



# SMART TRAFFIC CONTROLLER SYSTEM WITH STUD BARRIERS

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## ABSTRACT

Traffic is a major concern for most of the metropolitan cities of the world. Existing traffic system follows the method of merely listening traffic signals based on the three colors indicating the direction to the driver. People should listen the signal and follow the traffic rules. Now a days, people are least bothered about the signal being highlighted leading to drastic conditions like accidents, congestion, traffic blocks etc. To overcome this problem, the proposed system has been developed for traffic signal with automatic Rigid poles which acts as barrier. In this system, we introduce minimum of four to five poles in each lane, which controls the flow of the vehicle. The major goal of the project is to make traffic management system work dynamically using Internet of Things opened for traffic signal with Rigid poles that emerges automatically from the surface of the Road that maintains a Proper discipline of Road and control congestion. To avoid these circumstances, one new type of traffic system has been developed.

**Keywords-** Traffic management system, IOT, Arduino, LED lights processing, Relay, Gun, Buzzer.

## I. INTRODUCTION

Now a days, the traffic condition have become congestion to people making them face a lot of difficulties. Even for a small journey comprising very few kilometres is taking long duration. Also, the accident count is increasing tremendously due to the above stated problem.

Since, people used the road traffic signal only for signal like red for stop, yellow for wait and green for go. If the red light is on, all vehicles must stop. At the same time, if on the other direction when the green light is on, the vehicle can cross. This is the existing method for traffic signal. At the time of signal change from green to red, at that few seconds they want to cross the road. So, they ride very fast. They don't wait for the next signal change. At the same time, in the other direction, the vehicles automatically moved for change of green signal. These two vehicles are crossed at the centre of junction in the same time. So accidents are occurred. In order to avoid such a scenario, new traffic system has been proposed.

## II. LITERATURE REVIEW

Due to the increased population vehicles, technology causes lot of difficulties such as traffic jam. Traffic control system may vary based on countries and technology, etc., Traffic congestion is a major problem in cities of developing countries like India. [1] Due to the increased population, vehicles, technology causes lot of difficulties such as traffic congestion and traffic jam. [2] Besides physical elements such as congested roads, unchecked constructional work and increasing number of vehicles, following the timings of traffic lights is a major factor for jams. [3] Traffic jam is the main cause of inefficient traffic system and no strict laws have been followed which may also leads to incidents in heavy road. [6] Traffic control system may vary based on countries and technology, etc., In India, there are two types of traffic control systems. One of the methods, traffic police man controlling the traffic directly and other one is automatic traffic signal system with red, yellow and green lights. [2] Intelligent Traffic Control System has been a common and popular mode of traffic controlling in developed countries. Technologies are used in monitoring, controlling and maintaining their traffic systems and therefore the users of those developed countries can enjoy a flawless traffic system. [4] But some emergency vehicle like ambulance, fire brigades and other important security conveys get struck in the traffic and have to wait which is not desirable. It is also difficult for a traffic police to monitor the whole

scenario.[5] A green wave system which are used to provide clearance to any emergency vehicle by turning all the red lights to green on the path of emergency vehicle hence providing a complete green wave to desired vehicle. [7] The focus of this paper is to reduce the delay in arrival of the ambulance to the hospital by automatically clearing the lane, in which, ambulance is travelling, before it reaches the traffic signal. This can be achieved by turning the traffic signal, in the path of the ambulance, to green when the ambulance is at a certain distance from the traffic junction.[8] which can change travel on each links with equilibrium flows that will optimize.

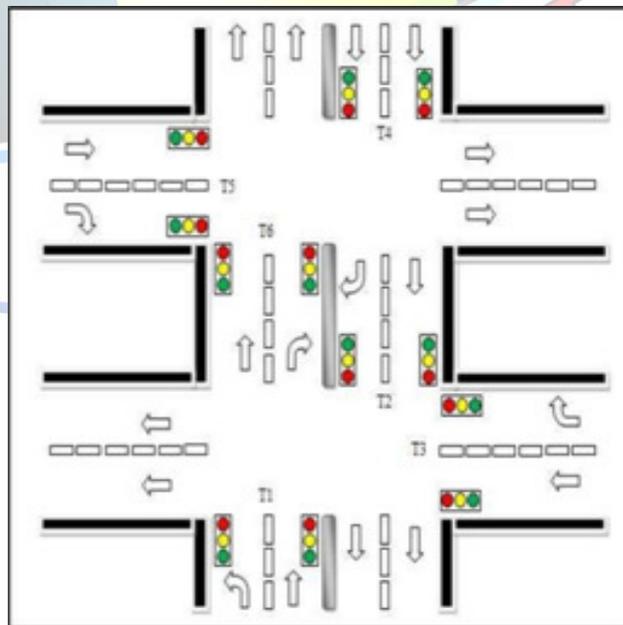
### III. EXISTING METHOD FOR TRAFFIC SIGNAL SYSTEM

Traffic signal system used to control the vehicle flow. Dueto increasing population, amount of vehicles, it should bedevloped with best performance. Nowadays, many accidentand congestion of traffic occur with the increasing population and number of vehicles. To avoid this problem, traffic signal system should be providing easy and convenient method to vehicle flow where the vehicles move from one direction to another direction.

In this method, it has 3 signal lights such as red, yellow and green. The top of the light is red for stop, middle of the light is yellow for wait and bottom of the light is green for go. The road has four direction such as north, south, east and west road. Each direction has two lanes. lanes are available[9]. In this situation, this system should maintain minimum 4 states for vehicle passing through the road. Fig 1 shows the road signal of four corners such as north, south, east and west. Each corner has two lanes such as left and right. Totally eight lanes are available in the existing method. In this method, each corner has two signal lights. One for the light is left side corner and other for right side corner. So, totally 8 signal lights are available.

Normally, any traffic method is better than only indication signal method to control the vehicle flow[8]. The indication method is only used for seeing some details. It cannot control the vehicle directly. Just it is blinked for seeing.

For example:,at the night time, nobody follow the signal. At the same time, any physical method is controlled the signal, a situation arise for all the people must follow the traffic rules.



**Fig.1 Existing method of Traffic Road Signal**

#### A. *Advantages of existing system*

Many advantages are available in existing traffic signalsystem such as reduction in normal recurring, enhancedworking tools to maintain the congestion, to improvedtransport service, to reduce the emergency response time, toimprove traffic flow, to reduce fuel consumption and less cost.Even though there is a proper channelization beingfollowed in the current traffic control system, the public is notsticking to it properly which leads to increase the number ofaccident.

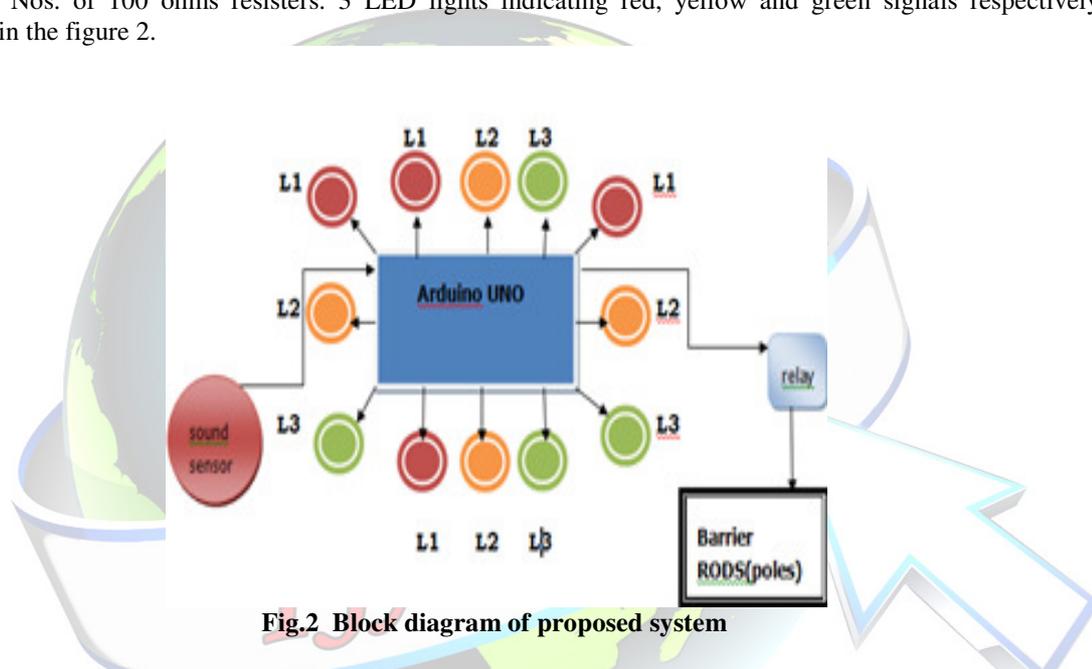
Forexample, it is a well known fact that red indicates “stop”, yellow indicates wait and green indicates go[6]. Once the red signal blinks, it should be understood that the vehicle has to be stopped, making the other side to go. In this situation, if it is not properly followed the scene becomes worse.

**B. Disadvantage of Existing method**

Existing traffic signal system is only used to indicate the signal. Each and every person should watch the signal and follow its rules when riding a vehicle. But, nobody wants to wait in the road when the signal lights turn from red to green. The vehicles are flying in the center place of junction area even red lights are blinked or vehicles are going very fast before another side vehicle crosses this place, even when red lights are blinked[10]. Because they don't want to wait and spend their time in waiting.

**IV. PROPOSED SYSTEM OF TRAFFIC SIGNAL SYSTEM WITH BARRIER**

In this proposed system, a computer is connected with Arduino through a cable. The cable of Arduino is connected with the ground of a breadboard. From the ground of the breadboard, 3 Nos. of LED light is connected through 3 Nos. of 100 ohms resistors. 3 LED lights indicating red, yellow and green signals respectively are shown in the figure 2.

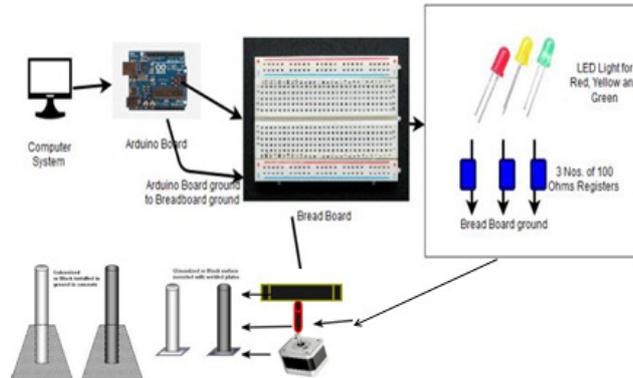


**Fig.2 Block diagram of proposed system**

Along with this, a gun connected to a relay which is in turn connected from the breadboard. At the top of the gun, the rigid poles are connected through an adjusted rod. If one of the LED lights connected in the breadboard turns Red, then the relay which acts as a switch is oned and a Gun which is connected to the relay is pushed which in turn pushes the poles from the surface of the road and act as a gate to stop the vehicle. These poles which are emerging from the bottom of the road will be containing Red lights indicating the vehicles to stop, along with this lights, a buzzer is placed inside the poles which produces a beep sound which alerts the public to stop the vehicle. In this system when the poles are emerging from the bottom suddenly, then the vehicle with high speed can be controlled by building the humps with few distance away from the poles, which controls the speed of the vehicle.

Similarly when the signal is turned to Green, the relay which acts as a switch is turned OFF and the gun is pulled down, where the poles which were introduced earlier emerge out of the floor (road) and free the vehicle in that particular lane and allow the vehicle to move. The proposed system has four corners such as north, west, south and east. Each corner has two sides left and right. Each side has one relay and 4-5 poles to control the vehicle flow. If at one side of the corner, the red light is ON state, at the same time the poles emerge from the surface before the signal lane. At the same time, the rods in the other direction move down for the free movement of the vehicles on the other side with green signal. In case if there is any emergency vehicle like ambulance, police, fire engine in one particular lane, then we will be placing two sound sensors in each lane which is used to detect the sound of any emergency vehicle. Once the sound is detected in some particular lane and if that lane's signal is Red and emerged with poles, then immediately the signal with Red light is turned to

Green and the poles is pulled down the floor, and release that particular lane and allows the emergency vehicle is to move. This Proposed system is to control the vehicle flow, congestion, traffic and accident, Also maintains the proper discipline which allows the public to follow the rules.



## V. WORKING DESIGN OF PROPOSED MODEL

The proposed system has been developed to implement the new method with barrier, designing and controlling the traffic light signal and flow of vehicle on a busy road. The design of the proposed system consists of a barrier for the purpose of indicating the current signal to be followed by the rider. It is designed in such a way, that the barrier pops up gradually once the signal falls to yellow and stops (emerges completely) when the signal turns to red. Similarly, the reverse happens when the signal starts falling from red to green. The proposed system opens a new version of vehicle control system to overcome the congestion of traffic jam. In this method, no vehicle passes the centre of the junction when the red light is switched ON in each direction. As shown is below figure

## VI. DISCUSSION

Here, the proposed system designed for one lane barrier and its working process is showed in the implementation process and the process of other lane poles in theoretical method. They are discussed later in the future enhancement. If any emergency vehicle like ambulance is crossed, the sensor detector can identify the vehicle and also gives route for emergency vehicle. In case any emergency vehicle enter the congestion it must be allowed to move freely without any hindrance which is also focused in the proposed algorithm.

## VII. CONCLUSION

The current method of traffic signal system involves a worst case condition, which if not followed leads to accidents. In order to overcome, such a scene a new methodology has been proposed which follows innovative technique of involving barriers stopping the driver amidst of signal being highlighted. This paper consists of solution for ambulance vehicle or any other emergency vehicle.

## VIII. FUTURE ENHANCEMENT

Any vehicle that fails to notice the red signal being ON may dash the poles at any movement. If the vehicle speed is not controlled by the speed breaker may dash the poles. If sound is not properly detected then it fails to reduce the poles. As we are using the gun for the poles to emerge from the road and goes down, we need more guns to implement in larger areas.

## REFERENCES

- [1] Akcelik R, "Traffic Signals: Capacity And Timing Analysis", Australian Road Research Board, ISSN: 1445-4467, ISBN 0 86910015 7, 1981.



- [2] Ara N. Knaian, "A Wireless Sensor Network for Smart Roadbedsand Intelligent Transportation Systems", Department of Electrical Engineering and Computer Science, Massachusetts Institute ofTechnology, June 2000 International Conference on Inventive Systems and Control (ICISC-2017).
- [3] Hai Yang and Sam Yagar, "Traffic Assignment and Signal Controlin Saturated Road Networks", Elsevier Science Ltd, Vol 29A, No.2,pp-125to139, 1995.
- [4] Hunt P B, Robertson D I, Bretherton R D and Royle M C, "TheScoot on-line Traffic Signal Optimisation Technique", The nationalacademic of sciences, engineering, medicine, Volume: 23, IssueNumber: 4, Publisher: Hemming Group, Limited, ISSN: 0041-0683.
- [5] Krishnaiah G, A.Rajani and P.Rajesh, "Literature review on trafficsignal control system based on wireless technology", InternationalConference on Developments in Engineering Research (ICDER),2014.
- [6] Luz Elena Y Mimbela and Lawrence A Klein, "Summary of vehicledetection and surveillance technologies used in intelligenttransportation systems", Southwest Technology DevelopmentInstitute, 2000.
- [7] Mario Collotta, Tullio Giuffre, Giovanni Pau, Gianfranco Scat. A,"Smart Traffic Light Junction Management Using Wireless SensorNetworks", WSEAS Transactions on Communications, E-ISSN:2224-2864, Volume 13, 2014.
- [8] Meenu Bhati, Mamta Devi Sharma, "Lan based intelligent trafficlight system with emergency service identification", InternationalJournal for Research & Development in Technology, ISSN (Online)2349-3585, Vol 2, Issue 1, July 2014.
- [9] Parthasarathi chakraborty, Prajeeth Nair, Pranshu Raj Sinha andIshan Kumar Behera, "Read Time Optimized Traffic managementalgorithm", International Journal of Computer Science & Information Technology (IJCSIT), Vol 6, No.4, August 2014.
- [10] Richard E. Allsop, "Delay-minimizing Settings for Fixed-timeTraffic Signals at a Single Road Junction", IMA Journal of AppliedMathematics", Oxford Journals of Science & Mathematics, IMA Journal of Applied Mathematics, Volume 8, Issue 2, Pp. 164-185, 1971.

