

## Smart Surveillance with 5G: A Performance Study in Adama City

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**Abstract :** In light of Adama City's smart city development vision, this study thoroughly investigates the performance of smart security systems with Fifth Generation (5G) network capabilities. It can be logistically difficult to install a lot of cabling, particularly in big or dynamic settings. Moreover, latency issues might affect linked systems, making it difficult for them to monitor in real time. Through a focused analysis that employs Adama City as a case study, the performance has been evaluated in terms of spectrum and energy efficiency using empirical data and basic signal processing formulations at different frequency resources. The findings also demonstrate that cameras working at higher 5G frequencies have more capacity than those operating at sub-6 GHz, notwithstanding frequency-related issues. It has also been noted that when the beams of such cameras are adaptively focussed based on the distance of the last cell edge user rather than the maximum cell radius, less energy is required than with conventional fixed power ramping.

**Keywords :** 5G, energy efficiency, safety, smart security, spectral efficiency

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