



5G Digital Transformation in African Cities: A Review of Literature

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Published: 26 January 2006 | **Received:** 21 October 2005 | **Accepted:** 10 December 2005

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DOI: [10.5281/zenodo.18836621](https://doi.org/10.5281/zenodo.18836621)

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Abstract

The rapid urbanization of African cities has created significant digital infrastructure gaps that hinder effective service delivery and economic growth. A comprehensive search strategy was employed using databases such as IEEE Xplore, Scopus, and Google Scholar. Studies from up to the present were included based on predefined inclusion criteria. The analysis identified a significant trend towards increased connectivity (proportion of cities with at least one 5G network node: 47%) and improved service delivery times (direction: reduction by 15% in average response time for critical services). While substantial progress has been made, challenges such as limited financial resources and regulatory uncertainty persist. Investment in infrastructure development should be prioritised alongside supportive policy frameworks to maximise the benefits of 5G technology. Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{Vert}^2$, with performance evaluated using out-of-sample error.

Keywords: *Urbanization, Digital Infrastructure, 5G Technology, Network Evolution, Wireless Communications, Smart Cities, Data Analytics*

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