Methodological Evaluation of Transport Maintenance Depot Systems in Rwanda: Panel Data Estimation for Cost-Effectiveness Assessment

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Abstract

In Rwanda, transport maintenance depots (TMDs) play a crucial role in ensuring vehicle reliability and safety across various transportation sectors. The study employed a fixed effects model to analyse costs and benefits over time, accounting for potential confounding variables such as sector-specific maintenance practices and regional economic conditions. Panel-data analysis revealed that the average annual cost per vehicle maintained was $120\ with\ a\ 95\%\ confidence\ interval\ of\ (115, 125)\ dollars, indicating\ significant\ variability\ between\ depots. The\ fi$ Y{it}=\beta0+\beta1X{it}+ui+\varepsilon{it}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Panel data, Fixed effects model, Maintenance systems, Cost-effectiveness, Transport infrastructure, Rwanda, Geographic analysis*

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