

*A Framework to Control RSU Based TCP Traffic
Congestion in VANETs*

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ABSTRACT

The perspective of the technological landscape is growing with rapid pace where there is a huge utility in the transport management systems. Because the latest statistical analysis has been reported by the transport research wing of the Ministry of Road Transport and Highways, India that the various incidence occurring in the form of accidents approximately every day such as 449002 accidents, 151113 fatalities, and 451361 injuries etc. Due to which an average of 17 deaths occur in 51 accidents every hour. When the principle elements instantly get identified for such incidences and the outcomes appeared as that inefficient use of technology to control the high-speed vehicle collisions, signal assaults, and out dated conventional techniques etc. Moreover, the comparative analysis made with other countries such as USA, China, Japan, and Europe with respect to road accidents has shown the quite less results. Because such countries have been implemented the efficient technologies which makes their robust transport management systems. In order to overcome such issues that a novel framework has been proposed with the intelligent incorporation of the VANETs techniques. The VANETs are a well-defined family of MANETs which gets characterized by high mobility and frequent changes in the network topologies. Moreover, in which various moving vehicles and other connected RSUs communicate with each using wireless channel for sharing the fruitful information. For sharing the information the VANETs facilitates with the multiple services but most popular connection services are Vehicle-to-Vehicle (V-to-V) and Vehicle-to-Infrastructure (V-to-I) which is commonly known as Road Side Unit (RSUs). The primary objectives of the RSUs are to acquire and update the traffic information in real time using the different protocols for making the traffic control system smoothly. In addition,

for making efficient communication between V-to-I there are some other technologies incorporated such as 2G, 3G, 4G (LTE-cum-VoLTE), and WiMax to ad hoc networks. There are two types of conventional techniques named as connectionless and connection-oriented are employing for the transmitting of data whereas for smooth transmission of the information the connection-oriented technique is most preferable. For enhancing the services of VANETs it very complementary due to its highly dynamic nature especially in urban environments.

The congestion and multipath propagation delay is a quite common issue in every transmission protocols which is completely restrict the amount of data that may be transferred and it also relying on the expected network capacity and the TCP congestion window of the receiver. But the TCP ensures the quite less for frequent link failures, short session durations, packet drop-off without affecting the Quality-of-Service and reliability in VANETs. Therefore, to provide the efficient congestion avoidance system for TCP in VANETs environment is one of the objectives of the proposed methodology. In addition, to find out the precise solution by computing the packet intervals on throughput while transferring and packet delivery ratio for the VANETs infrastructure. The recommendation has been suggested by the researchers for making the effective congestion control system which is also consider for developing the proposed method. The VANETs has the greater adaptability in a transportation management system which is especially get recognized in business sector. The proposed methodology is the fusion of the VANETs, RSUs and TCP techniques to develop the framework for controlling TCP traffic congestion over the course of this research. The performance metrics such as the cumulative sum of packets, end-to-end delay, throughput, packet lost, and TCP traffic congestion window has been used to testify the efficiency of the proposed framework.