IJCSC International Journal of Computer Science & Communication Vol. 1, No. 1, January-June 2010, pp. 211-213

Design Approach Towards Improving the Overall Quality of Driving Experience in VANET

Suresh Kurumbanshi[1], Avichal Kapur[2] & P.R.Bajaj[3]

[1]Assistant Professor, NYSSCER, Wanadongri
[2]Dean(QA) & Advisor, NYSS, Nagpur
[3]Professor & Senior Member IEEE, GHRCE
[1]sureshkurumbanshi@yahoo.com, [2]avichal.kapur@yahoo.in, [3]preetib123@yahoo.com

ABSTRACT

In this project, we will design traffic simulator which broadcast messages from server to all vehicles within the zone of reference. This system will collect information such as alerts, traffic updates such as position, ID, direction & broadcast this information to all vehicles but intelligence will be up to the driver. Traffic congestion is a major problem worldwide as the number of cars on the roads are increasing at a higher rate than road capacity. The main aim of this project is to improve the overall Quality of Driving Experience.

Keywords: Adhoc Network,Dedicated Short Range Communication, Vehicle Operation Director.

1. INTRODUCTION

In our project, server will be at the zone of reference.vehicles will be aproaching towards zone of reference form north, south (ie leading to north, leading to south). All vehicles periodically broadcast hello messages with their coordinates, speed and direction. In addition vehicles exchange traffic incident messages & congestion probe messages. The user can specify the message type, priority, the geographic region within which it may be rebroadcast & the lifetime. Dynamic data will be populate & density from north, south & west will be studied after every 1 second ping.

2.4 Ghz frequency is the standardized for commercial use where 16 channels are used for low power channels (Channel number 11-15) & high power channel (Channel numbers 21,22..26)

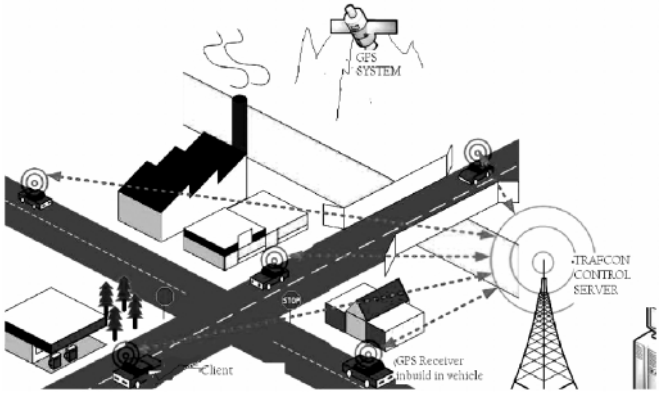

Fig 1: Proposed Architecture

A hybrid simulator for vehicular network currently supports vehicle to vehicle communication over an 802. 11a interface that has been modified to suit the 10 MHz channel bandwidth & 5.9Ghz center frequency of the DSRC specification.

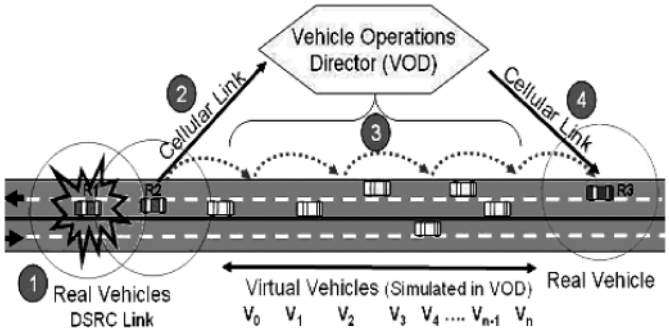

Fig 2: Creation of Real Vehicle & Virtual Vehicles

The leading vehicle on the left, *R*1, has experienced a traffic incident which triggers it to broadcast an alert event message. As there is no vehicle is within range of *R*2, the rebroadcast message over the DSRC interface is not received by any real vehicles.

*R*2 also forwards the message over the cellular interface to a remote server. The remote server, also known as the Vehicle Operations Director (VOD) simulates all simulated vehicles in the vicinity and updates the network state with the triggered event.

2. PRESENT WORK

2.1 BMW Studies Car-to-Car Communication

U.S. automakers have agreed upon a standardized frequency of 5.9 GHz. Incidentally, 5.9 GHz is the same

frequency European cars use. The car is going to act like a data-collection probe. The car's location anonymously will be transmitted to other cars and to an infrastructure, and this data will be used to identify traffic flow, slippery conditions, bottlenecks and more.

2.2 Advanced Monitoring & Control

Scotland Yard recently released a study demonstrating that wireless video surveillance helps solve 70 percent of U.K. murders. They concluded that video surveillance is as vital for forensic evidence as DNA or fingerprints. Motorola's Duo solution is a two radio meshed network consisting of a 2.4 GHz WiFi radio (802.11 b/g) and either a 4.9, 5.4 or 5.8 GHz (802.11a) radio. The initial pilot will allow law enforcement officers to access cameras utilizing a secure 4.9 GHz data network and will eventually allow public access to the network in the 2.4 GHz band. The benefits of traditional video surveillance are enhanced with IP-based wireless network solutions, because they eliminate the challenge of having camera placement dictated by wire or cable accessibility. In this case, real-time transmission of video from city parks enables a real-time response.

2.3 802.11p

An IEEE working group that is extending the 802.11 standard to automobiles.

The IEEE 802.11 and IEEE 802.16 standards are referred to as WiFi and WiMAX respectively. WiMAX and WiFi networks use IP-based technologies to provide connection services to the Internet. Wi Fi-Operates in license-exempt spectrum. Current solutions use the 2.4 and 5 GHz bands & Wi Max-Operates in licensed spectrum. Current soul tions use the 2.3, 2.5, and 3.5 GHz bands.

3. RESULT AND DISCUSSION

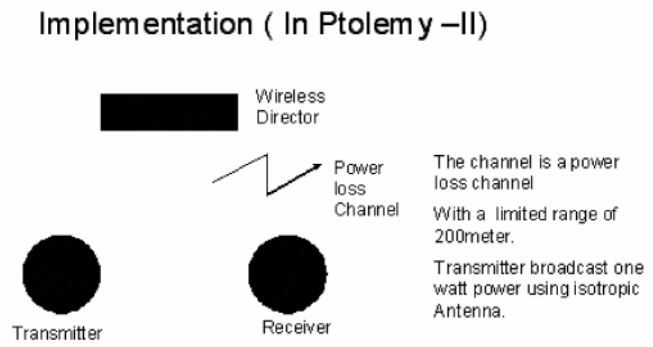

Fig 3: (a) Broadcasting one Watt of Power

When the receiver is in Range,power depends upon the distance to the transmitter according to inverse law

$$P_r = P_t G_t . G_r \lambda^2 / (4 \pi r)^2$$

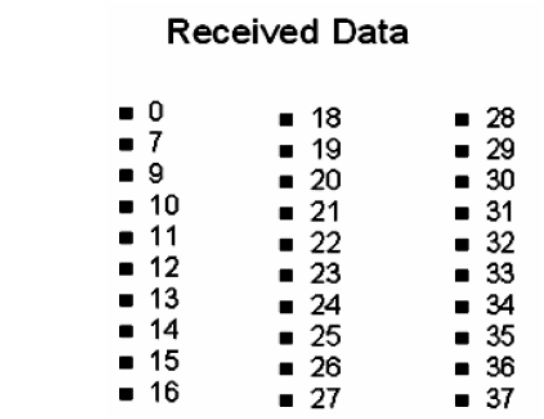

Fig 3: (b) Received Data

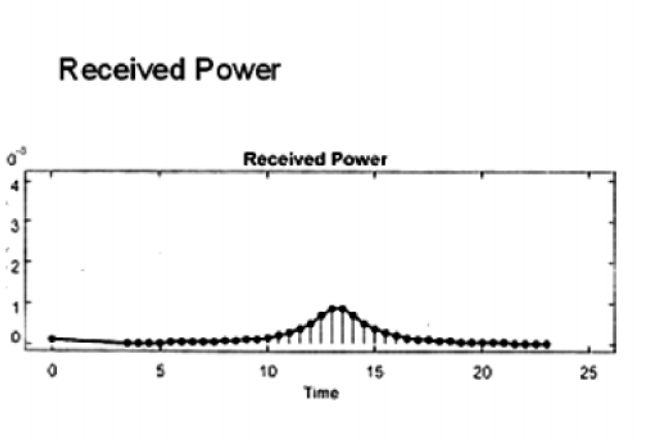

Fig 3: (c) Received Data

4. CONCLUSION

Traffic congestion is already a major problem worldwide and we can not control congestion as it is not in our hand. In our present work we have broadcasted one watt of power using wireless director within 200 meter. In future work, we will work on traffic simulator which collects information such as alerts, traffic updates & broadcast this information to all vehicles but intelligence is up to the driver.

REFERENCES

[1] "Car 2 Car Communication Consortium" http://www.car-to-car.org.

[2] "The Dedicated Short Range Comms Working Group", http://grouper.ieee.org/groups/scc32/dsrc/index.html.

[3] "The IEEE802.11p Task Group", http://grouper.ieee.org groups/802/11/Reports/tgp update.htm.

[4] Vehicle Safety Communications Consortium, "Vehicle Safety Communications Project Task 3 Final Report: Identify Intelligent Vehicle Safety Applications Enabled by DSRC", tech. rep., National Highway Traffic Safety Administration, March 2005.

[5] "Networks on Wheels-NOW", http://www.network-on-wheels.de.

[6] The PReVENT Project. http://www.prevent-ip.org/.

[7] "Intelligent Transportation Systems, U.S. Department of Transportation", http://www.its.dot.gov.

[8] U. Lee, B. Zhou, M. Gerla, E. Magistretti, P. Bellavista, and A. Corradi, "Mobeyes: Smart Mobs for Urban Monitoring with a Vehicular Sensor Network", *IEEE Wireless Communications*, **13,** no. 5, pp. 52-57, 2006.

[9] U. Lee, J.-S. Park, E. Amir, and M. Gerla, "FleaNet: A Virtual Market Place on Vehicular Networks", in In Proc. Of Mobiquitous'06, (San Jose, CA, USA), July 2006.

[10] M. Caliskan, D. Graupner, and M. Mauve, "Decentralized Discovery of Free Parking Places", in VANET'06, (LosAngeles, CA, USA), pp. 30-39, Sept. 2006.

[11] T. Lomax and D. Schrank, "Urban Mobility Study", tech. rep., Texas Transportation Institute, 2005.