ABSTRACT

Inadequate infrastructure and lack of information about alternative routes and the density of a road lead to congestion which is a problem in developing countries such as Indonesia. The importance of information on the density of a road segment will provide its own solution and it is expected that real time information will greatly help the rider to obtain traffic density information and provide solutions for the development of smart traffic system.

To realize realtime traffic density information in this research, a Wireless Sensor Network (WSN) system using an ultrasonic device as input device and open source microcontroller device is expected to be able to detect traffic density and presented through web page. To realize the system requires an optimal communication protocol.

In this research, searching system accuration in detecting congestion and comparison for two communication protocol namely ZigBee protocol and RF 2.4 GHz. The result of the analysis is the average of delay and throughput to compare the two protocols from the generated QoS parameters.

Accuracy obtained sensor is 95,31% to read speed of vehicle. Both communication protocols can be implemented for this system, but the 2.4 Ghz RF technology implemented on the nRF24L01 communications module is rated more for use with an average delay of 2.78 ms and an average 24,87 Byte / s of throughput up to 102 meters. While the Zigbee Protocol on the XBee S2C module yields an average delay of 6,06 ms and an average throughput of 20,23 Bytes / s despite its range of up to 112 meters.

Keywords *:* WSN, Ultrasonic, ZigBee, RF 2.4 GHz