ABSTRACT

The increasing demand for internet access has led to rapid development in 4G LTE network technology. However, the network coverage area is still limited, especially in residential areas, one of which is the Bukit Kalibagor Indah housing area in Banyumas. This was determined from existing simulations, revealing that each Key Performance Indicator (KPI), such as Received Signal Reference Power (RSRP), Signal-to-Noise Ratio (SNR), and throughput, still falls under poor categories. To address this issue, network optimization methods can be employed, including the use of the Automatic Cell Planning (ACP) technique, utilizing the 2100 MHz frequency and employing Base Transceiver Stations (BTS) with 3 sectoral antennas having varying azimuth and tilting values. ACP is an approach focused on enhancing network efficiency and coverage by considering key parameters like RSRP, SNR, and throughput. Research results indicate that in ACP scenario 1, RSRP values increased from -131.46 dBm to -110.64 dBm, SNR improved from 2.09 dB to 10.35 dB, and throughput surged from 6187.74 kbps to 17424.26 kbps. In ACP scenario 2, RSRP reached -118.64 dBm, SNR reached 5.7 dB, and throughput achieved 9190.41 kbps. Meanwhile, in ACP scenario 3, RSRP attained -120.09 dBm, SNR reached 4.72 dB, and throughput reached 8346.81 kbps. From these findings, it can be concluded that the implementation of the ACP scheme significantly enhances the coverage area of the 4G-LTE network in the Bukit Kalibagor Indah housing area.

Keywords: 4G-LTE, Coverage Area, Automatic Cell Planning (ACP)