SMART SCHOOL VAN SAFETY SYSTEM

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Introduction:

Now a day’s school van accidents are increasing day by day. This is mainly due to negligence of van drivers. The major causes for accidents are due to alcohol consumption by the driver, over speed, dislocation of wheels or any failure in the vehicle. Its always a headache for the parents to think about the safer journey of their children. It would be very convenient if there is a system to decrease these types of accidents. This Project is a new idea to implement the different kinds of safety features in the vehicle. If the driver consumed alcohol then the alcohol sensor senses the consumption of alcohol and stops the ignition of vehicle at that instant. If the speed of the vehicle crosses the specified limit system sends alerting message to the authority. Ultra sonic sensor detects the any dislocation in the wheel position and alerts the driver. This system has got built in GPS and GSM module, using this system sends the information to the parents about the arrival of the bus prior to one stop, also parents can access the information about the current location of the bus by sending SMS request. When a complete prototype of the proposed system is implemented, the system will promise safer transportation of school children.

Objectives:

School buses transfer millions of children daily in various countries around the world. While there are many issues that might disturb parents regarding the travel safety of school going children, moreover in the modern world all are busy in their works/business activities. No one has time to spend with their families. In such situations taking care of their school going children is a big headache for the parents. This paper ‘Smart School Van Safety System intends to look into introducing access safety in respect of school buses that will help the school children’s transportation in a secure and safer way.

Methodology:

HARDWARE REQUIREMENTS:

1) Alcoholic sensor:
It is suitable for detecting alcohol concentration on the breath just like the common breathalyser. It has a high sensitivity and fast response time.

2) Ultrasonic sensor:
It transmits ultrasonic waves into the air and detects the reflected waves coming from an object. Ultrasonic distance sensor provides steady and accurate distance measurements. This sensor transmits an ultrasonic sound that has a frequency of 40 kHz. The sensor has two main parts. Transducer that creates an ultrasonic sound wave, the other part listens to its echo. Four sensors are placed in the vehicle mudguard which will detect the dislocation of the wheel positions and alerts the driver.

3) Inductive sensor:
It is used as revolution counter, to show the rate of rotation of the engine's crankshaft. This is used to monitor the speed of the vehicle when the speed of the vehicle reaches a threshold value system will generate a danger indication signal to vehicle driver, meanwhile a SMS alert will be sent to the authority.

4) Global Positioning System:
To avoid students waiting for school bus long time GPS is installed in the vehicle. When the bus reaches near student A's house, Student B will be informed about the arrival of the bus. Similarly when bus reaches near B student C will be informed by the message. The GPS system finds the location of the bus and sends it to the Arduino, based on the signal generated by the Arduino, GSM module will sends the message to respective students/parents mobile number. Also in case of vehicle failure using this GPS module the Technician will be informed about the vehicle failure and location. So that he can attend it quickly to repair the vehicle and students can reach to the school on-time.

5) Global System for Mobile Communications:
System uses TDMA technique for communication. In this project all the message transferring action are carried out by this Module. The phone numbers of all the parents/students, Technician and authority are stored in this module. By using the SIM inserted it connects with other numbers.

Block diagram:
**Results & conclusion:**

The alcohol sensor installed in the bus senses the alcohol content of driver and if it is above the threshold level SMS alert sent to the authority and the ignition will not turn on. Students are able to receive message about the arrival of the bus prior to one stop. The inductive sensor accurately measures the speed of the wheel. Any dislocation in the wheel is detected by the ultrasonic sensor and sends alerting message to the driver.

The integration of all these safety systems in the school van leads in total security of school going children and also any parent can extract information about the current status of the bus at any time.

**Scope for Future work:**

- By developing the mobile application live tracking of school bus can be implemented
- To overcome the delays due to traffic in cities, real time clock can be used to know the exact time of the arrival of bus.