Published by :
http://www.ijert.org

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 10 Issue 07, July-2021

Smart Road Divider with Ambulance Priority

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***Abstract*— Traffic congestion is one of the biggest problems faced in recent times. So the main aim of this project is to reduce it but providing an effective solution to it. Generally, there's 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. Population as well as number of cars per family is increasing, thereby increasing the number of cars on roads. This involves better utilization of existing resources like number of lanes available. Even though with the advancements in technology, there has been no proper solution to overcome this problem. Traffic congestion has been one among the main concerns faced by the metropolitan cities today in spite of measures being taken to mitigate and reduce it. It has emerged together of the most challenge for developers in urban areas for planning of sustainable cities. The main focus of this study is aimed to provide a better, effective and efficient way of solution**.

Keywords*— *Smart Divider, Traffic, Ambulance Priority, H Bridge

I) INTRODUCTION

In the past few years, and with the ever-increasing rate of underground development around the world, there has been a corresponding increase in the number of cars on the road. Even though the number of cars on the roads, it is grown in a static infrastructure, it is very similar and will not be able to cope with changes such as congestion, unpredictable, travel delays and other events of the major types. The files had to be one of the most important issues of the day in the capital city, regardless of whether or not measures are taken to limit and to suppress them. This is a challenge for developers in the urban areas, the planning of sustainable cities.

In developing countries, such as India, where the movement is inherently chaotic, and loud. For the purpose of determining the amount of the congestion of the traffic, it is a prerequisite for the detection of traffic jams, and the finding of suitable vehicles. The main objective of this work is to understand the recurring urban traffic congestion, to measure, to prevent and to suggest remedial measures for the same thing. With the expansion of existing roads and the construction of the new one will only lead to an increase in traffic, which will continue to grow, to peak, to return to the previous level. The total amount of free space available in the city for the construction of roads, railways, and other modes of transportation, is limited. The article is of the opinion that the implementation of mobile communication and the barriers: a strategy for the liberation of the city, traffic congestion, instead of the traditional and the path of personal development. Moving traffic-limiter that helps in configuration and road capacity, so they can make the most efficient use of the road, on the dominant path.

The problem is with the static road is wide, that is, the number of lanes of traffic on either side of the path is increased. Since the resources are limited and the general public, as well as the number of cars per household is increasing, there is a significant increase in the number of cars on the road. This means a more efficient use of existing resources, such as the number of available lanes. The main objective of this proposal is to move the management of the movement into a new era. The purpose of this article is to reduce the travel time during rush hour to avoid traffic jams-and a better, smarter solution for the above transportation problems.

A cell-way distributor, and has been developed that is moving on the basis of the traffic flow. IoT collects in real time the movement of vehicles, from the data which is connected to the current operation of the transport vehicle and the road conditions. The IoT will be connected to each and every part of the movement, such as roads, dividers, and with the help of ir sensors. In many cases, we can see that there is a lot of traffic on one side of the road to character, but not in the other. In such situations, you can automatically set the position of the subject, allowing the flow of traffic. Also, the use of the separator, and movement, shall give to the ambulance as needed.

The measurement of the root cause of the congestion is, in the first place, that the solution to the problem. Road design has been carried out, taking into account the adverse conditions, and a clear separation between the cars, and will vary depending on the facts of the case, which highlights the difference between the theoretical and the practical conditions. The study of the principles, and laws that will help us to determine the actual traffic flow at a single location, as determined by the Government of the Russian Federation. The congestion of the traffic, you can travel delays, change of speed, change the volume and service levels. The congestion of the traffic, it also depends on the city, its structure, to the weather-centric, and volleyball-centric, or organic. Depending on the different congestion scenarios, each state has adopted its own measures, such as a high-density of traffic, in the US, the vehicle areas in the United Kingdom, and the flexibility of the working hours in the United ARAB Emirates (uae). Many

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other countries are in the process of taking a variety of measures to reduce the impact of traffic congestion. India's growth in the population

II) PROBLEM STATEMENT

The problem is with the static road is wide, that is, the number of lanes of traffic on either side of the path is increased. Since the resources are limited and as the population grows, the number of cars per family, and there is a significant increase in the number of cars on the road. This means a more efficient use of existing resources, such as the number of available lanes.

• At this time, there was a consistent and significant increase in the level of congestion in the road, causing traffic jams, especially during rush hour.
* Passengers who have to meet the extreme traffic during peak hours, on a day to day basis, so there will be a delay to arrive at their destination. In the morning, during rush hour, the traffic on one side of the road when compared to the other side of the road, and the situation is the same in the evening.

(III) LITERATURE REVIEW

The traffic light is a system that has been developed by Levi L. Rose, and was only used for emergency vehicles. The sensor is used for the transmission of the signal to be installed at each of a bad car at the receiver, installed on the each of the traffic light on the road.
A traffic light system has been developed by M. R. Smith, gave an early warning of an approaching emergency vehicle, in order to find a way out of the traffic jam, and the safe operation of the vehicle, to the destination of your choice.

The alarm system, and a light signal, which is developed by Salim Bin in the World, provided that the design and development of an intelligent control system based on a micro-controller. He proposed the replacement of the intelligent control system to regulate the way, light signaling to the idea of the current density on the flow of traffic. Prior to the introduction of Arduino, PIC microcontroller, board, established by general instruments in the year 1985, is one of the most widely used printed circuit boards for electronic enthusiasts. The PIC micro-controller board is very popular because of its speed and ease-of-programming-in a simple way, including the PBASIC.

W. L. Mitchell, has developed a traffic light system, which overcomes the problem of traffic congestion and provide a safe path for the emergency vehicle. W. E., Brill launched an emergency vehicle detection system to warn the driver of an approaching vehicle's malfunction, including an audio-signal-generation unit, it is installed on your emergency vehicle, and a signal detection unit is installed on a non-emergency vehicle, and a display unit and remote, is located in the non-emergency vehicle.

IV) SYSTEM DESIGN

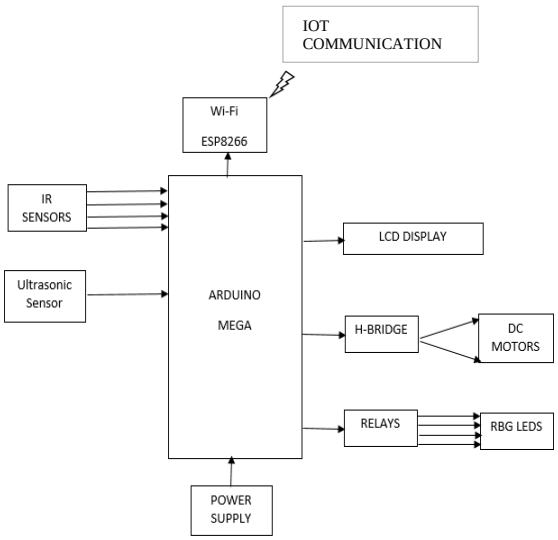

Fig 1: Block Diagram

V) METHODOLOGY:

A lot of the IR sensors are installed at each end of the line for the detection of the presence of the density of the cars, and, depending on the density of cars are measured by observation of the IR sensors of the separator, which moves in both directions, in order to have more space to create smooth movement in a closed group. In the liquid crystal display is used to show just how in order to convince the driver to move away from the distributor and to take protective measures. Node MCU is, in fact, a WI-FI module to connect to a local area network using a Wi-Fi Internet access, and can be adapted to the cloud-based traffic on the site's status. The partition is moved with the aid of an electric motor. The Arduino is the brain of the application, which shall govern the joint action of the separator is, and mention. If the signal changes its color to red, and the intensity of the movement is to be measured, and the action must be reached before the sound of green. If the traffic intensity is high, shall be an extended partition, up, and return to the normal wall is in the floor position. On the basis of the density of the traffic, the divider is moved to the right-hand lane. If the condition is not met, the dealer moves accordingly, the following condition is met, the dealer moves on to the normal state.
The steps involved in the proposed system are as follows:

(A) The proposed system is developed in a micro-controller-based module is composed of an ultrasonic sensor is used to measure the distance between the dealer and the vehicle.

- The IR sensor can be considered to be a vehicle for the purpose of determining the density, is on a one-lane road.
- This is a demo of a module, it is here shown for a one-way street.

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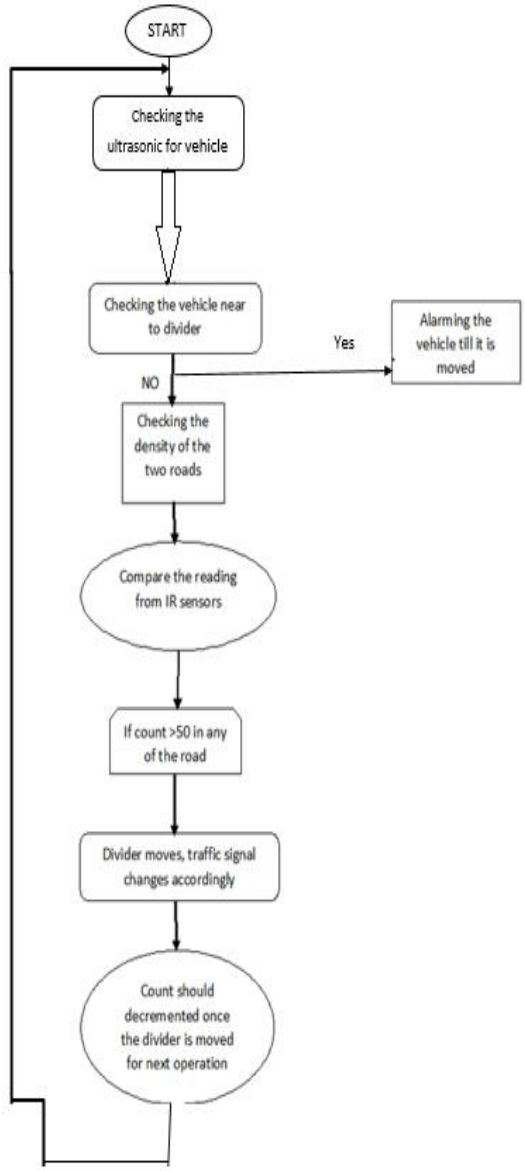

Fig 2 : Flowchart for divider movement under traffic conditions

(B) Working for ambulance priority

- The RGB-LED-display-has been carried out on both sides of the road.
- However, the driver receives a signal from the hospital, the RGB LED is connected to on the side of the road and it starts to glow.
- The word "ambulance" it will be seen from a distance of 100 m, it is in this sense that the corresponding signal will clear the way for the ambulance, as appropriate.

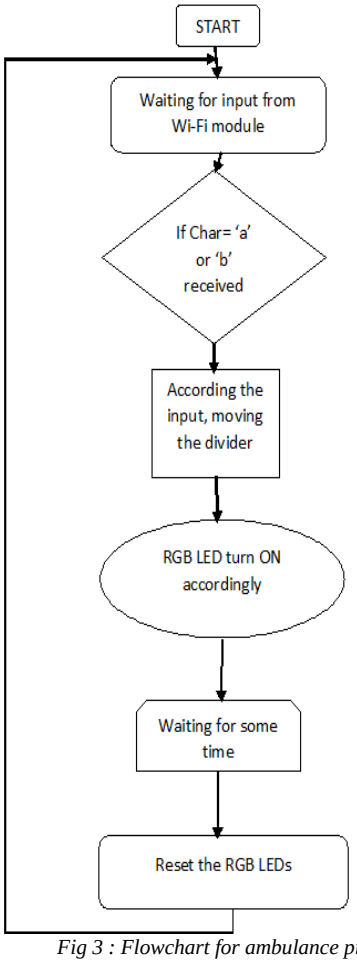

Fig 3 : Flowchart for ambulance priority

The work in which scenario, the article can be understood from the following drawings. At this time, as a result of traffic congestion, Intelligent Transportation System, it is required to minimize and eliminate the current traffic problems.
Therefore, to solve these problems, it is an idea that has been proposed, and a scheme is developed, in which the behavior, movements, and be able to analyses and understand the flow of traffic. Some of the solution was found to be in order for this problem to be solved, such as the ones mentioned above.
Finally, a Movable Road Divider is proposed in place of traditional dividers. A mechanical movable setup has been installed, in order to manage the traffic issues in the peak hours and helps in reducing the traffic in peak hours. Finally, congestion issues can be minimized to some extant due to the fact that the increase in population day to day and arise in utilization of private transportation due to the sophisticated life style.
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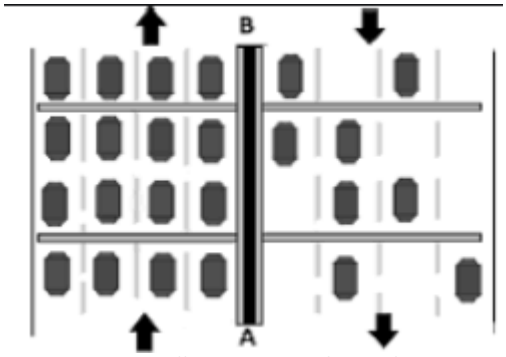

Fig 4: When traffic is heavy on left side of the road

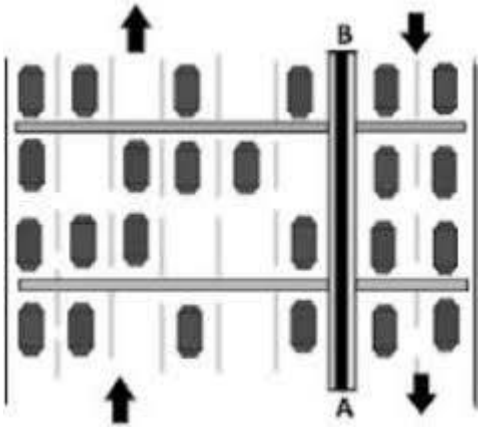

Fig 5: Divider is moved to right side

VI)RESULTS

In the experiment, with the help of multiple IR sensors, which are located on both sides of the dividing line, to detect the presence of the vehicle density i.e. the density of traffic. , the divider is moved on either side to give more space for the traffic to flow smoothly in the dense area. In the liquid crystal display, it is used to indicate whether or not the driver must move out of the area of the divider and to take protective measures. Node MCU is basically a WIFI module which connects the local WIFI network for internet and can be updated to the cloud. The partition is moved with the aid of an electric motor. The Arduino is the brain, that is, it is an application that allows the normal operation of the distribution, and to use the hint. And if it does detect an ambulance, a green signal will allow an ambulance to pass.

The below Fig represents, the prototype of Smart Movable Road Divider. The Arduino is the brain of the project which controls the overall divider action and intimations. And it detects the ambulance then it makes the signal green to pass ambulance.

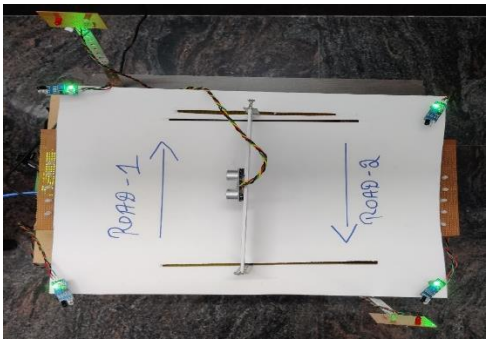

Fig. Proposed system

The below Fig represents, the prototype of Movable Road Divider, where the traffic is high in road 1 and the divider is moved towards road 2 after intimating the drivers about the movement of the divider.

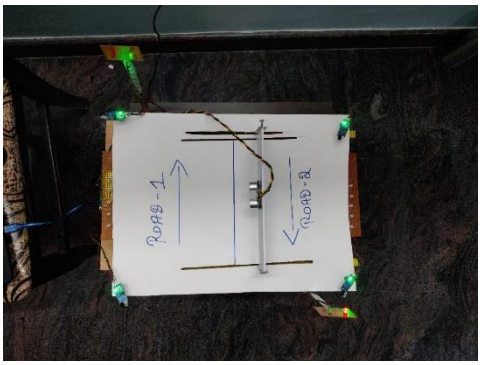

Fig. Divider is moved towards road 2

The below Fig represents, the prototype of Movable Road Divider, where the traffic is high in lane 2 and the divider is moved towards lane 1 after intimating the drivers about the movement of the divider and the divider is moved back once the traffic is normal.

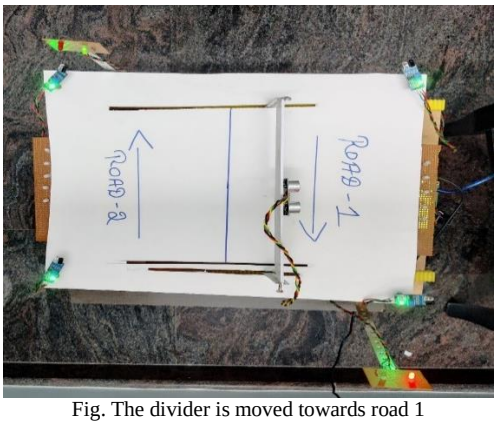

Fig. The divider is moved towards road 1

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The Below Fig represents, whenever divider receives signal from ambulance RGB LEDs connected on road side will start glowing.

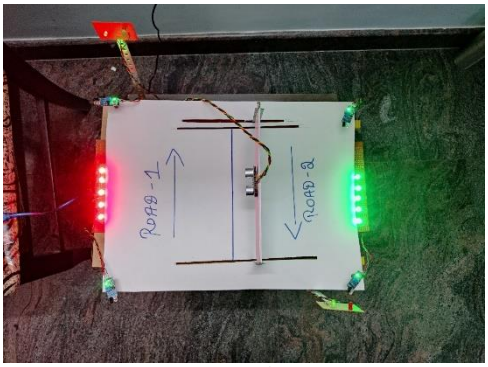

Fig. A narrow path is created in road 2 for ambulance clearance and RGB LEDs turn GREEN

VII)CONCLUSION

First, this paper analyzes the problem of traffic congestion in a particular area. In-depth studies of the files, and the causes of the problems have been carried out. To avoid traffic jams and reduce the travel time during the peak hours, as well as a more rational and better solutions to these problems, the company developed a prototype of a model in a Mobile Way of a Separator. This idea has been focused on the reduction of the traffic is due to the definition of traffic in either direction of the separator, and saving both time and fuel. This also works on safety measures by intimating the drivers about the moment of the divider. It will also make it possible for the user, that is, the movement of the police force in order to manually control the position of the dividers, depending on the requirement, and a clear path to an ambulance, which ensures that the ambulance to the hospital, and to achieve this, without any delay.

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