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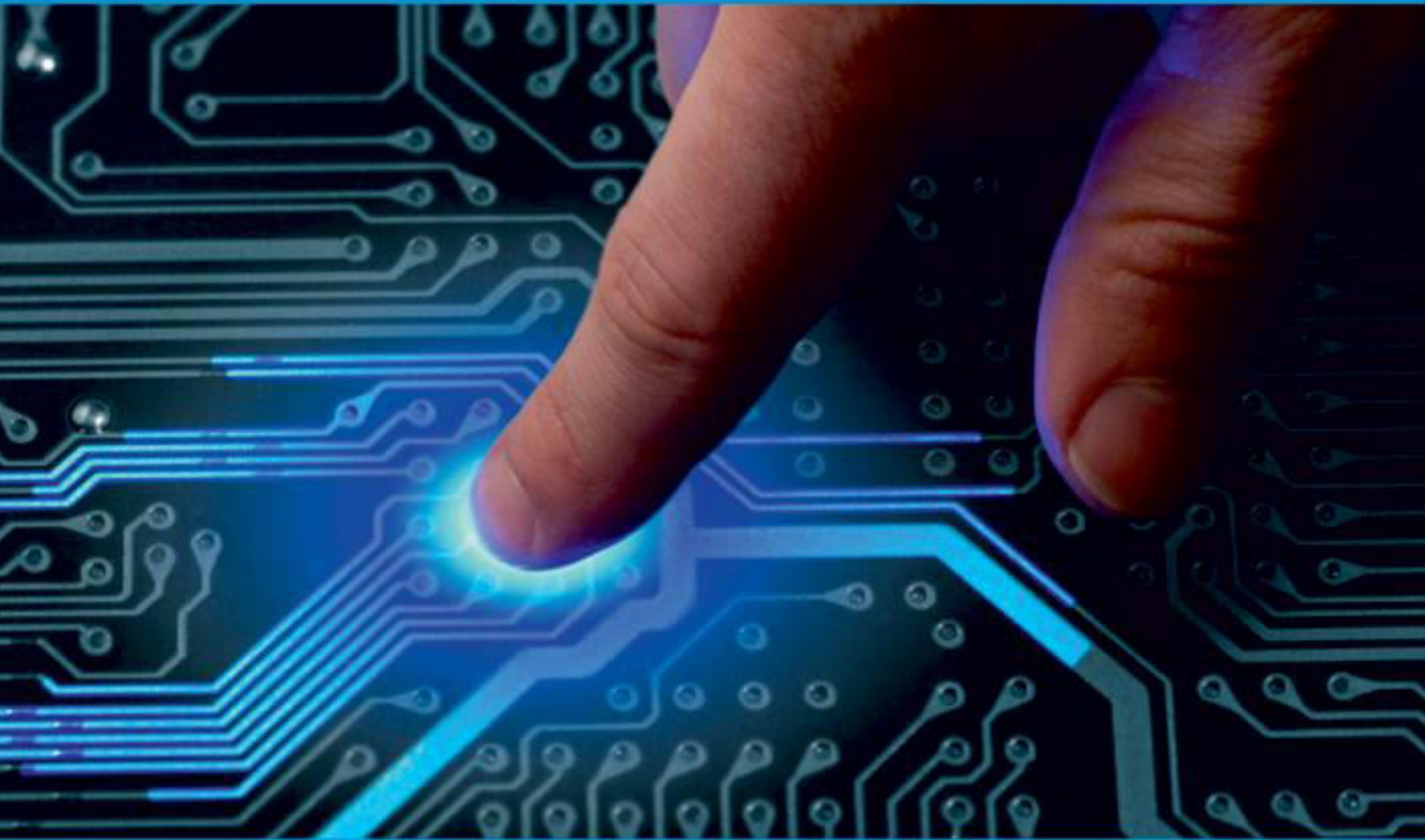

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A Survey on Selection of Dynamic Route to Avoid Traffic Flow in VANET

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ABSTRACT: Vehicles have increased dramatically in number globally over the past few decades. Therefore, rather of focusing on enhancing the quality of the roads, manufacturers, researchers, and the government are now concentrating on enhancing on-road safety. New types of networks, like Vehicular Ad Hoc Networks (VANETs), which enable communication between vehicles and between vehicles and infrastructure, have been created as a result of the rapid advancement of wireless technologies. In recent years, a number of novel ideas have been developed, including smart cities and living labs, where Vehicular Ad Hoc Networks (VANETs) play a significant role. This study reviews the various Intelligent Traffic Systems (ITS) that are currently in use as well as the various routing protocols in relation to our suggested solution. This study also introduces a novel plan made up of a smart city framework that disseminates data on traffic conditions to assist drivers in making informed choices. Our suggested system consists of a warning message module made up of Intelligent Traffic Lights (ITLs), which informs the driver of the traffic situation at the moment.

KEYWORDS: VANET, Smart City Framework, Intelligent traffic Lights (ITLs), Intelligent Traffic System (ITS), Routing Protocol.

I. INTRODUCTION

In the past 20 years, governments and automakers have made road safety a top priority. The overall number of vehicles has increased significantly, which has increased traffic density and led to an increase in accidents. In India, population growth is outpacing traffic by a factor of four. As a result of the advancement of new vehicle technology, businesses, researchers, and universities are now concentrating their efforts on enhancing traffic safety. Researchers may now create communication systems that include automobiles because to the advancement of wireless technology over the past few decades. In order to facilitate communication between automobiles and infrastructure, networks like Vehicular Ad Hoc Networks (VANETs) are developed. In order to construct a mobile network, a method called a vehicular ad hoc network (VANET) uses moving automobiles as network nodes. In recent years, innovative ideas like smart cities and living labs have evolved, where vehicle networks play a significant role. Some of the objectives of VANETs include the decrease of traffic congestion, pollution, and auto accidents. Both road operators and drivers stand to gain significantly from the implementation of an effective system in VANETs. Traffic congestion will be decreased, road safety will be improved, and city driving will be safer with effective traffic alerts and up-to-date information regarding traffic accidents.

Additionally, real-time traffic alerts cut commute times and fuel usage, which lowers CO2 emissions. This aids in sustainable and economical ways. Due to their numerous significant applications in the areas of traffic management and road safety, vehicular ad hoc networks (VANETs) are receiving attention. Due to rising population and congested roadways, smart cities would like to reduce their transportation issues. VANETs seek to address this problem by enhancing vehicle mobility, enhancing traffic safety, and fostering more enduring urban environments. The creation of roads that were more effective and safer was the primary focus at the outset of the development of vehicle technologies. Today, we may utilize Intelligent Transportation System (ITS), which will transform the way we travel and assist emergency services, thanks to the enormous development of wireless technologies and their usage in automobiles. Vehicles can readily connect with permanent infrastructure and one another thanks to VANETs. This will create new business opportunities in addition to enhancing general road safety.

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II. LITERATURE REVIEW

Intelligent Transportation Systems (ITS) have become a successful method for enhancing the performance of vehicle traffic on roadways over the past few decades. Road safety, comfortable driving, and the dissemination of up-to-date information about the roads are the objectives of ITS. In recent years, a lot of ITS-related studies have been presented. This section discusses some research on ITS in smart cities. The work in [4] is a survey about multifunctional data driven intelligent transportation system (D2ITS), which collects a large amount of data from various resources: Vision-Driven ITS (input data collected from video sensors and used recognition including vehicle and pedestrian detection); Multisource-Driven ITS (e.g. inductive-loop detectors, laser radar and GPS); Learning-Driven ITS (effective prediction of the occurrence of accidents to enhance the safety of pedestrians by reducing the impact of vehicle collision); and Visualization-Driven ITS (to help decision makers quickly identify abnormal traffic patterns and accordingly take necessary measures). There are some problems regarding object reorganization in some complex situations as shown in figure 1.

Figure 1: Complex Traffic on Road

In such a situation it becomes difficult to recognize each vehicle (object) and perhaps to find out the centroid of each object. Hence it creates problems centroid of each object. Hence it creates problems while calculating traffic density. Another problem is while doing object subtraction, if the color of vehicle and the color of background matches then it becomes difficult to uniquely identify the object. Figure 1. Complex scenario of traffic in [5] an adaptive traffic signal control system based on car-to-car communication is presented. This system reduces the waiting time of the vehicles at the intersection along with the reduction in queue length. To realize this system, the concept of clustering is used for the vehicles approaching the intersection. The density of vehicles within the cluster is computed using a clustering algorithm and sent to the traffic signal controls to set the timing cycle. It uses DBCV algorithm. This algorithm is a combination of cluster and opportunistic dissemination technique and is used to gather the required density information. The Clusters are created based on the direction of the vehicles in a given geographic region approaching the intersection. This direction parameter is computed within the vehicles by employing GPS and digital maps. Another system [6] that takes the control decisions based on the information coming from the other vehicles. Each vehicle is equipped with a short range communication device and controller nodes are placed in the intersection with traffic lights as shown in following figure. This controller node at intersection acts as adaptive control signal system.

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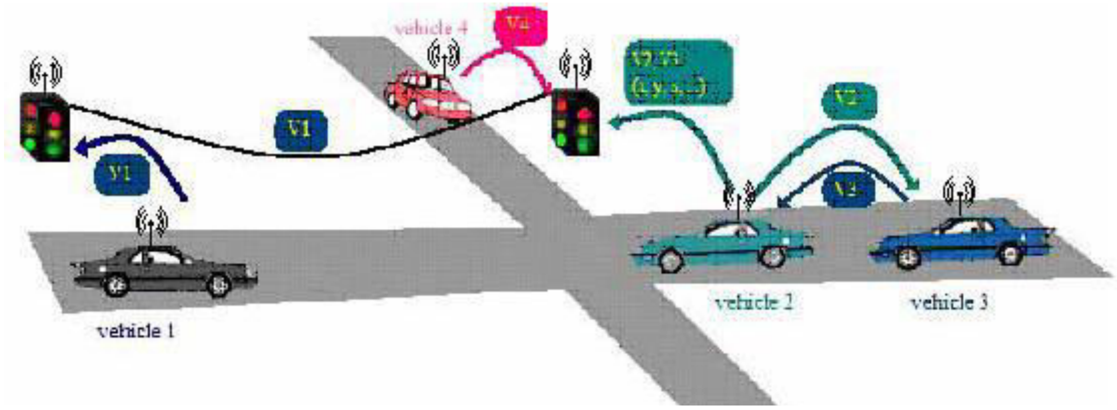

Figure 2. Traffic lights communicate with cars to adapt timings

Traffic lights communicate with cars to adapt timings In [5] and [6] two adaptive traffic light systems based on wireless between vehicles and fixed controller nodes deployed at intersections are designed and developed. These systems improve traffic fluency, reduce the waiting time of vehicles at intersections and help to avoid collisions. The e-NOTIFY [7] system was designed for

Automated accident detection, which sends the data to the Emergencies Center and assistance of road accidents using the capabilities offered by vehicular communication technologies. e-NOTIFY focus on improving post collision care with the fast and efficient management of the available emergency resources, which increases the chances of recovery and survival for those injured in traffic accidents .

III. PROPOSED SYSTEM OVERVIEW

The suggested remedy is a smart city framework with intelligent traffic lights (ITLs) installed at city intersections. These ITLs collect traffic data (such as traffic density) from passing vehicles, update citywide traffic statistics (such as congestion), and communicate those numbers to passing vehicles so they can choose a route that is free of congestion. Additionally, ITLs will deliver cautionary messages to motorists in the event of an accident to prevent additional collisions. As [4], our proposal manages traffic information seeking to avoid accidents, although the information here is gathered from the vehicles themselves so no further infrastructure is needed. Also our proposal could easily be used by the traffic information Centre to design an adaptive traffic light system similar to [5] and [6].

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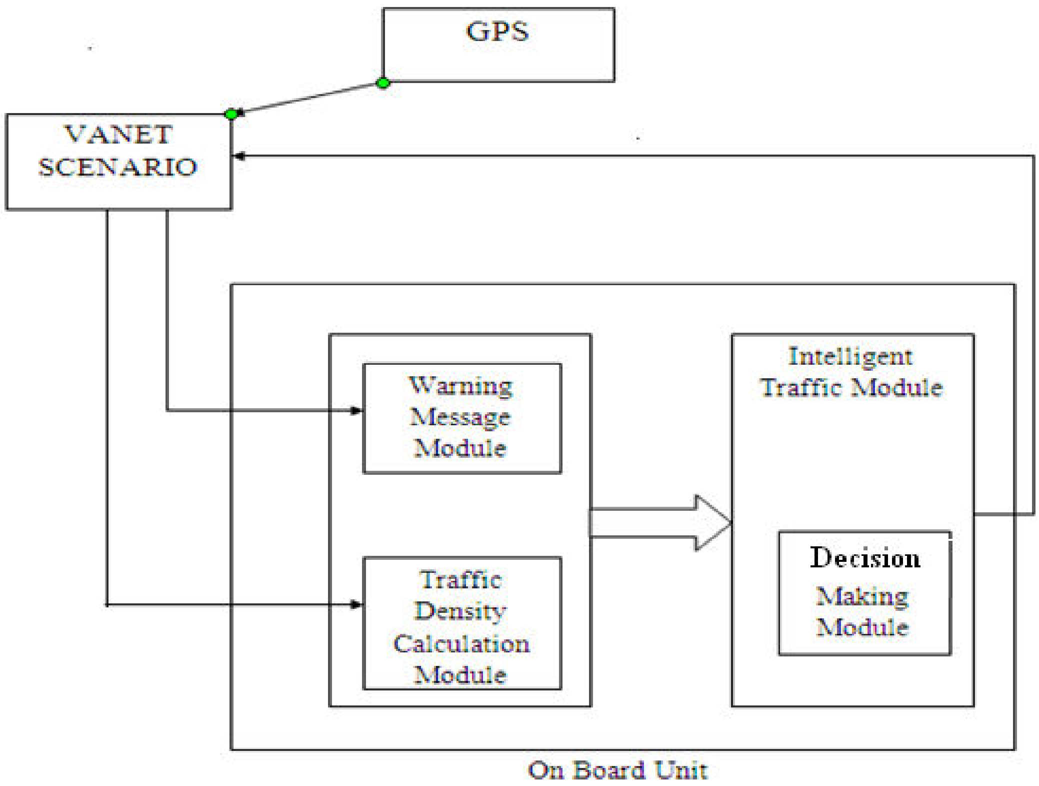

Figure 3. System Architecture

Vehicles are assumed to have a global positioning system (GPS) device, a driving assistance device, or an on-board unit, as well as complete map information of the city, including the locations of the ITLs, to make it simple for drivers to choose the ITL that is closest to them. Every two seconds, each vehicle will transmit a greeting message, from which we can determine the precise location of every other vehicle on the road. The warning message module will provide the data for the traffic density computation module. The traffic density of each road is then determined using the calculations done in this module. The decision making module will take the data from first two module and the appropriate decision is made here and the best congestion free path in provided to the particular vehicle whenever it come in the given ITL coverage range. Every ad-hoc node set on the scenario was configured with Ad hoc On-Demand Distance Vector (AODV) [8] routing protocol. AODV was selected because of its simplicity. Though it is well known that AODV is not suitable as routing protocol for general use in VANETs, there are some applications which work well with AODV with respect to situation. The main advantage of AODV is its simplicity and widespread use. The major drawback of AODV is that it needs end to end paths for data forwarding, which is difficult to handle because in VANETs end-to-end paths does not exists long due to high speeds of vehicles. Other routing protocols that use other strategies like greedy forwarding and geographical routing. For instance, GPSR (Greedy Perimeter Stateless Routing) [8] and GOSR (Geographical Opportunistic Source Routing) [9] shows good performance in VANETs, but has greater complexity and increased delay. Other protocols like Destination Sequence Distance Vector (DSDV) and Dynamic Source
Routing (DSR) are also there. AODV shows higher throughput than the DSR and DSDV. The AODV can handle more routing packets as compared to DSR because the AODV avoids loop and
Freshness of routes while DSR uses stale routes. The AODV has higher throughput than other two routing protocols at high mobility [10]. The applications that require a short delay, AODV can Perform well. Our proposed work consists of smart city services where vehicles send warning messages (traffic density) to the closest ITL, so it is not necessary to establish long paths that last long. Instead, vehicles need to establish very short paths (1- 2 hops) to the nearest ITL. Besides, the communication must be quick since vehicles move fast and remain in coverage range of one ITL for very short time. Thus, AODV is best suited for our purposed scheme.

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IV. CONCLUSION

This essay compares various efforts on the Intelligent Traffic System (ITS) and suggests a new approach. The main goal of the suggested plan is to construct a smart city framework for VANET made up of Intelligent Traffic Lights (ITLs), which can provide alerts and traffic data. The intention is for the driver assistance system to make wise travel decisions and so avoid congested roads, which reduces travel time and pollution while also improving the drivers' quality of life. Discussion and comparison of various routing methods have been place. According to what we suggested, AODV is ideal.scheme.

REFERENCES

[1] Marc Emmelmann, Bernd Bochow, C. Christopher Kellum, ―Vehicular networking: Automotive application and bey ond‖, John Wiley and Sons, 2010.
[2] Ferrari, G., Busanelli, S., Lotti, N., Kap lan, Y., ―Cross- Network Information Dissemination in VANETs‖, 11th International Conference on ITS Telecommunications, pp. 351-356, 2011.
[3] Junping, Z., Fei-Yue, W., Kunfeng, W., Wei-Hua, L.,Xin, X., Cheng, C., ―Data-Driven Intelligent TransportationSy stems: Survey ‖, IEEE Transactions on Intelligent Transportation Systems, Vol. 12, Issue 4, pp. 1624-1639, 2011.
[4] Maslekar, N., Boussedjra, M., Mouzna, J., Labiod, H.,―VANET based Adap tive Traffic Signal Control‖, IEEE 73rd Vehicular Technology Conference (VTC Spring), pp. 1-5, 011.
[5] Gradinescu, V., Gorgorin, C., Diaconescu, R., Cristea, V., Iftode, L., ―Adap tive Traffic Light Using Car-to-Car communications‖, IEEE 65th Vehicular Technology Conference (VTC Spring), pp. 21-25, 2007.
[6] Fogue, M., Garrido, P., Martinez, F. J., Cano, J. C., Calafate, C. T., M anzoni, P., Sanchez, M ., ―Prototypal ping an Automatic Notification Scheme for Traffic Accidents in Vehicular Networks‖, Wireless Day s (WD) IFIP, p p . 1-5, 2011.
[7] Perkins, C.E., Belding-Roy er, E. M ., Das, S.R., ―Ad hoc on-demand distance vector (AODV) routing‖, IEEE Personal Communications, pp.16-28, 2001.
[8] Karp, B., Kung, H. T., ―GPSR: Greedy Perimeter Stateless Routing for wireless Networks‖, MobiCom 2000.
[9] Md. Shohidul Islam, Md. Naim Hider ―An Extensive Comparison among DSDV, DSR and AODV Protocols in MANET‖, International Journal of Comp uter Applications (0975 – 8887) Volume 15– No.2, February 2011.

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