

## ABSTRACT

*Train is one of the type of public transportation to avoid traffic jam. By using trains, the poor quality of Long Term Evolution (LTE) network becomes one of the problems for internet user in trains. This caused by several factors, one of them is blankspot area in Pekalongan-Cepu train line.*

*To resolve this problem, this Final Project designs a microcell network by considering coverage, capacity, speed, and throughput for overlapping coverage. So that, the submission run well and is able to support LTE communication with a train speed of 140 km/hour. This Final Project uses network design software and delay simulators.*

*The design of the LTE network added the Remote Radio Unit (RRU) along the Pekalongan-Cepu high speed railway with due regard to the existing Telkomsel operator network sites. This Final Project finds that the number of new RRUs of 35 sites must be added. The results of signal feasibility are obtained from parameters according to the standard of the Main Performance Indicator (KPI) of Telkomsel, with an average value of  $-60.87$  dBm Reference Signal Received Power (RSRP)  $\geq -85$  dBm, Signal to Interference Noise Ratio (SINR)  $10.02$  dB  $\leq$  SINR  $< 10$  dB, and Throughput value  $26.929,01$  kbps  $\geq 12,000$  kbps. The simulation results using the delay simulator generate traffic at a speed of 140 km / h at 19.17 ms and the delay in handover is 20 ms. Delay results in an overlapping coverage value of 41% of the cell radius.*

**Keyword :** *Delay handover, LTE, RRU, Traffic delay, Overlapping*