ABSTRACT

PT XL Axiata Tbk (XL Axiata) recorded an increase in streaming traffic by 26%, and social networks by 16% in Central Java and DIY, which caused the quality of cellular services to be unable to handle the increase. Therefore, a 5G NR 2.3 Ghz coverage planning study was made in the city of Semarang covering an area of 373.7 km2 using the Atoll 3.4 application for the simulation. The purpose of this design is to determine the maximum allowable pathloss value (MAPL), signal strength results (SS-RSRP), signal quality (SS-SINR) and data rate. The study used 2 scenarios, namely scenario 1 uplink and scenario 2 downlink in non-line-of-sight (NLOS) conditions with the propagation model used, namely urban macro (Uma) based on the standardization of 3GPP 38,901. The simulation results show that the average SS-RSRP value for scenario 1 is -91.77 dBm in the "Normal" category, the SS-SINR average value of 10.14 dB is in the "Normal" category and the average value of the data rate of 68.625 Mbps is included in the "Normal" category. For scenario 2, the average SS-RSRP value of -89.81 dBm is in the "Good" category, the SS-SINR average value of 6.17 dB is in the "Normal" category and the average data rate is 61,787 Mbps is included in the "Normal" category. It is hoped that this research will be used as a reference if 5G NR technology is implemented in Indonesian cities, especially the city of Semarang.

Keywords: *5G NR network planning, 2.3 Ghz frequency, coverage area, 5g link budget, SS-RSRP, SS-SINR, Data Rate*