

## **ABSTRACT**

*The development of telecommunications in Indonesia has reached the fourth generation or better known as LONG TERM EVOLUTION (LTE) network technology. All telecommunication operators are competing each other to provide the best service and stay up to date. Therefore, it required a good network planning process to create a reliable network quality. It is not apart from the cost of building the network in the form of CAPEX and OPEX to know the cost of development. After that, we do the calculation of revenue that done with the purpose to know the revenue from the implementation of this network, and the last is to do the NPV calculations to determine whether or not his project or design is done. In this research, the design of Outdoor LTE network located in Yogyakarta city using Atoll software, this planning is using 1800 MHz frequency and 10 MHz Bandwidth based on Capacity. The planning process that must be done is to determine some calculations like User Estimation, Calculation of Throughput, Single User Throughput, Network Throughput, Resource Capacity, and eNodeB. This research's simulation is done by using NodeB existing location with 85 total NodeB which is upgraded to 85 eNodeB. From the design with the scenario will be analyzed the results of the calculations performed as mentioned above, the obtained user until the year of planning which is 2020 is 113008 users. CAPEX required for network design is Rp 1,351,024,000 and OPEX cost incurred in 2017 is Rp 44,043,529,044 and the revenue earned in 2017 is Rp 92,259,246,240. And the NPV obtained in the calculation of this research is positive so that this project can be run or done because it will be profitable.*

*Keywords: LTE, Planning, Atoll, Capacity, User, CAPEX, OPEX, NPV*