International Journal of Future Generation Communication and Networking
Vol. 13, No. 2s, (2020), pp. 1221–1225

# Smart Traffic Management for Emergence Vehicles using Arduino Implementation

ER. Kaushik Babhure, MS. Mona Mulchandani, Dr. Pradnya Borkar

*1Student, Department of Computer Science and Engineering, Jhulelal Institute of Engineering Nagpur, Maharashtra, India*
*2Head of Department, Department of Computer Science and Engineering, Jhulelal Institute of Engineering Nagpur, Maharashtra, India*
*3 Associate Professor Department of Computer Science and Engineering, Jhulelal Institute of Engineering Nagpur, Maharashtra, India*

***Abstract***

*In India, Many cities are on the trail for becoming smart city and lots of the projects like subway, Road Development (Cement Road), Flyover because of this kind of comes Traffic is implausibly badly affected and hence the native person should suffer from Congestion on roads lead to the traffic blockage. At this case Emergency Vehicles together deteriorate from Heavy traffic congestion. a wise city is one all told that uses a Keen system characterized by the activity between behaviors, capital, cultures and infrastructure, achieved through their integration. Nagpur has first Position In sensible city Program in Current Year. Sensible city Mission is objective to line examples that's in an exceedingly position to be replicated each among and out of doors city dashing up the creation of comparable good city in varied regions and other areas of the country. These Emergency vehicles have to be compelled to reach hospital or emergency place as quick as come-at-able. Within the survey of the great city construct by rendering recent IEEE papers throughout this domain, we've got an inclination to tend to tend to found heterogeneous construct of the great city; some papers mentioned it as a generic case study, whereas others deals with specific components. This paper is additionally a survey of favor of articles, that is bifurcate into 2 subsection:1-General case study, that covers the topic of fine city in degree passing general framework, and 2-Specific case study, that covers the subject of the great city from a selected careful application, like Traffic Management System, sensible street-Light Technology.*

***Key Words****: Arduino, Frequency, Detection, Trigger, Event*

## 1. INTRODUCTION

Emerging Mega Cities plays a large role within the positive growth for the economy of each nation, land is no exemption. On the brink of thirty first of India's current population lives in urban areas and contributes sixty three of India's gross domestic Product (Census 2011).In Asian country thanks to over growth population gift in Urban city the traffic jams has been exaggerated. Due to this many Emergency vehicles has been stricken and lots of lives came in to the danger. The Metropolitan population of Asian country has seen an increase from 74 % to 31 % between 1950 and 2015. With increasing urbanization, the Transport management getting older in terms of modernization and handling in Metropolitan areas and thereby contribute seventy fifth of India's gross domestic product by 2030 [1]. This finishes up during a challenge of comprehensive development of physical, institutional, social and economic infrastructure. the standard of period of the voters living within the cities. a wise town may be a self-contained city in terms of evolution information of data of knowledge and communication infrastructure technology. The Over loading of traffic ends up in heavy jams and Emergency vehicles it slow get at bay in traffic. Due to the huge traffic jam the emergency vehicles are not able to reach the needy location. India like nation is a developing country and hence the transportation, medical related facility is not up to the mark and hence many people have to come big city from small city which creating burden on traffic system which is very old. And hence every year huge traffic jam is increasing year by year which creating an problem for emergency vehicles like ambulances, fire brigade, police vehicles Etc wireless technology is an innovations which will support public health, giving doctors access to medical records just and at lowest worth with higher benefits .

### 1. Project Module

There are four major components has been utilized i.e.

ISSN: 2233-7857 IJFGCN

1) Arduino Uno (with its adapter)
2) Arduino IDE for Windows
3) Sound Detection device
4) Jumper wires & LEDS

**1. 1. Arduino Uno**

The Arduino Uno is an Essential a region of circuit. Arduino is degree code document hardware and code company, project and user community that designs and manufactures single-board
Micro controllers and microcontroller kits for building digital devices. The name Arduino comes from a bar in Ivrea, Italy, where type of the founders of the project accustomed meet. Arduino board designs use a variety of microprocessors and controllers. Arduino provides a typical kind issue that breaks the functions of the micro-controller into a loads of accessible package

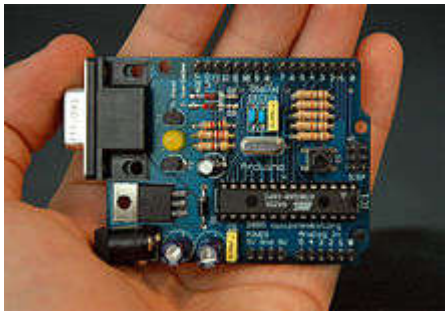


**Fig 1:** Arduino Uno Hardware.

**1.2. Arduino IDE for Window**

Arduino IDE is associate degree ASCII text file package program that permits users to place in writing and transfer code inside a period of time work atmosphere. As this code can henceforth be hold on inside the cloud, it's usually used by folks that are trying to find an extra level of redundancy.

**1.3. Sound detector**

Sensors square measure refined devices that square measure often accustomed sight and reply to electrical or optical signals. A detector converts the physical parameter (for example: temperature, pressure, humidity, speed, etc.) into a sign which could be measured electrically.
The Sound Detection detector might be a little board that mixes a electro-acoustic transducer and some process electronic equipment, it is the flexibility to sight totally different sizes of sound. These sensors square measure usually accustomed for a spread of uses from industrial to easy hobby or kidding.

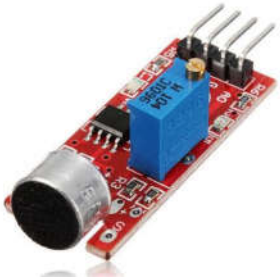


Fig2: Sound detection Hardware.

**1.4. Jumper Wires & LEDS**

A jump wire (also said as jumper wire, or jumper) is associate degree electrical wire, or cluster of them in associate degree passing cable, with a connation or pin at every finish (or generally while not them – merely "tinned"),

ISSN: 2233-7857 IJFGCN

that is commonly accustomed interconnect the elements of a bread board or alternative epitome or take a look at circuit, internally or with alternative instrumentality or elements, while not attachment. Individual jump wires square measure fitted by inserting their "end connectors" into the slots provided throughout a bread board, the header connation of a board, or a touch of apparatus.

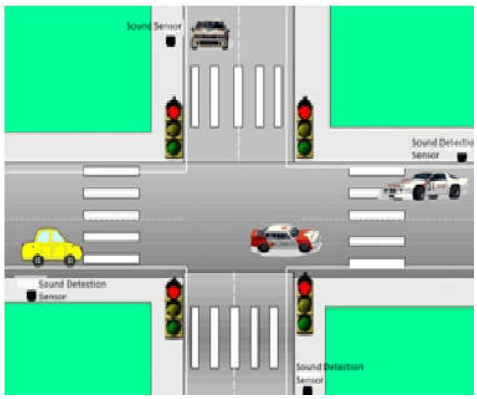
Fig 3: Jumper Wires

A semiconductor diode (LED) might be a semiconductor light-weight that emits light-weight once current flows through it. Electrons inside the semiconductor recombine with negatron holes, cathartic energy inside the type of photons. the color of the sunshine (corresponding to the energy of the photons) is ready by the energy needed for electrons to cross the band gap of the semiconductor. White light-weight is obtained by victimization multiple semiconductors or a layer of light-emitting phosphor on the semiconductor.

## 2. Implementation

The proposed system highlights to find solution for bypass the traffic for emergency vehicles. This is the biggest problem for every emerging smart city to deal with traffic jam. Every natives of “Smart City” should not be digitally blind but should be acquainted with online culture and concluded that before implementing creation of “Smart Cities”. The Arduino circuit, sound detector are assembled. Arduino code is written in C++ with an addition of special methods and functions. The Arduino Integrated Development Environment (IDE) is the main text editing program used for Arduino programming. The sample sound has been recorded so it could be use to compare it and can take decision on the basis of that. The siren sound of Emergency vehicles in India is defined by RTO rules and regulation body. The siren sound repeats tones after each cycle completed. The tones are 950 Hz and 740 Hz, and these are repeated 1.5 to 1.8 sec period. The sound sensor has been placed on road little far from the signal. The siren sound affected by the Doppler Effect and varies its frequency. The Doppler Effect in simple term is as a noticeable change in the frequency of sound an example of the Doppler Effect is that the frequency of the sound increases as the source moves closer to the observer. Sound sensor includes three pins a) Pin1 (VCC): 3.3V DC to 5V DC b) Pin2 (GND): This is aground pin and the third one c) Pin3 (DO): This is an output pin. When the emergency vehicle struck into the signal, the driver has to use its siren .the sound detecting sensors will detect the sound and compare it with sample sound. If the sample sound is match with capture sound then the Arduino trigger another set of code where the condition has been given for high low bit. When Arduino trigger the Event, this event accustomed begin signal from that direction wherever Emergency vehicle is coming. The four sounds Sensor has been used, they are set each side of the road that is returning toward signal which will use to identify the Signals and on the basis of that the further event will trigger and after that the traffic from that road will be clear and then can reach properly on destination.

ISSN: 2233-7857 IJFGCN



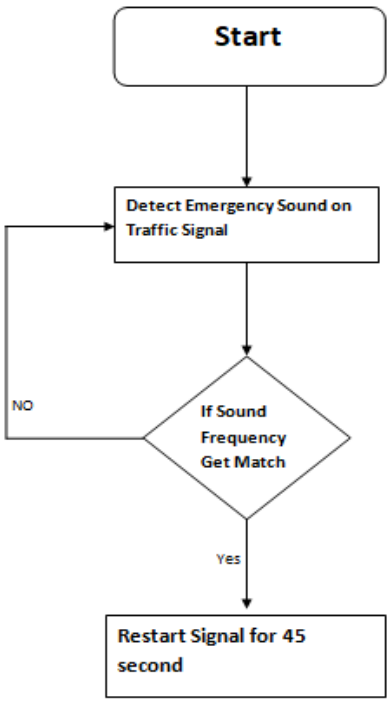



Fig 5: Traffic flow sheet and the project flow diagram.

## CONCLUSION

As a conclusion, in this paper, the application have achieved the main objective stated earlier which is analyzing and implementing the wireless communication. The prototype of this application by implementing the proposed system we can save several lives that are lost just because they does not reach the emergency location or on their destination. The project will help to make city much safer and in this way the city can be call a smart city. Emergency vehicles like Ambulances, Firefighters vehicle will able to reach the emergency location.

## REFERENCES

1. https://www.arduino.cc/end/Guide/ArduinoUno

2. http://robotix.com.au/#/Guild/AriduinoUno/WorkingSensores

3.https://www.researchgate.net/publication/3155+56+890_SMART_TRAFFIC_CONTROL_SYSTEM_FOR_AMBULANCE

4. N. M. Z. Hashim, , A. S. Jaafar, , N. A. Ali, , L. Salahuddin, , N. R. Mohamad "Traffic Light Control System for Emergency Vehicles Using Radio"IOSR Journal of Engineering (IOSRJEN), e-ISSN: 2250-3021, p-ISSN: 2278-8719, Vol. 3, Issue 7 (July. 2013), ||V5|| PP 43-52

5. https://www.you_tube.com/watch?v=RwHGSDS1515Sioglbk8.

6. Saurabh Bharathwal, Piyush Meghanani "An advance system for emergency vehicles: Based on M2M communication" 2017 11th International Conference on Intelligent Systems and Control (ISCO), 5-6 Jan. 2017

7. Kapileswar Nellore Gerhard P. Hancke " **Traffic Management for Emergency Vehicle Priority Based on Visual Sensing"**https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5134551/

ISSN: 2233-7857 IJFGCN

8. https://ieeexplore.ieee.org/document/7745309

9. https://www.sae.org/publications/technical-papers/content/2018-01-1644/

ISSN: 2233-7857 IJFGCN