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# A FLUID MECHANICS-BASED DATA FLOW MODEL TO ESTIMATE VANET CAPACITY

## ABSTRACT

Accurately estimated data transmission ability is important in operating a vehicular ad-hoc network (VANET), which has limited bandwidth and highly dynamic typology. The mobility behavior of traditional wireless networks is different from VANET's, and existing results on the former are not applicable to VANET directly. Most existing studies on VANET capacity estimation focus on asymptotic descriptions. In them, messages sent and received by vehicle nodes are composed of data packets, and vehicle nodes can move along roads only. In this project proposed, a modeling and calculation approach for accurate VANET capacity. We transfer vehicle nodes to data packets and then abstract data packets that can move along roads into data flow in virtual pipelines. Then, we derive a fluid mechanics-based data flow model and propose capacity calculation equations. According to network scale, network capacity is divided into following three stages: linear growth, maintenance, and decline. This paper demonstrates that the data flow model based capacity is consistent with that of simulation results.