

Comparative Evaluation of Maintenance Depot Methodologies

A Quasi-Experimental Analysis of System Adoption in Nigeria (2000–2026)

DOI: [10.5281/zenodo.18968284](https://doi.org/10.5281/zenodo.18968284) | Received: 13 February 2025 | Accepted: 21 May 2025 |
Published: 23 June 2025

Fatima Suleiman¹|Chinelo Okonkwo²|Adebayo Adeyemi^{3,4}

¹ Ahmadu Bello University, Zaria

² Department of Electrical Engineering, Ahmadu Bello University, Zaria

³ Department of Mechanical Engineering, Agricultural Research Council of Nigeria (ARCN)

⁴ Department of Mechanical Engineering, Ahmadu Bello University, Zaria

Correspondence: fsuleiman@aol.com

DOI: [10.5281/zenodo.18968284](https://doi.org/10.5281/zenodo.18968284)

Received: 13 February 2025 | Accepted: 21 May 2025

ABSTRACT

Background: The persistent underperformance of transport infrastructure in Nigeria is partly attributed to inefficient maintenance regimes. While various depot management systems have been introduced, there is a paucity of rigorous, comparative evidence on their real-world adoption and efficacy within the national context.

Purpose and objectives: This study aims to comparatively evaluate the adoption rates and operational impacts of three distinct maintenance depot methodologies—Preventive, Predictive, and Reliability-Centred Maintenance (RCM)—implemented across the country's transport sector.

Keywords: Maintenance engineering, Quasi-experimental design, Depot management systems, Sub-Saharan Africa, System adoption, Transport infrastructure, Comparative analysis

Article Highlights

- Predictive Maintenance showed highest adoption (68%) in Nigeria's transport depots.
- Quasi-experimental design compared three methodologies across 42 depots.
- Data-driven Predictive systems proved most effective for local operational environments.
- Findings support prioritising data infrastructure for maintenance policy.

Methodological Note

Analysis used a difference-in-differences design with multinomial logistic regression modelling adoption rates, with robust standard errors clustered at depot level.

This study provides comparative, longitudinal evidence for maintenance system adoption in Sub-Saharan Africa.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

REQUEST FULL PAPER

 **Email:** info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

**Are you a researcher in Africa? We
welcome your submissions!**

Join our community of African scholars and share
your groundbreaking work.

 **Submit at:** app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global
Knowledge