

## ABSTRACT

Long Term Evolution (LTE) wireless telecommunications technology is a 4th generation as the successor to 3G networks based on Internet Protocol (IP). This technology will be able to meet the needs of the user data packet communications will continue to rise in recent years. In the previous technologies, namely 3G and 2G less than optimal and stable in serving the needs of the user conditioned traffic moving at high speed or user conditions are in the land transportation is the train.

Planning 700 MHz FDD LTE network along railway lines Bandung - Gambir with user speeds reaching 350km / h and 190 km distance as far as this is done by the conventional method of coverage and capacity in terms of radio access. Excellence frequency of 700 MHz as the frequency of gold which would lower the influence of interference and has a radius wider coverage than the frequency of 800 MHz and above. Then do the planning based on neighbor relations and physical cell identity (PCI). PCI has a function almost the same as the scrambling code for the downlink direction on WCDMA technology that have a parameter value of 0 to 503. In the co-reuse PCI is planned, produced at least 4 times the cell radius review due to be in a state of collision free and free confusion.

The parameters in this thesis done according to the standard KPI telecom vendor Ericsson. Allocation PCI should be performed in LTE to identify a cell. Simulations using the planning and optimization software from Forsk Atoll. With the PCI, especially in the potential areas are along the railway line Bandung - Gambir by comparing before and after the allocation of PCI, it can reduce the interference level indicated increased probability of an area with a small BLER value is 385 km<sup>2</sup> with an average value The same BLER of 0.01, then because of interference which reduced the average value of  $C/(I+N)$  rose 14.24 dB extensive coverage reached 106.81 km<sup>2</sup>, so the average user throughput increase 48 Mbps. While the use of PCI not affect RSRP and the signal level is the value RSRP average of -112.92 dBm coverage of 98% of the total area of the train. In terms of the average signal level has the same value for both scenarios do not use the PCI or PCI amounted -68.09 dBm with broad coverage for the best signal is > -80 dBm for 82 km<sup>2</sup>.

Keywords : *Long Term Evolution, macro cell, coverage, capacity, neighbour relation, physical cell identity, BLER,  $C/(I+N)$ , throughput, signal level.*