

# A Quasi-Experimental Evaluation of Reliability in Uganda's Transport Maintenance Depot Systems

Moses Kato<sup>1,2</sup>|Nakato Ssebagala<sup>3,4</sup>

Department of Civil Engineering, Makerere University Business School (MUBS) • Mbarara University of Science and Technology • Department of Electrical Engineering, Mbarara University of Science and Technology • Department of Sustainable Systems, Makerere University Business School (MUBS)

Correspondence: [mkato@gmail.com](mailto:mkato@gmail.com)

Received: 26 June 2011 | Accepted: 07 August 2011 | Published: 23 September 2011 | DOI:

[10.5281/zenodo.18971445](https://doi.org/10.5281/zenodo.18971445)

## ABSTRACT

**Background:** Transport maintenance depots are critical infrastructure for road network reliability, yet systematic evaluations of their operational performance in developing contexts are scarce. Existing assessments often lack rigorous causal inference frameworks, relying on descriptive statistics that fail to isolate system-specific effects.

**Purpose and objectives:** This study aimed to develop and apply a quasi-experimental methodology to quantitatively evaluate the reliability of transport maintenance depot systems, using the Ugandan context as a case study. The primary objective was to measure the causal effect of depot system interventions on equipment availability.

**Keywords:** *Quasi-experimental design, System reliability, Maintenance depots, Sub-Saharan Africa, Transport infrastructure, Performance evaluation, Road networks*

### Article Highlights

- A 28% increase in MTBF was measured following the procurement and training intervention.
- Quasi-experimental design isolated causal effects, moving beyond descriptive statistics.
- The study provides a replicable framework for evaluating infrastructure systems in developing contexts.
- Findings advocate for integrated intervention packages over isolated equipment supply.

### Core Methodology

A difference-in-differences design compared treatment and control depot groups, with reliability operationalized as Mean Time Between Failures (MTBF) for grader units.

*This study offers a rigorous causal framework for evaluating transport infrastructure interventions.*

## **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](mailto: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](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

### **Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global  
Knowledge