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# Methodological Assessment of Transport Maintenance Depot Systems in Ethiopia Using Multilevel Regression Analysis to Measure Adoption Rates

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## Abstract

Transport maintenance depots (TMDs) play a crucial role in ensuring the reliability and efficiency of transport systems in Ethiopia. A multilevel regression analysis was employed to evaluate the factors influencing TMD system adoption at both regional and district levels in Ethiopia. Multilevel regression revealed that socioeconomic indicators significantly influence the adoption rates of TMD systems, with a coefficient for income level being positive and statistically significant ($\beta = 0.25$, $p < 0.01$). The multilevel approach provided nuanced insights into regional variations in TMD system adoption. Future research should explore the effectiveness of policy interventions aimed at boosting TMD system adoption among rural areas with lower income levels. Transport Maintenance Depots, Multilevel Regression Analysis, Adoption Rates, Ethiopia The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Geographic, Multilevel, Regression, Adoption, Maintenance, Depot, Evaluation*

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This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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