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# SMART MOVABLE ROAD DIVIDER FOR CONTROLLING TRAFFIC AND AMBULANCE PATH

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1) *Abstract*— **Basically a road divider is used as a barrier to separate the road for the vehicles which are moving in two different directions. As we have seen around us these road dividers are static i.e., they cannot be shifted/moved from one place to another. We have also witnessed a very high traffic only on one side of the road during peak/rush hours. When there is a high traffic it causes accidents and also many emergency vehicles get stuck in this traffic, which may result in loss of life. Therefore an efficient system is proposed here where smart movable road divider is implemented which will work based on the road density. The ambulance priority system is also included here which provides a free path for the ambulance using RFID tags and RFID reader. Vehicle signal violation can also be detected in this proposed project**.

***Keywords*—Arduino Mega 2560, IR sensors, RFID tags and RFIDreaders.**

**Introduction :**

Traffic has become a major problem in the developing cities or underdeveloped cities. If the vehicle is stuck in traffic this will not only affect the time taken to travel but also the fuel is wasted. Whenever a person gets stuck in traffic a huge amount of carbon dioxide, scientifically expressed as CO2, will be inhaled. This affects a person's health too. Due to this everyday traffic jam illegal activities like robbery, chain snatchingare also increasing. The

population across the globe is increasing day by day but there are no proper developments taking place to manage with the increasing population. This is because the resources which are available to us are very less.

Therefore a move has to be made such that the available resources should only be utilized in a better way possible. With all the above concerns a need has been developed for reducing the traffic flow. The government is also trying its best to reduce the traffic. Various rules are also made the government such as parking the vehicles on busy roads, waiting on busy roads are all prohibited but also the traffic overcrowding problem is not decreasing. Looking at all these problems that have been faced by the people daily, this paper has tried to provide a better solutionfor the day to day increasing traffic.

Hence in this work a smart movable road divider is implemented, which can change its original position based on the density of the vehicles on both side of the divider. As the emergency vehicles are also facing a lot of problem due to traffic congestion, a priority is given to these vehicles also. The signal violation is considered as one of the offence which has to be intimated immediately. Hence if any signal violation is caused by the normal vehicle, an alert message will be sent to the nearby traffic police station using a Wi-Fi module.

## I. LITERATUR SURVEY

In [1], a versatile Traffic Management System (TMS) joined with a fuzzy rationale-based plan so as to take proper activities to accelerate the advancement of crisis vehicles while maintaining a strategic distance from the production of bottlenecks around their courses. This is

 

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accomplished through the all-around planned adjustment activities and crisis reaction plans picked dependent on the crisis level promoted by the crisis vehicle and the yield of the fuzzy framework.

In [2], proposed a innovation in robotizing the traffic signals by utilizing picture handling, Infrared sensor, and in some spot's prioritization in rush hour gridlock motioning towards crisis vehicles dependent on the fuzzy rationale. The test with every one of these frameworks is that it is pricey.

In [3], RFID is a remote connection to extraordinarily recognize objects or people. RFID empowers distinguishing proof from a separation without requiring a view. This disposes of the utilization of additional equipment. This likewise incorporates the acknowledgment of vehicles by the sound of their alarm. This framework stays away from the meddle in in the rush hour gridlock stream the board. By utilizing the RFID tag, a different way will be make for emergency vehicles the rush hour gridlock stream the board. By utilizing the RFID tag, a different way will be make for emergency vehicles .

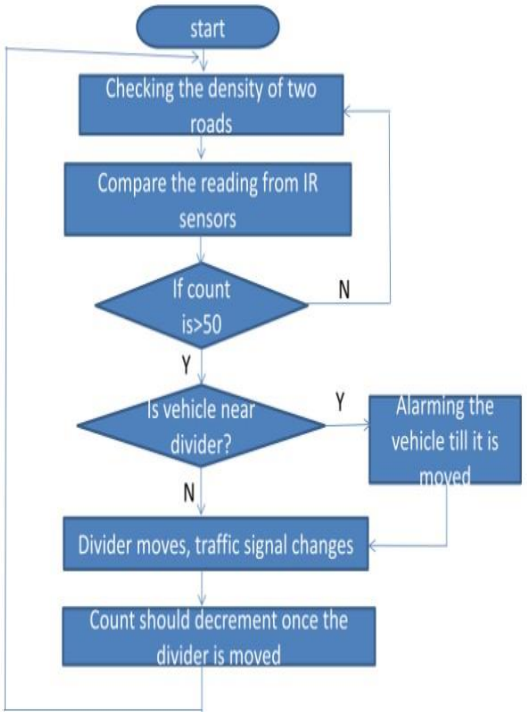
In [4], the traffic parameters, for example, traffic volume, path speed, path inhabitancy, and vehicle progress are gauges and utilized. The day of the week and the hour of day are additionally utilized by the calculation. Information investigation is done on a for every path premise and results are created for every path and for the general street fragment. Improving the proficiency of Traffic Management Systems (TMS) is as yet a functioning and testing research territory because of the criticality of transportation foundation being observed by such system. In , various smart and intelligent vehicle systems have been discussed.

In [5] Developed a project on movable road divider which used to change its position based on the density of traffic. RFID was also used to detect the arrival of the emergency vehicles.

In[6] Proposed a paper to decrease the traffic congestion problem. Here with the help of IR sensors the vehicle density was calculated, and then the divider changed its position. Using RF transmitter and the receiver the arrival of emergency vehicles were known

## II. DESCRIPTION OF PROJECT

In this project Arduino mega is used for the controlling actions. It will receive inputs from IR sensors, ultrasonic sensors and RFID reader. The output will be produced by the




LCD, LED'S, DC motors, RGB LED'S

**Fig1:** flow chart for traffic density condition.

### A. Traffic density condition

- The first step is to check the density of the roads using IRsensor.

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- Then the obtained value has to be compared with each other.
- Here the threshold is set to be 50 that mean if in any road, IR sensor reading is above 50 the divider and signal actions are required.
- After this if there are any vehicle near the divider, alarming is provided. Then the divider is moved creating more lanes for the denser side. After the vehicles are passed the divider and signal comes back to its original arrangement.

### B. Ambulance Detection and traffic violations

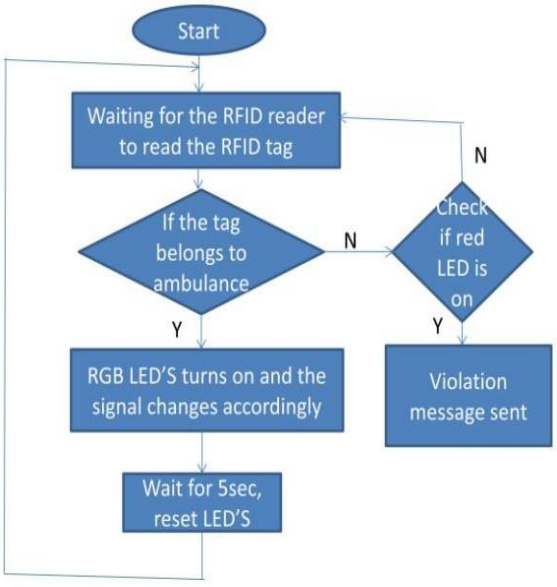


**Fig2:** flow chart for ambulance detection and traffic violation.

- RGB LED's will be deployed on two sides of the road
- Whenever the Arduino receives the signal from RFID reader, RGB LED's connected on road side will start glowing, if itbelongs to the emergency vehicles.
- Ambulance will be detected for 100 mts away in this project so accordingly respective signal will clear the Path for theAmbulance.
- Using RFID which will be attached to every vehicle, traffic violations can be detected. Using ESP8266 the authentication message will be sent to the local traffic police station.

### C. Overall working

Here we use 4 IR sensors, two for each road. At the road's entry point the IR sensor was used to increment the vehicle count whereas the exit point sensor was used to decrement the count. This was helpful to find if the vehicles got cleared at the road. So based on the density the divider movement was controlled. If any object is sensed by the ultrasonic sensor the divider movement will stop. All the actions of the road divider will be displayed on the LCD screen. Smart traffic light controlling is also included in this project. When ambulance with RFID tag arrives, the RFID reader sends the message to Arduino about an emergency request. Therefore the signal of the corresponding road changes to green and the traffic is cleared immediately. To intimate the drivers about the arrival of the ambulance, RGB LED'S glow in the red color.

## III. BLOCK DIAGRAM

In this project Arduino mega is used for the controlling actions. It will receive inputs from IR sensors, ultrasonic sensors and RFID reader. The output will be produced by the LCD, LED'S, DC motors, RGB LED'S.

This is the block diagram of smart movable road divider. Using this device we can control the traffic. The traffic intensity is detected by using ir sensors. And divider is moved using servo motors. Rfid tags are used to theemergency vehicle

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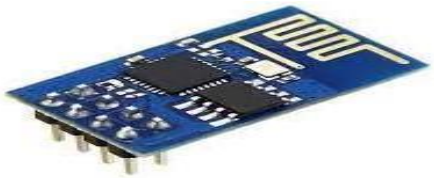


**Fig3:** Block diagram of smart movable road divider

## IV. HARDWARE DESCRIPTION

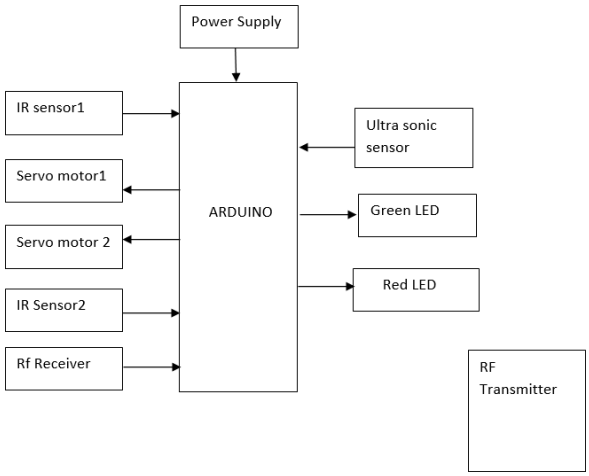
- **Arduino :**

Arduino is an open source equipment and programming. It has 14 advanced input/output pins, 6 simple data sources, a 16 MHz artistic resonator, a USB association, a force jack, an ICSP header, and a reset button. It contains everything expected to help the microcontroller. The ATMEGA328 on the Arduino UNO comes preprogrammed with a boot loader that permits us to transfer new code to it without utilizing an externalhardware programmer.

**Fig4:** Arduino board

- **ESP8266 Wi-Fi Module**

ESP8266 is Wi-Fi enable system on chip(SOC) module created by Espressif framework. It is for the most part utilized for the advancement of IoT implanted




applications. It eases independent remote handset that can be utilized for end-point IoT advancements. It has 2.4 GHz Wi-Fi, 16 GPIO, 10 piece ADC, Inter-Integrated Circuit serial communication protocol

**Fig6:** ESP8266 Wi-Fi Module

- **DC MOTOR**

A DC motor is an electric motor that runs on direction current. It chips away at the way that a current conveying conductor set in an attractive field encounters a power which makes it turn as for its original position.

**Fig7:**DC motor

- **LIQUID CRYSTAL DISPLAY**

An LCD is a flat board show or another electronically adjusted optical gadget that utilizes the light-

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balancing properties of fluid precious stones consolidates with polarizers. Fluid precious stones don't emanate light directly, rather utilizing a backdrop illumination or reflector ıochrome.


**Fig8:** liquid crystal display

The fundamental point in the planed structure is to diminish the reaction time to emergency or government vehicles, for instance, emergency vehicle , government, police, and firefighters vehicles and so forth., by giving RFID tag to these vehicles. The proposed technique is clarified utilizing the stream diagram as appeared in figure underneath. The suggested structure shows that the vehicle out and about are taken in tally and relying upon the power of traffic the divider moves. Two sorts of sensors are used here normal and high types The data acquired from sensors are refreshed in the site through the Wi-Fi module and showed on LCD. At the point when an emergency vehicle with an RFID label goes through each observing station along with the road, the RFID reader at those focuses will consequently read the label information identified with the emergency vehicle and gives the path by moving the divider. At the point when system interfaces with the web, all the information about traffic conditions on each street area are immediately saved in the database which is storage point and can be used in any way, shape ,or form and application

## IV. RESULTS

The experiment was done on smart movable road divider with ambulance priority system and obtained . Here we use 4 IR sensors, two for each road. At the road's entry point the IR sensor was used to increment the vehicle count whereas the exit point sensor was used to decrement the count. This was helpful to find if the vehicles got cleared at the road. So based on the density the divider movement was controlled. If any object is sensed by the ultrasonic sensor the divider movement will stop. All the actions of the road divider will be displayed on the LCD screen. Smart trafficlight controlling is also included in this project.

When ambulance with RFID tag arrives, the RFID reader sends the message to Arduino about an emergency request.

## V. CONCLUSION

Before starting this project a survey was done regarding the traffic density problem which was faced by many countries. The main aim was to provide a better solution to the traffic problem and to save lives. So this efficient system was designed and tested for the same. With the help of the smart divider traffic blocking problem was reduced. Whereas by using RFID system a free path was provided for emergency vehicles in a two way road and also signal violations were detected easily.

Here undertaking, the road is related with a cloud which steady seeing of the traffic is done and the density of traffic is moved to the cloud. Traffic density which is open in the cloud can be used for a various purposes like traffic writes about various applications for example, here maps. In the wake of transferring traffic reports on a cloud by considering traffic force in three factors like LESS, MEDIUM, and the MORE road divider is moved by a small distance. In the event that force is LOW, at that point divider remains in its position. If the intensity is MEDIUM then divider moves by a little separation. In the event that intensity is HIGH, at that point divider moves by an enormous separation. The project additionally gives an answer for traffic clearance to the emergency and government vehicle. Utilizing RFID a cloud is made to distinguish the appearance of an emergency vehicle and afterward to make a path uniquely for emergency vehicles by moving streetdivider in a like manner.

## VI. FUTURE SCOPE

For now the smart movable road divider can only control traffic and ambulance path by moving the divider based on

 

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the intensity of traffic. In future it can also accidents and send information and location of accident prone area.And send give information high traffic areas and control traffic

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