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AUTOMATIC SPEED BREAKER USING IoT

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Abstract - *The project's idea is that there will be an automated speed breaker on time demand and emergency vehicles as needed. Means when the speed breaker is not required on the highway, it disappears and the road gets smooth. When necessary the breaker comes from the ground and starts to operate at slowing vehicle speed. We use a hemi-cylindrical sheet metal breaker that is connected to the traditional screw jack to apply the principle. Therefore, when necessary, it is rotated in the direction of the clock and rotates in the direction of the anti-clock and is flat and combines with flat road when required. In this device, we use a transmitter and receiver for radio frequency. The emergency vehicle identification device. Keypad is used to manually control the configuration of the speed breaker. The internet of things will be best at this project, which enables the control of the speed breaker online portal.*

Key Words: **Speed Breaker, IoT, RF Transmitter, RF Receiver.**

1. INTRODUCTION

India has the world's second largest road network as a developing country. Almost 97,991 km was provided by national highways over a total length of 5 million km of road network. Because of its sheer magnitude, the Indian government already faces a great challenge to provide a world class path. A person on average spends from 30 to two hours a day driving anywhere. That's about 360 hours in one year. Imagine what type of stress the individual places on his body and unnecessary burden. Given all this, roads are India's biggest mode of transport. Nearly 90% of transport by passenger and industry is done through roads.

The fast-growing population raises traffic, and good traffic management is very necessary for safety and also decreases travel time. The solution that is now available every day and that is widely used is a nice, but not the best solution. In short, all vehicles are collectively liable and the path dangerous or accessible. When heavy cars and small vehicles are slowed down, more time is needed to regain their previous speed by vehicles as traffic increases. Slow-speed cars also get shocks and noise that they are not deserving of.

Internet of Things (IoT) is now a critical subject in the technology industry, software engineering, policy and has become important news in both print media and social media. This technology is implemented in a wide variety of networked devices, systems and sensors using advancements in computing power, declining electronics, and networks to manage original competences that are not possible previously. Day by day new topics and analysis on IoT issues abundance of conferences, studies and articles and discussion of the IoT uprising's potential influence from new technology openings and business innovations main concerns about security, privacy.

The rest of the paper is as follows:

section II emphasizes on the related work that has been done.

Section III and IV describes the literature survey and about the statistics of road accidents.

Section V and VI discusses the implementation of the proposed system and various components used in the proposed system

Section VII talks about conclusion and future scope.

Section VIII shows the references.

II. RESEARCH WORK

The speed has become an important factor in human life in the fast changing world. There are two viewpoints in the world of rapid speed, one is sustaining pace and the other is also maintaining safety media. There is a common practice of having concrete speed breakers on the road for safety purposes, to avoid road accidents. They're found solid all the time on the road in the case of traditional concrete speed breakers.

Such types of speed breakers are very effective on the road but also cause a great change in vehicle performance at the same time. The example diagram of such traditional speed breaker for concrete is (Fig. 1). And why don't we have such a speed breaker that can lower the speed and keep the vehicle running. That is why, according to the specifications, there is a need for an automated breaker on time requests. Means when there is no need for the speed breaker on the road, it disappears from the road and the road becomes smooth, and when a need occurs then the breaker emerges from the

ground on the road and starts working with slowing vehicle speed.

Figure 1. Conventional concrete speed breaker

III. LITERATURE REVIEW

[1] Vamsee Krishna Kiran M commented that when the user uses the Google maps, an android service begins in the background. The device collects speed breaker latitude and longitude data The proposed system is built in such a way that speed breakers don't need any person to tell. When a consumer encounters a speed breaker the sudden amplitude shift is noted.

[2] Shivam Gaikwad explains to develop Today's traffic safety solution requires all cars to slow down without realizing the speed of the ongoing vehicle, which raises the traffic issue. To prevent this, the device must work according to the speed of the car. In this assembly, the bumps of the smart speed breaker lower into the road surface is elevated above the physical residue.

[3] Dr.Raafiya Gulmeher addressed that Smart Speed Breaker system with IOT that will surface and only display if the speed of the vehicle is greater than those limits. Arduino board activates a motor to surface the speed breaker mechanism for control of the speed breaker, for use of RTC in real time. The Arduino board sends a signal to the buzzer to start the beep sound to warn the driver according to the speed and distance of the breaker.

[4] Ajay S addressed that to have an automatic speed breaker on time demand according to the specifications The breaker disappears when there is no need for a speed breaker and when there is a need then the breaker comes on the road by spinning itself and begins to work slowing the vehicles speed. In implementing this definition, we use a hemi-cylinder speed breaker made from iron

[5] M. Suresh discusses that the ambulance does not decrease the speed in order to save the patient from injury. As the ambulance approaches the speed breaker, the motor rotates after getting the signal. The speed breaker is flat. The speed breaker returns to normal after the speed programmed in the Arduino. The proximity sensor is located to avoid the rotation in the exact speed breaker location. The control circuit consists of Arduino, which processes the RF signal and transmits it to the RF receiver via the RF transmitter. The RF transmitter circuit shall be placed on the ambulance. The speed breaker lets the ambulance reduce speed, but this new flat speed breaker device plays a major role in protecting human lives by making the speed breaker flat.

IV. STATISTICS

Anyone who's driven on Indian roads should know this: the subcontinent's speed breakers can be harmful. Such undulating contraptions, usually unmarked and dreadfully built, can easily rattle bones and car chassis contort. They can be deadly too. Indian speed breakers are each year responsible for more than 10,000 deaths. The nation already has one of the world's deadliest road networks, with 400 deaths a day–or around one death every four minutes. In an answer to a parliamentary query last week, India's minister for junior roads, Pon Radhakrishnan, received a comprehensive breakdown of road deaths caused by speed breakers. In 2015, 11,084 individuals died as a result of speed breakers, according to government reports. The rate of fatality was only slightly reduced at 11,008 in 2014.

This is obviously not a regional issue, given that states across northern and southern India are the biggest contributors to fatalities related to speed breakers. "Ministry bans building speed breakers on National Highways," Radhakrishnan said in his written response. However, often illegal speed breakers are installed by local people. They are withdrawn when and when the road authorities inform them of them. Unless the speed breakers are not illuminated so it may not be apparent at night, and the cars may be mistakenly hurt by driving over it. Each vehicle is expected to break its speed to safely cross the breaker. It is a big downside for emergency services.

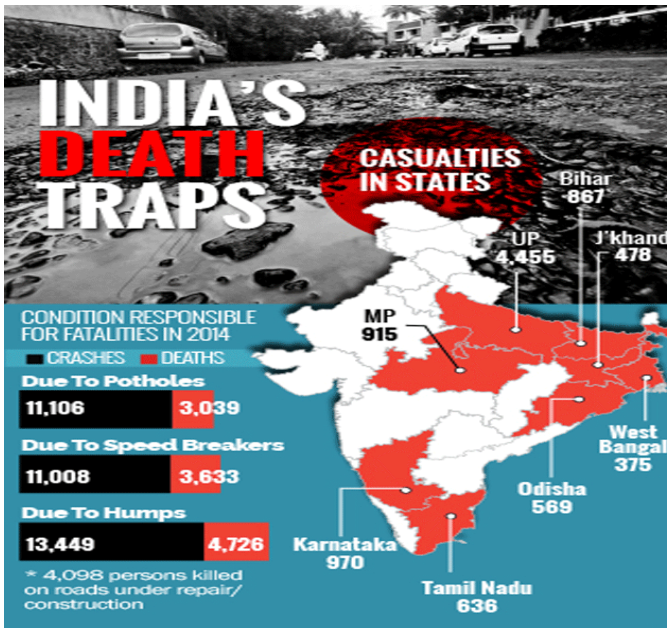


Figure 2: Death rate

V.PROPOSED METHODOLOGY

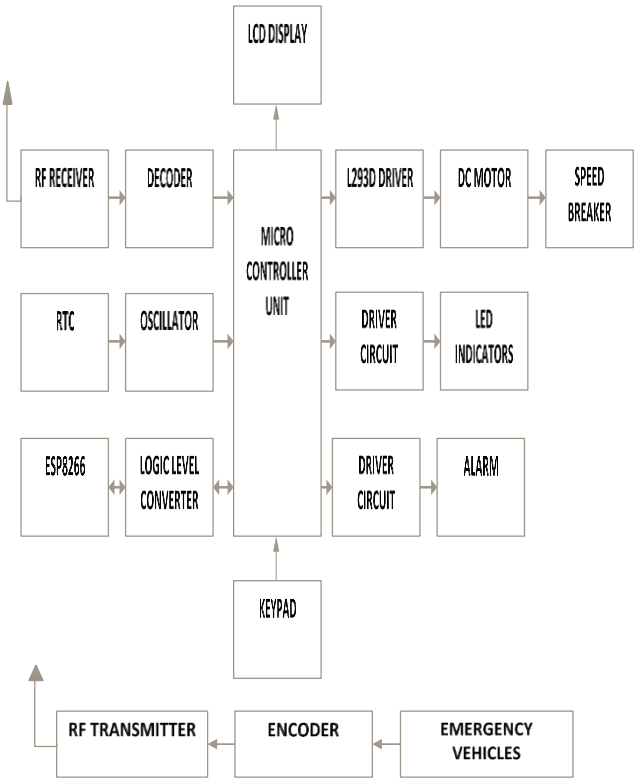


Figure 3: Block diagram of RF transmitter and receiver

Speed breaker is designed by a half flat and half semi-circle shaped long metal sheet pipe. Two magnetic sensors are connected across the velocity breaker to change the speed breaker closing and opening stage. The research work's principal block diagram is as follows (Fig. 2). All of the necessary devices and circuits are shown in the diagram. PIC16f877a is the principal tool of this research work. RTC and controller are related. We use 2x16 L.C.D to offer a delay in visual time and also to display the menu.

With the help of switches, we change the speed breaker's time period. The speed breaker on the road is making the ambulance cut down on its speed. The ambulance should not reduce the speed so as to save the patient from danger. And as the ambulance gets closer to the speed breaker, when the signal is received the engine rotates. The speed-breaker is attached to the motor shaft. The velocity interrupter becomes flat. For a certain time, the flat surface remains.

When the speed breaker module is disabled or deactivated, a led indicator and buzzer can cause the vehicle to stop as a traffic signal. After the signals are complete the cycle returns to normal. The routine is looped, and the user instructions are continually followed.

Module ESP8266 is used to contact the code via the webpage. The module only needs proper connectivity to the internet to enable or deactivate the speed breaker via web server. Traffic LED's are used to intimate velocity breaker status.

Figure 4: Hardware setup

The control circuit is composed of a microcontroller that processes the RF signal and is transmitted to the RF receiver via RF transmitter. The circuit RF transmitter is mounted on the emergency vehicle. This transmitter array has a frequency of 434MHz. When this switching system is made ON the transmitter receives the signal from the receiver system. Only when the emergency vehicle crosses near the speed interrupter is turned ON. The transmitter has a flipping press, is used for forwarding motor rotation and automatically reversed motor rotation occurs. The device of the RF receiver is located near the speed breaker. When transmitter is ON it receives the RF signal.

VI. CONSTRUCTION

The proposed system offers a cost-effective solution that activates and disables the speed breaker on the highways.

In the proposed work the components used are as follows:

MICROCONTOLLER PIC16F877A:

Peripheral Interface Control (PIC 16F877A) is an 8k programming memory microcontroller with 40 pins. Because of its low cost, high application support and wide availability it is widely utilized. The microcontroller is fundamental to the proposed system. It performs various tasks from processing all sensor inputs to alerting the driver. Due to low power

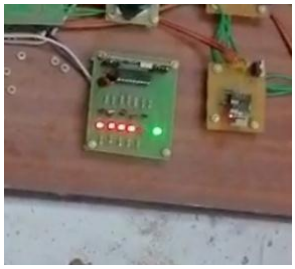
consumption, high performance flexibility and easy availability of its supporting hardware and software resources such as compilers, debuggers, and simulators, PIC microcontrollers are currently used extensively for industrial purposes.

Figure 5: Microcontroller

DC MOTOR:

The DC motor is a machine which transforms electric energy in the form of rotation into mechanical energy. The movement is brought about by the electromagnetism's physical behaviour. Within DC motors have inductors which generate the movement-generating magnetic field. We used wiper motor here.

RF TRANSMITTER AND RECEIVER:



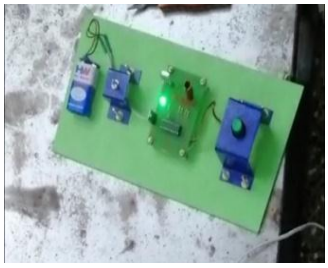


Figure 6: RF Transmitter Figure 7: RF Receiver

An RF transmitter receives serial data and transmits it wirelessly via RF via its attached antenna at pin4. The transmission takes place at a rate of 1Kbps-10Kbps. An RF receiver which operates at the same frequency as that of the transmitter receives the transmitted data.

LCD Display:

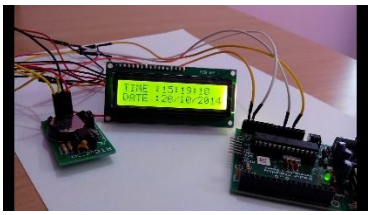


Figure 8:LCD display

The LCDs are lightweight with a thickness of just a few millimetres. Since the LCD consumes less power, they are compatible with low-power electronic circuits and can be powered over long periods of time. This gives the message about the vehicle whether it has been identified or crossed, on time and time. The two polarisers and the liquid crystal rotate light rays while the LCD is in the off state, so that the light rays come out of the LCD without any direction, and thus the LCD appears transparent. It displays the speed breaker status whether it is in state or off condition and also indicates that the emergency vehicle is identified and the road is traversed.

ESP MODULE:

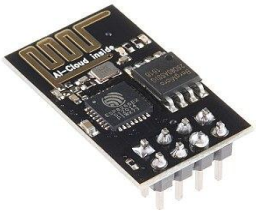


Figure 9: ESP Module

The WLAN module ESP8266 is a SOC with an integrated TCP / IP protocol board, which permits access to your WLAN by any microcontroller. The ESP8266 can either host an application or import from a different application processor all Wi-Fi networking features. The ESP8266 is the processor that links the signal to the web server for public purposes.

IOT MODEL:

Once emergency vehicles or any other VIP vehicles arrive we can use mobile application to monitor the breaker. ESP8266 is very useful for connecting the motor to the mobile app.

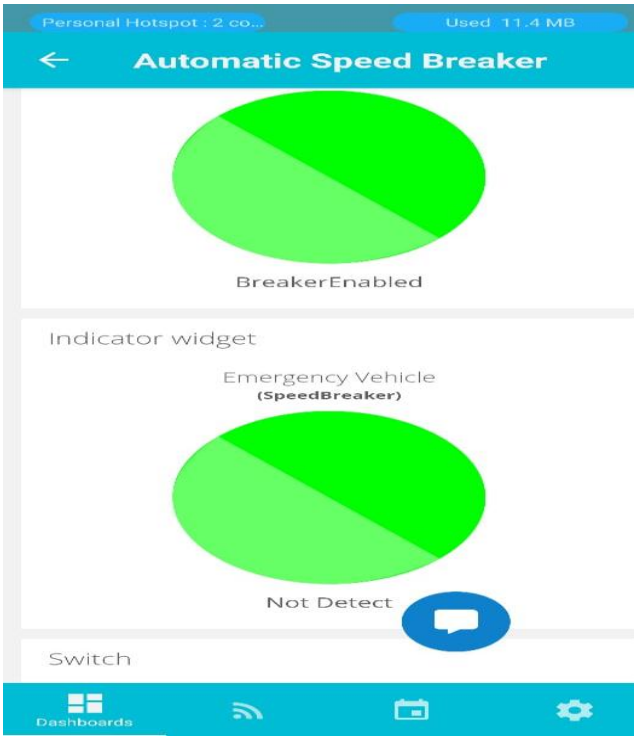


Figure 10: Speed breaker enabled shown in application

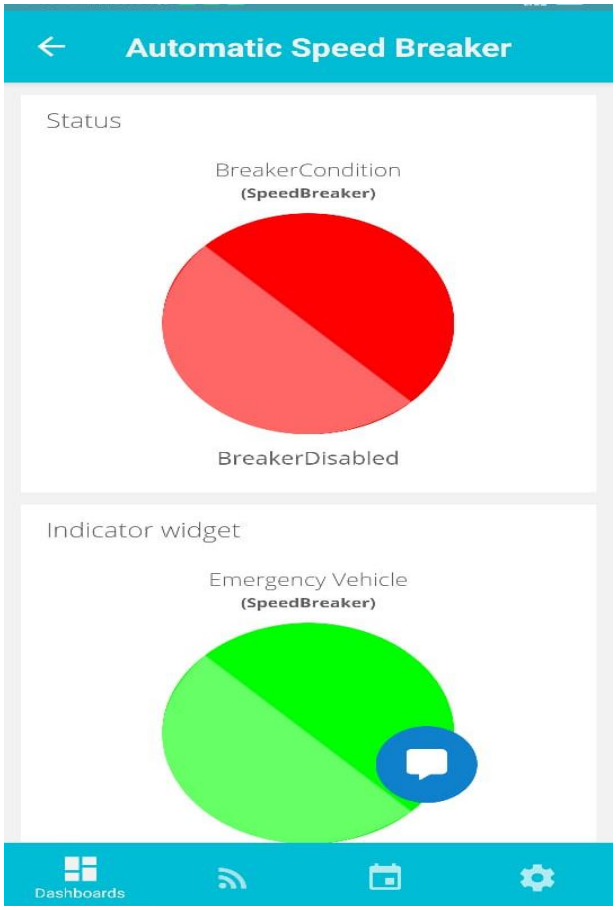


Figure 11: Speed breaker disabled shown in application

VII. CONCLUSION

The speed breaker allows the emergency vehicle to lower the pace, but this new flat speed breaker device plays the main role in safeguarding human lives by flattening the speed breaker. Transportation is easier and more convenient for emergency vehicle. This device will be introduced in future in most emergency situations, where emergency vehicles need to reach quickly with the help of solar energy.

VIII. REFERENCES

[1]Ajay s,Govind G,Dharmendhar S,parthasarathy J, "Automatic Speed Breaker on Time Demand Using Embedded Systems" , International Journal of Engineering and technology, Vol no 8, 2019 April.

[2]Rajeshwari Madli,Santhosh Heber,Praveenraj Pattar,G.V.Prasad,"Automatic Detection and Notification of Potholes and Humps on Roads to Aid Drivers" ,IEEE Sensors Journal , 2016.

[3]Vamsee Krishna Kiran M,Vimalkumar k,Vinodhini RE,Archanaa R," An Early Detection Warning systems to Identify Speed Breakers and Bumpy Rods using Sensor in Smartphones", International Journal of Electrical and Computer Engineering, Vol 7 No.3,2017 June.

[4]M.Suresh R.Jones Rexiya T,K.G.Santhosh R.Vignesh,"A Break Free Path for Ambulance using Speed Breaker", International Journal for scientific Research and Development, Vol 5,2017 June.

[5]Asma Farheen,Dr.Raafiya,"Automated speed breaker to Control Speed of Vehicle based on IOT", International Journal of Technical Innovation in Modern Engineering and science", Vol 5 issue 06,2019 June.

[6]T Mahbuba Afrin, Md Redowan Mahmud, "Real time detection of speed breakers and warning system for on-road drivers", 2015 IEEE International WIE Conference on Electrical and Computer Engineering (WIECON-ECE)

[7]zer-Ming Jeng, Sheg Chung Tzeng, Bo-Jun Yang and Yi-Chun Li, "Design Manufacture and Performance Test of the Speed Breaker System" 2017 IEEE.

[8]Anchal Dewangan and Dr. N. K. Saikhedkar, "Experimental analysis of Different Types of Speed Breakers" 2018 IEEE.

[9]AravindKaruppaiah, Gansh.S, Dileepan.T, Jayabharathi.S, "Fabrication and Analysis of Automatic speed breakers" 2019 IEEE.

[10] P. Mohamed Shameer and D. Christopher, "high Efficiency See Back Device for Power System Design and Efficiency Calculation: A Review of Potential Application" 2019 IEEE.