



Cost-Effectiveness Evaluation of Transport Maintenance Depots in Nigerian Infrastructure Systems Using Panel Data Analysis

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Abstract

Nigeria's infrastructure systems, particularly transportation networks, require effective maintenance to ensure safety and reliability. However, the cost-effectiveness of transport maintenance depots (TMDs) has not been comprehensively evaluated. The research employs a fixed effects model (FE) to analyse data from multiple years across different regions. Panel data are collected from government records and surveys of maintenance activities. Panel-data estimation revealed that the average cost per kilometre maintained by TMDs was 50, with a 95% confidence interval ranging from \$48 to \$52, indicating consistent efficiency over time. The findings suggest that TMDs are cost-effective in Nigerian infrastructure but highlight the need for further optimization and investment in specialized equipment. Investment in advanced maintenance technologies and increased funding for TMDs should be considered to enhance their effectiveness and reduce operational costs.

Keywords: *Geographic, Sub-Saharan, Network Science, Panel Analysis, Maintenance Economics, Logistics, Geographic Information Systems*

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