WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Advanced Road Transportation System

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ABSTRACT:

The purpose of report is to illustrate the implementation of advanced Road Transportation System. The Arduino & Microcontroller based advanced road transportation system is the idea which will be helpful for transportation purpose, alerting accidents, canteens and automatic work. The main aim of project is not only to make transportation better and manpower is not required but also it work on road. This system works on the DC supply. This system is fully based on sensor, which uses Arduino circuit.

Keywords:Arduino, Transportation, Microcontroller.

I. INTRODUCTION

An important metric for economic growth of any country is its burgeoning vehicle ownership. However, the indirect effect of vehicle ownership is acute traffic congestion. India has, in the past decade, seen an astronomical increase in vehicle ownership and associated road blocks and traffic snarls in its metropolitan cities. The variety of vehicles in India – two, three and four wheelers, in addition to a large pedestrian population, complicates the situation. The seriousness of the problem is reflected in the report of World Bank that estimates the economic losses incurred on account of congestion and poor roads alone run as high as $6 billion a year in India. The direct solution for this problem by improvements in infrastructure is constrained by space availability and other logistic problems..

II. PROBLEMSTATEMENT

People mostly use public transport system; they have to stay on the stop for waiting of busses. Because of that the important time of people wastes. So, they want to know the information of current location of bus.

III. NECESSITYOFPROJECT

Advanced Road Transportation System (ARTS) can be broadly defined as the use of technology for improving transportation systems. The major objective of ARTS is to evaluate, develop, analyse and integrate new technologies and concepts to achieve traffic efficiency, improve environmental quality, save energy, conserve time, and enhance safety and comfort for drivers, pedestrians, and other traffic groups. An overview of ARTS can be schematically represented. State-of-art data acquisition and evaluation technology, communication networks, digital mapping, video monitoring, sensors and variable message signs are creating new trends in traffic management throughout the world.

IV. LITERATURESURVEY

Advanced road transportation system consisting of 6 circuits.It provide better result for transportation. Power supply is the main circuit of our system. It supply power to the remaining circuits.

An application which has been successfully tested & developed in ARTS is Vehicle Accident Alert System in public transport.There are currently four major types of navigation technology employed by Automatic Vehicle Location system which include GPS Satellite Location, Signpost & Odometer, Radio Nevigation & Location.Over speed sensor consisting of IR sensor, Arduino.It measures the speed of any vehicle.

V. METHODOLOGY

Numerous ARTS applications have been developed by various organizations/institutions around the globe and tailored to offer transportation solution to meet their specific needs. In developed countries, road operators have become dependent on ITS for not only congestion and demand management, but also for road safety and improved infrastructure. ITS employ modern communication, computer and sensor technology directly, and are also enabled indirectly by developments in materials technology and operations research, including network analysis and risk assessment. The vastness of the playing field makes the ITS a cooperative effort between the public sector, private sector, and academia. There is substantial emphasis on the central and critical role of local public-sector partnership with knowledge input from academic circles.

VI.CIRCUITDIAGRAM

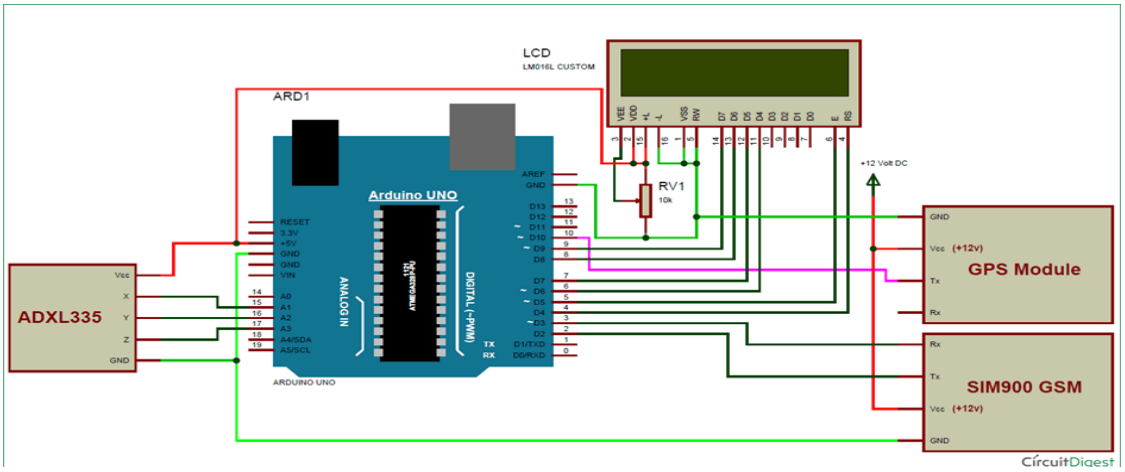

Fig.1. Circuit Dig of Accident Detection & Alert

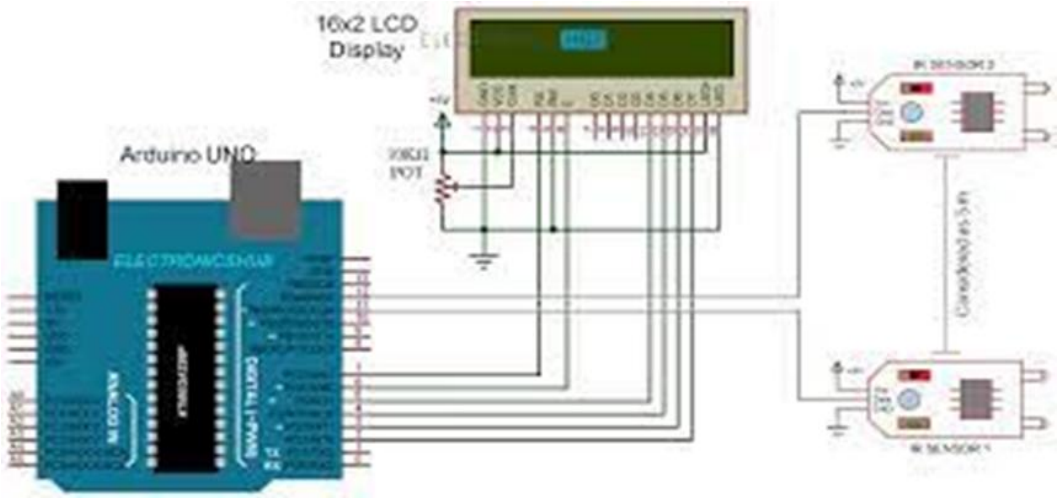

Fig.2. Vehicle Overspeed Sensor

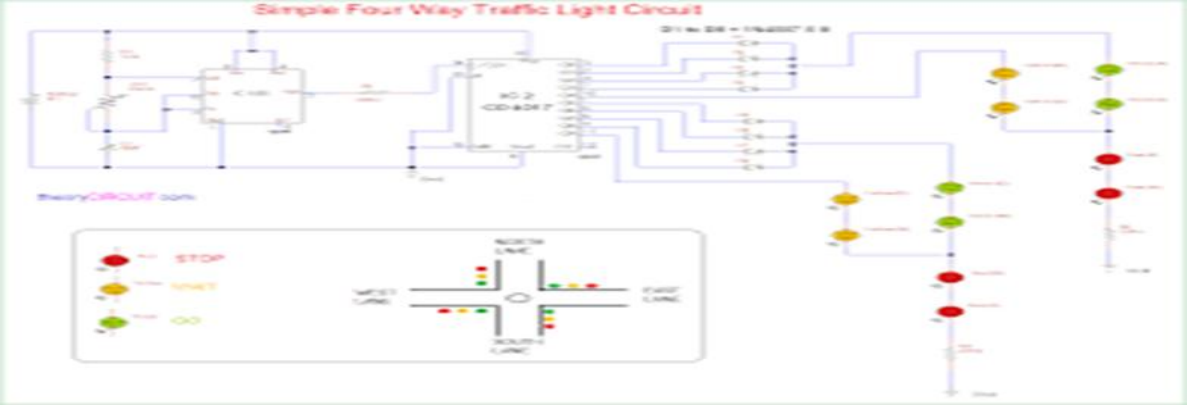

Fig.3. Four Way Traffic Light

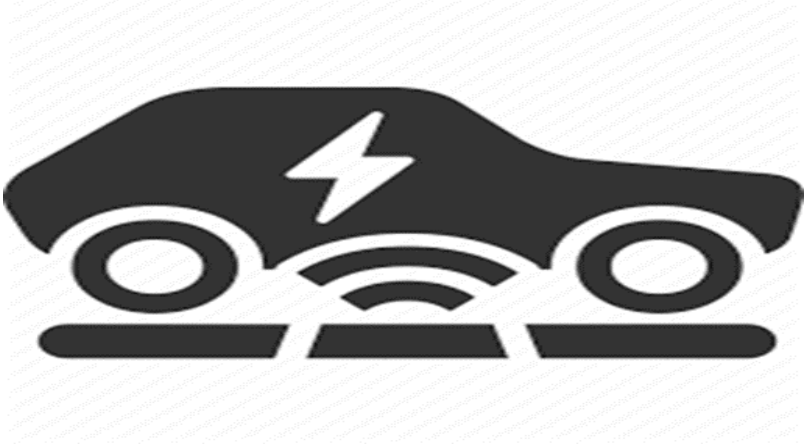

Fig.4.Wireless Vehicle Charging

Description: Advanced Road Transportation system consists of Two sections. First one is Power Supply and Second is Six Circuits. These two sections are connected to each other.

1. Vehicle Accident & Alert System
2. Vehicle Overspeed Sensor
3. 4Way Traffic Light
4. Wireless Vehicle Charging
5. Stright Light

It consist of

A. Arduino.
B. IR Sensor.
C. Transformer.
D. GSM Module.
E. GPS Module.
F. LCD display.

Aurduino-Arduino is an open-source electronics platform based on easy-to-use hardware and software.Arduino boardsare able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use theArduino programming language(based onWiring), andthe Arduino Software (IDE), based onProcessing.Arduino board designs use a variety ofmicroprocessorsand controllers. The boards are equipped with sets of digital and analoginput/output(I/O) pins that may be interfaced to various expansion boards ('shields') orbreadboards(for prototyping) and other circuits. The boards feature serial communications interfaces, includingUniversal Serial Bus(USB) on some models, which are also used for loading programs. The microcontrollers can be programmed using theCandC++programming languages, usingstandard

API which is also known as the "Arduino language". In addition to using traditional compiler tool chains, the Arduino project provides anintegrated development environment(IDE) and a command line tool (arduino-cli) developed inGo.

Fig. 1. Arduino

IR Sensor-IR sensor is an electronic device, that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the **infrared spectrum**, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations.

The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode . Photodiode is sensitive to IR light of the same wavelength which is emitted by the IR LED. When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR light received.

The three main types of media used for infrared transmission are vacuum, atmosphere and optical fibers. Optical components are used to focus the infrared radiation or to limit the spectral response

Fig. 2. IR Sensor

Transpoforemer-12-0-12 **5Amp** Center Tapped Step Down **Transformer** is a general purpose chassis mounting mains **transformer**. The **transformer** has flying colored insulated connecting leads (Approx 100 mm long). The **Transformer** act as step down **transformer** reducing AC - 230V to AC - **12V**. The **Transformer** gives outputs of **12V**, **12V** and 0V.

Fig. 3. Transformer

GSM module-A **GSM modem** or **GSM module** is a hardware device that uses **GSM** mobile telephone technology to provide a data link to a remote network. From the view of the mobile phone network, they are essentially identical to an ordinary mobile phone, including the need for a SIM to identify themselves to the network.

GSM is combination of TDMA (Time Division Multiple Access), FDMA (Frequency Division Multiple Access) and Frequency hopping. Initially, **GSM** use two frequency bands of 25 MHz width : 890 to 915 MHz frequency band for up-link and 935 to 960MHz frequency for down-link. Later on, two 75 MHz band were added

Fig. 4. GSM module

GPS module-**GPS modules** contain tiny processors and antennas that directly receive data sent by satellites through dedicated RF frequencies. From there, it'll receive timestamp from each visible satellites, along with other pieces of data.

GPS is a system of 30+ navigation satellites circling Earth. We know where **they** are because **they** constantly send out signals. A **GPS receiver** in your phone listens for these signals. Once the **receiver** calculates its distance from four or more **GPS** satellites, it can figure out where you are.

Fig.5. GPS module

1) *LCD display*- LCD modules are very commonly used in most embedded projects, because of being its cheap price, availability and programmer friendly. Most folk would have stumble upon these displays in our day to day life, either at PCO's or calculators. LCD Display's the knowledge of bus i.e. Bus is coming, Bus is on the stop, Bus is gone.

Fig.9. LCD display

VII. WORKINGPRINCIPLE

When accident is occurred, the location details of vehicle/object collected by the GPS module from the satellite, this information is in the form of latitude and longitude scale.Thus, collected information is then fed to arduino uno. Necessary processing is done and the information is passed to the LCD and GSM modemThe GSM modem collects the information for arduino uno and then transfer it to the mobile phone through the SMS which is in text format

Traffic lights Traffic lights, which may also be known as stoplightsSignaling devices positioned at road intersections. Use of lights in standard colors (Red ,yellow, Green)Illumination of the red signal prohibits any traffic from proceeding.Yellow light denoting if safe to, prepare to stop short of the intersection.Green light allows traffic to proceed in the direction denoted..

In wireless charging there are Transmiter and reciever 220V,50hz AC supply.It is converted into high frequency alternating current and this high frequency AC supply.That Supplied to transmitter Coil then it Creates alternating Magnetic field that cuts.The receiver coil & causes the production of AC power output.

VIII. BENEFITS

A. You'll improve passenger satisfaction and reduce customer complaints.
B. Good contact with the local actual (Contact with the local process).
C. Public welfare is strong, near the connection between business and customers (close business, business and business).

IX. RESULT

Fig.11. Advanced Road Transportation System.

The rapidly increasing vehicle population in India, spurred by the population boom and economic upturn lays a critical burden on traffic management in the metropolitan cities and towns of the country. While India has already made a foray into intelligent transport systems in organizing traffic, more extensive and urgent integration of advanced technology and concepts into mainstream traffic management is imperative.

The adoption of location and information based technologies into vehicles, infrastructure, traffic management and traveller information services have shown dramatic improvements in the safe, and efficient mobility of people and freight in USA, European nations, UK, Japan, Middle East and Canada. ITS is still in its infancy in India, with decision-makers, key planners and agencies still in the process of understanding its potential.

X. CONCLUSION

ART represents the next step in the evolution of a nation's entire transportation system.Traffic congestions , rate of road accidents , wastage of fuels are decreased to a large extend.Transportation has become a safer & efficient mode.Hence with much more interest & in advanced research in the field of ART.

It can be implemented in our country & can prove to be the solution of the traffic problems including traffic congestions , air pollution & traffic accidents**.**

XI. ACKNOWLEDGMENT

It is my great pleasure to present the dignity and sincere gratitude to my guide Ms.M.N.Patil Lecturer in Electronic and telecommunication Engineering, Sharad Institute of Technology Polytechnic, Yadrav helped in joining the hands in developing each and each steps of this project and for valuable guidance and constant encouragement during completion of project work. it absolutely was my privilege and pleasure to figure under her valuable guidance. I'm indeed gratefully to her for providing me helpful suggestions. thanks to her constant encouragement and inspiration I could complete my project work. I'm very thankful to Principal, Sharad Institute of Technology, Polytechnic, Yadrav. My grateful due to Head of E&TC Department, for his or her valuable guidance, support and constant encouragement. I express due to my family and friends for his or her support and encouragement at every stage of successful completion of this project work. My sincere thanks to all or any those that have directly or indirectly helped me to hold out this work.

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