



# Quasi-Experimental Evaluation of Transport Maintenance Depot Systems in Tanzania: Methodological Insights and Cost-Effectiveness Analysis

Tsering Tumbwe<sup>1</sup>, Simeon Simiyu<sup>2,3</sup>, Mwaka Wabirumu<sup>4</sup>, Kamili Kasungu<sup>5,6</sup>

<sup>1</sup> Ardhi University, Dar es Salaam

<sup>2</sup> Department of Civil Engineering, Ardhi University, Dar es Salaam

<sup>3</sup> Mkwawa University College of Education

<sup>4</sup> Department of Civil Engineering, University of Dar es Salaam

<sup>5</sup> Sokoine University of Agriculture (SUA), Morogoro

<sup>6</sup> Department of Electrical Engineering, University of Dar es Salaam

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**Correspondence:** [ttumbwe@aol.com](mailto:ttumbwe@aol.com)

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## Author notes

*Tsering Tumbwe is affiliated with Ardhi University, Dar es Salaam and focuses on Engineering research in Africa. Simeon Simiyu is affiliated with Department of Civil Engineering, Ardhi University, Dar es Salaam and focuses on Engineering research in Africa.*

*Mwaka Wabirumu is affiliated with Department of Civil Engineering, University of Dar es Salaam and focuses on Engineering research in Africa.*

*Kamili Kasungu is affiliated with Sokoine University of Agriculture (SUA), Morogoro and focuses on Engineering research in Africa.*

## Abstract

Transport maintenance depots (TMDs) play a critical role in ensuring the reliability and efficiency of transportation infrastructure in developing countries like Tanzania. A mixed-methods approach combining data from surveys, interviews, and financial records was employed. Quasi-experimental techniques were utilised to assess system performance under different conditions. The analysis revealed that the implementation of preventive maintenance strategies reduced vehicle downtime by approximately 15% compared to conventional practices. The quasi-experimental design provided robust insights into the cost-effectiveness and efficiency gains associated with TMDs in Tanzanian transportation networks. Based on findings, recommendations include prioritising preventive maintenance training for depot staff and expanding coverage of TMD facilities across the country. Transportation Maintenance Depots, Quasi-Experimental Design, Cost-Effectiveness Analysis, Preventive Maintenance Strategies

The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u + \epsilon$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** Sub-Saharan, Maintenance, Logistics, Evaluation, Quasi-experimental, Cost-benefit, Infrastructure

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