



# Evaluating Depot Systems in Transport Maintenance through a Randomized Field Trial in Rwanda: A Methodological Exploration

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## Abstract

Depot systems are crucial for optimising transport maintenance in developing countries like Rwanda where infrastructure is often underdeveloped and resources limited. A randomized field trial was conducted across ten depots, with data collected over six months. Depots were randomly assigned to control or intervention groups to measure performance metrics such as maintenance time and quality. The analysis revealed that the intervention group saw a statistically significant reduction in mean maintenance time by 15% (95% CI: -20%, -10%) compared to the control group, indicating improved depot efficiency. This study provides empirical evidence supporting the use of randomized trials for evaluating depot systems and highlights the potential cost savings achievable through optimised maintenance processes. Based on these findings, Rwanda's transport authorities should consider implementing or enhancing its depot systems to improve overall maintenance performance. The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Depot Systems, Rwanda, Maintenance Engineering, Randomized Control Trials, Cost-Benefit Analysis, Geographic Information Systems, Supply Chain Management*

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