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Intelligent Based Traffic Management System

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ABSTRACT

This paper presents an intelligent based traffic management system to pass emergency vehicles smoothly. Currently, number of vehicles has been increased and traditional systems of traffic controlling couldn't be able to meet the needs that cause to emergence of Intelligent Traffic Controlling Systems. Each individual vehicle is equipped with special RFID tag, which makes it impossible to remove or destroy. We use RFID reader for read the RFID tags attached to the vehicle. It counts number of vehicles that passes on a particular path during a specified duration. It also determines the network congestion, and hence the green light duration for that path. If the RFID-tag-read belongs to the stolen vehicle, then a RTO update the id on database. Also, when an ambulance is approaching the junction, it will communicate to the traffic controller in the junction to turn on the green light.

Keywords—Arduino mega 2560, RFID tag, RFID reader, wi-fi module.

I. INTRODUCTION

Indian traffic is nongame based and chaotic. It needs a traffic control solutions, which are different from the developed Countries. India is a fast growing economy. It is seeing terrible road congestion problems in its cities. Infrastructure growth is slow as compared to the growth in number of vehicles, due to space and cost constraints. With globalization and the need for mobility fueling traffic growth all over the world, the problem of congestion on highways and in cities is becoming more and more acute. Intelligent traffic management systems are helping people reach their destinations quickly and safely while at the same keeping traffic's environmental impacts in check. The goal of intelligent traffic management systems is to achieve improvements in mobility, safety and productivity of the transport system through integrated application of advanced monitoring, communication, display and control process technologies both in the vehicle and on the road. In recent years, wireless networks are widely used in the road transport as they provide more cost effective options. RFID is a wireless technology that uses radio frequency electromagnetic energy to carry information between the RFID tag and RFID reader.

II. LITERATURE SURVEY

Prithvinath Manikonda et al. proposed an intelligent traffic management system using RFID technology. The system is capable of providing practically important traffic data which would aid in reducing the travel time for the users. Also, it can be used for other purposes like tracing of stolen cars, vehicles that evade traffic signals/tickets, toll collection or vehicle taxes [1]. Sanket Gupte et al. developed a new approach for enabling autonomous and adaptive traffic management through vehicular networks. By allowing data exchange between

vehicles about route choices, congestions and traffic alerts, a vehicle makes a decision on the best course of action. Unlike centralized schemes that provide recommendations, our VANET-based Autonomous Management (VAM) approach factors in the destination and routes of nearby vehicles in deciding on whether rerouting is advisable [2]. Suresh Sharma et al. described a RFID technique deals with multivehicle, multilane, multi road junction areas. It provides an efficient time management scheme, in which, a dynamic time schedule is worked out in real time for the passage of each traffic column. This paper gives efficient and cheap traffic control. This work is that it does not discuss what methods are used for communication between the emergency vehicle and the traffic signal controller [3]. Ayush K.R. Mittal et al. proposed a 'green wave' is the synchronization of the green phase of traffic signals. With a 'green wave' setup, a vehicle passing through a green signal will continue to receive green signals as it travels down the road. In addition to the green wave path, the system will track a stolen vehicle when it passes through a traffic light. The biggest advantage of the system is that GPS inside the vehicle does not require additional power [4]. Anurag Kanungo et al. developed the method to use live video feed from the cameras at traffic junctions for real time traffic density calculation using video and image processing. It also focuses on the algorithm for switching the traffic lights according to vehicle density on road, thereby aiming at reducing the traffic congestion on roads which will help lower the number of accidents. In turn it will provide safe transit to people and reduce fuel consumption and waiting time. It will also provide significant data which will help in future road planning and analysis [5]. Amit Bhat et al. this system proposed in this work operates on the principle that "At any instant of time, no vehicle must be allowed to wait for more time than the average vehicle waiting time, at that instant". Also, it accomplishes prioritizing of vehicles such as ambulances and detection of unprecedented events such as road accidents and reduces average waiting time. The proposed system is highly adaptive in real time and provides automatic road block detection. It does not include stolen vehicle detection method [6]. Rajeshwari Sundar et al. proposed an intelligent traffic control system to pass emergency vehicles smoothly. Each individual vehicle is equipped with special radio frequency identification (RFID) tag (placed at a strategic location), which makes it impossible to remove or destroy. It also determines the network congestion, and hence the green light duration for that path [7]. M.Yogavalli et al. proposed a system which detects stop line violation during red light running and to capture the invalid license, Road Tax, FC, insurance & chassis of a vehicle by using Active Radio-Frequency Identification (RFID), Global System for Mobile communication (GSM) and Programmable Interface Controller (PIC). This system consists of vehicle unit, traffic junction and Road Traffic Officer (RTO) unit [8]. Tejashri Gadekar et al. proposed implementation of intelligent traffic control for congestion, Ambulance clearance, and stolen vehicle detection. This system was implemented based on present criteria that tracking three conditions in those one is heavy traffic control and another one is making a root of emergency vehicle like ambulance and VIP vehicle. In this paper we are going to implement a sensor network work which is used to detect the traffic density and also use RFID reader and tags. This module uses ZigBee modules on CC2500 [9]. V.K.G.Kalaiselvi et al. proposed communicating the siren lights of an ambulance with the traffic control sytem i.e, when an ambulance reaches near the traffic control the LED bulb of the siren and the LED bulb of the traffic control system communicates and the red light of the traffic control system turns into green signal thereby providing way to the ambulance to move on rather than by a manual method. Li-Fi technology has problems of Line Of

Sight and also the problem of receiver transmitting back to the transmitter is a big issue [10]. Anurag Saikar et al. proposed a real time traffic management system (RTMS) consisting of real time traffic monitoring system formed by small network of road side units, junction units and mobile units to dynamically decide the time of traffic lights to discourage formation of gridlock, coupled with a web based application for vehicle drivers that will derive the data from real time traffic analysis to indicate the local traffic flow and suggest the incoming vehicles to make use of alternative routes in order to further alleviate growth of the gridlock [11]

III. PROPOSED SYSTEM

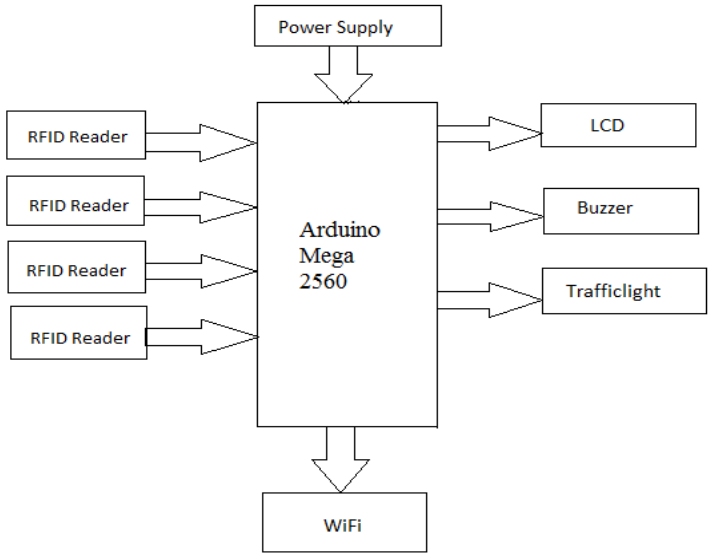

Fig 1: Block diagram

Figure 1 indicates block diagram of Intelligent Traffic Control System. It mainly consists of three parts.First part contains automatic signal control system. Here, each vehicle is equipped with an RFID tag. When it comes in the range of RFID reader, it will send the signal to the RFID reader. The RFID reader will track how many vehicles have passed through for a specific period and determine the congestion volume. Accordingly, it sets the green light duration for that path. Second part is for the emergency vehicle clearance. The buzzer will be switched ON when the vehicle is used for emergency purpose. It will make the traffic light to change to green. The third part is responsible for stolen vehicle detection. Here, when the RFID reader reads the RFID tag, it compares it to the list of stolen RFIDs. If a match is found, RTO update the id on database then put buzzer and display number.

IV. CONCLUSION

This system saved the manual effort on the part of the traffic policeman. As the entire system is automated, it requires very less human intervention. With stolen vehicle detection, the signal automatically turns to red, so that the police officer can take appropriate action if person is present at the junction. RTO will update on

webpage. Emergency vehicles like ambulance, fire trucks, need to reach their destinations at the earliest. If they spend a lot of time in traffic jams, precious lives of many people may be in danger. With emergency vehicle clearance, the traffic signal turns to green as long as the emergency vehicle is waiting in the traffic junction. The signal turns to red, only after the emergency vehicle passes through.

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