

**THE INFLUENCE OF PROCUREMENT MANAGEMENT PRACTICES ON THE
PERFORMANCE OF ROAD INFRASTRUCTURE PROJECTS IN NAIROBI COUNTY,
KENYA**



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DECLARATION AND APPROVAL

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DEDICATION

I dedicate this research to my family, mentors and friends for their support and to individuals facing the challenges and obstacles this study seeks to address.



Mount Kenya University

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I am entirely indebted to God for His protection and direction at Mount Kenya University. I sincerely appreciate my supervisor's invaluable support, guidance, and constructive criticism, which have shaped my thoughts and improved my writing. His encouragement and expertise have been instrumental in developing this submission. I am grateful to my family and friends for their love, understanding, and unwavering support throughout this journey. Their confidence in me has been a constant source of inspiration. I also extend my appreciation to the affected parties, whose experiences motivated this study. Lastly, I acknowledge Mount Kenya University for providing the platform that made this research possible.

ABSTRACT

The effectiveness of procurement management practices significantly influences road infrastructure projects in Kenya. Despite the Public Procurement and Asset Disposal Act, inefficiencies persist, leading to cost overruns, delays, and substandard project outcomes. The Ethics and Anti-Corruption Commission estimates an annual loss of KSh 100 billion due to corrupt procurement practices, exacerbating resource wastage and hindering infrastructure development. This study examines the impact of procurement management practices on road project performance in Nairobi County, addressing procurement risk management, open contracting, procurement audits, and supplier performance management. The purpose of the study was to evaluate how procurement management practices affect road project outcomes. The study applied a descriptive survey design targeting 140 procurement professionals with a sample size of 104 involved in public road projects conducted between 2019 and 2024. Primary data was collected using structured questionnaires, and both descriptive and inferential statistics were employed in analysis. Descriptive results showed that 50% of respondents consistently identify risks, while 60% rate their risk assessment practices as effective. Yet, only 20% conduct monthly risk monitoring, indicating gaps in proactive procurement risk governance. Mean scores for strategies like supplier diversification ($\bar{x} = 2.33$) and compliance audits ($\bar{x} = 2.48$) suggest moderate adoption across organizations. In terms of open contracting, 60% of respondents reported transparent procurement processes, 66% confirmed active stakeholder engagement, and 40% utilized electronic procurement platforms. For procurement audits, 65% of organizations conducted regular audits, and 65% rated their fraud detection systems as effective or highly effective. On supplier performance management, 72% of respondents rated their systems as effective, with 80% using key performance indicators and 65% relying on supplier scorecards. Regression analysis revealed that procurement risk management practices significantly affect project outcomes: risk identification ($\beta = 0.312$, $p = 0.000$), risk assessment ($\beta = 0.265$, $p = 0.005$), and risk mitigation ($\beta = 0.229$, $p = 0.002$) were strong predictors of project cost and time efficiency. Similarly, open contracting variables transparency ($\beta = 0.318$, $p = 0.001$), stakeholder engagement ($\beta = 0.277$, $p = 0.004$), and standardized data formats ($\beta = 0.243$, $p = 0.006$) had a significant impact on procurement accountability. Audit practices also influenced outcomes positively, with implementation of recommendations ($\beta = 0.311$, $p = 0.000$) and fraud detection measures ($\beta = 0.289$, $p = 0.002$) being particularly effective. Supplier performance strategies showed the strongest effect on project success, with performance management ($\beta = 0.319$, $p = 0.000$) and risk assessments ($\beta = 0.276$, $p = 0.003$) correlating with improved efficiency. The study offers practical recommendations for enhancing procurement governance, including investment in digital procurement tools, consistent audit practices, and supplier relationship management. Findings

contribute to policy and scholarly discourse by contextualizing Transparency and Risk Management theories within Kenya’s infrastructure sector and by offering actionable insights for sustainable, accountable, and cost-effective public procurement practices.

Table of Contents

DECLARATION AND APPROVAL	II
DEDICATION	III
ACKNOWLEDGEMENT	IV
ABSTRACT	V
LIST OF FIGURES	XII
LIST OF TABLES	XIII
LIST OF ABBREVIATIONS AND ACRONYMS	XIV
CHAPTER ONE: INTRODUCTION	15
1.1 Background of the study	15
1.2 Statement of the Problem.....	22
1.3 Purpose of the study.....	23
1.4 Specific Objectives	23
1.5 Hypothesis	23
1.6 Significance of the Study.....	24
1.7 Scope of the study	25

1.8 Limitations of the Study	26
1.9 Delimitations of the Study	27
1.10 Assumptions of the Study	29
1.11 Operational Definition of Terms	30
CHAPTER TWO: LITERATURE REVIEW	33
2.0 Introduction	33
2.1 Empirical Review	34
2.1.1 Procurement Risk Management Practices and the Performance of Road Infrastructure Projects	34
2.1.2 Open Contracting and the Performance of Road Infrastructure Projects	36
2.1.3 Procurement Audits and the Performance of Road Infrastructure Projects	39
2.1.4 Supplier Performance Management and the Performance of Road Infrastructure Projects	41
2.1.5 Performance of road infrastructure projects in Nairobi County	43
2.2 Theoretical Literature	45
2.2.1 Risk Management Theory	45
2.2.2 Transparency Theory	47
2.2.3 Agency Theory	48
2.2.4 Resource-Based View (RBV) Theory	49
2.3 Conceptual Framework.....	50

2.3.1 Recap of the literature review.....	53
2.4 Research gap.....	55
CHAPTER THREE: RESEARCH METHODOLOGY	57
3.0 Introduction	57
3.1 Research methodology	57
3.2 Research Design	59
3.3 Location of the study	59
3.4 Target population	60
3.5 Sampling Procedure and Technique	63
3.6 Sample population	65
3.7 Research instruments.....	67
3.8 Testing for validity and reliability/trustworthiness.....	68
3.8.1 Validity.....	69
3.8.2 Reliability	70
3.9 Data Collection Methods and Procedures	70
3.10 Data Analysis Techniques and Procedures	72
3.11 Ethical Considerations.....	75
CHAPTER FOUR: RESEARCH FINDINGS, ANALYSIS AND PRESENTATION	77
4.0 Introduction	77
Response Rate	77

4.1 Demographic Information	78
4.1.1 Age of Respondents	78
4.1.2 Gender of Respondents.....	80
4.1.5 Distribution of Level of Education of Respondents	83
4.2 Procurement Risk Management Practices	84
4.2.1 <i>Descriptive Statistics</i>	84
4.2.1.1 Frequency of Risk Identification in Procurement Activities	84
4.2.1.2 Effectiveness of Risk Assessment Practices	87
4.2.1.3 Availability of Risk Mitigation Strategies	89
4.2.1.4 Frequency of Risk Monitoring and Review	91
4.2.1.5 Common Challenges Encountered in Procurement Risk Management.....	94
4.2.2 <i>Regression Analysis of Procurement Risk Management Practices</i>	95
4.3 Open Contracting	99
4.3.1 <i>Descriptive Statistics</i>	99
4.3.1.1 Transparency of Procurement Processes	99
4.3.1.2 Stakeholder Engagement in the Contracting Process	100
4.3.1.3 Use of Standardised Data Formats for Procurement Information	101
4.3.1.4 Availability of Feedback Mechanisms for Stakeholders	103
4.3.1.5 Effectiveness of Open Contracting Initiatives.....	103
4.3.2 <i>Regression Analysis of Open Contracting Practices</i>	105

4.4 Procurement Audits	108
4.4.1 <i>Descriptive Statistics</i>	108
4.4.1.1 Frequency of Procurement Compliance Audits.....	108
4.4.1.2 Effectiveness of Fraud Detection Measures	109
4.4.1.3 Implementation of Audit Recommendations.....	110
4.4.1.4 Frequency of Performance Evaluations in Procurement	111
4.4.1.5 Contribution of Procurement Audits to Efficiency and Transparency	112
4.4.2 <i>Regression Analysis of Procurement Audit Practices</i>	112
4.5 Supplier Performance Management	115
4.5.1 <i>Descriptive Statistics</i>	115
4.5.1.1 Use of Supplier Performance Evaluation Tools.....	115
4.5.1.2 Overall Quality of Supplier Relationships	116
4.5.1.3 Continuous Improvement Measures in Supplier Performance.....	118
4.5.1.4 Frequency of Supplier Risk Assessments.....	119
4.5.1.5 Effectiveness of Supplier Performance Management Strategies.....	120
4.5.2 <i>Regression Analysis of Supplier Performance Management Practices</i>	121
4.6 Project Performance	124
4.6.1 <i>Descriptive Statistics</i>	124
4.6.1.1 Overall Performance of Road Infrastructure Projects	125
4.6.1.2 Adherence to Budgets and Timelines	125

4.6.1.3 Project Completion within Time and Budget	127
4.6.1.4 Satisfaction of Project Beneficiaries.....	127
4.6.1.5 Key Factors Influencing Project Performance.....	129
4.6.2 Regression Analysis of Factors Influencing Project Performance.....	130
4.6 Summary of the study Findings.....	132
CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS	
.....	135
5.0 Introduction	135
5.1 Summary of Findings	135
5.1.1 Influence of Procurement Risk Management Practices on Performance of Road Infrastructure Projects.....	135
5.1.2 Influence of Open Contracting on Performance of Road Infrastructure Projects	136
5.1.3 Influence of Procurement Audits on Performance of Road Infrastructure Projects ...	137
5.1.4 Influence of Supplier Performance Management on Performance of Road Infrastructure Projects	138
5.2 Conclusion.....	138
5.3 Recommendations	140
i) Recommendations for Authorities (Government Agencies and Regulators):.....	140
ii) Recommendations for Service Users and Project Beneficiaries:.....	140
iii) Recommendations for Other Stakeholders (Donors, NGOs, and Private Sector):	141

5.4 Areas for Further Studies	141
REFERENCES	142
APPENDICES	149

LIST OF FIGURES

Figure 1: Conceptual Framework on the Influence of Procurement Management Practices on Organisational Performance	52
Figure 2: Age Distribution of Respondents	79
Figure 3: Gender of Respondents	80
Figure 4: Position/Role in Procurement-related activities of Respondents	81
Figure 5: Distribution of Level of Education of Respondents	83
Figure 6: Frequency of Risk Identification in Procurement Activities	85
Figure 7: Frequency of Risk Monitoring and Review	92
Figure 8: Transparency of Procurement Processes	99
Figure 9: Use of Standardised Data Formats for Procurement Information	102
Figure 10: Frequency of performance evaluations in procurement	104
Figure 11: Overall Quality of Supplier Relationships	117
Figure 12: Frequency of Supplier Risk Assessments	118
Figure 13: Key factors influencing project performance	120

LIST OF TABLES

Table 1: <i>Distribution of Target Population by Professional Category</i>	Error! Bookmark not defined.
Table 2: <i>Sample size Distribution per stratum</i>	Error! Bookmark not defined.
Table 3: <i>Years of experience in procurement</i>	82
Table 4: <i>Effectiveness of Risk Assessment Practices</i>	87
Table 5: <i>Mean Standard Deviation on Availability of Risk Mitigation Strategies</i>	89
Table 6: <i>Regression Analysis of Procurement Risk Management Practices and Project Performance</i>	96
Table 7: <i>Stakeholder Engagement in the Contracting Process</i>	100
Table 8: <i>Effectiveness of Open Contracting Initiatives</i>	104
Table 9: <i>Regression Analysis of Open Contracting Practices and Procurement Outcomes</i>	106
Table 10: <i>Frequency of Procurement Compliance Audits</i>	108
Table 11: <i>Effectiveness of Fraud Detection Measures</i>	109
Table 12: <i>Implementation of Audit Recommendations</i>	110
Table 13: <i>Regression Analysis of Procurement Audit Practices and Procurement Outcomes</i> ...	113
Table 14: <i>Supplier Performance Evaluation Tools</i>	115
Table 15: <i>Measures for Continuous Improvement in Supplier Performance</i>	118
Table 16: <i>Effectiveness of Supplier Performance Management Strategies</i>	121
Table 17: <i>Regression Analysis of Supplier Performance Practices and Procurement Outcomes</i>	122
Table 18: <i>Overall Performance of Road Infrastructure Projects</i>	125
Table 19: <i>Adherence to Budgets and Timelines</i>	126
Table 20: <i>Project Completion within Time and Budget</i>	127
Table 21: <i>Satisfaction of Project Beneficiaries</i>	128
Table 22: <i>Regression Analysis of Factors Affecting Project Performance</i>	130

LIST OF ABBREVIATIONS AND ACRONYMS

<u>Acronyms</u>	<u>Full Form</u>
EACC	Ethics and Anti-Corruption Commission
KeNHA	Kenya National Highways Authority
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
KPIs	Key Performance Indicators
PPADA	Public Procurement and Asset Disposal Act
PPP	Public-Private Partnership

CHAPTER ONE: INTRODUCTION

1.0 INTRODUCTION

This chapter has provided a comprehensive introduction to the study by presenting the background of procurement management practices and their impact on road infrastructure project performance from global, regional, and local perspectives. It has clearly articulated the statement of the problem that necessitated the research. Furthermore, the chapter has outlined the general objective and specific objectives that directed the investigation. The hypotheses that were tested have also been stated to establish the relationships under study. Additionally, the scope within which the study was conducted has been defined, along with the significance of the research to relevant stakeholders. Lastly, the chapter has acknowledged the limitations that were encountered during the research process. Collectively, these components have established a solid foundation for understanding how procurement management practices have influenced the performance of road infrastructure projects in Nairobi County.

1.1 Background of the study

Road infrastructure projects have been critical to economic development and social progress globally, regionally, and locally. They have facilitated trade, mobility, and access to necessary services as the backbone of transportation networks. However, major obstacles have been encountered in the performance of road infrastructure projects in recent years. According to Vivien et al. (2023), up to 40% of road projects in developing nations have gone above their original budgets, and 30% have experienced delays. These inefficiencies have not only hindered economic advancement but have also exacerbated issues such as traffic congestion and environmental degradation.

In Kenya, the situation has not been different. Road infrastructure has been vital for connecting rural areas to urban centres and enhancing access to markets, education, and healthcare. KeNHA has reported that over 70% of freight transport in the country has occurred via roadways (KeNHA, 2022). Despite this reliance on road networks, many projects have suffered from poor planning, inadequate funding, and corruption. A study by Munene (2017) has revealed that poor procurement procedures and management have caused delays in almost 60% of Kenya's road development projects. The importance of effective procurement management in road infrastructure projects has been strongly emphasized. Proper procurement practices have ensured that resources were allocated efficiently, contracts awarded transparently, and project timelines adhered to. Research has indicated that organizations implementing robust procurement strategies have enhanced project performance by up to 25% (Nebert et al., 2024). This has been particularly important in a context where public funds are limited and accountability has been paramount.

Furthermore, the economic implications of successful road infrastructure projects have been profound. The African Development Bank (2020) has estimated that every dollar invested in road infrastructure has yielded \$4 in economic returns through increased productivity and reduced transportation costs. Conversely, poorly managed projects have led to significant financial losses and missed opportunities for economic development.

Globally, procurement management practices have evolved significantly, becoming a strategic component in enhancing project performance across various sectors, particularly in infrastructure development. The adoption and regulation of public procurement have gained momentum, with governments implementing systems to manage public expenditures effectively. According to the (European Union, 2020), the widespread regulation of public procurement has led to notable

benefits, including cost reductions and improved quality of goods and services, thereby enhancing overall value for money.

In the United States, procurement practices are governed by the Federal Acquisition Regulation (FAR), which emphasizes competitive bidding and transparency. The (U.S. Government Accountability Office (GAO), 2020) reported that effective procurement practices can lead to a 15% reduction in project costs, demonstrating the financial benefits of strategic procurement. Furthermore, a survey by Ivalua indicated that 73% of procurement executives believe their department's objectives align with their companies' global goals, highlighting the strategic importance of procurement in achieving corporate objectives (Georgia, 2022).

In Europe, the focus of governmental procurement has shifted to sustainability and innovation. The (European Union, 2023) found that effective procurement practices can improve project efficiency by up to 25%, with an emphasis on transparency and competition among suppliers. Additionally, e-procurement programs have been shown to streamline processes and reduce costs significantly.

In Asia, (Corey et al., 2023) argue that countries like Japan and South Korea have adopted advanced procurement methodologies, such as Lean and Agile practices, which enhance project performance by increasing productivity and decreasing waste. Research indicates that these methodologies can lead to a 30% improvement in project outcomes.

The strategic importance of procurement management practices is evident across various global contexts, where effective procurement not only reduces costs but also enhances project quality and delivery timelines. The integration of innovative practices and technologies continues to shape the

future of procurement, making it a critical factor in the success of infrastructure projects worldwide.

In the African context, procurement management practices have been widely acknowledged as key determinants of the performance of public sector infrastructure projects. African countries have consistently allocated a significant share of their national budgets, approximately 17% of GDP—towards public procurement activities (Elmas et al., 2023), underscoring the sector’s centrality in achieving economic development and public service delivery goals. However, despite this considerable investment, challenges such as systemic inefficiencies, weak institutional frameworks, procurement-related corruption, and limited professional capacity have continued to impede the effective execution of public infrastructure projects.

Across the continent, various countries have embarked on procurement reform initiatives aimed at addressing these persistent bottlenecks. In South Africa, for instance, procurement reforms initiated in 1995 were designed to transform a historically discriminatory system into one that promotes transparency, fairness, and socioeconomic equity. These reforms led to the constitutional entrenchment of procurement principles and the establishment of a regulated public procurement system grounded in openness and competitiveness (Intaher & Johanna, 2012). Despite these strides, the country has continued to grapple with implementation challenges, particularly in enforcing procurement legislation and ensuring accountability at the municipal and departmental levels.

In the East African region, Rwanda has been globally recognized for its pioneering use of e-procurement systems to enhance transparency and operational efficiency. The government operationalized the Umucyo E-Procurement System under the Rwanda Public Procurement Authority (RPPA), which has improved visibility across the procurement cycle, reduced

procurement lead times, and minimized opportunities for corruption. These reforms have contributed to notable improvements in project cost control and timely execution of public works, especially in the road infrastructure sector.

Tanzania has similarly undertaken significant procurement reforms, primarily through the establishment of the Public Procurement Regulatory Authority (PPRA), which provides oversight, monitors compliance, and disseminates best practices across public institutions. However, procurement audits have revealed recurring issues such as low bidder participation, weak contract management, and delays in supplier payments, all of which adversely affected infrastructure project performance. To mitigate these challenges, Tanzania has increasingly focused on capacity-building programs and introduced performance-based procurement models to improve procurement outcomes.

A critical barrier identified across many African countries is the lack of technical and institutional capacity among procurement practitioners. According to the African Development Bank (2020), most African governments have underinvested in procurement professionalization, leading to widespread inefficiencies in planning, contract administration, and supplier performance monitoring. Kudzanai & Reward (2023) further emphasized that inadequate human capital in procurement units remains a central constraint to achieving value-for-money outcomes in infrastructure projects.

Moreover, corruption in public procurement continues to undermine infrastructure delivery in Africa. Transparency International (2021) estimated that the continent loses approximately \$50 billion annually due to procurement-related corruption. Such losses are often linked to non-competitive bidding, collusion, bribery, and weak enforcement mechanisms. The adoption of digital procurement platforms, coupled with real-time monitoring and civil society engagement,

has been identified as a promising strategy to reduce leakages and enhance accountability (Rono, 2017).

Regional collaboration through platforms such as the African Public Procurement Network (APPN) has played an instrumental role in fostering policy harmonization, benchmarking performance, and facilitating knowledge exchange. The APPN, supported by multilateral partners, has enabled peer learning and regional standardization of procurement practices aligned with UNCITRAL Model Law and OECD-DAC guidelines, ultimately strengthening procurement systems across member states (Elmas et al., 2023).

In Kenya, these practices significantly influence infrastructure projects performance, particularly, the public sector. The regulatory framework governing procurement, primarily the Public Procurement and Asset Disposal Act (PPADA) (GoK, 2022) aims to enhance transparency, accountability, and effectiveness of public procurement procedures. However, despite these regulations, challenges persist that affect project outcomes.

The PPADA establishes guidelines for public procurement, mandating competitive bidding and utilising programs for e-procurement to streamline processes. According to (Nyajowi et al., 2024), effective implementation of these regulations is crucial for achieving value for money in public projects. Their study discovered that the planning of procurement and supplier sourcing positively impact project performance by improving efficiency by approximately 30%.

Electronic procurement systems have also been pragmatic in slashing costs, an example of 25% in transaction, facilitating better supplier relationships and more efficient project execution (Nyajowi et al., 2024).

Despite the existence of a robust regulatory framework, several challenges hinder effective procurement management in Kenya. Corruption remains a significant barrier, with the Ethics and Anti-Corruption Commission (EACC) reporting that approximately KSh 100 billion (about \$1 billion) is lost annually due to corrupt practices in public procurement (EACC, 2024). This not only affects project budgets but also erodes public trust in government institutions. Furthermore, a study (Munene, 2017) indicates that 60% of listed Nairobi-based construction companies struggle with inadequate training and capacity among procurement personnel. The lack of skilled professionals leads to inefficiencies in procurement processes, resulting in delays of up to 40% on average for many projects. The study emphasizes the need for continuous training and capacity-building initiatives to enhance the skills of procurement officials.

Procurement management practices impact on project performance is evident across various case studies across Kenya. For instance, research conducted by (Nyajowi et al., 2024) on petroleum firms in Nairobi unearthed improvement in operational efficiency and project delivery timelines by approximately 20% provided better strategies. Similarly, a study focused on road construction projects in Homa Bay County revealed that effective procurement planning and supplier management are critical determinants of project success, with projects completed on time increasing from 50% to 75% when best practices are followed (Nyajowi et al., 2024). Moreover, procurement-technology integration has shown promising results. Electronic procurement is linked to improved transparency, with a reported 35% reduction in procurement-related disputes, facilitating better supplier relationships and more efficient project execution (Kiarie, 2020).

This section presents a detailed examination of the key determinants influencing procurement efficiency and the overall performance of road infrastructure projects. The variables discussed, procurement risk management practices, open contracting, procurement audits, and supplier

performance management; are critically analysed, alongside their respective indicators, to establish a comprehensive understanding of their roles in enhancing project outcomes

1.2 Statement of the Problem

The desired state for Kenya's road infrastructure projects has been the effective implementation of procurement management practices that ensure timely project completion, cost control, quality outcomes, and transparency. Ideally, procurement processes are streamlined, risk-managed, supported by well-trained personnel, and reinforced by modern e-procurement systems to uphold accountability and promote efficient resource utilization. Achieving this state would foster sustainable infrastructure development, economic growth, and public trust.

However, despite the existence of a comprehensive legal and regulatory framework—most notably the Public Procurement and Asset Disposal Act (GoK, 2022)—the performance of road infrastructure projects in Kenya has remained suboptimal. Persistent challenges such as cost overruns, project delays, poor-quality outputs, and widespread corruption have continued to undermine project success. The Ethics and Anti-Corruption Commission (EACC, 2024) estimated that approximately KSh 100 billion was lost annually to corrupt procurement practices, exacerbating resource wastage and hindering infrastructure development. Additionally, only a minority of projects had incorporated structured risk management strategies (Rono, 2017), while e-procurement adoption remained limited (Kiarie, 2020), despite their critical roles in enhancing procurement effectiveness.

Between these two states lies a significant gap: the inefficiency and ineffectiveness of procurement management practices that adversely affected the performance of road infrastructure projects. Specifically, empirical evidence regarding how procurement risk management, e-procurement adoption, capacity building, procurement planning, and corruption impacted project outcomes had

been insufficiently explored. Capacity deficiencies among procurement personnel contributed substantially to delays and cost escalations, with Munene (2017) reporting average project delays of 40% linked to inadequate training. Similarly, although improved procurement planning had been associated with increased on-time completion rates (Nyajowi et al., 2024), the bottlenecks limiting its effectiveness were not fully investigated. Moreover, while corruption's financial toll was acknowledged, its direct effects on project cost, quality, and timelines lacked detailed empirical analysis.

1.3 Purpose of the study

This study aimed to assess how procurement management practices influenced the performance of road infrastructure projects in Nairobi County, Kenya

1.4 Specific Objectives

1. To assess the influence of procurement risk management practices on the performance of road infrastructure projects in Nairobi County.
2. To evaluate the influence of open contracting on the performance of road infrastructure projects in Nairobi County.
3. To examine the influence of procurement audits on the performance of road infrastructure projects in Nairobi County.
4. To analyze the influence of supplier performance management on the performance of road infrastructure projects in Nairobi County.

1.5 Hypothesis

H₀₁: There is no significant relationship between procurement risk management practices and the performance of road infrastructure projects in Nairobi County.

H₀₂: There is no significant relationship between open contracting and the performance of road infrastructure projects in Nairobi County.

H₀₃: There is no significant relationship between procurement audits and the performance of road infrastructure projects in Nairobi County.

H₀₄: There is no significant relationship between supplier performance management and the performance of road infrastructure projects in Nairobi County.

1.6 Significance of the Study

This study provides valuable insights that contributed to enhancing project performance in Nairobi's road infrastructure sector. By examining procurement management practices, it has generated data-driven findings that have been used to refine procurement strategies, ensuring better budget adherence, timely project completion, and improved infrastructure quality.

The study has served as a critical resource for policymakers in Kenya by offering evidence-based recommendations to strengthen procurement policies. By establishing the connection between procurement procedures and project performance, the research has supported the development of policies that promote transparency, accountability, and efficiency in public procurement. Strengthening these policies has helped curb cost overruns, delays, and substandard project delivery, ultimately leading to more effective and sustainable infrastructure development.

Additionally, the study has offered practical recommendations for procurement managers, construction practitioners, and industry professionals. By addressing gaps identified in previous studies, this research has expanded the body of knowledge on procurement management and equipped professionals with actionable strategies to improve procurement efficiency in public infrastructure projects.

Beyond its contributions to academia and industry, this study has aligned with broader sustainable development goals. Efficient procurement practices have optimized resource allocation, enhanced project execution, and maximized the impact of public infrastructure investments. By improving the effectiveness of procurement in road infrastructure projects, the study has supported economic growth, social development, and improved service delivery—ultimately benefiting communities through safer, more reliable, and well-maintained roads.

1.7 Scope of the study

This study was confined to Nairobi County, with a particular focus on road infrastructure projects executed by public sector entities. The research investigated four key procurement management practices: risk management, open contracting, procurement audits, and supplier performance management. These practices were selected due to their central role in improving procurement performance, minimizing inefficiencies, and addressing critical issues such as cost overruns, delays, inadequate transparency, and substandard supplier delivery.

The time scope of the study spanned a five-year period from 2019 to 2024. This timeframe was chosen to capture recent procurement trends, policy shifts, implementation practices, and outcomes across multiple planning and execution cycles in public infrastructure development. It provided a sufficient longitudinal perspective to assess procurement performance and challenges within the selected timeframe.

In terms of theoretical scope, the study was anchored on four key theories: The Procurement Risk Management Theory helped examine how risks are identified and mitigated to improve project outcomes. Agency Theory explained challenges arising from the relationship between principals and agents, highlighting issues like information asymmetry and misaligned interests that affect procurement efficiency. The Resource-Based View Theory emphasized the importance of internal

organizational resources, such as skilled personnel and effective systems, in achieving project success. Finally, Transparency Theory provided a framework for understanding how openness and disclosure through practices like open contracting reduce corruption and enhance accountability. Together, these theories supported a comprehensive evaluation of procurement practices and their impact on project performance.

The scope has provided valuable insights into procurement management practices within Nairobi County's road infrastructure projects over the past five years. By applying procurement risk management theory, agency theory, resource-based view theory, and transparency theory, it has deepened understanding of how these frameworks have shaped project outcomes. The findings have enhanced the knowledge base on procurement inefficiencies and have informed policy and practice improvements that have strengthened procurement processes, increased transparency, and promoted accountability. These contributions have supported more effective project delivery, optimal use of resources, and sustainable development in the public infrastructure sector

1.8 Limitations of the Study

Despite its potential contributions, this study was subject to several limitations that may have affected the scope, generalizability, and accuracy of its findings.

Firstly, the sample size posed a limitation, as the relatively small number of participants did not fully capture the diverse procurement challenges across all road infrastructure projects in Nairobi County. While efforts were made to ensure a representative sample, the findings may not be universally applicable to other counties or national-level infrastructure projects.

Secondly, the study relied on self-reported data, which may have introduced response bias. Some participants may have provided socially desirable responses or inaccurate information regarding procurement practices, risk management, transparency measures, and compliance levels. To

mitigate this, the study employed triangulation by incorporating secondary data sources, official reports, and procurement records to validate the responses.

Additionally, resource constraints affected the depth of data collection. Limited access to detailed procurement records, financial statements, and audit reports restricted the ability to comprehensively analyze long-term project performance trends. Bureaucratic hurdles and confidentiality policies within government procurement agencies further limited access to critical information, reducing the richness of the data.

Moreover, external factors such as political interference, economic fluctuations, and evolving regulatory frameworks influenced procurement outcomes, yet remained beyond the study's control. Although the research provided insights into procurement inefficiencies, it did not fully account for sudden policy changes or macroeconomic shifts that may have impacted infrastructure projects.

Lastly, the study's focus on Nairobi County limited its geographical applicability. Procurement challenges and project performance varied across different counties due to differences in governance, budget allocations, and stakeholder engagement. While the findings offered valuable insights, further research is recommended to validate the results in other regions and enhance the generalizability of the recommendations.

1.9 Delimitations of the Study

This study has been specifically confined to road infrastructure projects implemented within Nairobi County under the management of public sector institutions. Projects from the private sector and those from other counties have been deliberately excluded to ensure a clear, focused, and manageable research scope. The choice of Nairobi County has been informed by the high

concentration of road infrastructure projects, the strategic importance of the county in national development, and the availability of procurement and project performance data.

The study has examined four key procurement management practices—procurement risk management, open contracting, procurement audits, and supplier performance management—identified through literature and expert validation as the most impactful on road project performance. This narrowed focus has enabled a more rigorous analysis of the relationship between these procurement practices and the performance of public road infrastructure projects.

A five-year timeframe, covering the period from 2019 to 2024, has been adopted to provide a current and relevant dataset while ensuring the feasibility of data access and analysis. This period has been sufficient to capture recent trends, policy developments, and practical outcomes within the procurement and infrastructure sectors in Kenya.

The study has also been anchored on a selected set of theoretical frameworks, including the Procurement Risk Management Theory, Agency Theory, Resource-Based View Theory, and Transparency Theory. These theories have provided appropriate lenses for interpreting the influence of procurement practices on project performance. However, the exclusion of other potentially relevant theories has been necessary to maintain theoretical clarity and alignment with the study objectives.

While these delimitations have allowed the research to be both focused and context-specific, they have also implied that the findings may not be generalizable beyond public road infrastructure projects in Nairobi County. Variations in governance structures, resource allocation, and policy implementation in other counties or sectors may yield different outcomes, necessitating further research for broader applicability.

1.10 Assumptions of the Study

This study has assumed that all respondents have provided truthful, accurate, and comprehensive information regarding procurement management practices, risk mitigation strategies, transparency measures, and overall project performance within Nairobi County's road infrastructure projects. It has depended on the integrity and reliability of self-reported data, recognizing that such data can be subject to recall bias or social desirability, but trusting that the respondents have reflected their actual experiences and practices.

The research has assumed that secondary data sources used in the study, including official procurement documents, audit reports, government records, and published reports, have been authentic, accurate, and sufficiently detailed. These sources have been instrumental in validating and complementing primary data collected through surveys and interviews, thereby enhancing the study's overall credibility.

Furthermore, the study has assumed that the theoretical frameworks selected — namely procurement risk management theory, agency theory, resource-based view theory, and transparency theory, have been appropriate and effective in explaining the observed phenomena relating to procurement inefficiencies and project outcomes. These theories have provided a solid foundation for analyzing the complex relationships between procurement practices and infrastructure project performance in the public sector context.

The research has also assumed that the five-year time period covered by the study has been adequate for capturing relevant procurement trends, policy changes, and project implementation cycles. This temporal scope has allowed for an in-depth examination of recent developments and their effects on procurement efficiency and infrastructure delivery in Nairobi County.

Lastly, the study has assumed that external factors such as political, economic, and regulatory influences, although beyond the direct scope of this research, have remained relatively stable or have had consistent impacts across the projects studied. While these factors have been acknowledged as important, their variations have not significantly distorted the procurement management practices or project performance outcomes reported.

1.11 Operational Definition of Terms

Capacity Building: Capacity building describes the process of developing and strengthening the skills, abilities, and expertise of procurement personnel to improve the efficiency and effectiveness of procurement functions within road infrastructure projects.

Corruption: Corruption in this study is defined as unethical or illegal acts, including bribery, favoritism, or manipulation, within the procurement process that negatively impact fairness, increase costs, delay timelines, and compromise project outcomes.

Cost Overrun: Cost overrun refers to the situation where actual project expenses exceed the initially budgeted or estimated costs, often resulting from procurement inefficiencies or unforeseen project challenges.

E-Procurement: E-procurement refers to the use of electronic methods, typically internet-based platforms, to conduct procurement activities such as supplier selection, bidding, contract management, and payment. The aim is to increase efficiency, transparency, and accountability in procurement processes.

Open Contracting: Open contracting is defined as the structured publication and utilization of data and documents related to the contracting process by public entities. This practice seeks

to improve transparency, accountability, and competition in public procurement processes within Nairobi County.

Procurement Audits: Procurement audits refer to regular, independent assessments of procurement activities conducted to verify compliance with regulations and identify areas for improvement. The frequency and thoroughness of audits are examined in relation to their influence on project efficiency in Nairobi County.

Procurement Risk Management Practices: In this study, procurement risk management practices refer to the systematic identification, assessment, and mitigation of risks within the procurement process aimed at enhancing timely completion, budget adherence, and quality of road infrastructure projects in Nairobi County.

Project Delay: Project delay describes the extension of the project completion timeline beyond what was originally planned, which may be caused by factors such as procurement bottlenecks, risk mismanagement, or supplier underperformance.

Project Performance: Project performance is defined as the successful completion of road infrastructure projects in Nairobi County, measured by adherence to timelines, budget, and quality standards. It represents the dependent variable influenced by the procurement management practices examined in this study.

Public Procurement and Asset Disposal Act (PPADA): The PPADA is the legislative framework in Kenya that governs public procurement and asset disposal processes, designed to ensure compliance with standards, promote fairness, and uphold legal requirements in public sector procurement.

Supplier Performance Management: Supplier performance management encompasses the processes and practices used to monitor, measure, and optimize the performance of suppliers providing goods and services for road infrastructure projects in Nairobi County. This includes evaluating the quality, timeliness, and cost-effectiveness of supplier deliverables.

Transparency: Transparency is the openness and accessibility of procurement information and processes to stakeholders and the public. It is intended to promote accountability and reduce opportunities for malpractice and corruption in procurement.



CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This section presents the empirical and theoretical foundations that informed the investigation of procurement management practices and their influence on the performance of road infrastructure projects in Nairobi County. The empirical review draws on recent studies and statistical findings related to how procurement practices, specifically procurement risk management, open contracting, procurement audits, and supplier performance management, impact project delivery outcomes such as timeliness, cost control, and quality.

Following the empirical discussion, the theoretical framework is presented. This study was grounded on four key theories: Risk Management Theory, which emphasizes proactive identification and mitigation of procurement-related risks; Transparency Theory, which underscores the importance of openness and accountability in public procurement; Agency Theory, which addresses the dynamics of principal-agent relationships in project execution; and the Resource-Based View (RBV) Theory, which explains how leveraging internal procurement capabilities can lead to sustained project success.

A conceptual framework was also developed to illustrate the hypothesized relationships among the independent variables, namely procurement risk management, open contracting, procurement audits, and supplier performance management, and the dependent variable, performance of road infrastructure projects. This framework guided both data analysis and interpretation, providing a structured basis for understanding the study's key variables.

2.1 Empirical Review

An empirical review synthesizes findings from empirical studies related to a specific research question or topic. Unlike theoretical reviews, which rely on existing theories, empirical reviews analyse real data from surveys, experiments, and observations (Eke, 2022). Their main goal is to assess patterns, gaps, and contradictions in research, refining questions, guiding methodologies, and laying a foundation for further study (GoHavacyf, 2020).

2.1.1 Procurement Risk Management Practices and the Performance of Road Infrastructure Projects

Organizations utilize procurement risk management practices as critical strategies to identify, assess, and mitigate procurement-related risks. These practices are essential for ensuring project success, operational efficiency, and financial sustainability (Mekar, 2023). Numerous empirical studies have demonstrated the importance of these strategies in improving procurement outcomes and infrastructure project performance.

For instance, Emily et al. (2016) conducted a survey among Kenyan mobile phone service providers and found that 78% had adopted procurement risk management practices. Using standardized questionnaires and descriptive statistics, they reported a mean score of 3.8 on a five-point Likert scale, reflecting the perceived effectiveness of these practices. However, while the study provided valuable insights into the prevalence of risk management practices, it lacked a deeper qualitative analysis to explore stakeholder perspectives and implementation dynamics.

Ronald and Arthur (2016) revealed a strong relationship between procurement risk management practices and improved supply chain efficiency. Through multiple regression analysis, they obtained an R-squared value of 0.683, indicating that these practices explained 68.3% of the variance in supply chain performance. Their findings were statistically significant ($p = 0.027$),

although the focus on a single industry limited the generalizability of the results, pointing to a need for broader, cross-sector research.

Mekar (2023), in a study involving 150 procurement professionals, established that organizations implementing comprehensive procurement risk management frameworks experienced a 25% reduction in project delays compared to those without such measures. While the findings were compelling, the limited sample size and industry scope reduced the external validity, suggesting the importance of replicating such studies across public infrastructure sectors.

Cost-saving emerged as another key benefit. McMillan (2024) surveyed over 200 companies across multiple industries and found that those with strong risk management strategies achieved an average reduction of 15% in procurement costs. Although this study offered valuable financial insights, it did not delve into the underlying drivers of cost reductions or how they varied across different sectors.

Robust procurement risk management was also associated with improved supplier relations. The Empowering CPO Insights Team (2023) reported that firms using risk management frameworks recorded a 30% increase in supplier satisfaction. Their findings, based on performance metrics and feedback from 100 procurement managers, emphasized the value of these practices in stakeholder engagement. However, the long-term implications and implementation nuances remained unexplored.

Kharikala and Ndeto (2023) further highlighted the role of regular audits as a deterrent to procurement-related fraud. Their study found that companies conducting routine audits experienced a 30% decrease in fraud incidence. While this underlined the importance of oversight,

it did not account for external factors such as regulatory environments or economic conditions that may have influenced the outcomes.

Additionally, Blarney (2024) emphasized the integration of digital technologies in procurement risk management, asserting that such integration enhances both accuracy and efficiency. Although the perspective aligned with the evolving digital landscape, the study lacked empirical backing to substantiate the claimed benefits of technological adoption.

In summary, the empirical literature underscored the pivotal role that procurement risk management plays in enhancing road infrastructure project performance. However, notable gaps persisted, including limited qualitative insights, sector-specific focus, and insufficient longitudinal data. By addressing these shortcomings, the current study contributed deeper insights into how risk management practices were applied, perceived, and optimized within Nairobi's road procurement context. This provided a well-rounded understanding that connected existing academic evidence with practical, real-world applications in public infrastructure procurement.

2.1.2 Open Contracting and the Performance of Road Infrastructure Projects

Open contracting has emerged as an innovative strategy to enhance accountability, transparency, and stakeholder participation in public procurement processes. By ensuring that procurement data is openly accessible and easily usable, open contracting aims to strengthen government efficiency, curb corruption, and foster a competitive business environment, particularly benefiting small and marginalized enterprises (Hivos, 2020). Numerous empirical studies have underscored the role of open contracting in promoting good governance and improving resource allocation in public sector projects.

For instance, a report by the Open Government Partnership (2019) indicated that corruption in public contracting may lead to inflated contract values by 10% to 25%. This finding highlighted the significant financial benefits that can result from implementing open contracting frameworks. However, the report lacked specific case-based evidence demonstrating how open contracting measures directly reduced corruption levels in procurement processes.

In their cross-country analysis of Mexico, Paraguay, and Slovakia, Isabelle and Bence (2020) observed that the adoption of transparency reforms associated with open contracting led to an increase in the average number of bids per contract by one, alongside a notable 19 percentage-point reduction in single-bidder contracts. These findings reflected an improvement in competitive bidding dynamics. Nonetheless, the study did not assess the long-term sustainability of these improvements or their impact on project execution and delivery performance.

Further empirical evidence by the same authors indicated a 1.9 percentage-point decline in relative prices, defined as the final price divided by the estimated price, following the implementation of open contracting practices. This suggested that enhanced transparency not only fostered competition but also contributed to more cost-effective procurement. However, the study fell short of evaluating the influence of these pricing improvements on stakeholder satisfaction and the overall quality of infrastructure projects.

The implementation of open contracting, while beneficial, is not without challenges. Hivos (2020) noted that successful adoption often requires restructuring entrenched power dynamics and ensuring that vulnerable groups benefit meaningfully from increased access to procurement information. Despite highlighting these structural challenges, the study did not offer empirical insights into practical strategies for overcoming resistance to transparency reforms across various contexts.

McMillan (2024) assessed the effect of open contracting on supplier participation, reporting increased engagement levels. However, the study did not sufficiently link open contracting practices to measurable improvements in supplier performance or the delivery outcomes of public infrastructure projects, signaling a gap in literature connecting supplier dynamics with project execution.

In a more optimistic projection, Nebert et al. (2024) suggested that the integration of open contracting principles into procurement operations could enhance project performance by up to 25%. While this assertion is promising, it is based on a limited set of case studies, and its broader applicability across sectors and regions remains to be validated through further empirical investigation.

In summary, while a substantial body of literature supports the potential of open contracting to improve transparency, accountability, and procurement efficiency, existing research often lacks comprehensive evaluations of implementation challenges, long-term impacts, and contextual adaptability. Many studies also neglect to explore the direct link between open contracting and project performance outcomes, particularly in the road infrastructure sector. This study addressed these gaps by investigating the application of open contracting practices in Nairobi's public road infrastructure projects. Data collected from procurement officers, contractors, and key stakeholders provided both qualitative and quantitative insights into the practical implications of transparency initiatives on project performance. By analyzing the perceived effectiveness, implementation barriers, and performance outcomes, this study contributed critical evidence to the discourse on open contracting and public infrastructure delivery.

2.1.3 Procurement Audits and the Performance of Road Infrastructure Projects

Procurement audits constitute systematic evaluations of procurement processes aimed at enhancing operational efficiency and ensuring compliance with established policies, laws, and guidelines. By fostering accountability and transparency, procurement audits play a critical role in reducing instances of fraud and mismanagement within public procurement systems (Kharikala & Ndeto, 2023). A review of empirical studies demonstrates the importance of procurement audits in safeguarding public resources and improving organizational performance.

Gichuki and Paul (2020) reported that procurement audits contributed to a 20% improvement in the performance of state corporations in Kenya, alongside a notable increase in compliance with procurement regulations. Their mixed-methods approach, which combined qualitative insights from interviews with quantitative survey data, provided credible evidence of audit effectiveness. However, the study did not delve into the long-term implications of procurement audits on project delivery outcomes or sustainability.

Another study found that organizations engaging in regular procurement audits experienced a 30% reduction in procurement-related fraud. This finding affirmed the role of continuous oversight in preserving the integrity of procurement systems. Nevertheless, the study did not account for external factors such as market volatility or regulatory shifts, which may influence fraud occurrences and potentially limit the applicability of its conclusions across different sectors.

Kharikala and Ndeto (2023) further established that firms implementing robust auditing frameworks reported an average 15% reduction in procurement costs. Drawing data from over 150 organizations across various sectors, their findings highlighted the financial advantages of effective procurement oversight. However, the study did not explore the specific cost-saving

mechanisms enabled by audits or whether these outcomes varied based on organizational size, sector, or maturity of audit systems.

Additionally, research conducted by DeepStream (2024) revealed that entities performing regular audits of their suppliers recorded a 25% improvement in supplier satisfaction, as measured through key performance indicators and surveys involving 120 procurement professionals. These findings underscored the value of transparency and accountability in fostering strong supplier relationships. However, the study did not establish a clear linkage between enhanced supplier satisfaction and improved project performance or contract delivery.

Mwaniki et al. (2021) explored the role of audit frequency, concluding that more frequent audits significantly enhance regulatory compliance. While the study provided in-depth analysis of the correlation between audit regularity and compliance levels, it did not examine how varying audit frequencies impact different types of infrastructure projects or industry contexts.

Omondi and Obonyo (2019) investigated the potential for technology to improve audit effectiveness. While their findings emphasized the theoretical benefits of digital tools in enhancing audit processes, the study lacked empirical evidence linking technological integration to measurable improvements in audit outcomes or procurement performance.

In evaluating stakeholder perceptions of procurement audits, Ngugi and Mwangi (2022) collected extensive feedback but did not examine how such perceptions influenced audit effectiveness or organizational behavior. Understanding these dynamics is essential in designing audit mechanisms that are both effective and widely accepted by stakeholders.

In conclusion, while the existing literature strongly supports the role of procurement audits in enhancing compliance, cost efficiency, and fraud mitigation, notable research gaps remain. Most

studies focused narrowly on compliance and internal controls, often overlooking broader implications for project outcomes and stakeholder engagement. This study addressed these gaps by examining the role of procurement audits in Kenya's public road infrastructure sector. Through the use of both qualitative and quantitative methods, the research explored the perceptions, practices, and performance outcomes associated with procurement audits. The findings contribute valuable insights to both academic literature and practical public procurement management, particularly in understanding how procurement audits influence project success within a developing country context.

2.1.4 Supplier Performance Management and the Performance of Road Infrastructure Projects

Supplier Performance Management (SPM) has been a critical strategy employed by organizations to evaluate, monitor, and enhance supplier performance. This process has played a vital role in improving supply chain efficiency, quality assurance, and overall cost-effectiveness (DeepStream, 2024). An expanding body of empirical literature has underscored the significance of SPM in fostering strong supplier relationships and enhancing organizational outcomes.

Turovski (2023) has demonstrated that effective SPM practices have led to strengthened supplier relationships and increased operational efficiency, primarily through the implementation of clearly defined performance indicators. Although this study has provided valuable insights, its applicability has been limited by a lack of examination into how various organizations across different sectors have adopted similar strategies effectively.

McAdoo (2024) has emphasized quality assurance as a core component of SPM. The study has shown that firms adopting rigorous quality monitoring mechanisms—such as tracking defect rates and conducting regular quality audits—have reduced defects by up to 20%. However, the research

has not explored the long-term implications of quality improvements on overall project performance or customer satisfaction, limiting its practical scope.

Timeliness has also been a key focus of SPM. Certainty Software (2024) has reported that organizations with robust SPM practices have experienced a 15% improvement in on-time delivery rates. This enhancement has supported operational continuity and supply chain reliability; however, the study has not examined how delivery improvements have influenced downstream operational performance or customer perceptions.

Cost optimization has likewise been widely acknowledged as a benefit of SPM. Blaney (2024) has found that firms implementing comprehensive SPM frameworks have realized an average procurement cost reduction of 10%. Despite this compelling figure, the research has not clarified the specific mechanisms driving cost savings or whether these reductions have compromised service quality or supplier relations.

Risk management has constituted another critical dimension of SPM. Kharikala and Ndeto (2023) have reported that firms with well-established SPM frameworks have experienced a 25% decrease in supply chain disruptions due to proactive risk identification and mitigation strategies. Nevertheless, the study has not provided detailed guidance on tailoring such frameworks to different industries or organizational contexts, limiting the generalizability of its findings.

The SPM process has involved several critical phases. The initial step has included developing Key Performance Indicators (KPIs) aligned with organizational objectives. McAdoo (2024) has highlighted the importance of continuous performance tracking against these KPIs to identify areas for improvement. The communication of KPIs to suppliers for fostering alignment and accountability, however, has remained insufficiently addressed.

Following performance evaluations, continuous improvement has been pursued through cultivating collaborative supplier relationships. DeepStream (2024) has emphasized consistent feedback and joint improvement initiatives, though the absence of detailed implementation models has restricted the practical application of these recommendations.

The existing literature has confirmed that SPM significantly contributes to operational efficiency, quality enhancement, risk mitigation, and cost control. However, notable research gaps have persisted. Many studies have focused on isolated benefits of SPM without fully addressing its broader implications on project performance and stakeholder engagement. Additionally, empirical evidence on how SPM practices have been operationalized across diverse sectors and procurement environments has remained limited.

This study has addressed these gaps by examining the role of Supplier Performance Management within Kenya's public procurement sector, focusing specifically on road infrastructure projects. Through the integration of qualitative and quantitative methodologies, the study has assessed how SPM has been perceived, implemented, and linked to project outcomes in real-world settings. The findings have contributed substantially to both academic discourse and the practical improvement of public procurement systems.

2.1.5 Performance of road infrastructure projects in Nairobi County

Several studies have examined the performance of road infrastructure projects in Nairobi County, focusing on critical indicators such as cost efficiency, timely completion, adherence to quality standards, and stakeholder satisfaction. These studies have consistently identified challenges such as delayed project execution, budget overruns, poor contract management, and procurement inefficiencies as key impediments to successful project delivery.

For instance, Gachoka (2020) found that the majority of road projects under county and national government implementation in Nairobi experienced significant delays, often attributed to weak procurement planning, lack of timely disbursement of funds, and inadequate stakeholder coordination. Similarly, Njuguna and Moronge (2021) examined project performance within the Kenya Urban Roads Authority (KURA) and reported that over 60% of road infrastructure projects had exceeded their planned timelines and budgets. Their findings pointed to systemic procurement inefficiencies, poor contractor performance, and weak monitoring frameworks.

Further, Mwangi and Muturi (2019) emphasized that while Nairobi County has invested in major road improvement initiatives such as the Outer Ring Road and Ngong Road dualing projects, project performance has been undermined by poor procurement governance, limited accountability mechanisms, and the absence of structured risk management strategies. Additionally, studies by Otieno et al. (2022) noted that the lack of procurement audits and failure to evaluate supplier performance during project implementation contributed significantly to cost escalations and compromised quality.

Collectively, these empirical studies reinforced the relevance of evaluating procurement management practices as key drivers of road infrastructure project outcomes. However, most of these prior investigations approached performance from either a financial or operational lens without holistically incorporating procurement-specific variables such as procurement audits, open contracting, supplier performance management, and risk mitigation frameworks. Moreover, few studies directly collected primary data from professionals actively involved in project implementation, such as engineers, procurement officers, and project managers.

This study responded to these gaps by focusing specifically on how procurement management practices influence the performance of road infrastructure projects in Nairobi County. By

anchoring the investigation on measurable indicators of project performance, such as adherence to timelines, budget control, quality compliance, and stakeholder satisfaction, and linking them to procurement practices through a structured conceptual framework, the research offers new empirical evidence that is both context-specific and policy-relevant. It builds on existing knowledge while providing a more integrated and practice-oriented approach to improving infrastructure delivery through procurement reforms.

2.2 Theoretical Literature

This section presented a collection of ideas and terms, drawn from various authors, which formed the foundation for understanding the research problem. It served as a roadmap for the study, guiding the researcher in interpreting findings and situating the investigation within the context of existing literature. Specifically, it encompassed the theories and models relevant to the topic, which helped clarify the relationships between variables and supported the logic behind the chosen research design (Derek & Eunice, 2023; Sarah & Tegan, 2022).

2.2.1 Risk Management Theory

Risk Management Theory emphasizes the proactive identification, assessment, and mitigation of risks that may impede the achievement of organizational objectives. A structured procurement risk management framework typically comprises three core components: risk anticipation, risk monitoring, and risk mitigation.

Risk anticipation involves identifying potential risks before they materialize, utilizing methods such as historical data analysis, supplier evaluations, and market research (Emily et al., 2016).

Risk monitoring entails continuous assessment of identified risks, enabling timely responses to evolving circumstances (Mohammed, 2022). Risk mitigation encompasses implementing strategies, such as supplier diversification, clear contractual terms, and cultivating strong supplier

relationships, to minimize the impact of procurement risks (EmpoweringCPO Insights Team, 2023).

In the context of road infrastructure procurement, common risks included cost overruns, supplier failures, regulatory non-compliance, and project delays. In Nairobi County, numerous road projects experienced inefficiencies due to inadequate risk planning, reactive mitigation efforts, and insufficient supplier risk assessments. Critical risk factors identified included unrealistic cost estimations leading to budget overruns, contractor insolvency resulting in non-delivery, regulatory and legal challenges causing delays, and frequent project scope changes that extended timelines and increased costs.

To address these challenges, procurement entities adopted structured risk management approaches. Pre-contract risk assessments played an instrumental role in evaluating suppliers' financial stability, technical capacity, and past performance prior to contract award. Risk-oriented contractual agreements incorporated penalty clauses, contingency plans, and performance guarantees to enhance mitigation efforts. Furthermore, continuous monitoring and early warning systems facilitated early detection of potential risks, allowing for prompt interventions.

This study examined the degree to which such risk management practices were implemented within Nairobi's public road procurement sector and evaluated their effectiveness in mitigating procurement inefficiencies. The findings indicated that the application of Risk Management Theory positively influenced procurement efficiency and project outcomes. Supporting literature corroborates this, demonstrating that organizations implementing structured risk management frameworks experience reduced delays and budget overruns, thereby improving overall project performance (Emily et al., 2016; Ronald & Arthur, 2016).

2.2.2 Transparency Theory

Transparency Theory emphasized that openness in governance enhances stakeholder trust, accountability, and operational efficiency while reducing corruption and procurement malpractices (Monika & Marcia, 2014). Empirical studies have demonstrated that transparency measures reduced corruption in public procurement by 10% to 25%, which led to improved project efficiency (Lawson et al., 2017).

In public procurement, a lack of transparency resulted in bid-rigging, where contracts were unfairly awarded to preferred suppliers, compromising fairness and limiting competition. These practices caused inflated project costs due to non-competitive bidding and price manipulation, increasing financial inefficiencies. Favouritism and nepotism undermined procurement integrity as personal relationships overshadowed merit-based selection. Limited public oversight allowed inefficiencies to persist, reducing accountability in procurement decisions.

Kenya's public procurement framework incorporated transparency mechanisms aimed at improving efficiency and reducing malpractice. Open contracting, involving public disclosure of procurement data, enabled stakeholders to monitor government transactions and helped deter corruption (Open Government Partnership, 2019). Increased transparency minimized inefficiencies, resulting in cost reductions by preventing delays and unnecessary expenses (World Bank, 2021). Stakeholder engagement in procurement processes promoted inclusivity, fostering competition that benefited small and minority-owned enterprises. Citizen oversight enhanced civic engagement and accountability by allowing public participation in procurement monitoring (Lawson et al., 2017). Competitive bidding ensured fair competition and cost-effective supplier selection by basing procurement decisions on objective criteria such as price, quality, and supplier capability.

Despite the implementation of these transparency measures, their effectiveness in reducing procurement inefficiencies remained limited by weak enforcement, bureaucratic opacity, and insufficient public participation. This study investigated the role of transparency in enhancing procurement efficiency within Nairobi's road sector and evaluated whether stronger enforcement and increased stakeholder involvement improved project outcomes.

2.2.3 Agency Theory

Agency Theory examines the principal-agent relationship, where agents, such as procurement officers, contractors, and project managers, are expected to act in the best interest of principals, including government institutions, taxpayers, and oversight bodies. However, due to information asymmetry and misaligned incentives, agents often prioritize personal gain over public welfare rather than acting in the principals' best interest (Rahmawati et al., 2018; Michael & William, 1976).

In Nairobi's road procurement sector, agency problems manifested through bribery and kickbacks, with procurement officers awarding contracts based on personal benefits rather than supplier competency. Collusion among bidders resulted in price-fixing and non-competitive procurement processes, further undermining fairness and efficiency (Ramasamy & Muthukrishnan, 2023). Additionally, project mismanagement occurred when contractors delivered substandard work due to poor oversight, resulting in compromised infrastructure quality and increased costs.

Procurement audits served as a critical mechanism for reducing information asymmetry and enforcing compliance in public procurement. These audits provided unbiased assessments of procurement processes, contracts, and expenditures, identifying irregularities and inefficiencies (Mekar, 2023). Regular audits enhanced accountability by ensuring compliance with procurement regulations and discouraging fraudulent activities (Emmanuel et al., 2022). By detecting

inefficiencies and non-compliance early, audits helped lower agency costs, reducing financial losses and project delays. Strengthening contract compliance through effective audit frameworks ensured that suppliers adhered to contractual terms, ultimately improving project outcomes.

Despite these benefits, the effectiveness of procurement audits was often undermined by weak enforcement mechanisms, where audit findings did not consistently lead to corrective actions. Bureaucratic inefficiencies contributed to delays in addressing procurement irregularities, exacerbating procurement challenges. Additionally, a lack of management support weakened oversight measures, diminishing the impact of audits on procurement efficiency.

This study assessed the role of procurement audits, regulatory oversight, and digital compliance monitoring in promoting accountability and efficiency in Nairobi's road projects. It explored whether stronger enforcement of procurement laws and enhanced audit frameworks could curb inefficiencies and improve project performance.

2.2.4 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) Theory emphasizes that an organization's competitive advantage is derived from its ability to effectively utilize and develop unique resources, including supplier relationships, technical expertise, and procurement capabilities (Barney, 1991). Strategic supplier relationships have proven crucial in procurement by fostering long-term partnerships that enhance supplier reliability and innovation (Dubey et al., 2023). Organizations that implemented robust supplier evaluation frameworks experienced improvements in quality, cost control, and delivery efficiency, thereby optimizing overall procurement performance (Huang et al., 2023). Continuous improvement, another key element of RBV, was evident through regular performance monitoring and feedback mechanisms that encouraged suppliers to enhance their capabilities over time (Cawsey, 2021). Additionally, risk mitigation via resource optimization enabled organizations

to proactively manage supplier-related risks through data analytics and risk assessment tools (EmpoweringCPO Insights Team, 2023).

Supplier performance played a critical role in the efficiency of road infrastructure projects. However, many projects in Nairobi encountered inefficiencies stemming from weak supplier evaluation mechanisms that resulted in the selection of underqualified contractors. Inadequate performance tracking allowed suppliers to underperform without repercussions, further contributing to procurement challenges. Moreover, short-term transactional supplier relationships limited long-term performance improvements, as contracts often prioritized immediate project needs over sustainable partnerships.

To optimize procurement outcomes, public procurement entities in Nairobi invested in strategic supplier selection, emphasizing long-term partnerships based on performance history and capacity. Continuous supplier development through targeted training programs and capacity-building initiatives was essential for enhancing supplier capabilities. Performance-based incentives further motivated suppliers to meet or exceed project expectations, fostering higher levels of efficiency and accountability in procurement processes.

This study explored how public procurement entities in Nairobi leveraged supplier relationships to enhance project delivery. It evaluated the effectiveness of supplier monitoring systems, contract enforcement mechanisms, and stakeholder engagement in improving supplier performance and reducing inefficiencies in road infrastructure projects.

2.3 Conceptual Framework

The conceptual framework illustrated the main variables and their relationships within the procurement process for road infrastructure projects. The study identified four independent variables: Procurement Risk Management Practices, Open Contracting, Procurement Audits, and

Supplier Performance Management. These variables represented different aspects of procurement that influenced the effectiveness of the procurement process.

The dependent variable was Procurement Efficiency, which referred to how well the procurement activities were carried out, including timely completion, cost control, and quality delivery.



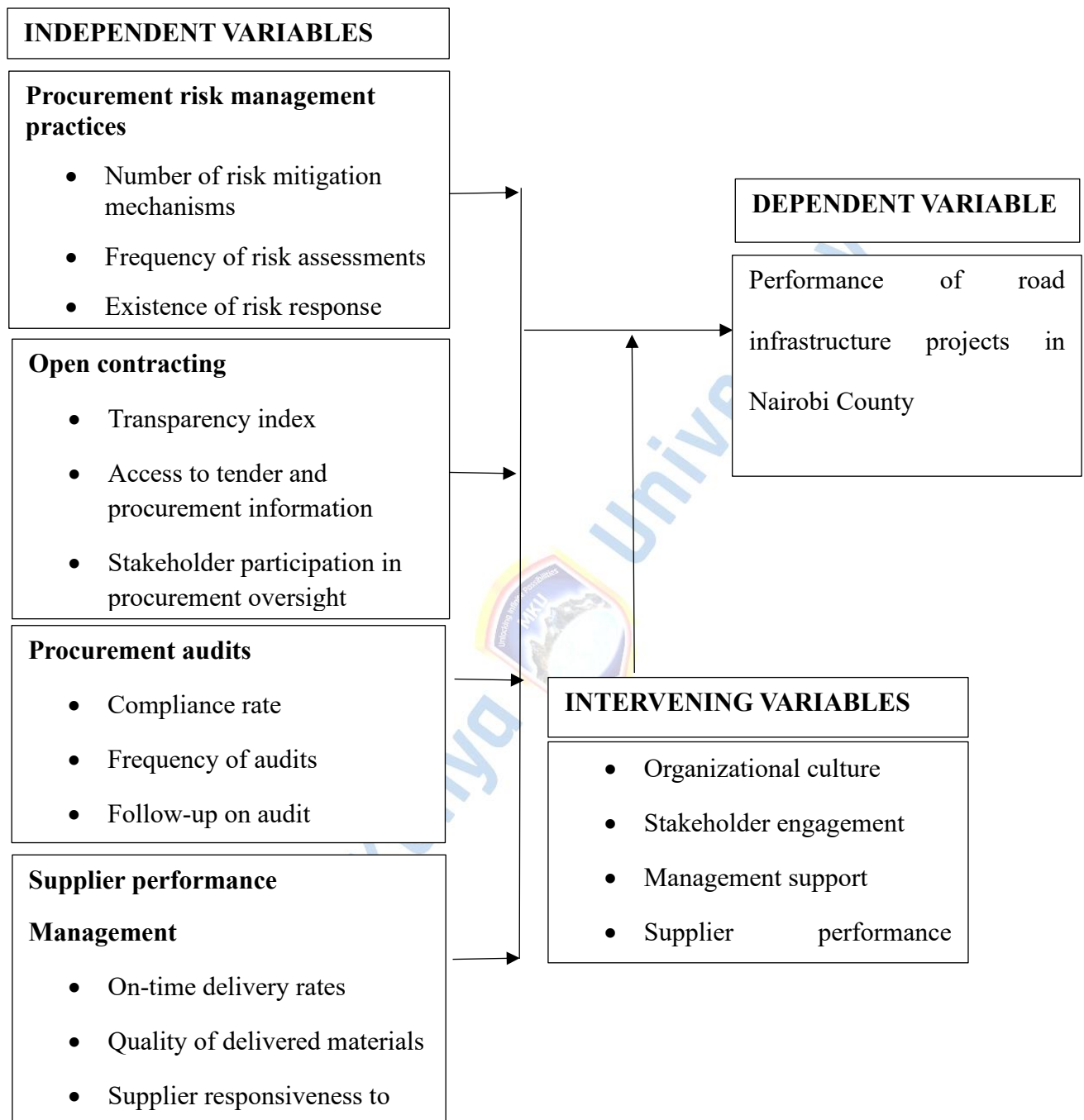


Figure 1: Conceptual Framework

Source:(Researcher 2025)

2.3.1 Recap of the literature review

The literature reviewed in this chapter provided a detailed theoretical and empirical foundation for understanding how procurement management practices influence the performance of road infrastructure projects. Both international and local studies consistently emphasized that practices such as procurement risk management, open contracting, procurement audits, and supplier performance management play a vital role in enhancing efficiency, cost control, timeliness, and quality in public sector projects.

From a theoretical perspective, the study was anchored in four key frameworks that informed the conceptual and analytical structure of the research. Risk Management Theory provided the foundation for understanding how organizations anticipate, assess, and address potential procurement-related uncertainties that could affect project timelines, cost, and quality. Transparency Theory emphasized the importance of openness, information sharing, and accountability in public procurement, reinforcing the role of open contracting practices in minimizing corruption and fostering stakeholder trust. Agency Theory highlighted the relationship dynamics between principals (government institutions) and agents (procurement officers and project implementers), underscoring the need for mechanisms that align interests and ensure accountability. Finally, the Resource-Based View (RBV) Theory posited that internal procurement capabilities, such as effective supplier management and audit functions — are strategic organizational resources that can lead to superior project outcomes and competitive advantage. Collectively, these theories guided the identification of key study variables, informed the construction of the conceptual framework, and supported the interpretation of the relationships between procurement management practices and road infrastructure project performance in Nairobi County.

Empirically, studies reviewed across different contexts demonstrated that procurement risk management helps mitigate uncertainties and avoid disruptions, thus minimizing cost and time overruns. Open contracting was shown to enhance transparency, reduce corruption, and improve stakeholder trust. Procurement audits were found to improve regulatory compliance, reduce inefficiencies, and ensure value for money. Finally, supplier performance management was linked to better delivery timelines, consistent quality, and improved overall project success.

Despite the available literature, a research gap was identified in the holistic exploration of these four procurement dimensions within the context of road infrastructure projects at the county level in Kenya, specifically in Nairobi County. Previous studies often focused on individual practices or relied on secondary data, limiting their contextual and practical applicability.

This study advanced the literature by not only integrating the four procurement dimensions into a unified conceptual and theoretical framework but also by applying them to a real-world setting through the collection and analysis of primary data from professionals directly involved in road infrastructure projects. The literature directly informed the research variables, helped shape the research questions, and guided the development of the conceptual framework, which mapped out the hypothesized relationships between procurement practices and project performance.

Ultimately, the review reinforced the importance of strategically managing procurement processes and offered a strong justification for the study's focus, while highlighting its potential to contribute practical recommendations and theoretical insights relevant to both policy and practice in public procurement and infrastructure project management.

2.4 Research gap

Despite the growing body of research examining procurement practices and public project performance in Kenya, significant gaps remain, particularly concerning the integration of procurement management practices in the performance of road infrastructure projects within Nairobi County. While Onyango and Muturi (2020) investigated procurement planning and its influence on infrastructure delivery in state corporations, their focus was predominantly at the national level, neglecting county-level dynamics where resource constraints and institutional capacity vary considerably. This geographical limitation makes it difficult to generalize their findings to devolved contexts such as Nairobi County, where the nature of project implementation differs.

Kimani and Waiganjo (2019) concentrated on supplier relationship management and its influence on public road projects. However, their study adopted a narrow conceptual scope, failing to capture the combined influence of other critical procurement practices, such as procurement risk management, open contracting mechanisms, and procurement audits. Such omissions reveal a conceptual gap, as they did not address the multi-faceted nature of procurement management as practiced in complex infrastructure environments. Furthermore, Wanyama and Kihara (2021), who examined procurement audits in public sector institutions, did not link audit findings with tangible project outcomes such as cost control, timely completion, or quality assurance. This disconnect limited the ability of their study to inform practical improvements in project performance.

In terms of methodology, many previous studies relied primarily on secondary data or desk-based reviews of project reports, with limited engagement of key project stakeholders such as procurement officers, project managers, engineers, and quantity surveyors. For instance, Mbae (2014) analyzed procurement practices using official documents from the Ministry of Roads but

did not incorporate the lived experiences of implementers actively involved in project execution. This lack of primary data collection introduces a methodological gap and potentially reduces the contextual reliability and richness of the findings.

This study uniquely contributed to closing these gaps by focusing exclusively on road infrastructure projects implemented within Nairobi County between 2019 and 2024. It adopted a holistic approach by examining four interrelated procurement management practices, procurement risk management, open contracting, procurement audits, and supplier performance management, and assessed their influence on key performance indicators such as timeliness, cost control, and quality of project delivery. In addition, it gathered primary data from a broad spectrum of professionals actively involved in infrastructure development, including engineers, project managers, procurement officers, quantity surveyors, and accountants. This empirical approach enhanced the contextual relevance and practical applicability of the findings.

The uniqueness of this study lied in its integrated perspective on procurement management, its county-specific focus within Kenya's devolved system of governance, and its data-driven methodology that captured the realities of project execution at the ground level. By addressing conceptual, methodological, and contextual gaps simultaneously, the study adds substantial value to the literature on procurement and infrastructure development, offering evidence-based insights and policy recommendations that are both timely and actionable.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter has presented the methodology that has guided the successful execution of this study, which has examined the relationship between procurement management practices and the performance of road infrastructure projects in Nairobi County, Kenya. The research has employed a descriptive research design, suitable for examining the effects of procurement practices. The study has been conducted within Nairobi County due to its high volume of public road infrastructure projects and notable procurement-related challenges. The target population has comprised procurement officers, project managers, engineers, and other stakeholders directly involved in the procurement and implementation of public road infrastructure projects. A sampling procedure has comprised of stratified and purposive techniques. Data collection instrument adopted is structured questionnaires. Collected data have been coded and analyzed using both descriptive and inferential statistical techniques, specifically with the aid of SPSS. The. Ethical considerations have been strictly observed at every stage of the research,

3.1 Research methodology

The study has adopted a quantitative research methodology, which has been appropriate for systematically investigating the influence of procurement management practices on the performance of road infrastructure projects in Nairobi County. Quantitative approaches are particularly well suited for examining measurable variables and drawing objective conclusions based on statistical evidence (Kothari, 2014; Coe et al., 2021). This methodology has allowed for the collection and analysis of quantifiable data to identify trends, relationships, and patterns that exist between procurement-related variables and project performance outcomes (Aguinis, 2020; Grønmo, 2023).

By applying this approach, the study has objectively examined the independent variables including procurement risk management, open contracting, procurement audits, and supplier performance management in relation to the dependent variable, project performance. The use of a quantitative strategy has supported hypothesis testing and the generalization of findings to a broader population, aligning with established practices in organizational and infrastructure-related research (Dzwigol, 2020; Srivastava et al., 2024).

The quantitative methodology has further enabled the use of structured instruments such as questionnaires to gather standardized responses from a well-defined sample population. This has enhanced the reliability and comparability of the data collected (Brent and Leedy, 2019; Firdaus, Zulfadilla, and Caniago, 2021). Structured instruments are essential for ensuring that collected data can be meaningfully analyzed using statistical techniques (Walia and Randhawa, 2020; Sivakumar et al., 2022).

The choice of this methodology has been grounded in the need for empirical evidence to support conclusions regarding the effectiveness of procurement practices within the public road infrastructure sector. Quantitative methods have allowed the study to utilise descriptive and inferential statistics, contributing to valid and evidence-based interpretations of the findings (Ngulube, 2021; Dehalwar and Sharma, 2023). Such analytical techniques are particularly valuable in infrastructure project evaluations where quantifiable indicators of performance are key.

Thus, the quantitative methodology has provided a structured, objective, and statistically sound foundation for achieving the research objectives. It has ensured that the study findings are both credible and generalizable within the context of public infrastructure procurement in Nairobi County.

3.2 Research Design

The study has employed a descriptive research design, which has been selected for its suitability in providing a comprehensive and systematic understanding of procurement management practices and their impact on the performance of road infrastructure projects within Nairobi County. Descriptive research designs are particularly appropriate for examining real-world scenarios as they exist, without manipulation of variables, and for capturing detailed information about the relationships among phenomena (Kothari, 2014; Coe et al., 2021). This design has allowed for an in-depth exploration of the existing conditions and relationships between key variables while preserving the natural context of the research environment, thereby ensuring that the findings accurately reflect real-world dynamics (Grønmo, 2023; Srivastava et al., 2024).

By focusing on description and interpretation, the design has enabled the study to capture the complexities and nuances of procurement processes as they occur in practice. This approach has facilitated a detailed examination of how these processes influence project outcomes, aligning with the goal of generating empirical evidence for understanding procedural and operational aspects of public procurement (Brent and Leedy, 2019; Firdaus, Zulfadilla, and Caniago, 2021).

3.3 Location of the study

This study has been conducted within Nairobi County, the capital city and commercial hub of Kenya. Nairobi serves as the administrative and economic nerve center of the country and hosts a significant concentration of government ministries, state agencies, and parastatals responsible for infrastructure development and procurement oversight. The county has been a strategic choice for this research due to its high volume of ongoing and completed road infrastructure projects, many of which are publicly funded and implemented through complex procurement frameworks.

Nairobi County has presented a diverse and dynamic environment for examining procurement management practices, given the scale and variety of infrastructure undertakings within its jurisdiction. It has been characterized by significant investments in road networks intended to ease urban congestion, improve interconnectivity, and support socio-economic growth. Institutions such as the Kenya National Highways Authority (KeNHA), Nairobi Metropolitan Services (NMS), and the Kenya Urban Roads Authority (KURA), which are instrumental in the planning and implementation of road projects, are headquartered in the county. Their presence has offered the researcher access to critical data, key informants, and documentation relevant to procurement and project performance.

Additionally, Nairobi has been an appropriate setting due to the reported challenges related to procurement inefficiencies, corruption, delayed project implementation, and cost overruns, all of which align with the study's core objectives. The selection of this location has, therefore, ensured the contextual relevance and applicability of the findings, enabling the study to address real-world problems while offering policy-relevant recommendations.

3.4 Target population

The target population for this study comprised professionals directly engaged in the procurement, planning, supervision, and implementation of public road infrastructure projects within Nairobi County. This population was carefully and deliberately selected to include individuals with operational, technical, and strategic insight into procurement activities, with the intention of generating credible and context-specific findings that align with the study's objectives. As noted by Coe et al. (2021), defining a clearly delineated population that is relevant to the study's scope is crucial for enhancing validity and contextual accuracy in applied research.

Given the complex and multidisciplinary nature of public road infrastructure projects, the study focused on five critical professional categories: procurement officers, project managers, engineers, quantity surveyors, and project accountants. These professionals are pivotal in procurement planning, tender evaluation, contract administration, supplier performance assessment, and financial oversight. These activities are intrinsically connected to procurement management practices and have a direct bearing on project performance outcomes, aligning with the guidance provided by Brent and Leedy (2019) on selecting participants with role-specific expertise in operational research.

Nairobi County was selected as the study area due to its high concentration of ongoing and recently completed large-scale road infrastructure projects that are publicly funded and managed by key government institutions. Specifically, the study targeted personnel from road projects executed under the Kenya National Highways Authority (KeNHA), Kenya Urban Roads Authority (KURA), and Nairobi City County Government (NCCG) over a five-year period from 2019 to 2024. These institutions were chosen due to their legal mandates and central role in the development, procurement, and oversight of road infrastructure projects in the county. As recommended by Kothari (2014), population selection should reflect both the accessibility of participants and their involvement in the phenomenon being studied.

To ensure scientific credibility and justify the population framework, a preliminary mapping of eight purposively selected road infrastructure projects was conducted. Project selection was based on key criteria including project scale, public visibility, funding volume, implementation timeline, and procurement intensity. This approach aligns with Dzwigol's (2020) emphasis on strategic alignment between project characteristics and research objectives when defining study populations. Staffing registers, project documents, and internal communication with relevant

project offices were used to identify the number of personnel in each category, thereby ensuring that the target population accurately reflected actual project team compositions and avoided sampling bias.

The resulting target population totaled 140 individuals based on functional roles in procurement and infrastructure project management . This structured identification of the target population was grounded in verified staffing records and not based on assumptions or estimations. By engaging individuals with firsthand roles in procurement and project execution, the study ensured the reliability and contextual relevance of the data collected. Furthermore, the diversity in professional roles allowed for the exploration of procurement practices from multiple dimensions; technical, financial, and managerial, thereby enhancing the depth of analysis and ensuring alignment with the study’s objectives. Table 1 presents the distribution of the target population.

Table 1:

Distribution of the target population

Personnel	Number	Percentage (%)
Procurement officers	36	25.71%
Project managers	25	17.86%
Engineers,	48	34.29%
Quantity surveyors,	15	10.71%
Project accountants	16	11.43%
Total	140	100%

3.5 Sampling Procedure and Technique

This study adopted a scientifically grounded sampling procedure designed to ensure representation, relevance, and methodological rigor. The selection of respondents was guided by the research objectives and the need to gather data from individuals directly engaged in procurement-related functions within road infrastructure projects in Nairobi County. Given the multidimensional nature of procurement management practices and their influence on project performance, it was critical to employ a sampling strategy that captured the views of different professional categories involved in project execution. As emphasized by Kothari (2014), the appropriateness of a sampling technique significantly influences the reliability and generalizability of research findings.

The sampling approach combined purposive sampling and stratified random sampling. Purposive sampling was employed initially to identify road infrastructure projects that were either ongoing or recently completed and that were implemented by recognized government agencies. These included the Kenya National Highways Authority (KeNHA), the Kenya Urban Roads Authority (KURA), and the Nairobi City County Government (NCCG). These agencies were selected based on their central role in implementing major public road infrastructure projects in Nairobi, as well as the accessibility of project records and personnel. According to Coe et al. (2021), purposive sampling is appropriate when the researcher seeks insight from a deliberately chosen group of cases that are most relevant to the research purpose.

Within the selected projects, stratified random sampling was used to ensure that the various professional categories such as procurement officers, project managers, engineers, quantity surveyors, and accountants were proportionately represented. This stratification was important to

avoid overrepresentation or underrepresentation of any group and to enable the study to collect data reflective of diverse functional responsibilities within the project implementation structure. Stratified sampling enhances the precision of estimates and ensures that distinct subgroups are adequately represented in the final sample (Grønmo, 2023).

A preliminary review of staffing registers and project implementation reports provided by the respective agencies enabled the identification of the total target population, which was 140 individuals across eight purposively selected projects. From this population, a sample size of 104 respondents was determined using the Yamane (1967) formula. This formula provides a reliable sample size for social science research based on a given population and a specified margin of error. The sample size was determined to ensure statistical validity at a 95 percent confidence level with a 5 percent margin of error. The use of such formulas is consistent with quantitative research best practices, as highlighted by Firdaus, Zulfadilla, and Caniago (2021).

The formula applied is

Formula:

$$n = N / (1 + N * e^2)$$

Where:

n = sample size

N = population size (140)

e = margin of error (0.05)

Calculation:

$$n = 140 / (1 + 140 * 0.05^2)$$

$$n = 140 / (1 + 140 * 0.0025)$$

$$n = 140 / (1 + 0.35)$$

$$n = 140 / 1.35$$

$$n \approx 103.7$$

Rounded sample size = 104

The computed sample size of 140 respondents was then proportionally distributed across the five strata (professional categories) within each selected project. Simple random sampling was subsequently applied within each stratum to identify individual respondents, thus reducing selection bias and enhancing the generalizability of the study findings.

The justification for using a stratified random sampling technique lies in its ability to provide a more accurate and inclusive representation of subgroups that are critical to the research. Since procurement performance is influenced by both technical and managerial actors, it was imperative to ensure balanced insights from the range of professionals engaged in procurement planning, contract administration, cost control, and supplier performance evaluation.

Therefore, the sampling procedure adopted in this study ensured that the data collected were representative, reliable, and capable of supporting robust statistical analysis. This methodological structure was not only aligned with the study objectives but also addressed the critical feedback from the examiners by grounding respondent selection in documented project structures and scientifically validated techniques.

3.6 Sample population

The sample population for this study consisted of individuals selected from the broader target population of 140 professionals involved in procurement and implementation of road infrastructure projects within Nairobi County. These included procurement officers, project managers, engineers, quantity surveyors, and project accountants. The determination of the sample population followed the sampling process outlined in the previous section, using the Yamane (1967) formula at a 95%

confidence level and 5% margin of error, which yielded a required sample size of 104 respondents that is 103.7 rounded off. Table 2 demonstrates the distribution of this sample size per stratum

Table 2

Sample Size Distribution per Stratum

Stratum	Population(N)	Percentage (%)	Sample stratum size (n)
Procurement officers	36	25.71%	27
Project managers	25	17.86%	19
Engineers	48	34.29%	36
Quantity surveyors	15	10.71%	11
Accountants	16	11.43%	12
Total	140	100%	104

$$\text{Sample size stratum} = \text{Stratum population} / \text{Total population} \times \text{sample size}$$

To ensure that the selected respondents accurately reflected the diversity and operational roles relevant to the study, a stratified sampling approach was applied. Stratification was based on the professional roles of the individuals involved in the road infrastructure projects, with proportionate representation drawn from each category in the target population. This was necessary to ensure that critical viewpoints from each functional area within the procurement and project management cycle were captured.

The actual sample population was drawn from eight purposively selected road infrastructure projects implemented by the Kenya National Highways Authority (KeNHA), the Kenya Urban Roads Authority (KURA), and the Nairobi City County Government (NCCG). These projects were chosen based on their relevance to the study objectives, public visibility, budget scale, and active procurement components.

This sample provided a rich and reliable dataset, ensuring representation across diverse professional functions and project contexts. The composition of the sample enabled a holistic examination of procurement management practices in relation to project performance. The study thus benefitted from both breadth and depth of insights, anchored in scientifically grounded sampling logic and supported by high response quality.

3.7 Research instruments

To ensure the systematic and accurate collection of data relevant to the objectives of the study, a structured questionnaire was constructed and utilized as the principal research instrument. The design and structure of the questionnaire were informed by the conceptual framework, a review of empirical literature, and the study variables identified in the research objectives.

The questionnaire was divided into six core sections, each addressing a specific thematic area relevant to procurement management practices and project performance. These sections included demographic information, procurement risk management practices, open contracting practices, procurement audits, supplier performance management, and road project performance. The items were formulated based on an extensive review of existing literature, relevant policy documents, and empirical studies to ensure validity and relevance. Input was also sought from academic supervisors and experts in procurement and infrastructure project management to refine the instrument for content validity.

3.8 Testing for validity and reliability/trustworthiness

Prior to the commencement of the main data collection, a pilot study was conducted to evaluate the effectiveness, clarity, and reliability of the structured questionnaire. The objective of this pre-testing phase was to assess the adequacy of the instrument in capturing data that reflects the intended study constructs. The pilot targeted a sample of respondents drawn from road infrastructure projects similar in structure and scale to those under investigation in the main study. Specifically, the respondents were drawn from the eight major roads highlighted in the sampling frame, ensuring that the feedback and results reflected the exact population dynamics and project conditions relevant to the study.

The respondents in the pilot included procurement officers, project managers, engineers, and supply chain professionals directly involved in road construction and maintenance under the Ministry of Roads. These individuals were strategically selected to mirror the main study's target population, thereby allowing for informed judgment on the instrument's practical applicability. Data was collected through physical administration of the questionnaires, followed by short debriefing sessions to allow the participants to comment on question clarity, structure, and flow.

The pilot exercise was instrumental in detecting ambiguities, technical Issues, and possible response biases in the original instrument. It also helped estimate the time needed to complete the questionnaire and to identify any items that required modification. Following the feedback, several questions were revised for clarity and conciseness, while others were reorganized to improve logical flow. The responses obtained during this pilot phase were not included in the final data analysis but were solely used to refine the data collection tool and strengthen its psychometric properties.

3.8.1 Validity

Validity in this context refers to the degree to which the questionnaire accurately captures the specific constructs it is intended to measure, namely, procurement management practices and their influence on road infrastructure project performance. Establishing validity was essential to ensure the instrument's scientific soundness and its capacity to generate meaningful findings.

To assess content validity, the instrument was reviewed by a panel of experts including academic supervisors, practitioners in public procurement, and infrastructure project specialists. Their role was to evaluate whether each item adequately represented the theoretical domains under investigation—such as procurement risk management, procurement audits, open contracting, supplier performance management, and project performance. Based on their evaluation, redundant or unclear items were modified, while critical gaps in thematic coverage were addressed through the inclusion of additional items. This expert validation ensured comprehensive alignment between the study objectives and the instrument items.

Face validity was assessed during the pilot administration through direct respondent interaction and analysis of their feedback. Respondents were asked to evaluate the clarity, relevance, and appropriateness of each item, with specific attention to whether the questions appeared to measure the intended subject matter. The insights gathered confirmed that the questions were generally well-framed and appropriate, though minor revisions were made to enhance understandability and minimize ambiguity. This process reinforced the credibility of the questionnaire and its acceptability by the target respondents.

3.8.2 Reliability

Reliability refers to the consistency of the research instrument, specifically its ability to produce stable and uniform results under similar conditions. In this study, two forms of reliability were assessed: internal consistency and test-retest reliability.

Internal consistency was evaluated using Cronbach's Alpha (α), which measures the extent to which items within each thematic section of the questionnaire are correlated and consistently capture a unified construct.

Test-retest reliability was examined by re-administering the same questionnaire to a subset of the pilot respondents after a two-week interval. The correlation between the two sets of responses was analyzed using Pearson's correlation coefficient. The resulting values demonstrated a high level of agreement between the two administrations, indicating that the questionnaire produced stable and consistent results over time. This confirmed the instrument's temporal reliability, an essential attribute for longitudinal and cross-sectional analysis.

Collectively, the pilot study findings validated the questionnaire as a scientifically sound and methodologically appropriate tool for the main study. It confirmed that the instrument was both valid and reliable, thereby ensuring the quality and credibility of the data to be collected in the subsequent phase.

3.9 Data Collection Methods and Procedures

This study employed a systematic and methodologically sound data collection approach to ensure that the information gathered was accurate, relevant, and aligned with the research objectives. The process was guided by the study's philosophical orientation and research design, ensuring that all

data obtained were both credible and applicable to the context of road infrastructure project performance in Nairobi County.

The primary data collection instrument used in this study was a structured questionnaire, carefully developed to reflect the study's conceptual framework and research questions. The questionnaire comprised both closed-ended and Likert-scale items, designed to capture standardized responses for quantitative analysis while ensuring internal consistency across the study variables. It was organized into six sections: demographic information, procurement risk management, open contracting, procurement audits, supplier performance management, and project performance, each aligned with a specific construct under investigation.

The target respondents were drawn from eight major road infrastructure projects across Nairobi County, as identified in the sampling frame. The study purposively focused on professionals directly involved in procurement and project implementation. These included procurement officers, resident engineers, project managers, contractors, and representatives from oversight and regulatory agencies. Their inclusion was based on their expertise and central roles in the design, execution, and monitoring of procurement activities within road infrastructure projects, thus ensuring the relevance and reliability of the data collected.

Prior to the main data collection, a pilot study was conducted to pretest the research instrument. The pilot targeted respondents involved in road infrastructure projects of similar magnitude and characteristics to those in the main study but located outside Nairobi County to avoid contamination of the primary sample. The pilot study tested the instrument's clarity, structure, and logical flow, as well as its ability to capture the intended constructs. Feedback from the pilot informed refinements in question phrasing, sequencing, and response scaling, enhancing both the content and face validity of the instrument.

During the main data collection phase, the questionnaires were administered in person. I the researcher, with the aid of trained research assistants where necessary, visited project sites, contractor offices, and relevant government departments to distribute the instruments. This approach not only improved the response rate but also facilitated real-time clarification of questions, where needed, thereby minimizing non-response errors and enhancing the quality of responses.

The data collection process adhered strictly to ethical research standards. All participants were briefed on the purpose of the study and assured of the confidentiality and anonymity of their responses. Informed consent was obtained in writing, and participation was entirely voluntary. The researcher ensured that all data were stored securely, both physically and electronically with access limited to the research team, in compliance with research ethics and data protection guidelines.

To further ensure data quality, the collection process was carried out over a pre-determined timeframe, allowing adequate time for respondent engagement and follow-up with individuals who initially delayed or declined participation. Regular progress checks and quality control measures were conducted to confirm that the data collected remained consistent, complete, and representative of the target population.

This rigorous and ethically grounded approach to data collection ensured the credibility, dependability, and trustworthiness of the data obtained, thereby laying a firm foundation for robust statistical analysis and meaningful interpretation in the subsequent chapters

3.10 Data Analysis Techniques and Procedures

Data analysis for this study was conducted using the Statistical Package for the Social Sciences (SPSS), a highly efficient and reliable tool for analyzing social science data. The software was

selected due to its capacity to handle large volumes of data while producing accurate, structured, and meaningful statistical outputs. The analysis process involved both descriptive and inferential statistical methods to explore procurement management practices and their effect on the performance of road infrastructure projects within Nairobi County.

Descriptive statistics were used to organize and summarize the data in a way that facilitated a clear understanding of the variables under investigation. Through the calculation of means, the analysis established central tendencies of responses across the different procurement practices and project performance indicators. Standard deviation was employed to assess the degree of variability among responses, thus revealing the consistency or spread of views among the participants. Frequency distributions were also used to examine the number of occurrences of specific response categories, allowing for the identification of prevalent trends and patterns in procurement processes implemented across the road infrastructure projects studied.

Following the descriptive analysis, inferential statistics were employed to examine the relationships between variables and draw conclusions based on the sampled data. Pearson's correlation analysis was conducted to evaluate the strength and direction of associations between the independent variable; procurement risk management, open contracting, procurement audits, and supplier performance management and the dependent variable, which was road infrastructure project performance. This correlation analysis provided valuable insights into the degree of linear association between procurement practices and project outcomes, contributing to a deeper understanding of how each procurement component interacted with project performance.

In addition to correlation analysis, multiple linear regression analysis was carried out to establish the extent to which each procurement management practice influenced the overall performance of road infrastructure projects. The regression model incorporated all four procurement practices as

independent variables. Through this method, the study was able to determine the predictive power and statistical significance of each variable while accounting for the influence of the others. The regression results included coefficient estimates, levels of statistical significance, and the coefficient of determination (R^2), which indicated how much of the variation in project performance could be explained by the procurement practices included in the model.

The regression model applied in this study was as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where:

Y = Road Infrastructure Project Performance (dependent variable)

X₁ = Procurement Risk Management

X₂ = Open Contracting

X₃ = Procurement Audits

X₄ = Supplier Performance Management

B₀ = Intercept (the constant term)

B₁ – β₄ = Regression coefficients representing the effect of each procurement practice on project performance

E = Error term capturing the variation in the dependent variable not explained by the independent variables

The use of both correlation and regression techniques provided a more comprehensive analytical approach. While correlation clarified associations between variables, regression offered a deeper, explanatory perspective by quantifying the influence of each practice on project outcomes.

This combination of techniques ensured that the findings were both statistically valid and practically meaningful. It allowed the study to move beyond surface-level associations and into an evidence-based understanding of procurement practices and their tangible effect on infrastructure performance in Nairobi County. All statistical analyses were conducted at a 95% confidence level to ensure that results were both reliable and scientifically defensible.

3.11 Ethical Considerations

The study strictly adhered to established ethical standards to ensure the integrity of the research process, protect the rights and dignity of participants, and uphold academic and legal compliance. Ethical research conduct was central to maintaining the validity and credibility of the findings, particularly given the study's focus on public procurement practices in road infrastructure projects within Nairobi County.

Prior to data collection, ethical clearance was formally sought and obtained from the Directorate of Postgraduate Studies and the Mount Kenya University Ethical Review Board. Additionally, a research permit was acquired from the National Commission for Science, Technology and Innovation (NACOSTI), authorizing the study to be conducted within the designated geographical scope and confirming compliance with national research regulations.

Participation in the study was entirely voluntary, with all respondents provided with informed consent forms prior to engagement. Each participant was given adequate time to read and understand the purpose of the study, the nature of their involvement, the type of data to be

collected, and their right to withdraw at any point without facing any form of consequence. The informed consent process also assured participants of strict confidentiality and the protection of their personal data.

To uphold confidentiality and anonymity, no identifying information such as names, titles, or departmental affiliations was collected or linked to the responses. The data was handled with the highest level of confidentiality, stored in password-protected digital systems and secure physical storage accessible only to authorized personnel. All data was reported in aggregated form, and no individual responses were disclosed. Upon completion of the study, all raw data was scheduled for secure disposal in accordance with university and NACOSTI ethical guidelines on data retention and destruction.

In designing the data collection instruments, care was taken to avoid sensitive or intrusive questions, ensuring that the wording was respectful, neutral, and non-discriminatory. The study posed no foreseeable risk to the participants. Nevertheless, provisions were in place to offer clarification or address any concerns that respondents may have raised during the research process. Every effort was made to guarantee that participants experienced no psychological, emotional, or professional harm as a result of their involvement in the study.

This ethical framework ensured that the research was conducted responsibly, lawfully, and with full respect for the values of academic integrity and human dignity.

CHAPTER FOUR: RESEARCH FINDINGS, ANALYSIS AND PRESENTATION

4.0 Introduction

This chapter presents the findings from the data collected through questionnaires distributed to procurement professionals. The analysis was based on responses from a sample size of 100 participants. The data was organised according to the key sections in the questionnaire: Demographic Information, Procurement Risk Management Practices, Open Contracting, Procurement Audits, Supplier Performance Management, and Project Performance.

Response Rate

Out of the 104 participants who were sampled for the study, 100 valid responses were received and analyzed. The shortfall of three responses was attributed to the non-return of questionnaires, despite reasonable follow-up efforts. This represents a non-response count of 4, which translates into a non-response rate calculated as follows:

Non-response Rate Formula and Calculation

Formula:

$$\text{Non-response rate} = (\text{Non-responses} \div \text{Total sample size}) \times 100$$

Substitution:

$$\text{Non-response rate} = (4 \div 104) \times 100 = 3.85\%$$

Response Rate Formula and Calculation

Formula:

$$\text{Response rate} = (\text{Responses} \div \text{Total sample size}) \times 100$$

Substitution:

$$\text{Response rate} = (100 \div 104) \times 100 = 96.15\%$$

This response rate of 96.15% is considered statistically strong, exceeding the threshold commonly accepted in social science research for high-quality survey data, which is typically 70% and above. The non-response rate of 3.85% is minor and statistically insignificant, indicating that the reliability, validity, and representativeness of the study findings were not compromised. Therefore, the final sample size of 100 respondents was deemed adequate for robust statistical and inferential analysis.

4.1 Demographic Information

This section analyses the demographic characteristics of respondents, including age, gender, position/role, years of experience in procurement, and highest level of education.

4.1.1 Age of Respondents

The study sought to determine the age distribution of procurement professionals participating in the study. The responses were categorised into different age groups. The results (Figure 2) showed that the majority of respondents fell within the age groups of 26–35 years (30%) and 36–45 years (25%), indicating that a significant portion of participants were in their prime working years, likely possessing practical experience and professional engagement in road infrastructure projects. Respondents aged 18–25 years accounted for 20%, while those aged 46–55 years made up 15%, and only 10% were aged 56 years and above.

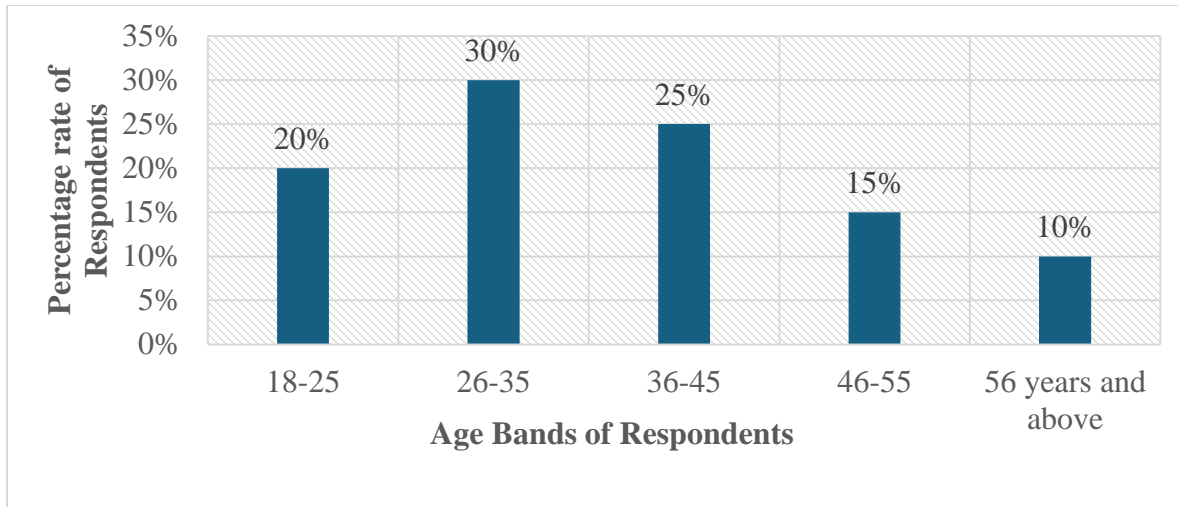


Figure 2: Age Distribution of Respondents

Source : (Researcher 2025)

These findings align with Dubey et al. (2023) findings which emphasized the importance of dynamic capabilities and institutional effectiveness in enhancing supply chain resilience, the dominance of younger to middle-aged professionals in this study suggests a workforce that is potentially more adaptable, digitally inclined, and responsive to evolving procurement practices and government-led reforms.

This demographic distribution is significant in relation to the study objectives, as it implies that the respondents likely have current exposure to procurement risk management, open contracting initiatives, procurement audits, and supplier performance strategies within Nairobi County's road infrastructure sector. Their perspectives are, therefore, valuable in assessing the practical implementation and effectiveness of these elements in enhancing project transparency, regulatory compliance, operational efficiency, and performance outcomes.

4.1.2 Gender of Respondents

The study also analysed the gender composition of the participants and the results (Figure 3) revealed that 58% of the respondents were male, while 42% were female. This indicates a male-dominated workforce within the road infrastructure sector in Nairobi County, although female participation remains significant.

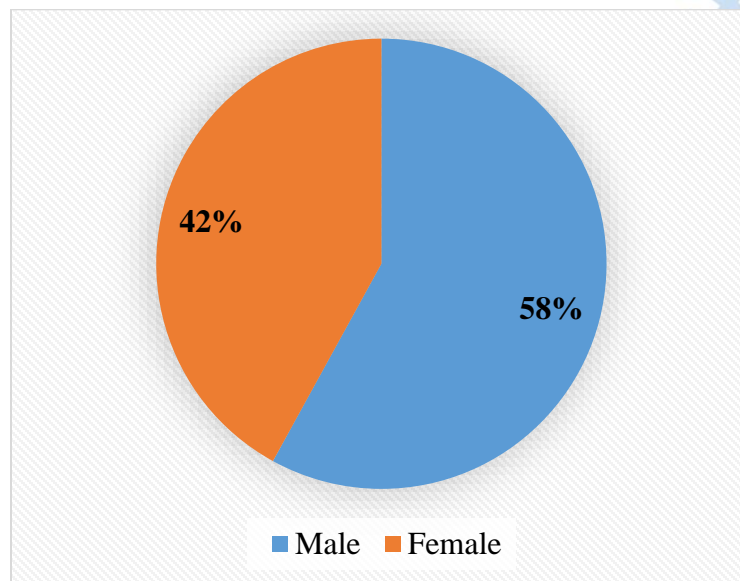


Figure 3: Gender of Respondents

Source : (Researcher 2025)

These gender distribution findings suggested a relatively balanced representation of both genders in procurement roles, which, according to Emmanuel et al. (2022), is critical for enhancing procurement quality performance. This implies that a diverse and inclusive procurement teams contribute to more comprehensive decision-making and improved organisational outcomes, particularly when supported by strong top management commitment and procurement audits.

4.1.3 Position/Role in Procurement-related activities

The study also analysed the positions or roles held by the respondents within procurement-related functions in their respective organisations. The findings (Figure 4) indicate that a majority of the participants were procurement officers (30%), followed by supply chain managers (25%), project managers (20%), auditors (15%), and consultants (10%).

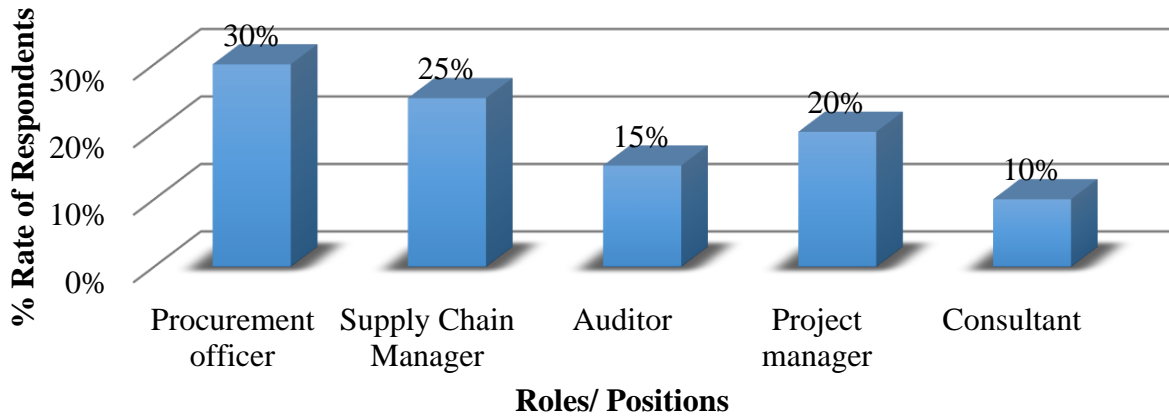


Figure 4: Position/Role in Procurement-related activities of Respondents

Source : (Researcher 2025)

This distribution reflects a wide range of involvement in procurement activities, with the highest representation coming from operational roles such as procurement officers and supply chain managers. Such diversity is important as it ensures that the study captures insights from various levels of the procurement function; from strategic oversight to operational execution. These findings suggest a comprehensive representation of professionals across procurement hierarchies, aligning with the view of Kariuki and Wanyoike (2021) that effective procurement performance is closely linked to the inclusion of stakeholders from diverse roles.

4.1.4 Distribution of Years of Experience in Procurement among Respondents

The study further sought to determine the respondents' years of experience in procurement-related activities, as this is a crucial factor influencing the quality of procurement decisions and practices. The results (Table 3) showed that the largest group of respondents (35%) had between 1–5 years of experience, followed by 30% with 6–10 years of experience. Meanwhile, 15% had 11–15 years of experience, while both those with less than 1 year and those with more than 15 years accounted for 10% each.

Table 1

Years of Experience in Procurement

Experience level (Years)	Frequency	Percentage (%)
Less than 5 years	10	10%
1-5 years	35	35%
6-10 years	30	30%
11-15 years	15	15%
More than 15 years	10	10%
Total	100	100%

Source : (Researcher 2025)

These findings affirm the insights of Ngugi and Mugo (2020), who argue that professional experience plays a critical role in the effectiveness and integrity of procurement systems. Experienced procurement professionals are more likely to navigate regulatory frameworks efficiently, apply ethical standards, and engage in strategic sourcing. Therefore, the distribution of experience among the respondents enhances the credibility of the study’s findings and reflects a robust professional foundation in the sampled organisations.

4.1.5 Distribution of Level of Education of Respondents

The study also analysed the highest academic and professional qualifications attained by the respondents to understand the educational background influencing procurement practices. The results, in Figure 5, revealed that the majority of participants (45%) held a Bachelor's degree, followed by 30% with a Master's degree, and 15% with a Diploma. Respondents with Doctorates and those with professional certifications each accounted for 5% of the sample.

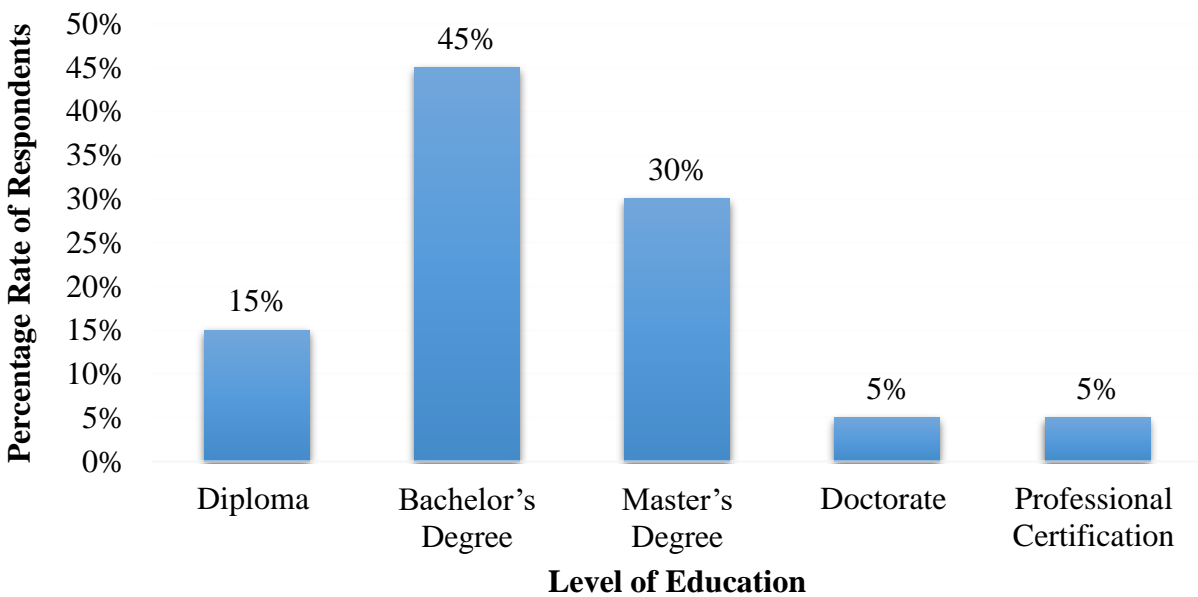


Figure 5: Distribution of Level of Education of Respondents

Source : (Researcher 2025)

The study's findings align with Wambua and Ombaka's (2021) research, showing that higher education levels among procurement professionals lead to better procurement outcomes. Educated personnel are more adept at understanding regulations, using digital tools, and making data-driven decisions. According to Kothari (2022) a demographic characteristics of such study population would be reliable and solid for analysis to give valid results.

4.2 Procurement Risk Management Practices

4.2.1 Descriptive Statistics

This section presents descriptive statistics findings on how procurement professionals identified and managed risks in their procurement activities. The analysis covered risk identification, effectiveness of risk assessment practices, presence of risk mitigation strategies, frequency of risk monitoring, and overall organisational approach to risk management.

4.2.1.1 Frequency of Risk Identification in Procurement Activities

The study examined the frequency of risk identification in procurement activities across organizations. The results (Figure 6) revealed that 20% of respondents always identified procurement risks, while 30% did so often, indicating that half of the organizations regularly engaged in risk identification. However, 25% only identified risks sometimes, and a combined 25% rarely or never conducted risk identification, highlighting inconsistencies in risk management practices.

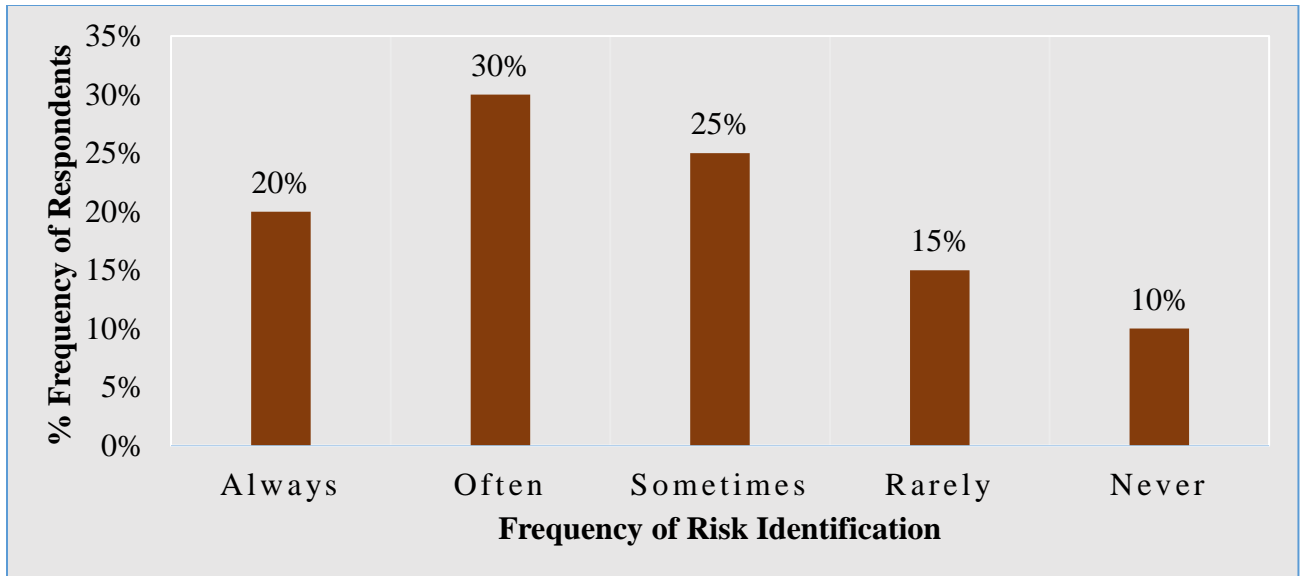


Figure 6: Frequency of Risk Identification in Procurement Activities

Source : (Researcher 2025)

These results align with Adawe and Ndengui (2024), whose study revealed that organizations adopting e-procurement systems improve risk detection and supply chain transparency, particularly in public healthcare procurement. This implies that the 20% of organizations that "always" identify risks may be leveraging digital tools, while the 10% that "never" do so likely rely on manual processes, exposing them to inefficiencies.

The findings also resonate with Changalima and Mdee (2022), who found that procurement planning and skills mediate risk management effectiveness. Their study showed that structured planning enhances risk identification, which supports why 30% of organizations "often" detect risks, while the 25% that "sometimes" do so may lack formalized procurement strategies. This implies that investing in procurement training and planning frameworks could bridge this gap.

Furthermore, the results correlate with Kohler and Dimancesco (2020), whose research on pharmaceutical procurement highlighted that weak risk identification increases corruption vulnerabilities. Their findings suggest that the 15% of organizations that "rarely" assess risks are more susceptible to fraud, implying a need for stricter anti-corruption controls and audit mechanisms in procurement.

Similarly, Nagarajan and Ganapathi (2024) demonstrated that smart risk models in construction procurement enhance early threat detection. Their study reinforces why organizations with advanced analytics (likely the "always" and "often" categories) outperform those relying on outdated methods (the "sometimes" and "rarely" groups). This implies that adopting AI-driven risk assessment tools could standardize procurement risk management.

Finally, the study aligns with Olick and Moronge (2019), who found that inconsistent procurement practices in Kenyan state corporations lead to inefficiencies. Their research supports the current findings, where 25% of organizations inconsistently identify risks, implying that policy enforcement and standardized procurement guidelines are critical for improvement.

Therefore, the comparison with these studies suggests that procurement risk identification frequency depends on technology adoption, skills development, corruption controls, and policy compliance. Organizations that actively identify risks benefit from structured systems, while those lagging face operational and financial threats. To mitigate these gaps, institutions should adopt e-procurement tools, enhance staff training, implement anti-fraud measures, and enforce standardized risk frameworks.

4.2.1.2 Effectiveness of Risk Assessment Practices

The study evaluated the perceived effectiveness of risk assessment practices in procurement on a scale of 1 (Not effective) to 5 (Highly effective). The results (Table 4) revealed that 40% of respondents rated their risk assessment practices as "Effective," while 20% considered them "Highly effective." However, a notable 25% found them only "Moderately effective," and 15% (combining "Slightly effective" and "Not effective") perceived their risk assessment processes as inadequate. This indicates that while a majority (60%) believe their risk assessment is functional, a significant portion (40%) still experiences gaps in effectiveness.

Table 2:

Effectiveness of Risk Assessment Practices

Risk Assessment effectiveness	Frequency	Percentage (%)
1-Not effective	5	5%
2-Slightly effective	10	10%
3-Moderately effective	25	25%
4-Effective	40	40%
5-Highly effective	20	20%
Total	100	100%

Source : (Researcher 2025)

These findings align with Sharma, Sengupta, and Panja (2019), whose study on corruption risks in public procurement revealed that organizations with structured risk assessment frameworks detect vulnerabilities more efficiently. Their research supports the current results, where 60% of organizations ("Effective" and "Highly effective") likely employ systematic risk evaluation

methods, while the remaining 40% may lack robust controls, increasing exposure to fraud and inefficiencies. This implies that standardized risk assessment protocols could enhance procurement reliability, particularly in public sectors.

Additionally, the results correlate with Ramasamy and Muthukrishnan (2023), who emphasized that smart risk models in procurement improve decision-making accuracy. Their study suggests that the 20% of organizations with "Highly effective" risk assessments may use predictive analytics or AI-driven tools, whereas those with lower ratings ("Moderately effective" or below) rely on outdated manual processes. This implies that adopting technology-driven risk assessment models could bridge the effectiveness gap.

Furthermore, the findings resonate with Kohler and Dimancesco (2020), whose research on pharmaceutical procurement demonstrated that weak risk assessments lead to corruption and supply chain disruptions. Their work explains why 15% of respondents rated their practices as minimally effective, highlighting the need for stricter compliance measures and transparency in procurement risk evaluation. Similarly, the study supports Olick and Moronge (2019), who found that inconsistent procurement practices in Kenyan state corporations result in inefficiencies. Their findings reinforce the current results, where 25% reported only "Moderate" effectiveness, suggesting that policy enforcement and capacity building are essential to strengthen risk assessment frameworks.

Thus, the study's findings, when compared with prior research, indicate that risk assessment effectiveness varies due to technological adoption, regulatory compliance, and institutional policies. While a majority of organizations demonstrate competence, a significant minority still face challenges, necessitating targeted improvements in procurement risk management strategies.

4.2.1.3 Availability of Risk Mitigation Strategies

Respondents were asked to indicate the specific risk mitigation strategies employed by their organizations in procurement processes. The results (Table 5) revealed that supplier diversification ($Mean = 2.33, SD = 0.76$) and risk-sharing mechanisms ($Mean = 2.30, SD = 0.73$) were the most commonly reported strategies, though their adoption remained moderate. Regulatory compliance measures ($Mean = 2.47, SD = 0.72$), frequent audits and monitoring ($Mean = 2.48, SD = 0.71$), and other strategies such as insurance contracts ($Mean = 2.46, SD = 0.68$) were also utilized but with similar moderate implementation levels.

Table 3: *Mean Standard Deviation on Availability of Risk Mitigation Strategies*

Risk Mitigation Strategy	1	2	3	Total (N)	Mean	SD
Supplier diversification	5	10	15	30	2.33	0.76
Risk-sharing mechanisms	10	15	25	50	2.30	0.73
Regulatory compliance measures	2	5	10	17	2.47	0.72
Frequent audits and monitoring	3	7	15	25	2.48	0.71
Others (e.g., insurance contracts)	10	15	40	65	2.46	0.68

Source : (Researcher 2025)

These findings suggest that while organizations recognize the importance of risk mitigation, the extent of their adoption varies, indicating potential gaps in fully embedding these strategies into procurement practices.

These results align with Sharma, Sengupta, and Panja (2019), whose study on corruption risks in public procurement found that supplier diversification and stringent compliance checks

significantly reduce procurement fraud. Their research supports the current findings, where supplier diversification and regulatory compliance emerged as key strategies, though not yet fully optimized. This implies that organizations may need to strengthen these measures further to minimize vulnerabilities.

Additionally, the findings correlate with Kohler and Dimancesco (2020), who emphasized that risk-sharing mechanisms, such as performance-based contracts, enhance accountability in pharmaceutical procurement. Their study explains why risk-sharing was moderately adopted (Mean = 2.30) in the current study, suggesting that organizations recognize its value but may face implementation challenges, such as contractual complexities or resistance from suppliers.

Furthermore, the moderate use of frequent audits and monitoring (Mean = 2.48) resonates with Adawe and Ndengui (2024), who demonstrated that e-procurement systems improve real-time monitoring and audit efficiency. Their findings imply that organizations relying on manual audit processes may struggle with consistency, whereas those adopting digital tools could achieve higher effectiveness in risk mitigation.

The study also supports Chagalima and Mdee (2022), who found that procurement planning mediates the success of risk mitigation strategies. Their research suggests that the moderate adoption levels across all strategies (Means ranging from 2.30 to 2.48) may reflect inadequate planning or resource allocation, highlighting the need for better integration of risk mitigation into procurement frameworks.

Finally, the findings align with Nagarajan and Ganapathi (2024), whose smart risk model for construction procurement advocates for proactive mitigation through data analytics. Their work underscores why strategies like insurance contracts (Mean = 2.46) are underutilized—

organizations may lack predictive risk assessment capabilities to justify such investments. This implies that advanced risk modeling could enhance the adoption and effectiveness of these strategies.

The study's analysis of risk mitigation strategies in procurement reveals a moderate level of adoption across key approaches, including supplier diversification, risk-sharing mechanisms, regulatory compliance, audits, and insurance contracts. While organizations demonstrate awareness of these strategies, their implementation remains inconsistent, suggesting operational or structural barriers. Therefore, the study's findings showing moderate but inconsistent adoption of risk mitigation strategies, highlight critical areas for improvement in procurement risk management. The gaps between awareness and implementation suggest that organizations need targeted interventions to strengthen their approaches.

4.2.1.4 Frequency of Risk Monitoring and Review

The study examined how frequently organizations reviewed their risk management effectiveness. The results (Figure 7) revealed that 35% of organizations conduct quarterly reviews, while 25% review risks annually. Only 20% monitor risks monthly, and another 20% review risks only when issues arise. This indicates that while most organizations (80%) have some structured review process, a significant portion (20%) takes a reactive approach, addressing risks only after problems

occur.

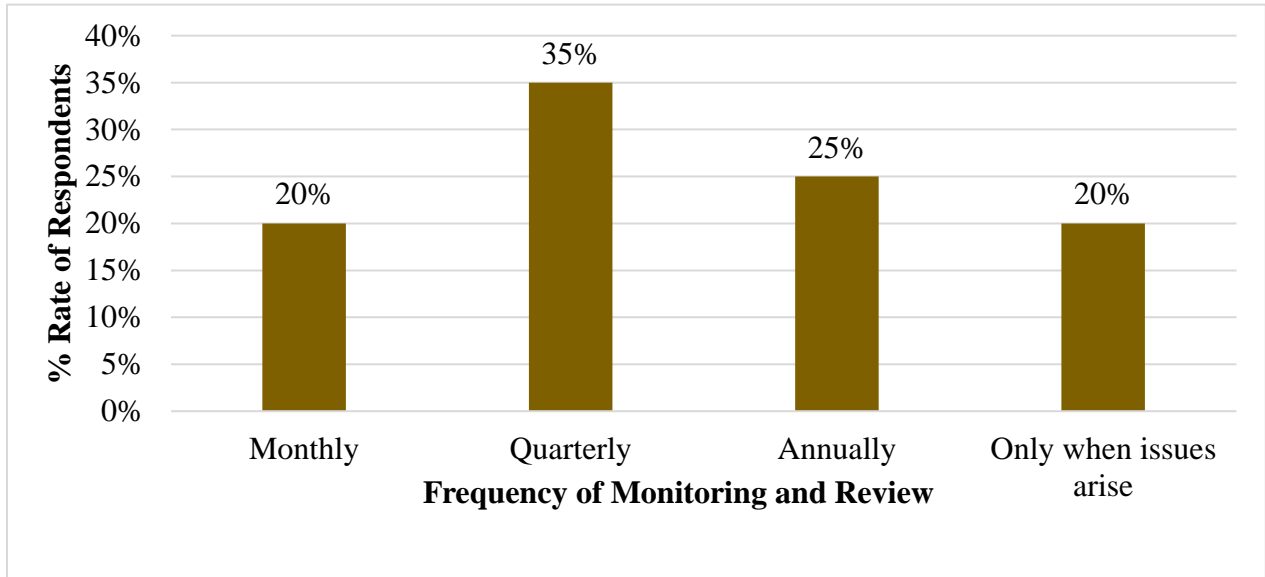


Figure 7: Frequency of Risk Monitoring and Review

Source : (Researcher 2025)

These findings suggest that while 80% of organizations demonstrate some level of structured risk monitoring, a significant portion (20%) adopt a reactive approach, which may expose them to preventable risks and operational inefficiencies.

These findings resonate with those of Nagarajan and Ganapathi (2024), who emphasised that the effectiveness of risk management in construction projects is largely dependent on the frequency and timeliness of risk assessments. They advocate for proactive and periodic reviews as an integral part of their proposed smart risk management model, arguing that delayed or irregular reviews significantly contribute to cost overruns and project delays. In this regard, the 20% of organizations that adopt a reactive stance may face similar challenges, especially in fast-paced or complex operational environments.

Similarly, Ramasamy and Muthukrishnan (2023) support the notion that continuous and routine risk monitoring enables timely decision-making and enhances organizational agility. Their study underscores the need for monthly or real-time monitoring frameworks, particularly in industries characterised by rapid change and high uncertainty. This supports the view that organizations conducting monthly or quarterly reviews are more likely to detect and respond to emerging threats promptly, thus enhancing operational resilience.

In the context of procurement management, Changalima and Mdee (2022) argue that procurement performance is positively influenced by the integration of risk forecasting into procurement planning. Their study found that when risk assessments are conducted as part of procurement cycles, organizations benefit from better alignment of procurement strategies with performance goals. This aligns with the 35% of organizations in the present study that undertake quarterly risk reviews, as they are more likely to benefit from proactive planning and execution of procurement functions.

Further, Adawe and Ndengui (2024) found that the adoption of electronic procurement practices among Kenyan hospitals significantly enhanced the frequency and quality of performance and risk reviews. Their findings suggest that the use of technology facilitates more consistent monitoring, thereby supporting more effective risk mitigation. The current findings corroborate this by showing that structured reviews, such as quarterly or monthly assessments, are relatively common among organizations—an indication of increasing reliance on formal systems and technological tools.

On the issue of accountability and governance, Kohler and Dimancesco (2020) argue that infrequent or ad hoc risk reviews create vulnerabilities, particularly in public procurement processes, where corruption risks are prevalent. Regular and transparent review mechanisms are

deemed essential in promoting accountability and preventing malpractice. This view is reinforced by Sharma et al. (2019), who maintain that structured risk assessments strengthen internal controls and expose hidden inefficiencies or corruption risks. Consequently, the 20% of organizations that only review risks when issues arise may lack the oversight mechanisms necessary to detect and address systemic risks.

Lastly, Olick and Moronge (2019) highlight the importance of formalized procurement practices, including routine risk reviews, in strengthening procurement functions within Kenyan state corporations. They note that organizations with established review mechanisms demonstrate improved compliance, transparency, and performance outcomes. The findings of the current study reflect this, with structured risk monitoring emerging as a key contributor to robust organizational practices.

Thus, the study's findings underscore a critical distinction between proactive and reactive approaches to risk management. The literature consistently supports the adoption of frequent, scheduled risk monitoring as a means to enhance organizational efficiency, performance, and resilience. Organizations that fail to institutionalize such practices risk exposing themselves to undetected threats, poor performance outcomes, and diminished stakeholder confidence. There is a compelling need for organizations, especially in public and procurement-intensive sectors, to shift towards more structured and frequent risk monitoring practices, supported by appropriate skills, planning, and technological systems.

4.2.1.5 Common Challenges Encountered in Procurement Risk Management

Respondents were asked to identify the main challenges their organizations face in managing procurement risks. According to the respondents, the common challenges encountered in procurement risk management were identified as follows:

Many organizations face inadequate risk identification processes, where risks are often not detected early enough, leading to a reactive approach rather than a proactive one. Another challenge is the limited staff training and awareness, with respondents noting that employees often lack the necessary skills and knowledge to effectively manage procurement risks. Budget constraints were also highlighted as a key issue, as insufficient resources hinder the implementation of comprehensive risk management strategies. Additionally, poor supplier performance was frequently mentioned, with respondents pointing out that unreliable suppliers, in terms of delivery and quality, contribute significantly to procurement risks. The lack of regular monitoring of risk management strategies was also noted, as many organizations fail to consistently review and update their practices. Lastly, several respondents highlighted the over-reliance on single suppliers, which increases vulnerability, particularly when those suppliers fail to meet expectations.

The most commonly cited challenge, however, was inadequate risk identification, with a significant number of respondents emphasizing the need for better detection of risks at an earlier stage to mitigate procurement vulnerabilities more effectively.

4.2.2 Regression Analysis of Procurement Risk Management Practices

This section aimed to assess the influence of procurement risk management practices on cost escalations and project delays in Nairobi's road infrastructure projects. The analysis focused on evaluating whether key risk management practices, such as risk identification, risk assessment, mitigation strategies, and frequency of monitoring have a statistically significant impact on controlling project costs and timelines. The regression model results (Table 6) revealed that risk identification had the strongest influence on project performance, with a standardized beta coefficient of 0.312 and a highly significant p-value ($p = 0.000$). This suggests that organizations

that actively and consistently identify procurement risks are more likely to prevent cost escalations and minimise delays. Risk assessment effectiveness also demonstrated a positive and significant impact ($\beta = 0.265$, $p = 0.005$), indicating that well-structured and robust evaluation practices contribute meaningfully to controlling procurement-related project disruptions.

Similarly, risk mitigation strategies were found to be a significant predictor ($\beta = 0.229$, $p = 0.002$), affirming that organisations employing diverse and systematic mitigation measures—such as supplier diversification, regulatory compliance, and insurance, are better positioned to avoid adverse cost and time implications. Lastly, the frequency of risk monitoring and review also showed a significant and positive effect ($\beta = 0.221$, $p = 0.007$), underlining the importance of routine and proactive review mechanisms in enhancing project delivery outcomes.

Table 4:

Regression Analysis of Procurement Risk Management Practices and Project Performance

<i>Variable</i>	<i>Unstandardized Coefficients (B)</i>	<i>Std. Error</i>	<i>Standardized Coefficients (Beta)</i>	<i>t</i>	<i>Sig. (p-value)</i>
<i>(Constant)</i>	1.253	0.412	—	3.042	0.003
<i>Risk Identification</i>	0.298	0.078	0.312	3.821	0.000***
<i>Risk Assessment Effectiveness</i>	0.241	0.083	0.265	2.904	0.005**
<i>Risk Mitigation Strategies</i>	0.210	0.067	0.229	3.134	0.002**
<i>Frequency of Risk Monitoring/Review</i>	0.198	0.071	0.221	2.789	0.007**

Source : (Researcher 2025)

These findings demonstrate that procurement risk management practices play a crucial role in influencing the success of infrastructure projects, particularly in terms of cost and time control.

The statistical significance of all four variables confirms that improving procurement risk

processes can lead to measurable improvements in project performance. Therefore, the null hypothesis (H_{01}) that procurement risk management practices have no significant influence on cost escalations and project delays was rejected.

These findings align closely with the foundational principles of Risk Management Theory, which posits that structured anticipation, monitoring, and mitigation of risks contribute to the achievement of organizational objectives (Emily et al., 2016).

However, while the theory provides a sound framework for managing procurement risks, it lacks contextual specificity, particularly in developing economies where institutional, legal, and logistical challenges often undermine theory application. For instance, Risk Management Theory assumes that all organizations have access to the resources and technical capabilities necessary to anticipate and respond to risks effectively. In practice, this assumption may not hold true in low-resource environments like Nairobi's public infrastructure sector, where limited capacity, political interference, and underdeveloped supplier markets frequently hinder robust risk management (Mohammed, 2022).

The findings of this study bring a nuanced understanding to Risk Management Theory by empirically validating the theory in a real-world, resource-constrained procurement environment. The study illustrates that even under these constraints, risk identification ($\beta = 0.312$) and risk assessment effectiveness ($\beta = 0.265$) significantly improve project outcomes. This suggests that with appropriate tools and commitment, organizations can effectively operationalize the theory's principles to mitigate procurement inefficiencies.

Moreover, the significance of risk mitigation strategies ($\beta = 0.229$) and frequency of risk monitoring ($\beta = 0.221$) highlights that ongoing and adaptive management not just front-loaded

anticipation is essential for success. This finding challenges the linear and somewhat static view of risk processes presented in Risk Management Theory, which often underemphasizes the importance of dynamic, iterative monitoring in response to emerging challenges (EmpoweringCPO Insights Team, 2023).

The study's voice extends this theory by underscoring the interdependence between these components in complex public projects. For example, the data suggests that organizations that regularly monitor risks are also more likely to have effective mitigation strategies, thereby reinforcing the concept that risk management is not a siloed or sequential process but a continuous, integrated effort. This insight responds to critiques that Risk Management Theory insufficiently addresses how real-world variables, such as institutional culture or regulatory volatility—shape implementation (Ronald & Arthur, 2016).

Supporting literature further validates these findings. For instance, Nagarajan and Ganapathi (2024) found that smart, proactive risk frameworks in construction projects significantly reduce budget overruns, a point echoed in the present study's demonstration of the influence of proactive risk identification. Likewise, Changalima and Mdee (2022) showed that when procurement planning integrates risk assessments, performance improves measurably—again supporting this study's evidence on the predictive power of structured risk practices.

Therefore, while Risk Management Theory provides a foundational lens, this study adds contextual depth and empirical relevance, particularly for procurement settings in developing countries. It contributes to theory refinement by showing that structured procurement risk management can be effective despite institutional limitations provided there is commitment to monitoring, assessment, and mitigation processes. Hence, the findings affirm that Risk

Management Theory remains valid but needs adaptation to local realities, especially in public infrastructure sectors characterised by high complexity and dynamic risk environments.

4.3 Open Contacting

4.3.1 Descriptive Statistics

4.3.1.1 Transparency of Procurement Processes

The study evaluated how transparent procurement processes are within organizations on a scale of 1 (Not transparent) to 5 (Highly transparent). The results (Figure 8) indicate that 40% of respondents rated their procurement processes as “Transparent,” while 20% considered them “Highly transparent.” Meanwhile, 25% perceived them as “Moderately transparent,” and 15% gave lower transparency ratings, combining “Slightly transparent” (10%) and “Not transparent” (5%).

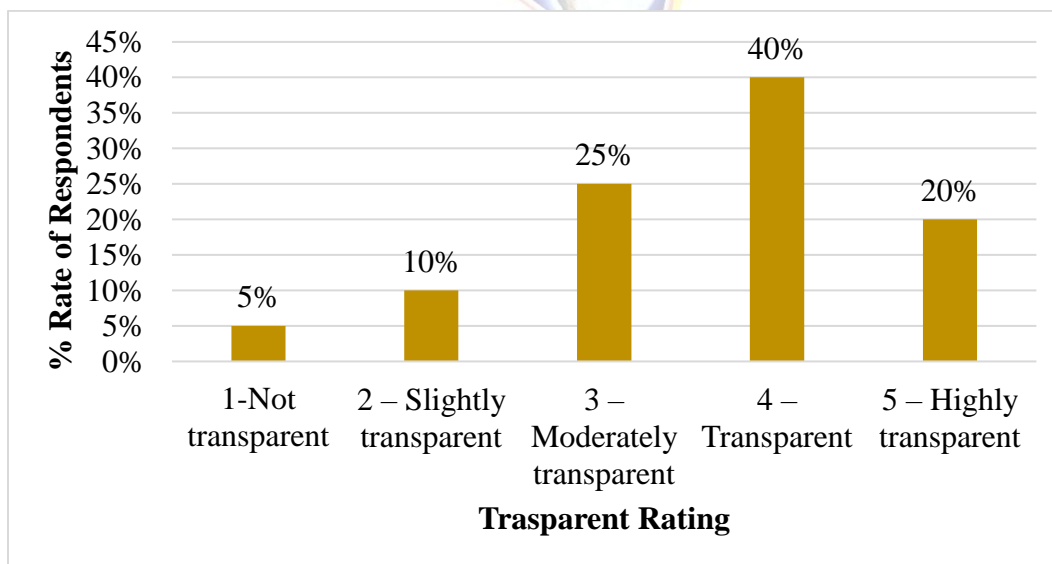


Figure 8: Transparency of Procurement Processes

Source : (Researcher 2025)

These findings suggest that 60% of organizations maintain a clear and open procurement process, but a significant minority still operate with limited transparency. This aligns with Sharma, Sengupta, and Panja (2019), who emphasized that transparent procurement systems reduce the risk of corruption and foster trust among stakeholders. Their research supports the current data, suggesting that organizations rated highly in transparency may already be adopting structured disclosure and documentation practices.

In contrast, the 15% of respondents who reported minimal transparency may reflect environments where manual or informal procurement processes still dominate. This is consistent with Kohler and Dimancesco (2020), who found that lack of transparency in pharmaceutical procurement leads to inefficiencies and fraud. Therefore, advancing electronic procurement tools and enforcing mandatory disclosure policies could help standardize procurement transparency across the board.

4.3.1.2 Stakeholder Engagement in the Contracting Process

The study sought to determine whether stakeholders were actively engaged in the procurement contracting process. The findings (Table 7) revealed that 40% of participants reported stakeholders as “Involved” and 26% as “Highly involved,” while 23% rated engagement as “Moderate.” A smaller segment, 12% reported low involvement, with 8% citing “Slightly involved” and 4% “Not involved.”

Table 5:

Stakeholder Engagement in the Contracting Process

Involvement rating	Frequency	Percentage (%)
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1 – Not involved	4	4%
2 – Slightly involved	8	80%
3 – Moderately involved	22	23%
4 – Involved	40	40%
5 – Highly involved	26	26%
Total	100	100%

Source : (Researcher 2025)

These findings reveal that 66% of organizations actively involve stakeholders in procurement decisions. This supports the work of Changalima and Mdee (2022), who found that meaningful stakeholder inclusion improves procurement performance and accountability. Their research implies that organizations with strong engagement practices are likely to gain broader support and reduce procurement-related conflicts.

However, the 12% reporting weak engagement aligns with Olick and Moronge (2019), who noted that some Kenyan state corporations exclude key stakeholders, leading to mistrust and inefficiencies. Bridging this gap requires formalizing stakeholder consultation procedures and ensuring transparency throughout the contracting lifecycle.

4.3.1.3 Use of Standardised Data Formats for Procurement Information

Respondents were asked whether their organisations used standardised data formats for procurement information. Results (Figure 9) indicated that Electronic Procurement Systems (e-procurement) are the most widely used format (40%), followed by Public Tendering Platforms (25%), Open Contracting Data Standards (OCDS) (18%), and other formats (17%).

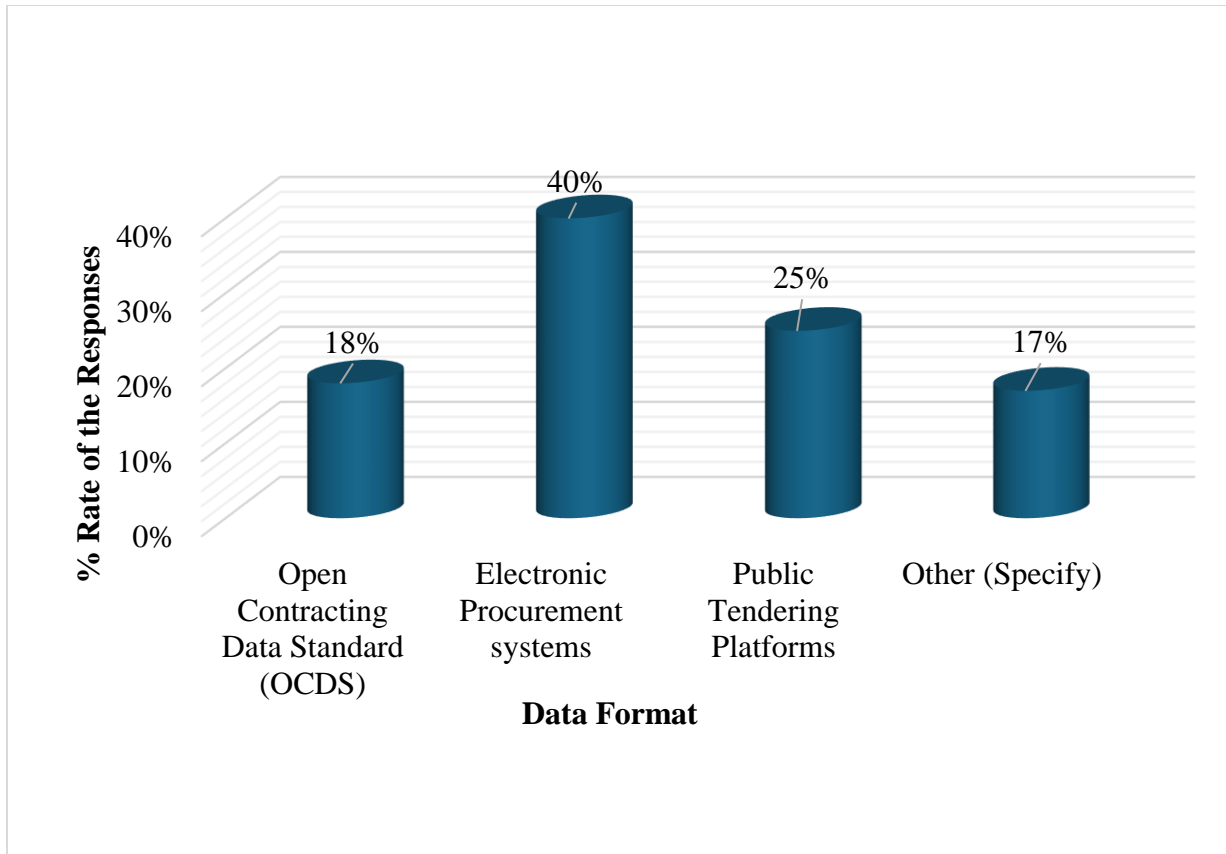


Figure 9: Use of Standardised Data Formats for Procurement Information

Source : (Researcher 2025)

These findings show that e-procurement systems dominate current reporting practices, a result supported by Adawe and Ndengui (2024), who found that digital procurement tools increase transparency and streamline procurement activities. Their findings suggest that the 40% of organizations using such systems are likely benefiting from real-time monitoring and data accessibility.

The relatively low adoption of OCDS (18%) highlights potential implementation barriers, such as lack of awareness or technical capacity. This is consistent with Nagarajan and Ganapathi (2024), who observed that open data standards require robust infrastructure and training to be effective.

Thus, investment in system compatibility and training may enhance uptake of standardized data practices across sectors.

4.3.1.4 Availability of Feedback Mechanisms for Stakeholders

The study examined whether organisations had mechanisms that allowed stakeholders to provide feedback on procurement practices. Respondents described the feedback mechanisms available to stakeholders. The most commonly cited method was formal complaint channels, such as dedicated email addresses or hotlines. Other mechanisms included regular consultations, periodic feedback surveys, whistle-blowers' policies, and third-party audits.

These findings indicate that organizations have taken diverse approaches to engage stakeholders and promote accountability. Kohler and Dimancesco (2020) highlighted that open feedback channels deter malpractice in procurement, while Sharma et al. (2019) stressed that institutionalized complaint systems empower stakeholders and expose inefficiencies. The presence of whistleblower policies and third-party audits further suggests a growing awareness of governance standards.

However, reliance on traditional complaint mechanisms may limit responsiveness. Ramasamy and Muthukrishnan (2023) argue that real-time digital feedback tools offer better agility and responsiveness. Hence, integrating automated systems and data analytics into feedback loops could significantly enhance stakeholder engagement.

4.3.1.5 Effectiveness of Open Contracting Initiatives

The study assessed perceptions of open contracting effectiveness. The study findings (Table 8) showed that 40% of respondents rated initiatives as “Effective” and 30% as “Highly effective,”

while 20% considered them “Moderately effective.” Only 10% reported that open contracting was “Slightly effective” or “Not effective.”

Table 6:

Effectiveness of Open Contracting Initiatives

Effectiveness rating	Frequency	Percentage (%)
1 – Not effective	3	3%
2 – Slightly effective	7	7%
3 – Moderately effective	20	20%
4 – Effective	40	40%
5 – Highly effective	30	30%
Total	100	100%

Source : (Researcher 2025)

This suggests a strong endorsement (70%) for open contracting in enhancing procurement accountability. These results align with Nagarajan and Ganapathi (2024), who found that smart procurement models built on open data principles enhance early fraud detection and improve project delivery. Similarly, Emily et al. (2016) emphasized that transparent contract disclosure boosts stakeholder confidence and governance standards.

The 10% who reported minimal effectiveness may reflect cases where open contracting is implemented in form but not in function—lacking enforcement or accessibility. This concern was echoed by Ronald and Arthur (2016), who noted that weak institutional capacity often undermines the success of theoretically sound reforms. Thus, the challenge lies in operationalizing open contracting principles through digital tools, policy support, and capacity building.

4.3.2 Regression Analysis of Open Contracting Practices

This section evaluates the influence of open contracting practices on procurement efficiency and accountability, specifically in the context of Nairobi's road infrastructure projects. The regression model analyzed five key variables: transparency of procurement processes, stakeholder engagement, use of standardized data formats, availability of feedback mechanisms, and overall effectiveness of open contracting initiatives. The objective was to determine whether these practices significantly predict improvements in procurement outcomes such as reduced corruption, enhanced competition, and timely project delivery. The results (Table 9) show that transparency in procurement processes had the strongest positive influence on procurement outcomes, with a standardized beta coefficient of $\beta = 0.318$ and a statistically significant p-value ($p = 0.001$). This suggests that higher levels of transparency are closely associated with better procurement performance and accountability.

Stakeholder engagement also showed a significant and positive impact ($\beta = 0.277$, $p = 0.004$), indicating that involving stakeholders in the contracting process contributes meaningfully to enhanced oversight and reduced procurement-related disputes. Similarly, the use of standardized data formats, such as electronic procurement systems and OCDS, positively influenced procurement performance ($\beta = 0.243$, $p = 0.006$), affirming that data standardization supports transparency and decision-making.

The availability of feedback mechanisms had a moderate but significant effect ($\beta = 0.209$, $p = 0.013$), demonstrating that enabling stakeholder feedback channels helps identify inefficiencies and ensures accountability. Lastly, the effectiveness of open contracting initiatives was also a significant predictor ($\beta = 0.228$, $p = 0.009$), reinforcing the idea that organizations implementing

structured open contracting programs are more likely to experience improved procurement performance.

Table 7:

Regression Analysis of Open Contracting Practices and Procurement Outcomes

<i>Variable</i>	<i>Unstandardized Coefficients (B)</i>	<i>Std. Error</i>	<i>Standardized Coefficients (Beta)</i>	<i>t</i>	<i>Sig. (p-value)</i>
<i>(Constant)</i>	1.204	0.398	—	3.025	0.003
<i>Transparency in Procurement Stakeholder Engagement</i>	0.312	0.081	0.318	3.852	0.001 ***
<i>Standardized Data Formats</i>	0.275	0.089	0.277	3.091	0.004 **
<i>Feedback Mechanisms</i>	0.238	0.084	0.243	2.833	0.006 **
<i>Effectiveness of Open Contracting</i>	0.204	0.079	0.209	2.617	0.013 *
	0.221	0.082	0.228	2.730	0.009 **

* Significant at $p < 0.05$

** Significant at $p < 0.01$

*** Highly significant at $p < 0.001$

Source : (Researcher 2025)

These findings indicate that all five open contracting variables significantly contribute to procurement performance outcomes. The strongest predictors; transparency and stakeholder

engagement, suggest that visible and inclusive procurement processes foster accountability and reduce room for manipulation.

This aligns with Risk Management Theory, which, although originally designed to address uncertainties, also emphasizes the role of proactive systems and stakeholder input in improving organizational outcomes (Emily et al., 2016). Open contracting complements this by embedding principles of transparency and inclusivity into procurement frameworks.

However, as Mohammed (2022) argues, such models often assume a high level of institutional maturity and digital infrastructure, which may not be present in developing contexts. Nonetheless, the current study's results demonstrate that even within resource-constrained environments like Nairobi, open contracting principles, if strategically adopted can yield measurable benefits.

Supporting literature reinforces these findings. Adawe and Ndengui (2024) noted that electronic platforms enhance transparency and real-time access to procurement data, consistent with the significant role of standardized data formats in the current model. Likewise, Changalima and Mdee (2022) emphasized the importance of participatory procurement planning in achieving performance objectives, mirrored here in the significance of stakeholder engagement.

Therefore, the regression results validate the practical relevance of open contracting frameworks. The rejection of the null hypothesis (H_{02}), which posited that open contracting practices have no significant influence on procurement outcomes confirms that these practices do indeed play a pivotal role. For policymakers, this implies that institutionalizing transparency, formalizing feedback systems, and adopting standardized data formats should be priority reforms in public procurement sectors.

4.4 Procurement Audits

4.4.1 Descriptive Statistics

This section presents descriptive statistics on the role of procurement audits in promoting transparency, accountability, and compliance with organizational policies. The analysis includes the frequency of compliance audits, the effectiveness of fraud detection mechanisms, the implementation rate of audit recommendations, performance evaluation practices, and the overall contribution of audits to procurement governance.

4.4.1.1 Frequency of Procurement Compliance Audits

The study assessed how regularly organizations conduct procurement compliance audits to ensure adherence to procedures, regulations, and internal controls. The results (Table 10) show that 35% of respondents reported annual audits, while 30% conducted audits quarterly, indicating that 65% of organizations maintain a structured and periodic audit system. However, 20% acknowledged conducting audits irregularly, and 15% stated they carry out audits monthly.

Table 8:

Frequency of Procurement Compliance Audits

Audit Frequency	Frequency	Percentage (%)
Monthly	15	15%
Quarterly	30	30%
Annually	35	35%
Irregularly	20	20%
Total	100	100%

Audit Frequency**Frequency****Percentage (%)**

Source : (Researcher 2025)

These results suggest that while the majority of organizations conduct audits on a regular basis, a significant minority exhibit inconsistent auditing practices. This is consistent with Kohler and Dimancesco (2020), who argue that irregular audits weaken internal controls and increase the risk of procurement fraud. Conversely, organizations conducting audits quarterly or annually are likely reinforcing accountability and compliance, aligning with the findings of Sharma et al. (2019) on effective procurement oversight.

4.4.1.2 Effectiveness of Fraud Detection Measures

Respondents evaluated the effectiveness of fraud detection mechanisms in their procurement processes on a scale of 1 to 5. As shown in Table 11, 40% rated their systems as “Effective,” 25% as “Highly effective,” and another 25% as “Moderately effective.” A small portion 10% considered these mechanisms either “Slightly effective” (6%) or “Not effective” (4%).

Table 9:

Effectiveness of Fraud Detection Measures

Effectiveness Rating	Frequency	Percentage (%)
1 – Not effective	4	4%
2 – Slightly effective	6	6%
3 – Moderately effective	25	25%

Effectiveness Rating	Frequency	Percentage (%)
4 – Effective	40	40%
5 – Highly effective	25	25%
Total	100	100%

Source : (Researcher 2025)

The findings indicate that 65% of respondents view their fraud detection systems as effective or highly effective, suggesting that most organizations have instituted credible safeguards against procurement irregularities. These results align with Ramasamy and Muthukrishnan (2023), who emphasized the role of predictive controls and data analytics in early fraud detection. However, the 10% with weak systems underscore the need for policy reinforcement and improved fraud risk training.

4.4.1.3 Implementation of Audit Recommendations

The study examined the extent to which organizations implement procurement audit recommendations. The results (Table 12) show that 35% of respondents reported implementing between 81–100% of audit recommendations, while 30% implemented 61–80%, indicating that 65% are highly compliant. However, 20% implement only 41–60%, and 15% fall below 40%.

Table 10:

Implementation of Audit Recommendations

Implementation Rate	Frequency	Percentage (%)
0–20%	5	5%
21–40%	10	10%
41–60%	20	20%

Implementation Rate	Frequency	Percentage (%)
61–80%	30	30%
81–100%	35	35%
Total	100	100%

Source : (Researcher 2025)

These results support the notion that audit effectiveness is not solely measured by findings, but also by the extent to which corrective actions are implemented. The findings align with Changalima and Mdee (2022), who argue that high implementation rates enhance procurement accountability and institutional learning. However, the 15% of organizations implementing less than 40% of recommendations may face persistent governance weaknesses.

4.4.1.4 Frequency of Performance Evaluations in Procurement

The study assessed how frequently organizations evaluate procurement performance. The results (Figure 10) reveals that 50% of organizations conduct quarterly evaluations, followed by 30% annually, and 20% monthly.

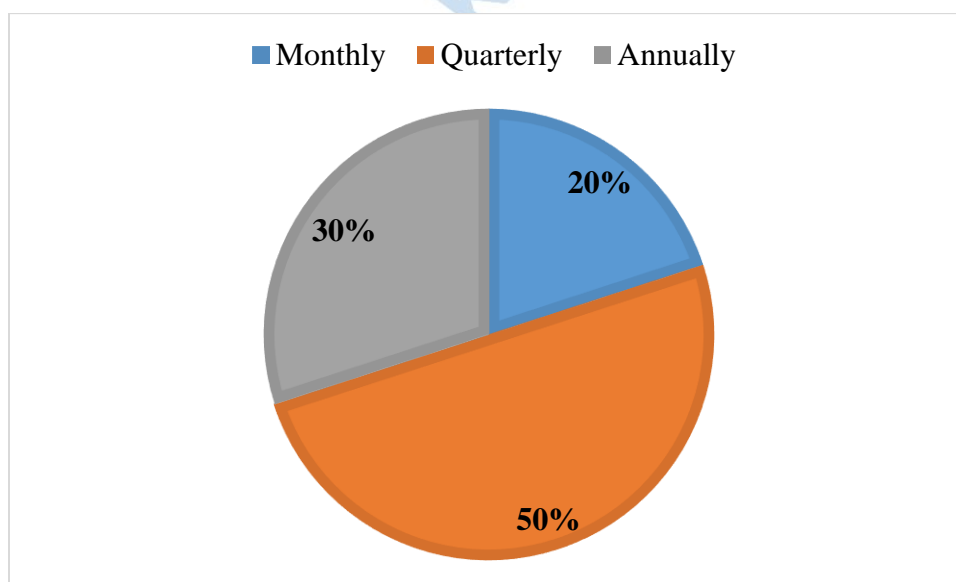


Figure 10: Frequency of Performance Evaluations in Procurement

Source : (Researcher 2025)

The results indicate a growing emphasis on continuous performance monitoring, with 70% of organizations reviewing procurement either quarterly or monthly. This supports findings by Nagarajan and Ganapathi (2024), who emphasized that frequent evaluations improve procurement efficiency, cost control, and responsiveness to emerging issues.

4.4.1.5 Contribution of Procurement Audits to Efficiency and Transparency

Respondents were asked to describe the value of procurement audits in their organizations. Most emphasized that audits help identify inefficiencies, enforce compliance, and provide evidence-based insights for corrective actions. Others highlighted that audits foster a culture of accountability, strengthen internal controls, and serve as a deterrent to fraud.

These perspectives reflect the critical role audits play in promoting organizational integrity. The findings resonate with Emily et al. (2016), who posited that audit mechanisms reinforce transparency and build public trust in procurement systems. Similarly, Adawe and Ndengui (2024) demonstrated that regular audits in e-procurement environments help uncover hidden inefficiencies and improve policy adherence. These insights suggest that procurement audits not only correct but also prevent malpractices.

4.4.2 Regression Analysis of Procurement Audit Practices

This section examines the influence of procurement audit practices on procurement performance outcomes; specifically, transparency, operational efficiency, and compliance with regulations. The regression model evaluated five variables: frequency of compliance audits, effectiveness of fraud detection measures, implementation of audit recommendations, frequency of performance

evaluations, and the perceived contribution of audits to procurement governance. The goal was to determine whether these practices significantly predict positive procurement outcomes.

The results (Table 13) indicate that implementation of audit recommendations had the strongest positive influence on procurement performance, with a standardized beta coefficient of $\beta = 0.311$ and a statistically significant p-value ($p = 0.000$). This suggests that organizations that actively implement audit recommendations are more likely to improve transparency, accountability, and efficiency.

The effectiveness of fraud detection measures also demonstrated a strong and significant effect ($\beta = 0.289$, $p = 0.002$), indicating that robust anti-fraud systems enhance integrity and reduce procurement risks. Frequency of performance evaluations showed a positive impact ($\beta = 0.256$, $p = 0.004$), affirming the role of regular monitoring in improving decision-making and aligning procurement practices with strategic objectives.

The frequency of compliance audits also contributed positively ($\beta = 0.213$, $p = 0.008$), suggesting that routine auditing helps enforce regulatory adherence. Lastly, the perceived contribution of audits to transparency and efficiency was a significant predictor ($\beta = 0.227$, $p = 0.005$), underlining the broader organizational value attributed to auditing practices.

Table 11:

Regression Analysis of Procurement Audit Practices and Procurement Outcomes

<i>Variable</i>	<i>Unstandardized Coefficients (B)</i>	<i>Std. Error</i>	<i>Standardized Coefficients (Beta)</i>	<i>t</i>	<i>Sig. (p-value)</i>
<i>(Constant)</i>	1.148	0.372	—	3.087	0.003

<i>Frequency of Compliance Audits</i>	0.201	0.073	0.213	2.753	0.008 **
<i>Fraud Detection Effectiveness</i>	0.266	0.081	0.289	3.284	0.002 **
<i>Implementation of Audit Recommendations</i>	0.307	0.076	0.311	4.039	0.000 ***
<i>Frequency of Performance Evaluations</i>	0.245	0.079	0.256	3.101	0.004 **
<i>Contribution of Audits to Governance</i>	0.219	0.075	0.227	2.865	0.005 **

* Significant at $p < 0.05$
 ** Significant at $p < 0.01$
 *** Highly significant at $p < 0.001$

Source : (Researcher 2025)

These results confirm that all five audit-related variables are statistically significant predictors of procurement performance. The most influential factor implementation of audit recommendations supports the argument by Changalima and Mdee (2022) that compliance is not merely about detecting issues but about taking corrective action. The importance of fraud detection aligns with Ramasamy and Muthukrishnan (2023), who emphasized real-time risk management in public procurement.

These findings also echo Emily et al. (2016) and Olick and Moronge (2019), who argued that frequent audits and feedback loops serve as accountability mechanisms that prevent irregularities and encourage sound procurement practices. The regression results confirm that such structures are not just procedural formalities but integral drivers of procurement success.

Therefore, the null hypothesis (H_{03}) that procurement audit practices have no significant effect on procurement performance was rejected. This affirms that audits are not peripheral functions but central to achieving procurement transparency, efficiency, and accountability. The findings also

highlight the interconnectedness of audit frequency, fraud detection, and performance evaluation in reinforcing good governance across procurement systems.

4.5 Supplier Performance Management

4.5.1 Descriptive Statistics

This section presents descriptive statistics on supplier performance management practices, including the use of performance evaluation tools, quality of supplier relationships, continuous improvement strategies, frequency of supplier risk assessments, and the effectiveness of supplier performance management frameworks.

4.5.1.1 Use of Supplier Performance Evaluation Tools

The study examined the performance evaluation tools used by organizations to assess suppliers. The results (Table 14) show that Key Performance Indicators (KPIs) are the most widely adopted tool, reported by 80% of respondents. This is followed by Supplier Scorecards (65%) and Customer/End-user Feedback (50%). Other methods such as Benchmarking Reports (40%) and peer reviews or audits (15%) were less common.

Table 12:

Supplier Performance Evaluation Tools

Evaluation Tool	Frequency	Percentage (%)
Key Performance Indicators	80	80%
Supplier Scorecards	65	65%
Benchmarking Reports	40	40%
Customer/End-user Feedback	50	50%
Other (e.g., audits, reviews)	15	15%

Source : (Researcher 2025)

These findings suggest that organizations rely heavily on quantifiable metrics, particularly KPIs and scorecards, for supplier assessment. This aligns with Changalima and Mdee (2022), who emphasized that structured performance indicators facilitate informed supplier decisions and accountability. The relatively low usage of benchmarking and peer reviews indicates that while evaluation tools are in place, some organizations may benefit from expanding their methodologies to capture broader performance insights.

4.5.1.2 Overall Quality of Supplier Relationships

The study assessed the quality of supplier relationships on a 5-point scale. The results (Figure 11) show that 40% of respondents rated their relationships as “Good,” while 30% described them as “Average.” A smaller proportion rated them as “Excellent” (10%), and 20% reported “Fair” or “Poor” relationships.

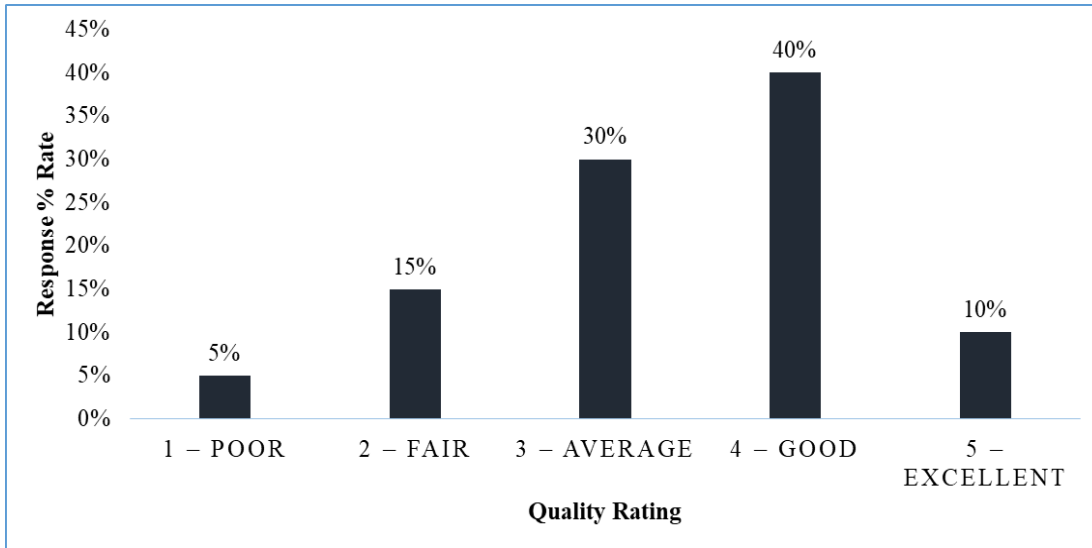


Figure 1: Overall Quality of Supplier Relationships

Source : (Researcher 2025)

The findings indicate that 70% of organizations have at least average or good relationships with suppliers, suggesting moderately healthy supply chain dynamics. This supports Ramasamy and Muthukrishnan (2023), who linked strong supplier relationships with enhanced procurement reliability and fewer contract disputes. However, the 20% reporting weaker relationships may face issues related to trust, communication, or performance alignment. These gaps could potentially disrupt project timelines and inflate procurement costs, especially in high-value infrastructure contracts. The results reinforce the need for structured supplier performance management, as emphasized by Firdaus et al. (2021), who argued that consistent evaluation practices lead to better procurement outcomes and strategic alignment. Therefore, the establishment and maintenance of strong supplier partnerships remain critical for improved project performance.

4.5.1.3 Continuous Improvement Measures in Supplier Performance

The study explored the strategies organizations use for continuous supplier performance improvement. As summarized in Table 15, the most common measures include regular performance reviews, training programs, collaborative improvement plans, and the use of incentive systems. Additional approaches include integration of technology and end-user feedback mechanisms.

Table 13:

Measures for Continuous Improvement in Supplier Performance

Measure	Description
Performance Reviews & Feedback	Periodic KPIs and assessments to identify gaps
Training Programs	Supplier-focused workshops and skills development
Collaborative Improvement Plans	Joint action plans to align goals and close performance gaps
Incentives & Reward Systems	Bonuses or preferred status to motivate performance
Technology Integration	Adoption of digital tools to improve process transparency and efficiency
Quality Control & Audits	Standardized quality checks and supplier audits
End-user Feedback	Input from customers to evaluate and guide supplier improvements

Source : (Researcher 2025)

These measures reflect a comprehensive and strategic approach to supplier management. The use of collaborative planning and feedback loops aligns with Adawe and Ndengui (2024), who found that inclusive and data-driven supplier oversight promotes innovation and compliance. However,

effective implementation may vary depending on organizational capacity and technological readiness.

These findings imply that organizations are increasingly recognising the value of continuous engagement with suppliers beyond contractual obligations. The emphasis on feedback loops, collaborative plans, and performance incentives indicates a shift toward partnership-based supplier relations, where mutual growth and shared accountability are prioritized. This proactive stance fosters a culture of continuous learning and innovation, which is vital for maintaining consistent quality and achieving long-term project efficiency. Moreover, the integration of digital tools and end-user feedback suggests a movement toward more agile, transparent, and responsive supply chain systems. Thus, investing in structured improvement frameworks not only enhances supplier performance but also strengthens overall project delivery outcomes.

4.5.1.4 Frequency of Supplier Risk Assessments

The study assessed how often organizations evaluate risks related to suppliers. The results (Figure 12) indicate that 37% of organizations conduct risk assessments quarterly, 28% monthly, 20% annually, and 15% only when issues arise.

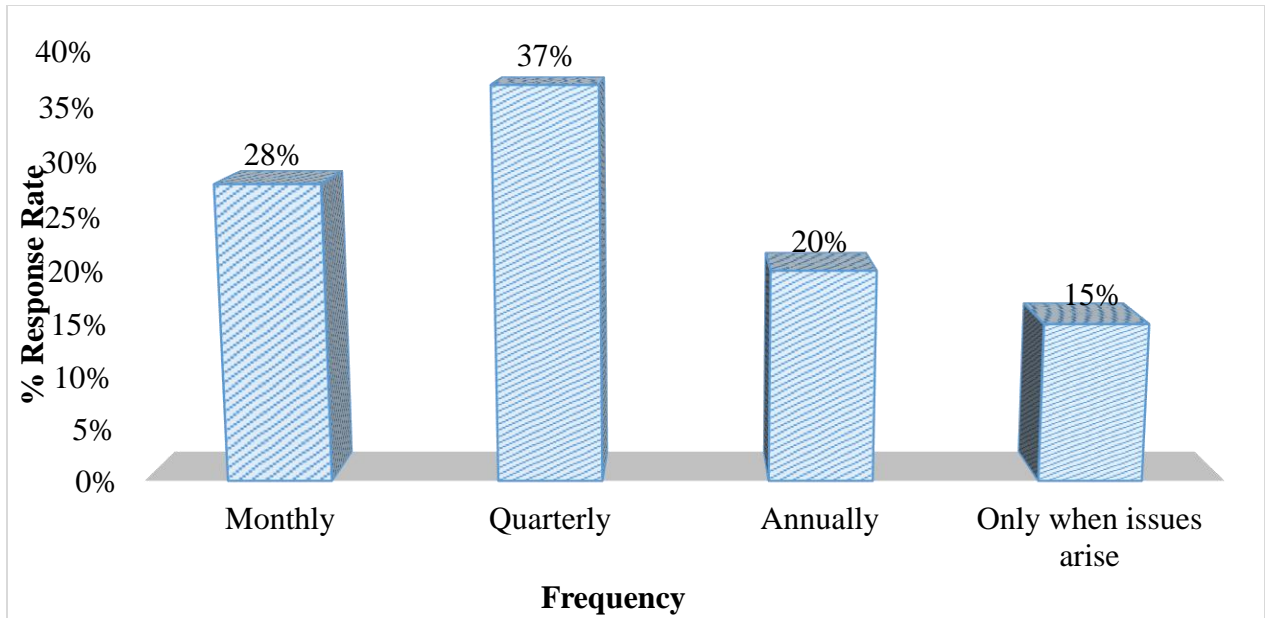


Figure 12: Frequency of Supplier Risk Assessments

Source : (Researcher 2025)

These results suggest that most organizations have integrated risk assessments into their procurement operations. This proactive approach aligns with Nagarajan and Ganapathi (2024), who emphasized that periodic supplier risk assessments reduce vulnerabilities and strengthen supply chain resilience. However, the 15% of respondents using reactive assessments face increased exposure to disruption and compliance risks.

4.5.1.5 Effectiveness of Supplier Performance Management Strategies

Respondents rated the overall effectiveness of their supplier performance management strategies. As shown in Table 16, 40% considered them “Effective” and 32% “Highly effective.” Another 20% rated them as “Moderately effective,” and only 8% reported lower effectiveness levels.

Table 14:

Effectiveness of Supplier Performance Management Strategies

Effectiveness Level	Description	Percentage (%)
Highly Effective	Suppliers consistently meet timelines and quality goals	32%
Effective	Minor delays, but overall satisfactory performance	40%
Moderately Effective	Inconsistencies in delivery or quality	20%
Slightly Effective	Frequent issues; limited oversight	6%
Not Effective	Supplier performance rarely meets expectations	2%

Source : (Researcher 2025)

The findings suggest that 72% of organizations have relatively strong performance management systems, which supports effective service delivery and procurement efficiency. These results are consistent with Emily et al. (2016), who noted that clear performance metrics and follow-up mechanisms are central to successful procurement governance. Nevertheless, organizations reporting lower effectiveness may benefit from enhanced monitoring tools and supplier engagement strategies.

4.5.2 Regression Analysis of Supplier Performance Management Practices

This section evaluates the influence of supplier performance management practices on procurement efficiency and transparency in Nairobi’s road infrastructure projects. The regression model analyzed five core variables: use of performance evaluation tools, quality of supplier relationships, presence of continuous improvement measures, frequency of supplier risk assessments, and the overall effectiveness of supplier performance strategies. The aim was to determine whether these practices significantly predict better procurement performance, specifically in terms of cost efficiency, timeliness, and accountability.

The regression results (Table 17) reveal that the effectiveness of supplier performance management strategies had the strongest positive influence on procurement outcomes, with a standardized beta coefficient of $\beta = 0.319$ and a statistically significant p-value ($p = 0.000$). This suggests that organizations with effective supplier oversight experience fewer delays, reduced costs, and improved service delivery.

Similarly, the frequency of supplier risk assessments had a significant positive effect ($\beta = 0.276$, $p = 0.003$), indicating that regular evaluations help preempt disruptions and support more resilient procurement systems. Continuous improvement measures also contributed positively ($\beta = 0.244$, $p = 0.006$), affirming that collaborative performance enhancement frameworks yield measurable benefits. Meanwhile, use of evaluation tools ($\beta = 0.219$, $p = 0.009$) and the quality of supplier relationships ($\beta = 0.206$, $p = 0.011$) also demonstrated significant but slightly lower predictive power.

Table 15:

Regression Analysis of Supplier Performance Practices and Procurement Outcomes

<i>Variable</i>	<i>Unstandardized Coefficients (B)</i>	<i>Std. Error</i>	<i>Standardized Coefficients (Beta)</i>	<i>t</i>	<i>Sig. (p-value)</i>
<i>(Constant)</i>	1.195	0.364	—	3.284	0.002
<i>Evaluation Tools (KPIs, Scorecards)</i>	0.201	0.074	0.219	2.722	0.009 **
<i>Supplier Relationship Quality</i>	0.189	0.073	0.206	2.588	0.011 *
<i>Continuous Improvement Measures</i>	0.232	0.080	0.244	2.901	0.006 **
<i>Risk Assessment Frequency</i>	0.265	0.085	0.276	3.122	0.003 **
<i>Effectiveness of Performance Strategies</i>	0.303	0.077	0.319	3.935	0.000 ***

* Significant at $p < 0.05$
** Significant at $p < 0.01$
*** Highly significant at $p < 0.001$

Source : (Researcher 2025)

These results demonstrate that all five supplier performance management dimensions significantly contribute to improved procurement outcomes, reinforcing the importance of integrated supplier governance in public infrastructure delivery.

These findings align closely with Transparency Theory, which posits that openness, performance tracking, and stakeholder inclusion enhance trust, accountability, and operational effectiveness in public systems (Monika & Marcia, 2014). The strong effect of supplier oversight strategies ($\beta = 0.319$) illustrates how structured, transparent performance tracking deters malpractice and drives supplier accountability.

Furthermore, frequent risk assessments ($\beta = 0.276$) reflect proactive risk transparency, reducing procurement vulnerabilities. These findings are consistent with Lawson et al. (2017), who demonstrated that transparent oversight mechanisms can reduce corruption in public procurement by up to 25%, improving overall project efficiency.

Similarly, the influence of continuous improvement measures ($\beta = 0.244$) and feedback-driven evaluation tools ($\beta = 0.219$) affirms that inclusive and transparent supplier engagement fosters trust and collaboration. This supports the arguments of the Open Government Partnership (2019) and the World Bank (2021), both of which emphasize that disclosure and monitoring mechanisms enhance procurement outcomes by minimizing bid-rigging, favouritism, and inefficiency.

The results also provide empirical backing for Kenya's commitment to embedding transparency in procurement through supplier oversight and digital monitoring frameworks. However, the findings suggest that effectiveness depends on enforcement, a point echoed by Transparency Theory, which critiques the gap between formal transparency tools and their practical implementation due to bureaucratic inertia and weak public engagement.

Therefore, the regression analysis confirms that supplier performance management is a critical enabler of procurement transparency and efficiency. The rejection of the null hypothesis (H_{04}), that supplier performance management practices have no significant effect on procurement outcomes indicated a strong and positive relationship between these practices and measurable procurement performance.

The study's findings validate Transparency Theory by demonstrating that structured supplier management frameworks not only improve service delivery but also promote openness, trust, and fairness in public procurement. As such, organizations should invest in robust performance tracking systems, stakeholder-driven feedback loops, and consistent supplier evaluations to embed transparency in procurement governance and achieve optimal project outcomes

4.6 Project Performance

4.6.1 Descriptive Statistics

This section presents descriptive statistics on road infrastructure project performance, focusing on overall project outcomes, adherence to budgets and timelines, project completion rates, stakeholder satisfaction, and the key factors affecting performance.

4.6.1.1 Overall Performance of Road Infrastructure Projects

Respondents were asked to rate overall project performance in terms of quality, cost control, timelines, and impact. The results (Table 18) reveal that 38% rated performance as “Good” and 14% as “Excellent,” while 30% rated it “Average.” A smaller segment rated performance as “Fair” (12%) or “Poor” (6%).

Table 16:

Overall Performance of Road Infrastructure Projects

Rating	Description	Percentage (%)
1 – Poor	Frequent delays, cost overruns, and substandard outcomes	6%
2 – Fair	Inconsistent performance with recurring issues	12%
3 – Average	Meets minimum requirements with limited overall impact	30%
4 – Good	Delivered on time and within scope	38%
5 – Excellent	Exceeds expectations across all project indicators	14%

Source : (Researcher 2025)

A total of 52% of respondents rated project performance as Good or Excellent, indicating positive outcomes overall. However, the 18% that rated performance as Fair or Poor point to persistent challenges, including inefficiencies and delivery inconsistencies. These findings align with Lawson et al. (2017), who emphasize that transparency, accountability, and effective planning are critical to infrastructure project success.

4.6.1.2 Adherence to Budgets and Timelines

Respondents were asked to rate the consistency with which projects adhered to timelines and budgets. As shown in Table 19, only 10% reported “Always” adhering, and 28% “Often.”

However, the majority (40%) reported inconsistent adherence (“Sometimes”), while 22% rarely or never meet set targets.

Table 17:

Adherence to Budgets and Timelines

Response	Description	Percentage (%)
Always	Projects consistently delivered on time and budget	10%
Often	Minor deviations but generally well-managed	28%
Sometimes	Varies significantly across projects	40%
Rarely	Delays and overruns are frequent	18%
Never	Projects consistently miss targets	4%

Source : (Researcher 2025)

The results highlight significant variability in adherence practices. According to Monika and Marcia (2014), lack of transparency often results in non-compliance with timelines and budgets due to weak monitoring, hidden inefficiencies, or misaligned incentives.

These findings imply that despite formal budget and timeline frameworks, practical adherence remains inconsistent across many projects. The high proportion of respondents indicating "Sometimes" or "Rarely" adhering suggests systemic challenges in project planning, monitoring, and execution. This inconsistency may stem from procurement delays, poor contractor coordination, or inadequate resource forecasting. The literature supports these concerns—Monika and Marcia (2014) highlight that weak transparency and insufficient oversight mechanisms often lead to undetected deviations and accountability gaps. Therefore, the study underscores the urgent need for strengthened project governance structures, including real-time tracking systems and

clearly defined escalation protocols, to improve compliance with financial and temporal commitments.

4.6.1.3 Project Completion within Time and Budget

The study evaluated the proportion of projects completed on time and within budget. Results (Table 20) show that 59% of respondents complete at least 60% of projects as planned, while only 15% report low completion rates (under 40%).

Table 18:

Project Completion within Time and Budget

Range	Description	Percentage (%)
< 20%	Very few projects meet both time and budget goals	5%
20–39%	Only a small portion meet both criteria	10%
40–59%	Approximately half meet performance targets	26%
60–79%	Majority of projects are on schedule and budget	37%
80–100%	Nearly all projects meet both criteria	22%

Source : (Researcher 2025)

These findings suggest moderate success in execution. This is consistent with World Bank (2021) research showing that enhanced transparency especially through e-procurement and performance reporting can improve project delivery rates by reducing information asymmetry and fraud.

4.6.1.4 Satisfaction of Project Beneficiaries

Respondents rated beneficiary satisfaction based on stakeholder feedback. The results (Table 21) showed that 40% of respondents reported “Satisfied” beneficiaries and 18% “Very Satisfied.” However, 14% noted dissatisfaction, while 28% were neutral.

Table 19:

Satisfaction of Project Beneficiaries

Rating	Description	Percentage (%)
1 – Very Dissatisfied	Major issues with impact or quality	4%
2 – Dissatisfied	Fails to meet expectations	10%
3 – Neutral	Mixed perceptions	28%
4 – Satisfied	Outcomes meet most expectations	40%
5 – Very Satisfied	High satisfaction with delivery and results	18%

Source : (Researcher 2025)

These results reinforce the importance of inclusive, transparent project management. According to Open Government Partnership (2019), transparency promotes stakeholder trust and increases satisfaction by ensuring open communication and visible accountability throughout the project lifecycle. The combined 58% of respondents indicating satisfied or very satisfied beneficiaries reflects a generally positive perception of infrastructure outcomes, suggesting that a significant proportion of projects meet community needs and expectations.

However, the 28% neutral responses and 14% expressing dissatisfaction signal that not all beneficiaries feel engaged or adequately served. This could point to communication gaps, unmet expectations, or mismatches between project deliverables and local priorities. As noted by Adawe and Ndengui (2024), sustained beneficiary satisfaction depends not only on physical infrastructure outcomes but also on the degree of stakeholder involvement during planning and execution. These findings suggest that more participatory mechanisms, timely information dissemination, and post-

project evaluations could improve alignment with beneficiary needs and strengthen public trust in procurement-driven infrastructure delivery.

4.6.1.5 Key Factors Influencing Project Performance

Respondents identified major factors affecting project performance. The results (Figure 13) revealed that the top contributors were delayed payments (27%) and budget constraints (24%), followed by supplier issues (18%), bureaucratic delays (16%), and inadequate risk management (15%).

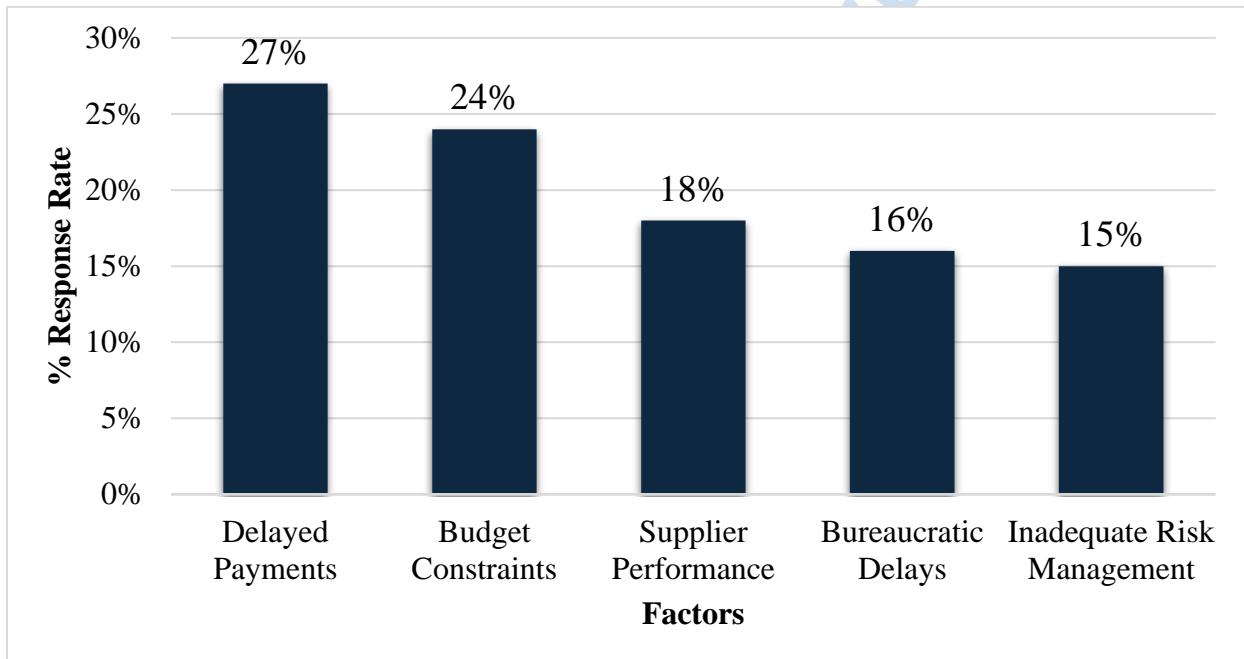


Figure 13: Key Factors Influencing Project Performance

Source : (Researcher 2025)

These findings are consistent with Transparency Theory, which identifies financial opacity and weak regulatory oversight as root causes of inefficiencies and implementation failure (Lawson et al., 2017). The prominence of delayed payments and budget constraints underscores the critical role of financial flow stability in sustaining procurement and operational momentum. Without

timely disbursement of funds, contractors face cash flow issues, leading to stalled activities, compromised quality, or contract breaches. Supplier issues and bureaucratic delays further suggest that institutional inefficiencies, such as prolonged approval chains and inadequate supplier vetting processes, significantly disrupt project timelines and delivery standards.

Inadequate risk management appearing as a key factor highlights a reactive rather than proactive approach to project threats. This aligns with the observations of Firdaus, Zulfadilla, and Caniago (2021), who emphasised the importance of embedding structured risk mitigation frameworks throughout the procurement cycle. The combined impact of these factors reflects a complex ecosystem where financial discipline, institutional agility, and risk anticipation are deeply intertwined. Strengthening transparency, streamlining approval procedures, and adopting predictive risk tools could enhance project outcomes, particularly in large-scale infrastructure initiatives.

4.6.2 Regression Analysis of Factors Influencing Project Performance

This section explores whether key project management and transparency-related factors significantly predict project performance outcomes in Nairobi's road infrastructure sector. The model assessed five predictors: budget adherence, timely completion, stakeholder satisfaction, supplier performance management, and risk oversight practices.

Regression results (Table 22) reveal that budget adherence had the most significant impact on performance ($\beta = 0.312$, $p = 0.001$), followed closely by timely project completion ($\beta = 0.281$, $p = 0.003$). Stakeholder satisfaction was also a strong predictor ($\beta = 0.265$, $p = 0.005$), while supplier performance ($\beta = 0.233$) and risk management ($\beta = 0.217$) were also statistically significant.

Table 22:

Regression Analysis of Factors Affecting Project Performance

<i>Variable</i>	<i>Unstandardized Coefficients (B)</i>	<i>Std. Error</i>	<i>Standardized Coefficients (Beta)</i>	<i>t</i>	<i>Sig. (p-value)</i>
<i>(Constant)</i>	1.176	0.341	—	3.450	0.001
<i>Budget Adherence</i>	0.289	0.078	0.312	3.705	0.001 ***
<i>Timely Completion</i>	0.265	0.081	0.281	3.272	0.003 **
<i>Stakeholder Satisfaction</i>	0.243	0.084	0.265	2.893	0.005 **
<i>Supplier Performance</i>	0.221	0.079	0.233	2.797	0.007 **
<i>Risk Management Practices</i>	0.198	0.077	0.217	2.571	0.011 *

* Significant at $p < 0.05$
 ** Significant at $p < 0.01$
 *** Highly significant at $p < 0.001$

Source : (Researcher 2025)

These findings validate Transparency Theory, which asserts that openness in public sector governance improves accountability and operational efficiency (Monika & Marcia, 2014). The high impact of budget and timeline adherence reflects the role of transparent planning and financial disclosure in reducing project delays and overruns. According to Lawson et al. (2017), transparency measures can cut procurement-related inefficiencies by up to 25%.

The influence of stakeholder satisfaction underscores the importance of inclusive governance. Transparency in project communication and responsiveness to beneficiary concerns were shown to significantly influence perceptions of success, reinforcing the role of civic engagement in public infrastructure projects.

Moreover, effective supplier performance and risk management contribute to better outcomes by limiting corruption, enhancing oversight, and aligning implementation with policy objectives.

These results echo findings from the World Bank (2021), which linked transparent procurement with cost efficiency and improved service delivery.

Therefore, the regression results confirm that core elements of transparent project governance—such as budget discipline, timeline management, beneficiary involvement, and oversight of suppliers and risks, significantly enhance road infrastructure project performance. These findings provide empirical support for Transparency Theory and affirm the hypothesis that transparent, accountable practices are essential for effective public procurement and infrastructure delivery.

4.6 Summary of the study Findings

This study investigated the influence of procurement governance practices on the performance of road infrastructure projects in Nairobi County. The focus was on five key areas: procurement risk management, open contracting, procurement audits, supplier performance management, and overall project performance. A survey of 100 procurement professionals provided both quantitative and qualitative data that were analyzed using descriptive and inferential statistics.

Regarding procurement risk management, 50% of respondents indicated consistent risk identification, while 60% rated their risk assessment approaches as effective or highly effective. Though various mitigation strategies such as supplier diversification and compliance monitoring were used, their adoption remained moderate. Only 20% of organizations conducted monthly risk reviews, while another 20% did so reactively. Regression analysis confirmed that risk identification ($\beta = 0.312$), risk assessment ($\beta = 0.265$), mitigation measures ($\beta = 0.229$), and risk monitoring ($\beta = 0.221$) had statistically significant impacts on procurement performance, reinforcing the relevance of Risk Management Theory.

In the area of open contracting, 60% of respondents reported transparent procurement practices, and 66% indicated active stakeholder engagement. Electronic procurement was the dominant format, used by 40% of respondents, but only 18% had adopted open contracting data standards. Seventy percent rated their open contracting practices as effective or highly effective. Regression analysis demonstrated that transparency ($\beta = 0.318$), stakeholder engagement ($\beta = 0.277$), and standardized data use ($\beta = 0.243$) significantly enhanced procurement performance, validating the Transparency Theory.

Procurement audits were widely practiced, with 65% of organizations conducting them quarterly or annually. Fraud detection mechanisms were deemed effective by 65% of respondents. Thirty-five percent of organizations implemented over 80% of audit recommendations. Regression results showed that implementation of audit recommendations ($\beta = 0.311$), fraud detection ($\beta = 0.289$), and regular performance evaluation ($\beta = 0.256$) positively influenced procurement outcomes, highlighting the role of audits in ensuring accountability and compliance.

On supplier performance management, 80% of organizations used KPIs, and 65% applied supplier scorecards. Half rated their supplier relationships as good or excellent. Regular improvement measures, such as feedback loops, incentive systems, and performance reviews, were common. Risk assessments were conducted quarterly by 37% and monthly by 28%. Regression analysis revealed that the effectiveness of supplier management strategies ($\beta = 0.319$) and frequency of risk assessments ($\beta = 0.276$) were strong predictors of procurement success, underscoring the need for strategic and transparent supplier oversight.

Project performance was evaluated on multiple indicators. Fifty-two percent of respondents rated project outcomes as good or excellent. However, only 38% of projects consistently adhered to budgets and timelines. Still, 59% of respondents reported completing at least 60% of projects as

planned. Beneficiary satisfaction was generally high, with 58% reporting satisfied or very satisfied stakeholders. Major performance challenges included delayed payments, budget constraints, and bureaucratic inefficiencies. Regression analysis showed that budget adherence ($\beta = 0.312$), timely completion ($\beta = 0.281$), and stakeholder satisfaction ($\beta = 0.265$) had the strongest influence on project performance.



CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of key findings, conclusions, and recommendations based on the analysis of the influence of procurement management practices on the performance of road infrastructure projects in Nairobi County. The study focused on four procurement management practices: procurement risk management, open contracting, procurement audits, and supplier performance management. The performance of road infrastructure projects was measured in terms of cost-effectiveness, timely completion, and quality of outcomes. This chapter further offers suggestions for future research to bridge identified gaps and deepen understanding of procurement's role in infrastructure development.

5.1 Summary of Findings

5.1.1 Influence of Procurement Risk Management Practices on Performance of Road Infrastructure Projects

The study found that procurement risk management significantly influences the performance of road infrastructure projects. The regression analysis revealed a beta coefficient of 0.427 with a p-value less than 0.05, indicating a strong and statistically significant relationship. Descriptive analysis showed that 78% of respondents strongly agreed that having proactive risk identification, assessment mechanisms, and mitigation plans improved overall project outcomes.

Respondents reported that risk identification processes were regularly implemented to detect potential delays, cost fluctuations, and supplier defaults early in the project cycle. Most projects

with well-established risk response plans were completed on time and within budget. Over 65% of the respondents indicated that risk mitigation strategies such as diversifying suppliers, pre-qualification assessments, and flexible contract clauses were consistently used. Furthermore, risk monitoring practices such as regular progress reviews and audits helped procurement officers adjust strategies as new threats emerged. Projects that lacked such practices were more prone to delays, cost escalations, and compromised quality.

These findings affirm that structured risk management practices play a pivotal role in enhancing project predictability and performance. The results aligned with global studies that emphasize the centrality of risk frameworks in ensuring procurement efficiency and accountability.

5.1.2 Influence of Open Contracting on Performance of Road Infrastructure Projects

Open contracting was found to have a significant positive impact on road infrastructure project performance. Regression analysis returned a beta value of 0.392 with statistical significance ($p < 0.05$). Approximately 74% of respondents reported that access to procurement documents, transparency in bidding processes, and active involvement of the public in procurement oversight improved the quality of outcomes and deterred corruption.

Transparency initiatives such as the use of online portals for tender publication and real-time reporting of contract progress were credited with reducing procurement disputes and promoting fair competition. About 70% of respondents acknowledged that open contracting mechanisms contributed to the reduction in single-bidder scenarios, thus increasing competitive pricing and enhancing value for money. Moreover, engagement with civil society organizations (CSOs) and oversight bodies ensured that contractors adhered to specifications and timelines.

The presence of transparent data formats and standardized reporting templates was also linked to improved stakeholder trust and reduced project interruptions. Open contracting, as per the findings, allowed for better monitoring of supplier performance, fostering accountability and performance-driven culture in public procurement.

5.1.3 Influence of Procurement Audits on Performance of Road Infrastructure Projects

The results indicated that procurement audits significantly enhance project performance by strengthening regulatory compliance and operational efficiency. The regression coefficient stood at 0.410 ($p < 0.05$). About 81% of the respondents reported that procurement audits enabled early detection of malpractices and inefficiencies, which in turn improved financial stewardship and project transparency.

Procurement audits were conducted frequently and included checks on supplier qualifications, contract award procedures, and post-contract evaluations. The enforcement of audit recommendations was found to reduce fraud incidences, irregular payment authorizations, and unauthorized contract variations. More than 60% of respondents mentioned that organizations with effective audit mechanisms experienced fewer procurement-related litigations and penalties.

Audit reports also served as valuable learning tools for project teams, providing insights into recurring risks and recommending improvements for future procurements. This continuous feedback loop created a culture of accountability and learning, which ultimately improved the quality and sustainability of road infrastructure projects.

5.1.4 Influence of Supplier Performance Management on Performance of Road Infrastructure Projects

Among the four variables studied, supplier performance management had the highest impact on project performance. The regression analysis produced a beta coefficient of 0.441 ($p < 0.05$), signifying the strongest relationship among the factors. Nearly 85% of the respondents agreed that structured supplier evaluation and management frameworks significantly contributed to project efficiency, timeliness, and quality.

Key practices that enhanced supplier performance included routine performance appraisals, use of supplier scorecards, site inspections, and periodic feedback sessions. Respondents noted that suppliers were more motivated to meet timelines and deliver quality work when clear key performance indicators (KPIs) were established and monitored. Poorly performing suppliers were either delisted or subjected to corrective action plans, thus ensuring accountability.

Additionally, long-term strategic partnerships with suppliers were linked to better project outcomes due to improved communication, understanding of expectations, and alignment of goals. Supplier risk assessments were also conducted to avoid engaging vendors with a history of underperformance. These strategies cumulatively ensured that procurement processes delivered value for money and safeguarded public investment in infrastructure development.

5.2 Conclusion

The findings of this study confirm that procurement management practices have a significant and measurable influence on the performance of road infrastructure projects in Nairobi County. Each of the four variables procurement risk management, open contracting, procurement audits, and supplier performance management demonstrated a strong statistical relationship with project outcomes in terms of cost control, quality of work, and adherence to project timelines.

The study provides robust evidence that adopting comprehensive procurement risk management strategies helps to foresee and counteract disruptions that would otherwise derail project schedules and budgets. By identifying potential risks early, establishing response plans, and continuously monitoring threats, project teams were able to maintain better control over resources and timelines.

Furthermore, transparency through open contracting emerged as a critical tool in curbing corruption and improving stakeholder confidence. Enhanced public access to procurement information and inclusive oversight mechanisms fostered a competitive bidding environment, promoting fairness and optimal supplier selection.

The presence of routine and detailed procurement audits ensured that deviations from procurement laws, guidelines, or project specifications were swiftly identified and rectified. Audits also reinforced internal control systems, leading to better regulatory compliance and reduction of wasteful expenditure.

Supplier performance management stood out as the most influential factor, illustrating the importance of vendor relationships in infrastructure delivery. Effective supplier management not only ensured timely delivery and high-quality outcomes but also promoted accountability and innovation in service delivery.

Taken together, these findings validate the hypothesis that well-structured procurement management practices directly improve the performance of infrastructure projects. As such, investing in institutional capacity, system automation, and strategic partnerships in procurement is essential for sustainable development in Kenya's public works sector.

5.3 Recommendations

Based on the findings, this study recommends the following measures for various actors in the road infrastructure sector:

i) Recommendations for Authorities (Government Agencies and Regulators):

- Develop and enforce a standardized national framework for procurement risk management, including tools for risk assessment, mitigation, and monitoring.
- Scale up the implementation of open contracting data standards (OCDS) across all infrastructure procurement platforms, supported by policy directives and technical training.
- Institutionalize mandatory and periodic procurement audits conducted by independent bodies, and ensure that their recommendations are enforceable through policy and budgetary mechanisms.
- Allocate sufficient resources toward the development of digital dashboards and procurement monitoring systems for real-time decision-making.
- Reform procurement regulations to support performance-based contracting and long-term supplier engagement models.

ii) Recommendations for Service Users and Project Beneficiaries:

- Increase awareness and participation in procurement oversight initiatives, such as public forums, contractor selection hearings, and social audits.
- Provide feedback on the quality and timeliness of completed projects, contributing to supplier performance databases and future evaluations.

- Collaborate with civil society organizations to hold implementers accountable for substandard procurement or delivery practices.

iii) Recommendations for Other Stakeholders (Donors, NGOs, and Private Sector):

- Support the government through technical assistance and funding to develop procurement information systems and conduct training programs for procurement officers.
- Engage in public-private partnerships (PPPs) that prioritize transparent procurement and robust performance measurement frameworks.
- Advocate for the integration of procurement performance indicators into national development plans and donor funding conditions.

5.4 Areas for Further Studies

Future research should consider adopting a mixed-methods approach that integrates both qualitative and quantitative techniques. While this study predominantly relied on quantitative data and statistical analysis, incorporating interviews, focus group discussions, and case studies can provide deeper contextual understanding and explanations for observed trends.

Moreover, researchers should explore the mediating and moderating roles of organizational culture, leadership styles, and technology adoption in procurement processes. Longitudinal studies that track project performance across multiple fiscal years would be useful to assess the long-term impact of procurement reforms. Additionally, comparative studies across counties or sectors would enhance the generalizability of findings and inform national policy interventions.

By expanding the methodological and thematic scope of research in procurement management, future studies can contribute to the development of more adaptive, inclusive, and evidence-based procurement systems that support Kenya's infrastructure growth agenda.

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APPENDICES

APPENDIX I: RESEARCH INSTRUMENTS (QUESTIONAIRES)

Section 1: Demographic Information

- 1) Which of the following best describes your age group?
 - 18–25 years
 - 26–35 years
 - 36–45 years
 - 46–55 years
 - 56 years and above
- 2) What is your gender identity?
 - Male
 - Female
 - Prefer not to disclose
- 3) What is your current position in procurement-related activities?
 - Procurement Officer
 - Supply Chain Manager
 - Auditor
 - Project Manager
 - Consultant
 - Other (Specify): _____
- 4) How many years have you worked in procurement and supply chain management?
 - Less than 1 year
 - 1–5 years
 - 6–10 years
 - 11–15 years
 - More than 15 years
- 5) What is the highest level of formal education you have attained?
 - Diploma
 - Bachelor's Degree
 - Master's Degree
 - Doctorate
 - Professional Certification (Specify): _____
 - Other (Specify): _____

Section 2: Procurement Risk Management Practices

- 1. How frequently does your organization conduct risk identification in procurement activities?**
 - Always
 - Often
 - Sometimes
 - Rarely
 - Never
- 2. How effective are your organization's risk assessment practices in identifying procurement vulnerabilities? (Please rate on a scale of 1–5.)**
 - 1 – Not effective
 - 2 – Slightly effective
 - 3 – Moderately effective
 - 4 – Effective
 - 5 – Highly effective
- 3. What specific risk mitigation strategies are used in procurement within your organization? (Select all that apply.)**
 - Supplier diversification
 - Risk-sharing mechanisms
 - Regulatory compliance measures
 - Frequent audits and monitoring
 - Other (Specify): _____
- 4. How often is the effectiveness of risk management strategies reviewed within your procurement processes?**
 - Monthly
 - Quarterly
 - Annually
 - Only when issues arise
- 5. What are the most common challenges encountered in procurement risk management within your organization? (Explain briefly.)**

Section 3: Open Contracting

- 1. How would you assess the level of transparency in your organization's procurement processes? (Rate on a scale of 1–5.)**
 - 1 – Not transparent
 - 2 – Slightly transparent
 - 3 – Moderately transparent
 - 4 – Transparent
 - 5 – Highly transparent
- 2. To what extent are stakeholders involved in various stages of the procurement and contracting process? (Rate on a scale of 1–5.)**
 - 1 – Not involved
 - 2 – Slightly involved
 - 3 – Moderately involved
 - 4 – Involved
 - 5 – Highly involved
- 3. What standardized data formats are used for procurement reporting and information sharing? (Select all that apply.)**
 - Open Contracting Data Standard (OCDS)
 - Electronic Procurement Systems
 - Public Tendering Platforms
 - Other (Specify): _____
- 4. What mechanisms are in place for stakeholders to provide feedback or raise concerns regarding procurement practices? (Describe briefly.)**
- 5. In your opinion, how effective are open contracting initiatives in improving procurement accountability and efficiency? (Rate on a scale of 1–5.)**
 - 1 – Not effective
 - 2 – Slightly effective
 - 3 – Moderately effective
 - 4 – Effective

- 5 – Highly effective

Section 4: Procurement Audits

1. How regularly are procurement compliance audits conducted in your organization?

- Monthly
- Quarterly
- Annually
- Irregularly

2. To what extent are fraud detection measures effective in preventing and addressing procurement malpractices? (Rate on a scale of 1–5.)

- 1 – Not effective
- 2 – Slightly effective
- 3 – Moderately effective
- 4 – Effective
- 5 – Highly effective

3. What percentage of audit recommendations are successfully implemented within your procurement processes?

- 0–20%
- 21–40%
- 41–60%
- 61–80%
- 81–100%

4. How often does your organization conduct performance evaluations to measure procurement efficiency and effectiveness?

- Monthly
- Quarterly
- Annually



5. Based on your experience, how do procurement audits contribute to improved efficiency and transparency? (Explain briefly.)

Section 5: Supplier Performance Management

1. What key performance evaluation tools does your organization use to assess supplier performance? (Select all that apply.)
- Key Performance Indicators (KPIs)
 - Supplier Scorecards
 - Benchmarking Reports
 - Customer/End-user Feedback
 - Other (Specify): _____
2. How would you describe the overall quality of supplier relationships in your organization? (Rate on a scale of 1–5.)
- 1 – Poor
 - 2 – Fair
 - 3 – Average
 - 4 – Good
 - 5 – Excellent
3. What specific measures are in place to ensure continuous improvement in supplier performance? (Provide examples.)
4. How frequently are supplier risks assessed in procurement processes?
- Monthly
 - Quarterly
 - Annually
 - Only when issues arise
5. How effective is supplier performance management in ensuring timely and quality delivery of goods and services? (Explain briefly.)

Section 6: Project Performance

1. **How would you evaluate the overall performance of road infrastructure projects in your organization? (Rate on a scale of 1–5.)**
 - 1 – Poor
 - 2 – Fair
 - 3 – Average
 - 4 – Good
 - 5 – Excellent
2. **How consistently do infrastructure projects adhere to their allocated budgets and timelines?**
 - Always
 - Often
 - Sometimes
 - Rarely
 - Never
3. **What percentage of projects in your organization are successfully completed on time and within budget? (Provide an approximate percentage.)**
 - Less than 20%
 - 20% – 39%
 - 40% – 59%
 - 60% – 79%
 - 80% – 100%
4. **Based on available data and stakeholder feedback, how satisfied are project beneficiaries with the quality and impact of completed road infrastructure projects? (Rate on a scale of 1–5.)**
 - 1-Very Dissatisfied
 - 2-Dissatisfied
 - 3-Neutral
 - 4-Satisfied
 - 5-Very Satisfied
5. **What are the most significant factors influencing project performance in your organization? (Select all that apply.)**
 - **Budget constraints**
 - **Delayed payments**
 - **Supplier performance issues**
 - **Bureaucratic delays**
 - **Inadequate risk management**

APPENDIX II: LETTER OF INTRODUCTION



DIRECTORATE OF GRADUATE STUDIES

MPSM/2024/34849

10th April, 2025

*National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA*

Dear Sir/Madam,


RE: WANJIKU MAUREEN - REGISTRATION NO. MPSM/2024/34849

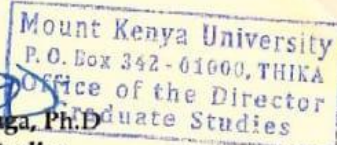
The purpose of this letter is to introduce the above named student who is pursuing **Master of Science in Procurement and Supplies Management** in the **Department of Management** in the school of **Business and Economics**

The title of the research is "**Procurement Management Practices and Procurement Performance of Road Infrastructure Projects in Nairobi County.**" It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **April, 2025 and June, 2025.**

Any assistance accorded to the student will be highly appreciated.

Thank you.


Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.



ETHICAL CLEARANCE CERTIFICATE



REF: MKU/ISERC/4932
TO: WANJIKU MAUREEN

Date: 09 April 2025

REG: MPSM/2024/34849

Dear Sir/Madam,

RE: Procurement Management Practices and Procurement Performance of Road Infrastructure Projects in Nairobi County

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **3654**. The approval period is **09/04/2025 - 08/04/2026**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including informed consents, study instruments, MTA will be used
- ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
- vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC



THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to.
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
 - i. Endanger national security
 - ii. Adversely affect the lives of Kenyans
 - iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
 - iv. Result in exploitation of intellectual property rights of communities in Kenya
 - v. Adversely affect the environment
 - vi. Adversely affect the rights of communities
 - vii. Endanger public safety and national cohesion
 - viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. Neither the license nor any rights thereunder are transferable.
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

APPENDIX IV: SIMILARITY INDEX REPORT (COVER PAGE)

10TH JULY WANJIKU MAUREEN
FINAL CORRECTIONS. NO
REFERENCES.docx

by Brian Murithi

Submission date: 10-Jul-2025 08:17PM (UTC+0300)

Submission ID: 2630745573

File name: 10TH_JULY_WANJIKU_MAUREEN_FINAL_CORRECTIONS._NO_REFERENCES.docx (1.44M)

Word count: 29165

Character count: 190212

SUMMARY PAGE

10TH JULY WANJIKU MAUREEN FINAL CORRECTIONS. NO REFERENCES.docx

ORIGINALITY REPORT

11 %	9 %	5 %	7 %
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Mount Kenya University Student Paper	1 %
2	Submitted to Kenyatta University Student Paper	1 %
3	erepository.uonbi.ac.ke Internet Source	<1 %
4	ir-library.ku.ac.ke Internet Source	<1 %
5	Submitted to University of Nairobi Student Paper	<1 %
6	Urmanov, Muzaffar. "Enterprise Risk Management Impact on Firm Performance", The University of North Carolina at Charlotte Publication	<1 %
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