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Over Speed Indication and Accident Prevention System Using IOT

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Abstract – *IOT (Internet of Things) concept is a technology to combine different devices from different areas that will result in exchanging of different data types through different networks. The high percentage of vehicle accidents occurs due to driver's error or distraction .Almost all the roads have specific speed limit signs and driver needs to adjust his speed accordingly. So we are implementing a system that warn the driver that he is exceeding the specified speed limit. When the vehicle enters the lane it acquires the specified speed limit of the lane. But sometimes driver over speeds the vehicle then the audio alert will be given to the driver .After getting the audio alert if the driver still exceeds the speed then message will be send to the toll station through GPS. After sending the message to toll station the governor will restrict the vehicle from exceeding the speed. The Governor will be assigned with some speed limit which will be greater than the speed limit of lane and if vehicle reaches to that limit the governor will stop the car from exceeding speed. And toll will be deducted when the car reaches the toll station. In this project proximity sensor is being used for speed detecting. A proximity sensor detect object without any physical contact .The system is used to monitor speed of vehicle and to avoid the accidents by using governor and proximity sensor.*

***Key Words*: IOT, GPS, Governor, Proximity sensor, speed of vehicle.**

1. INTRODUCTION

Road transport has become most important mode of transportation in India. India faces the highest number of accidents in the world. This becomes more dangerous in populated regions like schools and hospitals. In school areas speed breakers are provided to reduce the speed of vehicle's, but the drivers do this manually. Many times due to drivers fault speed is not controlled. This process can be automated by using governor. Nowadays no of vehicles have been increased and traditional systems of traffic controlling. In the developing countries we have seen a lot of crimes happening at bridges and highways. The criminals easily get escaped from the crime zone and victims' loose their valuable assets including cars, jewellery etc. Although the presence of police, sometimes it gets difficult to them to identify the right vehicle and stop it for the checking. Most of the cases those vehicles pass the toll booth area by giving toll amount and no one can identify the criminal .To avoid those problems we have introduced over speed indication system. This system will not let the criminals pass the toll booth area even after paying the toll amount. Thus, the crime rates at highways can be reduced .The overall system is user friendly, fast responsive and convient for the developing countries. As the data of each vehicle owner should be recorded in the database previously, so when any information of that vehicle owner is needed by the authority or police it can be easily found from the database to ease the investigation process.

2. RELATED WORK

Manual toll collection system is not reliable, it is time consuming and it creates traffic congestion .So, we have analyzed that many research works regarding automation of toll collection system for replacement of manual toll collection system. We aimed to combine those ideas and introduce something new which can be implemented at the highways and bridges to ensure security[4]. The basic model of the system has been developed by using RFID system and GSM module. To activate this system, every vehicle needs to hold a RFID number plate or tag. As RFID tag is unique and if we register and keep record of all vehicles identification number in the database, the owner of the vehicle can be easily identified and therefore chance of using duplicate or fake number plates will be reduced. However, a RFID tag or card reader will be placed at the toll collection booth of the highways or bridges which can detect the RFID tag. Whenever a vehicle will enter the toll collection booth area, the reader will immediately scan the tag and identify the type of that vehicle and deduct the toll amount from the vehicle owner's prepaid based account. Afterwards, the vehicle owner will instantly be informed about the deduction by a confirmation text message [3]. However, all the required information about the vehicle owner has to be saved previously in the database of the system. After executing all these steps the system will check whether there is any message received from the authority to stop the vehicle from passing the booth area. For instance, suppose police got to know that a group of people in a certain vehicle has done a crime and trying to go to another state by crossing the bridge. If the police-in-charge messages the tag number of that specific vehicle to the authority who will be controlling the system, then authority will send the system a code text message which will help to block that particular vehicle even after paying the toll fee. Now, if the police need to block all the vehicles at the toll booth area for any kind of checking purpose then it can also be done by using another code text message[4].

3. EXISTING SYSTEM

Nowadays many cities are connected by highways and some speed limit is assigned to it but many people don't follow the speed limit or sometimes boards are invisible. This is the main problem in existing system. Many crimes are happens

on the highways and bridges and it becomes difficult to catch the criminals. So this system is less secure. Accidents cannot be avoided in the existing system. Nowadays we are using manual toll collection system. This takes a long time for toll collection. Manual toll collection system is time consuming and unreliable. It also creates traffic congestion problem.

4. SYSTEM OVERVIEW

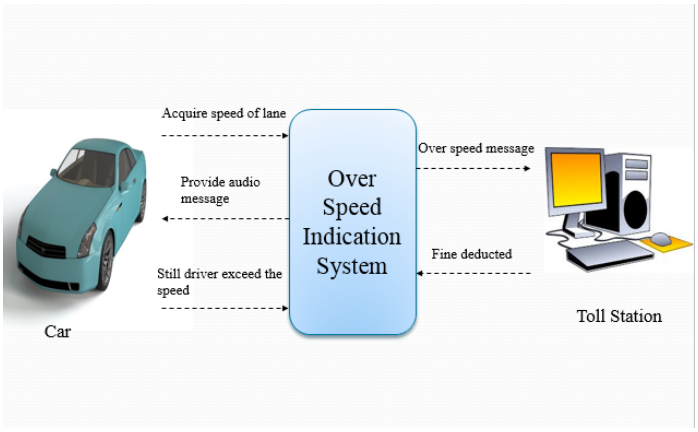

Fig -1: System Overview

Our country witness 1 accident over every 3minutes. The rapid growth of technology and infrastructure has made our life's easier. The abadon of technology has also increased the traffic hazards and road accidents takes place frequently which cause huge loss of life. Nowadays, number of vehicles has been increased and traditional systems of traffic controlling are not able to meet the needs that causes traffic congestion and leds to accidents. So we have introduced this project which measures the speed of vehicle. If speed is greater than the specified limit then our system senses the speed and the speaker will give audio alert which alerts the user that his vehicle's speed has exceeded the specified limit. If the vehicle still exceeds the speed after getting the audio message then the over speeding message is sent to the toll station through the server. In our system, when the user reaches the toll station he needs to pay the fine, and then only the vehicle is allowed to pass from the toll station. Accident prevention is also an important concern. So, governor will be used to control the specified speed of vehicle through which the driver cannot over speed his vehicle and accidents can be avoided. If the driver exceeds the speed even after the audio alert then governer will be used which will control the speed of vehicle. Some speed limit will be assigned to the governor and if driver exceeds that speed then governor will automatically control it.

5. CONSTRUCTION

The Lane safety by low cost automation system and accident prevention system comprises of the following :-

a) Chasis or Frame: - The chasis or frame is fabricated structure that carries the entire system, rear wheel shaft is the driver shaft, that carries the reduction pulley driven by motor using a open belt drive. The end carries the steering mechanism in form of ackerman steering with the central steering wheel controls the steering angle using the slotted lever arrangement.

b) Motor: - Motor is the prime mover, it is single phase AC motor 50 watt, 0 to 6000 rpm variable speed. Motor speed is regulated using electronic speed regulator

c) Over speed Sensing mechanism :- The over speed sensing mechanism is a mechanical linkage based on the bob-weight type centrifugal governor , only that is used to vary the proximal distance between the probe and the sensor which is inductive type.

d) Electronic Proximity sensor: - The electronic proximity sensor is mounted on the sheet metal panel on the base frame by means of an Z shaped clamp. The proximity sensor as the name suggests senses the proximity of the indexer buttons which acts as stops, such that when they come in front of the proximity sensor the table the relay is operated to stop the table motion. The proximity sensor is connected to the electronic relay and the power source. Sensor type : Inductive type proximity sensor Size : M18

e) Braking Mechanism: - The braking mechanism uses a Disk brake and brake caliper arrangement. The Disk brake is used with the view to maximize the braking and ensure safety. The brake caliper is actuated electrically using an solenoid, with electromagnetic operation.

f) Over speed indicator audio speaker: - This is the indication by alarm system, the audio speaker gives audio message after over-speed occurs there by alarming the driver.

6. PROPOSED SYSTEM

We are implementing a system in which if the vehicle exceeds the speed than the system will recognize the over speeding of vehicle and will give audio alert to the user. And if still the vehicle exceeds the speed limit then the message of over speeding will be sent to toll station through server which tells which vehicle exceeded the speed. And then the governor will control the exceeded speed. Manual toll collection system is so time consuming and unreliable so we have implemented automated toll collection system. Also we tried to design an embedded system to ensure a faster toll collection system .Many crimes happens on highways and bridges and it becomes difficult to catch the criminals. This system will not let the criminals pass the toll booth area even after paying the toll amount. Thus, the crime rates at highways and bridges will be reduced. The overall system is user friendly, convenient for the developing countries.

7. WORKING

System starts with motor startup. Motor speed is controlled by electronic speed regulator , as speed increases the dead weight of the centrifuge governor fly's out making the probe to slide back .At over speed level the resultant gap between probe of the slider and the proximity sensor exceeds the permissible limit which makes the relay to operate and consequently the following actions take place -

a) Over speed indicator in the form of audio alert.

b) Message of over speed indication to the toll server through GPS if still speed exceeded.

c) Automatic Toll deduction from the car which over speeded.

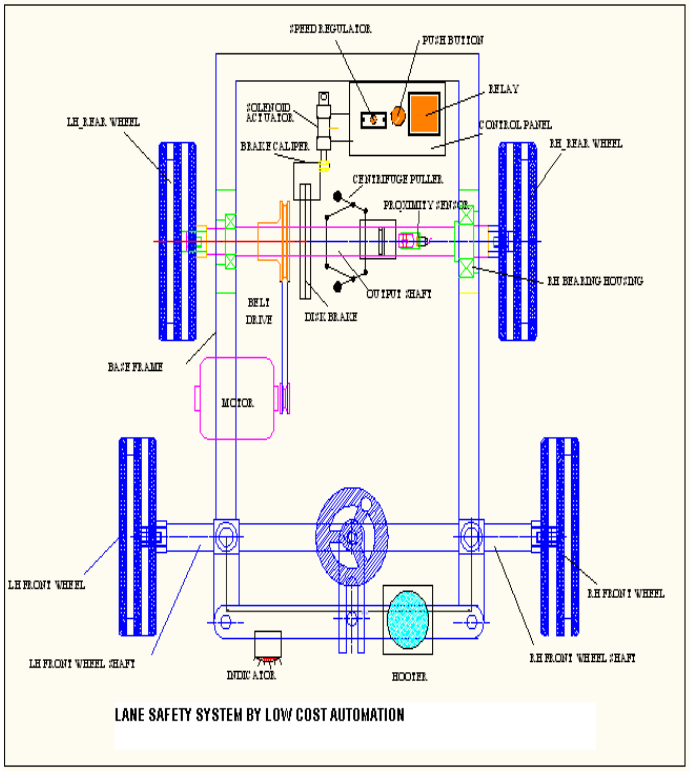

Fig -1: System Construction

7. CONCLUSION AND FUTURE SCOPE

Since number of accidents on highways are increasing day by day so it is necessary to check speed of the vehicles on highways so as to remove accidents cases and to provide a safe journey by controlling high speed of the vehicle. It also minimizes the difficulties of traffic police and can provide their service with more ease and accuracy. In this project we have focused on eliminating speedup and prevention of accidents and ensure driver's caution while driving, so our future work would be to implement automatic toll deduction technique. Nowadays manual toll collection is being used where single person needs to present every time for collecting toll from driver. So our future work would be automatic toll collection system by joining driver's bank account to the server. Another future work would be tyre pressure checking system. In that alert will be provided to driver after decrease in pressure of tyre. We would also include the feature of automatic temperature sensing system so that based on temperature AC will be switched ON/OFF automatically.

REFERENCES

[1] "An Advanced Security System Integrated With RFID Based Automated Toll Collection System", Third Asian Conference on Defence Technology (3rd ACDT), 2017.

[2] "Working Paper on future RFTD Research Needs", Cluster of EuropeanRFTD Projects, September, 2007.

[3] P. Salunke, P. Malle, K. Datir and 1.Zukale, "Automated Toll Collection System Using RFTD", lOSR 1. Of Com put. Eng., vol 9, issue 2, pp. 61-66 (January-February. 2013).

[4] The Mega 2560 is a microcontroller board based on the A Tmega2560.Retrieve

[5] FORCE-SENSITIVE RESISTOR (FSR). Retrieved from https://www.adafruit.com/products/166.

[6] R. Hossain, M. Ahmed, M. Alfasani, H. Zaman and R. Islam, "Automated Toll Collection System," Proc. 8th IntI. Conference On Electrical, Electronics and Civil Engineering (lCEECE'16), pp. 41-44, Dubai (UAE), Planetary Scientific Research Center (PSRC)

[7] U Farooq, M Hasan, M Amar, A Hanif and M Asad,"RFTD Based Security and Access Control System," in Proc. lACS IT International Journal of Engineering and Technology, Vol 6, No. 4, August 2014

[8] "Interactive RFID Based Driver Assistance and Safety Warning System" Fei YIN, Zhenhong LI, Haifeng WANG