

# Enhanced Security for School bus Tracking System based on RFID, GPS & GSM

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**Abstract** - In present days, number of road accident cases are increasing day by day. Due that parents worry about their child safety. So, this project aims to present a system which helps in monitoring pick-up/drop-off of school children to enhance the safety, during their daily transportation from and to school. This paper recommends a SMS based solution with help of RFID card, GPS module and GSM module. Whenever the child boards the bus the RFID tag present with him/her will be scanned by the RFID reader present in the bus. This will send a text message to the registered mobile number (such as parent's/ Guardian's) with current location and it also helps in tracking of their child's current location with a particular command. This paper also gives a system with drunk and drive identification and over speed detection for the safety purpose.

**Index Terms**- Short Message Service (SMS), Radio Frequency Identification (RFID), Global System for Mobile Communication (GSM), Global Positioning System (GPS), Alcohol Sensor (MQ7).

## I. INTRODUCTION

School transport assumes a basic part in conveying the majority of youngsters regular everywhere throughout the world. While there are a few issues that may exasperate the guardians/parents as for the movement of school going children; the paper tries to investigate starting the well being with deference of school transports through transport following and security framework that will help the school children's transportation in an ensured and more secure way. The situation of overlooking children on the transport is one of the issues endured, that has risen impressively as of late. This has frequently prompted the death of numerous understudies because of suffocation.

This framework, through section and leave chronicles plans to make a proper domain by means of following certain arrangement of criteria of security and prosperity for the school transport that will positively affect the understudy and their family. Additionally tipsy driving is a main consideration for street mishaps. As of late an article

was distributed in The Indian Express daily paper titled "Five kids harmed after alcoholic driver rams school transport into railing of extension ".The driver of the transport was tanked. Police booked him for careless driving. This demonstrates even school transport isn't sheltered from the inebriated drivers. Thinking about this, the framework is likewise outfitted with liquor sensor which is incorporated on the controlling haggles sense the level of liquor noticeable all around. On the off chance that the convergence of liquor in air is found over some endorsed restrain; at that point the start is cut off and the driver won't have the capacity to drive the transport accordingly guarding the understudies.

Street miss chances are rising step by step. Significant parts of these setbacks happen because of rash driving or over speeding of the vehicle. The speed control instrument will help in constraining the speed of the transport. The framework is planned utilizing single microcontroller which will decrease the equipment size thus the cost.

The paper likewise recommends a transport security instrument which is intended to check the passage/exit of understudies from the transport. The framework does different undertakings, for example, perceiving extraordinary data of every understudy utilizing RFID tag, which will exchange the information with the RFID per user by methods for radio waves. Moreover, if the transport takeoff and landing is refined effectively from the source to goal, it will educate guardians through a SMS about their fruitful flight and entry. The security system for safety of child in school bus is given as below. Before the driver is ready to start the bus, he need to take the alcohol test. If the result is positive (i.e. less than the predefined value), then the driver is able to start the motor of the bus. Otherwise, the driver is unable to start the bus from the desired location. In addition to alcohol test, over speed (i.e. speed more the normal speed) is also identified and a SMS regarding over speed is sent to parents/guardians and a buzzer will ON. In this way, the paper proposed a system for child safety in school bus.

## II. RELATED WORK

The most related work in regards to the issue expected by this undertaking is exhibited in this portion. In [1], the creator Saranya proposes a system that follows area of youths utilizing a tyke module that transmits the accompanying information to a database and a phone. The downside of this system is that the module may not be reasonable for kids and wide-scale organization is expensive. A paper [2], by Mori prescribes a framework that utilizes Bluetooth innovation to shape bunches and convey among them utilizing android terminals. The real disappointment of this procedure is high arrangement cost.

Paper [3], presents a framework utilizing biometric highlights for e.g. the school kids track biometric framework, while going into the transport understudies filter their palms over a palm per user. To reproduce the palm's particular example, palm per user utilizes IR light. For cross-confirmation the after effects of checked palms are sent against unique examples put away in secure database. The burden is that it is manual and little children feels hard to put their palms accurately on the scanner. A paper [4] titled "SMS Based Kids Tracking and Safety System by Using RFID and GSM" by Nithin Shyam proposes utilizing two distinct modules for following the kid with the assistance of RFID, GSM and GPS. One module is to be conveyed by the youngster and the other module is fitted in the transport. The issue with this framework is it utilizes two unique modules to monitor the tyke. It builds the operational cost of the general framework and furthermore it isn't plausible for the kid to convey an additional pack each time he goes to the school.

## III. RELATED TECHNOLOGY

### A. RFID Technology:

RFID remains for Radio Frequency Identification. To distinguish labels that are joined to objects and to follow them EM fields are used by RFID. For distinguishing proof there are various strategies however the most bland technique is: serial number, in this a man or a thing or whatever other information that is given on a microchip is perceived. The chip connected to a radio wire otherwise called RFID transponder or tag. RFID innovation allows the distinguishing proof of everything through radio waves naturally. The RFID per user distinguishes the thing without coordinate observable pathway, while the standardized tags are viewable pathway innovations.

#### i. RFID reader module:

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#### ii. RFID Cards:

RFID tag is a little gadget which stores and sends information to the user. They are ordered as – dynamic and aloof. Uninvolved RFID labels are less expensive and littler. Another advantage is their more extended timeframe of realistic usability. There are 2 vital parts – microchip and curl. The radio wire/curl gets power and RF signals from the RFID per user and sends those signs to the chip. The chip in the wake of getting those signs registers it and sends the information to RFID per user. To recognize the character of the RFID card, the per user sends radio signs which is caught by the loop (filling in as reception apparatus) for the card/tag. The curl gets these signs as rotating current and goes to the chip. The chip separates power and data from the current.

### B. GPS Module:

The Global Positioning System in vehicle tracking systems is commonly used to provide users with information such as location coordinates, speed, time, and so on, anywhere on the Earth. In this work, a GPS module with a GPS receiver is used. To recognize the separation from each satellite the GPS computes by subtracting the time at which flag was transmitted from the time at which flag was gotten. While sending signals GPS likewise knows particular position of satellites in the sky

### C. GSM Module:

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services. GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band. It supports voice calls and data transfer speeds of up to 9.6 kbit/s, together with the transmission of SMS.

### D. 8051 Microcontroller:

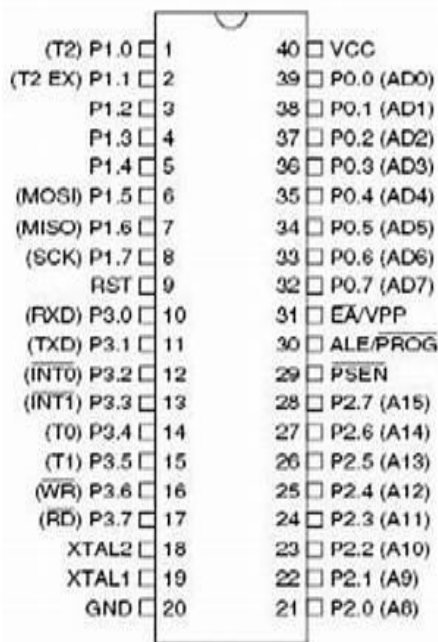


Fig.1 Pin Diagram for 8051 Microcontroller

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density non volatile memory technology and is compatible with the industry- standard 80C51 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional non volatile memory programmer.

**E. Alcohol Sensor:**

MQ-7 gas sensor has high sensitivity to Carbon Monoxide. The sensor could be used to detect different gases contains CO; it is with low cost and suitable for different application. It is more accurate for liquor gases hence can be more tremendous applications.

**IV. SYSTEM DIAGRAM**

The Fig.2 shows the block diagram of Enhanced Security for School bus Tracking System based on RFID,GPS&GSM. The microcontroller is the main building block of system. It communicates with different modules like GPS, GSM and RFID with RS232 serial communication protocols. As it is not possible to directly communicate with microcontroller relays are used. The microcontroller is also associated with motor and alcohol sensor.

Initially, The RFID tag present near the child will be scanned by RFID reader which is placed at bus entrance and it reads the child information which is predefined. Then, The GPS module communicates with microcontroller and identifies the particular location and it is transferred through a GSM module to registered

guardians/parents mobile number with location latitude and longitude values.

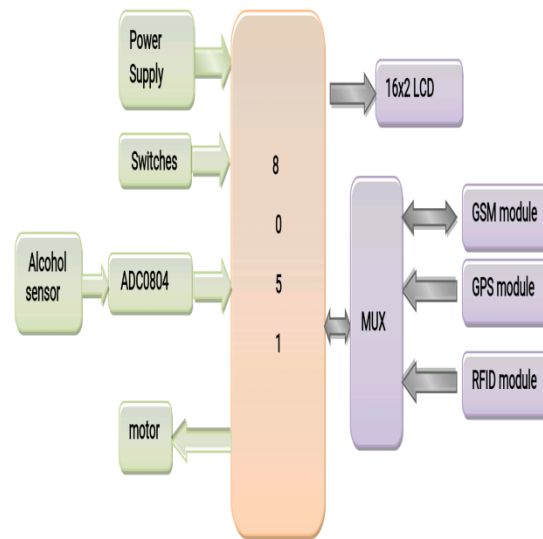


Fig.2 Block Diagram of Enhanced Security for School bus Tracking System based on RFID,GPS&GSM

The alcohol sensor MQ7 which is used in this system produces a analogue value. So, it needs to be converted in to digital value for the reason ADC is used. If the measured value is more than the accurate value, then the microcontroller doesn't allow starting the motor. Otherwise it allows.

The child location also can be tracked by using this system. The over speed of school bus leads to many accidents. So, it can also be controlled by maintaining a particular range of speed. If the driver tries to increase the speed, the buzzer will ON and and also intimates to parents through a SMS. In this way, along with the location tracking the paper also proposed a system for safety of the school bus.

**V. CONCLUSION**

RFID, GPS and GSM progresses for wellbeing and security reason is extraordinarily indispensable. Due to increment in setbacks of children getting out at wrong stations or kids getting passed up a major opportunity at the transport this may prompt downfall because of suffocation. This proposition demonstrates that RFID based school transport following innovation is a doable option for overseeing and following the understudies amid their drive to and from school. Moreover, the cost related with labelling of material is reasonably low. Likewise the alcoholic and drive counteractive action framework and the speed control framework assume a noteworthy part to enable the

youngsters to drive securely. In this way the framework is equipped for advising guardians through instant message once the youngster enters the varsity, empowering guardians to follow the transport, helping smooth and more secure rides to the different goals.

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