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Assessment of the major challenges in the performance of road construction projects. In the case of Addis Ababa City Road Authority

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A PROJECT WORK FIRST DRAFT SUBMITTED TO THE DEPARTMENT OF PROJECT MANAGEMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF ARTS IN PROJECT MANAGEMENT IN SCHOOL OF COMMERCE, ADDIS ABABA UNIVERSITY

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ADDIS ABABA

Approval sheet

This is to certify that; this project work was prepared by Yishak Maeregu Delaw entitled "Assessment of the major challenges in the performance of road construction projects. In the case of Addis Ababa City Road Authority" Prepared and submitted in fulfillment of the requirements for the Degree of Master of Arts in Project Management. This MA thesis complies with the regulations of the University and meets the accepted standards concerning originality and quality.

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Declaration

I, the undersigned, declare that this project work is my original work, prepared under the guidance of Fesseha Afework (Asst. Professor). And not been presented for a degree in any other university, and that all sources of materials used for the project work have been duly Acknowledged.

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This work comes to an end with the help of my God and his son lord Jesus Christ that made me strong and successful to go through all this time. Several people helped me in one way or another to achieve the completion of this project. To begin with, I would like to thank my advisor Fesseha Afework (Asst. Professor) for his constructive comments and outstanding help with this project work, I would like to thank the School of Commerce for giving me this opportunity of unleashing the best of myself. Next, my thanks go to my selfless and all-time best parents, Tsege Gebre and Maeregu Delaw. Besides, I want to express my deep gratitude to my Invaluable brothers and sisters for the devotion they showed me in every aspect of this project work.

May God bless you all!

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Abstract

Road building is a significant sector in Ethiopia as well as Addis Ababa, as it is in many other countries and cities, because of its enormous contribution to the country's economic growth and social development in terms of job possibilities and macro-economic aspects. However, the road construction industry in Addis Ababa suffers from many challenges and complex issues the road construction projects have low performance in schedule, cost, and quality dimension. To eliminate these challenges of performance identifying the main challenges of performance is important/significant. This project study was aimed to find out the main challenges of road construction projects performance in Addis Ababa Road construction projects in the case of Addis Ababa City Road Authority. This research uses descriptive methods of research and the data use to be collected by using a study survey through questionnaire and interview. The questionnaire was distributed to contractors, clients, and consultants. Meanwhile, managers who have a direct relation with road construction projects in AACRA are interviewed. The questionnaire was in the Likert five-point scale form and it analyzes by using the relative importance index (RII) to give weight for the challenges to identify the main challenges of road construction projects in the Addis Ababa city road authority. Clients, consultants, and contractors provided quantitative data via questionnaires, which was then analyzed using the Relative Importance Index (RII). The outcome of the study analysis revealed ten significant challenges of performance. As a result, clients, consultants, and contractors agreed that the top-three most significant challenges were inflation, lack of utility service coordination, and poor financial management, which are the key challenges of road construction performance, respectively. And the study also discovered the key six effects of challenges on the performance of road construction projects. According to the study, the top three effects of challenges on performance are time overrun, cost overrun, and creating social and economic concerns, respectively. The top ten challenges are identified after analyzing the data from the perspective of stakeholders.

Key Words: *challenges, challenges of performance, Addis Ababa City Road Authority, Relative Importance Index, Road Construction projects*

Acronyms

SDG	Sustainable development Goal
GDP	Gross Domestic Product
E.C	Ethiopian Calendar
G.C	Gregorian Calendar
EPRDF	Ethiopian people's Republic Democratic Front
AACRA	Addis Ababa City Road Authority
ERA	Ethiopian Road Authority
PDC	Planning and Development Commission
PMFC	Project Management Facilitation Committee
ROW	Right of Way
RII	Relative importance index
PMI	Project Management Institute
ECDSWC	Ethiopian Construction Design and Supervision Work Corporation

CHAPTER ONE: INTRODUCTION

1.1. Introduction

Challenges can be viewed as chances for success rather than problems. For projects to be completed successfully, project management bodies of knowledge and project managers' resource management capabilities must expand. Effective project management necessitates the ability to manage uncertainty and deal with a variety of challenges. A wide range of factors can pose a challenge, and these factors have a significant impact on projects and the body of project management knowledge as a whole. This project study was aimed to find out and rank the main challenges of road construction projects performance in Addis Ababa City Road Authority construction projects.

1.2. Background of the study

Societies aspire for development. It is believed that economic growth explains much of the development feature; countries spend much of their resources by facilitating and constructing public infrastructures to sustain their economic growth. Public infrastructure construction projects have a great role especially in developing countries it drives a country's economic success provides the ability to grow and become more viable and competitive in world markets. And also, to the paybacks arise as transport improvements goings to have access to larger markets and wider Economic activities. The availability of better services and cheap transport influence the firm’s location and size, size of trade activity, and higher agricultural production, such activities improve the quality of the country’s citizens’ life. Many theoretical works are linking the contribution of transport infrastructure to growth and welfare. (Aschauer, 1989) Presented an econometric model of the relationship between production and public investments.

The impacts of investment in road transport can be substantial. At the macro-level economy because of road connectivity is related to the national output and per capita income increment. Developed road transport network links supply with demand and it affects people’s living standards positively, and also it facilitates socio-economic activities. Generally, road transport development is believed as one of the international tools for development and also it is one part of Sustainable Development Goals (SDGs).

Effective road transport systems are vital to any country's development. The good condition of road infrastructure forms a good transportation system and reduced travel costs and time, it leads to a fast economic activity and facilitates timely delivery of tasks.

In the list developing nation the road construction industry has a big contribution on their gross domestic product (GDP). According to the Ethiopian economics association, the Ethiopian road construction sector contributes 5.2 percent of the GDP, the main part of the contribution is coming from some big cities of Ethiopia.

Several studies have been conducted to examine factors impacting project performance in developing countries. Shortage of skills of manpower, poor supervision, and poor site management, poor workmanship; client satisfaction, unsuitable leadership; shortage, and breakdown of equipment among others contribute to construction delays (Mohammed.B, 2004).

The construction industry is complex because it comprises large numbers of parties as owners (clients), contractors, consultants, stakeholders, shareholders, and regulators. The performance of the construction industry is affected by national economies (Abu-Shaban, 2008).

The road construction industry in Ethiopia suffers from many challenges and complex issues in performance. Performance is related to many topics and aspects such as time, cost, quality, client satisfaction; productivity, and safety. In the Addis Ababa Road Authority office, there are many roads construction projects such as big and wide ring roads, as well as small and medium road construction projects which are constructed by local and international contractors. On those projects, there are different challenges to the execution process and their performance. Consequently, this project paperwork was trying to find out the main challenges on the performance of road construction projects on Addis Ababa Road authority own force road construction projects.

1.3. Background of the organization

Addis Ababa City was founded in the late 19th century in 1886 by emperor Minillike-II and Empress Taitu of Ethiopia. As the city established the story of Addis Ababa Road construction is directly related to minillike-II. Addis Ababa Road construction beings in 1902 by the construction of Addis Ababa to Addis Alem and the palace of Minillike to British embassy Road construction by the leadership of Emperor Minilike-II. In 1907 E.C Emperor Minillike-II import the first car and the historians tell that Minillike-II was the first African and black to drive a car. After the death of Minillike-II of Ethiopia Emperor Haile Sellase proceed with the initiation of road construction in organized and modern ways. In the regime of Haile Sellase many contractors formally organize to facilitate the countries road construction (AACRA, 2021).

In 1942 when the national government decides Addis Ababa city has a mayor a council to administer the city. Addis Ababa city Road construction and maintenance were established under the city administration. Due to the downfall of Imperial time, the organization's name changed to Road and building works of Addis Ababa in the period of the military regime of DERG.

After the DERG regime in 1993, the new government EPRDF establish nine regional governments and two city administrations by making them have autonomous power to administer themselves. Related to this Addis Ababa establish a bureau of "work and urban development" under the bureau a department called road construction and maintenance.

In 1998 bureau of work and urban development was replaced by Addis Ababa City Road Authority (AACRA). Which is administered by the board of director's Road-related works of Addis Ababa under the city administration. Since the establishment of AACRA, the road construction of Addis Ababa increases at an increasing rate in quality and length on the road. And it plays a significant role in Addis Ababa city development and national urbanization development; due to this fast urbanization and the increment of vehicles still Addis Ababa needs many works from Addis Ababa City Road Authority for better economic development and to achieve a standard road in the capital city of Ethiopia.

1.4. Statement of the Problem

The road network or infrastructure of Ethiopia is very low compared to the international road infrastructure network standard, (PDC, 2021). Due to poor road infrastructure, Ethiopia faces challenges on the way to eradicating poverty (Adiam.A, 2016). The Ethiopian government by accepting the impact of road infrastructure on poverty alleviation starts to invest a significant share of the annual budget allocated for road construction (PDC, 2015).

Even if the government takes it seriously the road construction projects can't perform as expected especially timely execution of projects becomes a serious challenge in Ethiopia in a similar way to other developing countries (Shambel, 2018). This serious problem affects the country's plan for a road development program and due to those socio-economic activities can't grow as the government plans. As different studies and Ethiopian road authority reports most of the road construction projects are delayed at significant time variation.

In Ethiopia, as a previous constructed road infrastructure experience tells that road construction has a big contribution to the improvement of the economic and social development of the country. Meanwhile, the road construction projects pass through different execution process to accomplish the project in this many processes there are different challenges which affects the project performance in many different ways. Related to those many different challenges several road construction project's performances are not as planned or their achievement performance is low because of the challenges.

According to (Shambel G., 2018), in their study paper, mentioned; within 10 completed rod construction projects in Addis Ababa identified cost and time overrun was at least 25 percent and the maximum overrun was more than 264 percent. Related to that as (Worku K., 2016), in Addis Ababa Road construction projects identified only 8 percent of the road construction projects are completed as their schedule the remaining 92 percent of the projects get difficult to finish as a planned. And according to the above authors, 100 percent of the projects face difficulties to finish on their planned cost. In the same way, (Assefa, 2015), identified in his study 20.66% to 500% of delays in 15 Ethiopian Road construction projects.

Because of those different problems in road construction projects, several research and findings are essential to digest and know the major challenges of road construction and it needs more study for additional findings and perspective. And this project research was planned to identify and analyze to add and or fill the current road construction major challenges in Addis Ababa. And also, this project study is conducted on the most recent challenges of road construction projects.

Therefore, it appears that the problem of performance in road construction projects is critical and should be studied more, and low performance-causing challenges should be identified and ranked to reduce this problem by identifying the significance of challenges. This study will identify the most important challenges that affect project performance and provide overviews on the subsequent effects of performance.

1.5. Research questions

The objectives of the paper interpreted to research question for a better understanding of the project study objectives or the goal of the study:

1. What are the challenges of road construction projects performance? In the case of Addis Ababa Road Authority.
2. What are the major challenges of road construction projects performance? In the case of Addis Ababa Road Authority.

1.6. Objectives of the study

1.6.1. General objective

The overall objective of this project study is to identify and analyze the main challenges which affect road construction project performance in Addis Ababa City Road Authority.

1.6.2. Specific objectives

The specific objectives of the project studies are

1. To identify the challenges of road construction project performance in cost, schedule and quality dimension. In road construction projects of Addis Ababa Road authority.

2. To rank the challenges by their significance of road construction projects performance by using RII from the perspective of clients, consultants, and contractors.

1.7. Significance of the study

The main importance of this project work is to benefit the stakeholders of road construction projects by updating and indicating the challenges that affect the performance of road construction projects, particularly in the Addis Ababa City Road authority. And its goings to help stakeholders to have a better understanding of the challenges and their effect on road construction performance problems it can lead to taking remedial measures to prevent the low performance of road projects by eliminating the challenges from the project starting stage. Meanwhile, this study paper is important because projects are dynamic from time to time-related to technological and some other constant and unexpected changes due to that this type of assessment is critical constantly every time, and time is the main pillar of projects.

1.8. Scope and limitation of the study

The project study is limited both in terms of the issues and geographic coverage. It would not cover all parts of Ethiopia due to time, cost, and addressability; so, the study would be limited to AACRA (Addis Ababa City Road Authority). And there is an expected documentation clarity problem on the AACRA side, in addition to that because of different limitations like time and cost this project study is limited in scope, complexity, and types of variables. Meanwhile, the study area is limited within Addis Ababa City Road Authority Road construction projects although in a time perspective the study done by under consideration of only projects which are started from the year 2016 G.C to present on the challenges of road construction projects under AACRA (Addis Ababa City Road Authority). And the study is limited only to assessing the challenges from the perspective of the main project stakeholders (clients, contractors, and consultants)

1.9. Organization of the study report

An overview of the research and its goals is provided in Chapter one, and a discussion of the literature reviewed in light of those goals is provided in Chapter two. The research methodology, which includes data collection and analysis methods, study approach, and study design, is discussed in detail in the third chapter. Fourth-chapter analysis of research findings is followed by recommendations in fifth-chapter conclusions. The final chapter lists all of the sources that were consulted during the research process. The appendices also include useful data and information about the thesis.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

Construction projects have different problems and requirements by themselves or nature related to that taking action and intervention for better performance of construction projects are important and experts and related agencies acknowledge the importance of using different models and research and development for construction projects to control the overrun of time, cost, and for socio-economic development. Meanwhile, for continuous performance improvement, different countries organize institutions or agencies for further studies and to control construction projects.

Road construction is one of the core industries for economic and social development. And the industry uses many laborers, heavy types of machinery, and sophisticated equipment and it consumes highly resource; due to many stakeholders like clients, contractors, consultants, users, and suppliers and regulatory the sector round different challenges.

This chapter wills presents the theoretical and empirical and conceptual framework review of the literature related to the identification and analysis of the major challenges of construction projects mainly focused on Road construction projects of urban areas.

2.2. Theoretical literature review

2.2.1. Construction project

A project is defined as a set of tasks that must be performed to achieve a specific goal. Any project is unique in a variety of ways, including the time it takes to complete it, the location where it is completed, the quality of the work, the project's budget, and other factors such as the stakeholders. According to (PMI, 2021), the time, quality, and resources of all projects are limited and are scheduled for a specific plan in time, cost, and resources. In the meantime, the plan clearly states what the projects will accomplish and defines the start to the end of the project, and serves as the blueprint for the project.

2.2.2. Classification of construction project industry

The construction industry can be classified into different categories such as by types of purpose, size, or cost how significant is the budget of the project; meanwhile, the construction industry classified into three big categories are building, infrastructure construction sector, and industrial construction sector.

Residential and non-residential housing projects for a variety of purposes, such as schools, health centers, warehouses, commercial buildings, and other associated structures, are all part of the building construction industry. Infrastructure, often known as heavy civil or heavy engineering, is a construction sector that includes highways, railways, dams, and a variety of other public and private large infrastructure projects. Energy installations, mining and quarrying, and manufacturing units are all examples of industrial construction projects. In infrastructure and industrial construction projects, the hired contractors must be well-equipped, have a lot of capacity, and have a lot of experience with such large and complex projects.

2.2.3. Construction projects management

Project management is the skill or talent of leading and managing labor, inputted resources, and equipment throughout the project period by using modern project management techniques to achieve the planned goal or objectives of time, cost, scope, and quality, as well as the clients' desires, according to the (PMI, 2021).

According to the (Kam Shadan, 2012), knowing some distinct sorts of objectives that are required to complete the project process by implementing or following a continuous operation due to resource constraints is part of construction project management. There may be tensions between the declared goal and the limitations imposed on human, material, and financial resources. To address these types of conflicts, the appropriate balance must be struck at the start of the project, or another method must be devised. The following are the functions of project management for construction, according to the PMBOK:

1. Descriptions of the Project objectives and plans, as well as scope defining, budgeting, scheduling, establishing performance requirements, and choosing project participants.

2. The effectiveness of resource utilization is maximized by preparing workers, equipment, and materials according to the project's plan.
3. The execution of those many operations must pass through appropriate and systemic management and controls during the planning, design, estimating, and contracting processes.
4. Development of effective communications and mechanisms for resolving conflicts among the various participants.

2.2.4. Construction projects and projects performance

Construction success is primarily dependent on achievement success. Many past studies on building projects have been studied. The inappropriacy of the chosen procurement mechanism was one of the main causes of the lack of performance of the construction sector (Dissanayaka Sunnil, 1999) noted. The structure of work achievement, the retroactive productivity and work quality feedback, and the impacts from up-to-date to down-to-earth phases (Reichelt Kimberly, 1999) noted three major structures underpinning the dynamic of a project's performance.

The project performance areas (Cheung Sai, 2004) pinpointed: people, cost, time, quality, safety and health, environment, satisfaction with the customer, communication. Obtained that a control system is an essential consideration in identifying factors that influence the effort of building. One or more Project Performance Indicators are needed for each of the project objectives.

2.2.5. Challenges that affect the performance of the construction project

A wide range of performance indicators can be assessed and evaluated using multiple measures (Groups) such as time, costs, quality, customer satisfaction, changes to clients, performance, safety, health, and business (Cheung S, 2004).

In his study, (Mohammed B, 2004) found the issues of construction contractor's performance failure. These include lack of work experiences, production efficiency and enhancement, the use of computer software, procurement practices, claims, company's internal problems, low competitive margin profit margin, cash flow management, equipment management, and usage, increased project number, increased size, changes in the project size.

In his study, (Abu-Shaban, 2008) outlined the parameters affecting construction project performance in various groups from his research study. The most significant considerations are cost, time and quality, productivity, customer happiness, and organizational learning.

2.2.6. Factors affecting cost and time performance

Agreeing to (Okuwoga A., 1998), cost and time execution have been distinguished as common issues within the construction industry, and (Chan Daniel, 2002) expressed that amid the development stage, many unforeseen problems and changes from the initial plan emerge, coming about in cost and time performance issues. Poor management of the site and unexpected land conditions are identified as three main factors creating delays and problems with the schedule and cost performance in local building projects, and very slow coordination and integration among stakeholders of all project teams.

Competency of the project manager; top management support; coordination and leadership skills of the project manager; participant monitoring and feedback; decision-making; coordination among involved parties; owners' competence Cost performance is influenced by a variety of elements including social, economic, and climatic situations. Under (Iyer K.C., 2005). All of the factors influencing project cost performance were evaluated as essential, but coordination among project participants was rated as the most critical. (David J., 2005) Investigated project time-cost performance linkages in construction projects using project scope parameters.

Speed management is a key issue for the competitiveness of creative companies in engineering, procurement, and construction projects, according to (Le-Hoai, 2008). Customers may regard time as a limited resource, in which case they will pressure the contractor to improve his or her time management. (Le-Hoai, 2008), used data from eight countries to identify the factors that cause schedule and expense overruns. Some of the cost-related challenges are: Poor Finance management, Inflation, Scarcity of finance, poor project management system, high cost of ROW compensation, and delay of compensation (for ROW), and others are mentioned. The challenges of schedule-related factors are inadequate early planning of the project, poor project management assistance, very loose coordination and integration among stakeholders, Design change / Variation order, Transportation and logistics problems, and environmental factors are mentioned as the main challenges of construction projects performance.

2.2.7. Road construction projects

Road construction projects fall under the category of infrastructure construction. According to (Assefa. A, 2008), road construction projects are time-bounded, meaning they are transitory and one-of-a-kind. Roads enable the human, vehicle, and animal tariff activities for a variety of objectives, including commercial, tourist, and government functions. One of the most important concerns in road construction projects or under construction roadways, particularly in urban areas, is traffic flow management.

According to the (TRB, 2011), road development in metropolitan regions is more complicated than in rural ones, and this trend is projected to continue. Due to unplanned urbanization, especially in developing nations, the difficulty is more connected to land ownership concerns (right of way) and the increase in urban population, and these are the key challenges of road construction complexity in urban regions. Other existing roads, electric poles, and water pipelines are all entangled in urban road construction projects, as are other facilities. One of the issues is shifting those infrastructures. (International road federation I. , 2010) Published a report on the state of the world's roads.

2.2.8. Challenges of road construction projects

In project management, there are fundamental approaches for planning, organizing, and administering the project to control in one center with accountability, according to the (Federation, 1996). In addition, (Keith L., 1996) described project management as the application of knowledge, skill, tools, and various strategies to meet project needs. According to (Olateju. O. I., 2011), the low performance of road construction projects is caused by a lack of project management approaches on stakeholders. According to a previous author, (International road federation, 2010), Project management has sufficient strategies to achieve the project results planned. That being said, construction projects are relatively difficult to operate as intended and the goal of complexity, uniqueness, mass workforce, working conditions, various subcontractors, and construction sector suppliers is difficult to achieve.

According to (Belassi.W, 1996), the performance of construction projects is determined by the stakeholders who are involved in the project. Project managers' abilities to delegate power, trade-off, coordinate, perceive role and responsibility, competence, and commitment are the most

important factors. The project team members' technical talents, communication skills, troubleshooting skills, and commitments are all elements to consider.

The scope of the project, the uniqueness of the project's activities, and the urgency of the project are the primary variables or obstacles of the project. Higher management support, project organizational structure, functional manager support, and project champion are all aspects of the organization or company. Meanwhile, external elements such as the political situation, the economic environment, the social environment, the technological environment, nature, the client, competitors, and subcontractors all have an impact on the success or failure of building projects. (Belassi.W, 1996)

2.2.9. Stakeholders

Any company or individual with an interest in and engagement in a particular project or business is referred to as a stakeholder. In construction projects, there are many patrons as contractors, clients, consultants, and regulatory bodies. In the construction industry related to many stakeholders, the performance of projects is poor some causes are design change, the delay of material delivery, poor communication and coordination, and poor project management skills.

2.2.10. Contractor’s performance

According to (mawangi j., 2016), construction contracts bind partners to mutual contractual and legal obligations that are difficult to change based on fiscal exchange. The project owner purchased a construction company's service to undertake on a project contract as scheduled. Customers and contractors may have conflicts of interest in the perspective of their competing interests: clients want to have more value from their projects, but contractors are trying to maximize revenues to ensure that they are sustainable for a longer period. (mawangi j., 2016).

2.2.11. Client and consultants

Many tasks and millstones on construction projects are approved by the consultant from the beginning of a project; without approval, the contractor cannot proceed to the next construction level. The primary challenges that affect the performance of construction projects from the side consultants, according to (Alaghbari, 2007), are late approval or decision making of tests and drawings

1. Design errors
2. Poor consultancy skill and knowledge
3. Lack of the desired experiences

The Owner or client-related factors and challenges in urban road construction play a significant effect on Road construction project performance. According to (Tigabu, 2015), issues of concern that affect urban road construction include the lack of a plan preceding the construction project, a lack of awareness and clarity about the project scope and stakeholders, financial issues, a lack of experience and skill, a lack of alternative roads, and late decision making on the clients' or owners' part.

2.3. Empirical literature review

2.3.1. Challenges in urban areas of developing countries

Many studies have been conducted on the issues and performance of the road construction business, with a particular focus on developing countries. According to (Mohammed B, 2004), the lack of skilled personnel, poor management and supervision, poor leadership performance, and inadequate resources and equipment are all factors that contribute to the poor performance or difficulty of construction projects. In another perspective, the incapacity of stakeholders to resolve conflicts is one of the key reasons for the poor performance of construction projects.

According to (Mohammed B, 2004), the challenges or causes of the poor performance of construction projects is lack of experience, turnover of key personnel, unsuitable project leader in the site, low labor productivity and improvement, problems on uses of project management techniques, procurement practices, claims, internal conflicts, low follow-up of owner’s, the absence of using computer applications, corruption, neglect, low margin profit due to competition, poor estimation practices, employee benefits and compensations, controlling equipment cost and usage, once taking several projects, increased size of projects, changes in the type of work, lack of managerial maturity, national economic instability, shortage of foreign currency, construction industry regulation and bad weather are the main challenges in urban areas of the list developed countries.

2.3.2. The conflict between public utility or public infrastructures

The implementation of planned road construction in urban locations has more problems than rural road construction projects, according to (Collins, 2013). The external environment of urban road construction is different from the rural environment; external factors like dense population, social, political, lobbyist, utility, and the need for speed increase the challenges in urban road construction.

According to (Mathewos, 2006), some of the factors that influence the performance of road construction projects are Addis Ababa's basic government service suppliers or utility services companies, such as water and sewerage service, electric service, and Ethio-telecom. With the collaboration of the Addis Ababa city road authority, the road construction area will be ready or available on time. And the communication between utility service providers and the Addis Ababa city Road authority is not as good as the sector requires; information exchange is poor, and there are times when information is missed. As a result of poor cooperation on relocating utility infrastructures and insufficient information, Addis Ababa's utility service is inconsistent, and it affects the performance of road construction projects in Addis Ababa city.

2.3.3. Individual property rights, compensation, and high traffic problems

Cities in developing countries are not adequately planned or constructed according to a master plan. Addis Ababa is also another Ethiopian metropolis that is still in the process of development. Addis Ababa's settlement, like that of other developing countries, is not like the city's master plan in that there are numerous challenges in the process of infrastructure development related to individual legal property rights needs of compensation for their property.

According to (Mark T., 2004), In Florida, the United States, the costs of compensation for the right-of-way acquisition are above the cost of the new road construction. Many contractors in developing countries and others do not take care at the beginning of the projects of compensating for individual properties, but the major problem is the right-of-way or legal right to private or public property. Cities in developing countries must adopt policies and strategies to address legal property rights to solve problems and maintain things running smoothly (Bingham, 2010).

Land acquisition is one of the key challenges in road construction projects in Addis Ababa. And the legal process of compensating for the acquisition of land and other property takes a long time and costs a lot of money. According to an (AACRA, 2016), this complicated process harms the performance of road construction projects administered by the Addis Ababa City Road Authority (AACRA).

When the amount of pedestrian and vehicle activity exceeds the capacity of the road infrastructure, it is referred to as high traffic activity and crowding. A large city's significant traffic activity or congestion is expected due to its large population and diverse economic activities (TRB, 2011).

During road construction projects managing traffic activity is challenging and one of the main problems; meanwhile it can be the cause of traffic jams, it reduces the activities of humans and vehicles and it can be the cause of traffic accidents. From the side of the road construction project, jamming has a significant negative effect on the construction due to the slow movement of contraction material and labor if there is no other alternative road in which traffic can divert (AACRA, 2012).

To solve the problems related to traffic actives which can affect the road construction projects and other traffic activities making alternative road-ready is important before the beginning of the project and using alternative roads are important to sustain the previous traffic activities and to make free area for the road construction project (Chotchai., 2002).

2.3.4. Contractor's associated challenges

Many studies were made related to contractors' performance and their capacity effects on the performance of construction projects. According to (Kang, 2010), he identified many challenges that came from the contractor's side some of them are poor coordination, communication problem, project planning, and scheduling difficulties, and the problems of financing the construction projects are the main challenges that come from contractors are identified in his study.

According to (mawangi j., 2016), factors affecting a contractor's ability on government construction projects a contractor faces financial difficulties, shortage of labor, many design change orders are the main challenges of contractors.

As (Owusu Tawiah, 1999), identified in his study paper mainly on affecting the performance of contractors are two. Those the identified factors are financial problems and low capacities of managerial skill or knowledge of contractors. He stated that contractors who have the problem of financial stability are difficult or deprive of access to credit and it affects their performance for a long period of years. And when they are in a low capacity of managerial skill influence contractor's performance (Biyadglign, 2017).

2.3.5. Consultants associated challenges for road construction projects

Rendering to (Kang, 2010), insufficient data collection and survey before design work, poor coordination, communication, and having inadequate experience in consulting are problems that came from the consultant's side. In addition to that (Kang, 2010), most design changes are the effect of inadequate attention of consultants in Road construction projects. (A. Assaf, 2006), Many demands for changes come from customers and contractors after the road construction project is started; this type of design error is one of the major challenges for construction project's performance on construction projects. Late decisions on the road construction projects in the city of Addis Ababa and or late approval of design documents constitute challenges. Additionally, according to (Assefa, 2015), making incomplete documents, late supervision, and late approval of documents and millstone tasks are a consultant's responsibility and a factor of low construction project performance.

When concluding the authors finding of challenges which are from the side of consultants in general design problems or errors, punctuality problem and incomplete understanding of consultants with client and contractors are the major challenges which affect road construction project performance.

2.3.6. Client related challenges on the performance of road construction

According to (Kang, 2010), identification on his study is change order by the client, delay of decision making to approve, a conflict between the co-owners of the project, late approval of sample materials, lack of their attention for the projects, and making late progress payments are major challenges as client-related factors on the performance of road construction projects. In addition to those challenges or factors change of design, inappropriate assessment on process bid for selecting contractor, not having good coordination between consultants and contractors related factors are also considered as client factors.

(Assefa, 2015), identified in his study mentioned some factors of road construction projects which are related to the client's side are the delay of clearing the project site from the claim of property right, the financial problem of client or owners, lack of coordination with other public utility or infrastructure providers, contract change or recodification are considered as client's responsibility.

2.3.7. Environmental related challenges of road construction projects

The road construction project is a complex work that needs exhaustive arranging and controlled administration all through the project time. Its advance can be influenced by parcels of reasons that come about the venture to slack behind its planned time. Rainy periods are one of the challenges in the construction sector in general, especially for road construction projects. According to (Belay. M., 2015) In the rainy season, the construction area is not appropriate and difficult for laborers, machinery, and also for construction logistics. In Addis Ababa, there is also a rainy season of three months because of the destruction of most of the roads and because of a different perspective, such as delaying times and excessive rental of machines and professional costs, this has a negative impact on road construction projects. Many construction companies claim additional time and budget in connection with these factors.

2.4. Conceptual framework

According to the literature review, the conceptual framework is a factor or challenge that influences project performance. The variables that can challenge those that affect the performance of road construction projects are time and cost overruns, stakeholder disputes or communication problems, and resource management issues, and the dependent variable is project performance.

(Cooke-Davis, 2002) Says performance predictions affect performance and success. He underlined the relevance of stakeholders in connection with the project performance to better understand the actual success components of the construction project's performance. Related to that (Slevin, 1986) are only supported by claiming to have a project if it satisfies the demands of the target audience or clients. They identify the fact that efficiency and effectiveness measurements are the aspects of success in a project. Effectiveness measures pertain to user happiness and project utilization, whereas efficiency measures point to good management and internal organizational structures (Schedule, Cost, and Specification or Quality). Moreover, only via standard, system and methodology can efficiency be realized.

The indicators of performance specify measurable evidence to show that a planned effort has achieved the desired result. Project performance, financial measures, customer satisfaction measures, and employee measures are just a few examples. Performance measurement is an input and output assessment in manufacturing or building activities. It serves as an instrument for continuous enhancement (Kureshi, 2013).

By (Kureshi, 2013), measurement method and area of measurement are divided into two categories. Measuring performance comprises technical performance, business performance, and overall performance. It also proposes that a measuring model of performance in respect of outputs and resources should be measured at different levels. The outputs are measured to determine whether they help achieve objectives (efficiency) and the resources to determine whether minimum funds are spent producing outputs (efficiency).

2.4.1. Project performance

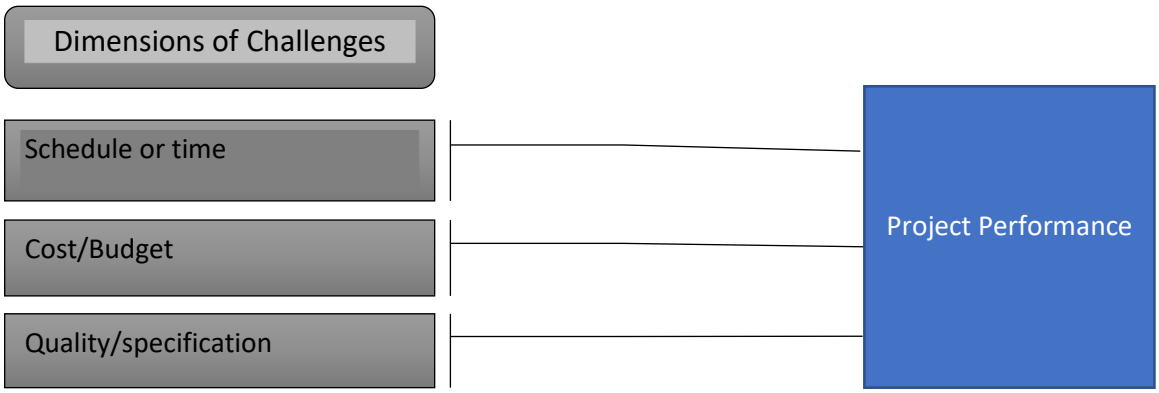
Project performance is measured in three measurements which are cost, time, and quality perspective. Project taken a toll performance is utilized to show whether the project follows to the concurred budget (Cheung S, 2004). It is significant since resources are frequently limited and cost overruns are to be avoided. Agreeing to (Kometa TS, 1996), a project with rate cost overrun over 20% is respected as a destitute project in terms of cost performance extend that lie between 10% and 20% respected as normal project, I term of cost performance, whereas project whose percentage cost overrun drop below 10% is respected as an as planned project.

Project time performance is one of the numerous challenges for project members. Time monitoring assesses the success of the project over some time following the plan arranged. As a result, schedule or time performance is calculated as a percentage increment within the actual completion period over the planned completion period. Those projects with a time- or schedule performance delay below 10 percent are considered exceptional and projects with a time- or schedule-related performance delay of 10 percent to 20 percent are considered standard projects (Kometa TS, 1996).

The performance measurement of project quality ensures that projects meet the quality standards laid down in the contract. In terms of compliance with the determination, the quality of an enterprise can be measured and this might sometimes be troublesome because it has a subjective nature.

This project study aims to inspect the challenges on the performance of road construction projects in AACRA projects; to assess and analyze or identify the major challenges of road construction and its effect on the performance of the projects. To express the conceptual framework of the study diagrammatically listed the challenges on the performance of the project and the impact or effect of challenges as discussed in the literature review part expressed as follows.

Figure; conceptual framework of the project study



Source; (Abraham. Kuma, 2019) And customized by the author

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

This research methodology chapter carries out procedures and activities of the research project; and its emphasis on the methods of data collection and techniques, questionnaire design, and the consideration of principles and ethics.

3.2. Research approach and design

3.2.1. Research approach

As mentioned in the objective part of the study, the purpose of this study was to identify and rank the major challenges in the performance of road construction projects. Due to the objective behavior, the study applied descriptive research. According to (Kothari S, 2004) the descriptive research approach is employed in this study, descriptive approach is an observational science method that focuses on the interpretation of non-numerical data. This is frequently accomplished through case studies, interviews, and personal experience, as well as observational, this sort of research focuses on why or how a phenomenon occurs rather than the frequency with which it occurs. The overall perception of attitudes, beliefs, and behavior is critical.

3.2.2. Research design

This study adopted a descriptive design of research, used to describe the attitude or the opinions of participants quantitatively or numerically in order to assess their perceived participation in the construction project. In order to assess the participants' knowledge and practice on road building projects, literature and a questionnaire survey were designed and used.

According to (Kumar, 2011), the Research design is a leading master plan of research and for different projects and case studies. It consists of schedule, financial and the whole activities of the research, every research implement or uses research design to check the accuracy of the studies, validity, and certainty; in addition to coming with acceptable results, to follow formal steps and to make their research smoothly.

Many types of research designs are used in different areas of studies as a research type and their used methodologies. Form those different research design options; the selection of research design depends on the type and area of the selected research projects; in addition, based on the purpose of the research it considers the scope of research, types of problem, data availability, the capacity and skill of researcher, time, and financial capacity (Kumar, 2011).

Every research design has different research methods usually it does collects and analyzes different types of data. That is collected in different ways like secondary data, primary data depending on the nature of the problem of the research or by nature of the research.

The research design of this research study as mentioned above uses a descriptive research design which is used to provide a quantitative or numerical description of attitude, or opinions of participants to evaluate the perception of parties involve in the construction process. And the study adopted a numerical approach for gathering data from which ideas are induced and the experiences of the stakeholders for the significance of this study. And the challenges which affect the performance of road construction projects are explored from a review of different pieces of literature. And it's focused on explaining the collected survey because the types of this project study will use cases that are not proper for the quantitative explanation; it to describe and explain the major challenges of road construction projects performance in Addis Ababa city road authority. Literature review and questionnaire survey were designed and employed to assess the knowledge and practice of participants on the challenges of road project performance.

3.3. Population and sampling

3.3.1. Target population

The study's population are the major accomplices of road development projects in Addis Ababa City, which are contractors, consultants, and client organizations in road development projects. Of these, the total number of 65 employees have worked for AACRA and the Ethiopian Construction Design and Supervision Work Corporation (ECDSWC), 47 of whom are members of AACRA's own force road construction and client (planning and contract administration) directorate experts, and 18 from the ECDSWC's supervision department, all staff members are included from the three directorates or departments.

3.3.2. Sample and sample size

By considering their closeness to the projects for the assessment to identify and analyze the major challenges which affect road construction project performance, engineers, or respondents from the targeted population group the project research is used or take all population of the three departments/directorates. On the other hand, the project study customs a deliberate sampling technique, doing intentionally for only top managers are interviewed and all employees of the three departments/directorates are filled the questionnaire. The main purpose of selecting all target population is to get relevant data from engineers who have contributed to implementing road construction projects and have experienced the challenges of project performance.

The project study selects all of 65 professionals and engineers from the targeted population group of the consultants, contractors, and AACRA on Addis Ababa City Road construction projects, which are under AACRA; who have participated in the execution process of the projects. From the three stakeholders, the respondents included in the survey consist of a total number of 65 professionals or engineers from the target population, the study has purposively distributed questionnaires to the respondents of engineers; and these responders have a direct participant in AACRA projects and therefore they are supported to the study objective. The proportion of the respondents will take from consultant's department eighteen (18) respondents, from the contractor's side (AACRA's own force construction department) twenty-five (25) respondents and the remaining twenty-two (22) respondents will be from the Clients (planning and contract administration) side (AACRA).

Category	Frequency	Percentage
Clients	22	33.85
Contractors	25	38.46
Consultants	18	27.69
Total	65	100

3.4. Data collection

In this project study, the data collection method was a primary data collection method. The data use to be collected by using a study survey through questionnaire, interview, and source documents which are client, consultant, and contractor's agreement or contract documents and other relevel progress reports are implemented for data collection. The questionnaire was distributed to contractors, clients, and consultants. Meanwhile, managers who have a direct relation with road construction projects from Addis Ababa City Road Authority are interviewed.

The questionnaire contains open and close-ended questions to identify and dig out the main challenges of road construction projects' performance in Addis Ababa. The survey questions are made based on a five-point Likert scale to identify the degree of agreement or disagreement and to identify the challenges of road construction project's severity. And each point has its weight.

3.5. Data processing and analysis

The primary data is collected in form of a questionnaire in the Likert five-point scale form and it analyzes by using the Relative Importance Index (RII) to give weight for the challenges to identify the main challenges of road construction projects in the Addis Ababa city road authority. The collected data were categorized on the same level and analyzed by using Microsoft Excel software.

And the comparative significance is measured for each questioner by using statistical techniques to positioning the components within the arranges of their significance as appear to the respondents

The challenges and impacts of construction performance are inspected and the positioning of their attributes was made by utilizing the Relative Importance Index (RII). Analysis of data comprises of calculating the Relative Importance Index (RII) and positioning of components in each category based on the outcomes about. The RII was utilized to rank the distinctive challenges. This can make a difference to decide the proportionate contribution of each variable and its incremental commitment when combined with other factors.

The relative importance index formula is given

$$RII = \frac{\sum W}{A*N}$$

Where: RII= Relative Index; W= Weighting given to each factor by the respondents (ranging from 1 - 5); A= the highest weight (i.e., 5 in this case); N= Sample size (i.e., total number of respondents).

3.6. Research instruments

The data collection method on this project study is through distributing questionnaires to the responders; appropriate open and close-ended questions will be prepared in the form of a questionnaire and it will be distributed to the selected sample of the involved personnel from the client, contractors, consultants, and another stakeholder to understand the challenges of road construction projects from different perspectives under Addis Ababa City Road Authority (AACRA).

And the survey instrument was through a questionnaire and the project study adopt a questionnaire from the previous studies. The adopted questionnaire is designed by using questions of a 5-point Likert scale; it was appropriate for collecting and capture the perception of consultants, contractors, and clients about the challenges of Road construction projects' performance level. The close-ended questions are in the form of a Likert scale and or yes or no questions. Meanwhile to include variables that might have been missed by the author to get additional perceptions and challenges of road construction projects. And the questionnaire was distributed to respondents by presenting by the person to their work area or office. And to collect and analyze the secondary data obtained by using document review to strengthen and relate the responder's perception.

The ideas of the questions are collected from the literature review and the questionnaire was also designed by consideration of the objective of the project study to know and identify challenges of road construction projects performance. And to measure the effects of the challenges the five-point Likert scale.

To prepare the questionnaire the author of the project study asks for consultation and feedbacks from engineers and professionals who are work in the area of road construction to prepare an appropriate and sound questionnaire. And the questioner classified into three sections; the first section carries general information of the respondent, the second section of the questionnaire focus on the challenges of road construction projects, and the effects of challenges on the performance of road construction projects under Addis Ababa City Road Authority. And finally, the last section consists of interview questions.

3.7. Ethical consideration

Human behavior and attitude if different from person to person and unpredictable. Any tasks that need human participation also there are ethical issues about how to respect, treat and deal with the people. So those appropriate ethical rules and principles are important in all project and research studies to manage ethical issues (Siti Roshaidai, 2018).

In this project study, the main expected ethical issues are confidentiality of data, the misinterpretation of findings, how respondents attentively fill the questionnaires. To avoid those threats the project tries to minimize by following the principles of research. In addition to that honesty, trust and reliabilities are the guidance of the project. And also, this study gains permission from the organization which is AACRA and also gives a letter that can clearly state the purpose and usage of data by assuring that the data going to be used for only study purposes. And the questionnaire responders have participated freely and voluntarily.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION

4.1.Introduction

The assessment of major challenges in the performance of Road construction projects in Addis Ababa city, this chapter presents the results of the project research based on the analysis of questionnaire and interview data. To answer the study objectives, the author gave his perspective and reflection on the topic, as well as the study participants' direct interpretations and understandings. And this chapter describes the analysis of (schedule, cost, and quality) related challenges from the perspective of responders, who are the three stakeholders (client, contractors, and consultants) involved in Addis Ababa City Road Construction Projects.

And the results and discussion of this project study contain the findings of the question directed towards identifying challenges of Road project performance and ranking them in the level of their significance or impact. In addition, based on survey results, the primary effects of challenges are analyzed and ranked.

4.2.Basic information of the responders

As stated in the tables below, the studies find out responders Characteristics and their background information to learn about the respondents', gender, age, and educational level.

4.2.1. Survey responses and responders' general characteristics

Table 1 demonstrates the respondents' organization's distribution profile in terms of type, size, and designation. It's important to note that the AACRA's force team is a contracting firm that has worked on road construction projects for the Addis Ababa City Road Authority (Client). The Ethiopian Construction Design and Supervision Work Corporation, on the other hand, is a consultancy firm of AACRA.

A total of fifty-three (53) questionnaires were returned out of the sixty-five (65) questionnaires that were sent out. Out of the returned fifty-three questionnaires (sixteen (16) from the client, twenty-one (21) from the contractors, and also sixteen (16) from the consultant) of the questionnaires sent were properly completed and returned, resulting in a return rate of 81.54 percent of the questionnaires issued that could be used for analysis. The table below summarizes the respondent's general characteristics.

Table 4.1: Characteristics of the respondents

Organization name	**Respondents' category**	**Distributed** Qr	**Returned Qr**	**Percentage (%)**
AACRA	Client	22	16	72.73
AACRA own force team	Contractor	25	21	84.00
Ethiopian Construction Design and Supervision Work Corporation	Consultant	18	16	88.89
Total		**65**	**53**	**81.54**

Source: survey data

4.2.2. Gender composition of the questionnaire and interview responders

Out of the total returned fifty-three (53) respondents, thirty-six people, or 67.92 percent, are male respondents, while seventeen people, or 32.08 percent, are female respondents, according to the assessment gender distribution from the returned surveys.

Table 4.2: Gender composition of the responders

Gender	**Number of responders**	**Percentage**
Female	17	32.08
Male	36	67.92
Total	**53**	**100**

Source: survey data

4.2.3. The educational status of respondents

The study sought to found the level of education of the respondents and the results are presented in the table below: From the total number of survey participants, eleven (11) responders have a diploma, representing 20.75 percent. A bachelor's degree was held by twenty-seven people or 50.94 percent. The remaining fifteen people have a master's degree, contributing to 28.30 percent of the total responders.

Table 4.3: Educational status of Respondents

Education level	Frequency	Percentage
Diploma	11	20.75
Degree	27	50.94
Masters and above	15	28.30
Total	**53**	**100**

Source: survey data

4.2.4. Work experience of the respondents

Respondents' percentage years of work experience shows that eight (8) which is 15.09 percent of the respondents have 1-3 years of work experience, twenty-six (26) representing 49.06 percent of the respondents have 3-8 years of work experience, and nineteen (19) or 35.85 percent of the respondents have more than eight (8) years of work experience in the Road Construction sector.

Table 4.4: Experience of respondents

Experience	Frequency	Percentage
1-3yrs	8	15.09
3-8yrs	26	49.06
Over 8yrs	19	35.85
Total	**53**	**100**

Source: survey data

In Addition to that, the interview process included one senior official from each department which means three of the total interviewee's works in a senior position. Two of the interviewees are in the Addis Ababa City Road Authority (one from AACRA own force team which is contractors and the client-side) and the rest of one interviewee is from the Ethiopian Construction Design and Supervision Work Corporation.

4.3.Respondents' perceptions

The data were analyzed using simple descriptive analysis and displayed in distinct sub-sections that corresponded to the study's objectives and the questionnaire items. The study's initial goal is to investigate the challenges of road construction project performance in Addis Ababa.

In the views of various stakeholders, which have been recognized and classified into three broad groupings. From the contractors', clients', and consultants' perspectives, these challenges were

ranked in each category based on their Relative Importance Index (RII) to road construction performance. These challenges are briefly described below:

4.3.1. Overall perspectives on challenges of road construction performance

The perspectives of all parties involved in the AACRA's road construction projects were first assessed from the overall stakeholder's outcome was computed and then each stakeholder's point of view. Based on the RII rating shown in the table below, the challenges of road project performance were explored.

Table 4.5: The ranking of all challenges from the three dimensions

Item	Group of challenges	mean	RII	rank
1	Inflation	3.60	0.72	1
2	Lack of coordination of utility services	3.42	0.68	2
3	Poor Finance management	3.38	0.68	3
4	Delay of compensation (for ROW)	3.34	0.67	4
5	Very loose coordination and integration among stakeholders	3.25	0.65	5
6	Relocation of utility services	3.11	0.62	6
7	Scarcity of finance	3.09	0.62	7
8	Design change / Variation order	3.06	0.61	8
9	Lack of alternative roads	3.04	0.61	9
10	High cost of ROW compensation	3.02	0.60	10
11	Design error	2.92	0.58	11
12	High traffic jam	2.91	0.58	12
13	Design change of the utility location	2.89	0.58	13
14	Slow decision making & tedious project approval process	2.89	0.58	13
15	Material and equipment limitation	2.79	0.56	15
16	Lack of flagman/ coordination	2.79	0.56	15
17	Transportation and logistics problems	2.75	0.55	17
18	Budget planning problem/poor cost estimation	2.70	0.54	18
19	Unable to use construction technologies	2.70	0.54	18
20	Unable to use computer software system	2.68	0.54	20

21	Lack of experience	2.66	0.53	21
22	Environmental factors	2.60	0.52	22
23	The slow movement of heavy construction equipment's	2.58	0.52	23
24	Poor project management	2.57	0.51	24
25	Lack of skilled labor and professionals	2.51	0.50	25
26	Corruption (focusing on personal benefit)	2.51	0.50	25
27	Geological factors	2.47	0.49	27

Source; survey data

Table 4.5 above shows the challenges in terms of all party's point of view. As a consequence, clients, consultants, and contractors concurred that the most top-five impactful challenges were Inflation, Lack of coordination of utility services, Poor Finance management, Delay of compensation (for ROW), and very loose coordination and integration among stakeholders' areas the main challenges of road construction performance respectively. And Relocation of utility services, Scarcity of finance, and Design change / Variation order are also assessed as prominent challenges of road construction projects on Addis Ababa City Road Construction Authority by following the above top five challenges.

Lack of alternative roads and high cost of ROW compensation are identified as important challenges as the ninth and tenth most prominent challenges, respectively. While the study finds out inflation, high cost of ROW compensation and Lack of coordination of utility services are major challenges of road construction projects performance by interview questions of the senior officials of AACRA and Ethiopian Construction Design and Supervision Work Corporation.

According to the entire data, five of the top 10 performance issues are cost-related challenges. The Lack of coordination of utility services, Relocation of utility services, And Design change / Variation order are the main schedule-related challenges that affect the performance of road construction. The three parties agreed on performance challenges. There are no quality-related challenges among the top ten challenges as a three-stakeholder response.

4.4. Challenges of road project performance from stakeholders' perspectives

It is important to compare the challenges of performance from the perspective of all parties, consultants, clients, and contractors separately. It shows the significance of challenges from different stakeholders (client, consultants, and contractures) points of view or perspective. And the challenges are ranked three-time based on the party's perspective.

In the perspective of client's inflation, Delay of compensation (for ROW), and High traffic jam are the main three challenges for the low performance of road construction projects. But not for consultants, in the consultant's perspective Delay of compensation (for ROW) is the number one challenge more than other challenges. In the contractor's perspective rank table, Inflation is listed first. Inflation, Lack of coordination of utility services, Poor Finance management are the top three difficulties respectively from the perspective of all three parties, according to the survey results.

4.4.1. Client's perspective

The results according to the study analysis of variables of the top ten client rating issues of road construction projects performance are shown in the table below. The relative importance index based on the client's point of view or perspective was used to rate the challenges. Inflation, delay in compensation (for ROW), High traffic jams, lack of coordination of utility services, and Lack of alternative roads are the top five challenges that clients face or agree, as seen in table 4.6. The efficacy of road construction projects is often hampered by Inflation.

Table 4.6: Top ten challenges ranking according to Clients'

No	**Ranked challenges on Client's perspective**	**Mean**	**RII**	**Rank**
1	Inflation	3.69	0.74	1
2	Delay of compensation (for ROW)	3.44	0.69	2
3	High traffic jam	3.38	0.68	3
4	Lack of coordination of utility services	3.38	0.68	3
5	Lack of alternative roads	3.31	0.66	5
6	Poor Finance management	3.19	0.64	6
7	Design change / Variation order	3.13	0.63	7
8	Scarcity of finance	3.06	0.61	8
9	Design error	3.06	0.61	8
10	Relocation of utility services	3.06	0.61	8

According to the study's findings, when it comes to cost-related difficulties, according to the interview question finding inflation is the most significant challenge that clients give priority. While the consultants prioritize schedule-related challenges.

4.4.2. From a consultant's perspective

The results of the study analysis of elements of the top ten consultants ranking challenges of road construction projects performance are shown in the table 4.7 below. Challenges were ranked based on RII, according to the respondent which is consultants Delay of compensation (for ROW) ranked at first place and both of Poor Finance management, and very loose coordination and integration among stakeholders are ranked in the second place as the main challenge of road construction projects performance from the consultant's perspective.

Table 4.7: Top ten challenges ranking according to consultants

no	Ranked challenges as a perspective of consultants	Mean	RII	Rank
1	Delay of compensation (for ROW)	3.38	0.68	1
2	Poor Finance management	3.00	0.60	2
3	Very loose coordination and integration among stakeholders	3.00	0.60	2
4	Inflation	2.94	0.59	4
5	Scarcity of finance	2.94	0.59	4
6	Slow decision making & tedious project approval process	2.94	0.59	4
7	Lack of experience	2.88	0.58	7
8	Lack of coordination of utility services	2.81	0.56	8
9	High cost of ROW compensation	2.75	0.55	9
10	Unable to use computer software system	2.75	0.55	9

Source; survey data

Based on the level of ranking as perceived by the consultant, Inflation, Scarcity of finance, and Slow decision making & tedious project approval process are the fourth main challenges and in the above table within the top ten challenges, the remaining four challenges are ranked the 7^{th}, 8^{th}, and 9^{th} level in the above table 4.7.

4.4.3. Contractors' perspective

According to the study finding Contractors ranked Inflation, Lack of coordination of utility services, and Poor Finance management as the first, second, and the third main challenges of road construction projects performance, and among these top three challenges two of them are cost-related challenges. The fourth and fifth major challenges which affect the performance of road construction are very loose coordination and integration among stakeholders and Design change / Variation order according to the contractor's survey data finding, below table 4.8. The top ten challenges are ranked below in the table.

Table 4.8: Top ten challenges ranking according to Contractors

No	**challenges as contractor's perspective**	**Mean**	**RII**	**Rank**
1	Inflation	4.05	0.81	1
2	Lack of coordination of utility services	3.90	0.78	2
3	Poor Finance management	3.81	0.76	3
4	Very loose coordination and integration among stakeholders	3.76	0.75	4
5	Design change / Variation order	3.52	0.70	5
6	Relocation of utility services	3.52	0.70	5
7	Design change of the utility location	3.38	0.68	7
8	Slow decision making & tedious project approval process	3.33	0.67	8
9	Scarcity of finance	3.24	0.65	9
10	High cost of ROW compensation	3.24	0.65	9
11	Delay of compensation (for ROW)	3.24	0.65	9

Source; survey data

4.4.4. Overall perspectives on the group (Cost, Schedule, and Quality) related challenges of road construction performance

It is important to compare the challenges of performance by dividing in into cost-related, schedule-related, and quality-related challenges. It shows the significance of challenges from time, cost, and quality sides. And according to stakeholder's response, the challenges are ranked by dividing into three groups as the following table 4.9:

Table 4.9: (Cost, Schedule, and Quality) related challenges of road construction performance

Item	Group of challenges	Mean	RII	Rank
A	**Cost related**			
1	Inflation	3.60	0.72	1
2	Poor Finance management	3.38	0.68	2
3	Delay of compensation (for ROW)	3.34	0.67	3
4	Scarcity of finance	3.09	0.62	4
5	High cost of ROW compensation	3.02	0.60	5
6	Design change of the utility location	2.89	0.58	6
7	Material and equipment limitation	2.79	0.56	7
8	Budget planning problem/poor cost estimation	2.70	0.54	8
B	**Schedule related**			
1	Very loose coordination and integration among stakeholders	3.25	0.65	1
2	Design change / Variation order	3.06	0.61	2
3	Lack of alternative roads	3.04	0.61	3
4	High traffic jam	2.91	0.58	4
5	Slow decision making & tedious project approval process	2.89	0.58	5
6	Lack of flagman/ coordination	2.79	0.56	6
7	Transportation and logistics problems	2.75	0.55	7
8	Unable to use computer software system	2.68	0.54	8
9	Environmental factors	2.60	0.52	9
10	The slow movement of heavy construction equipment's	2.58	0.52	10
11	Poor project management	2.57	0.51	11
C	**Quality related**			
1	Lack of coordination of utility services	3.42	0.68	1
2	Relocation of utility services	3.11	0.62	2
3	Design error	2.92	0.58	3
4	Unable to use construction technologies	2.70	0.54	4
5	Lack of experience	2.66	0.53	5
6	Lack of skilled labor and professionals	2.51	0.50	6
7	Corruption (focusing on personal benefit)	2.51	0.50	6
8	Geological factors	2.47	0.49	8

Source; survey data

According to the study finding from the perspective of all parties/stakeholders, the cost-related challenges side which is the cause of cost overrun are Inflation, Poor Finance management, and Delay of compensation (for ROW) takes place a rank of first to three respectively as a main cost-related challenge according to the study found. And when we see the schedule-related challenges which are eleven (11) challenges dig out from the literature review, the top three challenges of schedule are Very loose coordination and integration among stakeholders, Design change / Variation

order, and Lack of alternative roads are the main cause of time overrun in Addis Ababa City Road Authority, road construction projects.

On the side of quality-related challenges Lack of coordination of utility services, Relocation of utility services, and Design error are the top three challenges of quality-related challenges that affect the quality of road construction performance in the Addis Ababa City Road Authority.

4.4.5. Overall perspectives of stakeholders on effects of challenges on road construction performance

Overall viewpoints of stakeholders on impacts of challenges on road construction performance within Addis Ababa City Road Authority the study found out the major six effects of challenges on road construction projects performance. Out of those six effects of challenges, the top three effects of challenges on performance are first time overrun the send one is a cost overrun, and according to the study creating social and economic problems rated third place by following low quality. Although according to the assessment, the fifth and sixth effects of challenges are party disputes and leadership removal.

Table 4.10: Effect of challenges on performance

No	effects of challenges on performance	Mean	RII	Rank
1	Time overrun	3.92	0.78	1
2	Cost overrun	3.74	0.75	2
3	Creating social and economic problems	3.21	0.64	3
4	Low Quality	2.91	0.58	4
5	Dispute between parties	2.83	0.57	5
6	Leadership removal	2.47	0.49	6

Source; survey data

From the perspectives of consultants, clients, and contractors, the survey data collected from all parties was assessed. As seen in the table above, the effects of challenges on performance are ranked in order of importance from all perspectives. According to the results of the questionnaire survey, the three most significant consequences of challenges with their importance index values are time overrun (RII= 0.78), cost overrun (RII=0.75), and the creation of social and economic difficulties (RII=0.64), as indicated in the table. Contractors placed time overrun (RII=0.78) and cost overrun (RII=0.75) first and second, respectively, according to the survey findings, while clients and consultants scored similarly.

The main goal of this study was to identify and assess the major challenges that affect the performance of road construction projects in the Addis Ababa City Road Authority. As a result, 27 challenges issues were discovered, and a questionnaire survey was created to collect respondents' perspectives on performance issues. Finally, survey questionnaires were given to respondents (clients, consultants, and contractors) and data were analyzed. From the perspectives or viewpoints of all three stakeholders, the top 10 major challenges were determined.

In general, the key challenges of road construction project performance have been recognized in this study. In the Addis Ababa Road Authority's Road construction projects. From the perspectives of clients, consultants, and contractors, the obstacles were assessed by their importance in road construction projects using the relative importance index. And, in the case of Addis Ababa City Road Authority, the project study examined the effects of challenges on road construction project performance and ranked them according to their significance using RII.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1. Introduction

This chapter presents the conclusion of the project work findings that are presented in the previous data analysis and presentation chapter or chapter four and the recommendation of the project study, and also this chapter contains suggestions for the future project study authors.

5.2. Summary of the major findings

Challenges a literature review is used to describe the performance of road construction projects at the Addis Ababa City Road Authority. Through a literature analysis, 27 challenges to road construction project performance were identified, with the issues divided into three categories: cost, schedule, and quality-related challenges. The questionnaire forms were filled out by three primary stakeholders: 22 clients, 25 contractors, and 18 consultants. The top 10 challenges of road construction performance, according to the respondents in chapter four, are as follows.

1. Inflation (RII=0.72)
2. Lack of coordination of utility services (RII=0.68)
3. Poor Finance management (RII=0.68)
4. Delay of compensation (for ROW) (RII=0.67)
5. Very loose coordination and integration among stakeholders (RII=0.65)
6. Relocation of utility services (RII=0.62)
7. Scarcity of finance (RII=0.62)
8. Design change / Variation order (RII=0.61)
9. Lack of alternative roads (RII=0.61)
10. High cost of ROW compensation (RII=0.60)

The above top 10 challenges, according to the responses of the three stakeholders in the data analysis and presentation chapter (chapter 4), have a substantial impact on the performance of road construction projects in the Addis Ababa City Road Construction Authority. Within the top 10 challenges, most of them or half of which is five of the challenges are cost-related challenges.

In the perspective of client's inflation, Delay of compensation (for ROW), and High traffic jam are the main three challenges for the low performance of road construction projects. But not for consultants, in the consultant's perspective Delay of compensation (for ROW) is the number one challenge more than other challenges. In the contractor's perspective rank table, Inflation is listed first. Inflation, Lack of coordination of utility services, Poor Finance management are the top three difficulties of road construction performance respectively from the perspective of all three parties, according to the survey results.

This study in the previous chapter analysis part reveals the key six effects of challenges on the performance of road construction projects. The top three effects of challenges on performance are the first time overrun, the send one is a cost overrun, and according to the study, creating social and economic problems rated third place by following low quality. Party conflicts and leadership removal are the fifth and sixth outcomes of difficulties, respectively, according to the assessment.

5.3. Conclusions

Road construction industries or infrastructure help to facilitate socio-economic growth and advancement more than other sectors in developing nations, the construction sector is regarded as an important component of every economy around the world, and its importance and share of the gross domestic product are greater in developing countries than in developed countries. Investment in road transportation can have a big impact. At the macroeconomic level, increased road connectivity is linked to increased national output and per capita income. A well-developed road transportation network connects supply and demand, improving people's living conditions and facilitating socio-economic activity. By constructing infrastructure that supports the expansion of other industries. In terms of creating jobs, providing a road network, social services, infrastructure, and markets, the Road Construction industry makes a considerable contribution to the Gross Domestic Product (GDP) of those countries. In general, as mentioned in the literature part of the study Road construction industry has an impact on total economic growth, agricultural growth, urban growth, and poverty alleviation in both urban and rural areas. The energetic execution of road construction projects is what drives this sector's contribution to the national economy.

In Ethiopia, the inability to finish projects on time, on budget, and with high quality has remained a persistent issue. The main goal of this study was as stated in the objective part identify and assess the major challenges that affect the performance of road construction projects in the Addis Ababa City Road Authority. As a result, 27 challenges issues were discovered, and a questionnaire survey was created to collect respondents' perspectives on performance issues. Finally, in the data analysis and presentation chapter, respondents (clients, consultants, and contractors) were handed survey questionnaires, the data were analyzed and from the perspectives or points of view of the three stakeholders, the top ten major challenges were identified.

5.4. Recommendation

When looking at the study from the literature part to the analysis we can understand that for many years, there have been too many challenges in the performance of road construction projects, and now there are even more. This indicates that there is a deep-rooted challenge in place, and the significance of the challenges varies depending on the stakeholder, which includes clients, consultants, and contractors. The Addis Ababa City Road Construction Authority and the Addis Ababa City Administration must carefully examine all of the challenges from various perspectives or stakeholders.

According to the analysis (chapter four) part, inflation, compensation delays (for ROW), and a lack of coordination of utility services are all major road construction challenges that must be avoided or minimized for better road construction performance in the AACRA. Poor financial management and relocation of utility services were the next most prominent challenges that significantly affected road construction performance, followed by Design change / Variation order after the road was started. These challenges must be addressed using various administrative techniques and ethical measures.

As the project study finding to address the issue of funding shortages, the city Road Construction Authority must set aside sufficient funds for road construction projects. Some macroeconomic factors, such as inflation, must be factored into the budgeting system. To alleviate the lack of coordination of utility services, AACRA must collaborate with utility service providers and the city administration. Modern financial management approaches must be used in conjunction with the financial management system. The financial planning, budgeting, purchasing, and auditing practices must be free from interference. Delay of compensation for property owners to solve or to do it within a short period needs to ease the regulations and the process of legal procedures.

In general, the Addis Ababa City Road Construction Authority should assign equal weight to project challenges relating to cost, quality, and time because if there is one unsolved challenge it can create time overrun, cost overrun, or low-quality performance. The impact of a decision on one of the challenges must be carefully considered to see if it has an intended or unforeseen impact on the other restrictions. To improve the performance of road construction in Addis Ababa, the Authority must take a holistic and harmonic approach to implementation.

5.4.1. Recommendations for future studies

Generally based on this study's findings and the pieces of literature which are revised for this study it can recommend for future studies: to create ways for decreasing the challenges of construction performance, a similar study on the challenges of road construction project performance should be carried out. Separate research for a certain sort of construction project should also be carried out.

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Appendix 1

1. Clients ranking of challenges of road construction performance

No	challenges	mean	RII	rank
1	Inflation	3.69	0.74	1
2	Delay of compensation (for ROW)	3.44	0.69	2
3	High traffic jam	3.38	0.68	3
4	Lack of coordination of utility services	3.38	0.68	3
5	Lack of alternative roads	3.31	0.66	5
6	Poor Finance management	3.19	0.64	6
7	Design change / Variation order	3.13	0.63	7
8	Scarcity of finance	3.06	0.61	8
9	Design error	3.06	0.61	8
10	Relocation of utility services	3.06	0.61	8
11	High cost of ROW compensation	3.00	0.60	11
12	Transportation and logistics problems	3.00	0.60	11
13	The slow movement of heavy construction equipment's	2.81	0.56	13
14	Lack of flagman/ coordination	2.81	0.56	13
15	Very loose coordination and integration among stakeholders	2.81	0.56	13
16	Environmental factors	2.81	0.56	13
17	Budget planning problem/poor cost estimation	2.63	0.53	17
18	Geological factors	2.63	0.53	17
19	Design change of the utility location	2.56	0.51	19
20	Material and equipment limitation	2.44	0.49	20
21	Unable to use computer software system	2.44	0.49	20
22	Lack of skilled labor and professionals	2.44	0.49	20
23	Unable to use construction technologies	2.38	0.48	23
24	Lack of experience	2.31	0.46	24
25	Corruption (focusing on personal benefit)	2.31	0.46	24
26	Slow and decision making & tedious project approval process	2.25	0.45	26
27	Poor project management	1.94	0.39	27

2. Consultants ranking of challenges of road construction performance

No	road construction projects challenges	mean	RII	rank
1	Delay of compensation (for ROW)	3.38	0.68	1
2	Poor Finance management	3.00	0.60	2
3	Very loose coordination and integration among stakeholders	3.00	0.60	2
4	Inflation	2.94	0.59	4
5	Scarcity of finance	2.94	0.59	4
6	Slow and decision making & tedious project approval process	2.94	0.59	4
7	Lack of experience	2.88	0.58	7
8	Lack of coordination of utility services	2.81	0.56	8
9	High cost of ROW compensation	2.75	0.55	9
10	Unable to use computer software system	2.75	0.55	9
11	Material and equipment limitation	2.69	0.54	11
12	High traffic jam	2.69	0.54	11
13	Lack of flagman/ coordination	2.69	0.54	11
14	Unable to use construction technologies	2.69	0.54	11
15	Poor project management	2.63	0.53	15
16	Lack of skilled labor and professionals	2.63	0.53	15
17	Design error	2.63	0.53	15
18	Relocation of utility services	2.63	0.53	15
19	Design change of the utility location	2.56	0.51	19
20	Lack of alternative roads	2.56	0.51	19
21	Budget planning problem/poor cost estimation	2.50	0.50	21
22	The slow movement of heavy construction equipment’s	2.50	0.50	21
23	Transportation and logistics problems	2.50	0.50	21
24	Design change / Variation order	2.38	0.48	24
25	Environmental factors	2.38	0.48	24
26	Corruption (focusing on personal benefit)	2.31	0.46	26
27	Geological factors	2.19	0.44	27

3. Contractors ranking of challenges of road construction performance

No	challenges of road construction projects	mean	RII	rank
1	Inflation	4.05	0.81	1
2	Lack of coordination of utility services	3.90	0.78	2
3	Poor Finance management	3.81	0.76	3
4	Very loose coordination and integration among stakeholders	3.76	0.75	4
5	Design change / Variation order	3.52	0.70	5
6	Relocation of utility services	3.52	0.70	5
7	Design change of the utility location	3.38	0.68	7
8	Slow decision making & tedious project approval process	3.33	0.67	8
9	Scarcity of finance	3.24	0.65	9
10	High cost of ROW compensation	3.24	0.65	9
11	Delay of compensation (for ROW)	3.24	0.65	9
12	Lack of alternative roads	3.19	0.64	12
13	Material and equipment limitation	3.14	0.63	13
14	Design error	3.05	0.61	14
15	Poor project management	3.00	0.60	15
16	Unable to use construction technologies	2.95	0.59	16
17	Budget planning problem/poor cost estimation	2.90	0.58	17
18	Lack of flagman/ coordination	2.86	0.57	18
19	Unable to use computer software system	2.81	0.56	19
20	Corruption (focusing on personal benefit)	2.81	0.56	19
21	Transportation and logistics problems	2.76	0.55	21
22	Lack of experience	2.76	0.55	21
23	High traffic jam	2.71	0.54	23
24	Environmental factors	2.62	0.52	24
25	Geological factors	2.57	0.51	25
26	The slow movement of heavy construction equipment’s	2.48	0.50	26
27	Lack of skilled labor and professionals	2.48	0.50	26

4. Challenges of road construction by group ranking

Item	Group of challenges	mean	RII	rank
A	**Cost related**			
1	Inflation	3.60	0.72	1
2	Poor Finance management	3.38	0.68	2
3	Delay of compensation (for ROW)	3.34	0.67	3
4	Scarcity of finance	3.09	0.62	4
5	High cost of ROW compensation	3.02	0.60	5
6	Design change of the utility location	2.89	0.58	6
7	Material and equipment limitation	2.79	0.56	7
8	Budget planning problem/poor cost estimation	2.70	0.54	8
B	**Schedule related**			
1	Very loose coordination and integration among stakeholders	3.25	0.65	1
2	Design change / Variation order	3.06	0.61	2
3	Lack of alternative roads	3.04	0.61	3
4	High traffic jam	2.91	0.58	4
5	Slow decision making & tedious project approval process	2.89	0.58	5
6	Lack of flagman/ coordination	2.79	0.56	6
7	Transportation and logistics problems	2.75	0.55	7
8	Unable to use computer software system	2.68	0.54	8
9	Environmental factors	2.60	0.52	9
10	The slow movement of heavy construction equipment’s	2.58	0.52	10
11	Poor project management	2.57	0.51	11
C	**Quality related**			
1	Lack of coordination of utility services	3.42	0.68	1
2	Relocation of utility services	3.11	0.62	2
3	Design error	2.92	0.58	3
4	Unable to use construction technologies	2.70	0.54	4
5	Lack of experience	2.66	0.53	5
6	Lack of skilled labor and professionals	2.51	0.50	6
7	Corruption (focusing on personal benefit)	2.51	0.50	6
8	Geological factors	2.47	0.49	8

5. The overall stakeholders ranking of challenges

No	challenges	mean	RII	rank
1	Inflation	3.60	0.72	1
2	Lack of coordination of utility services	3.42	0.68	2
3	Poor Finance management	3.38	0.68	3
4	Delay of compensation (for ROW)	3.34	0.67	4
5	Very loose coordination and integration among stakeholders	3.25	0.65	5
6	Relocation of utility services	3.11	0.62	6
7	Scarcity of finance	3.09	0.62	7
8	Design change / Variation order	3.06	0.61	8
9	Lack of alternative roads	3.04	0.61	9
10	High cost of ROW compensation	3.02	0.60	10
11	Design error	2.92	0.58	11
12	High traffic jam	2.91	0.58	12
13	Design change of the utility location	2.89	0.58	13
14	Slow and decision making & tedious project approval process	2.89	0.58	13
15	Material and equipment limitation	2.79	0.56	15
16	Lack of flagman/ coordination	2.79	0.56	15
17	Transportation and logistics problems	2.75	0.55	17
18	Budget planning problem/poor cost estimation	2.70	0.54	18
19	Unable to use construction technologies	2.70	0.54	18
20	Unable to use computer software system	2.68	0.54	20
21	Lack of experience	2.66	0.53	21
22	Environmental factors	2.60	0.52	22
23	The slow movement of heavy construction equipment’s	2.58	0.52	23
24	Poor project management	2.57	0.51	24
25	Lack of skilled labor and professionals	2.51	0.50	25
26	Corruption (focusing on personal benefit)	2.51	0.50	25
27	Geological factors	2.47	0.49	27

6. Effect of challenges on performance

No	effects of challenges on performance	Mean	RII	Rank
1	Time overrun	3.92	0.78	1
2	Cost overrun	3.74	0.75	2
3	Creating social and economic problems	3.21	0.64	3
4	Low Quality	2.91	0.58	4
5	Dispute between parties	2.83	0.57	5
6	Leadership removal	2.47	0.49	6

Appendix 2

Research questionnaire

Dear Sir/Madam,

My name is Yishak Maeregu, a Project management student at Addis Ababa University, School of commerce in the Masters of Art program. Currently, I am conducting my project study on the topic entitled "Assessment of the major challenges in the performance of road construction projects. In the case of Addis Ababa City Road Authority, on selected Road construction projects. The overall objective of the project study is to identify and analyze the main challenges which affect road construction project performance in Addis Ababa City Road Authority. The purpose of this questionnaire is to collect relevant data for the study. The outcome of the study will be used to suggest possible solutions for the problems that will be identified while conducting the study. I would like to assure you that the information you provide will be used only for academic purposes and the information you provide will be kept confidential. Your involvement is regarded as a great input to the quality of the research results. Hence, I kindly request you to spent some of your precious time to fill the questionnaire as frank as and reasonable as possible. Your honest and thoughtful response is invaluable.

Thank you for your participation!

Sincerely yours, Yishak Maeregu

Yishakm1@gmail.com

MA. Project management

Addis Ababa University, School of Commerce

This questionnaire consists of four parts:

PART ONE: A. General Information

B. Basic questions on ongoing road construction projects.

PART TWO:

A. Identify major challenges that affecting the performance of Addis Ababa Road construction projects.

B. challenges frequently distress the road construction projects of Addis Ababa Road construction projects.

C. performance indicator questions for Addis Ababa Road construction projects.

PART THREE; Interview Questions

PART ONE

A. General Information

Please put (□) and/or fill in the blanks as appropriate

Name of Organization: _____

Type of Organization:

Client ☐ Contractor ☐ Consultant ☐

Other, please specify: _____

Current Job title in the organization/company:

Project Manager ☐ Site Engineer ☐ Project Coordinator ☐

Resident Engineer ☐ Other, please specify: _____

Years of experience of the road construction Projects in Addis Ababa:

< 3years ☐ 3-8years ☐ > 8years ☐

Gender: Male ☐ Female ☐

Level of Educational

Diploma ☐ Bacheller Degree ☐ Masters & above ☐

B. Basic information on Road Construction Project

Do you think some challenges affecting the performance of Road construction are a problem in the city of Addis Ababa?

Yes ☐ No ☐

PART TWO

A. Challenges frequently distress the road construction projects in Addis Ababa Road construction project with their factors.

Below are lists of challenges which are described generally in the above part "A" question in this part disaggregated them by categorizing (Cost, Schedule and Quality related) challenges of road construction projects. From your experience, please express/rate your opinion, the major challenges of road construction projects in Addis Ababa city. Please tick (□) the appropriate box

(5) Very High (4) High (3) Average (2) Minor (1) Never

		Rate of occurrence Challenges				
Item	**Group of challenges**	1	2	3	4	5
A	**Cost related**					
1	Poor Finance management					
2	Inflation					
3	Scarcity of finance					
4	High cost of ROW compensation					
5	Delay of compensation (for ROW)					
6	Design change of the utility location					
7	Material and equipment limitation					
8	Budget planning problem/poor cost estimation					
B	**Schedule related**					
1	Poor project management					
2	Unable to use computer software system					
3	High traffic jam					
4	The slow movement of heavy construction equipment's					
5	Lack of alternative roads					
6	Lack of flagman/ coordination					
7	Transportation and logistics problems					
8	Very loose coordination and integration among stakeholders					
9	Slow and decision making & tedious project approval process					
10	Design change / Variation order					
11	Environmental factors					
C	**Quality related**					

1	Lack of skilled labor and professionals					
2	Lack of experience					
3	Unable to use construction technologies					
4	Design error					
5	Lack of coordination of utility services					
6	Relocation of utility services					
7	Geological factors					
8	Corruption (focusing on personal benefit)					

C. Effects of Challenges in Road Construction projects performance questions for Addis Ababa Road construction projects.

Below are lists of the outcome of challenges on road construction projects with their factors? From your experience, please express/rate your opinion, the major challenges of road construction projects in Addis Ababa city. Please tick (□) the appropriate box

(5) Very High (4) High (3) Average (2) Minor (1) Never

	Challenges	Frequency/rate of occurrences				
		1	2	3	4	5
1	Cost overrun					
2	Time overrun					
3	Low Quality					
4	Dispute between parties					
5	Leadership removal					
6	Creating social and economic problems					

PART THREE

Interview Questions

Name of organization_____

1. What are the major challenges that affect the performance of road construction projects? In the case of Addis Ababa

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2. What are the effects of challenges in road construction project performance? In Addis Ababa City Road authority.

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3. What possible measures do you suggest to manage (reduce) the challenges of road construction projects in Addis Ababa? By considering the utility services conflict?

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Thank you for your cooperation!