

ABSTRACT

As stated by Badan Pusat Statistik (BPS), long distance travel by train become a first choice for the community because of the safety, low cost and right on time schedule. Therefore, Indonesia will build high speed train facilities on the Jakarta - Surabaya route with speed 140 km/h at 900 MHz frequency. However, there is a disadvantage when on a high speed train, high latency lead to huge packet loss. In order to provide comfort for passenger during communication, thus a research is conducted on high speed train with maximum allowed delay ≤ 40 ms.

Method that used during the research included the design of coverage areas and capacity planning using network dimensioning, which is a method for accumulating the number of sites and the capacity of each site needed. Performing simulation and calculating the total delay using a delay simulator. Simulation network of the LTE communication by taking coordinate existing eNodeB and RRU extend which are specifically for high speed train without neglecting to delay, throughput, SINR, RSRP and overlapping.

Based on the simulation and calculation, the total system delay is 38.6287 ms and the handover delay is 20 ms. The value of overlapping is 1483 m with the percentage of total coverage area obtained is 37.07%. Network design that used existing RRU produced RSRP -62.88 dBm and SINR 8.96 and RSRP -63.43 dBm and SINR values of 8.74 dB for design that did not use the existing RRU. This design is feasible, because it meets the requirements of LTE high speed train where total delay ≤ 40 ms and network quality meet requirements Telkomsel KPI standards.

Keyword: *Delay, Handover, Overlapping, LTE, RRU, High Speed Train*