

## INTELLIGENT TRAFFIC MONITORING SYSTEM

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### **Abstract**

*As the use of vehicles is increasing day by day so the problem of traffic is arising. The problem that is faced due to more traffic is called as traffic congestion. The objective of this problem is to overcome the problem of traffic congestion so that its negative effects like delays, fuel wastage, Emergency ,wear and tear of vehicles, collisions, traffic jams, frustration of passengers and drivers can be avoided. An IR sensor is placed at some distance from the traffic lights. This IR sensor will detect the traffic on the road and will then label that traffic as light, normal or heavy traffic. The assumption of the traffic by the IR sensor will be taken by the Arduino controller and that will be sent to the webpage through the GPRS module installed. . Further, an advanced traffic management system is proposed, implemented using Internet of Things (IOT). The system is supported by a circuit embedded in the vehicle.*

### **Keywords**

Automated traffic monitoring and controlling, Arduino, IR sensors, Traffic congestion and IoT.

### **I. INTRODUCTION:**

India is one among the huge populated country in the world. Due to increase in population, vast transportation is taking place across the country.

One of the most familiar problems that one faces across the globe is getting caught in traffic jams. As the population increases, it increases the number of private cars causing road traffic congestion. The daily commuting on the roads is becoming more exhausting every day, leading to the failure of public transportation system. To keep pace with the growing developing activities in major cities, there is a need to have a traffic control system that manages the traffic light timings and detects traffic light violators.

The fact says that during 2014 in India the total number of accidents are 4.97 lakh (annual) the Deaths are 1,42,485 (i.e., one death in every 3.7 minutes). The recent study states that 90 percent of the accident deaths are occurring while taking victims to the hospital. Nowadays traffic on the road of Indian cities is one of the serious problems. Number of vehicle on city road increasing day by day but roads and infrastructure in the city is not increasing as expected. Controlling traffic signals plays a major role to avoid congestion on the road

In this quick moving world everything is mechanized. Beginning from home apparatuses to following of vehicles every last framework is implanted.

### **II . MOTIVATION**

Nowadays traffic on the road of Indian cities is one of the serious problems. Number of vehicle on city road increasing day by day but roads and infrastructure in the city is not increasing as expected .

Controlling traffic signals plays major roll to avoid congestion on the road .This is controlling system also reduce the effort of police persons which are doing duties on signals.

The growth of industrialization and urbanization has lead to an immense increase in the population invariably leading to rise in the number of vehicles on road. The resulting traffic congestion and traffic jams are the major hurdles for emergency vehicles such as ambulance carrying critical patients as these emergency vehicles are not able to reach their destination in time, resulting into a loss of human life.

### **III . CHALLENGE**

From present situation, an efficient solution to the problem is not yet obtained. Hence in order to provide effective solution we have designed. To

solve this problem to some extent we have apparently come up with “Intelligent Traffic Monitoring System”.

The main concept of intelligent traffic monitoring system is to choose the shortest path for the ambulance to reach the hospitals in time and thereby minimizing the delay caused by traffic congestion.

This paper introduces the novel approach to handle the situation for emergency vehicles like ambulance and fire trucks to avoid traffic to reach the destination in time in order to save the lives. This system architecture is based on Internet-of Things (IOT) using cloud at its center.

This paper also explains the low-cost and real time smart traffic light control system that aims to overcome many defects and improve the traffic management.

The block diagram of the prototype is shown below:

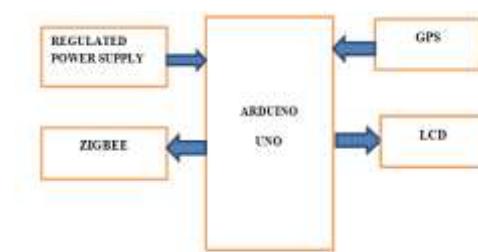


Fig. a Transmitter section

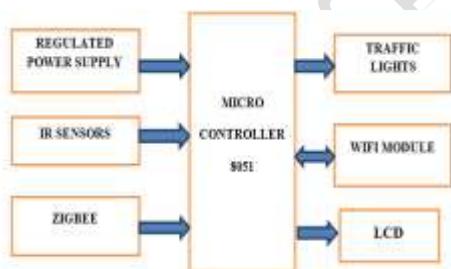


Fig. b Receiver section

In this proposed system we will provide solution to congestion, traffic clearance to ambulance and other emergency vehicles. The proposed system uses real-time GPS to track the location of the vehicle and update the same to cloud , smart traffic signals which are in present in route of the vehicle are notified the same. system maintains the details on the emergency vehicles to pass through the traffic with no or minimum waiting time, thus reducing the number of deaths during the travel to hospital and conditions to reduce the loss of property in case of fire emergency.

The system uses microcontroller that controls the various operations, monitors the traffic volume and density flow through infrared sensors (IR Sensors), and changes the lighting transition slots. This system is designed to monitor density of traffic on the road. If any emergency vehicle like ambulance is detected and tell the system to clear the traffic in critical condition by tuning on green signal on the path emergency vehicle is travelling . All other signals are tuned to red. After passing this vehicle normal signalling is carried on as it is. The system provide green corridor for such situation like emergency organ transplantation.

The Ambulance section is also included in the system. ZigBee TX (Transmitter) is fixed in the ambulance, the ambulance will give the signal to the transmitter and will send information wirelessly to the receiver in the traffic junction.

#### IV . METHODOLOGY:

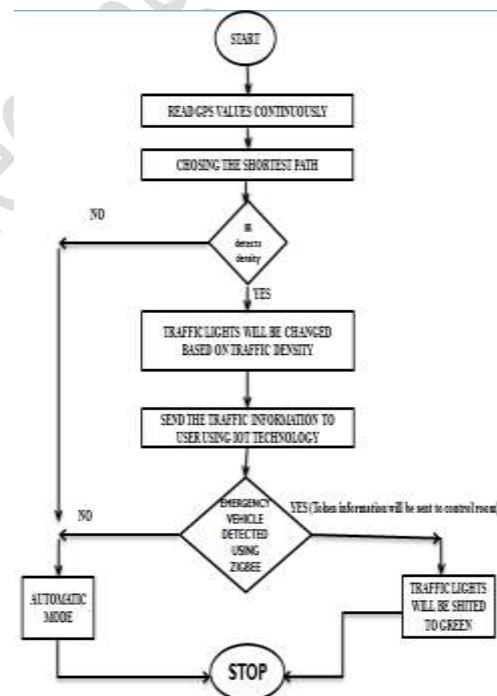
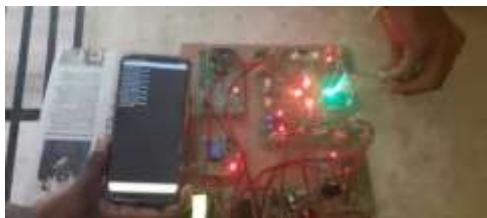


Fig c Flow chart of the project

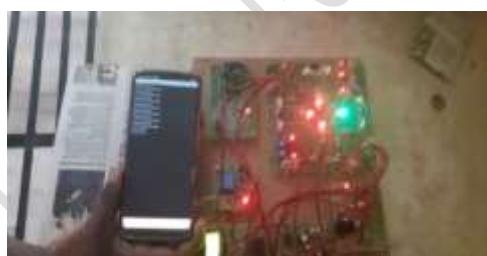
- In the initial position ,the emergency vechile will reach the accident spot where it is occured.
- Then the GPS reads the location values (Latitudes and longitudes) continuously of the emergency vechile...
- Then the emergency vechile will be moving to the hospital. At that time we need to choose the shortest path of the destination (hospital) to reach in minimum delay time .So we are

choosing the shortest path by using routing algorithm.

- While moving in that path ,we may had a traffic junction with 4 lanes. So in that case we are placing four (4) IR sensors at the top of the each lane. These ir sensors will detect the objects i.e.. (vechiles) and label whether the traffic is low ,medium or high.



- Then the traffic lights will be turn to green based on the vechile and traffic density. After changing the traffic signals the information will be send to the user using WiFi module .
- The traffic information will be telecated to user in telenet app using WiFi module ( esp8266).
- Whenever the emergency vechile is detected with ZigBee technology,then token information will be sent to control room. It will provide green signal in which lane it is and other lanes will be tuned to red automatically.



## V . APPLICATION

### Traffic Control:

In this application we will place IR senor at certain distance. Starting from signal light of that road first sensor is kept at 'x' metre distance. Second sensor at  $(x+5)$  metre and third sensor at  $(x+10)$  metre distance. When traffic too high all these sensors will give high output which signifies 'traffic is high', then for 60 sec green light will be ON. If 2nd and 3rd sensors are high it states that 'traffic is medium', then for 45 sec green light will turn ON. If only first sensor output is high the 'traffic is low' so only for 30 sec green light is turn ON.

## VI . RESULT:

In this work, the results are shown for the hospital emergencies. The proposed system can also be used in other emergency agencies.



## VII . CONCLUSION:

The ambulance is controlled by the central unit which furnishes the most scant route to the ambulance and also controls the traffic light according to the ambulance location and thus reaching the hospital safely. The server also determines the location of the accident spot through the sensor systems in the vehicle which encountered the accident and thus the server walks through the ambulance to the spot. This scheme is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time. Ambulance traffic light control system with optimal selecting of the path was presented. In addition, a complete navigation system to the ambulance was provided.

## VIII . FUTURESCOPE

The system saves valuable details in the records of the database, which can provide valuable information to planners and investigators. Further enhancements can be done to the prototype by testing it with GPS, so that the exact location of stolen vehicle is known.

## IX . ACKNOWLEDGMENT

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