



# FOOT BOARD TRAVEL DETECTION AND WARNING SYSTEM

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**Abstract—** A major portion of the population relies on the public transport, particularly buses, for their day-to-day travel. This results in fatal accidents of the passengers especially during travelling in the footboard of the buses. Therefore, there is a need for an automatic footboard accident prevention system in buses for ensuring the passenger safety. The present work, design and development of automatic footboard accident prevention system is carried out to ensure the safety of the passengers from accidents during travelling in the buses. The present system comprises of an ultrasonic sensor, IR sensor, Ignition control and alarm indication system. The ultrasonic sensor is attached to the side walls of the footboard of the buses to detect the presence of passengers. Signals from the ultrasonic sensor and IR sensor enables the Ignition, to restrict the movement of the bus. The signals are also sent to the alarm indication system to warn the driver and the passengers. This present system ensures the safety of the passengers during boarding and deboarding of the buses by preventing the acceleration of the buses if there is any passenger on the footboard during the stationary position of the bus. The hardware of the above system occupies only less space and consumes lesser power.

However, the buses are loaded beyond their safe load capacity, especially during peak hours and become dangerous to travel. Footboard travelling has become a usual scenario in major cities. Many accidents have been reported especially on footboard travellers. In India during 2015, totally 41,830 bus accidents was reported in which 10,743 casualties were identified . The safety of the passengers could have been ensured if there was a proper mechanism to prevent accidents in the buses. The current system of operating the pneumatic doors in the buses are found to be often neglected and tampered [2].In this scenario, if an effective footboard accident prevention system is demonstrated, it would be very useful for the passengers. Therefore, in this work, an attempt has been made to ensure the travellers' safety in the buses by design and development of the automatic footboard accident prevention system. The system will be turned off automatically once the doors of the bus are closed and it is designed to turn on automatically if the bus doors are in open condition.

## 1.INTRODUCTION

A typical bus of public transport can comfortably house 70 passengers at an instant (i.e., 45 sitting passengers and 25 standing passengers).

## II.PREVIOUS WORKS

An automated system to prevent footboard traveling in buses that works on the simple concept that a bus should not be allowed to move if there is a person standing on the

footboard or to put it in another way, unless the door is closed. To implement this system, pressure pad sensor is used to detect the presence of a person on the footboard, a method to control the acceleration of the bus and a sensor to detect whether the bus is stationary or in motion. A switch that will allow the driver to open the door when the bus is stationary is also used. This switch will be void when the bus is in motion. Just a handful of switches, some batteries and some logic gates are enough to implement the system. The system makes sure that the bus moves only when the people clear the footboard. The doors will close automatically when the bus starts to move, since it is already ensured that the bus will move only when the passengers are safe (Also, once the bus is in motion, standing on the footboard will not affect the moving of the bus, since, as previously mentioned; doors will remain closed as long as the bus is in motion. Using these factors, truth tables can be formulated. From these truth tables an architectural representation can be obtained using K-map .

### III. PROPOSED METHOD

Intelligent Footboard Accident Prevention System is an Automated Accident Prevention system to prevent the accidents occurring due to footboard travelling in buses. A major portion of the population depends upon the public transport system especially buses for their daily commute and a large number of accidents take place almost every day. Every year a large number of passengers die due to accidents caused by footboard travelling in buses. The negligence of either driver or passenger can result in a tragedy. So by developing an intelligent system in buses the passenger safety is assured. With the help of sensors placed on the footboard the presence of passenger is detected by the microcontroller and the circuit actuates the retarder which is coupled with the drive of the bus. The retarder slows the bus by when signal is received by the microcontroller. When the passenger presence is detected on footboard by the sensor, the acceleration pedal is deactivated, thereby preventing the driver from accelerating the bus. Thus the bus comes to rest smoothly when passenger is present on the footboard. The system will be deactivated when the doors are closed. The risk of sudden braking is eliminated by the use of the retarder. The retarder can be either Hydraulic or Electrical which is a secondary braking. System that enables braking without using the frictional forces thereby damages to the primary braking system. When passenger is away from the footboard, the

retarders are deactivated and fuel supply is switched on. Thus the safety of passengers are ensured by the system and the accidents due to footboard travelling can be prevented effectively.

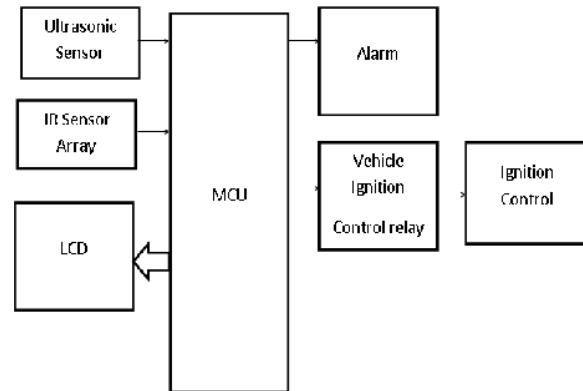


Figure 1. Block diagram of proposed system

### IV. CONCLUSION

In this work, design and fabrication of an automatic footboard accident prevention system is carried out for ensuring the safety of the passengers travelling in the buses. The major components of the system including the ultrasonic sensor, IR sensor, the Relay and the alarm indication system are connected with proper electronic circuitry. The hardware of this system occupies less space and consumes lesser power. Installation of this system does not require any design modifications in the existing models of the engines or the accelerators of the buses. The system successfully overcomes the limitations of other systems and ensures the safety of passengers travelling in the buses. The cost of the system is also less. All the components are connected in their respective places to form a circuit.

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