

# **Vehicle Control System with Accident Prevention by Using IR Transceiver**

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**ABSTRACT** The project presented here is an approach towards vehicle navigation & safety implementation. As the title suggests, the project is aimed at automatically sensing the areas / zones like “School zone”, “Work zone” or “Curve zone”. As an example, near school zone, the sign board displays “School Zone Ahead, Drive Slowly”, or near construction area, “Drive slowly, Work under construction”. Drivers go at very high speed usually near school zone, or indulge in speeding causing inconvenience to the other vehicle users and pedestrians. Even though these are meant for the safety of the vehicles traveling and also for the general public, it is not usually practiced and ignored by the vehicle drivers. The main objective is to design a Vehicle controller meant for vehicle’s speed control and monitors the zones, which can run on an embedded system. Vehicle Controller can be custom designed to fit into a vehicle’s dashboard, and displays information on the vehicle. The project is composed of two separate units: zone status transmitter unit and receiver (speed display and control) unit. Once the information is received from the zones, the vehicle’s embedded unit automatically alerts the driver, to reduce the speed according to the zone, it waits for few seconds, and otherwise vehicle’s controller unit automatically reduces the speed.

## **I.INTRODUCTION**

The project presented here is aimed at automatically sensing the areas / zones like “School Zone”, “Work zone” or “Curve Zone”. We are developing a system which will sense such traffic signs automatically and accordingly inform the driver and also assist him in controlling the vehicle. As the design of this system goes, the project proposed here consists of a set of units : Zone / Area Unit and Vehicle Unit. In convention, these special zones or areas are indicated at the roadside on a pillar or road sign poles. As an example, near school zone, the sign board displays “School Zone Ahead, Drive Slowly”, or “Curve Zone Area-Do not go fast”. Drivers go at very high speed as usual near school zone, or operate the harsh driving causing accident in the curve zone. As a result, making the whole concept of displaying warning sign and messages on the roadside boards does not help. To provide a better alternative, one can develop a system which will automatically sense such traffic signs automatically and accordingly inform the drives and also assist him in controlling the vehicle voluntarily or forcibly. All in all resulting in a very effective and fail proof system to provide traffic regulation, safety and convenience of the people. As the whole project not just limited for these few functions, this project can be made mandatory. That way one can provide a more reliable security device and streamline traffic flow. Few additional features which can be integrated with this system are, “Anti-collision”, “Auto breaking with curve detection” and “Auto Speed limit Sensor”.

## **II. EXISTIG SYSTEM**

- Public places such as school, hospital, and work or accident zone have warning sign and messages displayed on a pillar or road sign poles.
- It has to be followed by the vehicle driver according to the traffic rules.

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## 1.1 Disadvantage:

- The driver might not be aware about the sign or intentionally doesn't follow.
- It results in violation of the rule and occasionally in accident.

## III. PROPOSED SYSTEM

- A system that detects the particular zone and according the action are being carried out.
- The project proposed here consists of a set of units are
  1. Zone / Area Unit.
  2. Vehicle Unit
- Zone unit transmit the signal according to the traffic sign and vehicle unit perform the appropriate actions.

## 2.1 Advantage:

- Speed of the vehicle is controlled and accident is prevented.
- Features that are integrated with this system are:
  - 1) Auto-Breaking with Anti collision
  - 2) Auto Speed Limit control
  - 3) Curve detection.

## IV. BLOCK DIAGRAM

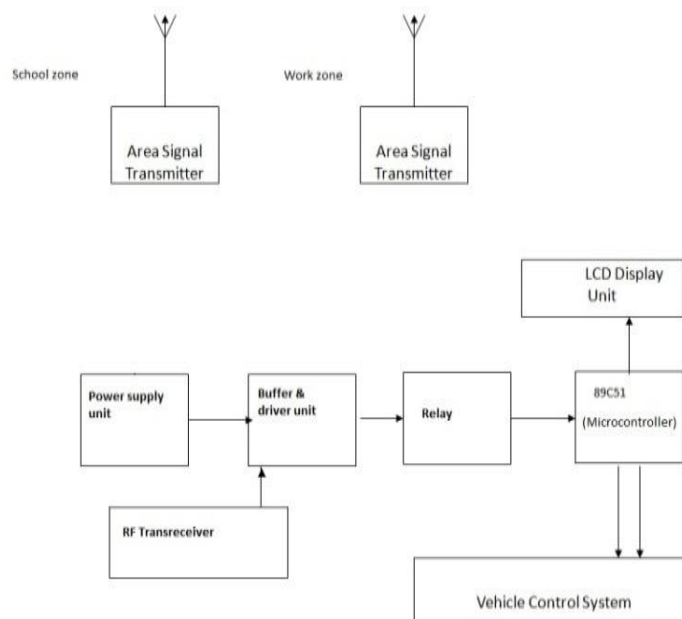


Fig1:Speed reduction and curve detection

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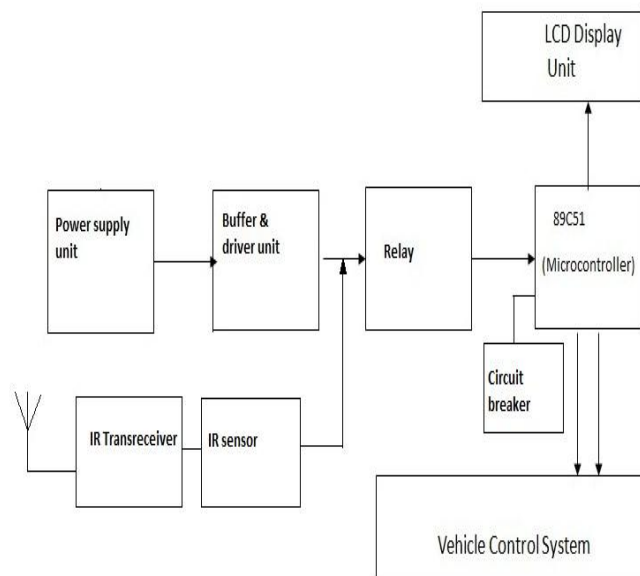


Fig2: Collision avoidance

## V. WORKING

The modules in the project are: RF transmitter and Receiver modules for establishing wireless communication, microcontroller for overall functioning and control and vehicle control system for the movement controller, IR trans-receiver and sensor for collision avoidance. The controlling device of the whole system is a Microcontroller to which RF receiver module; DC motors are interfaced through a motor driver. The Microcontroller checks the data with the program embedded in it and performs appropriate actions on the electric DC motors. The Microcontroller is programmed using Embedded C language. Whenever the vehicle is within the transmitter zone, the vehicle speed is controlled by receiving the signal, i.e. every time the vehicle speed is decreased by some cutoff and kept constant until the vehicle moves out of the transmitter zone, and then the vehicle can get accelerated by itself. The IR sensor detects if any other vehicle is increasing its speed and the distance between the vehicles is to be maintained and controlled. If the distance is reduced, collision might occur then the information is send to Microcontroller. Microcontroller interacts with motors through driver IC to take appropriate directions to prevent accidents.

## VI.METHODOLOGY

This ‘Smart Zone Sensing System with Accident Prevention’ system works like this. Each monitoring zones are fitted with RF Transmitter units with unique Identity Code. All the vehicles must be fitted with RF Receiver and respective circuitry on their vehicle’s number plate. Display will be fitted on the dash board for visual representation of the alert messages sent by respective zone Transmitters.

The Radio Frequency Transmitter transmits the zone code to the receiving units. There are two zones in the present system: School Zone and Curve Zone. Each Transmitter carries its own frequency. The Radio Frequency Receiver receives the Zone Code transmitted by the Transmitter. According to the frequency of transmitter, here Transmitter respective output pins go high. The output is fed to Buffer. This unit provides unit gain amplification to the received Zone Code signal and drives the relay for further feeding. The output of Zone Code signal is fed to Microcontroller chip as input and gets Speed Limit commands from it and drives the two more blocks. If obstacle still comes near to vehicle then it must stop the vehicle automatically. It is possible to construct such system using one IR Transmitter and two IR Receivers. The system’s IR Transmitter and IR Receivers must be fitted in front of vehicle and system must be

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supplied with power only when vehicle starts moving. That means power supply line of the system must be in series with ignition key of vehicle, and when rider switches ON the ignition key vehicle starts and system comes into action.

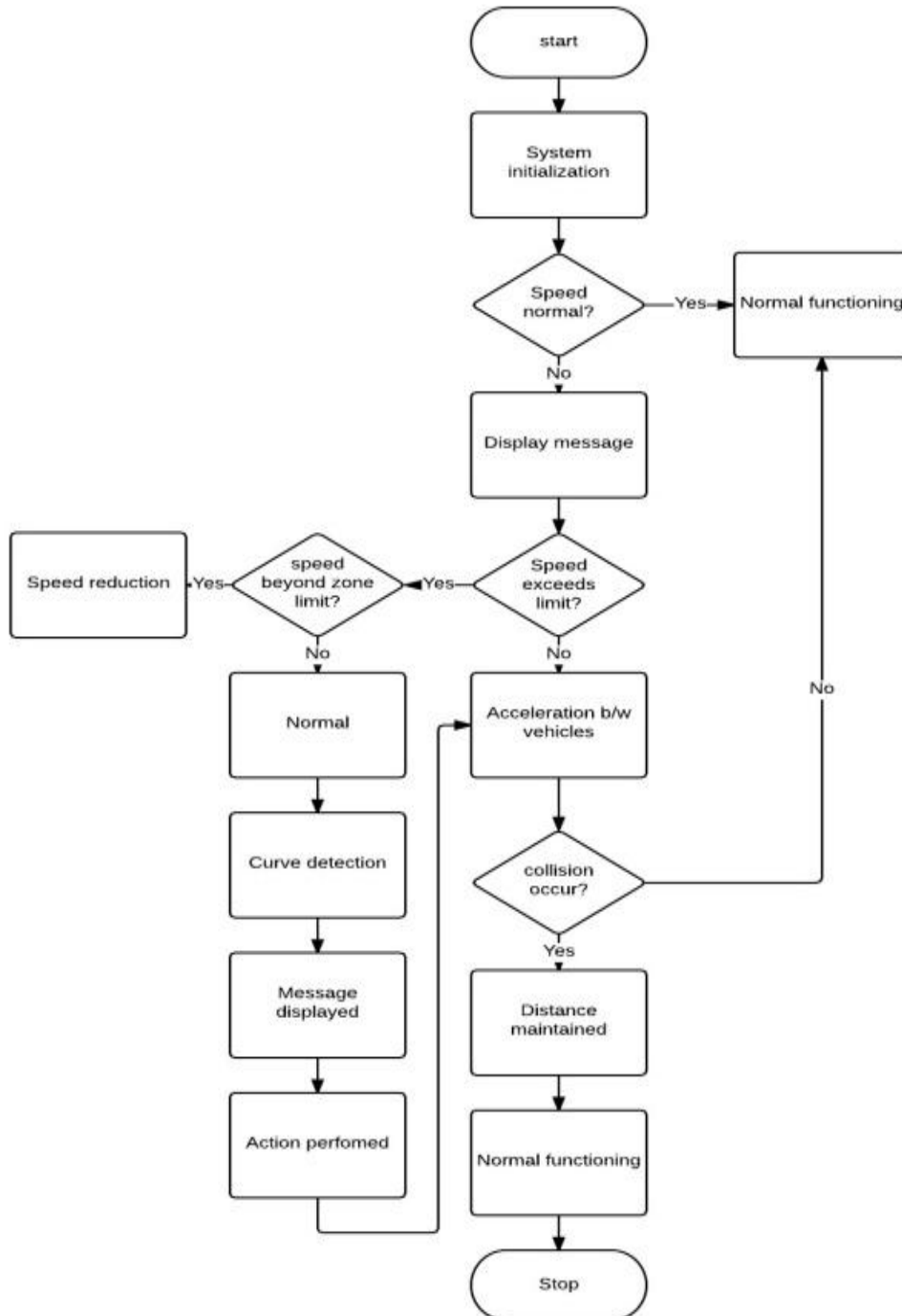


Fig3: Flow chart for the system

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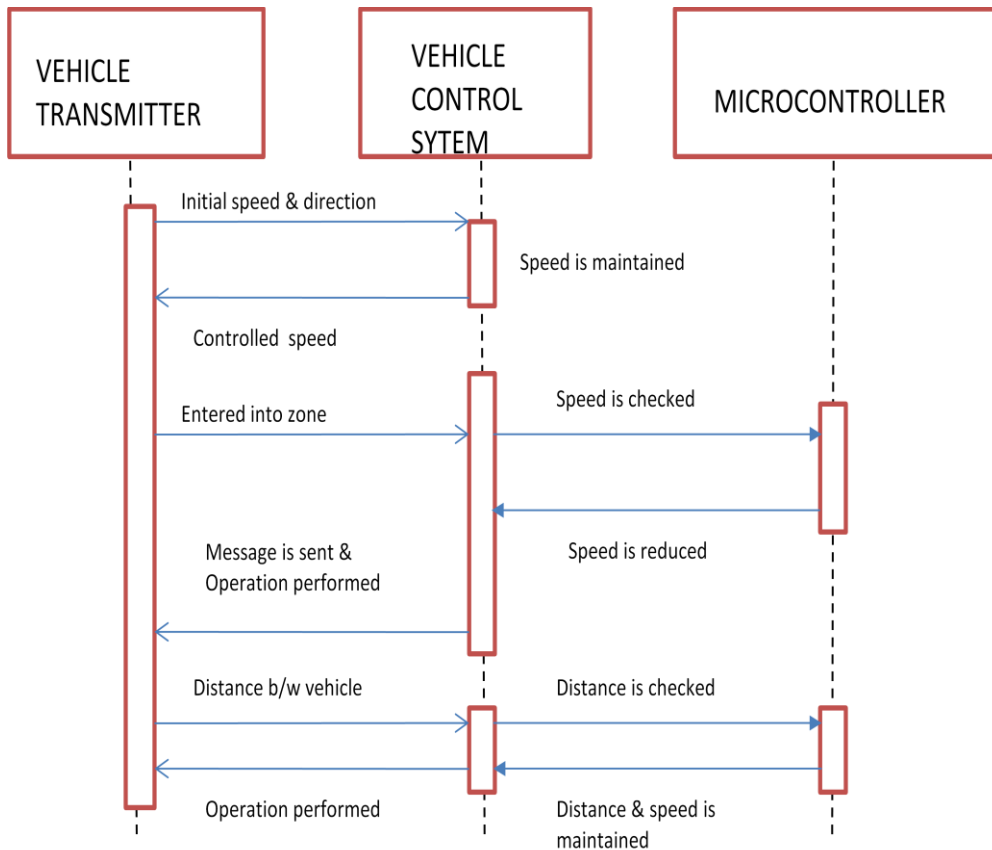


Fig 4:Sequence diagram

## VII.RESULT

In this project we controlled the speed of a Vehicle in a School zone, Work Zone, Curve zone, Highway, U-turn. Prevent the accidents by detecting the collision distance and speed using IR sensor.

## VIII.CONCLUSION

In this project we present heavy traffic zone accident preventions technique in the real world. It has been mainly designed in order to avoid accidents and to alert the drivers about the speed limits for safe travelling. It can be utilized in special areas with sudden sharp & high curve and thus accident are prevented in old bridges and Ghats section. It is used to control the speed of the vehicle in hospital, school, and work zones. Accidents can be prevented which are caused by the negligent driving or speeding of the user. Heavy traffic zone are schools, hospitals, Highways, U-turn etc. There the Vehicle speed can controlled automatically without the help of the driver. At the same time it detects obstacle and stops the vehicle, so that accident will be prevented.

## IX.FUTURE SCOPE

Impact sensors can be used for detecting the damage caused to a vehicle during an accident. GSM and GPRS can be used for tracing the location of the vehicle and message is send to user's relatives and the police station in the case of accident.

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