

Wireless Sensor Network Based Road Traffic Monitoring System

K. Renuka¹ and Dr. R.Muralidharan²

¹ Research Scholar, Department of Computer Science, Rathinam College of Arts and Science, Eachanari, Coimbatore, Tamil Nadu, India

² Principal - Academic, Rathinam College of Arts and Science, Eachanari, Coimbatore, Tamil Nadu, India

Abstract: Increasing traffic and busier roads force to develop intelligent traffic monitoring system which can play a vital role in road traffic management. Through which the need for intelligent traffic observation systems that can handle real time traffic data. Wireless sensor network is the method through which the hassle free and connection loss will create a safe road traffic monitoring systems. In this paper, wireless sensor network based safe road traffic monitoring system is discussed.

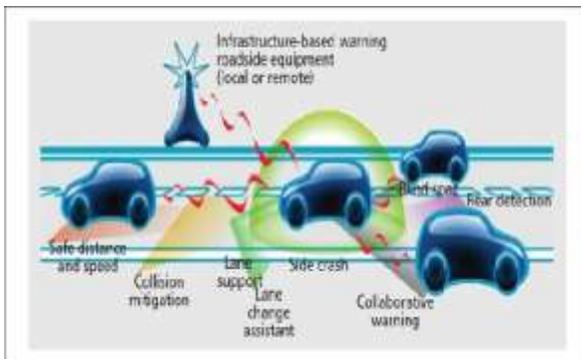
Keywords: Wireless sensor networks, Traffic information collection and processing, Intelligent Traffic System (ITS), Data Processing System (DPS), Vehicle to Vehicle Communication (V2X), Data Processing Unit (DPU).

I. INTRODUCTION

Traffic information collection is one of the critical and undeveloped parts of Intelligent Traffic System (ITS), and it is also the elementary for road plan, traffic managing and control, traffic strategy and operation of ITS and superfluous research of traffic flow[6]. The survey and analysis of traffic can help to know the traffic condition and nature of traffic problems, and to propose the resolutions; on the basis of overall and systemic survey on traffic network, the traffic change regulations can be analysed, and so as to provide the literature for traffic flow theory model and traffic prediction model and offer the basis for the implementation of information service for the subsystem of ITS[1].

II. INTELLIGENT INFRASTRUCTURE

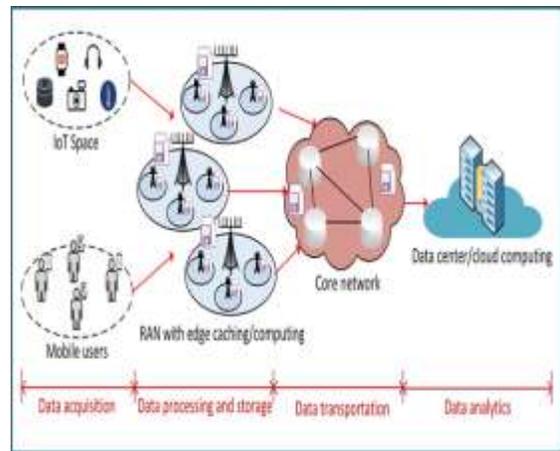
The Traffic System Management Intelligence solutions extend through a wide range of infrastructure with mobility applications based on wireless sensor network technology.



A wireless sensor network with unlimited applications are Smart cities, intelligent transport systems, automated parking spaces, as well as, advanced airport and harbour facilities are all part of our universal range

III. DESIGNED TO CONNECT INTELLIGENT INFRASTRUCTURE

The Traffic Data Technology offers modified solutions to detect, analyse and monitor vehicle traffic in real time based on the next generation for Data Processing System (DPS) [2]. In infrastructure applications, the wireless sensor network, quickly installed with a inconsequential damage in the roadway, transfers the sensed data to the Data Processing system (DPS) that processes the acknowledged information and connects it to the selected traffic regulation local systems and "cloud based" traffic management software [11].

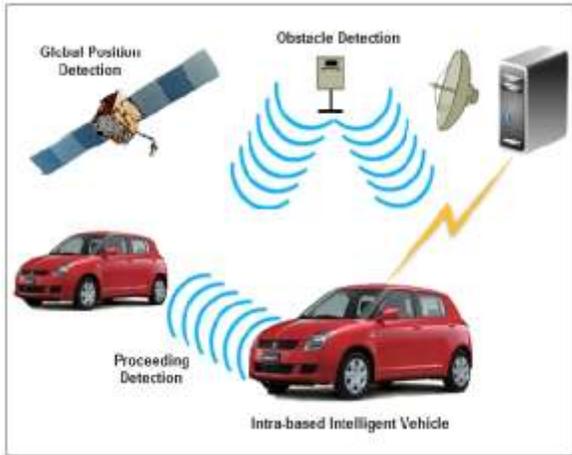


The application options of the Intelligent Infrastructure technology significantly differ conditional of the exact necessities and purposes but they can be recognized in four main action areas, urban, interurban, parking and airport.

IV. INTELLIGENT VEHICLE

The Traffic System Management Intelligent Vehicle technology is developed to spot and process interactive, appropriate and powerful data that provides ground-breaking smart solutions for a various change of aspects. As the Internet of Things is establishing its presence, now a day

compensating towards expanding the benefits of the related vehicle within the common movement services, the various sector management and the public vehicle processes field [8].

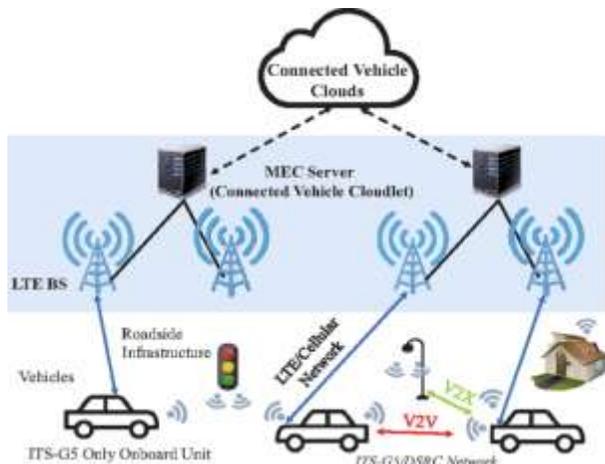


V. DESIGNED TO CONNECT INTELLIGENT VEHICLE

The Traffic System Management related with Vehicle Data technology agrees for a excessive variety of flexibility services that create vehicle interconnectivity based on the newly designed Data Processing Unit (DPU).

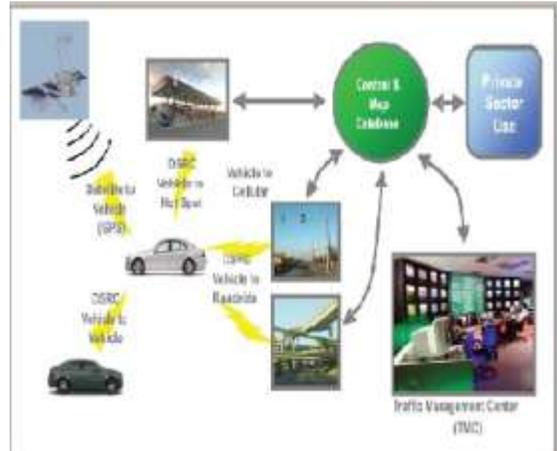
The benefit of ground-breaking proficiency in the traffic system management, the connected vehicle field by present innovative to use of technological devices to transmit over long distances services merging recognized Geolocation applications with information cultured local data processing solutions.

Traffic shaping combined the resources by growing individuality and tractability of provision, saving energy over recognition and intensive care of powerful designs and depressing user expenses done safeguarding contact to vehicles for tiny usage, DPU simplifies the report of the vehicle information with internal and external systems.



VI. VEHICLE TO VEHICLE COMMUNICATION BETWEEN INFRASTRUCTURE AND VEHICLE

The progressive connection of the next generation Data Processing System through the newly designed Data Processing Unit allows for actual bidirectional data communication among the vehicle and its external environment, consenting for a excessive series of V2X (Vehicle to Vehicle Communication) flexibility applications that connect infrastructure and vehicle [11].



Through a global series of converted applications, the new combined key consumes planned to help the protection industry, the automotive world and the fleet, car rental and shared vehicle operators, maximising efficiency, lowering costs and offering unique travel experiences[6].

The application of community movement strategies, along with the overview of following peer group services that agree for foremost control data communication for the general trend.



VII. A WIRELESS SENSOR NETWORK WITH UNLIMITED APPLICATIONS

Wireless sensor networks may include of several different types of sensors like low sampling rate, seismic, magnetic, thermal, visual, infrared, radar, and acoustic, which are clever to monitor a wide range of ambient situations [5].

Sensor nodes are used for constant sensing, event ID, event detection & local control of actuators. The applications of wireless sensor network mainly include health, military, environmental, home & other commercial areas[4]. Traffic System management more accurate for open and versatile applications that allow for very quick installation and low maintenance costs.

VIII. A VEHICLE ON BOARD UNIT THAT OPENS NEW HORIZONS

The traffic system management security services and versatile sensor monitoring, resolutions that permit innovative remote and community vehicle applications [13]. From public and taskforce movement services, to sophisticated public vehicle telematics and next generation Vehicle to Everything – V2X – communications.

IX. CONCLUSIONS

Nowadays, road traffic is an important problem in a lot of industrialized countries[9]. This fact makes essential to build a road and transport system characterized by high dynamicity and low congestion and incidents. This paper focused on analysing and defining a system to measure and classify road traffic based on WSN of which sensor nodes integrate magnetic sensors with Intelligent infrastructure and Intelligent vehicle network communication with traffic system management. The main conclusion is that WSNs provide an excellent information for Traffic System Management in infrastructure for the remote monitoring, tracking and control of internal and external environments, industrial plants, and other applications [7]. Traffic System management make urban infrastructure more intelligent, efficient and sustainable. Through the digitalization of confirmed transportation solutions, the line technology and an equipment depot maintenance sophisticated solution.

REFERENCES

- [1]. F. Martínez, A.B. García, I. Corredor, L. López, V. Hernández and A. Dasilva, "QoS in Wireless Sensor Network: Survey and Approach". IEEE/ACM EATIS, May, 2007.
- [2]. He, W., Yang, S.H., and Yang, L.: NMCA: Neighbour-aware multiple-path clustering aggregation in wireless sensor networks, IEEE International Conference on Networking, Sensing and Control, Évry, France, 10–12 Apr (2013)
- [3]. Yang, L., Yang, S.H., and Plotnick, L.: How the internet of things technology enhanced emergency response operations. Technol. Forecast. Soc. Change **80**(9), 1854–1867 (2013)
- [4]. Daniel-Ioan CURIAC, Constantin VOLOSENCU. "Urban Traffic Control System Architecture Based on Wireless SensorActuator Networks". Proceedings of the 2nd International Conference on Manufacturing Engineering, Quality and Production Systems. (MEQAPS'10). Constantza, Romania, September 3-5, 2010.
- [5]. Binbin Zhou, Jiannong Cao, Hejun Wu. "Adaptive Traffic Light Control of Multiple Intersections in WSN-Based ITS". Vehicular Technology Conference (VTC Spring), 2011 IEEE 73rd.
- [6]. Tubaishat, M., Zhuang, P., Qi, Q. and Shang, Y., "Wireless sensor networks in intelligent transportation systems", Wireless Communications and Mobile Computing, 9:287–302, 2009.
- [7]. J. Zhou, C. L. P. Chen, and L. Chen, "A small-scale traffic monitoring system in urban wireless sensor networks," in Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics (SMC '13), pp. 4929–4934, October 2013.
- [8]. Advanced Mobility Data Technology for Intelligent Traffic Management and Connected Vehicle Applications #IoT#DataAnalytics #IntelligentData#SmartVehicle
- [9]. Hong Kong Government Intelligent Transport System (ITS) [(accessed on 14 April 2015)]. Available online: <http://www.roadtraffic-technology.com/projects/hong-kong/>
- [10]. Sireesha E., Rakesh D. Intelligent traffic light system to prioritized emergency purpose vehicles based on wireless sensor network. Int. J. Res. Stud. Sci. Eng. Technol. 2014; 1:24–27.
- [11]. Available online: <https://sensefields.com>
- [12]. Google Database.
- [13]. Romano Fantacci and Francesco Chiti. "Urban Microclimate and Traffic Monitoring with Mobile Wireless Sensor Networks". Book chapter: Wireless Sensor Networks: Application-Centric Design, Geoff V Merrett and Yen Kheng Tan (Ed.), InTech. (2010).