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MOVABLE ROAD DIVIDER FOR ORGANIZED VEHICULAR TRAFFIC CONTROL WITH MONITORING

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ABSTRACT __The sharp rise in road traffic congestion has had significant negative impacts on individuals, the economy, and the environment, particularly in large urban areas around the world.Road dividers are used to separate incoming and outgoing traffic lanes, but with growing populations and vechicle numbers outstipping available road resources, congestion continues to worsen.This project aims to improve the efficiency of road use to save lives,particularly for ambulances. Instead of manually operating road dividers ,the proposed solution uses IoT and sensors to automate their movement,allowing for better management of traffic and quicker response times for emergency vehicles.

I.INTRODUCTION

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. 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 paper, we design a movable road divider which moves depending on the flow of traffic. The IoT 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 parts of the divider. So towards this some amount of research work has been carried out by employing Information and communication Technologies for regulating the traffic signaling system. The remaining part of the paper is organized such that Section II discusses the Literature Analysis, Section III explains the Implementation, Section IV discusses the Result followed by a conclusion in Section V.

II.LITERATURE SURVEY

B Durga Sri, K Nirosha, Sheik Gouse, "Design and Implementation of Smart Movable Road Divider using IOT", International Conference on Intelligent Sustainable Systems, ICISS, 2017, pp 1145–1148

The implementation of a movable road divider using IoT (Internet of Things) involves the integration of smart technology with traditional road safety measures. The objective is to create a road divider that can be moved to adjust the flow of traffic and to prevent accidents. This system consists of sensors, controllers and actuators that work together to detect and respond to changes in traffic flow. The sensors monitor the traffic flow and communicate with the controllers, which process the data and send signals to the actuators to adjust the position of the road divider. The use of IoT technology allows the system to be remotely controlled and monitored, providing real-time updates to traffic authorities. This paper presents the design and implementation of a movable road divider using IoT, highlighting its benefits in terms of safety, efficiency, and cost-effectiveness. IoT stands for "Internet of Things." It is a network of physical devices, vehicles, buildings, and other objects that are embedded with sensors, software, and connectivity, allowing them to collect and exchange data with each other by using internet. The purpose of IoT is to create a more connected world where devices can communicate and interact with each other to improve efficiency, convenience, and quality of life. IoT technology has applications in many industries, including healthcare, transportation, manufacturing, and agriculture, among others.Some examples of IoT devices include smart thermostats, fitness trackers, connected cars, and industrial sensors that monitor machinery and equipment. These devices can collect data on their environment or usage and use that data to make decisions or trigger actions. In this 21st century, road traffic congestion is a critical problem which is arising in most of the metropolitan cities like Hyderabad, Pune, Mumbai, etc.

There are numerous different situations where different strategies are applied to break them, then in this design we came up with a result which solves a type of traffic issue. Now-a-days operation of private motorcars is making urban traffic more and more rush area as a result traffic control has come one of the most important problem which is performing in vain attempt and pollution. Hence it is vital to find an effective solution for traffic control. Road divider is generally used for dividing the road for managing the ongoing and incoming traffic. The stationary road separator divides the number of lanes into equal halves where the separator is fixed. To overcome this problem, we have developed a moving road separator/divider that based on the advancement of traffic. Here , we have used ultrasonic sensors, the sensors are used with the ESP32 microcontroller to get information from detectors , also RFID is used to identify the emergency vehicles , such that the vehicle like ambulances will get a direction to reach their desired location .For case, road dividers with IR detectors. We see that there will be having high traffic congestion on one side of the road than the other. In this type of situation, it can be considered a controlled area due to the fact that it reduces traffic related problems.

Ch V A Satwik, L Pavan Kumar, K Vineeth and Kavitha N Pillai, "Intelligent Road Management System for Daily Transit", International Conference on Communication and Signal Processing, City of Conference, ICCSP, 2018, pp 0523–0526

Road dividers are often used to divide the road further and closer traffic. This helps to maintain the continuity of traffic. In this case, there are an equal number of routes in both incoming and outgoing traffic. Be that as it may, in some areas, such as industrial or shopping malls for a large part of the broadcast a one way to the first half in the morning or at night and another road is unpaved. It consumes more time of the public and leads to time loss. It means assembling a smart road divider up to that point a moving or moving motor separator a method that links the rise of the acceleration hour grid. Such

the type of traffic frame part sets the time as and fuel. It can include 1 other route based on traffic at a certain source. And very smart application listed below, hand-based reliance as well the relationship of manual traffic has diminished. ESP32, sensors and boards are used. The sensors are mounted on dividers heard the continuation of traffic according to which the divider moves to other lane having less traffic density. By using the separator upgrade, we can provide emergency vehicle traffic permit if required. It provides a high level of feedback on the road issue. Countries around the world are facing a crisis over traffic congestion due to the increase in the number of vehicles. Despite the fact that the number of vehicles using the road has been increased, the stationary foundation is almost equal and cannot adapt to conditions such as confinement. The problem with the unmovable road divider is, it can't move towards less traffic density lane. This requires the optimal use of available assets as a number of accessible methods. To overcome this problem, we built a moving road divider that relied on the advancement of traffic. The sensors are used with the ESP32 to get information from sensors and use the ESP32 Bluetooth model to detect emergency vehicles and the way to get to the destination on time. For instance, road dividers with IR sensors. We see that there will be having high traffic density on one side of the road than the other. In this type of situation, it can be considered a controlled area due to the fact that it reduces traffic problems. And road divider moves in preference with on one side of the road than the other. In this type of situation, it can be considered a controlled area due to the fact that it reduces traffic problems. And road divider moves in preference with emergency vehicle irrespective of traffic density. A moving road divider helps with road boundary planning, in order to achieve optimal profitability through the use of a current roadway. By using the separator upgrade, we can provide emergency vehicle traffic permit if required.

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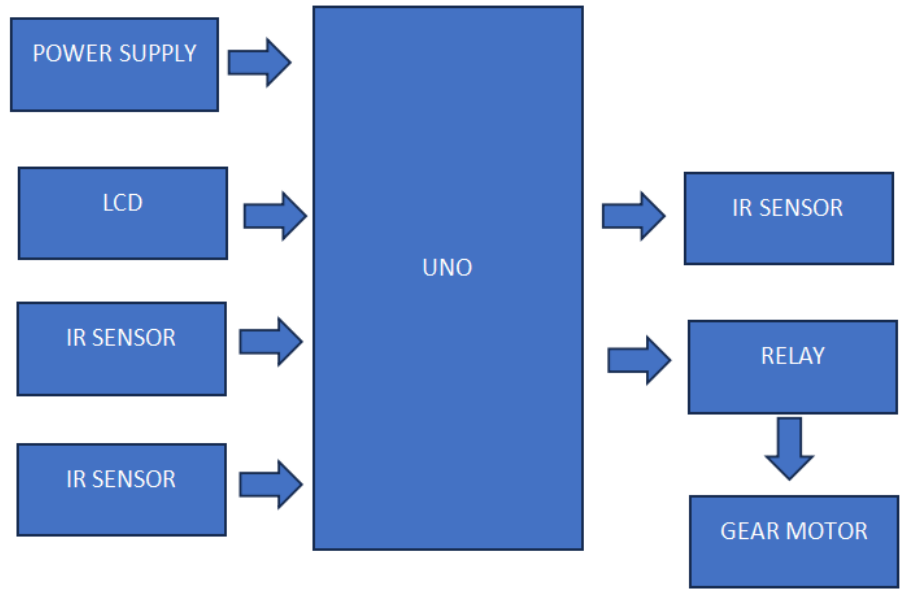
Block diagram



III.PROPOSED SYSTEM

The proposed system introduces a **movable road divider** that dynamically adjusts lane configurations in real-time to optimize traffic flow, reduce congestion, and enhance road safety. This system combines mechanical movement with embedded sensors, monitoring devices, and communication modules to provide an intelligent traffic management solution.

1.Movable Road Divider Mechanism:

The core of the system is a **mechanically operated road divider** that can move laterally across the road to adjust the number of lanes in either direction, depending on the current traffic demand. The divider will be equipped with wheels or motorized tracks, allowing it to slide along predetermined paths embedded in the road surface. Actuators controlled by microcontrollers will drive the movement of the divider, enabling it to shift positions based on real-time traffic conditions.

2.Traffic Monitoring and Control:

An array of **embedded sensors**, including traffic cameras, infrared sensors, and motion detectors, will monitor vehicular flow on both sides of the road. These sensors will continuously collect data on traffic density, speed, and congestion patterns. The information will be processed by a central control unit that determines the optimal lane configuration. The system will then activate the road divider to reallocate lanes by widening one side of the road and narrowing the other, depending on the peak traffic direction. For instance, during rush hours, the divider can move to allow more lanes for outgoing traffic in the morning and more lanes for incoming traffic in the evening.

3.Communication and Coordination:

The road divider system will be integrated with **IoT-based communication** modules to ensure real-time coordination with city traffic control centers. This connection allows authorities to monitor and override the system if necessary, providing remote

control over the divider. The system will also use V2X (Vehicle-to-Everything) technology to send alerts to vehicles, informing drivers of lane changes ahead and reducing confusion.

4.Safety Features:

Safety is a key aspect of the proposed system. The movable road divider will include **LED lights, reflectors, and warning signals** to ensure it is visible to drivers during both day and night. Before the divider moves, a series of warning lights and signals will alert nearby drivers to the change in road layout, ensuring smooth transitions without causing accidents.

Additionally, **pressure and proximity sensors** will be embedded in the divider to detect obstacles or vehicles in the way during movement. If any object is detected, the system will automatically halt the divider's movement and alert nearby drivers to avoid collisions.

5.Traffic Data Analysis and Optimization:

All traffic data collected from the sensors will be analyzed in real-time, allowing the system to make informed decisions about when and where to move the divider. The system can also store historical data to track traffic trends, helping city planners optimize traffic management strategies for the future.

IV.CONCLUSION

In this paper, we have successfully designed and developed a demo model ' IoT deployed automatic movable smart road divider' ,in which the results are satisfactory. The implementation of the automatic movable road divider describes a simple method, which uses IoT device. By using this movable road divider we reduce one sided traffic during peak hours. The proposed structure helps to reduce the chances of traffic jams and to provide clearance of road for the emergency vehicles to an extent. Emergency vehicles are allocated undisturbed route which can possibly save a life. Once this is deployed it will have a great revolutionary in the field of emergency.

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