

# A New Model for Effective Use of Robustness as a Measure of QoS in Vehicular Ad-hoc Networks

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**Abstract**—Applications of VANETs, as used in Intelligent Transportation Systems may have requirements of robust network and robust route for communication over it. This work aims at modeling robustness as a significant measure of QoS for the effective use in VANETs, first of its kind. Here, robustness has been defined as a qualitative QoS parameter of communication links that depends on link lifetime and error rate over the link. The forms of robustness considered here include Link-Robustness and Route-Robustness. Modeling and quantification of Link-Robustness has been carried out by synthesizing temporal, spatial and environmental dependencies of the network. It is so because these dependencies are responsible for variation of link-lifetime and link-error rate in VANETs environment. Similarly, Route-Robustness has been defined and modeled as a part of the overall network environment. Moreover, quantification of Link-Robustness and Route Robustness has been proposed and illustrated with the help of an example scenario. Based upon the proposed model and robustness as QOS measure in VANETs a route selection strategy has been proposed that is an important and integral component of any routing protocol. Subsequently, an algorithm has been presented that involves route selection and route request procedures. Finally, validation and analysis of the proposed model and consequent route selection strategy have been carried out the basis of results obtained from the associated simulations of AODV and AODV-R in addition to that of proposed model.

**Keyword**— Link-Robustness, Modeling robustness in VANETs, Quality-of-Service, Robust route selection in VANETs



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