contribute positively to the general well-being of the citizenry of an area. Seventeen respondents mentioned specific sectors such as health, education, agriculture, trade and tourism that road development can facilitate their development. The findings are presented in Table 4.4 below:
4.2.11 Suggestions for Improvement in Road Infrastructure Development.

This question sought general views from the respondents. This generated a lot of divergent and interesting views from the respondents. Some of the common suggestions are listed below.

- Fifteen respondents stated that the provision of road infrastructure is purely the responsibility of the government. There is therefore no need to involve the private sector in this area at all. One respondent suggested further that the government should rather look for more avenues to generate more income to be able to undertake this important responsibility.

- Six respondents suggested that some of the roads constructed in Ghana do not last as expected due to the fact that they are being used by overloaded vehicles. To prevent this, they further suggested that overloaded vehicles should not be allowed to use Ghanaian Roads.

- Seventeen respondents suggested that the Supervisory units of the Ministry of Transportation and its agencies should be strengthened to ensure that road contractors perform to specifications.

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Table 4.4: Can Road Infrastructure Development Contribute to the well Being of the Citizenry?
- Twenty five respondents suggested that the Government through the Ministry of Transportation should assist Ghanaian road contractors to improve upon their capacity in the road construction industry.

- Four respondents suggested that in order for the policies of the Ministry of Transportation to have a maximum impact on the economy of the country, they should be linked with those of other government agencies in charge of other modes of transport in the country, i.e. railway and maritime transport.

4.3 Findings from Interviews from the General Public

All the ten people interviewed were of the view that the private sector should be involved in the financing of road infrastructure development in Ghana. They were also of the view that the government should put in place the appropriate regulatory measures to prevent the exploitation of the general public by the private investor. All of them were also of the view that the government should continue to seek financial assistance from the development partners in order to make up for the shortfall in road infrastructure financing. One person was of the view that with the discovery of petroleum in Ghana the government should consider the possibility of using the oil revenue to finance road infrastructure development and stop depending on foreign donors. All of the people interviewed were of the view that there is the need for upward adjustments in road user charges to provide the needed revenue to finance road infrastructure development.
5.1 Introduction

Road transport constitutes about ninety percent (90%) of the passenger and freight traffic in Ghana. It is for this reason that investment in road infrastructure is very important. Road Infrastructure enhances the performance of other sectors of the economy. The government has the ultimate responsibility to provide the necessary infrastructure including road to facilitate the socio-economic development of the country. Because the government may not have all the needed funds to undertake this responsibility, it at times turns to the private sector to assist in this direction. Before one embarks on a project he has to weigh the costs against the expected benefit to see whether it is profitable to do so.

The first chapter looked at the background of what the researcher intended to achieve. The second chapter dealt with a collection of views, ideas, and information of previous writers and researchers in the study. The third and fourth chapters looked at the methodology for gathering data and interpretation of the data collected respectively. The fifth and final chapter is made up of a summary of the findings and the conclusions arrived at after interpreting the data. The necessary recommendations were also made in this same chapter.
5.2 Summary of Findings

After carefully analyzing and interpreting the data collected, the researcher unearthed the following. The government should be the main financier of road projects in Ghana. Furthermore, financing of road infrastructure development is inadequate in Ghana. In addition, there is the need for road use charges to be adjusted upwards. There is also the need for tolls to be collected on more roads in the country. The researcher also came out with the finding that the private sector should be involved in road infrastructure financing in the country. Another finding of the research is that Build-Operate-Transfer (BOT) is the most preferred form of private sector participation. What is more, the researcher also came out with the finding that Social-Cost-Benefit Analysis is the preferred form for evaluating investments in road infrastructure development. Thus evaluation of investments in road infrastructure should not be based on only economic benefits that are expected to accrue from the construction of the road in question. This is because developments in road infrastructure come with other benefits like access to health care, education and tourism. These benefits are difficult to quantify in monetary terms. Another finding from the research is that the best method for financing road projects is a combination of government, private sector and donor support. Finally, the researcher came with the finding that road infrastructure development contributes to the general well-being of the citizenry of an area concerned.
5.3 Conclusions

Based on the above-mentioned findings the following conclusions were arrived at. To begin with, Government financing of road projects is inadequate. This inadequacy in road financing often creates a situation where the Ghana Road Fund owes contractors huge sums of moneys for road contracts executed. For example, the fund carried forward an indebtedness of GH¢85 million from 2007 to 2008. Government therefore had to secure a loan in order to pay the contractors involved (Ghanaian Times, 29/8/2008).

There is therefore the need for the government to look for other sources of funding in order to increase the revenue base for the financing of road projects. One method the government can use to get more funds is an upward adjustment of road user charges. As at now (March 2009), motorists pay only five Ghana Pesewas per saloon car for the use of roads and bridges in the country. It is suggested that the government should take a decision to increase the road user charges which have remained low over the years. In order that increases in the road user charges do not attract a lot of resentment from the public, it is recommended that the conditions of the roads involved are improved to warrant the need for such increases. Closely related to increasing the road tolls is the finding that more roads in Ghana should be tolled. Similarly, for any road to be effectively tolled, the condition of such road should be improved to warrant the need for charging such a toll.

Increases in road user charges and tolling of more roads may not necessarily lead to improvements in road infrastructure financing if measures are not put in place to reduce incidents of revenue leakages. One measure that can be used to do this is to automate the revenue collection process as is being done in South Africa. This reduces
the number of contacts between the collector and the one paying. Apart from having the potential of reducing corrupt practices, it can also lead to a reduction in the cost of collection. Furthermore, to deter people from indulging in corrupt practices, stringent punishment should be meted out to people who engage in such practices.

The government should also consider the possibility of issuing bonds on the Ghana Stock Exchange to provide the needed funds for road projects. For these bonds to have the necessary impact on road financing, they should be issued for periods long enough to enable the government accumulate enough revenue from road user charges to be used for their redemption at the maturity date. Furthermore, the government should continue soliciting for loans and grants from external sources like the International Development Association (IDA), Agence Française de Développement (AFD), Department for International Development (DFID), German Technical Co-operation (GTZ), Danish International Development Agency (DANIDA), Saudi Fund etc. There are some challenges associated with donor financing. It should be noted that these external sources may not continue for ever. It is therefore important that the government should look for relatively permanent sources to finance road infrastructure. One main aim of these donor agencies is to help the borrowing country to reduce poverty. For the last couple of years the Gross Domestic Product (GDP) per capita of Ghana has been rising and it is expected to rise further with the discovery of oil. It is possible that the donors may not continue giving us loans and grants if the GDP rises beyond some level.

Because government alone does not have the necessary financial resources to undertake the needed road infrastructure development, there is the need to involve the private sector in this area. Since the main aim of private businessmen is to make profits
their involvement in road financing should be regulated to prevent them from exploiting the general public. The package however should be attractive enough in order to appeal to the private investor. Furthermore, road infrastructure in Ghana is seen as a national asset. The research showed that people prefer Build-Operate-Transfer (BOT) form of private participation. This will ensure that this all important national asset is not transferred to the private sector forever. Thus the research has shown that after the private man has recouped his investment in addition to his profits, the asset should be transferred back to the state.

The research proved that improvement in road infrastructure can lead to improvements in the general well being of the citizenry. Road Transport plays a complementary role in almost all socio-economic activities, including poverty-interventions other sectors initiate. Although the development of a transport component for a poverty reduction strategy is a task for transport specialists and policy makers, it requires close collaboration and coordination from specialists and policy makers from all other major sectors like education, public health, rural and urban development, tourism, trade and private sector development. Therefore road investment decisions should not be based solely on the economic benefits to be derived from the construction of that particular road.

In conclusion, investments in road infrastructure may not necessarily be evaluated using the same traditional methods used in the evaluation of other capital investment projects. This is due to the fact that road infrastructure comes with other social and economic benefits that are difficult to quantify in monetary terms. For example, when a locality is opened up through the construction of efficient roads, people
get more access to social services like schools, health, entertainment and others. These social benefits in turn improve the well-being of the citizenry concerned. Better roads also lead to a reduction in the average travel time. This reduction in time in turn leads to savings in terms of fuel and man hours. Some of these benefits may be difficult to quantify in monetary terms.

5.3.1 Recommendations

After a careful and thorough analysis of the research findings, the researcher has come out with the following recommendations. Road infrastructure plays a pivotal role in the socio-economic development of every country. In particular road infrastructure facilitates poverty reduction especially in the rural areas. Governments should therefore give it the needed attention. Although over the last few years, the road sector has seen appreciable annual budgetary increases, the funding is inadequate. The Government should therefore look for other sources to increase its revenue base. When government revenue increases, there would be more revenue available to finance government expenditure including road infrastructure funding. One method that can be adopted is to expand the tax net to include more people who currently do not pay the requisite tax. Expansion of the tax net may not necessarily lead to increases in government revenue if revenue leakages in the public sector are not minimized. This, the government can do by ensuring that those who engage in such practices are given punishments that are severe enough to deter others from engaging in similar practices.

Governments alone do not have the necessary financial resources to provide the requisite road transport infrastructure. There is therefore the need for the government to collaborate with the private sector in road infrastructure development. This can be done
through the granting of concessions in the form of BOT, BOO, etc to the private sector. The agreement in the concessions should be attractive enough to pool private businessmen into this area. There should however be provisions in the agreement that will make it difficult for the private businessmen to exploit the general public.

The evaluation of road infrastructure investments should not be based solely on economic benefits to be derived from the construction of a particular road. Such evaluations should be based on social cost benefit analysis. If evaluation of road infrastructure projects is based only on economic benefits, there is the likelihood that some areas in the country may never benefit from any form of road infrastructure developments. This is because the contribution of such areas to the economy of the country may not be significant to warrant the construction of any roads to those areas.

Since road infrastructure plays a crucial role in the socio-economic development of every country it is necessary that further studies be conducted to find out more with respect to sources for financing road infrastructure development in Ghana. To enable an in-depth analysis to be conducted, there is the need for the government as well as private businessmen to sponsor such researches. There is also the need for further research to be made into the methods for the evaluation of road infrastructure development in Ghana. Similarly, a sponsorship package from either the government or the private sector will be of a great help towards the achievement of the objectives of any such a research. Finally, there is the need for further research to be made into the benefits and impacts of road infrastructure development to the country as a whole. For Example, researches could be conducted to find how efficient and reliable road networks in the rural areas can contribute to a reduction in rural-urban migration in Ghana.
This questionnaire is designed purely for academic work in partial fulfillment of a Commonwealth Executive Masters in Business Administration. All information shall be treated as confidential and besides, your anonymity is guaranteed.

**Topic: Financing and Evaluation of Investments in Road Infrastructure Development.**

An adequate, efficient and reliable road transport system is necessary for poverty reduction, so transport policies and investment programmes are an important part of poverty reduction strategy for low-income countries where transport is typically underdeveloped. Transport reduces poverty by supporting economic growth, complementing most poverty-targeted interventions, and encouraging the poor to participate in social and political processes. Road transport therefore has pervasive influences throughout a country’s economy and social fabric.

The Government, like any other investor would like to compare the costs against the expected benefits before undertaking any project. Capital investment appraisal methods like the Internal Rate of Return (IRR), Net Present Value (NPV), and Accounting Rate of
Return (ARR) etc. are some of the methods used in evaluating projects. Primarily, it is the responsibility of the government to provide the necessary finance towards the provision of road infrastructure to facilitate the socio-economic development of the country. However, in many developing countries government revenue is usually not adequate, hence the need for the government to look for other sources of finance to fill the gap in the finance of road infrastructure development. Governments normally do this through collaboration with the private sector and loans and grants from Development Partners.

In each of the following questions, kindly mark or tick [✓] in the appropriate option or write brief answers in the spaces provided.

1. Age: (a) 18-30 [ ] (b) 31-40 [ ] (c) 41-50 [ ] (d) 51 years and above [ ]

2. Sex: (a) Male [ ] (b) Female [ ]

3. Educational Background: (a) Masters [ ] (b) 1st Degree [ ] (c) Diploma [ ] (d) A-Level (e) Others (specify)……………………………………………………………

4. What is your current position or job title in your organization?

…………………………………………………………………………………………

5. In your opinion what should be the main source of finance for road infrastructure development in Ghana?

(a) The private sector [ ]

(b) The government [ ]

…………………………………………………………………………………………
6. How would you describe the financing of road infrastructure in Ghana?

(a) Adequate [ ]
(b) Inadequate [ ]

If yes why? .................................................................
..................................................................................

If No Why? .................................................................
..................................................................................

7. Will you recommend an upward adjustment in the current levels of road and bridge tolls in the country?

Yes [ ]

No [ ]

If yes why? .................................................................
..................................................................................

If no why? .................................................................
..................................................................................

8. Road user charges should be imposed on more roads in the country.

Strongly Disagree [ ]

Disagree [ ]

Agree [ ]

Strongly Agree [ ]
9. The private sector should be involved in the financing of road infrastructure development in Ghana.

Strongly Disagree [ ]

Disagree [ ]

Agree [ ]

Strongly Agree [ ]

Please comment briefly ………………………………………………………………………
…………………………………………………………………………………………………………………………
…………………………………………………………………………………………………………………………
…………………………………………………………………………………………………………………………

10. In your opinion in what form should the involvement of the private sector be?

Build-Own-Operate [ ]

Build-Operate-Transfer [ ]

Design, Build, Finance-Operate [ ]

11. How will you rank the following methods for evaluation of investments in road infrastructure development? Rank by writing 1st, 2nd, 3rd and 4th.

Internal Rate of Return (IRR) [ ]

Net Present Value Method (NPV) [ ]

Social Cost Benefit Analysis [ ]

Payback Method [ ]
12. Should road investment decisions be based purely of economic benefits?

Yes [ ]

No [ ]

13. In your view what is the best method for financing investments in road infrastructure development?

Government only [ ]

Private Sector only [ ]

A combination of Government, Private Sector and Donor Financing [ ]

14. Do you agree that developments in road infrastructure can contribute to improvements in the general well being of the citizenry in an area?

Yes [ ]

No [ ]

15. What do you think can be done to improve upon road infrastructure development in Ghana? Please state briefly.

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