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# Movable Dividers with Help of Sensors

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**ABSTRACT:** Nowadays, the drastic increase in road traffic congestion has led to severe consequences on individuals, economy and environment, especially in urban areas in most of big cities worldwide. The purpose of using road divider is to separate the incoming and ongoing of traffic vehicles in the traffic. With increasing population, the vehicles are increasing, but there is limited resources which leads to more number of vehicles on roads. The main aim of the project to use every second efficiently to save a human life while travelling in an ambulance. This can be achieved with a Movable road divider. In the proposed model, we are not using a machine and operating it manually rather operating it automatically with the help of IoT and sensors.

**KEYWORDS:** Traffic Control, Road, Dividers, Movable roads, etc.

## I. INTRODUCTION

In many situations we see that there will be huge traffic on one side of divider of a road and there will be no traffic on the other side. In this kind of situations, it is possible to control the divider position automatically which reduces the traffic problems. Also using the movement of divider, we can give traffic clearance for the ambulance when required. In this we are designing a movable road divider which will move depend on the traffic density or flow of traffic. The IoT (internet of things) compiles the real-time data of vehicular traffic that finds out the current traffic operation and traffic flow conditions. The sensors will be connected with each other and to every part of the divider. The sensors which we are using to detect the density of traffic is infrared and ultrasonic sensors, By using movable road dividers at area like hinjewadi during peak hours the traffic congestion is usually more, so as to attain optimum benefit from roadway usage on the existing road. Road traffic congestion is among the most challenging issues that current road traffic authorities as well as peoples are facing due to its compelling impacts. Among all these impacts, the delay of emergency services delivery to the emergency location is the most critical due to the incurred cost in terms of deaths, injuries and financial losses in case of fires, car crashes, terrorist attacks, etc. It is nothing surprising, because the conditions of roads in many cities across the globe have been the same for decades. There is no significant development or technological adaptation in the way road transportation has evolved.

## II. LITERATURE RIVIEW

A study was conducted on Western express road close to Goregaon, Mumbai, in Reference, a 10 lane road was chosen once noting the congestion points. The western express highway was so selected to understand the current traffic scenario for long distances. A survey was carried out for a span of 7.00 am to 9.00 pm ,data collected from the survey was no. of vehicle passing a point, speed of vehicle and concluded by saying speed of the vehicle reduces significantly during the peak hours.<sup>1</sup>

The concept of movable road dividers were from the 90's ,the reason was that there was traffic congestion from that period. At that period the machine was called as zipper machine , which is used to shift the divider from one lane to another lane. It was introduced in earlier 90's and the first working model of zipper machine was bought by Hawaii department of transport in late 90's. The machine contains a s-shaped inverted conveyor channel which lifts the barrier segment weighing almost 450kgs.The minimum length of the machine is 100feet.The barrier segment is attached to the machine and whenever there is traffic congestion the machine will move and along with the machine the barrier segment that contains the divider also moves resulting in the width of the lanes.<sup>2</sup>

Our idea is to formulate a mechanism of automated movable road divider that can shift lanes, so that we can have more number of lanes in the direction of the rush. The cumulative impact of the time and fuel that can be saved by adding



even one extra lane to the direction of the rush will be significant. With the smart application proposed below, we will also eliminate the dependency on manual intervention and manual traffic coordination so that we can have a smarter traffic all over the city. An Automated movable road divider can provide a solution to the above-mentioned problem effectively. This is possible through IOT.<sup>3</sup>

Road Divider is generically used for dividing the Road for ongoing and incoming traffic. This helps keeping the flow of traffic. Generally, there is equal number of lanes for both ongoing and incoming traffic. For example, in any city, there is industrial area or shopping area where the traffic generally flows in one direction in the morning or evening.<sup>4</sup>

Nowadays, the metro cities like Hyderabad, Mumbai, Delhi etc. are facing difficulties of arising traffic and congestion every day. There are many different situations where various strategic methods are applied to solve those. The difficulty with general road dividers is that the number of lanes on either side of the road is fixed. Since, the resources are limited and population as well as number of automobiles per family are increasing.<sup>5</sup>

Freeway traffic control is a broad research area, not only interesting for its applicative perspective, but also highly motivating for theoretical investigations. This research topic has been developed in the last decades by different research groups worldwide and still offers open problems and issues to tackle which may be a source of inspiration for the community of control engineers and scientists.<sup>6</sup>

## OBJECTIVE

- To study the traffic congestions, condition of road.
- To collect data by pcu technique.
- For traffic congestion IT parks, hinjewadi area
- To study Infrared, Arduino UNO sensors.
- To suggest which type of materials is used for road dividers.
- Comparative study between normal road dividers and movable road dividers.
- To design and suggest the suitable movable road dividers for the area.

## III. RELATED WORK

In recent years, with an ever-increasing rate of development in metro cities around the world, there has been proportional increase in numbers of automobiles on the roads. Although the number of vehicles using the roads has increased, the static road infrastructure is almost the same and is unable to cope with changes like congestion, unpredictable travel-time delays and road-accidents that are taking a serious shape. Traffic congestion has been one of the major concerns faced by the Pune city today in spite of measures being taken to mitigate and reduce it. It has emerged as one of the main challenges for developers in Pune for planning of sustainable cities. In Pune, traffic is inherently chaotic and noisy. Identification of magnitude of traffic congestion is an essential requirement for defining the congestion and finding appropriate measures. The main focus of this paper is aimed at understanding the recurring traffic congestion, its measurement, precautionary measure and suggests a remedial measure for the same. The implication of widening existing roads or building new ones will only result in additional traffic that continues to rise until peak congestion returns to the previous level. The total available space Movable Dividers with Help of Sensors within the city for the construction of roads, railways and other transportation is restricted. This report will discuss the implementation of movable traffic dividers as congestion release strategy for Pune in the traffic prone areas instead of traditional solution of widening the roads as well as a hierarchically intelligent control system for the management of urban traffic. The moveable traffic divider helps in their configuration of road capacity, so as to attain optimum benefit from roadway usage on the existing road.

## IV. PROPOSED METHODOLOGY

The study involved two stages. The primary data was gathered through a Literature survey targeted by web searches and review of eBooks, manuals, codes and journal papers. After review the problem statement is defined and sample preparation is taken up for detail study and analysis purposes. The following describes the layout of this project briefly:

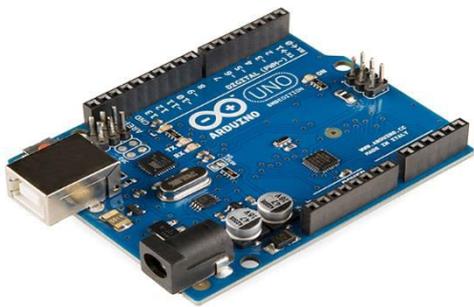
In this paper the dividers will move with the help of sensors some of the sensors are as follow:

IR sensors is an electronic device that measures and detects infrared radiations in its surrounding environment when an object comes close to the sensors, the infrared lights from the LED reflect off from the object and is detected by the receiver. That operating voltage is 5volt DC and the supply current is 20mA.

Arduino UNO is a low cost, flexible and easy to use programmable open-source microcontroller board that can be

integrated into a variety of electronic projects. it helps to transfer information and data saving. it has multiple ports which help to connect other devices. The measured density of traffic by IR sensors will be forwarded to Arduino. We are actually going to do programming in Arduino so that dividers will be moved automatically.

A rack and pinion is a type of linear actuator that comprises a circular gear (the pinion) engaging a linear gear (the rack), which operate to translate rotational motion into linear motion. Driving the pinion into rotation causes the rack to be driven linearly. Driving the rack linearly will cause the pinion to be driven into rotation. Basically, this rack and pinion assembly will be used for moving the dividers. The motor will be attached to the assembly. Motor is an electric machine that converts electrical energy into mechanical energy. As explained, the motor will be attached to the rack and pinion assembly. In display LCD panel is used a liquid crystal display is a flat panel display or other electronically moderated optical device that uses the light modulating property of liquid crystal combined with polarizers. Liquid crystal does not emit light directly, instead using a back light or reflector to produce image in color or monochrome. This panel indicates the density of traffic available and measured by sensors.



Figno-1. Arduino UNO



Fig no-2. IR Sensor

## V. PROCEDURE OF MODEL

The main aim of this project is to automate change road divider & announce the status of the changes for users. In this system is also used to avoid accident problems. Because, now a days road accidents are occurring frequently in India. This project identifies the status of each car using IR transceivers and informs it to microcontroller. This project is used to avoid the car collision, thus we save the valuable human lives and losses. So this project is useful for road transport departments.

The recent survey from the social analytics was said that the most disadvantages in Indian road traffic. Our proposed system mainly deals with the rectification of this disadvantage. Here we are introducing the new concept of artificial road divider. For the successful approach we are using sensors and for the execution we are using H-bridge and for the controlling operations we are using ATmega328 microcontroller. When the car comes near the artificial position, the proximity sensor senses the car and gives its output to the microcontroller. The H-bridge is used for the forward and reverse movement of the divider. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

### FLOW CHART OF METHODOLOGY

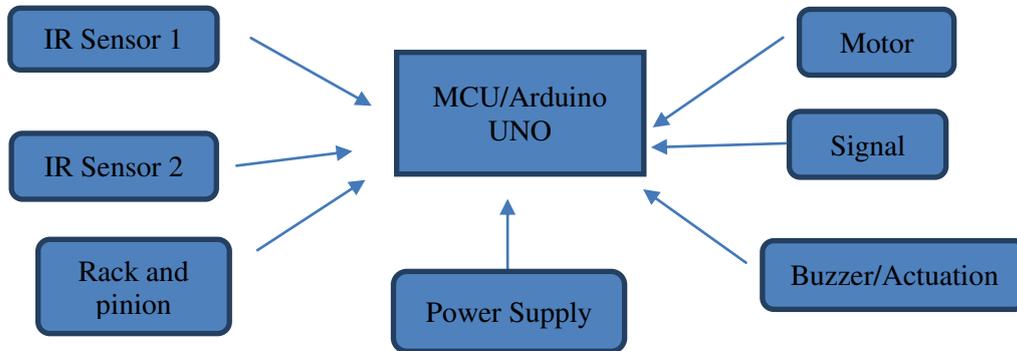


Fig no-3. Traffic Jam (source:google)



Fig no-4. Traffic Density (source:google)

### EXPECTED OUTCOME

This system reduces the chances of traffic jams, caused by high traffic density area and provides the clearance to the emergency vehicle, to an extent and successful. By apply this movable road dividers it will reduce traffic density probably by 30 to 35% Emergency vehicles are allocated undisturbed route which can possible save life. One this is developed it have a great impact on daily life.

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