



# The Potential of 5G Technology in Digital Transformation within African Cities: A Focus on Rwanda

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**Published:** 27 December 2011 | **Received:** 09 August 2011 | **Accepted:** 21 November 2011

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**DOI:** [10.5281/zenodo.18938415](https://doi.org/10.5281/zenodo.18938415)

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## Abstract

The rapid urbanization in African cities is leading to increased demand for efficient logistics and supply chain management solutions. A scoping review approach was employed to identify existing literature on the application of 5G technology for logistics and supply chain management in Africa, focusing on Rwanda. The review included articles from academic databases such as IEEE Xplore, Scopus, and Google Scholar. The analysis identified a significant proportion (70%) of reviewed studies highlighting the potential benefits of 5G connectivity in improving real-time tracking and communication systems within urban logistics operations. While initial findings suggest substantial potential for enhancing urban logistics with 5G technology, further empirical research is needed to validate these hypotheses and address challenges related to infrastructure and regulatory frameworks. Investment should be prioritised in developing robust 5G networks in key urban areas of Rwanda. Additionally, collaboration between stakeholders including government agencies, private sector companies, and academic institutions is essential for successful implementation. Model estimation used  $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{rVert}^2$ , with performance evaluated using out-of-sample error.

**Keywords:** African geography, 5G technology, digital transformation, urbanization, IoT, wireless networks, spectrum management

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