International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 08 Issue: 04 | Apr 2021 www.irjet.net p-ISSN: 2395-0072

Survey paper on Traffic Management System using IOT for Emergency Vehicles

Kartik Gupta[1], Pragati Jagdale[2], Reet Agarwal[3], Rishabh Saraswat[4], Hanmant Magar[5]

[1-4]Final Year, B. Tech CSE, Dr. Vishwanath Karad MIT World Peace University, Pune, India
[5]Professor, Dr. Vishwanath Karad MIT World Peace University, Pune, India

---

Abstract - *This paper describes different methods used to detect an emergency vehicles and normal vehicles. It also covers different methods to tackle the traffic for normal and traffic at the time of passing of an emergency vehicle. By time-to-time new methods are developed to overcome the congestion issues at traffic junctions. In this survey paper, we describe and compare many techniques of identification through table and figures.*

Key Words*: *Emergency vehicle, RFID, Wireless Sensors, Traffic Management System.

1. INTRODUCTION

With the growing number of individuals and vehicles within the populated area, traffic jam has become a serious problem and a challenge in big cities. Slow cars not only drive trips, but even have an impression on the environment by polluting the air, the economy by wasting working hours and fuel, and private health by increasing the extent of stress. It also can be life-threatening when emergency vehicles attempt to undergo traffic jams.

In addition to the economic impact, traffic jams can severely disrupt services provided by ambulances, firefighters, and emergency services, hampering their efforts to satisfy target reaction time and maintain quality of service. Table 1 shows that emergency services like the Metropolitan Fire and Emergency Services Board (MEFSB), Country Fire Authority (CFA), State Emergency Service (SES), and Ambulance Victoria (AV) have a way shorter time interval than their corresponding reaction time (travel time). There are many ITS recommendations within the literature, most notably Green Wave, ITS Integration model, application-based model, Smart traffic signal system (STLC), and Smart Congestion avoidance (SCA).

In these activities, researchers are discussing a process to scale back the danger of green traffic jam. These programs contain many smart devices which will communicate with traffic infrastructure (e.g., road signal), off-road vehicles, and other smart traffic devices using wireless communication systems. Since wireless communication is susceptible to cyber-attacks, its ITS also can be compromised. Such attacks may increase the danger of life-threatening traffic jam within the event of an emergency vehicle being suffering from an ITS hack or unreliable robots. Existing ITS programs don't have the means to hack and reduce their impact. As a result, these systems cannot guarantee the reliability of the road signal system and are therefore completely unreliable.

2. Literature Survey

[1] ITS is one among the foremost important Internet of Things (IoT) applications powered by Smart Cities. The green wave-based ITS system has been introduced, which makes the road signal system green to green when an emergency vehicle approaches a road signal. As a results of turning the signal to green, the emergency vehicle detects all the green signals on its way. during this project, the road signal system can detect any stolen vehicle passing through the signal. Here, figure 2 shows the processing steps of our proposed intelligent traffic signals system. The worst thing a few green wave is that, when traffic synchronization is disrupted, it can cause tons of traffic (overcrowding). to scale back the impact of non-compliance, an RFID-based traffic management system is suggested . to scale back traffic jam , we've introduced a typical traffic measurement system to watch traffic and use-based insurance (UBI), consisting of seven components loaded from a smartphone to a high-end business model. This measurement system can specify traffic details on the road and may calculate the entire traffic duration, and supply an appropriate solution. during this project, they need developed a contemporary traffic monitoring system to extend traffic flow to satisfy current and future traffic needs. The authors have proposed the gathering of road information through the mixing , integration, and maintenance of the city's smart traffic systems employing a wireless network (WSN), which provides a far better solution by reducing more traffic compared to current road signal systems. Keep your text and graphic files separate until after the text has been formatted and styled. don't use hard tabs, and limit use of hard returns to just one return at the top of a paragraph. don't add any quite pagination anywhere within the paper. don't number text heads-the template will do this for you.

Table -1: Emergency Services Incident reaction time target

Types of Emergency	Target	Percent within target	50th percentile (mins)	90th percentile (mins)
Department of Justice & Regulation (DJR)				
Road Accident	90%	91	13.1	27.0

rescue response for SES, CFA and MFEB				
Country Fire Authority				
Road Accident rescue response – urban	90%	93	10.6	17.7
MFESB				
Road Accident rescue response	90% within 13.5 Minutes	89	9.5	14.5
DHHS and AV				
Code1 incidents – state wide	85% within 15 Minutes	74	11.1	22.4
Code1 incidents – in centres (population greater than 7500)	90% within 15 Minutes	79	10.8	19.4

[2] Traffic jams fill the streets and cause emergency vehicle problems. Sometimes it takes about 2-3 'signals' time to travel just one km. As a result, emergency vehicles like fire ambulances are unable to succeed in the specified location on time. Some patients with serious problems don't have access to hospitals while they need serious problems. In many cases, emergency patients need immediate treatment and will be hospitalized as soon as possible. to beat these problems this paper focuses on building a system which will be ready to communicate with signs and emergency vehicles. Here, figure 1 shows the processing steps of our proposed intelligent traffic signals system. because the emergency vehicle reaches a particular distance, the signal will automatically detect the emergency vehicle and if therein way there are other vehicles then the signal are going to be turned green, and other road signs are going to be red which can make it traffic-free. this manner the emergency vehicle will easily pass the traffic and once it passes the signal, all the signals are going to be back to normal. To alleviate the issues caused by traffic jam , the proposed program focuses on vehicle management by adjusting signals as needed during a particular situation. In an emergency, the road signals are going to be used as required , which can immediately remove the traffic restrictions on a specific signal and stop some roads. The IoT-based program proposed a model during which the authors focused on calculating traffic jam that might help people find heavy road areas. To detect or detect traffic jam , this program utilizes IR sensors which will detect traffic and calculate traffic jam . they need completed a program based largely on a PIC microcontroller that tests the dimensions of traffic by providing powerful time-spaces at different levels. This paper focuses on solving the matter of emergency vehicles. a transportable control device has been developed which is employed to unravel the matter of emergency vehicles that are suffering from traffic jam . The ZigBee component is primarily used for wireless communication with emergency vehicles to send information. The program covers the matter of traffic jam in large traffic areas by providing powerful spaces at different levels. The system works fine but has not completely solved the traffic problem.

A plan has been proposed which will specialise in paving the way for emergency vehicles. The program provides the simplest consistent with the sort of incident that occurred. So within the event of an accident and therefore the refore the patient is in critical condition the system will prioritize 1 within the ambulance and move to the emergency vehicle by finding differently the ambulance can reach the specified location during a short time and the patient are often treated as soon as possible. The proposed system has some drawbacks because it isn't always possible to supply alternative routes for emergency vehicles, and this technique might not work properly in high traffic.

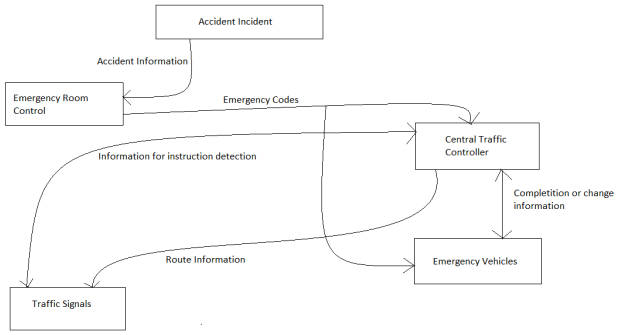

Fig. 1: The processing steps of our proposed intelligent traffic signals system

[3] The Intelligent Traffic Management System aims to effectively manage traffic during an emergency using minimal communication and processing technologies and appropriate understanding skills. Figure 2 shows the sources of traffic congestion and their contribution. The points at which the road narrows are called "bottlenecks". The crash of cars and stables is called "traffic incidents". Road repairs, new road construction, and maintenance works are called “work area”. “Inclement weather” such as heavy rains, snow, and fog are causing congestion. “Poor signal timing” occurs when the robot controller is faulty and no relationship is maintained between the time allotment signal and traffic volume. "Rare events", e.g. Strikes and marathons, cause increased traffic volume and lead to congestion. The wireless network is a promising technology that provides a solution for the construction

and development of good automotive control systems. The sensor network contains sensor and gate locations. The function of the node is performed to monitor traffic in a shared area, using different devices that can measure visual traffic parameters such as flow, congestion, volume, header, standby time, penetration, and pollution. The node gateway collects traffic information across all nodes and directs the same to the base station. WSNs have attracted widespread interest from academic and industrial investigators due to their low maintenance, low price, and use in a variety of application areas, such as health, military, industry, and home. Special features of WSN include sensory node mobility, ability to withstand harsh environmental conditions, node failure, low power, and deceleration. The WSN standard system based on the Urban Traffic Management System (W-UTMS) performs four functions: (i) data collection; (ii) the distribution of data; (iii) processing the data to plan the required activities; and (iv) the implementation of appropriate actions. To perform these functions independently, UTMS is equipped with wireless sensors, Traffic Management Centre (TMC), Road Side Unit (RSU), and On-Board Units (OBUs) in vehicles. Sensors collect real-time traffic information, such as traffic jams, vehicle type, average waiting time, and pollution, and transmit traffic data to RSU. When an emergency vehicle approaches a crossroads, the OBU directs that information to RSU. RSU collects data from all sensor nodes and OBUs and transmits the same to TMC. The TMC data collection module collects data, analyzes traffic parameters, and sends it to the TMC traffic signal control module. The control module scans data and makes smart decisions to provide the first signature to emergency vehicles. After passing an emergency vehicle, the system starts operating regularly. The system will effectively deal with urban traffic congestion, which is particularly important in emergency vehicles, vehicle waiting times, fuel consumption, and safety. Recently, Vehicular Sensor Networks (VSNs) are a good solution for traffic monitoring. At VSNs, cars have hearing aids and these vehicles roam the city to hear traffic. Vehicles transmit sensory information to the city traffic monitoring centre through vehicle connections to the vehicle or vehicle to infra. The automotive sensor system has high safety capabilities and low shipping costs. Dynamic traffic monitoring using vehicle networks (DTMon) is another way to collect reliable information about free movement and temporary traffic conditions. The average Wait Time (AWT) for a car at the intersection of a standard system is unpredictable. Smart and road-related strategies are continuously developed and used to build an Intelligent Traffic Management System (ITMS), which can reduce AWT traffic at intersections and control traffic. This paper provides a comprehensive review of existing WSN urban vehicle management strategies, discusses key challenges, and identifies future research indicators.

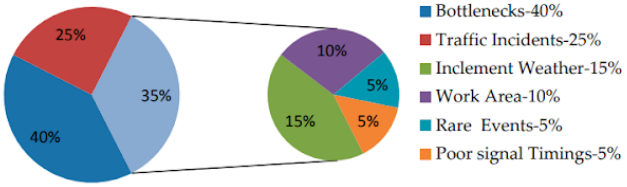

Fig. 2: Sources of urban traffic congestion

[4] The Intelligent transportation (ITS) plays a key role in linking traffic jam and ensuring security, which helps solve many of the foremost challenging challenges in large urban areas. Advances in information and communication technology have enabled the planning and implementation of solutions to enhance ITS and supply modern services like promoting safety, disseminating useful information to drivers, and avoiding traffic jams. Given the improvements made in urban areas, however, the present construction of automotive networks isn't flexible, so it seems difficult to use very large services and agreements. to enhance the pliability and planning capabilities of appropriate service delivery, it's suggested that the newly developed, advanced Software-defined Networking (SDN) technology be applied to automotive, controlled, dynamic, and economical networks, and is predicated on the division of knowledge and control plane. Adaptability, planning capabilities, and centralized controls are often added to the available infrastructure. during this paper, the time it takes an emergency vehicle (EV) to reach the scene of an accident from an emergency facility is named a recovery time, and therefore the route you're taking is named a rescue route. Since emergency vehicles like fire trucks, ambulances, and police vehicles are always at the forefront of their routes and intersections within the city, EV traffic lights are wont to ensure their smooth, non-stop traffic. during this study, the above techniques are wont to integrate a central controller with car networks to scale back the recovery time to a lower value than normal. during this paper, the right route of an emergency vehicle is described before its departure given the present state of the road within the city at the time of the accident. to scale back the recovery time after the required route, the appliance method is employed to enable continuous EV movement at intersections. within the proposed release sector, the central controller is recognized for the supply of comprehensive view and consistent access to all or any traffic lights on the thanks to the rescue and therefore the assessment of traffic conditions near intersections. this will help to balance the time and place necessary for the implementation of the pre-emption strategy and for the controlled robot to show green to take care of the delay set for normal traffic at a suitable level while providing the acceptable recovery time. Also, the proposed return of controlled robots is proposed, a way aimed toward maintaining communication and harmony between the

lights available on this route. within the system model, RSU periodically sends beacons to vehicles. After a short time , once the present traffic jams round the city have stabilized, an accident occurs, during which the affected vehicle sends its partial road ID to the closest RSU via V2I. As envisaged within the proposed system, the message arrives at the controller via the I2I wireless connection when adopted by any RSU. Once it's received information at the scene, the controller conducts a proposed search of the closest emergency centre, where it sends a message after specifying a rescue route. The search process and route adopted during this step are supported the Dijkstra algorithm. during this study, the value of every route depends on its traffic conditions. After receiving an identification of the scene of the accident, the emergency department sends the EV via a route specified by the controller, during which it seeks to scale back the recovery time using the required traffic signal output. Here, two different algorithms are wont to calculate the space and time required for an ambulance to reach the scene of the accident and to work out the extent to which the ambulance must reach the hospital.

[5] Recalling the growing problem of traffic jam outside of India, various TCSs were discussed further. These tried and used systems, however, can't be implemented in India without creating flexibility that would help improve control in certain specific high-density areas. Therefore, to style iTCS, it becomes a priority to find out how the techniques are used and the way they're used. And studying its pros and cons gives us a far better idea of its adaptability to Indian conditions.

Few such TCS have been briefly discussed.

Image processing using CCTV to find traffic and generate feedback.

Automotive communication is the communication between cars and sending the status name to each other.

3. Inductive loop traffic detector system to get traffic and have feedback.

A. THE USE OF THE IMAGE

Image-based methods are supported images taken from video recordings using robotic cameras, during which the amount of vehicles in each robot is calculated, and therefore the traffic signal is controlled consistent with this number. This method is usually wont to align the partition ideas with the symbolic logic control. Artural Neural Networks play a serious role in in-depth learning parameters to analyse data (images / storage number of vehicles). Sensitive controls are primarily focused on detection of various green and non-green times for the signal. an equivalent method of junction or node was used for an equivalent route

B. VEHICLE COMMUNICATION

This solution focused on the planning and implementation of a stochastic driver style to research the impact of driver compliance and speed acceleration and reduce traffic jam by reducing the time set behind the robots and therefore the time to travel completely. the traditional speed of every vehicle passing through the road section is transferred to other vehicles. On the reception side, cars count the “bars on the edge” of those sections of the road; on the idea of those weights, they calculate the acceptable method. Real communication takes place with the assistance of ‘Dedicated Short-Range Communication (DSRC)’ wireless communication devices. The approximate width of those devices is 1000m. DSRC equipment communicates not only with other vehicles but also with road infrastructure. Includes road signals or instructional nodes installed along the road.

C. PAVEMENT INVASIVE DETECTORS

1. Inductive Loop: This is the foremost common mechanical technology utilized in various countries. It can detect passing or approaching vehicles approaching a traffic signal . It consists of 1 or more turns of the loop wound with a thick wire during a shallow structure to be kept within the trail (grid) of the road rearrangement required. Loop detectors are available a spread of sizes and sizes, and different configurations are often used counting on the situation to be obtained, the kinds of vehicles to be detected, and therefore the purpose (such as line detection, vehicle count, or speed measurements).

2. Magnetometer: Unlike the first models, this model can measure changes in both; the straight and vertical parts of the Earth's magnetism. This uses two axis flux gates, and as a result, operates fully within the equator region where the lines of the magnetic flux are horizontal. Temporary inputs and bridges, where the metal support structure interferes with loop detectors.

3. Magnetic Coil: Contains a wire coil with a really open medulla spinalis that measures changes within the earth's magnetic flux . the disadvantage of this technique is that it can only detect cars moving faster than a particular speed, so it'll not be used as an existing detector.

Suggested Solution

A.USE OF INFRARED SENSORS

There are several ways during which we will get this answer to traffic volume as mentioned within the solutions available. we'll use Infrared sensors to work out the utmost traffic length in each line and make feedback supported sensor output. Since these sensors will use infrared waves to detect traffic, sensory emissions won't be suffering from low visibility conditions like fog or dust as these IR waves can't be prevented by fog. Another point to think about is that there'll be many other Infrared signals which will affect sensory output; which is why we'd like to possess a selected operating frequency and

filter the sound.

B. POSITIONING OF SENSORS

As we take the length of traffic to a specific line to calculate the green time for that route the location of the sensors are going to be in line for an additional distance. we will see the length of traffic counting on the sensor output in each line and this will be considered as a response. Sensors should be placed on the dividing side in order that they are doing not have minor disturbances. Number of sensors that indicate traffic, that's the detection of vehicles; will provide the length of traffic thereon particular route. This number are often given as a response the green time are often reviewed. Another thing to think about is that because there are gaps between cars in cars some sensors may indicate that there are not any cars there but we'll check out the last sensor indicating traffic jam , assuming that some sensors could also be lost thanks to spaces between cars.

C. ALGORITHM

After receiving the sensory response, the foremost important part is to process the response to urge the specified results. As we determine the amount of sensors that detect automobiles , we'll be using this to get feedback employing a simple fuzzy-logic algorithm. we'll have time repetitions supported the space between the nerves and add bias thereto . The duration of the repetition will depend upon how long it takes for the traffic to hide the space between two consecutive sensors. Bias are often stored for a hard and fast amount which will be used when no sensor receives traffic, assuming that little or no traffic is present therein particular route and should exceed the sensor we give the green time to clear traffic.

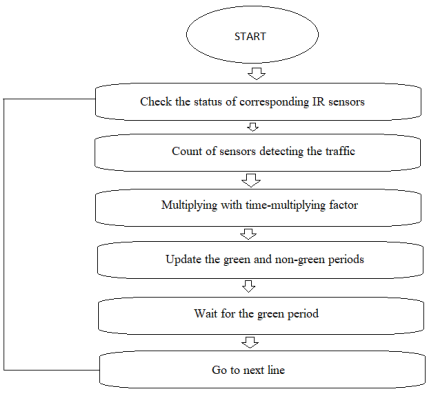

Fig. 3: Algorithm for sensors in traffic signals

[6] Use of technology,

Time Period: -The road signs used follow a fixed cycle of robots. This system proves inefficiency in queues, when there are small cars, the waiting time is always the same and in the case of too many cars, the time remains the same. This can be replaced by more traffic. A flexible system that changes the length of time depending on the number of vehicles present at that intersection without human interference.

Infrared Sensor: - To measure traffic congestion, existing, systems using IR sensors. This uses LOS technology to transmit a light source that detects a car crashing into a counter whenever the circuit is broken. What is worse is that it can be affected by climate change and that is why it has led to false predictions. And the movement of animals on the road can lead to other errors in the predicted quantity.

CCTV Cameras: - HD cameras are currently being used on the sides to detect violators. The blurred image is then applied to the AI model that receives the number. This process is very complex and relies heavily on image processing that requires a lot of computer power, which is why we use a lot of resources. The program therefore comes with some of the following obstacles: Expensive use and repairs, which are affected by climate change, the erroneous effect during the night.

TECHNOLOGY USED

RFID: Radio Frequency Identification uses radio waves to distinguish objectives. This

technology uses Automatic Identification and Capture to scan and store the required data. It has three main parts: -

l. RFID tag

2. RFID-Reader

3. Antenna

The marker has a unique ID and a pre-built antenna for transmitting data to the RFID reader. The reader converts this data into an easy-to-use form. This data can be stored and can be used for further analysis. Each vehicle will have an RFID tag that you give to Unique Identification. This UID will be linked to the details of the RTO vehicle owner. When a vehicle crosses a particular road, details related to that vehicle will be scanned by an RFID reader, who will be placed in front of Traffic Signal. This data will be stored for future use and for observational purposes.

Use of Passive RFID over Active RFID is proposed for the reasons outlined below:

• Active RFID requires a battery transfer transmission and Passive RFID uses RF power to operate.

• For maximum use Active RFID is more expensive than Passive RFID

Use of UHF RFID reception (860 -960 MHz) is proposed:

- Deformed technology
- Fast data transfer rate
- High bandwidth
- Easy to produce

In order for the RFID reader to receive the same tags without error, the tags must be placed on the front window of the vehicle which provides approximately 20 feet of access to a width sufficient for the reader to receive the tags.

DEFINITION AND APPLICATION

The RFID technology used here serves three main purposes:

l) Power Traffic Signal Control by measuring traffic congestion

2) Controlling Red light violations

3) Vehicle Monitoring

The current system uses an infrared sensor, GPS module, HD CCTV camera and a lot of processing power with added difficulty. The use of RFID in the system removes all other technologies currently in use.

The first problem mentioned is the timed cycle of road signs Instead of using an infrared sensor to measure traffic congestion, RFID technology is used. RFID students who were placed ahead of the signs continued to receive all the vehicles. The counter continues to operate and counts the number of vehicles passing the signal over a set period of time. If a certain number of vehicles cross the signal during this time the system operates at the fixed time limit, if the number of intermittent vehicles is greater than the specified time limit, the system automatically generates the delay and increases the time to the green signal. As the green signal period is increased the system will continue to count the number of vehicles crossing the organization. This will ensure that there is a small amount of congestion in organizations.

If there are no cars in a certain line, the system will automatically give a red signal to it and allow a high-traffic route to pass. The discovery of cars to determine the size of the population, it all happened with force.

The second issue is the red light violators. Suppose one lane traffic is removed and a car from another lane where there is a red signal violates the signal and tries to break traffic rules and endangers the safety of other vehicles. This is where other system applications come into play. As soon as any vehicle falls into the intersection with a red signal (violates a traffic signal), the RFID reader receives all the details of the abuser's RTO and automatically sends a warning to him or her and issues a signal violation. Here no one who breaks the law will survive because all the cars on the road must pass RFID cross-road module. The UID for vehicles such as an ambulance, police van, or other emergency vehicle that cannot wait for the red signal to be opened, is allowed to cross the signal without being charged. All other vehicles will be required to follow traffic rules strictly.

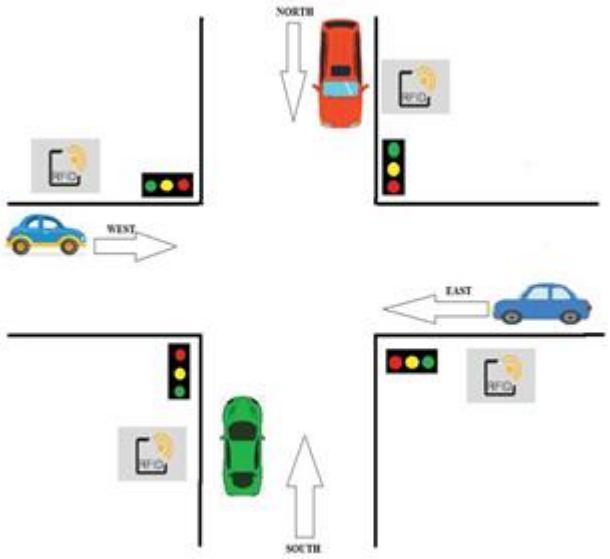

Fig. 4: Placement of RFID readers on a Traffic Junction

The RFID program will be spread throughout the city. Each street will have RFID students. 'Absconding mode' has been added to the system. In the event of a robbery or criminal act in which the police have to apprehend a fugitive, the plan seems to be very effective. According to the framework all vehicles must pass to RFID students or whatever. The UID of the refugee vehicle is highlighted and marked each time it passes one of the sides. A message containing the latest checkpoint of the fugitive is sent to the nearest police station. The system terminates the use of GPS in this case. Vehicle tracking becomes much easier when such a system is used. This paper describes a model using a single technology to solve many problems. Radio Frequency Identification (RFID) technology is now widely accepted around the world. The use of the proposed system reduces the use of resources such as personal and financial resources. A system with reduced complexity and a very wide application gamut will serve as a catalyst for technological advancement.

FLOWCHART AND FINAL SEQUENCE

- Start the process
- Launch the program
- Start getting the UID
- The density of the stiffness opens again
- Whether the signal is red or not
- If so, the UID for the offenders is scanned and minimized and a warning is sent
- If not, continue scanning for monitoring and save data for a period of time.

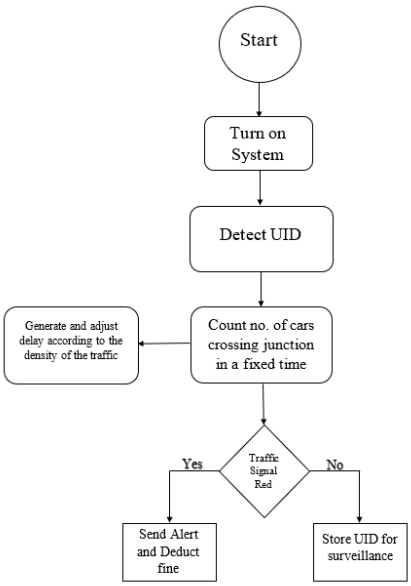

Fig. 5: Stepwise flowchart of UID

[7] Literature research is completed with systematic information and therefore the refore the current work seeks to shut the gap between existing work and the perceived requirements in book reviews. The perceived limit is that the lack of development and implementation of a true program. Benefits of IoT based traffic light Monitoring System: Reduce traffic and traffic jam , monitor real-time traffic flow, traffic jam , tracking lost vehicles using RFID, efficient and accurate traffic monitoring, rapid emergency vehicle clearance. Designing a heavy-traffic road signal system supported signal time will automatically change when it senses traffic jam in a corporation . IR sensors are wont to measure traffic jam in a corporation , which is meant to figure on the goal of delaying traffic signals. for every road resulting in the organization, sensors were installed to calculate the amount of vehicles passing through the world covered by the sensor. By identifying a stolen vehicle, a singular RFID tag read by an RFID student on stolen RFID stored within the system. When a match is found, then the road signal is quickly turned red for 30 seconds. Also, data is uploaded to the RFID webserver number via ESP32 Wi-Fi. The LCD will show the route to which the stolen vehicle is found . The MQTT (Message Queuing Telemetry Transport) protocol is hospitable the Internet-based protocol used ESP32 and Blynk for IoT, I2C (Inter-Integrated Circuit) protocol used between ESP32 and LCD, Universal Asynchronous Receiver-Transmitter (UART) is employed for communication between devices with a Serial Peripheral Interface (SIP) protocol using communication between ESP32 and RFID Reader. Figure 2. shows a diagram of the ESP board system 32.

This is translated into 3 sections
A. Board ESP 32
B. Installation
C. The result.

Board ESP 32

The controller (ESP32) is meant and optimized for electronic, mobile, and Internet of Things (IoT) applications and provides details of all modern features of low-speed chips, including an honest clock, multi-power, dynamic scale, etc. a particular condition is noticeable. The low performance cycle is employed to scale back energy the utilization of a cleaning chip. The output of the facility amplifier also can be changed. Therefore, it provides a moderate trademark of knowledge rate measurement, distance connection, and power consumption. The Microcontroller ESP32 may be a combination of a chip attached to Bluetooth with a 2.4 GHz single Wi-Fi made with TSMC Ultra-low 40nm technology. it's designed to realize better power and productivity and performance of RF and performance, power consumption, reliability on an outsized acquisition base, power scenes, various operations as one level of freedom, hence the only installation. Installation

This section contains 2 sub-sections
1) Type of vehicle
2) Power supply
3) Type of vehicle
This is further divided into 3 categories.
a. Ordinary car
b. Emergency vehicle
c. Stolen car
a) A normal car

It is a public service vehicle wont to travel from one place to a different . Each vehicle will have a singular RFID code tag that identifies the vehicle, the RFID code is read by the RFID reader on the side of the road.

b) Emergency vehicle

An emergency vehicle may be a vehicle employed by paramedics, ambulances, firefighters and police vehicles. within the event that any emergency vehicle like an ambulance is given a singular RF transmitter, transmits the signal and is received by the RF receiver on the server means the controller activates the signals and generates zero traffic and therefore the same is transmitted to subsequent station.

c) Stolen vehicle

It is also a government vehicle that would be stolen or stolen by an unknown person. The server is meant to assist detect stolen vehicles with unique RFID codes. If there are any registered complaints that the car is missing which is different from that car it'll be reviewed on the server. In real time, when a car is found on the road, it'll close all signs and notify the room in order that non-stolen vehicles are often found by a trafficker within the organization.

d) Power supply

To enable your ESP32 kit, you have three options:
• Using a USB port.

• Use uncontrolled voltage between 5V and 12V, connected to 5V and GND pins. This voltage is controlled by the board.

• 3.3V power controls are used, connected to 3.3V and GND terminals. Be very careful: do not exceed the 3.3V limit, or your ESP32 module will be damaged.

C. The result.

The output consists of four categories.

1) Web Server (Blynk App)
2) The seventh stage of the show
3) LCD display
4) Traffic Light

[8] The Traffic Signal Prevention (TSP) programs propose a structure that allows the normal operation of traffic signals to be released. These systems are widely used to change the direction of traffic signals on an emergency vehicle, allowing them to move in a straight line, to help reduce response times as well as to improve road safety. TSP systems are made up of various components namely, Acoustic Systems, Light and infrared based system, Radio based systems, GPS Satellite. It is done by following the steps below.

A. Emergency Application Status

In this program the problem is avoided using a unique IoT process. An effective way to reduce traffic congestion on any conventional vehicle is to prevent traffic jams and reduce patient transport to the nearest hospital. The server detects the location of the vehicle and creates a control request based on that data to prevent the normal operation of traffic lights at a crossroads. There are three levels of performance:

Interruption Request (User): Your traveling companion the patient can send a request for interruption. As smartphones are common these days, the application can be sent using a smartphone with a program. This mobile application allows communication between server and sender. The user sends a request for interruptions to the server and other related metadata such as geo links, an indicator where the vehicle can turn, verification key, user ID etc by the same application. This request is sent to a server, which can be a cloud or web server, processing this data and generating the necessary interruptions. Mobile application authorizes the user, preventing misuse of the proposed application.

Disruption Generation (with server): The web / cloud server receives emergency vehicle metadata. Two geo connectors can be used to determine the direction of the vehicle. This method and the direction between the current vehicle location and adjacent intersections can be used to determine pre-detection. Metadata also includes how a car could turn and a road signal, between three or four road signs at a crossroads could turn green. Every city intersection should be viewed separately from the server and its details such as geo links, place name, etc. When you receive an emergency request from a user, the server / cloud generates an interference signal that is pushed to a specific traffic junction to transmit the required traffic signals. The server does not produce interruptions when the user is farther away from a pre-set value such as 250 meters. This enables the server to generate minor interruptions and reduce the load on the system.

Interruption (Administrator): After the emergency request has been sent to the server and processed, pushed to the intersected intersections, the road sign stops its normal operation and changes the required road sign as requested by the user. After an urgent request is made, the controller restarts the order in which it was operating before it receives a request for interruption.

B. Program authorization

The proposed design has a plan to ensure protection from abuse by users. The user must enter his or her ID number such as AADHAR number in India, social security number in the United States etc. and upload the current photo using the front camera of the smartphone. This data is sent to a server that keeps a complete record in the system. The server generates a value-key pair and is shared between the user's mobile application and the target hospital. As soon as the car arrives at the hospital, the value pair is the same. In the event of a misalignment or expiration of the keys and the value of the value, the citizen may be marked as a system block and legal action may be taken against him or her.

C. Emergency Status Request Priority

The proposed system may encounter multiple disruptions at one intersection. The proposed construction therefore contains a preliminary plan. Priority is determined by the following factors:

The first and most important thing can be given to an ambulance in a critical situation such as a heart attack, a woman giving birth etc.

The second priority may be provided to the ambulance carrying the victim to the hospital.

The most important thing in the end is given to the patient with injuries that can be very serious.

Therefore, donations made to this construction tripled. First, any standard vehicle is capable of emitting a traffic signal in the event of an emergency, eliminating the need to wait for an ambulance to assist any patient from the area to a nearby hospital. Second, the model is integrated with authentication that prevents system misuse. Third, the pre-established approach is considered to make it more efficient. It removes any conflicts that may arise due to multiple emergency situations at certain intersections.

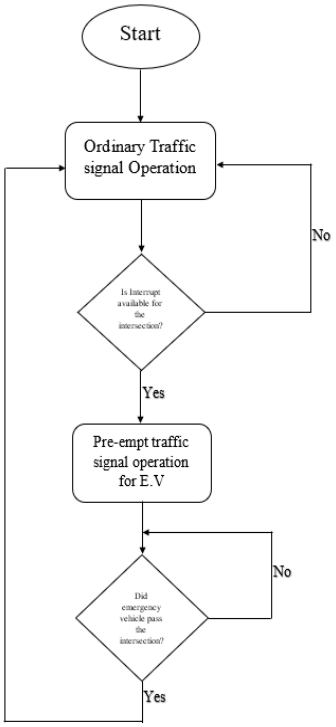

Fig.6: Flowchart of traffic signal operation

REFERENCES

[1] A. Chowdhury, "Priority based and secured traffic management system for emergency vehicle using IoT," 2016 International Conference on Engineering & MIS (ICEMIS), Agadir, 2016, pp. 1-6, doi: 10.1109/ICEMIS.2016.7745309.

[2] S. V. Bhate, P. V. Kulkarni, S. D. Lagad, M. D. Shinde and S. Patil, "IoT based Intelligent Traffic Signal System for Emergency vehicles," 2018 Second International Conference on Inventive Communication and Computational Technologies (ICICCT), Coimbatore, 2018, pp. 788-793, doi: 10.1109/ICICCT.2018.8473210.

[3] K. Nellore and G. Hancke, "A Survey on Urban Traffic Management System Using Wireless Sensor Networks," *Sensors*, vol. 16, no. 2, p. 157, Jan. 2016.

[4] N. Bagheri, S. Yousefi and G. Ferrari, "Software-defined Control of Emergency Vehicles in Smart Cities," 2020 10th International Conference on Computer and Knowledge Engineering (ICCKE), Mashhad, Iran, 2020, pp. 519-524, doi: 10.1109/ICCKE50421.2020.9303706.

[5] S. V. Raut, S. A. Jangam and B. Rajpathak, "Improving Vehicular Traffic Efficiency by Infrared Sensors," 2020 IEEE First International Conference on Smart Technologies for Power, Energy and Control (STPEC), Nagpur, 2020, pp. 1-6, doi: 10.1109/STPEC49749.2020.9297743.

[6] Y. Desai, Y. Rungta and P. Reshamwala, "Automatic Traffic Management and Surveillance System," 2020 International Conference on Smart Innovations in Design, Environment, Management, Planning and Computing (ICSIDEMPC), AURANGABAD, 2020, pp. 131-133, doi: 10.1109/ICSIDEMPC49020.2020.9299578.

[7] N. G. R, S. R, P. S. B and A. B. N, "IoT Enabled Smart Traffic System for Public and Emergency Mobility in Smart City," 2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), Palladam, India, 2020, pp. 53-59, doi: 10.1109/I-SMAC49090.2020.9243489.

[8] P. Attri, F. Rafiqui and N. Rawal, "Traffic Signal Preemption (TSP) system for ordinary vehicles in case of emergency based on Internet of Things ecosystem," 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom), New Delhi, 2016, pp. 85-89.