CONTROLLING OF TRAFFIC USING MOVABLE ROAD DIVIDERS

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Abstract — *The main aim of this project is reducing the traffic congestion in our daily life. Road Divider is generically used for dividing the Road for on-going and incoming traffic. This helps keeping the flow of traffic; generally there is equal width of lanes for both on-going and incoming traffic. The problem with Static 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 cars per family is increasing, there is significant increase in number of cars on roads. This calls for better utilization of existing resources like number of lanes available.*

Keywords-Ultrasonic sensors ,Arduino Uno board, Wi-Fi module(HLK RM04),Transformer.

I.   INTRODUCTION

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 metropolitan cities today in spite of measures being taken to mitigate and reduce it. It has emerged as one of the main challenge for developers in urban areas for planning of sustainable cities.

In developing countries, like India, 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 urban 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 results in additional traffic that continues to rise until peak congestion returns to the previous level. The total available space within the city for the construction of roads, railways and other transportation is restricted. The paper discusses implementation of movable traffic dividers as congestion release strategy for metropolitan areas instead of traditional solution of widening the roads. The moveable traffic divider helps in there configuration of road capacity, so as to attain optimum benefit from roadway usage on the existing road.

II.   LITERATURE SURVEY

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.

In the proposed model , we are not using a machine and operating it manually rather operating it automatically by using two dividers namely normal and extended dividers .In this paper we place the ultrasonic sensor to one side of the road to detect whether there is any traffic congestion or not, if there is a congestion then the extended divider raises up and normal divider is set to ground level , else the normal divider is raised up and extended divider is set to ground level . And if there is a congestion then a message is sent to the nearby traffic control police stating that traffic congestion has occurred. So this is simple and can replace the heavy machines.

III.   EXISTING AND PROPOSED SYSTEMS

3.1 EXISTING SYSTEM

In the existing system for the free flow of traffic heavy machines like zipper machines, barrier transfer machines are used for the movement of road dividers . Using these machines a whole stretch of dividers is used to move either left or right based upon the traffic density .

DISADVANTAGES

☐   Not efficient.

☐   Time consuming.

☐   It is not flexible.

☐   Cannot detect automatically in case of traffic density.

3.2 PROPOSED SYSTEM

- In this proposed system, a module has been developed based on microcontroller that consists of an ultrasonic sensor which is used for measuring the traffic density in this case and two dividers normal and extended .
- When the signal turns **red ,** the traffic density is measured and the action should take place before the signals turns into **green .** If the traffic density is high then the extended divider comes up and the normal divider goes to ground position.
- Since the traffic density is high a message is delivered stating that 'Alert pls traffic density is high, extended divider is up' to the nearest traffic control room.
- If the traffic density is normal then no type of action is taken and the normal divider is up and the extended divider is to ground level.
- In this case the traffic density is normal then a message is delivered stating that 'Traffic density is normal. ,normal divider is up and the extended divider is to ground level ' to the nearest traffic control room.
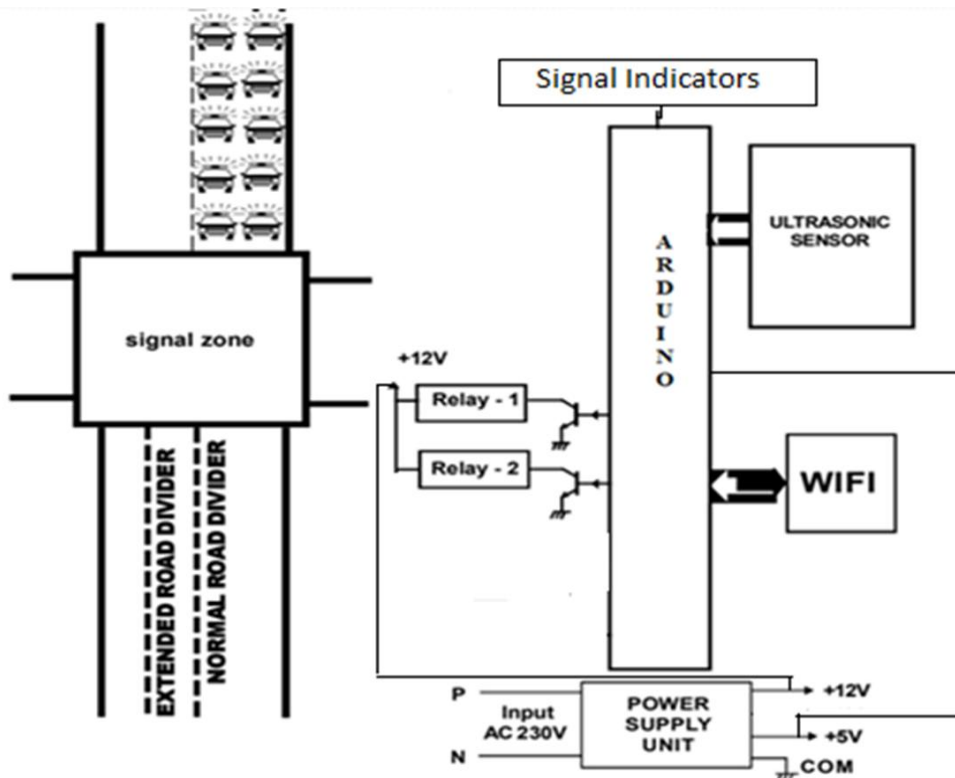- Since it is a demo module , we are just showing for the one way of traffic flow.

Fig.3.2.1: Block diagram

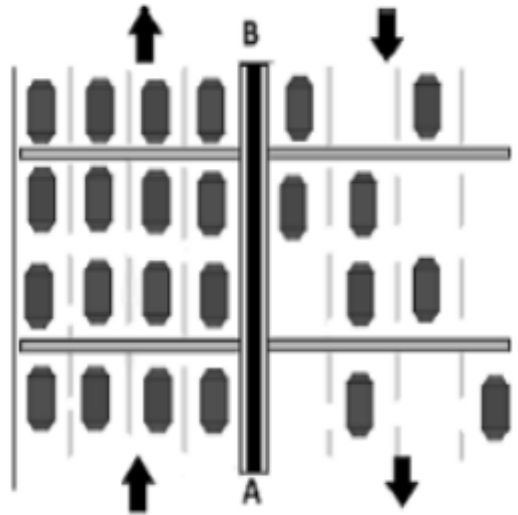**3.2.1 FUNCTIONALITY OF PROPOSED SYSTEM**

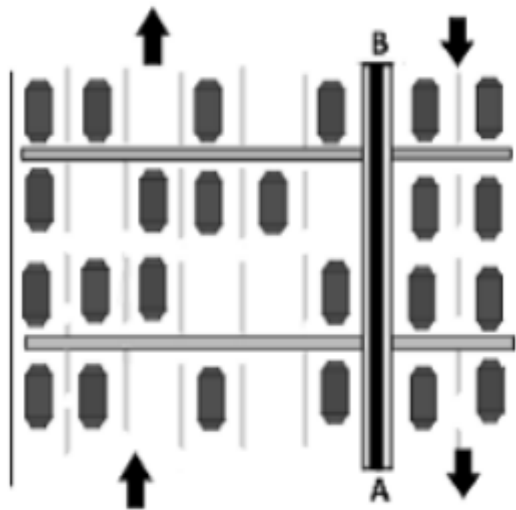**Fig 3.2.1.1: When traffic is heavy on left side of the road**

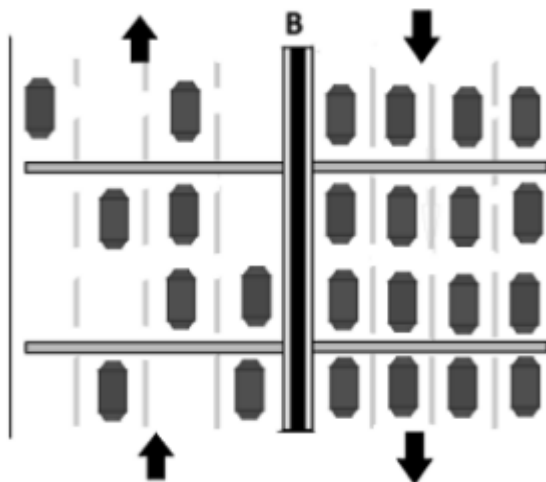**Fig 3.2.1.2: When divider is moved to the right side**

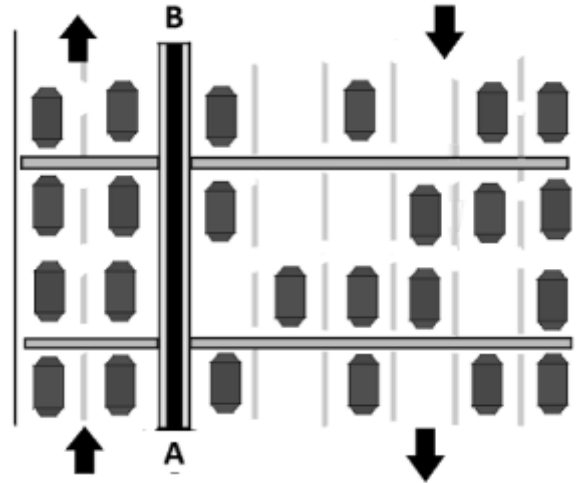**Fig 3.2.1.3: when traffic on the left side of the road is high**

Fig 3.2.1.4: When divider is moved to the left side of the road
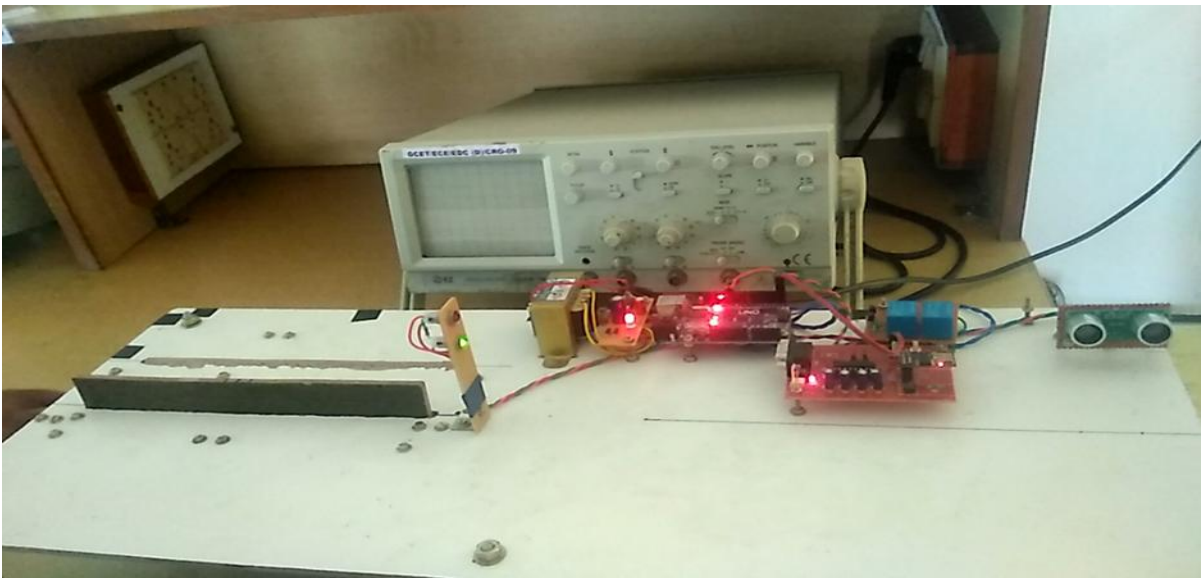
IV.   RESULTS

Fig 6.1: When there is no traffic congestion ,normal divider is up and extended divider is down
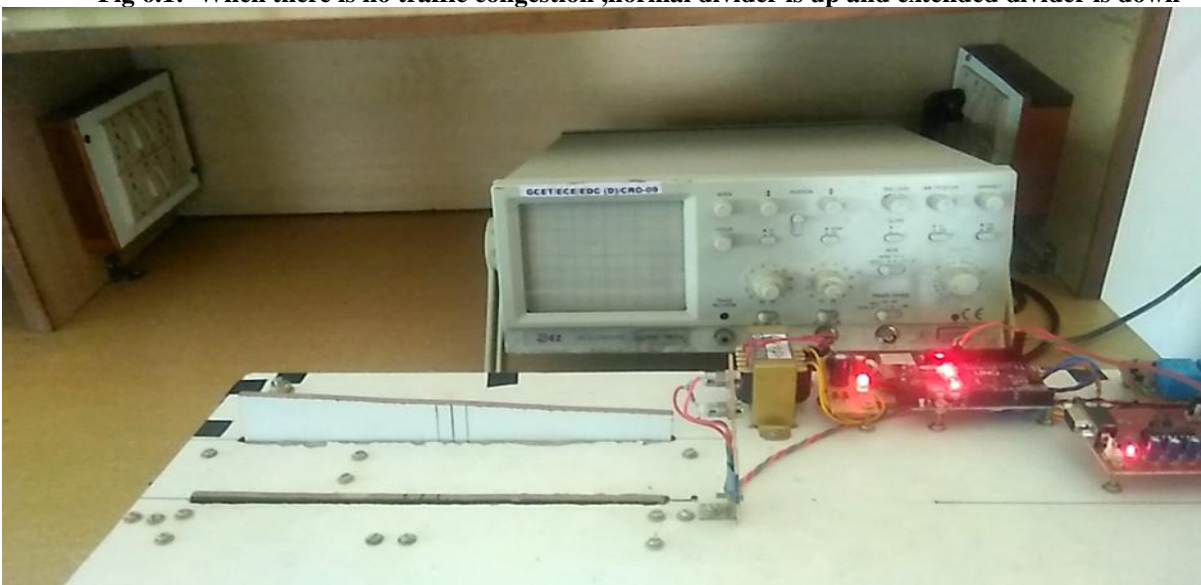

Fig 6.2: When there is traffic congestion , normal divider is down and extended divider is up

V. FEATURES

1. This proposed model can be operated automatically.

2. More organized traffic flow can be achieved, reducing traffic jams.

3. Based on the traffic density the time allotted for the passing of traffic is decided automatically.

4. Location Based Services can be done by means of enabled devices.

5. High traffic density can be detected and instant alert messages can be sent through Wi-fi.

VI. CONCLUSION

In this paper, we have successfully designed and developed a demo model of 'Controlling of traffic using Ultrasonic sensors' ,in which the results are satisfactory. Since it is a demo model , we have only shown it through one way of traffic using ultrasonic sensors . The traffic congestion data from the sensors is given to the nearest traffic control room using a wi-fi module .The data from the sensors is updated automatically. But in real time traffic congestion can be in more than one direction , then also this module can be used by using image processing rather than the basic sensors.

VIII. FUTURE SCOPE

1. The congestion of traffic through traffic jams can be easily reduced.
2. Traffic congestion can be monitored through cloud.
3. Based on the values available in cloud actions can be made automatically.

REFERENCES

[1] Movable Traffic Divider: A Congestion Release Strategy (2017)**,** vol-5,issue 1.
[2] Chaudry, A. G. (2012). Evolution Of Transportation System In Dubai. National Industries Quarterly Vol-14.
[3]Indian Road Congress "Manual For Specifications And Standards For Lanes On Highways"; Irc: Sp: 84; 2014.
[4]Mcgm Mumbai city Development Plan 2005.
[5]Basic Electronics By: GROB.
[6]Electronic Circuit guide book – Sensors – By JOSEPH J.CARR.