



Methodological Assessment of Transport Maintenance Depot Systems in Nigerian Context: Panel Data Estimation for System Reliability Measurement

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Published: 24 August 2007 | **Received:** 18 May 2007 | **Accepted:** 23 July 2007

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DOI: [10.5281/zenodo.18851192](https://doi.org/10.5281/zenodo.18851192)

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Abstract

Transport maintenance depots play a crucial role in ensuring reliable vehicle operations in Nigeria's transportation sector. This study employs panel-data estimation techniques using time-series and cross-sectional data from multiple depots across Nigeria. The empirical analysis utilizes a generalized linear mixed model (GLMM) for robust system reliability measurement. The GLMM revealed that the proportion of operational vehicles in depots varied significantly, with some depots maintaining vehicle availability at over 90%. Panel-data methods provide valuable insights into the variability and reliability of transport maintenance systems in Nigeria, highlighting areas for improvement. Implementing targeted interventions based on identified system deficiencies can enhance overall operational efficiency and safety. The maintenance outcome was modelled as $Y_{it} = \beta_0 + \beta_1 X_{it} + u_i + v_t + \epsilon_{it}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Nigerian, Transport, Maintenance, Depots, Reliability, Analysis, Econometrics

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