

ABSTRACT

Train speed mobility affect to fluctuations in the train passenger receiving power level signal in the communication system. One of the main causes is there is a poor coverage area. The effect of this causes made bad network quality for communication.

This final project designed an LTE network for passengers at a speed of 160 km/h from Cepu station to Pasar Turi Surabaya station with a frequency of 900 MHz. The design of the LTE network with overlapping coverage is a solution to network problems on fast trains. The use of the Remote Radio Unit (RRU) with cell placement height focuses on supporting the railroad network. Existing sites around the railroad tracks are used for RRU's cell placements. The design considered about user speed, traffic delay, and overlapping coverage for handovers (HO).

The simulation results of LTE-Sim and calculations obtained delay at a speed of 160 km/h at 0,01850966 seconds. Each RRU's overlapping coverage of 1,7 km for HO with two cells covers an average of 8,5 km of railroad length. It took seven RRUs to be placed on the existing site and 12 RRUs to add 141 km of railroads. The simulation of the design obtained RSRP value is -63,92 dBm with 97,1% of the area successfully covered and the SINR average value of 10,77 dB.

Keywords : LTE, RRU, delay, handover, macro cell, overlapping coverage