

# Traffic Control System Using Barricade

Minakshee Suryawanshi<sup>1</sup>, Poonam Wagavkar<sup>2</sup>, Shweta Chendake<sup>3</sup>, Anagha Deshpande<sup>4</sup>

<sup>1,2,3,4</sup> Dept of Electronics and Telecommunications Engineering

<sup>1,2,3,4</sup> MIT College of Engineering, Pune, Maharashtra, India

**Abstract-** India is the second largest road network in the world. The traffic jam is a testing time for families of patients who were being transported in ambulances. Sometimes people died just because of not reaching hospital at time. Traffic jam occurs due to violation of traffic rules. Hence it is necessary to implement traffic control system which can smartly identify the ambulance, give priority to it and lifting a barricade up by managing the traffic signal. In this system steel barrier is used to control traffic system which can be opened by receiving the signal from ambulance and closed when ambulance passes through signal. This system consists of rack and pinion, RF module, Arduino, Servo motors and LED's. This is a smart way by which we can able to drive the traffic as per need.

**Keywords-** Ambulance, Arduino Uno, Barricades, RF Module, Rack and Pinion, Servo motor, Traffic signal.

## I. INTRODUCTION

The problem of ambulance getting stuck in a traffic jam can be addressed by ensuring that the lane in which the ambulance is travelling is cleared. That is, arrival of ambulance is to be a communicated to the nearest traffic signal, so that it can turn the light to green and hence clear the traffic. Nowadays people don't follow the traffic rules sometimes Stopping at red signal isn't mandatory for them. People keep moving even though red signal is visible to them and this causes accidents. To overcome this problem, we thought of the new system for traffic management. In this we introduced the idea of blocking the road by using steel barrier when red signal comes up [1]. One of the major causes of traffic is violation of traffic signal, hence it is necessary to introduce a system which will ensure driver will compulsorily follow the traffic rules and violation of traffic signal not be possible [2]. The most commonly used Traffic controlling System in developing countries is the microcontroller-based system. This system involves a predefined time interval setting for each junction road at every junction [3]. The barricades increase the traffic-handling capacity of most intersections. They can work independently on timers, or connect to a microcontroller that operates over several intersections in a control room. In a computerized system, traffic barricades are placed at several locations-generally in the pavement [4]. Several accident cases on traffic control have been reported in past due to poor control of traffic control at cross roads. In

today's world speed is the ultimate word. Everyone is running a ratrace and people definitely prefer to spend more time and utilize their energy in doing their respective professional and personal work rather than wasting both their valuable time and energy in commuting on road [5]. In this system we are using rack and pinion mechanism which will ensure lifting of barricade up and down according to the traffic signal. When there is ambulance in any lane it is identified by IR sensor and immediately the signal from IR are given to traffic signal on that lane. upon reception of IR signal traffic signal get controlled and barricade lifting downward to clear the path for ambulance. Once ambulance passes through signal automatically signal come to their original position, barricade lifting upward and traffic flow become continuous. The traffic barricade system will smartly manage the working of traffic signals and will not driver to violate traffic signals at any cost. On the other hand, it is practically not possible for traffic police to control the smooth moving of vehicles at each and every signal. As the number of traffic police as compared to traffic signals is very less. This smart traffic barricade system will significantly reduce the workload of the traffic police and approve more efficiency in road transportation and health.

## II. RELATED WORK

This system takes ideas from other systems which have already been implemented earlier. It merges two different project ideas into single unit. It is an extension of already existing traffic control system. But here we are using steel barricade, which will automatically go down when it receives signal from ambulance, irrespective of the traffic signal. The accuracy is very crucial for the system since half a second up or down can cause damage which can lead to road collisions. This process is highly efficient as well as reliable for working out the traffic congestions and preventing the breakage of traffic rules.

## III. COMPONENTS

### A) Hardware specification:

1. Arduino Uno
2. Rack and pinion
3. servo motor
4. RF module

**B] Software specification:**

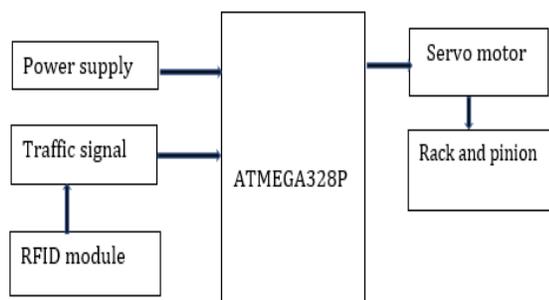
Arduino.cc

Table 1. hardware specification

Sr. No.	Component Name	Specification
1	Arduino Uno	Microcontroller: ATMEGA328p Frequency: 16MHZ Digital I/O pin: 14 Analog I/O pin :6 RAM: 2KB
2	Rack and Pinion	A rack and pinion are a type of linear actuator that comprises a pair of gears which convert rotational motion into linear motion.
3	Servo motor	Operating voltage: 5V Torque: 2.5kg/cm Operatingspeed :0.1s/60° Rotation: 0°-180° Weight: 9gm
4	RF module	Operating frequency :434MHZ Range: 500ft Supply: 1.8-5.5DC

**IV. WORKING PRINCIPAL**

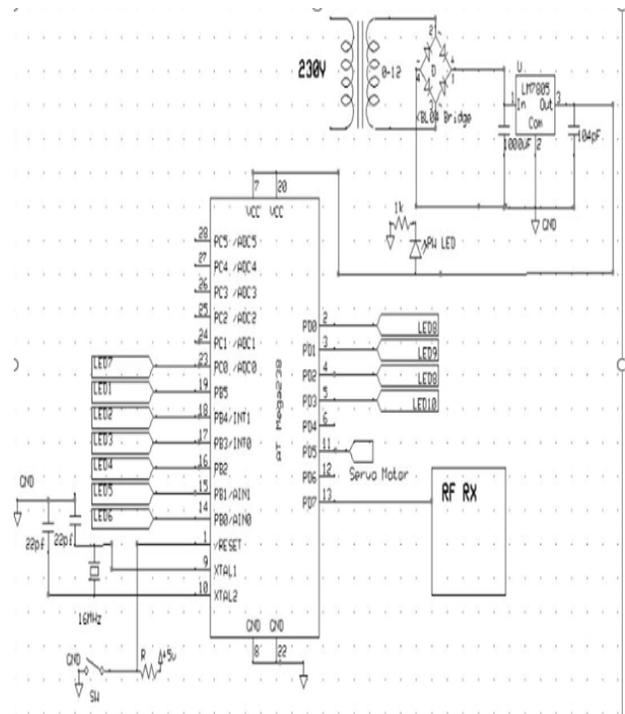
The main idea behind the working of smart traffic barricade system is barricade that will allow the driver to stop their vehicle when the traffic signal is red. Secondary thing is priority to ambulance, that means whenever it receives the signal from ambulance irrespective of the position of traffic signal the barricade will lift upward and give service to the ambulance. for that in 5 seconds the barricade will raise up to the a desired height and then will hold the position for 10 seconds and further the barricade will lower down in 5 seconds as soon as he receives signal from ambulance. This periodic arrangement is obtained with the help of arduino unit. The initial step is to upload the code into the arduino board. The output of arduino board is around 5V and servo motor is interfaced to the arduino board. Pinion is attached to servo motor while the rack is connected to pinion. Thereby rotational motion is converted to linear motion.



**Fig 1. block diagram**

**V. CIRCUIT DIAGRAM**

This proposed system consists of Arduino Uno which does all the function according to program interfaced. It consists of RF module, LED's, servo motor, rack and pinion. The servo motor is interfaced to pin PD5 which attached to the rack and pinion mechanism which intern lift the barricade up and down. The RF module is connected to pin PD7, which receive the signal from ambulance and transmit to the arduino board. The pin PC4 to PC1 is given to IR and pin PB0 to PB5 are given to LED's. When the signal from the ambulance is detected these signals is transmitted to RF module of controller. The controller then send signal to servo motor. This motor is attached with rack and pinion, which lift the barricade.



**Fig 2. Circuit diagram**

**Algorithm:**

- Step 1:** Traffic signal start and signal is RED, the barricade is in upward direction.
- Step 2:** RFID continuously check the status of ambulance.
- Step 3:** As soon as the ambulance is detect on one of the lane on road ,RF transmitter module send signal to receiver module.
- Step 4:** receiver send signal to Arduino Uno which acts as a controller.
- Step 5:** Microcontroller perform two action as soon as he receives the signal from RF receiver A) it sends signal to traffic signal LED'S  
B) It sends signal to servo motor

Step 6: as soon as traffic signal get controlling signal from microcontroller it immediately releases the signal in lane on which ambulance is detects GREEN

**Step7:** simultaneously servo motor receive the signal and it send signal to rack and pinion for opening the barricade for the same lane.

**Step 8:** once ambulance is passed the barricade automatically goes upward and traffic signal come to original position.

## VI. HARDWARE



## VII. CONCLUSION

This proposed system will solve the problem of traffic jam in developed country and not allow the driver to break the traffic signal, It will also help the emergency vehicle to reach in time to the destination. So, this intelligent system will help us to control traffic in more autonomous way. The traffic barricade system is very effective in controlling traffic. The whole setup of Smart Traffic barricade system can be implemented in cities with increasing traffic problems. This will help in betterment of smooth moving traffic. The whole setup can be implemented at signals. By implementing this system, the problem of ambulance stuck in a traffic is overcome and we can save the life of people who is travelling in those ambulances.

## REFERENCES

- [1] Keyur Sudhir Shirgaonkar; Traffic Signal Controlling By Barrier Using PIC 18F4550. *International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering*
- [2] Sumeet Sambhaji Pisal, Ajinkya Snehalraj Patil, Vinayak Shankar Agrawal; Smart traffic barricade system *International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056*

- [3] Rashid Hussein, Sandhya Sharma, and Vinita Sharma, et al. WSN Applications: Automated Intelligent Traffic Control System Using Sensors. *International Journal of Soft Computing and Engineering (IJSCE)*. ISSN: 2231-2307. 2013; 3(3).
- [4] Ahmed Salih Mahdi. Al-Zuhairi. Automatic Railway Gate and Crossing Control based Sensors & Microcontroller. *International Journal of Computer Trends and Technology (IJCTT)*. ISSN: 2231. 2013; 4(7).
- [5] Lutfun Nahar Nipa. Development of a Traffic Control System by Using Microcontroller Based Barricade. *Journal International of Image Processing and Artificial Intelligence*