African Intellectual Property Law Journal
(Law/Technology/Arts crossover)

Methodological Evaluation of Transport Maintenance Depot Systems in Nigeria Using Difference-in-Differences for System Reliability Assessment

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Published: 07 December 2003 | **Received:** 22 June 2003 | **Accepted:** 20 October 2003

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DOI: 10.5281/zenodo.18779105

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Abstract

Transport maintenance depots (TMDs) in Nigeria are critical infrastructure for ensuring road safety and vehicle reliability. However, their operational effectiveness varies significantly across different regions. A DID analysis was employed to assess changes in vehicle maintenance outcomes before and after the implementation of new operational procedures at selected depots. The study utilised data from 10 randomly chosen TMDs over a two-year period. The results indicate that there is a statistically significant improvement ($p < 0.05$) in vehicle reliability post-intervention, with an estimated increase of 25% in the proportion of vehicles meeting maintenance standards. This study provides empirical evidence supporting the effectiveness of DID methodology for evaluating system reliability in TMDs and offers a robust framework for future research and policy development. Transport authorities should consider replicating this approach across other depots to enhance overall vehicle safety and efficiency in Nigeria. Nigeria, Transport Maintenance Depots, Difference-in-Differences, System Reliability, Engineering The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Geographic, Infrastructure, Maintenance, Reliability, Methodology, Regression, Time-Series*

ABSTRACT-ONLY PUBLICATION

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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