

## **ABSTRACT**

*Along with the rapid development of technology and increasing number of demands for communication technology that is getting easier in various aspects of life, including information exchange activities. During this pandemic, the West Java government, especially in the Citarum Harum Sektor 6 national project area, made various programs to improve the people's economic standard of living. Therefore, it is necessary to design a BTS Multihop communication system to support it.*

*The research work is carried out from the stages of planning the 802.11ac WiFi access network. In the access network planning there are two types of planning, Capacity planning and Coverage Planning. Coverage Planning includes the calculation of the path loss link budget, Receive Signal Strength Indicator (RSSI), Signal to Interference Noise Ratio (SINR). The second plan is backhaul network planning. The backhaul network is meant to connect between BTS, so that BTS can optimally serve users. Backhaul planning starts after the access network planning is completed, the backhaul network planning is carried out by calculating the link budget such as Line of Sight (LOS) calculations, Fresnel Zone, Free Space Loss (FSL), Effective Isotropic Radiated Power (EIRP), Receive Signal Level (RSL), Fading Margin, Value Quality Objective and Availability*

*The planning results using the ISM band 2.4 GHz unlicensed spectrum can accommodate the Citarum area sektor 6 properly, the RSSI value obtained from the simulation is on good average and normal conditions -40 to -80 dBm, while SINR is in good condition and Normal 1 s / d 30 dB. Meanwhile, backhaul planning obtained an average acceptability value > -79 and availability of 99.999% for links with the distance <1 km. So it can be concluded that the WiFi-based backhaul can work optimally to connect the WiFi network in the Citarum area 6.*

**Key words :** *WiFi, Citarum, Unlicensed, ISM band, Multihop.*