

# DESIGN OF AN INTELLIGENT TRAFFIC CONTROL SYSTEM

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**Abstract :** *The number of vehicles is gradually increasing day by day all over the world. Vehicles are also increasing in the metropolitan cities of Bangladesh. As a result huge traffic congestions and traffic jam is increasing day by day. For traffic congestions a huge amount of time is being wasted by the citizen of metropolitan area. In this proposal an intelligent traffic control system is developed by us to minimize the congestions of traffic system. Here the traffic signal will be automatically control by the system. When a certain number of vehicles are stuck in the traffic signal then the other part of the path will be show red signal and the congested path's signal will be Green. After a few times when the first path will reach a certain number of vehicle then the second path's signal will turn into red and the first path's signal will turn into green. Our intelligent traffic control system can detect temperature of the environment also. And the information about signal and temperature will send to the certain vehicle holder by Short Message Service (SMS).*

**Keywords:** *Short Message Service (SMS), Red Signal, Vehicle, Intelligent Traffic Control System.*

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## I. INTRODUCTION

Congestions in traffic system occur when there are more vehicles than the road can handle. This situation makes the trip longer than it should be as it increases the queuing of vehicles. This phenomenon is also known as traffic jam. Congestions in traffic can be a result of accident, going through wrong way, for VIP passing, unauthorized parking etc. it can be happened due to bad road layout, misunderstanding traffic rules also.

Various studies and surveys have estimated that, on a daily basis most of the traffic congestion or traffic jams occur because of traffic light system. Traffic congestion is nothing but an additional waste of time from one's daily routine. It is noticed that most of the traffic congestion is occur during the morning and late afternoon. Basically during that time the students and employers go to school, college,

University or office so they also be late for their office or institutions at the traffic light spot. As the number of road users constantly increasing with respect to time, and resources provided by current infrastructures are limited, intelligent control of traffic will become a very important issue in the future. Avoiding unwanted traffic jam would be beneficial to both environment and economy.

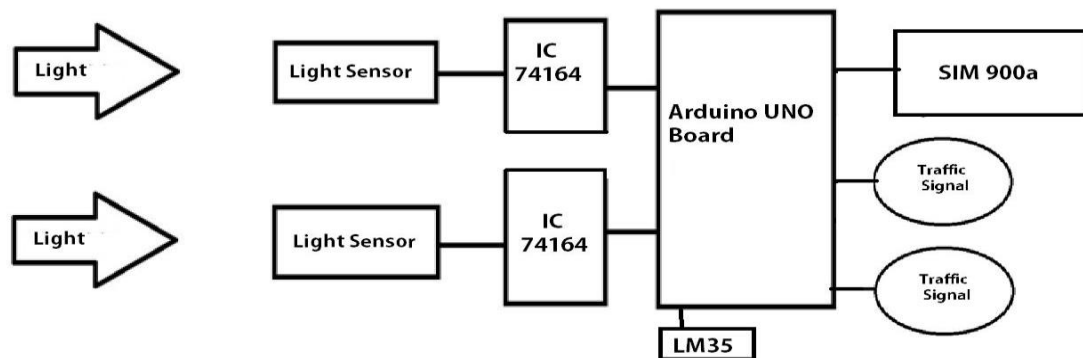
Our smart traffic light and congestion control system designed to have a solution of traffic congestion problem of metropolitan cities of the country that will results in minimizing the economic cost and save time also. By decreasing the congestion of cities we can also decrease the extra waste of energy like CNG, Petroleum for special case electricity also. As a densely populated developing country like Bangladesh whose GDP is on an average 6% and whose most of the foreign currency from reserves are spent on importing petroleum and electricity, can't afford to waste such an important resource.

### Intelligent Traffic Control System

We propose a new intelligent traffic control system that is able to control the traffic system through traffic signals on the basis of current traffic density. The current traffic control system of Bangladesh is controlled by the traffic police manually. Some roads of Dhaka city have a automatic system for controlling the traffic light. It has fixed time interval for passing the traffic from either sides of the road that causes congestion problem. Our intelligent traffic control system will solve this problem on real time basis. This system will observe the current traffic condition then it will take decision that which road will remain open and which road will be remain close.

## II. SYSTEM DESIGN AND ANALYSIS

The hardware design of this project is very simple and efficient also. First of all we have designed the Dark sensor. The Dark sensor generally works as counter. And counter passes a signal after a significant number of signals or movement is detected. Then we have designed the whole circuit in the breadboard with the help of microcontroller. Arduino UNO board is the perfect choice to make the project more efficient and easy also.

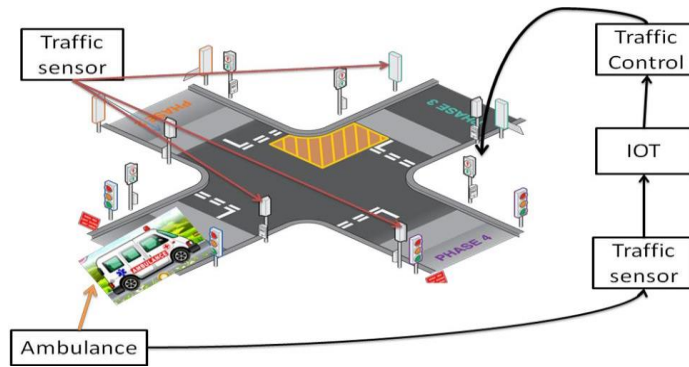


In this control system we have used some basic components to design this circuit. These components are found easily at any electronics shops or markets. For counting we have made a light sensor with some basic components. The output of this circuit is connected to the Yellow, Green and Red lights of Traffic Signal.

## III. IMPLEMENTATION AND TESTING

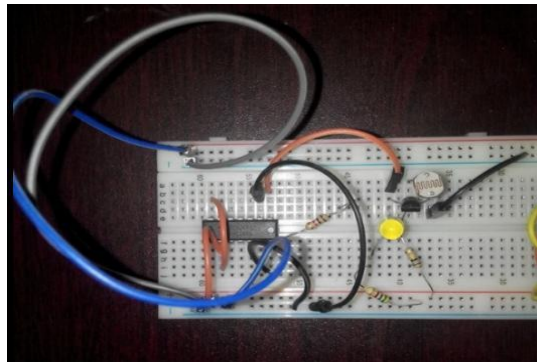
### 3.1 Implementation

After connecting all the parts as the circuit design diagram we have uploaded the programming code in the Arduino UNO Board. After uploading we have got positive result. The circuit works properly as it is designed.



### 3.2 Count Testing

In the count testing unit we have found that it works properly. Still the counter sometimes provides wrong results because of error noise in the IC74164 SIPO shift register. Here first of all we tested the counter only with an LED, after finding that the counter works properly then we added that with the Arduino UNO Board.



### 3.3 Development of the Whole System

After testing all the components we have combined all the components together as like as the circuit design diagram and found that the application works correctly. When a certain number of vehicle passes through the Dark sensor one side of the road gets stopped and the other road will be free to move forward.

### 3.4 Pictorial representation

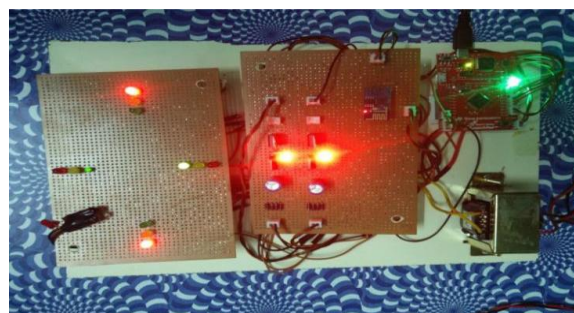


Figure: Final Development of Circuit

### 3.5 Product Commercialization

After completing the circuits together and developing the Intelligent Traffic Control System we connecting it into a demo Two way road and it worked correctly. As a result we can say that the Traffic control system we have developed is ready to use commercially.

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## IV. CONCLUSION

The Intelligent Traffic Control System was designed and developed to decrease traffic congestions or traffic jam that is occurred by the traffic control system. We have used 5v and 3.3v from Arduino UNO Board. We have used LDR and BC547 NPN transistor to develop the Dark sensor. With the help of Dark Sensor we have counted the number of vehicle passed through the sensor.

At the end we have designed and developed a microcontroller based Intelligent Traffic Control System, and fixed the problem that we had before. Finally we have reached our goal successfully.

In this proposal we are succeeded to minimize the traffic congestions created by the fixed traffic light system with the help of microcontroller and improved algorithm. That is dependent on real time rather than a fixed time. We have noticed that our intelligent traffic control system is much efficient and the cost of production is very low. As a result “Intelligent Traffic Control System” is suitable enough to use commercially.

## V. FUTURE SCOPE

With the help of this project there is an opportunity of doing a big project in future. The applications those are stated above are some demo applications. But there is a huge possibility of developing this project. Because both the number of vehicles will increase and the roads will decrease proportionally with respect to time. Initially for the limitation of funding and time we have developed an intelligent traffic control system for two way road. To make the project more efficient we can use IR sensor. That will be more efficient than dark sensor. Here we can see a big future work scope in this sector. We have faith that we will be able to complete all the features needed for the ultimate application in near future.

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