International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 11 | Nov 2022 www.irjet.net p-ISSN: 2395-0072

Review of causes of accident & its prevention methods in cars.

Yashodeep Katkar[1], Bhushan Save[2], Pratik Patil[3] , Saurabh Bait[4]

[1,3,4] BE student, Dept. of Electrical Engg, VIVA Institute of Technology, Virar (E), Maharashtra
[2] Assistant Professor & HOD, Dept. of Electrical Engg, VIVA Institute of Technology, Virar (E),

---

Abstract - *In addition to an overview of various types of causes of accident and prevention methods/techniques, in this paper introduce a basic developed techniques used in cars. The paper represents a solution where we try to tackle the problem of loss of life and property due to drunken driving. The survey highlights the facts that total number of traffic deaths is excessive because of drowsiness of the driver. Driving a vehicle in a crowded road has become a nightmare because of the road conditions poor weather conditions, haste to reach the destination and excess of traffic. Drowsiness of driver, drink and drive are coming further major reasons for road accidents.*

Key Words: ***Drowsiness, loss of property, prevention and road conditions, traffic, death ratio.***

1. INTRODUCTION

Driver drowsiness driving is one of the main reasons for road accidents. In current survey it shows that out of 5 accidents one accident is due to drowsiness of the driver which is approximately 20% of road accidents and it increasing gradually in every year. The survey highlights the facts that total number of traffic deaths are excessive because of drowsiness of the driver. Driving a vehicle in a crowded road has become a nightmare because of the road conditions, poor weather conditions, haste to reach the destination and excess of traffic. Drowsiness of driver, drunk and drive are coming further major reasons for road accidents. Due to less conscious we can't take care of ours while driving that results as loss of property i.e. car, money and human life. The new system proposed will be built using ESP32 Microcontroller. The reason for selecting ESP32 Microcontroller is that it is inexpensive, supports various protocols such as wired (Serial, I2C, SPI etc.) as well as wireless(Wi-Fi, Bluetooth) which makes it suitable for our application. Drowsiness is determined using Eye Blink Sensor which is basically an IR Sensor that can determine whether the eyes are closed for certain threshold amount of time. An alcohol sensor is used to monitor whether the driver is drunk or not. In any condition if the driver is drowsy an alert is sent as a message through the ESP32 Microcontroller over as SMS. LED and Buzzer are used for local indication. Solving the problem became critical when the design of earlier accident prevention systems was found ineffective for alerting the driver. In this paper, the discussed part will be road accidents, their causes, prevention methods.

1.1 Road Accidents.

The fatal road accident related to former Tata Sons Chairman Cyrus Mistry on September 4 2022 has again placed the spotlight on the high quantity of death resulting from such incidents in India. Mistry, 54, changed into a dead man after his vehicle hit a divider in Maharashtra's Palghar district when he was travelling from Ahmedabad too Mumbai.

According to current National Crime Records Bureau (NCRB) statistics released currently more than 1.55 lakh people had been killed in road crashes across India in 2021, a median of 426 each day or 18 each hour. This is the very best death discemment recorded in such accidents in any calendar year of 12 months. Over speeding continues to be the largest killer on Indian roads. The records from the past few years display that almost 60% of street crashes are induced by dashing. The percentage of fatalities due to rushing has been inside the 55%-57% range.

In 2020, the Indian nation with the very best variety of street accidents changed to Tamil Nadu, with over 45 thousand cases reported, accompanied with the aid of Madhya Pradesh, with over 42 thousand pronounced road accidents.

1.2 Causes.

A street twist of fate is most undesirable issue to take place for an avenue user, even though they manifest quite regularly.

The most unfortunate component is that we do not learn from our mistakes. Most of the street users are pretty well aware of the general rules and protection measures even as they use the roads; however, it's only a small part of them who are lax, which leads to accidents and crashes. An important reason for accidents and crashes is human error.

A number of the common behaviour of human beings that leads to twist of fate:

1) Over speeding.
2) Drunken drive.
3) Distractions to driver.

4) Red light jumping.

5) Avoiding safety gears like seat belts and helmets.

Non-adherence to lane driving and overtaking in a wrong manner.

1) Over speeding

At high speed, the automobile desires extra distance to prevent accidents, i.e., braking distance. A slower vehicle comes to a halt at the same time that a faster one takes a long time to stop and additionally skids a long distance because of the law of perception. A car moving at excessive speed can have an extra effect at some point in the crash and therefore cause more accident.

2) Drunken drive.

Alcohol reduces awareness. It decreases the response time of a human frame. Limbs take extra time to react to the brain's instructions. It hampers imagination and prediction due to dizziness. Alcohol dampens worry and incites humans to take risks. These kinds of factors even contribute to driving related accidents and lots of they prove deadly.

3) Distractions to driver.

The major distraction now a days is talking on a mobile phone while driving. The act of talking on the phone occupies a large portion of the brain, and the smaller part handles the driving skills. Some of the distractions on road are:

1) Adjusting mirrors even as using,

2) Stereo/Radio in car

3) Animals on the road.

4) Banners and billboards.

4) Red light jumping.

A red light jumper now jeopardizes not only his life but also the safety of road users. This act with the aid of one driving force, incites other drivers to strive for it. At the end, causes chaos at the crossing. This chaos at intersection is the principle reason for the traffic jams.

5) Avoiding safety gears like seat belts and helmets.

Use of a seat belt in a four-wheeler is now mandatory, and no longer sporting a seat belt invites a penalty, just as in the case of helmets for two-wheeler drivers. Sporting seat belts and helmets has been made mandatory under law after proven studies showed that those things lessened the severity of injury for the duration of accidents. Carrying seat belts and helmets doubles the probability of survival in an extra accident. Safety gears maintains you intact and safe in case of accidents

1.3 Prevention methods.

It took an endemic to teach human beings that nothing subjects extra than lifestyles, not even cash. The COVID-19 will finally shrink with the regular efforts all and sundry is putting in. but, if demographics are to be compared in India, road injuries have taken a lot more lives in comparison to this virus. For this reason, the want of the hour is to make certain the motors you buy are safe. So, here is a list of 10 important safety features that a vehicle need to be prepared with.

1) Dual-front Airbags.

The driver-facing airbag has been made mandatory under the BNVSAP protection norms in India. However, you should look for a vehicle that has dual front airbags, one for the driver and one for the passenger. Any range greater than that is high-quality. Airbags are critical in accidents because they act as restraints and reduce the amount of damage that could occur.

2) Anti-lock Braking System with Electronic Brake-force Distribution.

The anti-lock braking system (ABS) prevents tyres from locking during braking, allowing you to maintain control of the vehicle. It is far more beneficial to brake when an obstacle appears unexpectedly. Paired with digital brake-force distribution (EBD), which distributes the brake force consistent with various parameters inclusive of speed, traction on the wheel, and street conditions, this device can act quickly in vital situations. So, ensure that the vehicle you propose to shop for has ABS with EBD. BTW, you don't want to worry; this has additionally been made obligatory with the aid of the Indian authorities below BNVSAP norms.

3) Cornering Stability Control.

It is not a component of the electronic balance management machine. This device is critical because it prevents the car from rolling or skidding outwards while performing curve maneuvers, particularly at high speeds. This device distributes the brake pressure for that

reason and ensures that each wheel has traction with the road.

4) Rear parking sensors.

These sensors not only assist a driver when parking a car, but also ensure the safety of any pedestrians who may be in danger while reversing the vehicle. These sensors sense any obstacle, and for this reason they alarm the motive force, relaying on the gap between the auto and the impediment.

5) Seatbelt Pre-tensioners.

As the name indicates, this feature restrains the seatbelt in the event of unexpected braking or a crash, which prevents the motion of the occupants and restrains them to the seat. Fortunately, most cars in India come standard with seatbelt pretensioners.

6) Speed Sensing Door Lock.

After achieving a sure pace, the doors of the car lock routinely, ensuring the safety of the occupants. BNVSAP has made it mandatory for the cars to have a speed-sensing alarm, but the computerized door lock has not been made mandatory. So, to make sure that you are protected, do make sure that the car you propose to buy has a velocity-sensing door lock.

7) Impact Sensing Door Unlock.

Most of the time, after injuries, occupants stay trapped in the vehicle as the auto doors remain locked. This device unlocks the door as soon as the car's brakes engage, allowing the occupants to open the doors.

8) Panic Braking Signal.

A few may not regard this feature as vital. But in fact, this simple feature can assist in the prevention of crashes. In the event of unexpected braking, the brake lights on the rear glow with a high frequency of flashing, alerting the driver behind of the impending hazards. As a result, this energetic system of protection in automobiles can save you from risk.

9) Reinforced B-pillar.

In the event of a fender-bender crash, it is the B-pillar that could mitigate the aftereffects of the crash, decreasing the harm to the occupants. So, if the B-pillar is reinforced, it may decrease the effect accordingly, improving the safety inside the automobile.

10) ISOFIX Child-Seat Anchors.

This might now not be important for the ones, who don't have a toddler inside the own family. However, for those with little toddlers, ISOFIX toddler anchors are a necessity. It enables you to repair an infant seat while driving.

2. CONCLUSIONS

Studies and researches regarding road accidents and its preventive options may overcome a large number of deaths. By these methods, every person is able to save his life as well as their respected loved once. This explanatory mixed methods study's findings will provide records on traffic-volatile behaviours for all drivers. The results can be implemented to lay out a culturally based total method, and intervention applications are to be designed to promote drivers' fitness within the community. Furthermore, this examination will provide some insights into the health behaviour elements that must be considered if effective strategies and intervention programs to promote driver fitness in Iran are to be designed. The consequences of this paper will be disseminated as peer-reviewed publications at meetings and as part of a doctoral thesis.

REFERENCES

[1] Stephen Eduku, Mohammed Okoe Alhassan, Joseph Sekyi-Ansah," Design of Vehicle Accident Prevention System Using Wireless Technology".

[2] Adu.A. (2017, April, 03) Road Accident in Ghana: Pulse.com.Gh.

[3] Mohm. T. (2016). Drowsy related accident: Forbes.com. Governors Highway Safety Association (GHSA), 08/08/16.

[4] Dankyi, D. A. (2010) Tema records 75 deaths in 732 Accidents between January-September: http://newtimes.com.gh/story/tema-records-75-death-in-732-accidents-between-January-September-2010. [4] Morris, E. (2009): Top Causes of Car Accidents. Ezine Articles, http://ezinearticles.com/?Expert=Eric_ Morris.

[5] World Health Organization. (2009). Global status report on road safety. Retrieved from the World Wide Web

[6] Leandro M. Young drivers and speed selection: A model guided by the Theory of Planned Behavior. Transportation Research Part F: Traffic Psychology and Behaviour. 2012; 15(3):219–32. doi: 10.1016/j.trf.2011.12.011

[7] Anderson JE, Govada M, Steffen TK, Thorne CP, Varvarig-ou V, Kales SN, et al. Obesity is associated with the future risk of heavy truck crashes among newly recruited commercial drivers. Accident Analysis & Prevention. 2012; 49:378–84. doi: 10.1016/j.aap.2012.02.01

[8] Jayatilleke AU, Nakahara S, Dharmaratne SD, Jayatilleke AC, Poudel KC, Jimba M. Working conditions of bus drivers in the private sector and bus crashes in Kandy district, Sri Lanka: A case control study. Injury Prevention. 2009; 15(2):80–6. doi: 10.1136/ip.2008.01893

[9] World Health Organization. World report on road traffic injury prevention. Geneva: World Health Organization; 2004.

[10] Leproust S, Lagarde E, Salmi LR. Systematic screening for unsafe driving due to medical conditions: Still debatable. BMC Public Health. 2008; 8(1). doi: 10.1186/1471-2458-8-27

BIOGRAPHIES

Mr. Yashodeep Shrikant Katkar.
Student of BE Electrical Engg.
VIVA Institute of technology, Virar, Dist. Palghar, Maharashtra, India.

Prof. Bhushan Save
Assistant Professor & Head of Department
Electrical Engg. VIVA Institute of technology, Virar, Dist. Palghar, Maharashtra, India.

Mr. Pratik Vijay Patil
Student of BE Electrical Engg.
VIVA Institute of technology, Virar, Dist. Palghar, Maharashtra, India.

Mr. Saurabh Mohan Bait
Student of BE Electrical Engg.
VIVA Institute of technology, Virar, Dist. Palghar, Maharashtra, India.