# Embedded Based Pedestrian Safety and Guidance System While Traveling in Public Transport

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*Abstract:*
*This research paper is based on the concept of pedestrian safety while travelling in bus. Due to the continuous development of technology, the establishment of intelligent transport system has become the trend for the development of transport. This paper, by means of integrating advantages of multiple technologies, aims at designing and constituting IT'S mainly to increase the level of utilization, safety and comfort. This is mainly proposed for safer journey using ARM processor. This ARM processor is used because of its low power consumption and high speed. This proposed system consists of RFID reader that ensures the passenger to enter the bus. In addition alcoholic sensor is also used which does not allows the passenger to enter into the bus if he/she supposed to be drink. This alcohol detection will help us to ensure the safety to both men and women. Speed controller is placed inside the bus in order to control the speed of the bus and that information also send to the data base in order to ensure the safe journey. Voice talking GPS inside the bus guides the passenger to identify their departing location, information related to safety, security system, seating arrangement and prevention methods during accident. ZIGBEE plays a role of data transferring and to communicate with the bus. The result of our research idea is done in Auto Cad and the simulations are shown in this paper.*

*Key words: ARM Processer, Alcohol sensor, Speed controller, GSM, GPS and ZIGBEE*

## 1. Introduction

Intelligent transport system safely featured with ARM 7 processor is mainly proposed to overcome the safety issues rising in our day to day journey like safety, over crowd, mesh between supervisor and passengers etc. This system we introduce ARM processor which is with reduced instruction set consumption provides high performance and low power consumption. Being a human we demand and expect our transport system to get us where we want, when we want to be there and as fast as possible. We are however human beings with human bodies our fast and efficient modes of travel are necessarily always good for us. This system also breaks away the fear of

travelling and unsafe particular at night. Here we deploy multipurpose notification and display systems for information dissemination to commute through appropriate use of smart technology which includes GPS, Interactive voice response system, speed controller and alcoholic sensor.

This proposed safety system accompanied with ARM Processor ensures safe and fast journey with low power consumption. ARM is RISC based architecture executes almost all the instruction in only one cycle. ARM processor is mainly used to overcome the disadvantage in other controllers. Safety in the sense ensures that alcoholic sensor is fixed at the door which disables the passenger to enter the bus if he/she is supposed to consume alcohol. This system also includes the speed controller which automatically controls the speed of the bus. This system there by improves the driver comport in steady traffic conditions and better fuel efficiency. Voice GPS had been integrated with the system to guide the passengers related to the location during accident.This replaces the bus promoters and also ensures the illiterate to travel in the bus in a safe mode to reach their destination. Zigbee has a vital role in this intelligent transport system that transmits the data related to transport and display the particular locality in led display.

### 1.1. Causes of Road Accidents reported by Ministry of RoadTransport & Highways, Govt of India

Road accident is most unwanted thing to happen to a road user, though they happen quite often. The most unfortunate thing is that we don't learn from our mistakes on road. Most of the road users are quite well aware of the general rules and safety measures while using roads but it is only the laxity on part of road users, which cause accidents and crashes. Main cause of accidents and crashes are due to human errors. We are elaborating some of the common behavior of humans which results in accident.

- Over Speeding
- Drunken Driving
- Distractions to Driver
- Red Light Jumping
- Avoiding Safety Gears like Seat belts and Helmets
- Non-adherence to lane driving and overtaking in a wrong manner

### 1.2. Over Speeding

Most of the fatal accidents occur due to over speeding. It is a natural psyche of humans to excel. If given a chance man is sure to achieve infinity in speed. But when we are sharing the road with other users we will always remain behind some or other vehicle. Increase in speed multiplies the risk of accident and severity of injury during accident. Faster vehicles are more prone to accident than the slower one and the severity of accident will also be more in case of faster the severity of accident will also be more in case of faster vehicles. Higher the speed higher the risk. At high speed the vehicle needs greater distance to stop i.e. braking distance. A slower vehicle comes to halt immediately while faster one takes long way to stop and also skids a long distance due to law of notion. A vehicle moving on high speed will have greater impact during the crash and hence will cause more injuries. The ability to judge the forthcoming events also gets reduced while driving at faster speed which causes error in judgment and finally a crash.

### 1.3. Drunken Driving

Consumption of alcohol to celebrate any occasion is common. But when mixed with driving it turns celebration into a misfortune. Alcohol reduces concentration. It decreases reaction time of a human body. Limbs take more to react to the instructions of brain. It hampers vision due to dizziness. Alcohol dampens fear and incites humans to take risks. All these factors while driving cause accidents and many a times it proves fatal. For every increase of 0.05 blood alcohol concentration, the risk of accident doubles. Apart from alcohol many drugs, medicines also affect the skills and concentration necessary for driving. First of all, we recommend not consuming alcohol. But if you feel your merrymaking is not complete without booze, do not drive under the influence of alcohol. Ask a teetotaler friend to drop you home.

### 1.4. Distraction to Driver

Distraction while driving could be minor but it can cause major accidents. Distractions could be outside or inside the vehicle. The major distraction now days are talking on mobile phone while driving. Act of talking on phone occupies major portion of brain and the smaller part handles the driving skills. This division of brain hampers reaction time and ability of judgment. This becomes one of the reasons of crashes. One should not attend to telephone calls while driving. If the call is urgent one should pull out beside the road and attend the call Courtesy. Various national and international researchers have found these as most common behavior of Road drivers, which leads to accidents.

### 2. Literature Survey
**As per the REF of the Hindu newspaper reported by Anand Bodh, TNN Oct 26, 2011, 06.23AM IST**
- **SHIMLA: Himachal Pradesh witnesses around 4,000 road accidents every year that kill over 1,000 and leaves 6,000 injured**. While Drunk and drive ,rash driving, overloading, untrained drivers and poor roads are among the factors that have led to the rise in fatal accidents, a majority (97.84 %) of them were due to drunk driving and human error. In the last three years alone, 3,479 people have lost their lives in different road accidents. The state government, in the past, had announced taking concrete steps to curb road accidents, but the spurt in such mishaps belies their claim.

- **State transport minister Mahinder Singh had admitted during assembly session that 97.84 % of the accidents were due to drunk driving and human error.** He had stated that only about 1.52 % accidents had occurred due to bad road conditions and 0.64 % owing to mechanical failure.
- **Monday's road accident at Bilaspur, in which 27 people were killed and 25 others injured,** could have been averted had the driver of the bus applied his mind and ensured proper safety of the passengers and bus before alighting from the vehicle. He did not make any effort to ensure that the bus remains stationary on the steep road, which resulted in the vehicle rolling down a gorge.
- **Himachal Pradesh Congress Committee president Kaul Singh Thakur said**, "It is unfortunate that thousands of people are losing their lives in road accidents. He said that bus drivers need to be educated about the minute precautions which they should take for the safety of passengers ".
- **A day after the mishap in Bilaspur, the state government announced to spend Rs 60 crore on the improvement of 'black spots'** along all major state roads and national highways, so as to ensure safety of the commuters**. State PWD minister Gulab Singh said this while presiding over a meeting with senior officers of the department.Gulab said Rs 25 crore is being spent during the current year, while Rs 35 crore would be spent during the next year on improvement of accident-prone zones.** He said that target has been fixed to improve 170 'black spots' during the current financial year, out of which 92 of them have already been improved. He said 192 'black spots' would be improved during the next financial year.
- **The NCRB report further states that drunken driving was a major factor for road accidents. Joint Commissioner of Police Maxwell Perreira maintains that there has to be a change in drivers' mindsets.**
- **"Most of the city accidents are not necessarily out of drunken driving," says Pereira. "But 99 per cent of the accidents, the fatal accidents that occur outside the cities are due to drunken driving** and there is no check on this kind of drunken driving. Unfortunately, truck drivers think they are fully armed to drive on the highway when they are fully.
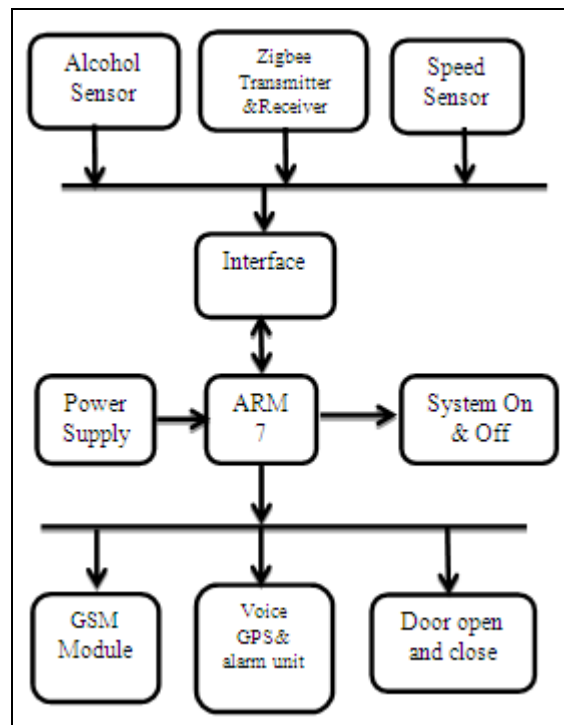
**3. Hardware Description**



*Figure 1: Block diagram for the proposed system*

This above system is utilized in bus that consists of alcoholic sensor, Speed controller, voice talking GPS, ZIGBEE, GSM, display and ARM 7. ZIGBEE plays a role of receiving the data which helps the driver to identify the location where the passengers preferred. Once the transport reaches the exact location with the help of smart card (touch and go card) we can enter into the bus. We also implemented alcoholic sensor for safety purpose. If the passengers supposed to have any alcoholic consumption automatic door present in the bus will not get open. The data's related to the passenger in the bus is send to the arm 7 and the data's are sending to the database. ZIGBEE in the ticket friendly machine transfers the data to the GSM related to the location booked by the passengers. GPS receives the signal from GSM and if the particular location is reached or crossed by the transport then through voice talking GPS the passengers can identify their destination place. The speed of the bus is also controlled in this system with the help of speed controller

and that information also sends to the data base in order to ensure the safe journey. Voice system is placed inside the bus to guide the passenger during the case of emergency and safety measures during accident.
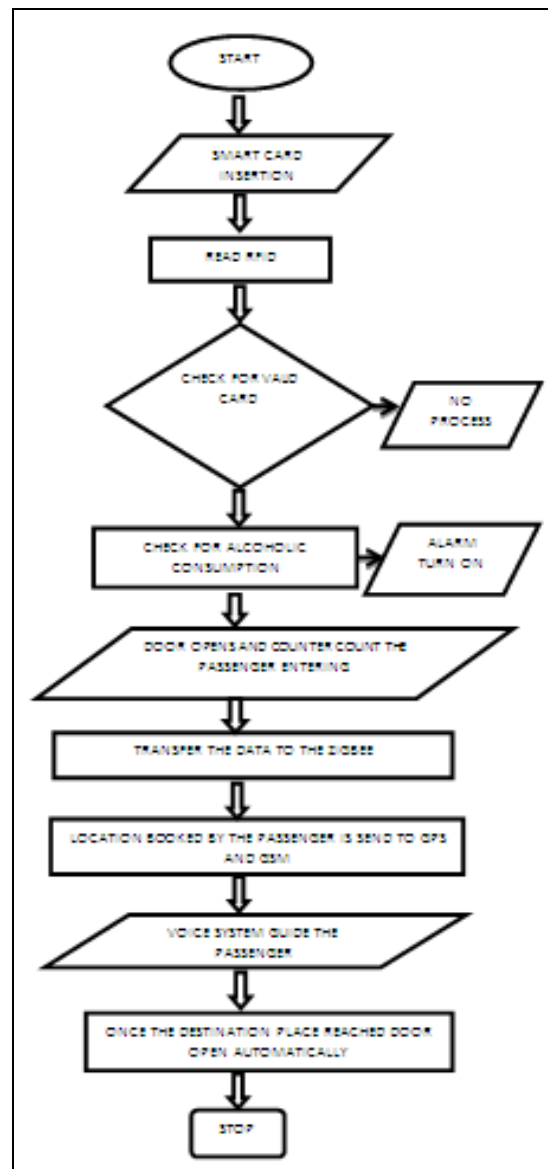
## 4. Flow Chart



*Figure 2: Flow chart for the proposed system*

## 5. Result and Analysis
Auto CAD is ageneral purpose Computer Aided Desighn and Drafting (CAD) programwhich can be used to create all kinds of line drawings available since 1982 as a desktop application and since 2010 as a mobile web and cloud-based app, currently marketed as Auto CAD 360. Developed and marketed by Auto desk, Inc. The software is currently marketed in its 18th generation. Emphasise is placed on efficient and accuret drawing technics incorprated the features, commands and technics for creating and editing and printing 2D production drawings. The simulations of the bus structure is shown in the lates auto CAD 2014.
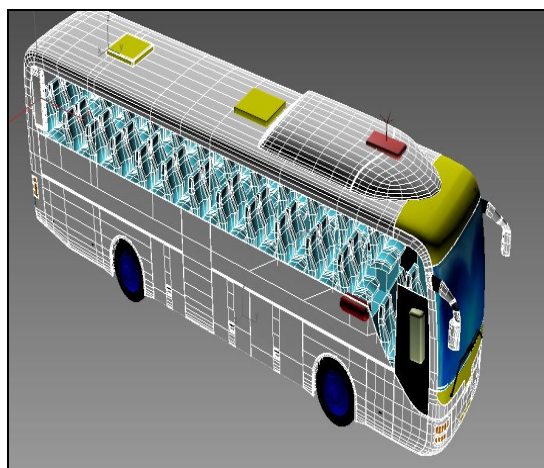
*Figure 4: Proposed bus system in auto cad*

## 6. Conclusion

In this paper from our above work we can conclude that this proposed system can provide a safe, secured and efficient way for public transport system. The proposed system, which is installed at the bus, consists of Alcohol sensor, speed sensor, ZIGBEE transmitter, GSM module and ARM 7 processor. Alcohol and speed sensor performs two different operations and the input is given to the ARM 7 processor. Under critical conditions it automatically stop the bus. The features of GSM and ZIGBEE are explored to design the system for long distance and short distance communication related to bus information and during emergency cases. This novel research can make a great change in the accident avoiding and prevention of rape in the future and ensures the full safety for people.

## 7. References

1. Ben Ammar Hatem Hamam Habib ," Bus Management System Using RFID In WSN",European and Mediterranean Conference on Information Systems 2010(EMCIS2010) April 12-13 2009, Abu Dhabi, UAE
2. Md. Foisal Mahedi Hasan, Golam Tangim, Md. Kafiul Islam, Md. Rezwanul Haque Khandokar,Arif Ul Alam," RFID-based Ticketing for Public Transport System: Perspective MegacityDhaka".
3. Ameer H. Morad," GPS Talking For Blind People", Journel of emerging technologies in web intelligence, Vol. 2, No. 3, augest 2010.
4. Dhruba Ningombam, Chitra, Nitashi Kalita, Vinita Pat Pingua," An Intelligent Voice Enabled Distance to Empty and Navigation System",International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-2, Issue-3, July 2012
5. Ran Hee Jeong, and Laurence R. Rilett (2004) "The Prediction of Bus Arrival Time Using AVL Data", Transportation Research Board 83rd Annual Meeting, Washington D.C.
6. Qing-Jie Kong, Yikai Chen, and Yuncai Liu,(2009) "A fusion-based system for road-network traffic state surveillance: a case study of shanghai," IEEE Intelligent Transportation Systems Magazine, vol. 1, no. 1, pp. 37-42.
7. Sheng, Q.Z., Li, X. and Zeadally, S. (2008) "Enabling Next-Generation RFID Applications: Solutions and Challenges", IEEE Computer, Vol 41 No 9, pp 21-28.
8. Ollivier M., (1995) "RFID- a new solution technology for security problems", European Convention on Security and Detection, 408, pp. 234-238.
9. Bo Yan, Danyu Lee; , "Design of Sight Spot Ticket Management System Based on RFID", pp. 496 - 499, 2009 International Conference on Networks Security, Wireless Communications and Trusted Computing.
10. Venugopal Prasanth, Hari Prasad R., K.P. Soman, "Ticketing Solutions for Indian Railways Using RFID Technology," act,pp.217-219, 2009 International Conference on Advances in Computing, Control, and Telecommunication Technologies, 2009.
11. Maria Grazia GNONI, Alessandra ROLLO, PiergiuseppeTUNDO, "A smart model for urban ticketing based on RFIDapplications," IEEM09-P-0572, 2009 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)