

# Intelligent Network for Traffic Control System: Emergency Vehicle Clearance, Stolen Vehicle Detection, Automatic Fine Collection

Akshay Surve<sup>1</sup>, Varsha V. Shinde<sup>2</sup>, Shatawari S. Raut<sup>3</sup>, Monika Nawale<sup>4</sup>

Student, Computer Engineering, JSPM's PVPIT, Pune, India <sup>1, 2, 3, 4</sup>

**Abstract:** This paper presents Intelligent Network for Traffic Control System. The network is used to pass the traffic. The system uses machine learning for giving the dynamic count to the Traffic System. “Emergency Vehicle Clearance” & “Automatic Fine Collection” are the sub modules of the System. Each individual vehicle is equipped with Infrared Frequency Identification (RFID) tags i.e. attached to vehicle at the time of manufacture to particular location, which makes it impossible to destroy or remove. The Infrared (IR) Sensors are used to generate the count of vehicles that passes the signal. The system maintains huge amount of data of each vehicle at the server machine. The Green Light Duration is depending upon number of vehicles. The traffic rule break collection is collected automatically through RFID tag. The person, who breaks the rule, gets the mail or message from the system.

**Keywords:** RFID: Radio Frequency Identification Tags and Readers, IR Sensors: Infrared Sensors, Android.

## I. INTRODUCTION

INDIA is second populated Country in the World and is a fast growing frugality. It is seeing that deathly road congestion problem in its cities. Process of Infrastructure growth is slow as compared to growth in number in vehicles. This is because of space and cost constraint [1]. There is no lane based traffic and is also messy. It needs some intelligence in the Traffic Control System. The main drawback of Indian Traffic Signals, is there waiting count is static for long duration. So the solution on his problem is the Traffic Signal should itself generate the count dynamically as per the traffic requirement. Also in Country like India, there is no option for clearance of any type of emergency vehicles, such as Ambulance, Police Van and Fire Brigade. Also in Country like India, there is no option for clearance of any type of emergency vehicles, such as Ambulance, Police Van and Fire Brigade. Traffic Control System can reduce the negative impact of traffic congestion. Also it provides the traffic clearance for the Emergency Vehicles.

## II. LITERATURE SURVEY

TABLE 1 Literature Survey of Some Already Implemented Systems

Paper Name	Author	Mechanism Used	Drawbacks
<i>DTC: A Framework to Detect Traffic Congestion by Mining versatile GPS data</i>	Shachi Paul, Sajal Choudhary	Detect the areas which face frequent traffic congestion using the data coming in from all kinds of GPS enabled devices like mobiles, tablets and from vehicles etc.	Wrong prediction of the extent of jam by the framework, in a few cases
<i>Real time traffic congestion detection and management using Active RFID and GSM technology</i>	Siuli Roy, Munmun Das	The active RFID technology to automatically detect and manage road traffic congestion in near real-time	Use of GSM network to exchange SMS among the coordinators, is not fully reliable.

## III. IMPLEMENTATION

The Intelligent Network for Traffic Control System is implemented by the network of three components. The components are RFID Tags & Readers, IR Sensors, and Arduino UNO.

### A. RFID Tags and Readers:

The RFID stands for Radio Frequency Identification. It refers the technology where the digital data is stored in RFID tags. The data is retrieved after with the help of RFID Reader by using the Radio Waves. The digital data is in the form of Bar-Code that is captured by reader and then store in database by the system.



Fig. 1 Traffic conditions in country like India at Bangalore city.

As the RFID used radio frequency, Reader reads the data from Tag by using this Radio Frequency. In this system the Tag is equipped with the vehicle at the time of manufacturing at such a place from where it is impossible to destroy or remove. The reader then reads the data and sends it to the server which is then store in the database.

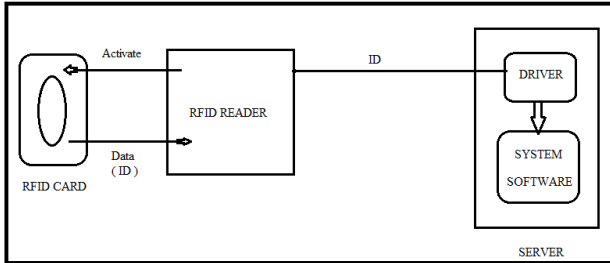


Fig. 2: Working of IR Sensor

**B. Infrared (IR) Sensor**

The IR sensor i.e. Infrared Sensor used the Infrared signals to send and receive data. By the definition measures energy that could be emitted or reflected energy off an object that falls on the sensor. The IR sensor emits the signal which is reflected by some object in their path and some signals are transfer back to the sensor. The sensor detects the radiation coming from the object.

Here object is vehicle, the emitted signals send by sensor are reflected back to the sensors because of presence of vehicle.

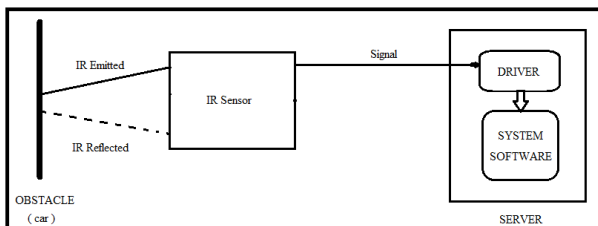


Fig. 3: Working of IR Sensor

**C. Ardiuno Uno**

Ardiuno Uno is kit that creates the microcontroller. The kit is used for building digital devices. The ardiuno creates interactive objects that can gives data from physical devices and controls the physical devices. The Ardiuno is used as microcontroller in the system. An Ardiuno board consists of an Atmel 8-, 16- or 32-bit AVR microcontroller.



Fig. 4: Ardiuno Uno SMR D3

**IV.SYSTEM ARCHITECTURE**

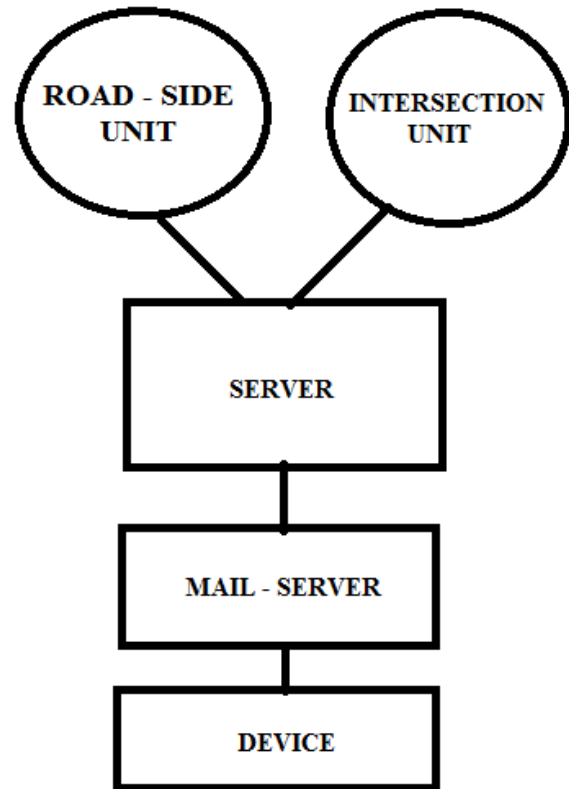


Fig. 5: Block Diagram of U.N.I.T.C.S

**A. Road-Side Unit**

“Road-Side Unit” contains LED, IR Sensor, RFID Reader, Switches. The purpose of this unit is to collect information of real time traffic from road and send it to “Intersection Unit”. It is also responsible to follow the commands of “Intersection Unit”. It will send the info like No. of vehicles and there IDs.

**B. Intersection Unit**

“Intersection Unit” contains System Controller which is responsible for controlling LEDs. This unit is also responsible for, whatever collected data from “Road – Side Unit” to the main server.

**C. Ardiuno Uno**

Arduiuno UNO is microcontroller for the system. Arduiuno UNO is used for controlling LEDs.

**D. Server**

Server is responsible to store collected data from Road-Side Unit and Intersection Unit. The server calculate and generate the time count which is then send to Arduiuno UNO. Server also sends the current traffic condition to mail server.

**E. Mail Server**

Mail Server are nothing but Gmail, Yahoo, etc. This is responsible for sending mails. The responsibility of the mail server is to send mail to the clients.



## V. CONCLUSION

The Intelligent Network for Traffic Control System is computer based System. It is also considered as a part of Artificial Intelligence. The Machine itself learns that, “what action should be taken?” The human efforts reduce on the part of the Traffic Policeman because of Intelligent Network for Traffic Control System as it requires very less Human Interaction. Intelligent Network for Traffic Control System will reduce corruption by using an Automatic Fin Collection System. The system will bring transparency into the system by using the system e-governance

## REFERENCES

- [1] “Implementing Intelligent Traffic Control System for Congestion Control, Ambulance Clearance, and Stolen Vehicle Detection”, IEEE SENSORS JOURNAL, VOL. 15, NO. 2, FEBRUARY 2015
- [2] “Uneversal Network for Intelligent Traffic Control”, IRJTE, Volume : 03 Issue : 06 | June 2016.
- [3] “INTELLIGENT TRAFFIC CONTROL SYSTEM”, 2007 IEEE International Conference on Signal Processing and Communications (ICSPC 2007), 24-27 November 2007, Dubai, United Arab Emirates.
- [4] ” A New Intelligent Traffic Control System for Taiwan”, IEEE SENSORS JOURNAL, VOL. 06, NO. 2, JUNE 2015.