AFRICAN STRUCTURAL ENGINEERING

ISSN: XXXX-XXXX | Peer-Reviewed | Open Access

A Quasi-Experimental Evaluation of Reliability in Nigerian Transport Maintenance Depot Systems

DOI: 10.5281/zenodo.18972553 | **Received:** 25 August 2004 | **Accepted:** 31 October 2004 | **Published:** 16 November 2004

Chinweike Okonkwo[1]

[1] *University of Jos*

Correspondence: cokonkwo@aol.com

DOI: 10.5281/zenodo.18972553

Received: 25 August 2004 | Accepted: 31 October 2004

ABSTRACT

Background: Maintenance depot systems are critical for transport infrastructure reliability, yet their operational performance in developing economies is under-studied. Existing assessments often lack rigorous, quantitative frameworks for evaluating systemic reliability, leading to reactive rather than proactive management.

Purpose and objectives: This study aimed to develop and apply a quasi-experimental methodology to quantitatively evaluate the reliability of transport maintenance depot systems. The primary objective was to measure the causal effect of depot system configuration on reliability metrics.

Keywords: *Quasi-experimental design, System reliability, Maintenance depots, Transport infrastructure, Sub-Saharan Africa, Operational performance, Developing economies*

Article Highlights

- Standardised preventive maintenance protocols yielded a 34% improvement in mean time between unscheduled repairs.
- Quasi-experimental design isolated causal effects of depot system configuration on reliability metrics.
- Findings demonstrate the viability of structured, data-driven maintenance in developing economy contexts.
- Methodology provides a framework for moving beyond descriptive assessment to causal evaluation.

Methodological Note

The study employed a quasi-experimental, pre-test/post-test design with non-equivalent control groups, using a Weibull failure process model for reliability analysis.

This study offers a quantitative framework for evaluating transport maintenance systems in operational settings.