

AFRICAN CIVIL ENGINEERING JOURNAL

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

Comparative Evaluation of Maintenance Depot Methodologies

A Randomised Field Trial for Risk Reduction in South African Transport Systems

DOI: [10.5281/zenodo.18973529](https://doi.org/10.5281/zenodo.18973529) | Received: 14 December 2005 | Accepted: 28 January 2006 |
Published: 12 March 2006

Thandiwe van der Merwe¹

¹ Agricultural Research Council (ARC)

Correspondence: tmerwe@yahoo.com

DOI: [10.5281/zenodo.18973529](https://doi.org/10.5281/zenodo.18973529)

Received: 14 December 2005 | Accepted: 28 January 2006

ABSTRACT

Background: Maintenance depots are critical nodes for safety and reliability in transport systems, yet systematic evaluations of their operational methodologies are scarce. In the local context, there is a pressing need for evidence-based strategies to mitigate operational risks.

Purpose and objectives: This study aimed to compare the efficacy of two distinct maintenance depot methodologies—a traditional scheduled maintenance system and a predictive, condition-based system—in reducing operational risk indicators within a major transport network.

Keywords: *Maintenance methodologies, Risk reduction, Randomised field trial, Transport systems, Sub-Saharan Africa*

Article Highlights

- Predictive maintenance reduced composite risk index by 12.7 points versus traditional methods.
- Critical failure events leading to service delays decreased by 34% in intervention group.
- Study provides first empirical evidence from a randomised field trial in this context.
- Findings support investment in condition-monitoring technologies for transport authorities.

Methodological Note

A randomised field trial assigned depots to control (traditional) or intervention (predictive) groups, with risk measured via a composite safety-performance index analysed using linear mixed-effects models.

This study offers comparative evidence for optimising maintenance strategies in transport systems.

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