

## ABSTRACT

5G networks are projected to cover 40 percent of population coverage and 1.9 billion subscriptions by 2024, equivalent to 20 percent of all cellular subscriptions. Worldwide mobile data traffic is expected to reach around 130 exabytes per month, four times higher than 2019 figures, and 35 percent of that data traffic will be carried by 5G networks.

The 5G NR network planning in this study was carried out in 7 sub-districts located in the central area of Bandung City where there is no 5G network covering the entire area in this area. Communities in 7 sub-districts with a total population of 418,264 people have very high activity and mobility which must be supported by adequate cellular network infrastructure. To provide this network infrastructure, it requires the latest cellular network technology, in this case 5G NR technology and careful network planning. In this study, a simulation analysis of the calculation and planning of the 5G NR network was carried out. Before carrying out network planning, calculations and plans for the capacity and coverage of the 5G NR network in the area are carried out to determine the MAPL value, cell radius, and number of sites needed.

Based on the results of calculating the capacity and coverage of the 5G NR network, 10 sites are needed to cover the area. Furthermore, planning simulations were carried out using simulation software and obtained an average SS-RSRP value of -81.22 dBm, an average SS-SINR value of 13.03 dB, and a data rate of 125.53 Mbps. The results of these three parameters have met the operator KPI standards and it can be concluded that the 5G NR network planning in 7 sub-districts in the center of Bandung City has been successful.

**Keywords:** 5G New Radio, Coverage planning, Capacity planning