



# Cost-Effectiveness Analysis of Tanzania's Transport Maintenance Depots Using Panel Data Techniques

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**Published:** 23 February 2011 | **Received:** 22 November 2010 | **Accepted:** 01 February 2011

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**DOI:** [10.5281/zenodo.18938026](https://doi.org/10.5281/zenodo.18938026)

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## Abstract

Transport maintenance depots in Tanzania are crucial for ensuring road infrastructure durability and safety. However, their cost-effectiveness remains underexplored. Panel data techniques will be employed to analyse the impact of maintenance depot operations on road infrastructure longevity and safety. Robust standard errors will account for potential heterogeneity across depots and over time. A significant proportion ( $p < 0.05$ ) of maintenance activities were found to correlate with a reduction in road repair costs, indicating cost-effectiveness gains. The findings suggest that targeted improvements in depot operations could further enhance efficiency, highlighting the need for policy interventions focused on optimising resource management and operational strategies. Policy makers are advised to prioritise investments in maintenance depots with proven cost-saving benefits, alongside measures to improve depot infrastructure and workforce training. The maintenance outcome was modelled as  $Y_i = \beta_0 + \beta_1 X_i + u_i + v_i \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *African geography, cost-benefit analysis, econometrics, panel data, regression analysis, sustainable infrastructure, transport economics*

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