



# The Application and Assessment of 5G Technology in Facilitating Digital Transformation within Benin’s Urban Landscape

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### Abstract

The urban landscape of Benin is undergoing significant changes driven by rapid population growth and economic development. The need for robust communication infrastructure to support these transformations has become increasingly evident, particularly in the context of emerging digital technologies such as 5G. A mixed-method approach was employed, combining quantitative data collection through surveys and interviews with qualitative analysis of existing infrastructure and stakeholder perspectives. Statistical models were used to analyse data on network performance and user adoption rates. The preliminary findings indicate that while 5G coverage is expanding in urban centers, there are still significant gaps, particularly in less populated areas. A key theme emerging from the qualitative analysis involves the need for government support to bridge these digital divides. This study highlights the importance of a collaborative approach involving both private and public sectors to maximise the benefits of 5G technology in Benin’s urban environment. Recommendations include developing comprehensive strategies for infrastructure deployment, fostering partnerships between tech companies and local governments, and conducting further research on specific use cases that could benefit from 5G. Benin, 5G Technology, Digital Transformation, Urban Development, Mixed-Methods Research Model estimation used  $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n \text{sumiell}(y_i, f\theta(\xi)) + \lambda \text{Vert}\theta \text{rVert}^2 \}$ , with performance evaluated using out-of-sample error.

**Keywords:** African Geography, Digital Transformation, Network Architecture, 5G Technology, Wireless Communications, Urban Informatics, Internet of Things (IoT)

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