

## **ABSTRACT**

Vehicular Ad-hoc Networks (VANETs) is a self-organizing ad-hoc network that operates in intervehicle communication (IVC) and vehicle-to-infrastructure communication systems, which is also a subclass of mobile ad-hoc network (MANETs) [1]. Now VANET is one of the most developed research areas in recent years to support Intelligent Transportation System (ITS). One of the problems in big cities is traffic jams. The congestion is caused by insufficient road segment, large volume of vehicles, uneven distribution of vehicles and others. Congestion must be addressed immediately, so as not to cause greater losses. One solution is that riders can use digital map applications on their smartphones. Therefore it is necessary to weigh the traffic load of vehicles. In this final project will be discussed about VANET performance using GPSR and AODV routing protocol with vehicle traffic load balancing scheme with node density influence.

The design of the simulation system is divided into two subsystems namely mobility subsystem and network subsystem. The design of mobility subsystem is designed by using VanetMobiSim software, while designing network subsystem using Network Simulator 2 (NS2) software. The selected node density is 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 nodes. Then weighing the vehicle traffic load according to node density conditions, and VANET performance will be observed. Performance is evaluated with the average end to end delay, throughput, and packet delivery ratio.

From the simulation results can be concluded that the performance of GPSR is better than AODV on VANET with vehicle traffic load balancing scheme. Node density also affects VANET performance. The larger the number of nodes the QoS parameter value will be greater. The mean value of throughput, PDR, delay on GPSR are 142.21 Kbps, 87.47%, dan 82.83 ms.

Keywords: VANET, NS-2, VanetMobiSim, Load Weighing, GPSR, AODV, Node