

## ABSTRACT

The number of telecommunication network operators in Indonesia with 5 operators makes frequency resources limited. While the Ministry of Communication and Information has mapped the need for 95% telecommunication services to be provided for the entire population of Indonesia. PT Telkomsel as a telecommunications network operator began to use the existing frequency spectrum, 900 MHz frequency which is only used for GSM voice services, it will be tried to service data services on LTE, so that with a wide bandwidth at 900 MHz frequency it is expected to help accommodate more existing LTE users currently at 1800 MHz.

Departing from the above conditions, the authors conducted a study of the use of the 900 MHz frequency spectrum for GSM (voice) and LTE (data) technology with international journal references entitled "Comparison of GSM, WCDMA and LTE Performance on 900 MHz bands".

Based on the results of the simulation and analysis, the values obtained on the existing GSM 900 network are signal level of -54.01 dBm, C / I is 20 dB and user connected is 120 users. GL (GSM) 900 network has a signal level value of -53.99 dBm, C / I of 20 dB and user connected as many as 125 users. The existing LTE 1800 network has a signal level value of -77.93 dBm, C / I is 15.68 dB and user connected is 619 users with a throughput of 163.01 Mbps. And the GL (LTE) 900 network has a signal level value of -48.63 dBm, C / I of 50.2 and user connected of 406 with a throughput of 106.92 Mbps

**Keywords: GL, GSM, LTE, Rx Level, Rx Qual, RSRP, SINR, User Connected, Throughput, Signal Level, C/I**