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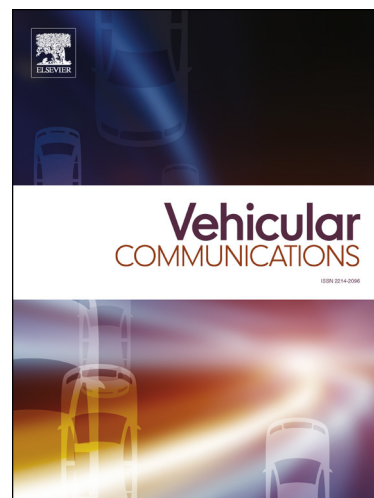
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# Location Service Implementation in Vehicular Networks by Nodes Clustering in Urban Environments

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## Abstract

Position based protocols, such as routing protocols, require a location service to find the position of destination nodes. In other words, a source node requests the location of the destination from the location service, and then the service starts to search for the destination node and returns its location to the source node. In this paper, a Cluster Based Location Service (CBLS) for Vehicular Ad-hoc networks (VANETS) is proposed. CBLS divides the vehicles into clusters according to their speed, distance and neighboring parameters. A node in each cluster, cluster head, collects the other nodes position information and passes them to a main server in a hierarchical manner. In the proposed service, instead of fixed antennas, the vehicles antennas are used, so the services scalability and efficiency grow and capital cost decreases. The performance evaluation of the proposed service shows it outperforms the traditional (without clustering) hierarchical location services in terms of query delay and success rate.

*Keywords:* Vehicular Networks, Hierarchical Infrastructure, Location Service, Clustering;

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## 1. Introduction

Vehicular networks have been developed in Intelligent Transportation System (ITS) to improve safety, enhance vehicle efficiency, and reduce traffic. Vehicular networks connect vehicles using wireless radio waves. Each vehicle identifies the neighboring vehicles and constructs a network [1].

When two mobile nodes tend to communicate, first, they need to find a route. Two categories of routing protocols have been proposed for vehicular networks: topology based routing protocols and position based routing protocols [2,3]. Because of the dynamic nature of vehicular networks, the network topology is

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