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Movable Road Divider Using Internet of Things

Anireddy Sushrutha[1*], C.R.K. Reddy[2]

[1,2]Dept. of Computer Science, Mahatma Gandhi Institute of Technology, Hyderabad, India

[*]*Corresponding Author: anireddy.sushrutha60@gmail.com, Tel:+91-8309062397*

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Abstract—Road Divider is used for dividing the road for ongoing and incoming traffic. This helps keeping the flow of traffic in control. The problem with Static Road Dividers is that the number of lanes on either side of the road is fixed. This calls for better utilization of existing resources like number of lanes available.The main aim is to formulate a mechanism of automated road divider that can shift lanes at one side, so other side can have 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 smarter application proposed below,it will be helpful eliminate the dependency on manual intervention and manual traffic coordination to have a smarter traffic all over the city. An Automated road divider can provide a solution to the above mentioned problem effectively.

Keywords— Automated road divider, traffic system, arduino board.

I. INTRODUCTION

Internet of Things (IoT) is a system of inter related computing devices, and digital machines that are provided with unique identifiers (UIDs) and have the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Traffic management is one the most unsolved problems in our country. It is very difficult to avoid or reduce it. The main aim of this paper is reducing the traffic congestion in our daily life.

II. RELATED WORK

Existing System

Barrier transfer machines called zipper machines or road zipper transfer concrete lane dividers, like jersey barriers that hold up throughout rush hours. A drawback is that lane widths is slightly reduced and they need human interference.

Proposed System

The road contains a fixed road divider so it is difficult to find solution. To overcome this problem IoT Deployed Smart Road Divider is proposed to avoid traffic problem at the side of the road having heavy traffic.

Required Specifications

Hardware:Arduino board,Motor Driver,IR Sensors , LCD,Regulated PowerSupply,ESP8266 Wi-Fi Module.
Software: Embedded C, Arduino IDE.

III. METHODOLOGY

Three IR sensors are connected to the power supply and arduino nano board which can sense the density of the traffic to be low, medium or high respectively.

The wi-fi module is connected to power supply and arduino nano. Arduino nano is a development board having microcontroller where the entire code is stored.LCD is connected to a rectifier and arduino nano which also has connection with motor driver for the movement of the divider. The below figure shows the setup.

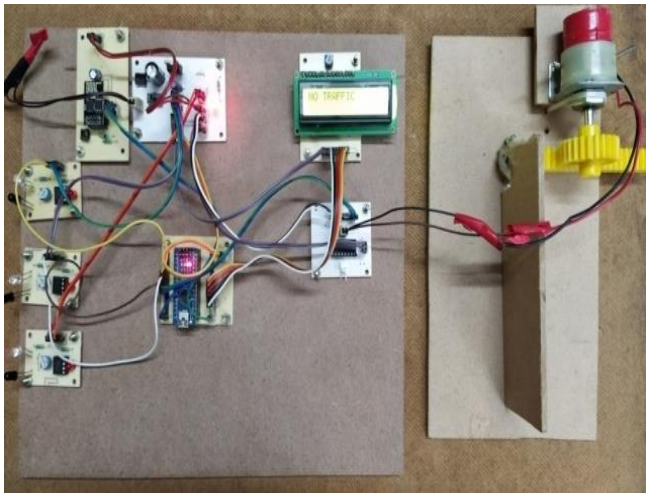

Fig 1: Structure of movable road divider.Here entire setup is visible.

IV. RESULTS AND DISCUSSION

When the power is switched on the IT sensors check for any obstacle and then into red color when detection is positive. If the first IR sensor turns red then traffic is low, if second IR sensor also glows then traffic is medium. If third IR sensor also glows then traffic is very high which leads to the movement of the road divider. Traffic density will be shown on the LCD (Liquid Crystal Display).

Test case 0: When there is no traffic
Here the traffic is nil hence there is no glow in the 3 IR sensors.

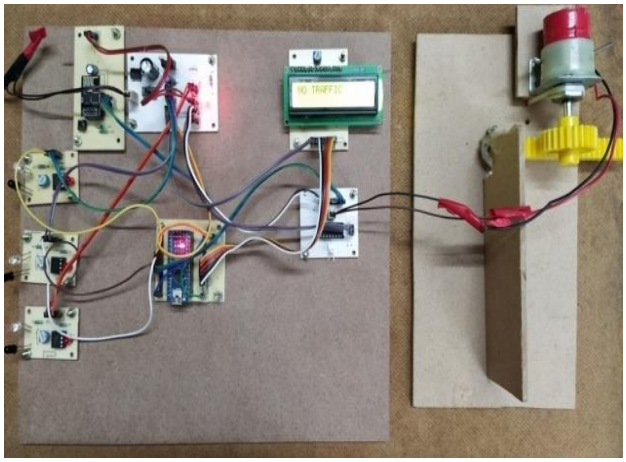

Fig 2: When traffic is nil. Hence no IR sensor is glowing

Test case 1: When traffic is low
Here first IR sensor detects obstacle showing that the traffic density is low on the LCD.

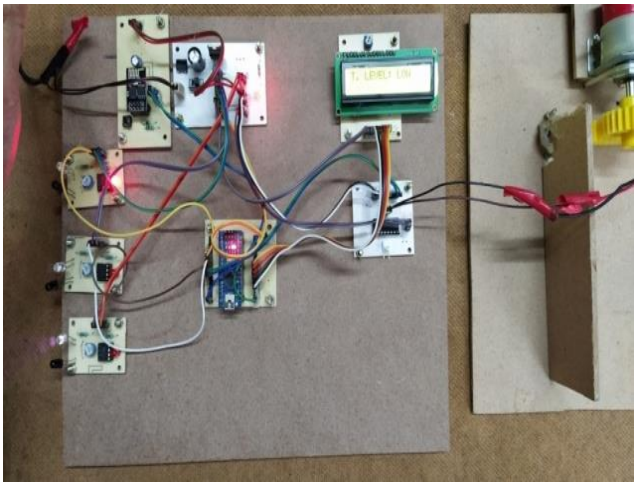

Fig 3: When traffic is low. Hence the first IR is red.

Test case 2: When traffic is medium
Here two IR sensors show red color since density of traffic is medium.

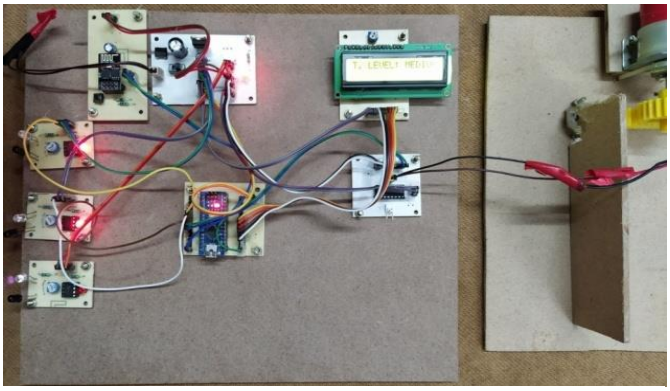

Fig 4: When traffic is medium. The two sensors glow showing that the traffic density is medium.

Test case 3: When traffic is high
Here all the 3 IR sensors glow showing that the density is very high which results in movement of the divider. We can see that the divider is moved from its original position.

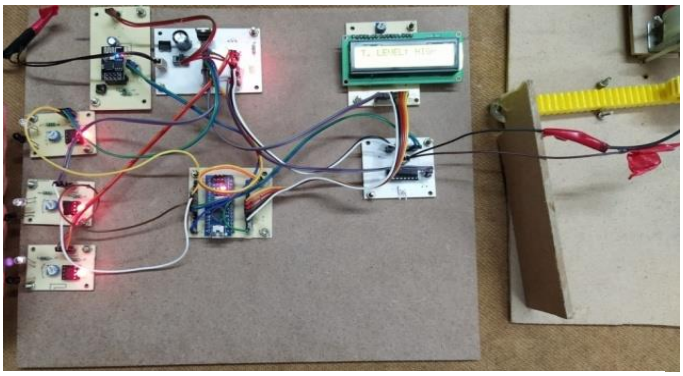

Figure 5: When traffic is high. Here all the three sensors glow resulting in high traffic density.

RESULT
For the first two test cases the divider doesn't move but when the traffic is high the divider slightly moves to make way for the vehicles to come forward in order to reduce traffic congestion towards the side having less traffic.

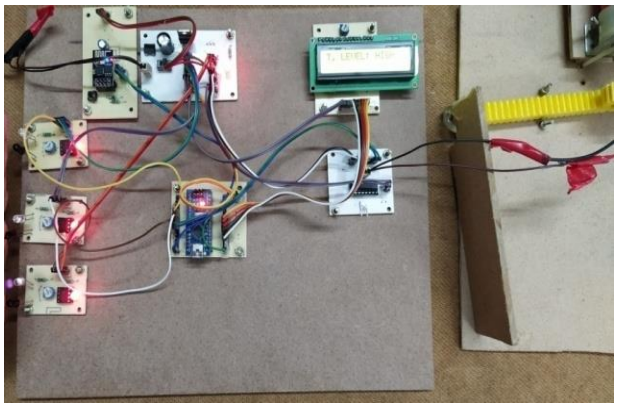

Fig 6: Movement in the divider due to high traffic density.

V. CONCLUSION

The proposed system helps to reduce the chances of traffic jams and to provide clearance of road in times of emergencies. My aim is to reduce the traffic in accordance to priority. The road with best priority (high traffic level) will be cleared first. This system mainly focuses on vehicles.

VI. FUTURE SCOPE

The congestion of traffic through traffic jams can be easily reduced. . Traffic congestion can be monitored through cloud. .This will provide on-the-go access, which will overcome the demerits of zipper machine. This method can be implemented for parking vehicles at malls, to avoid space wastage.

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Authors Profile

Ms. Sushrutha Reddy, Student of Bachelors in Engineering at Mahatma Gandhi Institute of Technology, Hyderabad. She worked on Canteen management System projectfor the college in 2018. Her places of interest in researches are IOT, Artificial Intelligence, Machine Learning, Network Security.

Mr C R K Reddy, Professor at Mahatma Gandhi Institute of Technology, Hyderabad. He is working as professor from the past 23 years.He has a PH.D in Computer Sciences for Visualization of Program Dynamics through Stochastic L-systems.he was a Co Chair for ICITE 2018 (Intl. Conf on Innovative Tech in Engg.), held at Osmania University, Hyderabad on 11-13 Apr2018 and is presently working as the Head of Department in Mahatma Gandhi Institute of Technology.

