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# **An Implementation of Proposed Telematics System Of Automatic Traffic Violation Detection**

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**ABSTRACT:** In the growth of population in world, people use vehicles like sedan and lorry to meet their comfort and necessity. This lead to heavy traffic, pollution etc. at the same time there is increase in traffic violation. This project is not implemented in the present days. For these new ideas the system divided into three sections vehicle, signal and RTO section respectively. Every vehicle must be implemented with inbuilt RFID transmitter during its manufacturing itself. There is a receiver with ON condition in the signal section. There is a database for the every vehicle maintained in the RTO section as server. The proposed method indicates that, as debit calculation for the vehicle those who violate the traffic rules. The condition as whenever the luggage vehicle entering the city limit in the peak hours, vehicle be overloaded beyond on their certain weight limit, vehicle which cross over the signal when it is in the red condition. This system which is undergoing testing and validation process once provides satisfactory result can be installed in the real time.

**KEYWORDS:** RFID transmitter, traffic violation, RTO section, Vehicle Overloaded .

## **I. INTRODUCTION**

One can create a life no one has the rights to destroy it. The saying goes like this. Due to the growth in population leads to the growth of vehicles and increase in vehicle are leads to the traffic rules violation where Traffic rule violation leads to accidents. Traffic control is a major challenge in India, due, in part, to heterogeneous modes of transportation, shabby and deteriorating road conditions, and inadequate traffic control mechanisms and systems. Besides, violators often escape without a penalty either by taking advantage of busy traffic or by bribing the law enforcement officials, thus compounding the problem. So employing cops to monitor the vehicle is not possible in all roads and remote area and this monitoring cannot be done 24 hours. So taking this problem as problem statement designed a tool on embedded system basis to overcome this problem faced by the cops.

In today's fast world, everything has become very fast and speed has become the other name for life. This theory is applicable for all the different aspects of life. And so it even includes fast driving and riding as well. Lead to an increase in the number of accidents every year and it seems to increase year after year. Although different governmental and nongovernmental organizations do carry out workshop and other training programs to make people aware of careless driving, yet this whole process has not been very successful till date.

Our system basically has three sections. The three sections are vehicle section, signal section and RTO section. We have built our system using RFID module. The advantage of RFID is that it is a cost effective system which will provide uninterrupted communication in our network even in bad weather conditions. One of the main advantage of the system is that the debit calculation for the vehicle those who violate the traffic rules and so that the government will be debit the amount.

## II. EXISTING SYSTEM

This analysis about the conventional techniques for the fault diagnosis methodology presented by various authors and points out the drawbacks and the complexities which could not be overcome by their approaching methods.

The Green wave systems are most suitable to provide clearance to emergency vehicles during rush hours. Many systems are used to implement the green wave systems. We have developed a cost effective system using Radio frequency identification (RFID) Technology, Global system for mobile communication (GSM) modules and latest high speed microcontrollers to achieve the desired results.

### System Structure and Block Diagram

The use of high frequency reader which will provide long range to the system. During the manufacturing of vehicles, passive tag or transponders are embedded inside the dash board of the vehicle such that it is not easily visible to human eyes. During the registration of the vehicle, each vehicle gets a unique license plate number. In our system a database is maintained, in which table comprises of information like Unique ID of tag against which the vehicle license plate number and its category is stored. We have defined three categories for this system namely Emergency vehicle, Stolen Vehicle and a Normal Vehicle. A Column of priority is also added in table, in which three levels are defined: - low, high and highest. A Priority "T" for stolen vehicles. However, as per the demand of the user, more levels and categories can be added easily.

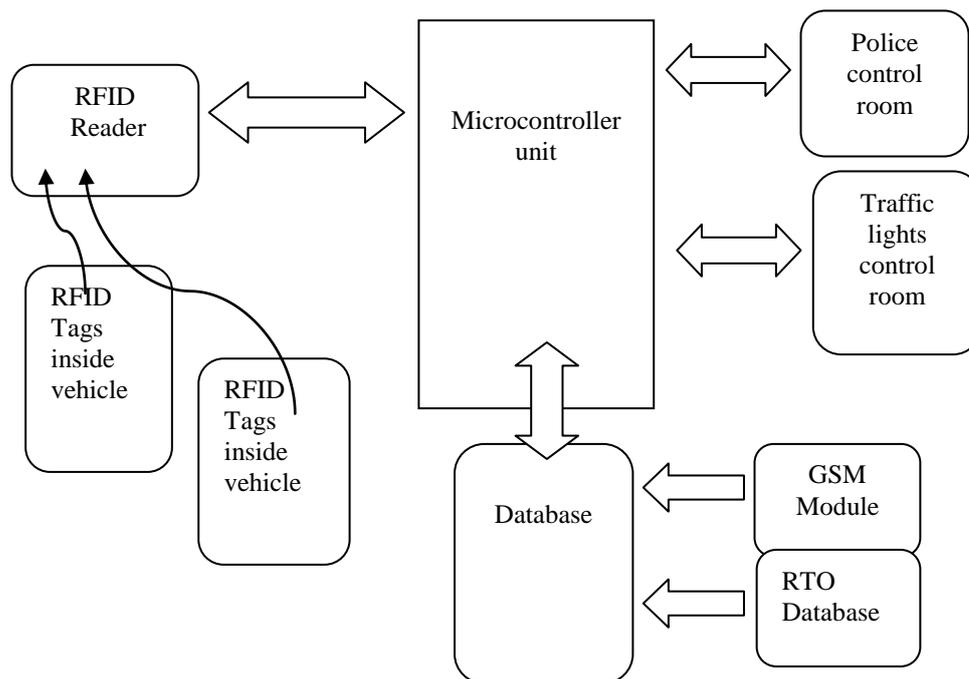


Fig. 2. System structure

Readers are installed on every junction of the city, on top of the roads. The reader reads the unique ID present on the tag or transponder and sends the information to the main system to check its category and priority in the database and take the desired action accordingly. For immediate update of category of vehicle and also its priority level the database is connected to the GSM module.

### III. PROPOSED SYSTEM

In this proposed system explain about the abstract, block diagram, explanations of each block circuit diagram and its explanations. Here in our proposed system we implement the thesis based implementation for the people who don't do the repeated things. The vehicle usage by the people has been increased that has also lead to misuse the traffic rules depending upon their situation. So we have designed the system in a move to save lives on the road by measuring the pressure of the vehicle. Current estimates suggest annually there are around 43,000 deaths across Europe's road networks. Experts believe this could be reduced significantly if the load of the vehicle is maintained as well as the traffic is also maintained by allowing the heavy vehicles only in the specific time.

As an additional feature for this new idea we divided our system into three section vehicle, signal, RTO section respectively. Every vehicle must be implemented with an inbuilt RFID transmitter during its manufacturing itself. An RFID receiver is kept in ON condition at the signal section. A database for every vehicle is maintained on the RTO section as server.

The system is proposed with three applications from this paper namely as debit calculation for the vehicle those who violate the traffic rules. The condition as whenever the heavy luggage vehicle enter the city limit in the peak hours, Vehicle that has been overloaded beyond their certain weight limit, Vehicle which cross over the signal when the signal in the Red condition.

#### Vehicle Section

The device which used to monitor the vehicles is installed. Fig.2. shows the block diagram for vehicle section. The device is updated with the microcontroller, to make it function without any human intervention. In addition with microcontroller, weight calculating sensor and RF 433.92MHz transmitter are installed to calculate the weight of the vehicle and to transmit the signal to signal section.

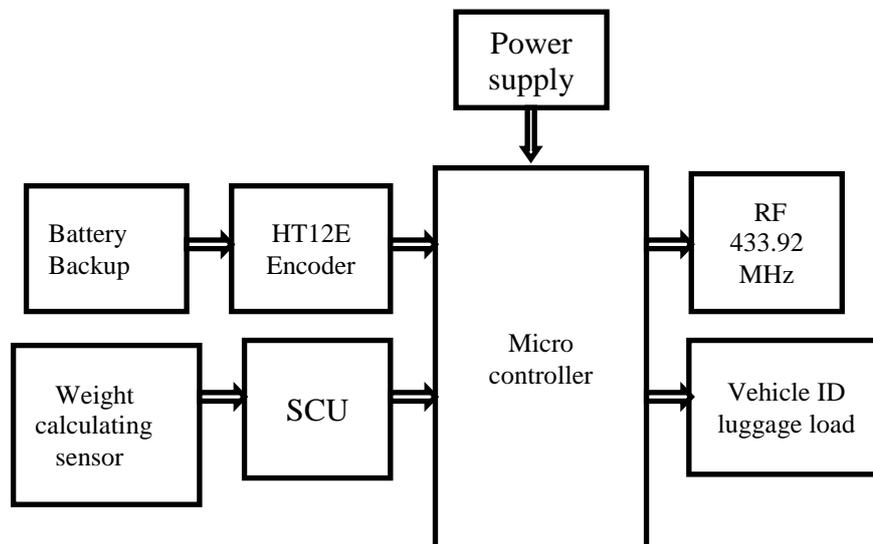


Fig.2 Block diagram of Vehicle section

The schematic representation of vehicle section is shown in Fig.2 The program was successfully burned on the micro-controller and when an vehicle approaches the sensor, it is successfully detected by the system and database is maintained.

- Automatic fine can be charged using wireless technology
- Traffic signal will be controlled
- Easy to maintain the record about the vehicles crossing from the other area.

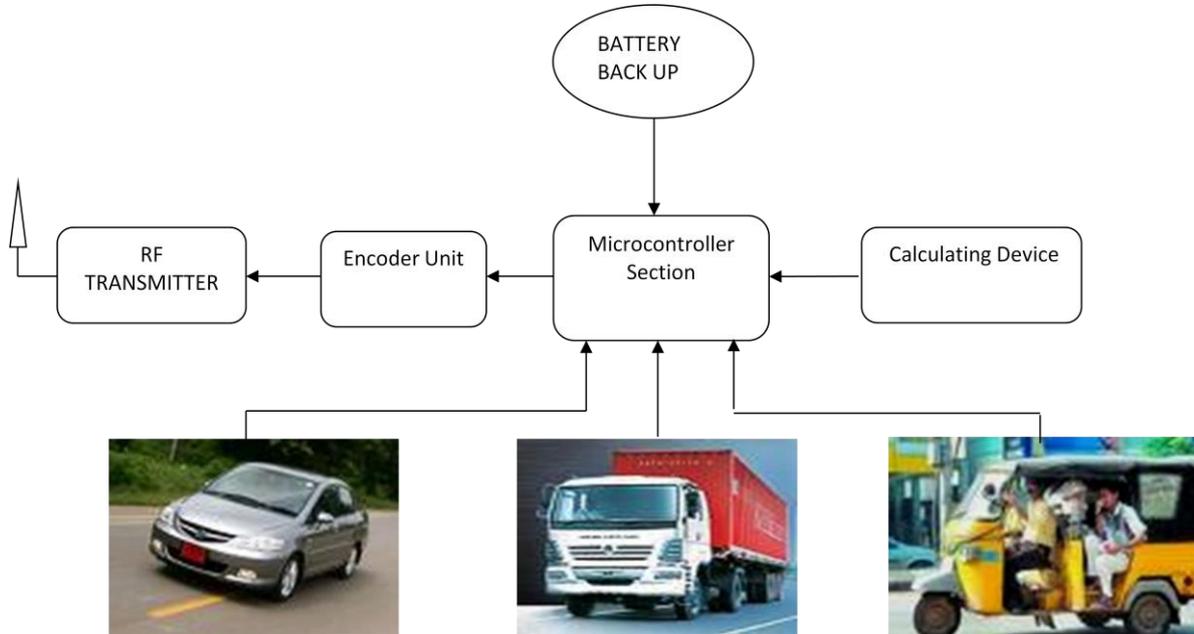


Fig.3 Schematic representation of vehicle section

**Signal Section**

The output signal from the vehicle section is given as input to the signal section by using RF 433.92 MHz receivers. The status of the signal can be observed by using the IR transmitter and IR receiver in this section.

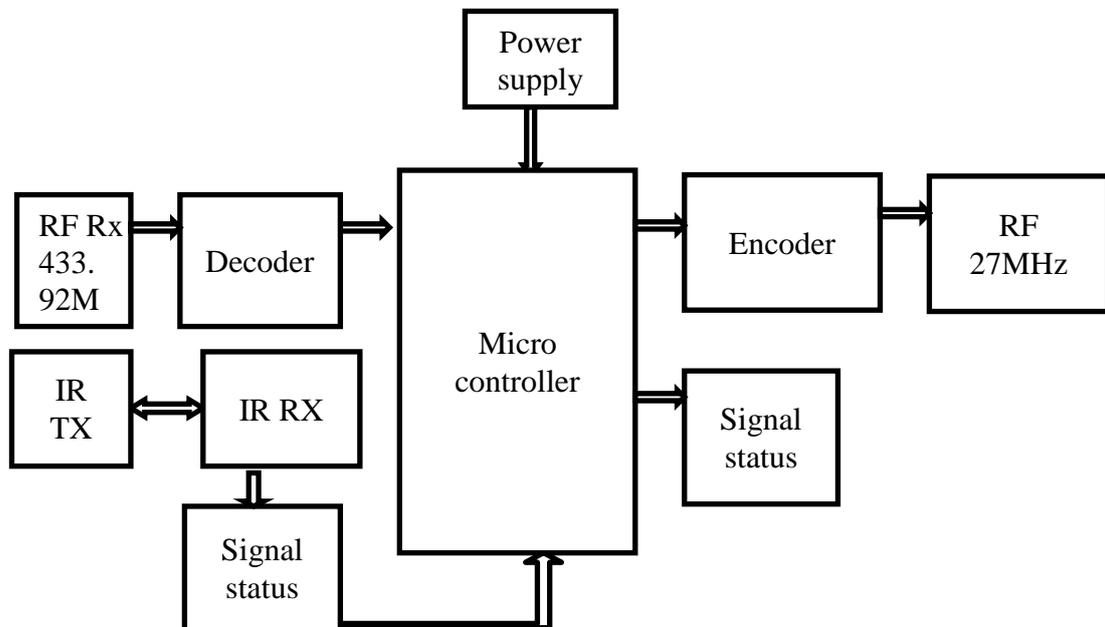


Fig 4. Block diagram for Signal Section

For example, If a vehicle is crossing the signal during red condition it will identify the vehicle using its ID and sends information to the RTO section. Fig 4 shows the block diagram of signal section. Here RF 27MHz transmitter is used to transmit the signal to RTO section.

The output of the signal section is carried over to the RTO section, which is the third section of our proposed system.

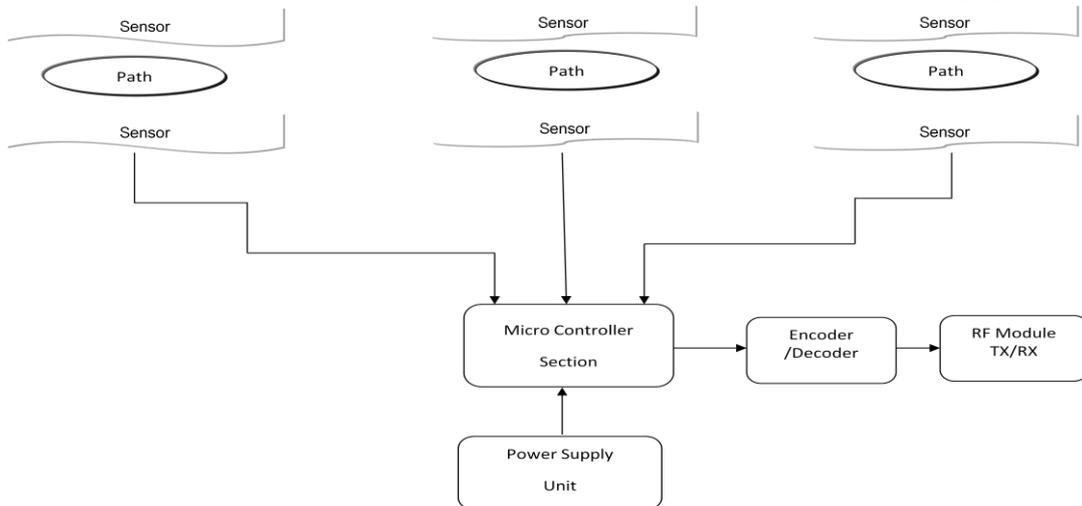


Fig.5 Schematic representation of signal section

**RTO Section**

A tool can be designed and connected to the PC's in the RTO office. Fig.6 shows the block diagram for RTO section. This tool consists of the RF 27MHz receiver, UART and 8051 microcontroller. The status of the signal from the signal section is received at RTO section by using RF 27MHz receiver. By the usage of UART communication, the signal information, weight of the vehicles and any misuse of the traffic rules can be identified and retrieved in the form of database stored in the system of RTO office. Automatic debit calculation is done through the output of the RTO section.

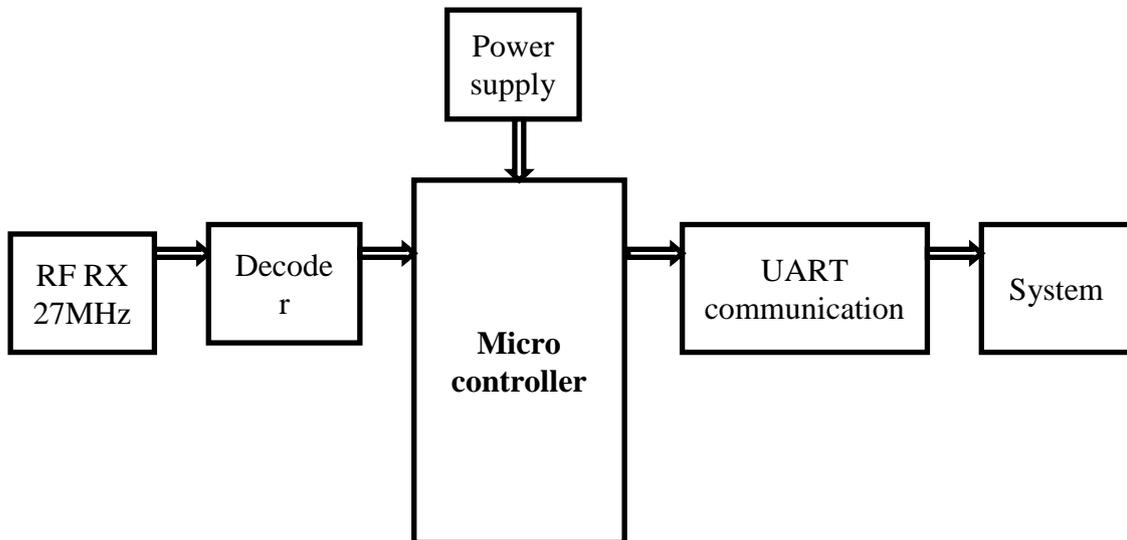
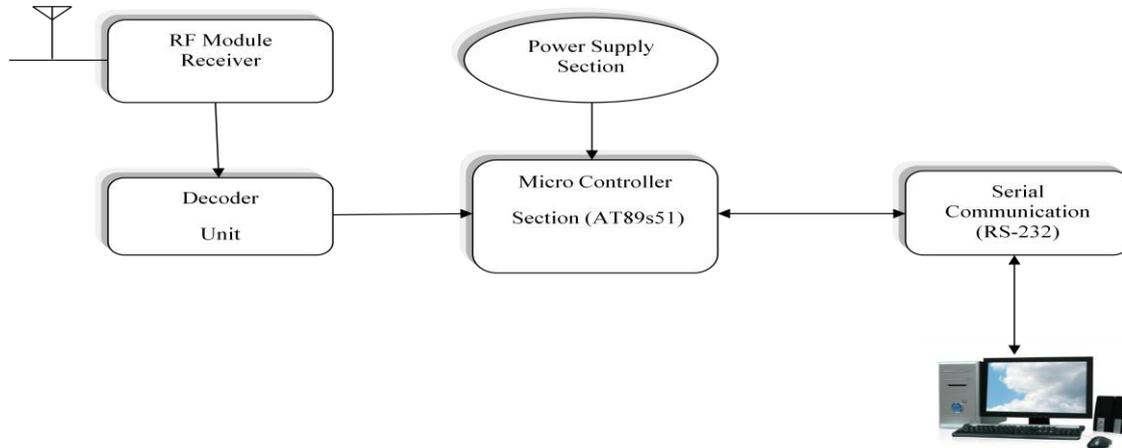


Fig.6 Block diagram of RTO Section

Finally, RTO section plays a vital role in making a decision that, whether the vehicle that is crossing the traffic signal is heavily luggage or not, and whether the vehicle is following the traffic rules or not. And the above mentioned application, detecting the heavily luggage vehicle that enters the city during peak hours.

**Fig.7. Schematic representation of RTO section**

#### IV. EXPERIMENTAL RESULTS

##### Experimental Setup

In the implementation of this system, the system functioning was satisfactory in inferring the monitoring of the vehicles and transmitting the data as mentioned from one section to another section takes place in wireless communication. The fig.8 shows the experimental setup of this system.

**Fig.8 Experimental Setup of the Three Sections**

##### Monitoring of the Vehicle

The sensor senses the each vehicle and monitors the vehicle if any miscellaneous can be evaluated it immediately transmits the data to the RTO database and the fine will be automatically debited from the user account by using an RFID. Thus the each vehicle will be provided by the RFID. The initial step of this process is to monitor the each vehicle. If the vehicle follows all the terms and conditions then it will be displayed as Normal Good day. Fig 8 and fig 9 shows the result of monitoring a vehicle.

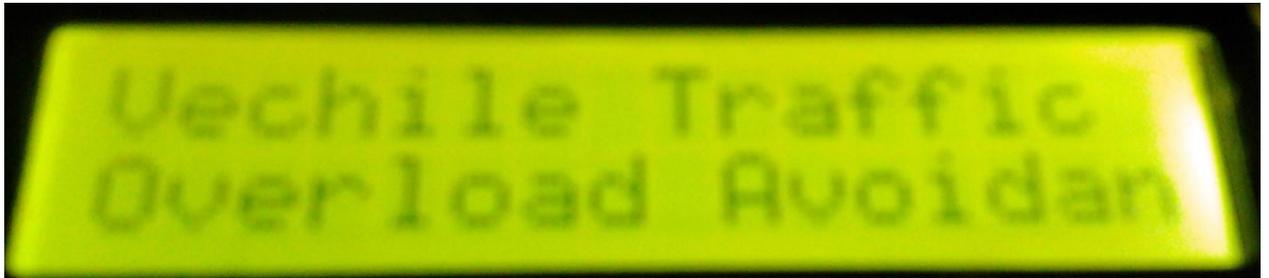


Fig 9. Initial data of the system



Fig 10. Monitoring performance of the Vehicle

### **Traffic Violation Detection**

One of the application this system is to detect the traffic violation and the penalty can be debited automatically. After the monitoring of the vehicle if the traffic rules had been violated the data has sent to the database with the vehicle ID. Fig 11 Shows the detection of traffic violation by a vehicle.

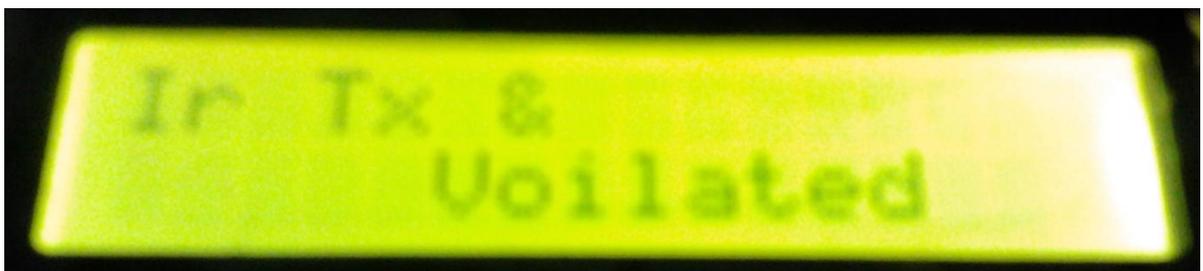
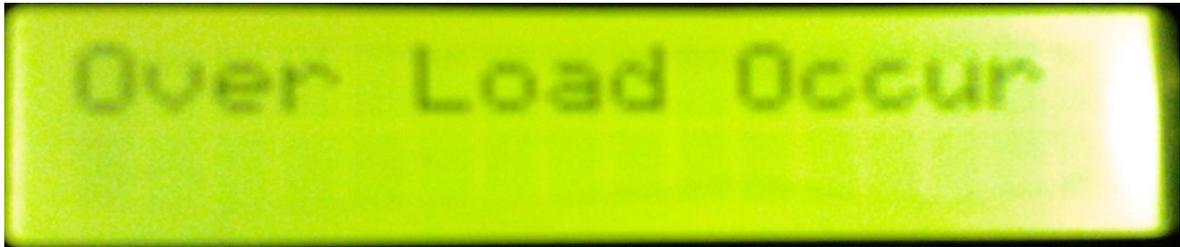


Fig 11. Traffic Violation Detection

### **Detection of Overload Vehicle**

The vehicle must follow the certain weight limit. In case, if the vehicle is overloaded it can be detected by this system in the basis of evaluating the voltage and pressure of the vehicle. Also if the heavy luggage vehicle enters into the city this process is applicable.



**Fig 12. Detection of Overload Vehicle**

Thus the above three applications are done experimentally and the results are will be up to date and it is systematic one. The fine amount can be debited automatically from the vehicle ID account.

## V. CONCLUSION

The advance of technology can provide better solutions to the increasingly difficult problems of traffic overflow. The program was successfully burned on the micro-controller and when an vehicle approaches the sensor, it is successfully detected by the system. On the other hand, if any vehicle is detected of any illegal issues, it is displayed on the LCD in experimentally. The system is efficient. The overall system is quite cost effective and has various advantages over the conventional technologies.

This system is aimed towards the welfare of the government and the human beings. The calculated fine details to be debit will be handover to the government. The government has the responsibility to debit the amount from the user database which has been already registered in the RTO section. It creates awareness among the people. It is applicable for all transport system. This project avoids corruption all over the cities. This is a new proposed system experimentally implemented in the real time yet to be recognized in the future.

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