

## ABSTRACT

Nowadays, especially in the field of telecommunications, to fill human needs, the 3GPP create new technologies name as Long Term Evolution, or better known as LTE and marketed as 4G LTE is a wireless communication standard based on GSM network / EDGE and UMTS / HSDPA for high speed data access using a cell phone like any other mobile device.

LTE planning methods used in the final project are, using a frequency of 700 MHz, Radio Network Planning using Planning Capacity, as well as the use of optimization using a genetic algorithm method is implemented by matlab. To determine the path loss using the Okummura-Hatta formula.

The results of the planning that in Bandung area we need 18 site, 15 for urban area and 3 for suburban area, and the result for fitness is 4.361% when cross over probability 0.9 it has 150.8 km<sup>2</sup> for coverage and 6.8 km<sup>2</sup> for blankspot area. For manual placement it has 146.88 km<sup>2</sup> coverage and 10.8 km<sup>2</sup> blankspot area. In Jakarta area we need 175 site and the result for fitness is 8.920% when population 1000 it has 596 km<sup>2</sup> coverage and 59 km<sup>2</sup> blankspot area. For manual placement it has 576 km<sup>2</sup> coverage and 78 km<sup>2</sup> blankspot area In Tol Cipularang we need 11 site, ant the result of fitness 16.417% when cross over probability 0.9 it has 119 km<sup>2</sup> coverage and 23 km<sup>2</sup> blankspot area. For manual placement it has 95 km<sup>2</sup> coverage and 57 km<sup>2</sup> blankspot area.

**Keywords:** Long Term Evolution (LTE), Radio Network Planning, Capacity Planing, genetic algorithm