

Traffic Efficiency Models for Urban Traffic Management Using Mobile Crowd Sensing: A Survey

ABSTRACT

The population is increasing rapidly, due to which the number of vehicles has increased, but the transportation system has not yet developed as development occurred in technologies. Currently, the lowest capacity and old infrastructure of roads do not support the amount of vehicles flow which cause traffic congestion. The purpose of this survey is to present the literature and propose such a realistic traffic efficiency model to collect vehicular traffic data without roadside sensor deployment and manage traffic dynamically. Today's urban traffic congestion is one of the core problems to be solved by such a traffic management scheme. Due to traffic congestion, static control systems may stop emergency vehicles during congestion. In daily routine, there are two-time slots in which the traffic is at peak level, which causes traffic congestion to occur in an urban transportation environment. Traffic congestion mostly occurs in peak hours from 8 a.m. to 10 a.m. when people go to offices and students go to educational institutes and when they come back home from 4 p.m. to 8 p.m. The main purpose of this survey is to provide a taxonomy of different traffic management schemes for avoiding traffic congestion. The available literature categorized and classified traffic congestion in urban areas by devising a taxonomy based on the model type, sensor technology, data gathering techniques, selected road infrastructure, traffic flow model, and result verification approaches. Consider the existing urban traffic management schemes to avoid congestion and to provide an alternate path, and lay the foundation for further research based on the IoT using a Mobile crowd sensing-based traffic congestion control model. Mobile crowdsensing has attracted increasing attention in traffic prediction. In mobile crowdsensing, the vehicular traffic data are collected at a very low cost without any special sensor network infrastructure deployment. Mobile crowdsensing is very popular because it can transmit information faster, collect vehicle traffic data at a very low cost by using motorists' smartphone or GPS vehicular embedded sensor, and it is easy to install, requires no special network deployment, has less maintenance, is compact, and is cheaper compared to other network options.