International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 04 | April - 2023 Impact Factor: 8.176 ISSN: 2582-3930

MOVABLE SMART ROAD DIVIDER

Ms. Shylaja B N
Associate Professor
Computer Science and EngineeringRGIT

Shaima Sadiya
Computer Science and Engineering
RGIT

Sadiya Sajid
Computer Science and Engineering
RGIT

Samreen Fathima S
Computer Science and Engineering
RGIT

Sucharitha B
Computer Science and Engineering
RGIT

Abstract—This project's primary goal is to lessen the traffic in our daily lives. Generally speaking, a road divider is utilisedto separate outgoing and incoming traffic. There are more cars per family and more cars on the road than ever before. This necessitates better exploitation of already available resources, such the number of lanes. The essentially identical static road infrastructure is unable to adapt to changes like traffic, irrational travel time delays, and road accidents. One of the main issues that metropolitan cities have is traffic congestion, and our product provides a solution

Index Terms— automatic road divider, IOT, deep learning, traffic control, and density of traffic.

1 INTRODUCTION

A one-lane road was built in the past, which caused traffic congestion and made it difficult for people to get where they were goingefficiently. At the same time there were also fewer facilities, securitymeasures and flexibility available After that 2 lane were added to theroot, although this was insufficient to relieve the traffic congestion. The road then has 4 lanes, which divides it into four sections, however this is insufficient to lessen traffic. According to numerousstudies, people employ IoT and embedded systems two observe the traffic, however these methods are ineffective at accuratelyidentifying the traffic and necessitate numerous connections that areinconvenient. There had been proportionally more cars on the road due to the metropolises throughout the world developing an ever increasing rate. Despite a rise in the number of vehicles utilising the roads, the tactic transportation system remains essentially the same and is unable to adapt 2 changes like congestion unforeseen travel delays and major traffic accidents. Despite efforts to alleviate and lesson it, traffic congestion continues to be one of the male issue facing metropolitan areas today. It has big com one of the biggest obstacles facing urban planners in creating sustainable cities.

In order to maximise the use of the existing road, the adjustable traffic divider aids in the configuration of road capacity. Static roaddividers have the drawback of having a fixed number of lanes on either side of the roads. There are much more cars on the roadways due to the limited resources, growing population, and rising numberof cars for family. This necessitates making greater use of already available resources, such the number of lanes. This projects primarygoal is to usher in a new era of traffic control. The project's goals isto reduce peak-hour travel times, prevent traffic jams and give a more convenient alternative.We create a mobile road barrier that moves in accordance with trafficflow the Internet of Things gathers real time information about vehicle traffic to determine how traffic is operating and how it is moving. With the aid of infrared sensors the IoT will be linked to allaspects of traffic includinging dividers and road surfaces. We frequently observe that there will be little or no traffic on one side ofa road divider while there is heavy traffic on the other. It is feasible to automatically control the divider location in these circumstances,which eases traffic congestion. Also as necessary, we can grant traffic clearance for the ambulance by moving the divider

2.1 MOTIVATION

In order to have additional lanes, in the direction of the rush hour former our concept is to create an autonomous moving road barrier that can change lanes. Even one additional lane in the rush hour direction will have a substantial cumulative effect on the amount of time and fuel that may be saved stop in order to have smarter trafficacross the city the smart application suggested below will alsoremove the need for manual intervention and manual traffic coordination.

.

2.2 PROBLEM DEFINITION

Nowadays traffic's downside square measuring increasing thanks to the increasing range of vehicles and also the restricted resources provided by this infrastructure. Because of this there isa desire to attend longer time before the signals in India it is the second most thickly settled country within the world may be a quick growing economy. Its seeing exaggerated number of roadscongestion issues in its cities infrastructure growth is slow as

compared to the expansion in range of vehicles because of house and price constraints.

2.3 LITERATURE SURVEY

[1] Moving traffic divider: A Congestion Reduction TechniqueAuthors Prathiba Singh, Advait Kawle, Dhruv Shah, Kavin Doshi call Manish bhatiani and Yash Gajja publication includethe 2017 issue of the International Journal of Recent Advances in Engineering and Technology(IJRAET).

Abstract: There have been proportionally more cars on the roadin recent years, due to the metropolises throughout the world developing at an ever increasing rate .Although there are morevehicles on the road , static road infrastructure remains essentially a same and is unable to adapt the changes like trafficcongestion unpredictable travel time delays, and major road accidents. Despite efforts to alleviate and lesson it, the traffic congestion continues to be one of the main issues facing metropolitan areas today.

[2] Mobile Road Divider:

Prof. Rashmi Wade, Pankaj Kamble, Prashant Kabutare, RohitMohite, Abhijeet Kaname.,

The number of cars on the road has increased proportionally inrecent years due to the metropolises' ever-increasing rate of development. Although there are more vehicles on the roads, the static road infrastructure remains essentially the same and is unable to adapt to changes like traffic congestion, unpredictable travel time delays, and major road accidents. Despite efforts being made to alleviate and lessen it, traffic congestion continues to be one of Pune's biggest problems. It has become one of the biggest obstacles facing developers in Pune who are trying to construct sustainable towns.

2.4 EXISTING SYSTEM

Daily heavy traffic during peak hours causes delays for commuters as they try to get to their destinations. The traffic onone side of the road is heavier during peak morning hours thanon the other side, and the same is true of evening traffi. Abdulreidha Abdulrasoul Alsaffar published a solution to this issue in the US in 2013 that includes a method to move road barriers using large vehicles before the buildup of traffic duringpeak hours. The methods utilised to transfer the road barrier machine are, Heavy vehicles used to transfer concrete lane barriers are called zipper machines or barrier transfer machines.

In its undercarriage, it has an S-shaped groove that elevates thebarrier portion.

2.5 DISADVANTAGES OF EXISTINGSYSTEM

- Ineffective.
- It takes time.
- It isn't adaptable

Thus in the situation of traffic density ,automatic detection isnot possible

2.6 OBJECTIVES

Static road dividers have the issue that there are always paths on both sides of the road.. There has been a significant increase in the number of vehicles on the road due to the limited resources, growing population, and growing number of vehicles per family. This necessitates making greater use of already available resources, such the number of open pathways. The main goal of this project is to move traffic control to a different era.

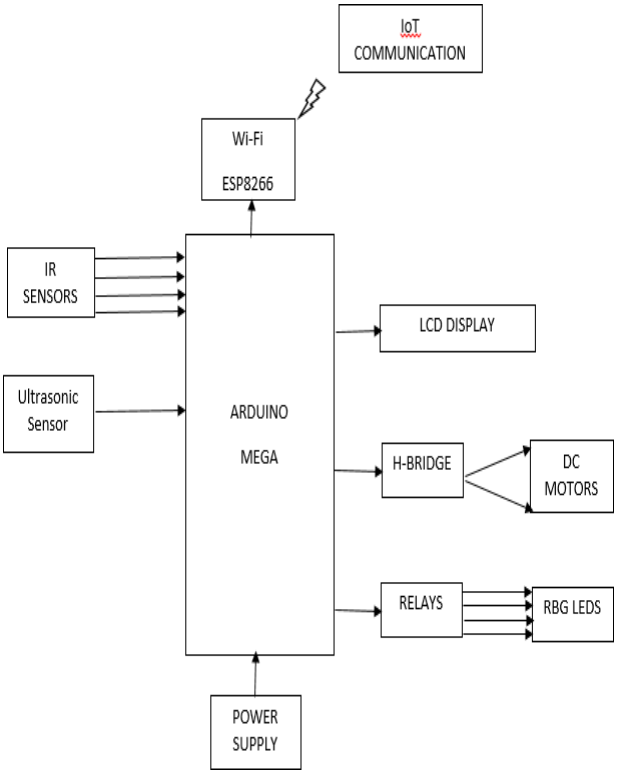
The following are the paper's objectives:

- To reduce heavy traffic.
- In order to prevent traffic congestion.
- To cut down on set travel time during rush hour

2.7 PROPOSED SYSTEM

- A microcontroller-based module that includes an ultrasonic sensor—which in this case is utilised to measurethe traffic density—and two dividers—normal and extended—has been designed for use in the proposed system.
- When the signal is red, the amount of traffic is counted, and action should be taken before the signal is green. Whenthere is a lot of traffic, the extended divider rises and the regular divider drops to the ground.
- A message indicating "Alert PLS traffic density is high, extended divider is up" is sent to the closest traffic control room due to the high traffic density.
- If the volume of traffic is typical, no action is required, andthe standard divider is up and in place.

2.6 SYSTEM DESIGN



The major goal of this project is to inform the status of the changes to users while automating road divider changes. Under this technique, difficulties with accidents are also avoided. Using IR transceivers, this project determines eachcar's status and notifies the microcontroller of it. This initiative is utilised to prevent car accidents, preventing costly injuries and fatalities in the process. The road transport departments will benefit from this project.According to a recent social analytics poll, Indian road traffic has the greatest drawbacks. The main focus of our suggested method is the elimination of this flaw. The idea of an artificial road divider is being introduced here.

Sensors are used for the successful approach, and for the execution, we use an H-bridge and an ATmega2560 microcontroller to control our operations.
The proximity sensor detects the car when it approaches thesimulated spot and sends its signal to the microcontroller. The divider can travel forward and backward using the H- bridge.

2.7 METHODOLOGY

- In the suggested system, a microcontroller-based module that includes an ultrasonic sensor for detecting traffic has been designed.
- The colour of the road will change and appear on the LCDdisplay whenever an ambulance is detected on either side ofthe road.

2.8 FUNCTIONALITY OF PROPOSEDSYSTEM

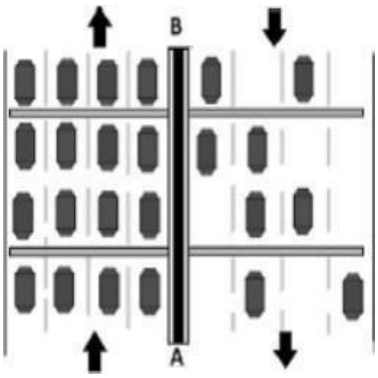


Fig 2.8 (a): When there is a lot of traffic, stay to the left of the road.

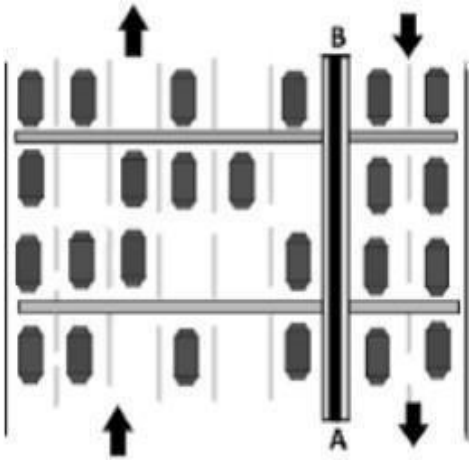


Fig 2.8 (b) When divider has moved to the right side of theroad

The Doppler Effect is employed by metro count, which is used for traffic surveys. Pneumatic tubes were laid on bothsides of the road, perpendicular to the direction of traffic flow, and an instrument was installed on the existing trafficdividers at the road. The arrangement of the instrument is asshown in figure No. 2 and the pneumatic tube is attested into the A and B side of the Metro count. Many aspects are considered during installation, including the rubber pneumatic tube's homogeneity, length needed to cover the width of lanes, absence of any physical alterations inside the pipe, alignment, perpendicularity to the direction of traffic flow, and length.

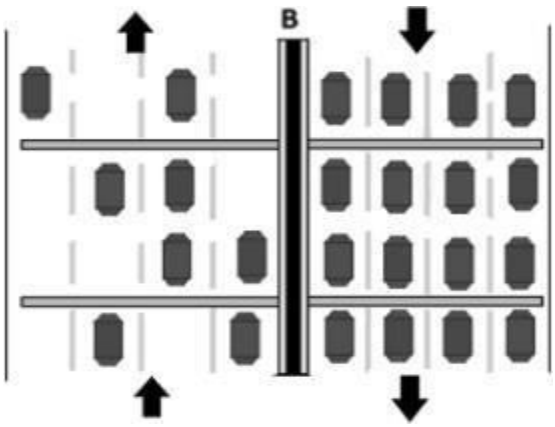


Fig:2.8 (c) When traffic on the right side of the road is heavy

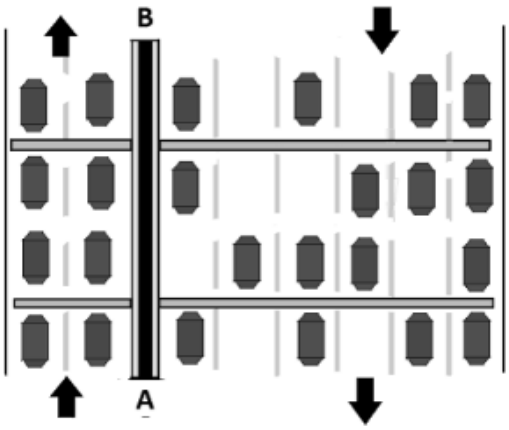


Fig 2.8 (d) : When the divider moves on the left side of theroad.

2.9 DESCRIPTION OF MODULES

The following is description of the modules

2.9.1 Traffic Density Detection

To monitor the traffic density in this system, we shall employ ultrasonic sensors. One sensor must be set up for each road; this sensor continuously detects traffic on that specific road. The microcontroller is interfaced with all of these sensors. These sensors allow the controller to detect traffic and manage the traffic system.

Fig : 2.9.1 Ultrasonic Sensor

2.9.2 Traffic Detection and Divider Operation

In the suggested system, a microcontroller-based module that includes an ultrasonic sensor for detecting traffic has been designed. The colour of the road will change and appear on the

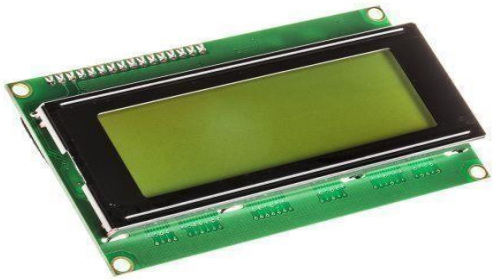


Fig 2.9.2 LCD

LCD display whenever an ambulance is detected on either side of the route.

2.9.3 Ambulance Detection

RGB LEDs were installed on both sides of the road.When the ambulance sends a signal to the divider, RGB LEDs connected to the side of the road will begin to glow.In our project, the ambulance will be detected from a distance of 100 metres, and the corresponding signal will open the pathfor the ambulance.

2.9.4 Alert and Detection for Vehicle Violation Whenever a vehicle violates traffic laws by crossing the ambulance path, this module should record the licence plateof the offending vehicle. The owner of the violated vehicleshould automatically receive an update communication from the system.

3.0 SOFTWARE TOOLS STUDY

EMBEBBED C LANGUAGE

One of the most well-liked and frequently employed programming languages in the creation of embedded systems is embedded C. Thus, we will look at some of the Fundamentals of Embedded C Program and the Embedded C Programming Structure in this post.

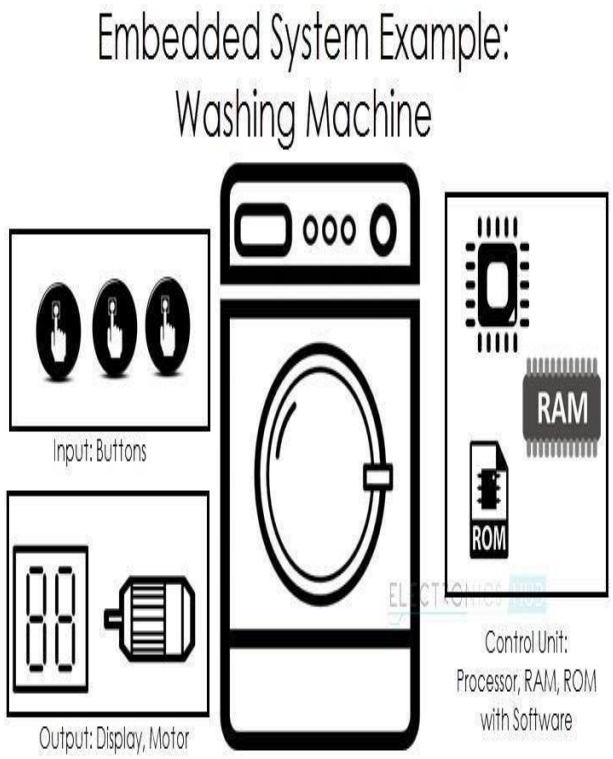


Fig: Basics of Embedded C program

The language most frequently used by embedded programmersto create embedded systems is probably embedded C. Although several prominent programming languages, like Assembly,BASIC, C++, etc., are frequently used for creating embedded systems, Embedded C is still widely utilised because of its portability, efficiency, and short development time. EmbeddedC Programming Language Introduction

We will first discuss the C programming language beforedelving into the specifics of embedded C programming and the fundamentals of embedded C programmes.

The most famous and frequently used programming language is C, which Dennis Ritchie created in the late 1960s and early 1970s. The C programming language enabled efficienttranslation to machine instructions and low level memory access using

a simple compiler (a piece of software that transforms programmes into machine code).

The C programming language has become so well-liked that itis utilised in a variety of applications, from supercomputers to embedded systems. An extension of the C programming language is embedded C programming language, which isfrequently used in the creation of embedded systems. The mainfunction, datatype declarations, defining variables, loops, functions, statements, and other programming constructs foundin the C programming language are all used in the embedded C programming language in the same syntax and semantics.

Things to Consider While Choosing a Programming LanguageThe following are a few things to keep in mind while choosing a programming language for creating embedded systems.

Size: Because embedded processors like microcontrollers havea very little quantity of ROM, the memory that the software uses is crucial.
Speed: The programmes need to run as quickly as they possiblycan. A slow-running software shouldn't slow down the hardware.
The same software can be compiled for various processors thanks to portability.
Easy to Install and Easy to MaintainReadability
Assembly Language was mostly used in the development of embedded systems in the past. Assembly Language is the language that is closest to the actual machine code instructions,however because it is not portable and requires a lot of resources Making Assembly Language tough to deal with during code development.

Several high-level programming languages existed that had theaforementioned features, but none came close to C.Protocol for Extensible Messaging and Presence (XMPP) The XMPP has a distinctive design. It exchanges messagesin real time using a push method. XMPP is adaptable andcan effortlessly incorporate the changes. Extensible Markup Language (XML) was used in the development of XMPP,which functions as a presence indicator by displaying theavailability state of the servers or devices sending orreceiving messages.

XMPP is used in online gaming, news websites, and Voiceover Internet Protocol in addition to instant messaging appslike Google Talk and WhatsApp (VoIP).

Data Sharing in a Safe Environment is Made Possible by IoT Protocols
According to a Forbes report, "32,000 smart homes and businesses are at risk of data leakage." Thus, it is crucial toinvestigate the possibilities of IoT protocols

Conclusion

There are now more cars than ever, which has causedgridlock. The method described above for measuring the number of vehicles and processing the length of the traffic light can be used for traffic control, preventing accidents, traffic jams, etc. The continuous movement of the people could be facilitated by applying this strategy at each crossroad. Additionally, the signals will be watched, and the server will be updated with the traffic signal state. This willbe useful for future planning. Now that we are merely keeping an eye on the number of vehicles at the signal, we can also use this strategy to keep an eye on the number plate(also known as the registration number) of the vehicle to identify those that break traffic laws. Moreover, we could also keep an eye on the traffic at night.

REFERENCES

[1] Density Based Traffic Signal System, Volume 3, Special Issue 3, March 2014, by K. Vidhya and A. Bazila Banu

[2] "A Technique on Road Tranc Analysis Using ImageProcessing," Vol. 3 Issue 2, February 2014, Priyanka Khanke and Prof. P. S. Kulkarni.Implementing

[3] Intelligent Traffic Management System for Congestion Control, Ambulance Clearance, and Stolen Vehicle Detection," IEEE Sensors Journal, Vol. 15, No. 2, February 2015, by Rajeshwari Sundar, Santhoshs Hebbar, and Varaprasad Golla.

[4] Real Time Traffic Light Management Using VisualProcessing," Vol. 2, No. March, by Ms. Pallavi Choudekar,Ms. Sayanti Banerjee, and Prof. M. K. Muju.

[5] World Journal of Advanced Engineering Technologies ISSN (Online), Volume 4, Issue 4, 2015, pp. 413–415; Shabbir Bhusari, "Traffic control system utilisingRaspberry-pi."MARCH 2015.

[6] S. Lokesh, "An Adaptive Traffic Control System UsingRaspberry PI," International journal of engineering sciences &research Technology, IEEE conference, June 2014, pp. 831– 835.

[7] Reduced Emergency Services Response Time in SmartCities: An Advanced Adaptive and Fuzzy Strategy by SoufieneDjahel, IEEE 2015, pp. 978–986

[8] George Kiokes, "Development of an Integrated WirelessCommunication System for Linking Electric Vehicles to the Electricity Grid," 2015 IEEE Conference, pp. 296-301.(2017),vol. 5, issue 1, "Movable Traffic Divider: A Congestion Release Strategy."

[9] The Chaudry, A. G. (2012). Dubai's transportation system has evolved. The National Industries Quarterly, Volume14.

[10] Innovative Technology for Smart Roads by Using IOTDevices, International Journal of Innovative Research in Science, Engineering, and Technology, Vol. 5, Special Issue 10, May 2016

[11] Journal of Applied Engineering Research International