

# DENSITY BASED TRAFFIC SIGNAL SYSTEM USING MICROCONTROLLER

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**ABSTRACT:** This project aims at designing THE DENSITY BASED TRAFFIC CONTROL SYSTEM in which the traffic signal is changed according to traffic density using sensors. In recent times the traffic congestion has become a severe problem in many metropolitan cities. So, in this project we change the traditional traffic system or time-based traffic system to density-based traffic control system. Present day traffic system is based on the time based. This may render inefficient if one lane is operational than other. As the number of vehicles increase constantly and current resources & infrastructure being limited. This type of project is particularly important for future. Our project will demonstrate the optimization of traffic light using wireless sensors. With multiple junctions, the complexity increases as the state of one light influence the flow of traffic that reflects on many other nodes

## INTRODUCTION

In present day world, traffic congestion has become a genuine issue in our daily life. It brings down the productivity of individuals and therefore lots of working hours are wasting at signals. Huge volumes of vehicle will also cause chaotic congestion. It indirectly adds to increase in pollution level, huge volume of natural resources like petrol, diesel is consumed. Therefore, to reduce this we should implement newer schemes by using IR sensors based on automation technique. Even though today's methods are robust and work well when traffic load is distributed evenly across the lane in intersection, unnecessary waiting time in the signal can be avoided by determining which side the green should be showed. This project is designed such that system will work on traffic density and manage signal light based on density using IR sensors. The timing will vary according to density hence improve the light system and reducing the traffic congestion

## LITERATURE SURVEY

Currently the vehicle problem is increasing and Traffic congestion is a severe problem in many modern cities all over the world. To overcome the problem, we have come up with the idea of Density based traffic light control system [1]. Traffic research has the goal to optimize traffic flow, as roads have been overloaded with the increasing number of vehicles. There are several models which give solutions for traffic simulation. In our research we have focused on controlling the traffic lights on the bases of traffic density. Nowadays congestion in traffic is a genuine issue [2].

The traffic congestion can also be caused by large red light de-lays, etc. The delay of respective light is hard coded in the traffic light and it is not dependent on traffic. Thus, I propose multiple traffic light control system.[3] The system tries to reduce possibilities of traffic jams, caused by traffic lights, to an extent. The system is based on microcontroller. The micro-controller used in the system is AT89C51. The system contains IR transmitter and IR receiver which are mounted on the either side of roads, respectively. The IR system gets activated whenever any vehicle passes on road between IR transmitter and IR receiver. Microcontroller controls the IR system and counts number of vehicles passing on road. Microcontroller also store vehicles count in its memory. Based on different vehicles count, the microcontroller takes decision and updates the traffic light delays as a result. The traffic light is situated at a certain distance from the IR system. Thus, based on vehicle count, microcontroller defines different ranges for traffic light delays and updates those accordingly. In this system IR sensors are used to measure the density of the vehicles which are fixed within a fixed distance. All the sensors are interfaced with the microcontroller which in turn controls the traffic signals system according to density detected by the sensors if the traffic density is high on side more priority is given for that side [7].

### **EXPLANATION**

The main aim of our project is to minimize the traffic congestion. We may come across situations like where there is an empty lane with green signal and on other side with red signal where the lane is functioning with vehicles. Due to these we are indirectly wasting natural resources and effective time on waiting for green signal. Here in this project, we will try to minimize the traffic congestion problem by using density-based traffic control system where the signals reflect according to the density on the lane.

The system contains two IR transmitter and IR receiver for density measurement which are mounted on either side of road. IR system get activated when vehicle pass between the IR sensors. when there are no vehicles the IR rays is not obstructed and the photodiode receives the IR light and start conducting. The photo diode is coupled with transistor. Due to the conduction the corresponding transistor also starts conducting and thus the output is high and it is sent to microcontroller. The microcontroller is programed in such a way that whenever it receives high signal the line is show red signal

Whenever the IR rays is obstructed by any vehicle the photodiode does not receive the IR receive the IR light and thus the corresponding transistor could not conduct and cut off voltage low as output and same is transferred to microcontroller and it shows green signal for that lane. Thus, traffic system becomes flexible with traffic and control traffic on different lane based on density

### **CONCLUSION**

There is exigent need of efficient traffic management system in our country, as India meets with 385road accidents everyday. to minimize this problem of traffic congestion and time delay of traffic signal an advancement is designed in this project

With field application of this technology, the maddening chaos of traffic can be effectively channelized by distributing the time slot based on the merit of the vehicle in certain lane of multiple junction crossing.

### **FUTURE SCOPE**

The future scope includes profiling of traffic signals by managing traffic light based on the collected information and it also stores the data. This can also be used for traffic study and any changes in traffic density throughout the day. We can also improvise it by placing the sensors which senses specific sound for ambulance, police vehicles so that the lane show green signal to avoid congestion problem.

### **REFERENCES**

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