

# Vehicle Speed Control and Monitoring using Automatic Speed Bumps

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**Abstract-** The speed bumps are constructed a cross roads to prevent the speed of vehicles. Today's road breakers are a major problem for accidents and most of them are constructed without proper permission but the most critical thing is preventing remedy leading to the cause of accidents. So, here a propose a solution to this problem of accidents caused by over speeding of the vehicles in Highways by the use of speed breakers.

## I. INTRODUCTION

This paper presents a device to detect rash driving on highways and to alert the traffic authorities in case of any violation. In past, lot of devices to detect rash driving on highways has been made. Most of the approaches require human concentration and involve a lot of effort, which is difficult to implement. In this paper we intend to design a system aimed at early detection and alert of dangerous vehicle driving patterns related to rash driving. The entire implementation requires an IR transmitter, an IR receiver, a control circuit and a buzzer. The speed limit is set by the police who use the system depending upon the traffic at the very location. The time taken by the vehicle to travel from one set point to the other is calculated by control circuit and displays that on seven segment displays. Moreover, if the vehicle crosses the speed limit, a buzzer sounds alerting the police.

## A. MAJOR COMPONENTS USED

### ▪ POWER SUPPLY

The circuit uses standard power supply comprising of a step-down transformer from 230v to 12v and 4 diodes forming a Bridge Rectifier that delivers pulsating dc which is then filtered by an electrolytic capacitor of about 470microf to 100microF. The filtered dc being un regulated IC LM7805 is used to get 5v constant at its pin no 3 irrespective of input dc varying from 9v to 14v. The regulated 5volts dc is further filtered by a small electrolytic capacitor of 10 micro f for any noise so generated by the circuit. One LED is connected of this 5v point in series with a resistor of 330ohms to the ground i.e. negative voltage to indicate 5v power supply availability.

### ▪ MICROCONTROLLER(ATMEGA 328)

The high-performance Atmel 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers.

### ▪ IR SENSORS

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the

motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes, that can be detected by an infrared sensor. The emitter is simply an IR LED and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, The resistances and these output voltages, change in proportion to the magnitude of the IR light received.

### ▪ IR LED

An IR LED, also known as IR transmitter, is a special purpose LED that transmits infrared rays in the range of 760 nm wavelength. Such LEDs are usually made of gallium arsenide or aluminum gallium arsenide. They, along with IR receivers, are commonly used as sensors. The appearance is same as a common LED. Since the human eye cannot see the infrared radiations, it is not possible for a person to identify whether the IR LED is working or not, unlike a common LED. To overcome this problem, the camera on a cell phone can be used. The camera can show us the IR rays being emanated from the IR LED in a circuit.

### ▪ PHOTO DIODE

A photodiode is a type of photo detector capable of converting light into either current or voltage, depending upon the mode of operation. Photodiodes are similar to regular semiconductor diodes except that they may be either exposed (to detect vacuum UV or X-rays) or packaged with a window or optical fibre connection to allow light to reach the sensitive part of the device.

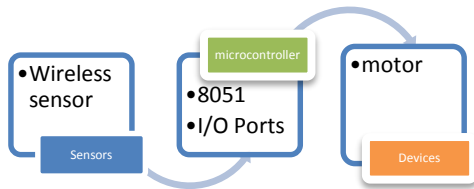
### ▪ LIQUID CRYSTAL DISPLAY

Most common LCDs connected to the microcontrollers are 16x2 and 20x2 displays. This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively. The standard is referred to as HD44780U, which refers to the controller chip which receives data from an external source (and communicates directly with the LCD).

### ▪ SERVO MOTOR

A servo motor mainly consists of a DC motor, gear system, a position sensor which is mostly a potentiometer, and control electronics. The DC motor is connected with a gear mechanism which provides feedback to a position sensor which is mostly a potentiometer. From the gear box, the output of the motor is delivered via servo spline to the servo arm.

### ▪ SYSTEM OVERVIEW



Radiations output from sensors are fed as input to the microcontroller. Based on the input value, the microcontroller takes action to give positive or negative output.

II. WORKING

When you are driving within the speed limit, as the object sensor will sense the speed of the vehicle will provide message to the microcontroller that the vehicle is within the speed limit. The message transmitted will be seen on the LCD

screen. The microcontroller hence will take a decisive action of not to turn the servo motor that is connected to the speed breaker. Hence, the speed breaker will be flat to the surface of the road and the vehicle can pass very easily through it. When the vehicle is exceeding the speed limit of that highway, then the sensors after sensing the speed of the vehicle will send the message to the microcontroller that the vehicle is above the speed limit. The same message will be displayed on the LCD screen. The microcontroller will hence take a decisive action of rotating the servo motor that is connected to the speed breaker. Hence, the speed breaker will come above the surface of the road in the shape of a speed bump. The vehicle when passes through it will automatically be lowered in speed. Hence, the vehicle will be forcibly brought within the speed limit.

III. WORKING SHOWN IN FIGURE



IV. RESULT

This idea has helped us in avoiding the road accidents to some extent. Also, the speed limit violation in highways by the vehicles has been reduced. So, this idea to reduce the accidents has served its purpose and hence successful.

some time to sense vehicles in continuous. The average traffic of highways is comparatively very less compared to the commercial roads. The future scope is that by making it can be made portable and easily accessible to all. It can be used for women security purpose by adding a GSM, GPS tracker in the circuitry which will track the location of the person in danger by making a particular gesture, and the location will be sent to the nearest police station.

V. CONCLUSION

It can be used to reduce the accidents to a certain amount which is due to the negligence of the speed limit within the roads. However, it has a certain limitation that it can be used for highways only and not for the commercial roads. This limitation is due to the fact that the sensors we are using need

VI. REFERENCE

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