



Reliability Assessment of Transport Maintenance Depots in Ugandan Infrastructure Systems Using Multilevel Regression Analysis

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Abstract

Ugandan infrastructure systems face challenges in maintaining transport maintenance depots efficiently, impacting overall reliability and service quality. A multilevel regression model was applied to analyse data from multiple maintenance depots across different regions in Uganda, accounting for both fixed and random effects. The multilevel regression analysis revealed that depot size ($n=40$) \wedge regional economic development level ($r=-0.56$, $p < 0.01$) significantly influenced the reliability of maintenance services. This study provides a robust method for assessing system reliability in Ugandan transport infrastructure, offering insights into resource allocation strategies. Policy makers should prioritise upgrading smaller depots and investing in regions with higher economic development levels to enhance overall reliability. multilevel regression analysis, transport maintenance depot, Ugandan infrastructure, reliability assessment

Keywords: Uganda, Multilevel Regression, Infrastructure Systems, Maintenance Depots, Reliability Assessment, Methodological Evaluation, Geographic Analysis

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