

## **ABSTRACT**

*An LTE network requires large capacity so it needs backhaul as a link between the access side and the core network. Previously in the research area using RTN 950 devices as backhaul, but this device was not able to accommodate large data traffic so it is necessary to update the device that is Minilink CN 710 because it can accommodate data traffic capacity of up to 1 Gbps. In this paper, the research begins with data collection in the form of existing sites, then calculates LTE throughput capacity for each eNodeB so that the calculation of the required backhaul link capacity is needed, then determines the antenna height needed to reach LOS, and then performs link budget calculations and simulations observed at frequencies of 23 GHz and 18 GHz according to the desired performance standards. On the results of network design that has been done, the total target user of LTE is 18,717, the throughput capacity of each eNodeB is 61 Mbps and the total capacity of the backhaul link is 488 Mbps. From the Atoll 3.3 software simulation results obtained the average RSL value for the frequency of 23 GHz as - 25.42 dBm with an average Availability of 99.999530% and the average value of RSL for the 18 GHz frequency of - 24.50 dBm with an average Average Availability 99.999930%. Both of these frequency scenarios have met the backhaul performance standard, which is minimal receiving power - 58 dBm and Availability 99.999% but the best scenario chosen is the 18 GHz frequency because it has better performance. So it can be concluded that the design of the Minilink CN 710 backhaul using the 18 GHz frequency is more feasible to implement.*

**Keywords :** *LTE, backhaul, microwave, Atoll*