

Hilly Highways Accident Alert System

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Abstract: India is an emerging country in terms of infrastructure Development. With this development, the problem of accidents has increased tremendously. This study has been undertaken to investigate the functioning of a self-sustained multi-powered Accident Alert System particularly aimed at reducing accidents in hilly regions. The proposed system is powered by renewable energy i.e. wind and solar power.

Keywords – Renewable Energy, Wind Power, Solar Power

I. INTRODUCTION

Nowadays, many accidents occur in Hilly Ghat areas. Accidents occur due to the vehicle not being able to recognize the other vehicle coming from the opposite side and when suddenly a vehicle comes in front, drivers are not able to control the speed of the vehicle, and hence accident results in accidents. Such accidents result in a great loss of life. Also due to accidents, losses of money as well as loss of life results. Last year in India deaths were over 1.51 Lakh, and in Maharashtra, total accidents were 11870. This accident affects the economy of the country, affects transportation, and causes too many loss of lives. On curved roads accidents happen because the driver is not able to recognize vehicles coming from opposite sides. So to avoid such incidents we have come up with the idea of a “Multi powered accident alert system for hilly highways”. Here we developed a circuit by which when a vehicle or obstacle on the opposite side is detected the IR module senses it and sends the signal to the transistor (triggering circuit) then the transistor switches on the supply of buzzer and glows a red LED and at the same time buzzer produce sound to alert the driver. The same execution of the system happens on another side of the curved road. Now, when E vehicles are used all over India, Charging Stations will be required. In those areas, Power loss occurs a lot. Hence we can provide charging stations at the start and end of Ghat, by Installation of solar panels and wind turbines and using their generated energy to charge the charging station. Now because A large amount of solar rays strikes hilly areas, the same solar rays can be used to generate energy using solar panels. Also, wind is being wasted in abundant amounts in hilly areas. These winds can be brought into use by installing wind turbines, and hence power generated by solar panels and wind turbines can be used to power the charging station by making it a hybrid system. The main aim of this paper is to avoid accidents on the curved road. Here solar power and wind power are used for powering the charging station. The energy obtained by solar panels and wind turbines will be used to power the charging station. By Application of this project in a hilly area loss of lives will be reduced, and thousands of lives will be saved, this project is fully automated and hence doesn't require any operator, it provides a safe journey to passengers, energy will be generated without any pollution of air, water or noise.

II. PROBLEM IDENTIFICATION

At hilly ghat areas in curve roads, accidents occur in great numbers, and due to no solution to the prevention of accidents at hilly ghat areas in curve roads, accidents are not reducing but increasing day by day. This accident occurs because, in curved roads or U-shaped roads, drivers are not able to recognize or see the vehicles or objects on the other side of the road due to the obstacle in between. Hence due to this above reason accident occurs in hilly areas ghat region on curved roads or pin-shaped roads. Last Year in India total number of deaths that occurred was over 1.51 lakh, and the total number of accidents that occurred in Maharashtra was 11,870. This accident resulted in great loss of lives and not only loss of lives but also affected the economy of the country, and transportation over that road, and caused much other damage. Now, to avoid all these severe losses, like loss of lives, disturbing the transport facility, and affecting the economy of the country we have to build a system in which the driver on hilly ghat areas at curve roads or U-shaped roads must be able to recognize the vehicle coming from the opposite side.



Fig.1 Ghat Crossing

III. MULTI-POWERED ACCIDENT ALERT SYSTEM FOR HILLY HIGHWAYS

In this system whenever any vehicle, object, or obstacle is sensed on the road by the IR Sensor, the IR Sensor sends this signal to the transistor and a buzzer with a beep sound alerts the driver and a red LED glows so that the driver may slow down and pass the road with precaution. If there is no vehicle, object, or obstacle on the other side of the road, then the IR Sensor sends a signal to the transistor and a green LED glows which indicates that the driver is safe to proceed and pass the road. By 2025 in India E - E-vehicles will be introduced and will be very common, so a charging station at the start of the ghat and a charging station at the end of the ghat so that the same E-vehicles can be charged. Now, in hilly ghat areas Sun rays strike the ground and are wasted by not making any use of it, and simultaneously the winds that flow in hilly areas in abundant amounts are also wasted by not making any use of it. So to make use of the sun rays striking the ground and the wind which flows in hilly areas we came up with the idea to install solar panels to generate electricity by Sun rays and wind turbines to generate electricity by flow of wind. Now, and thus generated electricity by a hybrid system of Solar and Wind turbines will be brought into use to power the charging stations, street lamps, and Accidents Alert System.



Fig.2 Prototype of Multi-Powered Accident Alert System

IV. WORKING OF PROPOSED SYSTEM

By Installation of this system whenever any vehicle, object, or obstacle is sensed on the road by the IR Sensor, the IR Sensor sends this signal to the transistor a buzzer with a beep sound alerts the driver and a red LED glows so that the driver may slow down and pass the road with precaution. If there is no vehicle, object, or obstacle on the other side of the road, then the IR Sensor sends a signal to the transistor and a green LED glows which indicates that the driver is safe to proceed and pass the road. With the application of this system, severe losses will be prevented, like the loss of life will be saved, the transportation system will not be disturbed, and the economy of the country will not be disturbed and thus generated electricity by a hybrid system of Solar and Wind Turbine will be brought into use to power the charging stations, street lamps, and Accidents Alert System. With this system, accidents will be reduced and energy will be generated without any type of air pollution, noise pollution, or water pollution.

4.1 Applications

- Use in Hilly Highways to Avoid Accidents.
- In the Generation of Electricity for nearby residents & villagers.
- In Charging E- vehicle.

IV. FUTURE SCOPE

By implementation of this system, MPAAS accidents in hilly regions will be reduced. The battery station of our project will be useful for Vehicles to recharge will be Everywhere in the future.

V. CONCLUSION

In the current era of development, new highways are likely to be constructed by NHAI and other government bodies. The proposed system is proven to be self-sustaining and reliable for reducing accidents in ghat sections. By use of an image processing unit and automation system, the efficiency of the proposed system can be improved. Power generation through the wind and solar system will add an additional advantage for vicinity villagers & residents. We can conclude that the proposed system is in need of future for expressway-based hilly areas.

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