ABSTRACT

In this research, LTE network planning that has been existed in Cawang - Cikarang Utama toll road is analyzed whether it still adequate the capacity demand and the coverage necessity for five years later or not. The planning calculation output is 22 sites, while 30 sites are existed in the network. Therefore, it is unnecessary to add the number of site around the toll road. Although the drive test data showed, the received signal level of one of these sites is -111 dBm. It means the eNodeB is not operated optimally. That phenomenon becomes the reason of this research to make an analysis of network performance in this area. Besides, the goal of this research is to proof that ASFR technique can improve cell performance by doing power and subcarrier adjustment. This technique is developed from SFR technique because SFR only increase the cell edge throughput capacity.

System that implemented ASFR technique has more good quality and higher cell throughput capacity than system with SFR or not with SFR. The cell layout of the simulation is a hexagonal cell with 0.7 km cell radius and serving 69 users. The mean value of SINR of each user of 22.8139 dB, 28.6502 dB, 31.2724 dB, is obtained for system without SFR, SFR, and ASFR, respectively. The mean value of data rate user that achieved for system without SFR is 2.0518 Mbps, SFR achieved is 2.3956 Mbps, and SFR achieved is 2.7014 Mbps, with target data rate is 2 Mbps. To fulfill target data rate, in ASFR technique, 822 subcarriers with total power 20.5821 W are allocated to cell center users. The mean value per subcarrier is 0.0250 W. Remaining subcarriers with total power 19.2286 W are allocated to cell edge users which is mean value subcarrier is 0.0509 W. Throughput cell capacity of 141.5744 Mbps, 165.2961 Mbps, 186.3943 Mbps, respectively is obtained for system without SFR, SFR, and ASFR. For implementation of SFR technique, the throughput capacity increased is 16.76% while for implementation of ASFR technique, throughput capacity increased is 31.66%.

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