International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 4 Issue 1, December 2019 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Implementing Secured and Comport Transportation using Vehicular Ad-Hoc Network for Realistic City Scenario

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ABSTRACT

VANET is the largest wireless communications research area. VANETs of rapidly moving vehicles can be inefficient or unreliable. With the passing of time, VANET technology advances via inter-vehicle interaction, but many problems need to be resolved in order to strengthen the network. This paper simulates road traffic simulators in a way that ensures safe communication between different types vehicles and prevents traffic based congestion in the cities of India.

KEYWORDS: *Simulation, Road Safety, Vehicular Communication, India Traffic Condition, Congestion*

How to cite this paper: Ms. Pooja Deshpande | Mrs. Vrushali Uttarwar | Ms. Ekta Choudhari "Implementing Secured and Comport Transportation using Vehicular Ad-Hoc Network for Realistic City Scenario" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-4 | Issue-1, December 2019, pp.978-981, URL: www.ijtsrd.com/papers/ijtsrd29771.pdf

IJTSRD29771

I. INRODUCTION

The car communication systems have recently attracted a great deal of attention, driven mainly by a growing interest in ITS [1, 2]. In many parts of the world, the implementation of security information such as speed limits and road conditions is used, but more work is needed. Information relating to traffic may be exchanged through V2V (e.g. regular balancing) communications so that drivers are better informed about the conditions surrounding the transport network. Radios, access points, bandwidth, standards and so on, and devices such as parking assistant and adaptive cruise monitoring [1] are possible for vehicles and road infrastructure. Such embedded sensors, however, have a restricted area of operation, which could be extended by wirelessly equipping the cars. In many applications these systems are useful with emergency warning systems, vehicle traffic control as well as travel supports. Every year, hundreds of millions are wounded or handicapped. More than 1.256 million victims every year in our country i.e. India, deaths in cars constitute the biggest death cause in humans aged between 1 and 34 years [3]. India is losing 20 billion dollars from accidents by highways. The protection of road traffic is still a major concern in our daily lives for children's, pedestrians and elderly peoples who are among the most defenseless to road users. The main solution to crash avoidance is to improve the drivers ' awareness of the environment through a proactive approach. In addition, a variety of ITSs were planned to use vehicle traffic data by means of a system of communication. Once the safety information has been gathered and circulated, alert drives about the danger before actually dealing with it significantly reduce the number of incidents. The first move to this has been to include an impressive number of sensors (these systems are designed to address critical issues such as passenger safety and traffic congestion through the implementation of information and communication technologies in transport infrastructure and vehicles). This potential network will exploit valuable information, possibly affecting driving behavior and human life[2]. To order to define a complete set of Wireless Access Protocols to Vehicle Environments (WAVE) protocols, it strengthened work on car connectivity and the IEEE 802.11p task group was set up. Specifically, the VANET consists of (1) on-board (BOU) [2,3] vehicle-based units and (2) roadway-side vehicle (RSU)[2,3] road-side units, which allow for vehicle – vehicle (V2V) communication and for vehicle – infrastructure (V2I) vehicle-to-car (V2I) communications. Wireless Local Area Networks (wireless network) have become increasingly popular with Wi-Fi techiques, based on IEEE 802.11. It is built on the top of autonome, Vehicle Adhoc Networks (VANET) [2,3,4,5], a network consisting of wireless cellular vehicles. India, with a population of 1.220,200,000 (1.22 billion). India, worldwide the second largest country in

terms of transport. The transportation of vehicles is most important means of transport in India.

II. ARCHITECTURE OF VANET

Vehicle Adoc Network (VANET) has been one of wireless communication's most important research areas VANET's are expected to allow the plenty of communications based applications containing numerous in - car infotainment systems and roadside security services, thanks to the virtue of vehicle – by – vehicle as well as vehicle-by-infrastructure connectivity. VANET is an MANET subset [2, 15] in which nodes display the motion of vehicles at a high speed. That vehicle communicates with neighboring vehicles in a highly dynamic adhoc networking environment via wireless networks. In the presence of RSUs, the ride-drive-through Internet access (i.e.) may be made possible for road and traffic conditions [15] (e.g. sharply turning heads) to be wide cast to driver. Infotainment services can also be easily provided via V2I communications (for example, ads, parking and automated routing).

It would likely affect the conduct of the pilot, and strongly s upport the use of simulation by the techniques suggested in the broadcasting structure of VANET to IVC [2].

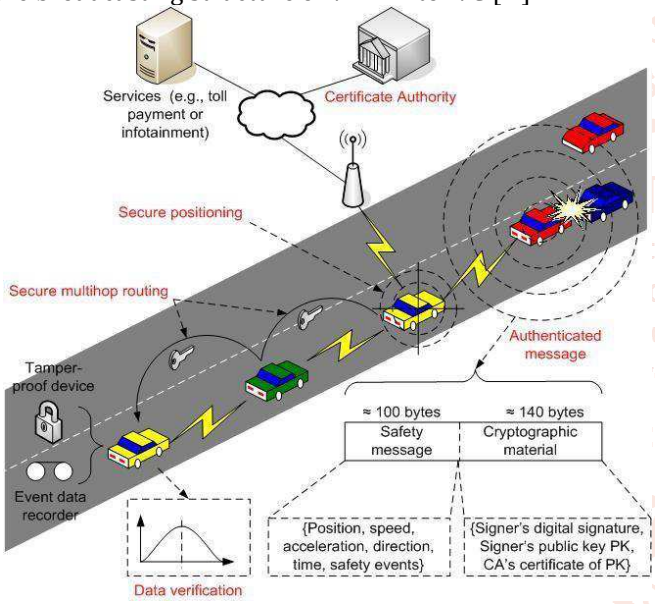
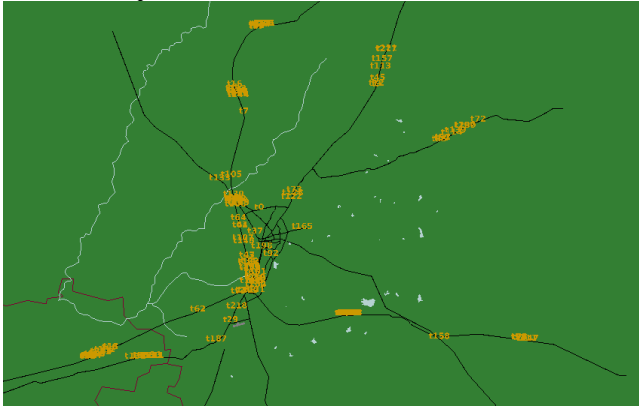


Figure1. An illustration of a VANET

Figure 1 offers an example of a working VANET architecture. Vehicles networks have many parallels with MANETs in terms of flexibility, autonomy and low bandwidth. In the event of an emergency, event-driven communications in the danger zone (or zone of relevance, ZOR) can be created and transmitted on the vehicles [17]. Communications solutions unique to VANET are important. Adhoc vehicle network is a new technology for the future on the highway. In addition, with RSU sin place the communications service area can be



big. In addition, some obstacles such as road lights, buildings and trees may be encountered in vehicles that lead to poor quality of the channel and connectivity. Nevertheless, as in MANETs, vehicle network topology is highly dynamic because of its rapid motion and the topology of road systems is often constrained. The topology is very dynamic. V2V communications can also support peer to peer applications such as information sharing and gaming. Data from mote data servers can be supplied by the Internet backbone to a car and vice versa. Consequently, protocols for conventional MANETs do not deliver consistent, high outputs and low latency in VANETs. Information about traffic shared via V2V (e.g., regular beaconing) communications, so that drivers are better aware of the traffic condition in the vicinity.

III. IMPLEMENTATION AND RESULT

In the same field of research, many systems may be modeled. Network simulation is often used for modeling computer network architecture in the real environment long before it is implemented. Actually SUMO [2, 23] is a discreet network event simulator for open-source applications. Each vehicle is specifically modeled, has its own route and travels independently through the network. It is pure microscopic. In such circumstances the main tool in VANET research has now become computer simulation [11]. Simulation can be used to compare the performance of different network configurations to allow performance problems to be identified and solved without the need for expensive field testing. Traffic simulator can give the real example of the open source, multi-modal and microscopic traffic simulation "simulation of urban mobility" or "SUMO,"[23] as short. The vehicle world is extremely complex and theoretical models must not only take into account the network but also the characteristics of the vehicles and the behavior. The simulation allows a wide range of traffic management issues to be addressed. Nonetheless, these models are built independent of SUMO, only for the design of the particular simulation module SUMO provides the required structure. It can either be used for modeling computer networks or for simulating network queues. It allows you to simulate the movement through a certain road network of a given traffic demand consisting of single vehicles.

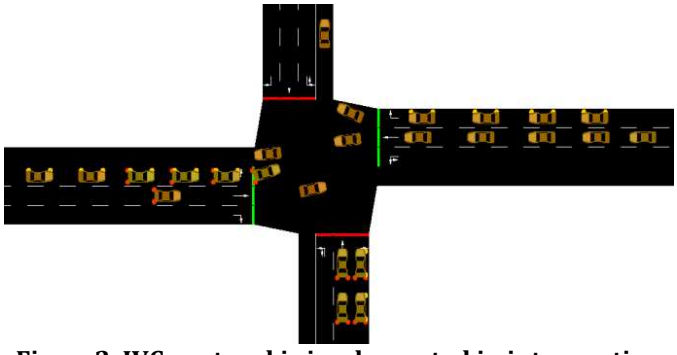


Figure2. IVC protocol is implemented in inter section of Road to prevent from an accidents

Figure3: Broad Casting of Vehicles in Amravati City (India)

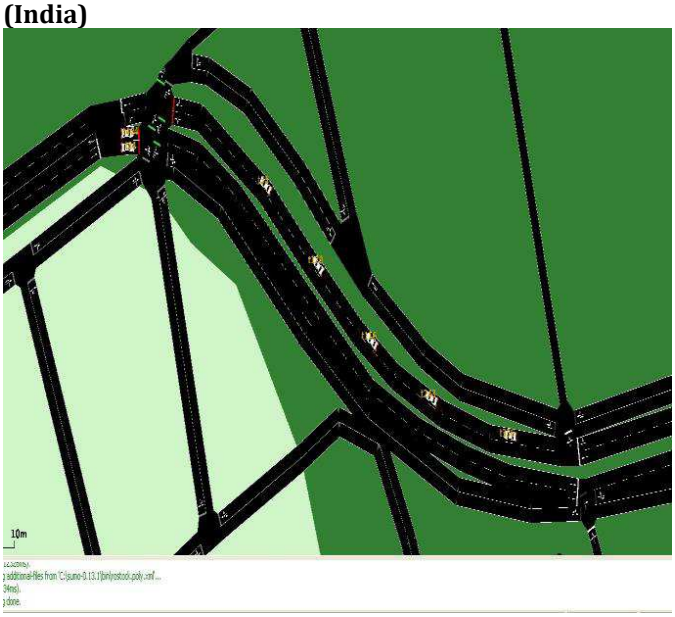


Figure4: Amravati City (India)

IV. APPLICATIONS

Potential applications can be divided in two main categories within a vehicle context, namely.

A. Road safety

Security systems are a true way of reducing the number of accidents considerably, primarily in order to avoid accidents. In conjunction with the V2V-assisted adaptive cruise control, the issue of vehicle accidents can be minimized because of a human error.

B. Traffic monitoring and management

Traffic control and management are important if road capacities are to be maximized and traffic congestion avoided [6,8]. Conversely, drivers can improve their driving routes with knowledge of traffic conditions, thereby reducing the issue of traffic congestion (highway). Scheduling of traffic lights can make intersections safer for drivers. The handling of a lane changeover and/or speed shift ensures that vehicles can go together closely but safe [6,9]. The crossing in the city street test of intersections is challenging and dangerous. Allowing a smooth traffic flow will increase the traffic and reduce travel times considerably. To improve road safety is by platooning vehicles. Fuel savings may also benefit from a decreased smooth drag as the vehicle's progress (i.e. less than 2 meters).

V. CONCLUSION

The new vehicle networking model, including safety, convenience and comfort, can be seen as promising for a wide range of new on-road applications. VANETs can interact with V2V and V2I. Car communications are an essential part of a future smart transport system. Computer simulations have been placed as the leading approach for V2X interaction research by the difficulty of theoretical models and the expense of actual hardware testing. Next, the variables that vary from the modeling of a classic MANET to the simulation of a VANET. The simulation architecture relies on state of the art simulators from both realms, thereby integrating well-known models for micro-simulation of road traffic. This paper aims to promote the first step of a vehicle interaction analysis by providing meaningful data on the many current VANET simulators. When cars are an integral part of our daily life, the market for car interconnections and in-vehicle computing is on the rise. A vehicular network used with a different profile by applications, such as traffic administration and protection of passengers, designed primarily for safety reasons.

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