

## ABSTRACT

Requirement for reliable technology with wide bandwidth and high mobility, and supports all the features required services. This has encouraged the emergence of mobile technology, Long Term Evolution (LTE). Bandung is potential to be developed cellular technologies like LTE have a dense population and consumption big data plus number of mobile users. In this thesis, WiMAX enabled as a backhaul technology for supporting geographic of Bandung. Although fixed WiMAX technology is a microwave-based communications system that supports access and backhaul.

In this plan, LTE method dimensioning by capacity and dimensioning by coverage. Data from the Central Statistics Agency (BPS) Bandung for 8 years and liveliness factor in the customer service to be the basis of planning in capacity. While data of e-nodeB device for planning coverage. It also includes analysis of CINR and throughput on LTE networks by using Fractional Frequency Reuse Frequency Reuse (FFR) and compared to LTE without using Fractional Frequency Reuse (FFR). For planning WiMAX as backhaul, WiMAX as a backhaul system used is a point-to-point LOS Fixed WiMAX (802.16d - 2004).

The results obtained in this thesis is the design of Fixed WiMAX backhaul networks are optimal with 7 Hop and 57 branches of the antenna height, FSL and RSL (Received Signal Level) is averages of  $-44 \text{ dBm} > -101 \text{ dBm}$  Rx Sensitivity standard so, this plan feasible to implementation, as well as planning LTE downlink using 58 sites. Analysis of signal level parameters (RSRP) is  $-49 \text{ dBm} > -70 \text{ dBm}$  with the percentage of 96%, non-LTE performance analysis with FFR and FFR, the CINR level with LTE network conditions without FFR at 10.15 dB, and an increase in quality by using FFR at 11.25 dB, the throughput of 17.601 kbps non FFR and FFR with an increase in throughput is 36.614 kbps so, will be better on LTE networks using Fractional Frequency Reuse (FFR).

Keywords: LTE, WiMAX, Backhaul, FFR, dimensioning by capacity and by the coverage.