ABSTRACT

Advances in cellular technology must always be improved in line with developments and human needs. The presence of 5G New Radio (NR) technology provides service upgrades with use cases and significant improvements compared to previous technologies. 5G (fifth generation) has 3 frequency sections, namely High Band (mmWave), Mid-Band, and Low-Band which provide adjustments to user needs based on region and user density. In this study, the 2100MHz FDD and 2300MHz TDD frequencies were chosen to be implemented in the city of Jakata with an area of 661.5 km2 using link budget calculations and carrier aggregation techniques. The calculation of the two-frequency link budget used produces a maximum downlink FDD value of 140.81dB with a cell radius of 0.990 km2 and a TDD of 137.81dB with a allowed cell radius of 0.746 km2 and the appropriate cell range and provides an estimate of the number of network elements needed to achieve coverage and operates in the city of Jakarta with a total of 146 sites which produce a downlink carrier aggregation throughput of 812.45 Mbps. This planning simulation uses the Atoll software, contains the SS-RSPP, SINR simulation results based on the coverage area in the City of Jakarta, with the help of the Neighbor Relations method to find out where the distance between the original cell and the co-site is, with an average of 0.5% to 30% with the neighboring destination Cell has a different order in the allocation sequence in each Automatic Resource Allocation area, so it has the best average power level of -271.9dBm using Physical Cell Identity (PCI). The simulation uses Tableau software which is used for geo-mapping the identity of the tracking area or Track Area Code (TAC) site in the city of Jakarta.

***Keywords** : 5G NR, Coverage, Neighbour, PCI, TAC.*