MANTECH Publications

Journal of Transportation Engineering and Its Applications
Volume 7, Issue 2, May-August, 2022

Traffic Light Priority Control to Emergency Vehicle

Tushar Kamble[1], Omkar Kamble[2], Shubham Biroje[3], Sammed Chougule[4]

Students[1, 2, 3, 4]

Department of Electrical Engineering

SIT, Yadrav, Kolhapur, India

Corresponding Authors' Email: - *Kamblet472@gmail.com[1], Kamom1307@gmail.com[2], birojeshubham@gmail.com[3], Sammedchougule599@gmail.com[4]*

Abstract

Traffic congestion and transportation delay on urban requirements are increasing worldwide. Traffic signal is the significant issue to control traffic lights in vehicle systems. To improve the safety for both pedestrians and the vehicles Traffic signal is must. Emergency vehicles, like Ambulance have responsibilities to reach patients or those who are met with accidents have to quickly transfer them to hospital. Due to traffic signals they may be delayed for rescue operations. Define how traffic signal lights will detect emergency vehicles, how to manipulate the traffic light and how to provide free way to emergency vehicle.

Traffic control system plays an important role to manage traffic congestion on the road especially during peak hours and peak seasons.

Keywords: *Traffic Congestion, Transportation, Traffic Lights, Emergency Vehicles*

INTRODUCTION

The rapid growth in the vehicle ownership is one of the measures for economic growth of country. However indirect effect of vehicle ownership is acute traffic congestion. The exploitation of new trends and technologies requires fast transportation of goods, machinery and manpower for various reasons. The goal of each one is to reach at destination without wasting time and money. But resources provided by current infrastructures are

Page 73-78 © MANTECH PUBLICATIONS 2022. All Rights Reserved

limited. So the Traffic management at road is crucial to reduce waiting and traveling times, save fuel and money. Even though present traffic light controlling system handles the traffic at intersections, many times congestion, accidents happened due to its poor performance.

Existing System

Basically, the main function of traffic light control is to control the flow of traffic. The normal form of traffic light is comprises of simple three colors for traffic signal which are red means stop, yellow means ready to stop and green means move This general traffic light control system cannot give prioritizes and recognize the emergency vehicle and normal car. As an example, the delay of the ambulance to reach at the hospital because of the traffic congestion may cause danger to patient's life.

Proposed System

Internet technologies are anticipated to create a revolution in traffic management and control systems. The data base contains online statistical information, which can be used by operators and planners to develop better models in the future. The system saves valuable details in the records of the database, which can provide valuable information to planners and investigators. Further enhancements can be done to the prototype by testing it with Bluetooth module so that using Bluetooth in the data upload.

Proposed Methodology of Solving Identified Problem

It can be concluded is the best technique to implement a smart traffic light control system especially for emergency vehicles because of low maintenance, low price and can be used in various areas of applications. Based on In Malaysia, where the economic situation is in the stage of development and control of the existing traffic light is not enough to control the increasing of vehicle. Therefore, this proposed method takes all consideration based on the problems that occur to improve the existing traffic light control system for emergency vehicles.

1. Techniques used to control traffic routing decisions.
2. Traffic data collection methods to manage the routing decisions.
3. Number and types of variables use to support the routing and signal decisions

ELECTRICAL SYSTEM

- **Ardino**

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable

Page 73-78 © MANTECH PUBLICATIONS 2022. All Rights Reserved

circuit board (often referred to as a microcontroller) and a piece of software, IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board – you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible pack.

- **Bluetooth Module**

As a world leader in short-range wireless connectivity, Laird offers the widest range of high-performance classic Bluetooth and Bluetooth Low Energy (BLE) modules for data and audio applications. With over a decade of experience in the development and production of Bluetooth wireless modules and associated development kits wouldn't you love to switch on and off the lights in your house without having to raise a finger? (well, technically you would have to raise a finger or two, but you get the jist of the story). The good news is that you can. All you needs is an arduino, HC-06 bluetooth module, some relays and a little electrical know-how.

Procedure for Making

A. We collect some more information above the project through the IEEE paper.

B. We get started to collecting the information above the various components which requires for the project.

C. For the whole assembly first we generate the actual circuit diagram and check working by using various apps, the following.

D. After we collect the required materials we start to build the actual project.

E. We also start to represent the programming of the arduino witch has in a next topic.

F. We start to build a proper circuit; we are now on that a position.

Page 73-78 © MANTECH PUBLICATIONS 2022. All Rights Reserved

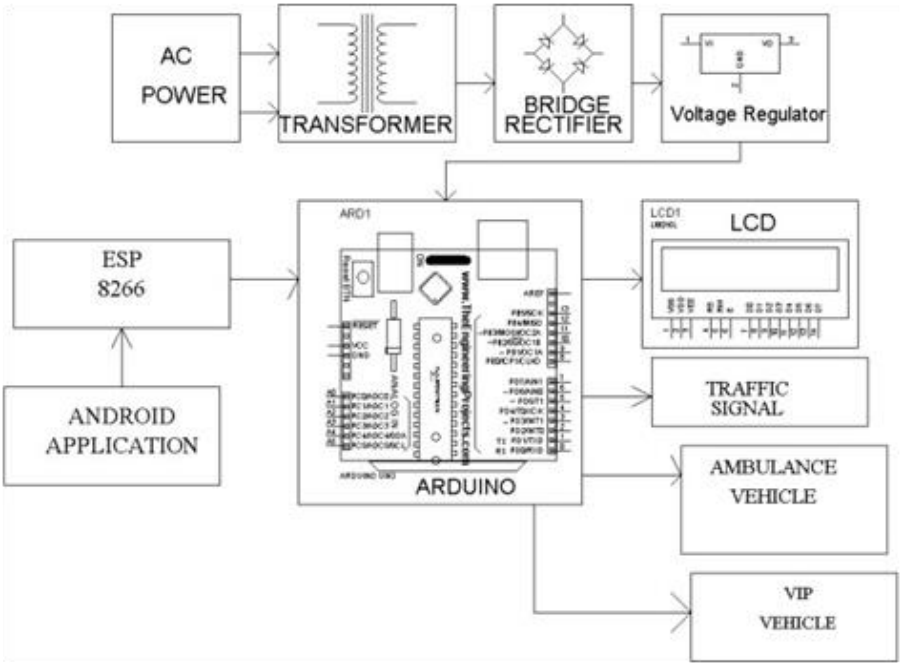


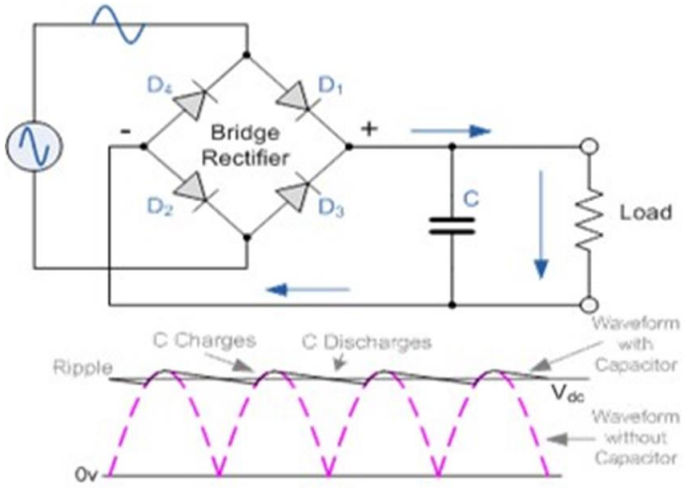
Fig.1. Block Diagram

RESOURCES AND CONSUMABLE REQUIRED

The following components required system.

Bridge Rectifier

Bridge rectifier circuit is a common part of the electronic power supplies. Many electronic circuits require rectified DC power supply for powering the various electronic basic components from available AC mains supply. We can find this rectifier in a wide variety of electronic AC power devices like home appliances, motor controllers, modulation process, welding applications, etc.



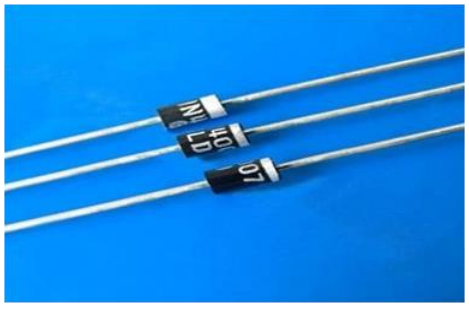
Page 73-78 © MANTECH PUBLICATIONS 2022. All Rights Reserved

Liquid Crystal Display



This is the first interfacing example for the Parallel Port. We will start with something simple. This example doesn't use the Bi-directional feature found on newer ports, thus it should work with most, if not all Parallel Ports. It however doesn't show the use of the Status Port as an input for a 16 Character x 2 Line LCD Module to the Parallel Port. These LCD Modules are very common these days, and are quite simple to work with, as all the logic required running them is on board.

1N4007 Diode



Diodes are used to convert AC into DC these are used as half wave rectifier or full wave rectifier. Three points must he kept in mind while using any type of diode.

- Maximum forward current capacity
- Maximum reverse voltage capacity
- Maximum forward voltage capacity

Approximately Expenditure

Sr. No	Activity	Expenditure
1.	Material	2500
2.	Fabrication	1500
4.	Consumable	1000
	Total	5000

REFERENCES

1. G. Varaprasad and R. S. D. Wahidabanu,―Flexible routing algorithm for vehicular area networks,‖ in Proc. IEEE Conf. Intell. Transp. Syst.Telecommun., Osaka, Japan, 2010, pp. 30–38.

2. B. P. Gokulan and D. Srinivasan,―Distributed geometric

Page 73-78 © MANTECH PUBLICATIONS 2022. All Rights Reserved

fuzzy multiagent urban traffic signal control,‖ IEEE Trans. Intell. Transp. Syst., vol. 11, no. 3, pp. 714–727, Sep. 2010. 921 P a g e

3. K. Sridharamurthy, A. P. Govinda, J. D. Gopal, and G. Varaprasad, ―Violation detection method for vehicular ad hoc networking, Security Commun. Netw, to be published.

4. A. K. Mittal and D. Bhandari, ―A novel approach to implement green wave system and detection of stolen vehicles.

Page 73-78 © MANTECH PUBLICATIONS 2022. All Rights Reserved