# SMART TRAFFIC MANAGEMENT SYSTEM

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**Abstract -** *The motor vehicles accidents are one of the major causes of death globally of highest rate in a developing country. Around 3000 accidents have caused throughout the world. This is due to poor traffic management system. In India especially at night times, there is a high rate to cause accidents because as the traffic police is not available. The present solution is we are using cc cams to capture the vehicles who are violating the traffic rules. But there is drawback with it that means cc cams are not automated, someone has to take care about the cc cams. Sometimes if we capture the image but the vehicle number is hidden.*

*Our solution is to use the RFID device which is coupled with the signaling system. As the RFID tag is fitted to the vehicle and the vehicle details are stored in the database whereas the RFID reader is fixed to the zebra crossing and it is linked to NodeMCU. When the vehicle crosses the zebra crossing during the red signal, RFID reader will read the tag and send the information to NodeMCU then an e - challan will be generated automatically to the corresponding vehicle.*

***Key Words***: RFID reader, RFID tag, traffic signals, cc cams, NodeMCU

## 1. INTRODUCTION

In present times, accidents are one of the major causes of death in a developing country due to poor management system such as signal jumping. The government has introduced many schemes like cops capture the vehicle number who crosses the red signal and an e-challan will be generated to the corresponding vehicle and cc cams .But we can't get the vehicle number efficently at night times as well as cops are not available. It is a time consuming process that takes around 6-7days for the challan to be received by the offender. Here comes the use of automation. Inorder to overcome this problem we are introducing an Smart Traffic Management System for signal jumping where an automatic e-challan will be generated automatically to the offender who crosses the signal. This system uses RFID tag, RFID reader, NodeMCU where the RFID tag will be attached to the vehicle and the RFID reader will be coupled to the signal system. The RFID reader switch on when signal is red. Whenever the vehicle crosses the zebra crossing, the reader is on, the reader will read the tag and send the information to NodeMCU and using that information we will generate an e-challan to the corresponding offender.

## 2. EXISTING SYSTEM

We know that accidents are one of the major cause of death in developing country. this may lead to loss of people and loss of money. So in order to overcome this problem we have to generate challans for the people who are violating the traffic rules. At present we are using cc cams to capture the vehicles that are violating traffic rules. That is the only solution we are having at present. Even all the cams are not automated. Someone has to take care of those like to capture the vehicles. If the vehicle number was hidden or may not be visible clearly then we can't capture him. If we capture the image of a vehicle number, then we should generate a challan which takes a time consuming task to be received by the offender. But they are some drawbacks with this system.

## 3. PROPOSED SYSTEM

For our system we are using the new technology called Radio Frequency Identification (RFID) which is coupled with existing signalling system without changing the architecture of roads. If the vehicle crosses the traffic an e-challan is automatically generated to the corresponding offender. The RFID tag will be attached to the vehicle and RFID reader will be connected with the NodeMCU and signal system. When the vehicle crosses the signal the challan will be generated. So that from this system we will automatically reduces the work for the traffic control system to generate fines for the people who violate the traffic rules.
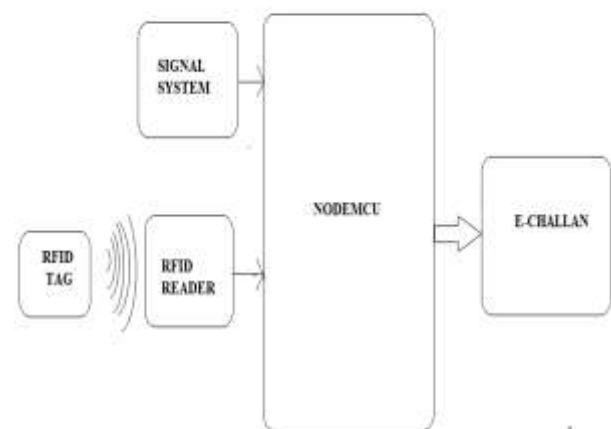
### 3.1 IMPLEMENTATION



**Fig-1:** Block Diagram of Smart Traffic Management

## 3.2 NODE MCU

NodeMCU is an IoT Module based on ESP8266 Wi-Fi Module. It uses Lua Scripting language and is an open source Internet of Things (IoT) platform. This module has CH340g USB to TTL IC.

**Features:-** Open source IoT Platform, Easily Programmable, Low cost & Easy to Implement, WI-FI enabled.



**Fig-2:** ESP8266 Wi-Fi Module

## 3.3 RFID TAG

A **Radio Frequency Identification tag(RFID tag)** is an electronic tag that exchange data with RFID reader through radio waves.These tags contain two main parts1)Antenna, which recieves radio frequency waves2) Integrated chip(RFID chip) used for processing and storing data as well as modulating and demodulating the radio waves sent or received by antenna or RFID chip.



**Fig-3:** Rfid tags

## 3.4 RFID Reader

A **Radio Frequency Identification reader (RFID reader)** is a device used to gather information from an RFID tag which is used to track individual objects.Radio waves are used to track data from tag to reader. These are the devices that transmit and receive radio waves in order to communicate with tags.It is the brain of the system and necessary to function.
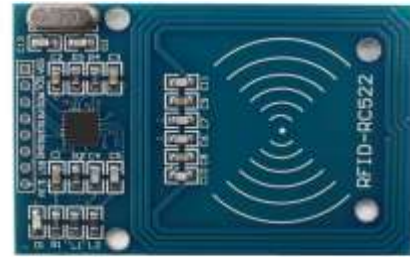


**Fig-4:** RFID READER

## 3.5 JUMPER WIRES

A jumper is an electrical wire, or group of them in a cable, which have a connector or pin at each end and it is normally used for making connections between items on your breadboard and your Arduino's header pins. In our project these are used to connect LED matrix and Wi-Fi module.



**Fig-5:** Jumper Wires

## 4. LITERATURE SURVEY

### 4.1 Automated E-Challan System

Authors: Shubham Kukde, Sakshi Lokhande, Santosh Mishra, Pranoti Mahalle, Prof.Kiran

This paper mainly deals to convert the traditional challan system, to a automated challan system so that whenever a traffic cop clicks the photo of the offender's vehicle it is uploaded to the server, further the traffic cop creates the E-Challan with the vehicle number and then the E-Challan is made available to the motorist on consumer side of system and also notified through sms.

The Limitations are Some times Vehicle number will not be visible at night times,Photo will not be effective.

### 4.2 Controlling and Analysing Signal Jumping Using RFID and Hadoop

Authors: B. Hemanth, V. Akhil, A.K.V Raghavendra, N. David Murphy, K. Neeharika

This paper mainly deals about the implementation of Electronic toll cotsystem using automatic vehicle identification technique.Here they uses an approach based on the GPRS to appliance the red light violation system and hardware and software for its configuration.The whole system is divided into 2 parts monitoring stations and control center.The monitoring center are placed at red lights and the control center is at the central location

The limitations are any damage to monitoring stations or control center the whole hardware will be damaged.

### 4.3Automatic Vehicle Identification System Based on RFID

This is another RFID based system refers to an automatic identification of vehicle and management system.This system is capable of receiving and transmitting the data for automatic identification of vehicle.It consists of camera for capturing the vehicle the vehicle number and sends the captured data to RTO.

The limitations are vehicle number will not be visible at night times, inefficient image capture

### 5. APPLICATIONS

- This project is used in monitoring no entry areas.
- This project is used in monitoring one way routes.
- This project is used in monitoring the traffic at single poles.

### 6. RESULTS AND DISCUSSION

The proposed system was successfully designed,and tested.It basically reduces the pen and paper work for the police.In this the when the vehicle jump the red signal ,the RFID reader attached to the signal will detect the crossing vehicle and sent the information to the NodeMCU.The NodeMCU after processing the details of the offender ,generate E-Challan that will be transmitted to the offender's registered mobile number.

The result will be displayed as follows:
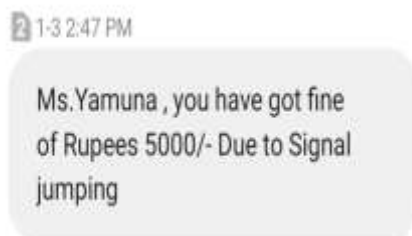


**Fig-6** Output

### 7. CONCLUSIONS

In this paper our proposed scheme is automatic e-challan generating system that detects and fine the person who break the traffic rules.

In this way we came up with a implementation of a system which will automatically generate a E-Challan for violating the traffic rules.We hope this solution will be useful in reducing the traffic problems and reducing the accidents.

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