



# TRAFFIC VIOLATION DETECTION AND PENALTY GENERATION SYSTEM USING WEB SERVER

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**Abstract :** Using radio frequency identification (RFID) technology, this project aims to create an intelligent traffic system. It is developed and operated in such a way that fines are tracked independently. RFID technology, passive tags, a processing unit (computer), and a communication system were all utilized with low-cost equipment. The first level is represented by data collection via RFID, which scans any identifiable tag connected to cars. After that, information is received by server on internet connection. Modern era is usually growing with a aim to make people's each day obligations easier. One of the major issues facing developing cities is traffic management, which is exacerbated by increasing population density and vehicle numbers without expanding roads. Road congestion wastes time and fuel, resulting in increased pollution. This observe demonstrates that growing a traffic management system with the use of the Internet of Things (IOT) is achievable and inexpensive.

**IndexTerms -** RFID technology, Raspberry pi, traffic management.

## 1.INTRODUCTION

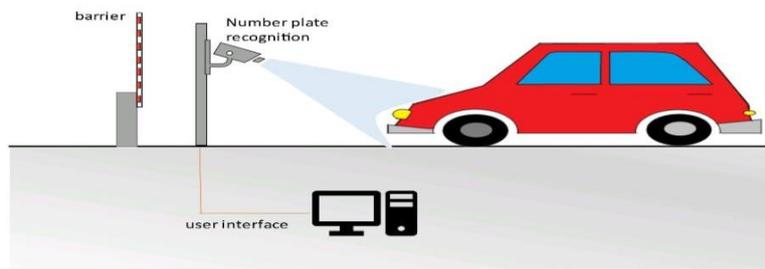
The number of cars has been elevated extensively in India, in consistent with that traffic accidents have additionally been increased. In order to lower those traffic accidents, steps were initiated with the aid of using the authorities however those initiations were failed several instances and residents breaking traffic guidelines were elevated[1,2]. To keep away from those diverse tasks and coordination were initiated. One of the coordination is enforcing penalty for those folks that violate traffic guidelines mainly signal jumps. In this project the concept which has been proposed will clearly lower the traffic accidents and avoidance. Internet of Things (IOT) is used sincerely playing a critical position in our regular life[7,8,9,10,11,12]. As all of us recognize traffic control are one of the essential town assets. Many nations are be afflicted by the traffic congestion troubles that impacts the transportation system in cities and it causes dilemma. In spite of changing traffic officials and flagmen with the aid of using automated traffic systems, optimization at the heavy traffic jam continues to be a major problem to be faced, mainly with a couple of variety of automobiles and the continuously elevating variety of road users aren't accompanied with promoted infrastructures with enough resources. The main aim of this project is collecting penalty for violating traffic signal. To overcome this problem, we're the use of RFID module. In the vehicle the RFID tag is positioned, and it'll be read with the aid of using the RFID reader. A specific number will be given to the RFID tag and it'll read with the aid of using the RFID reader and it'll detect the vehicle.[1] The reader will deliver the records to the Raspberry Pi-3 with the use of python software. Raspberry Pi-3 will obtain the information from the RFID reader.

## 2.RELATED WORK

Traffic congestion is a major problem in developing countries like India. The middle-class segment discussed a priority-based traffic lights controller that used wireless sensor networks.[6]The system's benefit is that it can control traffic at multiple crossings, but it also has some drawbacks. For starters, placing sensors on all of the roads is too expensive, particularly in a developing country like India. Second, data transfer between sensors is unstable, and wireless sensor network communication is still a research issue.[3] Finally, in order to resist the Indian climate, the sensors must be study.

## 3.EXISTING METHOD

Currently, image processing techniques are used to track signal violations in current systems. The cameras employ infrared signals to continuously capture vehicle licence plates. These cameras require a lot of upkeep and are vulnerable to damage in inclement weather. Image processing is challenging due to dirt on the license plate.[4]



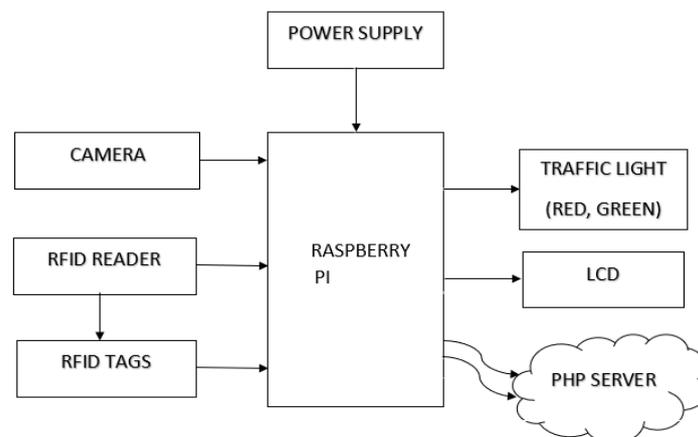
**Fig 1: Number plate recognition**

#### Disadvantages:

- Cameras do require excessive protection, maintenance and are vulnerable to harm in terrible climate conditions.
- Dirt at the number plate makes picture processing difficult.
- Camera by itself isn't the perfect way.

#### 4.PROPOSED METHOD

To monitor and measure red light jumping, we provide an intelligent traffic infraction detection and traffic flow analysis system in this project. Radio Frequency Identification (RFID) technology is used in this system to identify vehicles on the road. The reader will read the tag that breached the regulation and collect its information from the database if any car passes the stop signal. A PHP server will be used to send the fine for breaching the signal to the authorities.



**Fig 2: Proposed System**

#### 4.1 RFID

RFID (radio-frequency identification) is a technology that employs electromagnetic fields to identify and track tags attached to items. A radio reader, a radio receiver, and a tag make up an RFID system. The RFID tag is made up of two inner components: an integrated chip (IC) for processing and storing data, and an antenna for transmitting and receiving RF waves[5,6,8].

#### 4.2 RFID Reader

It is a technology that uses electronic identification to confirm the identity, status, and authenticity of vehicle data. It uses radio waves to communicate an object identify. Each object is identified by a serial number that distinguishes it from the others. RFID provides more data storage capacity, faster identification speeds, and faster and more accurate data collection.[1] This RFID reader can be used to track multiple objects at a time.



**Fig 3: RFID Reader**

### 4.3 RFID Tag

A Radio Frequency Identification Tag (RFID Tag) is a type of electronic tag that communicates with an RFID reader using radio frequency waves. This RFID reader is continuously sending radio waves, when the RFID tag is in the range of the RFID reader it transmits the feedback signal to the reader which is similar to bar code, the difference is the tags and reader need not to be in line of sight to each other.



Fig 4: RFID tag

### 4.4 Raspberry pi

With the exception of the Raspberry Pi's major chip, the Broadband Communication SoC (System on Chip), which runs many of the board's main components such as the CPU, graphics, memory, and USB controller, the Raspberry Pi is open hardware.



Fig 5: Raspberry pi 3 board

### 4.5 WORKING

RFID Tag on the vehicle will be read by RFID Reader and it will detect the vehicle that violates the traffic rule. The reader will give the information to Raspberry Pi3 and the information is shared with authorities. The additional proof is gathered with the web camera, the picture of vehicle jumping the red signal. This captured picture is sent to the individual who violated traffic rule through mail as coded in the language supported by the raspberry OS[7,8,9,10].

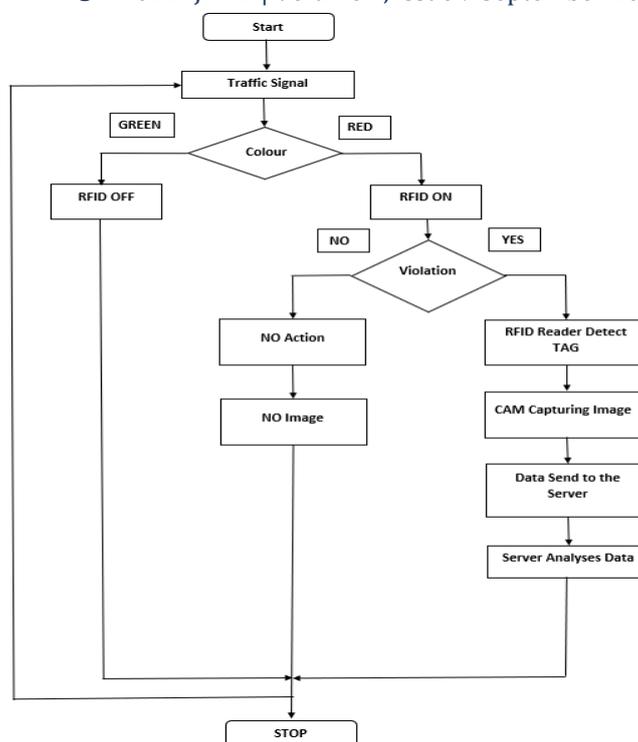


Fig 6: Flow chart

#### 4.6 HARDWARE PROTOTYPE



Fig 7: Hardware prototype

#### 5.ADVANTAGES AND APPLICATIONS

##### Advantages:

Because only traffic lights are currently automated based on time, the project "Advanced traffic violation control and penalty system with web server" is necessary. Cops must apprehend reckless drivers on their own, which may result in injury to them. Fines are manually assessed and paid in cash or electronically (with recent transformation). Because most individuals are unaware of the fee for a particular offence. In the current system, if you are arrested, the cops may take a bribe for a lower sum than the actual fine.

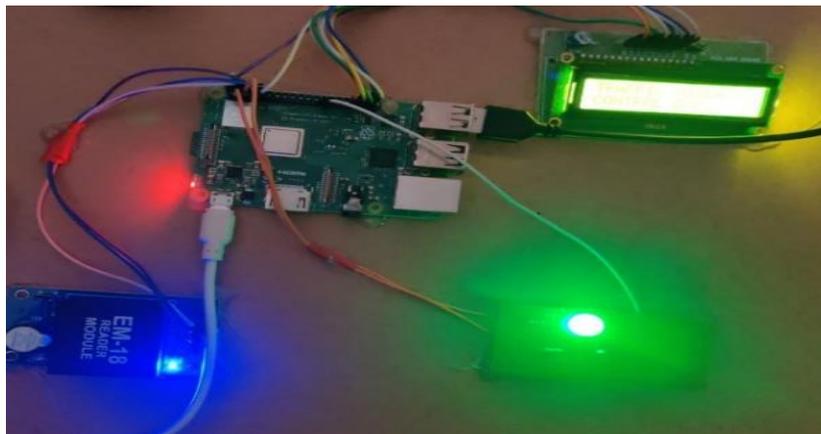
- Automated Penalty Collection for Traffic Signal Violation.
- Less traffic congestion
- Less wasting time and fuel.
- Does not require to be in line of sight.

##### Applications:

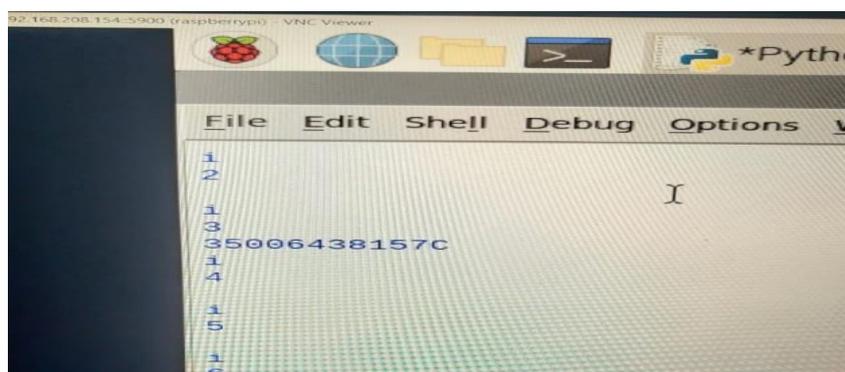
You may need to track the real-time position of assets, staff, or consumers in some applications. RFID solutions enable visibility in any number of areas, whether you're assessing the efficiency of worker movements, the success of a store floor layout, or tracking the location of key supplies.

**6.RESULTS**

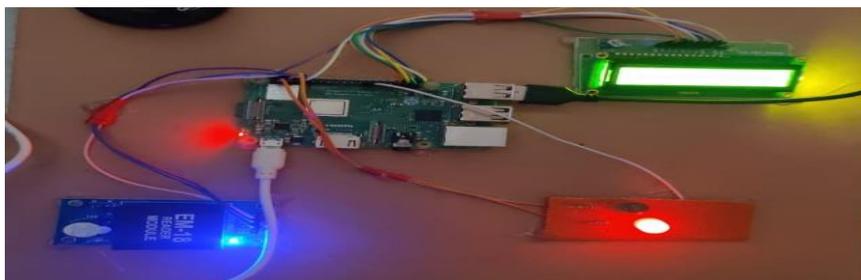
The technology will compel people to follow traffic regulations, instilling road discipline in the process. As a result, traffic signal accidents are expected to drop significantly.



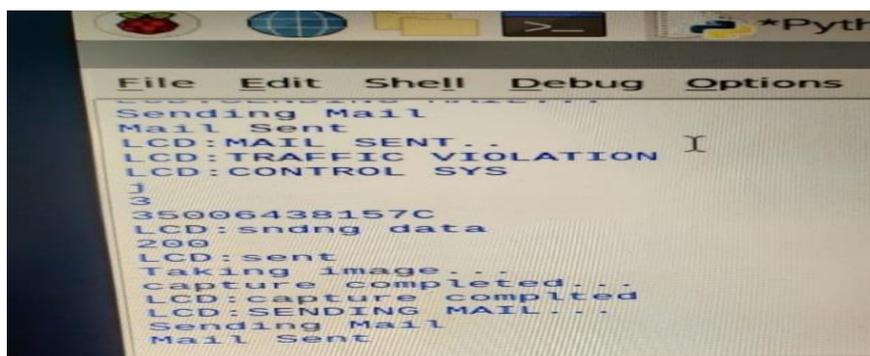
**Fig 8: When green led is ON**



**Fig 9: No Action taken**



**Fig 10: When red led is ON**



**Fig 11: Output image**

## 7.CONCLUSION

As a result, we have developed a system that will automatically impose penalties for violations of traffic laws, resulting in more disciplined traffic in our country. We expect that these efforts will aid in the reduction of many traffic-related issues that cause disruption throughout the system, as well as the reduction of the number of accidents, traffic jams that waste our time, and pollution to some level. Our technology only monitors traffic at signal poles, but it may also be used to monitor no-entry zones, one-way routes, and other areas.

## 8.FUTURE WORK

RFID defence technologies and applications and use of RFID to monitor and track items safely and securing securely in the military supply chain. RFID retail technologies applications which allow retailers to improve on shelf availability increase sales cut labour costs and improve customer care. OCR (Optical character recognition) software with RFID system or module. RFID is playing at Boeing Airbus commercial airlines and the US Department of Defence as well as in home line security. In healthcare, logistics, manufacturing, Pharmaceuticals etc.

## REFERENCES

- [1]. EPC Radio-Frequency Identify Protocols. Class-1 Generation-2 UHF RFID. Protocol for Communications at 860 MHz – 960 MHz, EPCglobal Inc. Standard, Rev. 1.2.0, 2008.
- [2].G. Varaprasad and R. S. D Wahidabanu, “Flexible Routing Algorithm for Vehicular Area Networks”, in Proc. IEEE Conf. Intell. Transp. Syst. Telecommun., Osaka, Japan, 2010, pp.30- 38.
- [3]. Shruthi K R and Vinodha K, “Priority Based Traffic Lights Controller Using Wireless Sensor Networks”, International Journal of Electronics Signals and Systems (IJESS) ISSN: 2231- 5969, Vol-1 Iss-4, 2012.
- [4].Ms. Pallavi Choudekar, Ms. Sayanti Banarjee and Prof. M K Muju, “Real Time Traffic Light Control Using Image Processing”, Pallavi Choudekar et. al./ Indian Journal of Computer Science and Engineering (IJCSE), ISSN: 0976-5166, Vol. 2 No. 1.
- [5]. R. Hegde, R. R. Sali, and M. S. Indira, “RFID Based Automatic Lane Clearance System For Ambulance”, Int. J. Adv. Elect. Electron.Eng, vol.2, no. 3, pp. 102-107, 2013.
- [6]. Traffic Congestion in Bangalore-A Rising Concern. Available: [http://www. Common floor. com/ guide/ traffic- congestion -in -Bangalore-arising- concern- 272 38. html](http://www.Commonfloor.com/guide/traffic-congestion-in-Bangalore-arising-concern-27238.html), accessed 2013.
- [7]. N Ashok Kumar, P Nagarajan, Mr Neeruganti Vikram Teja, Mr Raja Suresh,” Intelligent Greenhouse Monitoring and Controlling By Using Python on Raspberry Pi“Vol .5 ,No.2 Sep 2021.
- [8]. N.AshokKumar, Krishnagandhi P, B Kannan, Y David Solomon Raju,” Smart Farming Field Observation Using Embedded Systems” International Journal of Electrical Engineering and Technology (IJEET), Volume 11, Issue 4, June 2020, pp. 241-245.
- [9]. P. Vijayakumar, P. D. Selvam, N. Ashokkumar, Sharmila , R. Raj Priyadarshini , M. Tamilselvi, Rajashree. R, Xiao-Zhi Gao , “IOT Based Wireless Smart Shoe and Energy Harvesting System” International Journal of Innovative Technology and Exploring Engineering (IJITEE) ,Volume-8 Issue-7 May, 2019.
- [10].A.Kavitha.,N.AshokKumar,J.N.Swaminathan “Wireless ECG monitoring system using a smart phone via WiFi” Journal of Advanced Research in Dynamical and Control Systems ,Vol. 10. Sp– 2, 2018.
- [11]. A.Kavitha, N.AshokKumar, “Automatic Identification of Maritime boundary alert system using GPS ”International Journal of Engineering and Technology Vol 7 ,No.3.1 2018.
- [12]. N. Ashokkumar , A. Kavitha , S. Devi , P. Venkataramana ,” Wireless Sensor Data Fusion Techniques in Estimating Temporal Resource Attributes in Scenarios of Intermittent Connectivity” El-Cezerî Journal of Science and Engineering Vol: 9, No: 2, 2022 (413-423) DOI :10.31202/ecjse.948125.