Technologies Used to Reduces Car Accident: Review

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Abstract*— Traffic accidents have become an important problem for governments, researchers and vehicle manufacturers over the last few decades. However, accidents are unfortunate and frequently occur on the road and cause death, damage to infrastructure, and health injuries. Therefore, there is a need to develop a protocol to avoid or prevent Car accidents at the extreme level in order to reduce human loss. The aim of this research is to develop a new protocol, to minimize the number of road accidents, decrease the death rate caused by road accidents, many documents include the task of ensuring life safety and solving socio-economic issues as a key part. For example, Federal Law No. 196 "On Road Traffic Safety" dated December 10, 1995, which addresses the protection of the rights and interests of the society and state, the protection of life and health of citizens, and the prevention of road traffic accidents (RTAs), regulates the relations between car owners and the entire transport system as a whole. It is important to carry out preventive measures, which will result in a general decline in the accident rate on the roads.

Indexed Terms*— Intelligent Transportation System, accident, reduction, VANETs

I. INTRODUCTION

Worldwide, motor vehicle accidents are a major cause of death, and, despite improvements in automobile safety, projections have indicated that deaths from traffic crashes will increase significantly by 2030 because of increased motor vehicle ownership. Examples of causes of traffic accidents include speeding, drunk driving, distracted driving, and inexperienced driving. Although seat belts can save lives, millions of people fail to use them. Likewise, helmets are an effective means of protecting motorcyclists from traumatic brain injury and death, yet many riders choose not to wear a helmet.

Motor vehicle accidents result in a wide range of injuries and often in permanent disability. In an attempt to limit some of this damage, laws in places around the world have been enacted specifically to improve road safety. For example, some U.S. states have imposed universal helmet laws, requiring all motorcycle riders and passengers to wear protective helmets. Some governments impose fines on automobile drivers and passengers who do not use seat belts. Accidents involving buses are also responsible for injuries to large numbers of people, and this has led to mandatory seat belt use in some places. Safety features on cars, including seat belts, side-impact reinforcement, and air bags, have contributed to fewer injuries and deaths. Certain changes in the design of car bumpers and windshields have been aimed at causing less harm to pedestrians who may be hit. Preventive measures, such as campaigns on the dangers of drunk driving, enforcement of speed limits, the use of cameras to catch traffic law violators, and education of children about road safety, have helped raise public awareness about the importance of safety precautions on the road.

II. METHODOLOGY

Vehicle Fitness: Automated fitness testing for vehicles has been made mandatory. This would reduce corruption in the transport department while improving the road worthiness of the vehicle [1]. Penalty has been provided for deliberate violation of safety/environmental regulations as well as for body builders and spare part suppliers [2]. The process for testing and certification for automobiles is proposed to be regulated more effectively [3]. The testing agencies issuing automobile approvals have been brought under the ambit of the Act and standards will be set for motor vehicle testing institutes [4]. The Act also provides for compulsory recall of defective vehicles and power to examine irregularities of vehicle companies [5].

Road Safety Board
A National Road Safety Board, to be created by the central government through a notification to advise the central and state governments on all aspects of road safety and traffic management including standards of

motor vehicles, registration and licensing of vehicles, standards for road safety, and promotion of new vehicle technology. Protection of Good Samaritan
The Act lays down the guidelines and provides rules to prevent harassment of Good Samaritan (a person who renders emergency medical or non-medical assistance to a victim at the scene of an accident) to encourage people to help road accident victims. Cashless Treatment during Golden Hour.

The Act provides for a scheme for cashless treatment of road accident victims during golden hour Third Party Insurance The Act has included the driver's attendant in 3rd Party insurance with no cap on liability of insurers. There will be a 10 time increase in insurance compensation, from Rs 50, 000 to Rs 5 lakh. Claim process has been simplified. Insurance firms have to pay claims within a month, if the victim's family agree to accept Rs 5 lakh compensation. The minimum compensation increased for hit and run cases from Rs 25,000 to two lakh rupees in case of death, and from Rs 12,500 to Rs 50,000 in case of grievous injury.

New Technologies That Can Prevent Accident
AUTOMATIC EMERGENCY BRAKING (AEB):
AEB is a newer feature that alerts a driver to an imminent crash, and assist the driver in using the maximum braking capacity of the car.If the situation becomes critical and the driver is not responding, AEB can independently brake.

There are 3 categories of AEB
Low speed system – this system is designed for use on city streets to detect other cars in front of yours, in hopes to prevent crashes and minor injuries such as whiplash [1]. Higher speed system – scans up to 200 meters in front of your car and uses a long-range radar for faster speeds [2]. Pedestrian system – picks up pedestrian movement in relation to the direction your vehicle is traveling and determines risk of collision [3]. AEB goes by many names such as; active city braking, pre-crash safety system, and active city brake.

BACK UP CAMERA:
This feature isn't brand new, but can be extremely helpful to drivers. Many accidents happen at low-speed, like during parking. A 360-degree camera system is a combination of cameras on all sides of car, sensors, and a display inside the car. It helps drivers see their surroundings behind them, which can be extremely helpful when backing up. If a car gets to close to an object, most systems beep to alert the driver, giving the driver time to break. Since this feature has been around for a while, it is fairly inexpensive to add when purchasing a car, and is valuable to have.

AUTO-STEERING:
Today, some cars have auto-steering capability. No, this doesn't mean your car will full driver itself, but it can taking the steering wheel away from a driver in certain situations to avoid collision. It will apply the breaks a steer around a potential pedestrian or object in the car's path, all while staying within the current lane of traffic. Many auto-steering systems work in conjunction with an automatic emergency breaking system.

LED HEADLIGHTS:
Quality headlights are crucial to preventing car accidents when driving at night time. LED headlights are brighter, and typically last much longer than traditional halogen bulbs, some over 20 years. Besides lighting up the street in front of you so you can see, LED lights are more efficient. They convert 80% of the energy they use directly into light, only wasting 20%, compared to halogen bulbs that waste 80% of their energy. The actually lighting that LED headlights provide is a greater quality of light.They provide clear and illuminating light, while being less blinding to other drivers. An additional benefit of LED headlights is that they draw less energy from your car to produce a purer quality of light, which improves fuel efficiency.

LANE DEPARTURE WARNING/LANE KEEPING SYSTEM:
Lane departure warning is designed to prevent distracted driving errors. Even if you just look down at the radio or to the passenger for a second, it can cause you to get distracted for long enough to shift the car. A lane departure warning system uses cameras to determine if a car has drifted across a lane. It sends an audible, vibration, or visual notification if your car has shifted too far. There are two main types of systems. systems that warn the driver if the car is leaving its lane. systems that warn the driver, and if no action is

taken, automatically take steps to ensure the car stays in its lane (also known as lane keeping system) A lane keeping system involves more advanced technology and can even nudge a car back to its lane. This can be vital if a car has shifted into the direction of opposing traffic.

REAR CROSS-TRAFFIC ALERT:
Rear cross-traffic alert is similar to a back up camera, but alerts you to approaching objects, instead of stationary ones. The alerts are helpful when backing out of parking spaces, since it can detect approaching vehicles, people, carts, animals etc. and warn you. It usually sounds a warning tone and flashes indicators on side mirrors.

REAR AUTOMATIC EMERGENCY BRAKING (REAR AEB):
Vehicles that have rear cross-traffic alert often have rear AEB. If an object is detected, brakes are automatically applied to prevent backing into it.

AUTONOMOUS CRUISE CONTROL (ACC):
Cruise control has been around a long time and can make long distance driving much more bearable. ACC is a more advanced type of cruise control that automatically adjusts your cars speed to maintain a safe distance from vehicles ahead of you. This way you can enjoy the benefits of cruise control, without having to slam on the breaks and reset it. An even more advanced option, Cooperative Adaptive Cruise Control, gathers information from satellites, roadside beacons, and mobile infrastructure to determine the distance between cars, and to adjust from there.

BLUETOOTH/VOICE CONTROL:
Again, this one isn't brand spanking new, but it is so beneficial in preventing distracted driving. Safe driving apps are on the rise and will continue to be funded due to the rise in car accidents caused by phone distractions. In many states, texting and being on your phone while you drive is illegal, and for good reason. Now, smartphones can automatically connect when in a Bluetooth capable car, and then if there is an incoming call you can answer using voice command. Or you can use it to hear map directions. Some phones even have voice texting that you can set up, or pre-made message responses you can easily select on a car display. Other voice control systems let you do various things in the car such as change a song, turn on heat, and more.

FORWARD COLLISION WARNING (FCW):
As the name implies, this system is designed to prevent or reduce the severity of a collision. It uses radar, laser, and camera to detect an imminent crash and GPS sensors can detect fixed objects like an approaching stop sign. It is detects something, the system will warn the driver, or take action without driver input to avoid collision.

BLIND-SPOT WARNING:
No matter what type of car you drive, there is always a blind spot. Blind spots are the cause of thousands of accidents every year. Blind-spot warning gives an audible or visual notification of a car in your blind spot. Many systems provide additional warning if you use your turn signal when there is a car next to you in another lane.

INTERLOCK DEVICES:
Every year, there are more than 9,000 fatalities that can be avoided if an attention detection device was implemented to monitor a driver for any sign of drowsiness or inebriation. Some tools such as an in-vehicle breathalyzer that will subdue a vehicle if the blood alcohol content is over 0.08 for the driver.

DROWSINESS VIDEO SENSOR:
There is also a drowsiness video sensor that goes on the dashboard that will monitor the face of the driver for any signs of drowsiness. This sensor will tug on the seat belt of the driver or make noises to get the driver to pull over.

PHONE SUPPRESSION TECHNOLOGY
New apps such as Zoom Safer are improving road awareness and helping drivers to ignore the phone. Zoom Safer is installed on the headset to screen text messages and calls. This technology will block text messages and inform those texting that you are currently driving. It will announce any callers over a speaker, so the driver does not have to look at the phone.

Driver Monitoring Systems:
Technology developers use algorithms to monitor drivers and computers to analyze the information to

detect when someone is drowsy or falling asleep while driving. The systems alert drivers in order to make them pay attention.

Autonomous Cruise Control:

Cruise control offers the convenience of allowing a driver to set a speed and having the vehicle automatically maintain it. Autonomous cruise control introduces a new measure of safety by automatically monitoring and maintaining a safe distance between vehicles. It does this by slowing the equipped vehicle to avoid allowing it to get too close to the rear of another vehicle.

III. CONCLUSION

Our proposed model is a big step towards prevent the accidents even before they occur, hence they prevent significant loss to human life as well as vehicular damages. The use of new technology makes this whole detection and prevention process very cost- effective and also carries it out in a very efficient manner. The proposed technology can work effectively both during the day and night as it involves very little human interference and reducing the human errors involved in accidents drastically. It assists emergency services and quick response teams to take immediate action.

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