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RESEARCH ARTICLE

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Vehicular adhoc network-traffic safety management approach: A traffic safety management approach for smart road transportation in vehicular ad hoc networks

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Summary

Over the past two decades, vehicular collisions have been a significant concern for governments, researchers, and automobile manufacturers. However, collisions are unexpected and occur regularly on roads, resulting in deaths, infrastructure destruction, and health injuries. As a result, it is essential to avoid, prevent, and detect traffic collisions at the highest degree possible for minimizing human loss. In this article, the trend of road traffic accidents in India has been analyzed graphically. Towards the end, a VANET-based traffic safety management approach (VANET-TSMA) has been proposed to reduce road accidents in India. This approach uses message distribution, traffic management, and congestion control efficiently for reducing the overall rate of road accidents. This method is based on multiple information and communication technology (ICT)-based safety mechanisms which include collision avoidance, collision detection, and traffic congestion avoidance for the protection of future connected automobiles on roads.

KEYWORDS

collision avoidance, collision detection, road safety, traffic congestion avoidance, traffic safety management approach

1 | INTRODUCTION

Every year, around 1.35 million people die worldwide on roadways, with 20 to 50 million suffering nonfatal injuries. If current trend continues, it is projected that traffic accidents would rise by 65% and become the fifth leading cause of death by 2030.[1] Handling vehicular collisions and rising vehicular traffic is a severe issue. With the help of emerging technologies, intelligent transportation system (ITS)[2] addresses these issues. Although ITS has been used in developed countries for two decades, it is still a relatively recent phenomenon in developing countries like India, Brazil, and South Africa. Driver inattention is a major cause of road accidents in India. ITS is a standardized infrastructure that implements a variety of communication, tracking, automobile sensing, and electronic systems to assist in observing and controlling traffic flow, mitigating congestion, ensuring optimal routes for commuters, increasing the system's efficiency, and saving lives, money, and time. A World Bank Technical Note titled "ITS for developing countries"[3] explored the state of ITS in developing countries. It discussed long-term societal benefits that ITS can offer to individuals by