

# Implement Green Wave Traffic system and Detection of Stolen Vehicles using wireless communication

<sup>1</sup>Gullapally Siddhartha & <sup>2</sup>M. Srujana,

1. M.Tech, Pathfinder Engineering College, Warangal, Thimmapur, Hanmakonda, Telangana 506005.

2. Asst. Prof, Pathfinder Engineering College, Warangal, Thimmapur, Hanmakonda, Telangana 506005.

## ABSTRACT—

*The main aim of this paper is to develop a green wave system for emergency and stolen vehicles. In these days we know the traffic is more in the rush hours and we may strike in the traffic for a while. Where coming to the point in the case of emergency vehicles like ambulances, VIP vehicles also may wait in the signal for a long time until the red signal turns into green signal. This may also leads to loss of human lives because of not reaching their destinations in proper time. To overcome this problems we are implementing a new trend technology by categorizing the vehicles mainly into three type's namely High priority, Normal, Stolen vehicles we may also increase the category depending up on the priorities. Here we are making a setup of GREEN WAVE by identifying the which type of vehicle is in the traffic if the vehicle is a high priority one and then if the signal is in red it automatically turns into green by giving way to that vehicle here we are making an arrangement at every traffic signal for monitoring the high priority vehicle and also we are fitting a GPS at every traffic signal because in the case of stolen vehicles we want to trace them we also use the same green wave setup. Thus we implement this setup for both the emergency vehicles and stolen vehicles.*

## I. INTRODUCTION

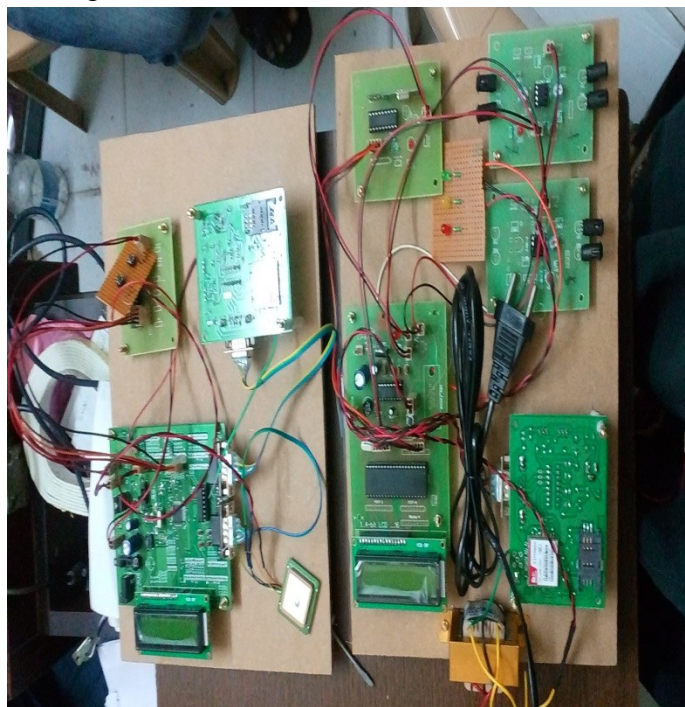
This project is very cost efficient and very useful to clear the traffic for the emergency vehicles and also for the police department to identify the stolen

vehicles quickly. Here we are using a high frequency cost efficient Radio Frequency Identification technology for detecting the emergency vehicle in the traffic. Here every vehicle is attached with a RFID Tag on the top of it in the manufacturing itself. And this Tag contains all the details of the vehicle like chaises number serial number and the priority assigned to it. In this project we are using high speed micro controller, Global Positioning System (GPS) to track the location and GSM to transmit and receive the message. In earlier days we are using the Image processing to identify the stolen vehicles by number plate recognition. But this system has so many drawbacks like bad weather conditions and noise in the image and distortion. To overcome these problems we are using RFID technology which works in any kind of weather conditions.

## II. SYSTEM STRUCTRE AND BLOCK DIAGRAM

The block diagram of the project is shown below in Fig.1. The system consists of RFID reader, RFID tag, GSM and GPS. Here we are using a high frequency RFID reader to cover a wide area of the traffic. The RFID Tag is embedded into the dash board of the vehicle. During the registration of the vehicle the RFID Tag is provided with the details of the vehicle model, unique ID number and its category is stored. The priority of the vehicle is categorised with the help of the alphabetic

character suppose for a stolen vehicle the character is 'T' and the RFID readers are fixed at every junctions on top of the road. The reader read the data of the Tags and checks the appropriate Tag with the data base present in the main system. The database of the main system is also updated with the help of GSM also.



**III. SYSTEM FEATURES**

**A. Categories** The main system consists of main three categories of vehicles they are Emergency, Stolen, and Normal. Depends up on the requirement we can change the category levels of the vehicles with the help of the Gsm module interfaced to the main system as shown in Fig.1.

**B. Priority of Vehicle** There are three priority levels for the vehicles which are defined in the main system namely high, medium, low. For the stolen vehicles the priority is set to 'M'.

**C. Update of database dynamically through SMS** The database of the main system is updated with the help of GSM module. Thus we can change the category and priority of the vehicle in few seconds only with the help of SMS.

**D. Traffic**

**Monitoring** At the traffic signal we are always monitoring the vehicles and receive data from the vehicle and the data received is checked with data present in the database and perform the operation what we have written for it.

**E. Sensing the Direction of the stolen vehicles** For the purpose of sensing the direction where the stolen vehicle is moving we employ the readers on top of the road at certain height. If the stolen vehicle comes in to the range of the reader it automatically sends a message to the police department regarding where it is present.

**IV. SYSTEM HARDWARE**

The complete system consists of the following parts

**A. RFID Readers** High frequency RFID readers are fixed above the roads at every traffic signal system in all the directions in such that it covers the entire area under the reader.

**B. RFID Transponders/Tags** Passive RFID transponders/Tags are embedded inside every vehicle at the time of manufacturing. These RFID Tags consist of unique Identification number. When the vehicle is registered and gets the license plate number, the total data of the vehicle is stored in the database along with their category either the vehicle is 'Normal' or 'Emergency' one. Then after the category may be changed from the first one to other category.

**C. Base Station** Here the base station consists of a microcontroller unit and it consists of all the information in its database. The database can be access with the help of a GSM module connected to it. By sending a SMS the database can be updated. The database can also be updated manually also. The RFID readers connected to the base station keep on tracking the Tag's unique ID number to the microcontroller unit. The micro controller unit check the category and priority of the vehicle in the data base and sends the output to the traffic signals and also to the police department if there is any stolen vehicle is detected.

**D. User**

interface for Emergency Vehicle In this we are also providing an interactive interface with the vehicle, where the driver of the emergency vehicle can update the priority of vehicle. In most of the cases, if there is no patient in the vehicle, its default priority level is set to Low. And in the case of emergency the user of the vehicle can set vehicle priority to medium or high as the requirement of the user. This is done by sending a SMS to the GSM interfaced to the database.

## ARM7

The ARM7 family includes the ARM7TDMI, ARM7TDMI-S, ARM720T, and ARM7EJ-S processors. The ARM7TDMI core is the industry's most widely used 32-bit embedded RISC microprocessor solution. Optimized for cost and power-sensitive applications, the ARM7TDMI solution provides the low power consumption, small size, and high performance needed in portable, embedded applications.

The ARM7EJ-S processor is a synthesizable core that provides all the benefits of the ARM7TDMI low power consumption, small size, and the thumb instruction set while also incorporating ARM's latest DSP extensions and enabling acceleration of java-based applications. Compatible with the ARM9™, ARM9E™, and ARM10™ families, and Strong-Arm® architecture software written for the ARM7TDMI processor is 100% binary-compatible with other members of the ARM7 family and forwards-compatible with the ARM9, ARM9E, and ARM10 families, as well as products in Intel's Strong ARM and x scale architectures. This gives designers a choice of software-compatible processors with strong price-performance points. Support for the ARM architecture today includes:

- Operating systems such as Windows CE, Linux, palm and SYMBIAN OS.

- More than 40 real-time operating systems, including qnx, Wind River's vxworks and mentor graphics' vrtx.
- Co simulation tools from leading eda vendors
- A variety of software development tools.

## RESULTS AND CONCLUSION

After the code is programmed into the controller and powered up then the RFID waits for the vehicle which come into its range and execute the code by operating the traffic lights and also indicate the stolen vehicle which comes into its range on the other hand it is also displayed on the LCD regarding the category of the vehicle. Here we are developing a conventional system for the efficient usage of the traffic and for the emergency conditions.

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