

## ABSTRACT

*The JKT-SUB 160 km/h high speed train will soon be implemented demands the need for communication network planning for passengers. The plan is especially for passengers when accessing the LTE network which is capable of supporting high speed data rate communication.*

*This Final Project uses LTE technology that uses the RRU device specifically to cover the railroad area. Therefore, the coverage analysis is carried out by covering planning and validating the results with the existing real site conditions that used. This Final Project did X2 handover analysis on a train with a speed of 160 km/h and also carried out to determine the distance of the overlapped zone used for the validation process.*

*From the results of uniform calculations obtained the number of sites as many as 39. Handover analysis using NS3 software obtained the results of delay transmission data of 14,39 ms so that the overlapped zone distance of 600 m was obtained. The validation process with the radius of the different existing site and the distance of the overlapped zone obtained 47 sites for railroad tracks with distance 219 km. From simulation using software, the best condition of the cover area is 98% with an average signal level (RSRP) of -65.87 dBm and the average value of  $C/(I + N)$  is 19.52 dB. This Final Project design aims to serve passengers to carry out data communication. Capacity Planning is based on that goal with the traffic behavior provided by LTE. The results obtained from capacity planning are Single User Throughput of uplink 95.087 Mbps and downlink side 363.921 Mbps. The number of passengers as many as 1000 resulted in network throughput of 9.508655758 Mbps on the uplink side and 36.3921199 Mbps on the downlink side.*

*Keywords : High Speed Train 160 km/h, LTE, Coverage, Handover.*