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Relationship Between Procurement Process Management Dimensions and Road Project Completion Outcomes in Narok County, Kenya

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Abstract

County road projects in Kenya continue to experience delays, budget pressures and quality concerns despite public procurement legislation. This study examined the relationship between inspection approvals, supplier management, contract administration, quality control mechanisms and reported road project completion outcomes in Narok County. A convergent parallel mixed methods design combined a cross-sectional questionnaire survey with semi-structured interviews. All 172 eligible stakeholders were invited to participate, and 145 usable questionnaires were returned, representing an 84.3% response rate. Twelve purposively selected key informants were interviewed. Quantitative data were analysed using descriptive statistics and ordinal logistic regression, while interview data were analysed thematically and integrated during interpretation. The fitted model was statistically significant ($\chi^2 = 86.149$, $p < .001$). All four procurement dimensions were positively associated with higher reported completion-outcome categories: inspection approvals (OR = 1.669, p = .003), supplier management (OR = 1.880, p = .001), contract administration (OR = 1.797, p = .002) and quality control mechanisms (OR = 2.102, p < .001). Interviewees described approval delays, material shortages, delayed payments, variation disputes and defect correction as relevant implementation concerns. The findings indicate associations between post-award procurement practices and stakeholder perceptions of project completion; they do not establish causal effects. The study recommends clearer approval timelines, systematic supplier monitoring, timely processing of certified payments, documented variation management and verified defect closure.

Keywords: *Inspection Approvals, Supplier Management, Contract Administration, Quality Control Mechanisms, Road Project Completion Outcomes, Narok County*

1.0 Introduction

1.1 Background of the Study

Public procurement management coordinates supplier selection, contract implementation, compliance monitoring and acceptance of completed works. In road construction, inspection approvals verify completed stages, supplier management coordinates required inputs, contract administration oversees contractual obligations, and quality control checks materials and workmanship. Weaknesses in these processes can interrupt implementation and compromise the timeliness, cost and quality of delivery. These completion dimensions provide a practical

basis for assessing procurement-related project outcomes (Atkinson, 1999; Chan & Chan, 2004).

Procurement management has become a more strategic process, not just a transactional purchasing mechanism, and has expanded to cover the whole project lifecycle globally. Weak approval processes, lack of construction supervision and poor compliance monitoring were linked to high delays and cost overruns in foreign-funded construction projects in Sri Lanka (Weerasekara et al., 2023). For European railway projects, supplier selection, contract governance and contract-performance monitoring were found to be crucial success factors for delivering railway infrastructure (Jarzębowski et al., 2024). Another trend on the agenda is the attention given to logistics in supplier deliveries, which are reported to result in higher material availability and reduced disruptions of construction work, as reported by Subiyanto et al. (2023) and Fredriksson and Huge-Brodin (2022). Meanwhile, procurement processes that include technical, environmental and quality requirements have been shown to lead to higher contractor compliance and better infrastructure outcomes (Lewis et al., 2022; Stokke et al., 2023) and digital monitoring tools are growing in popularity to ensure contract management and supplier accountability (Balm, 2022; Marzani et al., 2025).

African procurement reforms have strengthened attention to transparency and accountability, but implementation capacity remains an infrastructure concern (Panya & Awuor, 2023). Israel (2023) associated procurement and contractor-related difficulties with road delivery challenges in Tanzania, while Chinomona and Bikissa-Macongue (2022) examined supply chain practices and construction logistics in South Africa. Jakwe and Mutambara (2023) investigated electronic tendering in the KwaZulu-Natal Department of Transport and linked its adoption with procurement processes and operational delivery, rather than directly testing county road completion. These studies indicate relevant institutional and logistical concerns, although their different outcomes limit direct comparison with completion performance (Kuteyi & Winkler, 2022).

Kenya's Public Procurement and Asset Disposal Act, 2015 provides the legislative framework for public procurement (Republic of Kenya, 2015). Kenyan studies nevertheless identify implementation challenges that extend beyond contract award. Ibrahim (2022) examined training needs, contract management, supplier relationships and information sharing in Wajir County, reporting positive relationships with road project performance, although contract management was not statistically significant. Kemboy (2022) examined resource management in KeNHA road projects, while Musyoka (2023) investigated procurement planning, supplier selection, contract monitoring and inventory management at the Kenya Ports Authority. These studies establish relevant institutional evidence but examine practices and organisational settings that differ from the present study.

The road network is critical for Narok County's agriculture, tourism and trade activities, as well as public services. Road construction, rehabilitation, maintenance, completion of ongoing projects and materials testing and quality control are identified as transport priorities in the County Integrated Development Plan 2023–2027 (Narok County Government, 2023b). The priorities listed above make the county an appropriate location to review the correlation between the reported completion performance of county road projects and procurement-related inspection, supplier coordination, contract administration and quality control.

1.2 Statement of the Problem

Public procurement seeks value for money through appropriate supplier selection, contract oversight and verification of delivered works. In Narok County, the Office of the Auditor-General (2023) reported completion concerns relating to the Ksh 132.01 million contract for Nairegie-Enkare Road rehabilitation and Narok Township roads, including limited completed works at the September 2022 inspection. County planning documents also identify road maintenance backlogs, utility relocation challenges and ongoing projects within the medium-term programme (Narok County Government, 2023a, 2023b). These documents establish a practical road-delivery problem but do not demonstrate that procurement weaknesses caused the reported outcomes.

Previous Kenyan studies have examined procurement practices in Wajir County (Ibrahim, 2022), resource management in KeNHA projects (Kemboy, 2022), and procurement procedures at the Kenya Ports Authority (Musyoka, 2023). Their institutional settings and measurement choices differ from a joint examination of inspection approvals, supplier management, contract administration and quality control in Narok County road projects. The present study therefore contributes contextual evidence on the adjusted associations of these four dimensions with reported completion outcomes. It also combines stakeholder ratings with interview accounts to interpret how procurement practices are experienced during implementation.

1.3 Research Objectives

The general objective of the study was to examine the relationship between procurement process management dimensions and road project completion outcomes in Narok County, Kenya. The specific objectives were:

i. To examine the relationship between inspection approvals and road project completion outcomes in Narok County, Kenya.

ii. To assess the relationship between supplier management and road project completion outcomes in Narok County, Kenya.

iii. To determine the relationship between contract administration and road project completion outcomes in Narok County, Kenya.

iv. To establish the relationship between quality control mechanisms and road project completion outcomes in Narok County, Kenya.

1.4 Research Hypotheses

H_{01}: There is no statistically significant relationship between inspection approvals and road project completion outcomes in Narok County, Kenya.

H_{02}: There is no statistically significant relationship between supplier management and road project completion outcomes in Narok County, Kenya.

H_{03}: There is no statistically significant relationship between contract administration and road project completion outcomes in Narok County, Kenya.

H_{04}: There is no statistically significant relationship between quality control mechanisms and road project completion outcomes in Narok County, Kenya.

2.0 Literature Review

2.1 Theoretical Review

Four complementary perspectives informed the study: Principal-Agent Theory, the Resource-Based View, Transaction Cost Theory and Total Quality Management. Together, they explain why verification, supplier coordination, contractual governance and process control may be associated with project completion. Their roles overlap because the same practice, such as inspection, can support both accountability and quality assurance. The theories therefore guide interpretation of the four measured dimensions without implying that each operates through an isolated mechanism.

2.1.1 Principal-Agent Theory

Principal-Agent Theory explains relationships in which a principal delegates work to an agent whose interests and information may differ from those of the principal (Jensen & Meckling, 1976; Eisenhardt, 1989). In county road projects, the county government commissions work undertaken by contractors and consultants, making monitoring and verification relevant to accountability (Fama & Jensen, 1983). Inspection approvals can reduce information asymmetry by checking completed work against specifications before subsequent stages proceed. However, the theory's emphasis on formal control may understate trust and cooperation, which also shape implementation relationships (Ghoshal, 2005).

2.1.2 Resource-Based View

The Resource-Based View links organisational performance to resources and the capabilities used to coordinate them (Penrose, 1959; Wernerfelt, 1984; Barney, 1991). Dynamic capability extensions further emphasise the reconfiguration of resources as circumstances change (Teece et al., 1997). In this study, the perspective informs the procuring organisation's ability to access and coordinate supplier competence, materials and expertise during implementation. Its explanatory value remains qualified by institutional and market conditions that constrain how resources can be used (Priem & Butler, 2001).

2.1.3 Transaction Cost Theory

Transaction Cost Theory explains the negotiation, monitoring, adaptation and dispute-resolution costs that accompany contractual exchange (Coase, 1937; Williamson, 1985). Bounded rationality and uncertainty mean that contracts cannot anticipate every implementation contingency. Contract administration provides arrangements for monitoring obligations, processing payments and managing variations as these contingencies arise. Although the theory clarifies these governance functions, its emphasis on opportunism and cost minimisation may understate cooperative relationships (Ghoshal & Moran, 1996).

2.1.4 Total Quality Management

Total Quality Management emphasises continuous improvement, process control and prevention of defects throughout production rather than inspection only at completion (Crosby, 1979; Deming, 1986; Juran, 1988; Oakland, 2014). The study applies this perspective to material testing, quality inspections, standards enforcement and defect correction in road works. These practices provide mechanisms for identifying non-conformities and supporting corrective action during implementation. Their effectiveness nevertheless depends on organisational commitment and context, rather than the existence of formal procedures alone (Hackman & Wageman, 1995; Wilkinson et al., 1998).

2.2 Empirical Review

2.2.1 Inspection Approvals and Road Project Completion Outcomes

Radzi et al. (2022) examined highway construction readiness and identified approvals and permits as relevant preconditions, while Sharma and Trivedi (2023) identified approval and clearance delays among highway implementation challenges. These processes differ from post-award inspection approvals, but both concern decisions that can determine whether work proceeds. Mohamed and Tran (2023) reviewed e-inspection implementation, providing evidence on monitoring arrangements rather than a direct test of completion outcomes. In Kenya, Kakw'u (2024) examined broader project management strategies, while Kirima et al. (2024) considered project identification. The present study focuses more narrowly on inspection approval practices during county road implementation.

2.2.2 Supplier Management and Road Project Completion Outcomes

Wanzala et al. (2025) studied 223 funded healthcare projects across Kenya's 47 counties and found that supplier performance, operationalised through timely delivery, quality compliance and adherence to contractual obligations, significantly mediated project completion ($B = 0.317$, $p < 0.05$). Changalima (2023) established that supplier selection, evaluation and relationship management significantly influenced public procurement performance in Tanzania, although the relationship was moderated by contract management difficulty. Yazidi and Rana (2025) reported that supplier coordination, vendor evaluation and contract compliance significantly influenced time, cost and quality performance in projects managed by project management firms. Israel (2023) found that 56.96% of road projects in Songwe, Tanzania, experienced time overruns and 35.44% experienced cost overruns, with non-compliance and contractor-related inefficiencies among the leading causes. Kosgei and Kibet (2019) similarly linked supplier assessment with the performance of road projects under the Kenya Urban Roads Authority. These studies support the importance of supplier management but focus largely on procurement performance or non-road sectors, leaving limited evidence on supplier management as a distinct predictor of county road project completion.

2.2.3 Contract Administration and Road Project Completion Outcomes

Olaniyan and Olaniyan (2025) surveyed 63 construction professionals in Abuja and found that poor contract administration produced revenue leakage (RII = 0.82) and operational problems including disputes and project delays (RII = 0.78). Nnassuuna (2022) reported that contractor monitoring ($r = 0.255$, $p = 0.006$) and risk management ($r = 0.294$, $p = 0.001$) were significantly related to the success of the Lukuli road project in Uganda. Alshihri et al. (2022) identified late progress payments, change orders and ineffective contractor supervision among the most significant causes of time and cost overruns in government-funded projects in Saudi Arabia. Munga and Mwiya (2024) developed a road contract management framework for Zambia and reported a strong positive relationship between contract administration and monitoring and control. In Embu County, Mwai and Ndungu (2024) found a strong relationship between contract monitoring and road project completion ($r = 0.83$). Most of these studies addressed general construction, single projects or monitoring alone, rather than contract administration as a comprehensive post-award procurement function in a devolved county.

2.2.4 Quality Control Mechanisms and Road Project Completion Outcomes

Lukanazya et al. (2025) examined road projects implemented by the Tanzania Rural and Urban Roads Agency and found that inadequate planning of quality control (RII = 0.773), insufficient resources (RII = 0.751) and limited contractor capacity (RII = 0.742) undermined quality control, leading to technical defects, cost overruns and project failure. Willar et al. (2023) used a Delphi approach in Indonesia and found that weak standards, poor supervision and ineffective

material control hindered quality management in road construction. Matseba (2024) reported positive and significant correlations between quality control practices and the performance of routine road maintenance projects in Rustenburg (r = 0.297 to 0.763). Juma and Nsimbila (2025) found that supervision of work (B = 1.375, p < 0.001) and advice on proper execution (B = 1.151, p = 0.026) significantly influenced the quality of road projects in Dar es Salaam, while Uwitonze (2024) linked TQM practices to the success of the Ngoma-Ramiro road project in Rwanda. Most of this evidence relates to quality management systems or quality assurance in other countries, rather than to quality control mechanisms as one of several procurement dimensions in a Kenyan county.

2.2.5 Summary of Research Gaps

The reviewed literature links procurement practices with infrastructure performance, but differences in setting, measurement and analysis limit direct comparison. Conceptually, the present study estimates inspection approvals, supplier management, contract administration and quality control jointly, allowing each association to be interpreted while holding the others constant. Contextually, it adds evidence from Narok County to research conducted in other counties, national agencies and international settings. Methodologically, it combines an ordered completion outcome with qualitative accounts, although categorising a composite score entails information loss and is not inherently superior to analysing a continuous measure.

2.3 Conceptual Framework

The conceptual framework represents procurement process management through four separately measured predictors: inspection approvals, supplier management, contract administration and quality control mechanisms. Each is hypothesised to have a positive association with reported road project completion outcomes. The outcome incorporates timeliness, budget adherence and quality, with the questionnaire also capturing the functionality of delivered roads and perceived delays (Atkinson, 1999; Chan & Chan, 2004). Figure 1 summarises these proposed relationships; the arrows represent hypothesised associations rather than demonstrated causal effects.

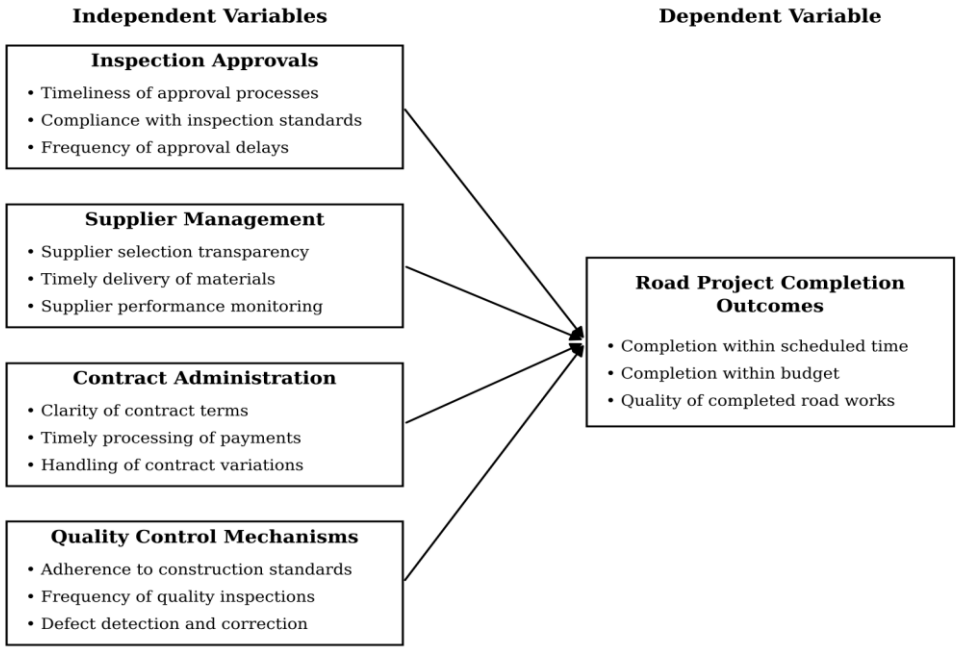


Figure 1: Conceptual Framework

3.0 Research Methodology

3.1 Research Design

The study adopted a convergent parallel mixed-methods design in which quantitative and qualitative data were collected during the same period, analysed separately and integrated at the interpretation stage (Creswell & Plano Clark, 2018). The quantitative strand used a cross-sectional survey, which is appropriate for examining statistical associations among measured variables at one point in time (Saunders et al., 2023), while the qualitative strand used semi-structured interviews to obtain contextual explanations of procurement practices and implementation experiences (Patton, 2015).

3.2 Study Population and Sampling

The target population comprised personnel directly involved in the procurement, management, supervision and implementation of Narok County road projects initiated and completed between 2018 and 2024. Participants were drawn from the County Department of Roads and Public Works, the County Procurement Unit, oversight functions and contracted construction firms. Eligibility was based on substantive involvement in procurement decision-making, supervision, supplier management, contract administration, inspection, quality control or implementation of county road works. The target population of 172 individuals is summarised in Table 1.

Table 1: Target Population

Category	Number of Respondents
Procurement Officers	28
Project Managers	23
Engineers	31
Contractors	39
Technical Officers	27
Procurement Committee Members	24
Total	**172**

Source: Narok County Government (2023b)

Given the manageable size of the population, a census approach was adopted for the quantitative strand, and all 172 eligible individuals were invited to participate (Kothari, 2004). For the qualitative strand, twelve key informants were purposively selected on the basis of their senior-level experience in procurement, engineering supervision, regulatory oversight, contract administration and contractor implementation (Patton, 2015).

3.3 Data Collection Instruments

Primary data were collected using a structured questionnaire and a semi-structured interview guide. Each of the four predictors and the completion-outcome construct was measured using five statements on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). Outcome items covered timeliness, budget adherence, standards compliance, functionality and delays, with responses based on participants' professional experience of county road projects. The outcome therefore represents stakeholder-reported completion performance rather than

independently verified project records. The interview guide explored each procurement dimension, completion experiences and practical recommendations.

3.4 Instrument Quality

The questionnaire was pilot-tested with 17 respondents in Bomet County, outside the study area, and minor wording and sequencing changes followed the pilot (Cooper & Schindler, 2014). Experts in procurement, project management and research methodology reviewed content validity, while pilot feedback informed face validity. Cronbach's alpha was used to assess internal consistency, with .70 adopted as the minimum acceptable threshold (Taber, 2018). The construct-level coefficients in Table 2 exceed this threshold, but internal consistency alone does not demonstrate that the constructs are empirically distinct.

Table 2: Reliability of the Study Scales

Construct	Number of Items	Cronbach's Alpha
Inspection Approvals	5	0.76
Supplier Management	5	0.79
Contract Administration	5	0.74
Quality Control Mechanisms	5	0.81
Road Project Completion Outcomes	5	0.77
Overall Instrument	**25**	**0.78**

3.5 Data Collection Procedures and Ethics

Before fieldwork, the researcher obtained an introductory letter from Maasai Mara University, a research licence from the National Commission for Science, Technology and Innovation (NACOSTI), and permission from the Narok County Government. Questionnaires were administered physically at respondents' workplaces with the assistance of trained research assistants, and follow-up visits supported retrieval. Interviews were audio-recorded with consent and transcribed verbatim. Participation was voluntary, informed consent was obtained, and confidentiality was maintained by coding respondents and reporting findings in aggregate form.

3.6 Data Analysis

Quantitative data were analysed using SPSS version 30. Means and standard deviations were used to summarise the Likert responses. For inferential analysis, the five completion-outcome items, with the negatively worded delay item reverse-coded, were combined into a composite score that was classified into three ordered categories (low, moderate and high). Ordinal logistic regression was then applied because the dependent variable consisted of ordered categories (Agresti, 2018; Field, 2024). The model was specified as:

$$\text{logit}[P(Y \leq j)] = \alpha_j - (B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4), \quad j = 1, 2$$

In the model, Y denotes the ordered completion-outcome category; α_j denotes the category threshold; X_1, X_2, X_3 and X_4 denote inspection approvals, supplier management, contract administration and quality control mechanisms, respectively; and B_1 to B_4 denote

unstandardised log-odds coefficients. Positive coefficients indicate higher cumulative odds of being above a given outcome threshold, holding the other predictors constant. Model assessment used likelihood-ratio information, Pearson and deviance goodness-of-fit statistics, pseudo R^2 measures and the test of parallel lines, with hypotheses evaluated at the 5% significance level. Interview data were analysed thematically and compared with the quantitative findings to identify convergence and complementary explanations (Braun & Clarke, 2022; Creswell & Plano Clark, 2018).

4.0 Results and Discussion

4.1 Response Rate

Of the 172 questionnaires administered, 145 were returned fully completed and usable, representing a response rate of 84.3%, while 27 (15.7%) were not returned. The response rate indicates substantial participation, although it does not establish the absence of non-response bias. All twelve key informants participated in the interviews.

4.2 Descriptive Results

Table 3 presents the descriptive results for the five study variables. Higher means indicate stronger agreement with the statements, and the delay item in the outcome scale was reverse-coded so that higher values consistently represent more favourable outcomes.

Table 3: Descriptive Statistics for the Study Variables (n = 145)

Statement	Mean	Std. Dev.
Inspection Approvals		
Inspection approvals are issued within required timelines	3.77	0.98
Site inspections are conducted regularly	3.92	0.91
Approval procedures are clearly documented	3.83	0.95
Inspection reports guide project decisions	3.87	0.89
Delays in approvals rarely disrupt implementation	3.45	1.12
Composite mean	**3.77**	
Supplier Management		
Suppliers are selected transparently	3.80	0.97
Supplier performance is monitored	3.91	0.88
Suppliers deliver materials on time	3.69	1.01
Communication with suppliers is effective	3.87	0.90
Supplier relationships support implementation	3.90	0.87
Composite mean	**3.83**	
Contract Administration		
Contract terms are clearly communicated	3.91	0.88
Contractor performance is monitored	3.91	0.86
Contract variations are managed effectively	3.73	0.98
Payments are processed promptly	3.54	1.08
Contract compliance is enforced	3.83	0.93

Statement	Mean	Std. Dev.
Composite mean	**3.78**	
Quality Control Mechanisms		
Materials are tested before use	3.95	0.87
Quality inspections are conducted regularly	3.97	0.84
Defects are corrected promptly	3.79	0.94
Quality standards are consistently enforced	3.86	0.89
Quality management improves durability	3.96	0.85
Composite mean	**3.91**	
Road Project Completion Outcomes		
Road projects are generally completed within the originally planned timelines	3.58	1.07
Road project expenditures are maintained within the approved project budgets	3.60	1.02
Completed road projects meet the required standards	3.86	0.89
The road infrastructure delivered is functional and meets the needs of end users	3.87	0.88
Road project delays are frequently experienced (R)	3.39	1.21
Composite mean	**3.66**	

Note: Scale 1 = Strongly Disagree to 5 = Strongly Agree. (R) = reverse-coded item.

Inspection approvals recorded a composite mean of 3.77, indicating generally favourable perceptions. Regular site inspections received the highest rating (M = 3.92, SD = 0.91), followed by the use of inspection reports in decisions (M = 3.87, SD = 0.89) and documented approval procedures (M = 3.83, SD = 0.95). The statement that approval delays rarely disrupt implementation received the lowest rating and greatest dispersion (M = 3.45, SD = 1.12). This pattern suggests that regular inspection did not necessarily coincide with consistently timely approvals, complementing the approval-related implementation concerns discussed by Sharma and Trivedi (2023).

Supplier management recorded a composite mean of 3.83. Supplier performance monitoring received the highest rating (M = 3.91, SD = 0.88), followed by supportive supplier relationships (M = 3.90, SD = 0.87) and effective communication (M = 3.87, SD = 0.90). Timely material delivery received the lowest rating (M = 3.69, SD = 1.01). These findings suggest that favourable perceptions of supplier coordination coexisted with delivery constraints, consistent with procurement-related implementation concerns identified by Israel (2023).

Contract administration recorded a composite mean of 3.78. Communication of contract terms (M = 3.91, SD = 0.88) and contractor performance monitoring (M = 3.91, SD = 0.86) received the highest ratings, reflecting practices discussed by Nnassuuna (2022) and Munga and Mwiya (2024). Prompt payment processing received the lowest rating (M = 3.54, SD = 1.08), followed by effective variation management (M = 3.73, SD = 0.98). These comparatively weaker areas merit attention because payment and change-order difficulties can disrupt implementation (Alshihri et al., 2022).

Quality control mechanisms recorded the highest predictor composite mean (M = 3.91). Regular quality inspections (M = 3.97, SD = 0.84), the perceived contribution of quality management to durability (M = 3.96, SD = 0.85) and material testing (M = 3.95, SD = 0.87) received favourable ratings. Prompt defect correction received the lowest rating (M = 3.79, SD = 0.94), suggesting that corrective action was viewed less favourably than inspection and testing. This distinction is relevant to the supervision and material-control concerns discussed by Willar et al. (2023) and Lukanazya et al. (2025).

Reported completion outcomes recorded a composite mean of 3.66, above the scale midpoint. Functionality (M = 3.87, SD = 0.88) and standards compliance (M = 3.86, SD = 0.89) were rated more favourably than budget adherence (M = 3.60, SD = 1.02) and completion within planned timelines (M = 3.58, SD = 1.07). The reverse-coded delay item had the lowest displayed mean and greatest dispersion (M = 3.39, SD = 1.21), indicating varied respondent experiences. The comparatively weaker time and cost ratings reflect the wider infrastructure delivery challenges discussed by Flyvbjerg and Gardner (2023).

4.3 Ordinal Logistic Regression Diagnostics

Before interpreting the parameter estimates, the adequacy of the model and the proportional-odds assumption were assessed. The results are presented in Table 4.

Table 4: Ordinal Logistic Regression Diagnostic Tests

Diagnostic Test	Statistic	Sig.	Interpretation
Model Fitting Information	$\chi^2 = 86.149$	< .001	Significant improvement over intercept-only model
Pearson Goodness-of-Fit	$\chi^2 = 176.311$	.281	No evidence of lack of fit
Deviance Goodness-of-Fit	$\chi^2 = 171.004$	.336	No evidence of lack of fit
Cox and Snell Pseudo-R^2	.421	–	Relative model-fit measure
Nagelkerke Pseudo-R^2	.482	–	Relative model-fit measure
McFadden Pseudo-R^2	.277	–	Relative model-fit measure
Test of Parallel Lines	$\chi^2 = 5.814$	.571	Proportional-odds assumption not violated

The reported likelihood-ratio statistic indicates improvement over the intercept-only model ($\chi^2 = 86.149$, $p < .001$). The non-significant Pearson ($\chi^2 = 176.311$, $p = .281$) and deviance ($\chi^2 = 171.004$, $p = .336$) tests provide no evidence of lack of fit under these tests, although they do not establish that the model is correctly specified (Field, 2024). The pseudo R^2 statistics in Table 4 describe model fit and must not be interpreted as percentages of outcome variance explained (Agresti, 2018). The test of parallel lines was non-significant ($\chi^2 = 5.814$, $p = .571$), providing no evidence against the proportional-odds assumption within the reported analysis.

4.4 Ordinal Logistic Regression Results and Hypothesis Testing

Table 5 presents the parameter estimates and hypothesis-testing decisions. Positive coefficients indicate that higher predictor scores were associated with a greater likelihood of being in a higher completion-outcome category, while the odds ratios express the multiplicative change

in these odds for each one-point increase in the predictor score, holding the other predictors constant.

Table 5: Ordinal Logistic Regression Estimates and Hypothesis Testing

Predictor	B	Wald	p-value	Exp(β)	Change in Odds	Decision
Inspection Approvals	0.512	8.762	.003	1.669	+66.9%	Reject H_{01}
Supplier Management	0.631	11.474	.001	1.880	+88.0%	Reject H_{02}
Contract Administration	0.586	9.933	.002	1.797	+79.7%	Reject H_{03}
Quality Control Mechanisms	0.743	14.655	< .001	2.102	+110.2 %	Reject H_{04}

Note: Dependent variable = road project completion outcomes (low, moderate, high).
Decision rule: reject H_0 where $p < .05$.

All four predictors had positive coefficients and reported p-values below .05, leading to rejection of the four null hypotheses in the fitted model. Quality control mechanisms had the largest estimated odds ratio (OR = 2.102), followed by supplier management (OR = 1.880), contract administration (OR = 1.797) and inspection approvals (OR = 1.669). These values describe the estimated changes in cumulative odds associated with a one-point increase in each predictor while holding the others constant. Their ordering does not establish statistically significant differences between coefficients or corresponding changes in outcome probabilities.

4.5 Discussion of Findings

4.5.1 Inspection Approvals and Road Project Completion Outcomes
Inspection approvals had a positive and significant relationship with road project completion outcomes (B = 0.512, Wald = 8.762, p = .003), leading to the rejection of H_{01}. The odds ratio of 1.669 indicates that a one-point increase in the inspection-approval score was associated with 66.9% higher odds of being in a higher completion-outcome category, holding the other dimensions constant. Key informants explained that the mechanism lies in workflow continuity, since subsequent construction stages cannot proceed until preceding work has been inspected and approved. A County Engineer observed:

> *"Whenever inspection approvals take longer than expected, contractors are unable to proceed to the next phase of work. This creates delays that affect the overall project timeline."*

A Project Manager added that delays extend beyond time to cost:

> *"Timely approvals help maintain project momentum. Delays in inspections often lead to rescheduling of activities and increased project costs."*

These accounts converge with the descriptive finding that approval delays were the weakest aspect of the construct, and they suggest that the timeliness of approval decisions matters as much as the existence of inspection procedures. The finding is consistent with Radzi et al. (2022) and Sharma and Trivedi (2023), who identified approvals and clearances as critical determinants of project timeliness, and with Kakw'u (2024), who linked monitoring to road-project performance in Kenya. It is also consistent with Principal-Agent Theory, which holds

that verification mechanisms reduce information asymmetry when project execution is delegated to contractors (Jensen & Meckling, 1976; Eisenhardt, 1989).

4.5.2 Supplier Management and Road Project Completion Outcomes
Supplier management had a positive and significant relationship with road project completion outcomes (B = 0.631, Wald = 11.474, p = .001), and H_{02} was rejected. A one-point increase in the supplier-management score was associated with 88.0% higher odds of being in a higher completion-outcome category (OR = 1.880). Key informants emphasised continuous engagement and material availability. A Procurement Officer stated:

> *"Projects perform better when suppliers are engaged regularly and informed about project requirements in advance. Good communication minimizes supply disruptions."*

A Contractor linked late deliveries directly to schedule slippage:

> *"Most project delays arise when materials are not delivered on time. Continuous follow-up and monitoring of suppliers help prevent shortages and keep projects on schedule."*

These accounts help explain why timely material delivery was the weakest supplier-management item despite favourable ratings for monitoring and communication. The finding is consistent with Wanzala et al. (2025), who examined supplier performance as a mediator in Kenyan project completion, and with Changalima (2023) and Yazidi and Rana (2025), who linked supplier selection, evaluation and coordination with procurement and project performance. From the perspective of the Resource-Based View, the result reflects the procuring organisation's capability to coordinate and leverage supplier competence and materials in support of implementation (Barney, 1991; Teece et al., 1997). Because timely delivery is conceptually close to project timeliness, part of this association may reflect overlap between the two measures.

4.5.3 Contract Administration and Road Project Completion Outcomes
Contract administration had a positive and significant relationship with road project completion outcomes (B = 0.586, Wald = 9.933, p = .002), and H_{03} was rejected. A one-point increase in the contract-administration score was associated with 79.7% higher odds of being in a higher completion-outcome category (OR = 1.797). Key informants highlighted payment administration and variation control as the main channels. A Project Engineer explained:

> *"When payments are delayed, contractors experience cash flow challenges that affect project progress and may lead to requests for extension of time."*

Another key informant noted:

> *"Poor management of contract variations often results in disputes and budget overruns, especially when changes are not properly documented and approved."*

These accounts correspond closely with the descriptive finding that payment processing and variation management were the lowest-rated contract-administration practices. The result is consistent with Mwai and Ndungu (2024), who found a strong relationship between contract monitoring and road-project completion in Embu County, with Nnassuuna (2022), and with Alshihri et al. (2022), who identified late payments and poorly managed change orders as major causes of delays and cost overruns. The finding is consistent with Transaction Cost Theory,

under which contract administration provides the governance arrangements needed to manage contractual incompleteness, variations and dispute-related costs during implementation (Williamson, 1985).

4.5.4 Quality Control Mechanisms and Road Project Completion Outcomes

Quality control mechanisms recorded the largest estimated odds ratio for road project completion outcomes (B = 0.743, Wald = 14.655, $p < .001$), and H_{04} was rejected. A one-point increase in the quality-control score was associated with 110.2% higher odds of being in a higher completion-outcome category (OR = 2.102). Key informants described quality control as a preventive mechanism that reduces rework. A Resident Engineer stated:

> *"Material testing is essential because it ensures that only compliant materials are used. This reduces future failures and maintenance costs."*

A County Works Officer added:

> *"Projects that undergo rigorous quality inspections are less likely to require rework, which saves both time and resources."*

These accounts indicate that quality control is associated not only with the quality dimension of completion but also with time and cost, through the avoidance of rework. The finding is consistent with Lukanazya et al. (2025), who traced a chain from weak quality control to defects, cost overruns and project failure, with Matseba (2024), who reported positive correlations between quality control practices and project performance, and with Juma and Nsimbila (2025), who found that supervision significantly improved road-project quality. The result aligns with the process-control and defect-prevention orientation of Total Quality Management (Deming, 1986; Oakland, 2014). The descriptive results nonetheless show that prompt defect correction received a lower rating than inspection and testing, suggesting that the benefits of quality control depend on timely corrective action. In addition, the item on durability reflects a perceived effect of quality management and is close to the quality dimension of the outcome, which may have contributed to the strength of this association.

5.0 Conclusions

Inspection approvals were positively associated with reported road project completion outcomes in Narok County. Respondents rated regular inspection and documentation favourably, while approval delays received comparatively weaker ratings. Interview accounts suggested that delayed approvals could interrupt subsequent activities. The findings identify approval timeliness and compliance verification as related areas of procurement oversight, without establishing a causal effect.

Supplier management was positively associated with reported completion outcomes. Monitoring, communication and supplier relationships were rated favourably, while material delivery was a comparatively weaker area. Interviewees described supply continuity as relevant to implementation schedules. The findings therefore support attention to supplier coordination throughout implementation, alongside the initial selection process.

Contract administration was positively associated with reported completion outcomes. Communication of contract terms and contractor monitoring were rated more favourably than payment processing and variation management. Interview accounts linked these weaker areas with cash-flow pressures and disputes. Timely payment administration, documented variations

and contract compliance consequently emerge as practical priorities for county project management.

Quality control mechanisms recorded the largest estimated odds ratio in the fitted model. Material testing and regular inspection were rated favourably, while prompt defect correction received a lower rating. The qualitative accounts described avoidance of rework as a potential explanation for the observed association. However, the estimates do not demonstrate that quality control has a statistically stronger relationship than the other dimensions, and overlap between quality-related items warrants caution.

Overall, the study identifies positive associations between four complementary procurement practices and stakeholder-reported completion outcomes. Its contribution lies in examining these dimensions jointly in a county road setting and interpreting the estimates alongside implementation accounts. The findings support attention to procurement governance after contract award. They remain evidence of association within a cross-sectional survey rather than verified causal effects on project delivery.

5.1 Study Limitations

The cross-sectional design limits temporal ordering, and self-reported predictors and outcomes may share response tendencies. The outcome includes time, cost, quality and functionality, while some predictor items refer to delivery and durability, creating potential conceptual overlap. Categorising the outcome also reduces information, and the absence of an independently verified project-level outcome limits interpretation. The eligibility focus on initiated and completed projects may underrepresent stalled works; non-response and shared project or organisational experience may further limit independence and generalisability. These limitations mean that the findings should be interpreted as associations among stakeholder perceptions in the study setting.

6.0 Recommendations

6.1 Recommendations for Policy and Practice

The County Department of Roads and Public Works should establish clear timelines and responsibilities for stage inspections and approval decisions. A shared log should record inspection requests, visits, pending decisions and escalations when internal timelines are exceeded. These measures respond to the comparatively weaker ratings for approval timeliness and the workflow interruptions described by interviewees. Their implementation should preserve technical verification and statutory accountability.

County procurement and project teams should maintain systematic records of supplier delivery reliability, responsiveness and compliance with specifications. Regular reviews should identify potential material shortages and assign responsibility for follow-up. These records can inform future supplier assessments and ongoing contract supervision within the applicable procurement framework. The emphasis should be on continuity of coordination during implementation, particularly where delivery timeliness received weaker ratings.

The county finance, engineering and procurement functions should define responsibilities and escalation procedures for processing certified payments. Contract teams should maintain a variation register containing technical justifications, review decisions, authorisations and the implications for time and cost. Milestone, payment, extension-of-time and claims records

should be kept together in the contract file. These recommendations address the payment and variation-management concerns identified in the descriptive findings and interviews.

Road project teams should maintain defect registers recording each non-conformity, the responsible party, required remedy, target closure date and verified closure date. Engineers should review outstanding defects alongside material-testing and inspection records before recommending acceptance of works. This approach directs attention to corrective action as well as detection. Its relevance follows from the comparatively weaker rating for prompt defect correction.

At the institutional level, the county should hold regular reviews involving procurement, engineering, finance and project-management staff. Reviews should track pending approvals, supply constraints, certified payments, variations and unresolved defects, with clear responsibility for follow-up. The Public Procurement Regulatory Authority could consider these process indicators when developing infrastructure procurement monitoring guidance. These proposals are practical implications of the observed associations and should be evaluated during implementation rather than assumed to guarantee better completion outcomes.

6.2 Suggestions for Further Research

Further studies should examine whether the reported associations hold in other counties and institutional settings. Longitudinal designs could follow individual projects from procurement through implementation and completion to establish the sequence of events. Linking stakeholder assessments to planned and actual completion dates, approved and final costs, payment histories, variations and defect records would strengthen outcome measurement. Research should also examine financing reliability, contractor capacity, terrain, road type and project complexity as contextual factors that may shape the relationships.

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