Advanced Traffic Management for Ambulance &VIP's Vehicles Using Embedded & RFID Technologies

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Abstract: Traffic management is the critical issue of the road. Traffic lights play an important role in the traffic management. The existing traffic lights follow the predetermined sequence. So these lights are called static traffic lights. These traffic lights are not capable to count the number of vehicles and the priority of the vehicles on intersection point. As a result some vehicles have to wait even there is no traffic on the other side. The vehicles like Ambulance and VIP vehicles are also stuck in traffic and waste their valuable time. The proposed system provides quality of service to Emergency vehicles and improves the accuracy of Automatic Traffic Light Violation Detection system as well as helps to trace out the stolen vehicles using RFID.

Keywords: Traffic Management, Ambulance & VIP vehicles, Valuable time, Detection System, RFID.

I. INTRODUCTION

In today's world health hazards are a major concern. Especially people in the older age group are the victims, and moreover the traffic conditions are worsening day by day, which results in traffic jams.

Many important jobs get delayed due to these traffic jams. Ambulance service is one of the major services which get affected by traffic jams. And also for VIP's it will very difficult if they are stuck in traffic. To solve this problem we have come up with the solution of "Special entry for VIP &ambulance with automatic traffic control".

The problem of traffic light control can be solved by RFID based system. With this system, we can consider the priority of different type of vehicles and also consider the density of traffic on the roads by installing RF reader on the road intersections. Radio frequency identification is a technique that uses the radio waves to identify the object uniquely. RFID is a technique that is widely used in the various application areas like medical science, commerce, security, Electronic toll collection system, access control etc.

II. BLOCK DIAGRAM

The important blocks of the block diagram are,

- Arduino Uno
- RFID tag
- RFID reader
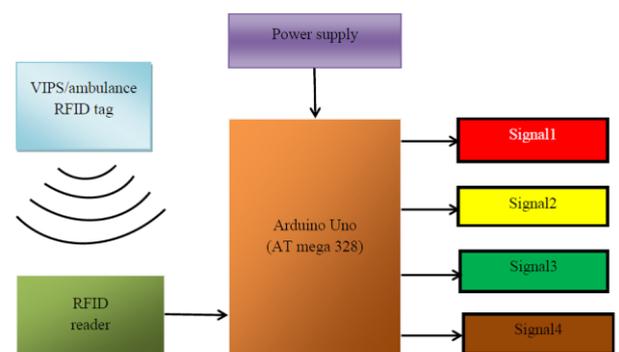- Regulated Power supply
- Signals

Fig 1.   Block Diagram

III. WORKING

Each intersection contains 4 RFID readers. The road is divided into two lanes. Each lane has its RFID reader to track the vehicles passing through it. Each intersection point has its own database to store the information regarding the vehicles that passed from it with timestamp and traffic light. Every vehicle has a RFID enabled device that stores a vehicle identification number (VIN). Every vehicle has its unique VIN number that provides the information regarding the priority of the vehicle and type of the vehicle. With the help of VIN we can uniquely identify the vehicle & its owner. In the proposed work RFID, tag will store a Vehicle Identification Number. The system category includes Ambulance, Fire Brigade vehicles and V.I.P vehicles. These vehicles have the highest priority.

When Ever the vehicles having RFID tag passes on the reader, the reader identifies and send the unique code to the microcontroller. It then put on the red signal for all the 4signals for some while, because some vehicles will be still in canter of road. After few seconds the signal where the RIFD tag is identified will turn to Green. After the vehicle passes the signal all signals will get back to normal state.
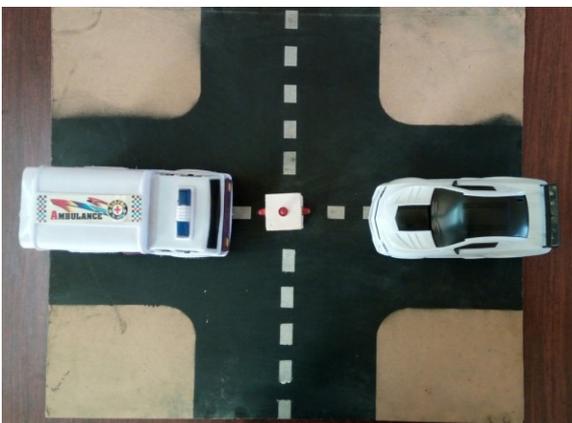
IV. HARDWARE AND SOFTWARE REQUIREMENTS

A. Hardware requirements

- Arduino Uno
- RFID tag
- RFID reader
- Regulated power supply
- Signals

B. Software requirements

- Arduino Uno

V. SNAPSHOTS

VI. ADVANTAGES

- No line of sight requirement.
- The tag can stand a harsh environment.
- Long read range.
- Portable database.
- Multiple tags read/write.
- Tracking people, items, and equipment in real time.

VII. APPLICATIONS:

- Inventory management.
- Asset tracking.
- Personnel tracking.
- Controlling access to restricted areas.
- ID badging.
- Supply chain management.
- Counterfeit prevention (e.g. in the pharmaceutical industry)

VIII. CONCLUSION

This system will definitely help to traffic police to give the way to the ambulance when there is heavy traffic on the road. 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. Further enhancements can be done to the prototype by testing it with longer range RFID readers.

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