Time-Series Forecasting Model for Evaluating Transport Maintenance Depot Systems in Tanzania,

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Abstract

The study focuses on evaluating transport maintenance depot systems in Tanzania, aiming to improve reliability through advanced forecasting techniques. A time-series analysis approach was employed, utilising historical data from to predict future maintenance needs. Robust statistical methods were applied to ensure accurate predictions and account for uncertainties in the forecasting process. The model identified a significant upward trend in vehicle breakdowns over the study period, necessitating proactive preventive measures to mitigate potential disruptions. The time-series forecasting model demonstrated high predictive accuracy, offering insights into depot maintenance strategies that could enhance system reliability and efficiency. Based on the findings, it is recommended that Tanzania's transport authorities implement periodic maintenance schedules and invest in predictive analytics tools to better manage their depot systems. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African Geography, Time-Series Analysis, Forecasting Models, System Reliability, Maintenance Engineering, Econometrics, Stochastic Processes*

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