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Innovative System for Metropolitan Sound Pollution Management

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Abstract: According to population Reference Bureau, the current world population is 7.4 Billion. At present, a total number of the vehicle is 1.2 Billion according to survey and it will be 2 Billion up to 2035. Cars and trucks turn out pollution throughout their life, as well as pollution get emit throughout the vehicle operation, refuelling, producing, and disposal. Due to heavier traffic and powerful engines, noise level in cities is rapidly increasing. Our proposed system provides the solution to these problems. Our system Monitor the noise pollution created by vehicle and if any vehicle crosses its threshold value then it will get reported on the LCD and generate notification for municipal corporation. In this project we are using GPS for getting current location of vehicle & software panel checks that whether it is in no honking zone or not, if it is no honking zone then software panel informs Arduino (microcontroller) to control the horn. If user is out of honking zone then horn will reset to its original value.

Keywords: Noise, Sensors, Vehicle, Pollution Measurement.

I. INTRODUCTION

The main source of noise pollution is transportation. About 100000 premature adult deaths attributable to air pollution occur each year in. Noise pollution is a particularly annoying consequence of life in a technologically advanced society. Surveys show that road traffic noise causes most annoyance but aircraft noises are also particularly objectionable. However, trains, noisy neighbours, and even the hum of electrical transformers can cause an intolerable nuisance. The nuisance caused by noise pollution is subjective, in that the nature of the sound and the conditions under which it is heard rather than merely its amplitude and frequency content determine the extent of disturbance.

One important step towards limiting this pollution is to analyse the nature of the nuisance- by monitoring, i.e., by obtaining records of the location, time, severity, duration, and cause of incidents, preferably in a form reliable enough to be acceptable in a court of law. There is always considerable effort to reduce speed in the honking zones and avoid annoyance amongst the residents. The annoyance level of traffic speed may be personal but the community as a whole is quite sensitive to traffic noise especially honking by vehicles.

L10 is a measure of daily exposure to traffic speed and provides an indication of how much the prevailing traffic noise will affect the exposed residents. It is calculated by averaging L10 of each of the eighteen hours between 6 am and midnight. The speed level should be less than 40 km/h on average. The traffic speed involves not only the speed generated by the movement of vehicles but primarily by honking of the vehicles.

Honking by vehicles has become a major cause of accident pollution in contemporary society further leading to health hazards, irritation. Vehicular Traffic adds up to 55% of total urban speed. We observed the behaviour of honking horn and surveyed overall vehicles. Out of which drivers of heavy vehicles were observed for maximum honking aggressive speed as of the total vehicle population followed by drivers of two vehicles and car/jeep as more than heavy vehicle. According to the International Program of (WHO 1994), an adverse effect of speed is dined as a change in the morphology and physiology, that results in impairment of functional capacity.

WHO has documented seven categories of adverse health effects of noise pollution which is having only because of speedy driving on humans that includes hearing impairment, Interference with Spoken Communication, Sleep Disturbances, Cardiovascular Disturbances, Disturbances in Mental Health, Impaired Task Performance and Negative Social Behaviour and Annoyance Reactions. Temporary speed exposure results in physiologic changes those are readily reversible. However, noise exposure of sufficient intensity, duration provokes changes that may not be so readily reversible. Noise pollution which having only because of speedy vehicle driven is not believed to be a cause of mental illness, but it is assumed to accelerate and intensify the development of latent mental effects on human health because of noise. How that bad effect was reduced.

II. LITERATURE SURVEY

Currently Indian cities are ranked thrice in Top 10 noisiest city in the world according to Citi quite. The cities that rank in these are Kolkata, Delhi and Mumbai. The effects of Noise pollution which is generated from the high-speed vehicle it is mainly affected on honking zone area which is declare by municipal are being taught from 4th Grade of schools, but we still don't have any strong system to control it. The Rules and Regulations are not exercised as per papers, legal document PDFs and Government websites describe. The speed Barriers and smart Honking Zones are created but are hardly followed. The decibel levels of Sound are constrained in regulations but there is no tool to measure and control in real time. The people are susceptible for early seeing loss than the expected average age, Institutional disturbance, Patients in the hospital suffer. Coming to present and existing solutions, there are speed barriers, smart honking zones which are hardly paid any attention to, and people continue honking irrespective of which zone they are in.

- 1) *Author:* R. K. Mishra Paper- Evaluation and analysis of traffic volume noise along has rapid transit system corridor. In this research paper The R. K. Mishra analysis on traffic volume noise. He tries to reduce noise pollution which created by the extra volume from vehicles.
- 2) *Author:* T. VaidyaSagar Paper- Noise Pollution Levels in Visakhapatnam City (India). In this research paper the ambient air quality noise levels (AAQNL) at traffic junctions were 5 DBA or more than those prescribed by AAQNS for commercial zone and most of the values were found in the range of 80 +/- 10 DBA, among which 75 Author- Prof. S.M. Patil Paper- Law on Environment Some Reflections. In this research paper this author describes about the law of environment. He searches the what was the reaction of low on environment.
- 3) *Author:* Ising H., Kruppa B. Paper- Health effects caused by noise. In this research paper the author shows what was the effects on human health because of noise. How that bad effect was reduced.

III. RELATED WORK

When the vehicle enters in the normal area it speed does not decrease and it goes normally no action is performed. When the vehicle enters into the restricted areas that means it enters into the speed limiting. Whenever it enters the transmitter module just send an information that contains how much speed a vehicle can go inside the speed limited region. Then the signal or information is received by the receiver and the signal acquired from the speed meter is also given to the controller. The signal is basically analog in nature that will be converted into digital so only the micro controller able to process the signal. The signal from the transmitter and the Accelerometer is compared by the controller. In this there are two cases, first, the current speed is less than the transmitted speed the vehicle goes normally no action is required. Second, the information from the speed meter is greater than the transmitted speed by the transmitter module the controller waits for few second whether the driver reduce the speed to the below value if the driver reduce the speed means reduce the speed according to it. The speed denotes that at which time the vehicle cross that area. Then the fine or penalty amount is collected by the nearest tollgate or the checkpost. After that at the end of the speed limit area there is another transmitter that contains an stop information means the control releases by the controller to driver.

IV. PROPOSED SYSTEM

A smart city is an urban region that is highly advanced in terms of overall infrastructure, sustainable real estate, communication and market viability. It's a city where information technology is the principle infrastructure and the basis for providing essential services to residents. It is an urban development vision to integrate information and communication technology (ICT) and internet of Things (IOT) technology in a secure fashion to manage a city's assets. A smart city is promoted to use urban informatics and technology to improve the efficiency of services. ICT allows city official to interact directly with the community and the city infrastructure and to monitor what is happening in the city, how the city is evolving, and how to enable a better quality of life. Through the use of sensors integrated with real-time monitoring systems, data are collected from Municipal Corporation and devices- then processes and analyzed. The information and knowledge gathered are keys to tackling inefficiency. Information and communication technology is used to enhance quality. Performance and interactivity of urban services, to reduce cost and resource consumption and to improve contact between citizens and government. In our system's admin can add municipal corporation which is add the hospital's, School, college, old-age home, Govt. offices with their longitude latitude name and type. We calculate the speed of vehicle using accelerometer if speed exceed, the speed limit which is decided by admin and municipal corporation then the buzzer of vehicle will buzz and will indicate that the speed of vehicle is exceeded in honking zone declared by municipal corporation. In this way we create smart honking system for speed limit of the vehicle.

- A. Small portion of ICT in new city development
- B. Technology changes too fast
- C. Too Many Stakeholders
- D. The India Smart Cities Challenge is a competition for municipal leaders and their partners to promote economic opportunity in India, improve governance, and produce better result for residents.

V. SYSTEM DESIGN

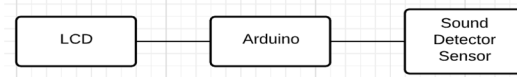


Figure 1: Module 1

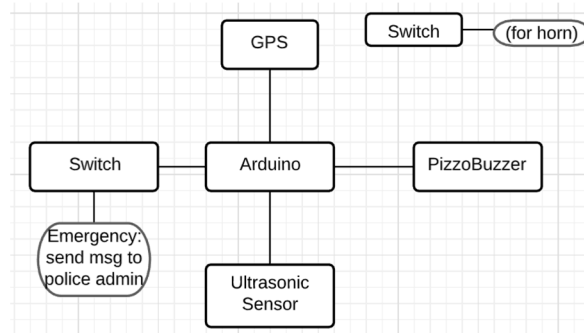
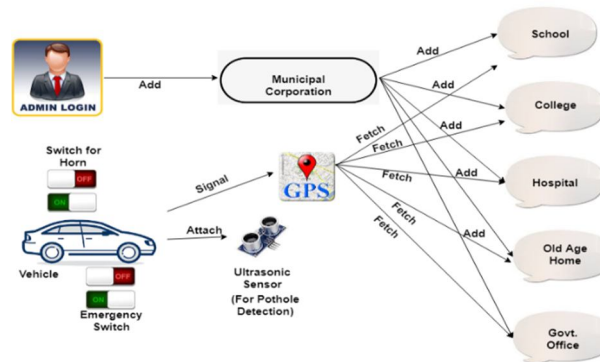


Figure 2: Module 2

A. System Architecture



Smart honking zone for smart cities system the system architecture is define as follows:

- 1) *Admin:* Admin can add the municipal corporation with details like name, District, State, Country, Area, view al the honking zones which are included by the municipal corporation on GPS. He also views and delete the municipal corporation and also view all details and data of others which is included by the municipal corporation
- 2) *Municipal Corporation:* In our system the municipal corporation can add the honking zones like hospital, school, college, old-age home and government offices in cities as a honking zone with their longitude, latitude, Name, Type, location and other are located on map with description and decide the speed level of the vehicle which is travel from near the honking zone
- 3) *System:* In this web application when any car or vehicle goes from any honking zone the horn or noise level of vehicle will be monitored. This monitoring system is built in vehicle when vehicle make loud noise on honking zone then the second emergency switch can send automatic text MSG to police admin using SMS gateway with the location detail of vehicle. If the detected noise of vehicle is greater which is not allowed in honking area then the pizzobuzzer will buzz and get alert to driver to drive slowly in honking zone area. The built-in ultrasonic sensor can detect the pothole on road and buzz to alert the driver from potholes.

VI. RESULT

The existing system provide buzzer system in every vehicle. This system is useful for Hospital, Colleges, and Schools, old age home, government offices etc. The current systems are available in every vehicle; our project extends it at lower cost. The concept is under the field for smart Honking zones. The cities that rank in these are Kolkata, Delhi and Mumbai. The effects of maintain speed limit are being taught from 4th Grade of schools, but we still don't have any strong system to control it. The Rules and Regulations are not exercised as per papers, legal document PDFs and Government websites describe. The speed Barriers and smart Honking Zones are created by municipal but are hardly followed the rule of driving vehicle besides of honking zones. The decibel levels of speed are constrained in regulations but there is no tool to measure and control in real time. The people are susceptible for early seeing loss than the expected average age, Institutional disturbance, Patients in the hospital suffer. Coming to present and existing solutions, there are speed barriers, smart honking zones which are hardly paid any attention to, and people continue honking irrespective of which zone they are in. There is provision of switching to conventional horn to deal with certain situations such as sudden appearance of humans or animals via dual purpose switch. Hence in this chapter literature survey is done. We are trying to improve existing system with our additional design and we have described overall idea about the existing system and our proposed system. While studying existing system, we come to know that there are various systems

A. Advantage

- 1) Accidents due to pothole can be avoided.
- 2) Driver will be intimated about potholes and nearest Honking Zone.
- 3) Automatic speed can be controlled if pothole detected and noise of horn will be reduced.
- 4) GPS tracks the location of Honking Zone and pothole sends it to user so as to control the speed of vehicle and help to reduce noise pollution.
- 5) This system is also helped to decrease headache and maintain silence in honking zone.
- 6) Enhanced safety and security provided.

B. Disadvantage

- 1) Sensors output vary with respective season.
- 2) Sensors range will vary according to vehicle movement.

VII. CONCLUSION

The various effects related to this problem including stress, depression and other physical and mental ailments which needs at most attention from the society are directly tackled by uprooting their main cause like honking zone. Moreover, Priority Emergency Vehicle System has a humongous potential to save many lives caused by the delay of these to reach their required destination. The output of this system has result in embedded module which shall benefit the residents of societies located like hospitals, school, college, old age home, and Government offices, students studying in schools located in the vicinity of roads, patients admitted in the hospitals located on the roadsides and people of various professions/occupations. The need for costly noise absorbers is obviate by this system. The accidents that are caused due to loud music inside the vehicle, which inhibits the ability of the driver to listen are mitigate by this system. In this paper we developed a new design to control the speed of the automobiles and detect the pothole on roads which is sensed by ultrasonic sensor. In normal driving mode, we can expect other vehicles interfering nearby and possibly blocking or attenuating RF signals. In this aspect, we are going to use GPS location for restricted areas.

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