



Methodological Evaluation of Transport Maintenance Depot Systems in Ghana: Quasi-Experimental Design for Risk Reduction Assessment

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Abstract

Transport maintenance depots in Ghana are critical for maintaining road safety and infrastructure efficiency. A quasi-experimental design was employed to assess the impact of transport maintenance depots on reducing operational risks in Ghanaian roads. Data collection included surveys and observational studies. The analysis revealed a significant reduction (30%) in vehicle breakdowns at depots, with an uncertainty interval suggesting a 95% confidence that this effect is real. This study provides evidence of the effectiveness of transport maintenance depots in Ghana, offering a method for mitigating operational risks. Further research should focus on long-term sustainability and cost-effectiveness of these systems. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Africanization, Quasi-experimental, OperationalResearch, QualityControl, InfrastructureSustainability, DeviationAnalysis*

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