iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** III **Month of publication:** March 2023

DOI: https://doi.org/10.22214/ijraset.2023.49589

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue III Mar 2023- Available at www.ijraset.com

Insight on Vision Zero Strategy and Road Accidents in India

Dr. Ankita Srivastava[1], Dr. Anubhav Shrivastava[2]
[1]*Professor, School of Architecture, LNCT University, Bhopal*
[2]*Architect-Planner, Consultant, Bhopal*

Abstract: ***Vision Zero is a road safety strategy that aspires to eliminate all traffic deaths and serious injuries while also promoting safe, healthy, and egalitarian transportation for all. It focuses on improving road infrastructure, lowering vehicle speeds, and encouraging everyone on the road to be safe. Vision Zero strategy has been implemented by India so that road deaths are minimized. The paper examines the attributes and reasons of road accidents in India. It further provides recommendations for minimizing the road accidents. The paper concludes with understanding the importance and need of vision zero strategies in India. Vision Zero proposes that all road accidents can be prevented and offers a basis for learning from accidents and improving processes should they occur.***
Keywords: Vision Zero, road safety, accidents, strategy

I. INTRODUCTION

The number of road accidents and fatalities reported increasingly each year leads the road safety as a major concern in India. Road crash fatalities in India account for approximately 11 percent of the estimated 1.35 million global road crash deaths each year (WHO 2018). The recent road accident data form task force of National Police Commission the Ministry of Home Affairs India along with National Crime Records Bureau reveals that about 1,104 accidents and 426 deaths take place every day on roads, this data exclaims those 46 accidents and loss of 18 lives on an average, every hour, in India (NCRB, 2021). According to the Ministry of Road Transport and Highways, in 2019 there were over 4.5 lakh road accidents resulting in more than 1.5 lakh deaths and several lakh injuries in India. Vulnerable road users, primarily pedestrians, cyclists, and two-wheelers, account for almost 54 percent of all fatalities and serious injuries (GoI 2019). Several factors contribute to the high number of road accidents in India, including reckless driving, speeding, drunk driving, lack of enforcement of traffic rules and regulations, poor road infrastructure, and inadequate road safety education and awareness. Vision Zero is the approach to road safety that intent to eradicate all traffic mortalities and injuries on roads by strategizing preventive causes of accidents. This approach was first initiated in Sweden in 1997 and later had been adopted by many countries. Its aims is to create a transportation system that prioritizes safety, with the aim of reducing the number of fatalities and serious injuries on the roads to zero. The National Road Safety Strategy from 2018 to 2030 guides for the road safety agenda in India. This strategy sets out India's proposed journey towards Vision Zero, which seeks to reduce road fatalities to zero (WHO,2020).

II. DEVELOPMENT OF ROADS FROM STREETS

Road is not just a physical infrastructure; it is much more especially in a developing country like India. The essence of Indian streets in towns is a unique blend of chaos, colors, and culture. Indian streets are bustling with activity, with vendors selling all sorts of goods and services. Traditionally people had been largely acquainted with the urban streets as they were an integral part of a particular house. The streets are usually narrow, lined with shops, food stalls, and people going about their daily business. One of the most prominent features of these streets are the diversity of people as they are from different walks of life, religions, and cultures all mingling together in the same space. This diversity creates a rich tapestry of sights, sounds, and smells. Another important feature of Indian street culture is the food and it is famous around the world for its taste and variety. These foods are often served in small paper cups or on plates made from banana leaves. Finally, Indian streets are also famous for their vibrant colors. The bright colored fabrics, flowers, and decorations adorning the shops and stalls can be easily witness while wandering through these streets. The colors are the reflection of the country's rich cultural heritage and add to the overall charm of the streets. Thus, Indian streets is a unique blend of chaos, colors, and culture. The streets reflect the country's diverse population and offer a glimpse into the daily life of ordinary people in India as people and kids used to play, eat, chat, quarrel, and party on streets. The same street has been upgraded with concrete payment and gained a little width now a days.

©IJRASET: All Rights are Reserved

One can observe the flood of cars with unregularized and unplanned road side parking in front of majority of houses the widened street now also called a major atrial road in an Indian town has not been benefited as far as people's movement is concerned. In fact, the hard pavement that has been largely advocated over the years with merits of low maintenance and high defect liability has rather triggered the impression of driving fast with new age trending high speed vehicles has induced a likely risk of a road accidents and increasing frequency of the same. The Marco level national picture to understand the seriousness of the issue. It is also imperative to review our situation in the light of our commitment to the rest of the world. India, as a signatory to the Brasilia declaration, intends to reduce road accidents and traffic fatalities by 50% by 2022 (PRS, 2017).

III. SCENARIO OF ROAD ACCIDENTS IN INDIA

The road system in India has developed based on industrial growth, population rise, and urban agglomeration. Roads such as National Highways (NH), State highways (SH), and other district roads (ODRs) are insufficient to accommodate the rising traffic (Dash 2022). It is an irony that traffic laws in India is one of the strictest in the world, yet the rate of road accidents in the country is high. The age group of 18 to 45 years are involved in 70% of accidents that occur. National Highway Traffic Safety Administration (NHTSA) suggests that, majority of accidents (78.4%) are caused due to driver's fault. This includes over speeding, driving under the influence of alcohol or drugs, and hit and run cases. Other causes of road accidents include fault of others (7.1%) such as fault of cyclists, pedestrians, or drivers of other vehicles. Fewer accidents are caused due to neglect of civic bodies (2.8%), defect in motor vehicle (2.3%), and poor weather conditions (1.7%) (MoRTH, 2020). The range of measures to ensure road safety includes improving the built environment (e.g., safer road design, regulating sidewalks and traffic lights, introducing safe bicycle lanes), law enforcement and education to increase seatbelt use and helmet wearing while reducing speeding and drink driving, better vehicle standards, and improved post-crash response (Shah, 2018). The statistics of RTAs both NH (132500km) and SH/others (186528km), totally killed 61.63% and injured 56.85% out of the total accidents 116496 and 90755 accidents in India was due to stagnancy in road activities during the Pandemic. The worst sufferers are the two-wheelers and pedestrians (MoRTH, 2020) (Sikdar, 2022). Drivers often make mistakes because of the combination of an unforeseen event and inattention. Therefore, should cars go driverless, will it solve the problem the answer is, No this may need to revisit the factors in a more vigorous manner. An understanding of the existing burden of road traffic deaths in the population is necessary for developing effective interventions.

A World Bank report (2018) states that if India could manage to halve injuries and deaths arising out of road accidents, in a period from 2014 to 2038, its gross domestic product could rise by 7%. Amending road safety requires the implementation of context-specific solutions. This review of the road traffic injury literature provides strong evidence that the distribution of road traffic fatalities varies dramatically across different parts of the world (Naci 2009). The major reasons of an accident and try and categories them in line of the users' & use condition of a particular urban road.

1) *Drivers:* Over-speeding, rash driving, violation of rules, failure to understand signs, fatigue, alcohol.
2) *Pedestrian:* Carelessness, illiteracy, crossing at wrong places moving on carriageway, Jaywalkers.
3) *Passengers:* Projecting their body outside vehicle, by talking to drivers, alighting and boarding vehicle from wrong side travelling on footboards, catching a running bus etc.
4) *Vehicles:* Failure of brakes or steering, tyre burst, insufficient headlights, overloading, projecting loads.
5) *Road Conditions:* Potholes, damaged road, eroded road merging of rural roads with highways, diversions, illegal speed breakers.
6) *Weather Conditions:* Fog, snow, heavy rainfall, wind storms, hail storms.
7) *Road Design and Construction:* inappropriately designed or constructed road and its allied infrastructure, road side encroachments, in adequately monitored temporary construction sites and to not follow manuals, guidelines, and protocols.

As per National Crime Records Bureau, most of road accidents were due to over speeding accounting for 59.7% of total accidents (2,40,828 out of 4,03,116 cases) that caused 87,050 deaths and injuries to 2,28,274 persons (NCRB, 2021).

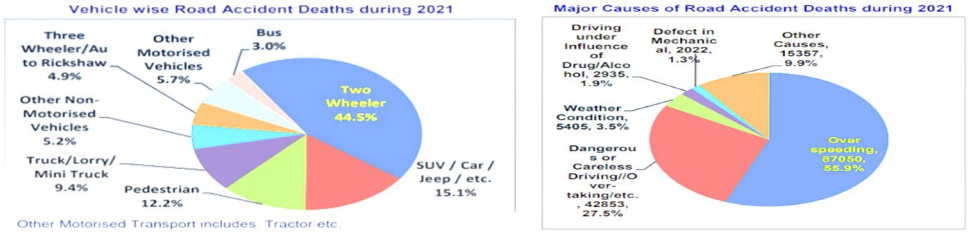


Figure 1: Road Accident data in India (Source: NCRB report, 2021)

IV. MEASURES FOR ROAD SAFETY IN INDIA

The experts from engineering & planning domain exclaim that if road conditions were more amenable to driving, road accidents could well be avoided but the matter of the fact is that Since 2000, while road length has increased by 39%, number of motor vehicles have increased by 158% (PSR India, 2017). India has considerable potential to improve its road safety performance over the coming decade. Road safety performance in India can be reviewed in terms of progress being made across the five pillars for action specified in the current United Nations Global Plan for the Decade of Action for Road Safety 2011–2020 (WHO, 2020):

- Pillar 1: Road safety management
- Pillar 2: Safer roads and mobility
- Pillar 3: Safer vehicles
- Pillar 4: Safer Road users
- Pillar 5: Post-crash response

The Motor Vehicles (Amendment) Bill, 2016 seeks to address issues related to road accidents, third party insurance and road safety measures in India. To improve road safety following measures should be implemented:

1) Enforcement of traffic rules and regulations should be mandatory at all levels. Implementing stricter penalties for traffic violations, such as fines, suspension of driving licenses, and imprisonment in case of serious offenses.
2) Enforcement of use of helmets and seat belts for both drivers and passengers as mandatory.
3) Improving design and construction of road and bridges infrastructure, and installing speed breakers, signals, and signboards.
4) Conducting regular inspections and maintenance of vehicles to ensure their roadworthiness.
5) Conducting awareness of road safety to drivers, pedestrians, and school children.

While these measures have helped improve road safety to some extent, there is still a long way to go to make India's roads safer for all. Road safety audit (RSA) is a method used to proactively identify safety risks in road projects from planning, design, and construction stages (AlHamad, 2022). Motorized vehicles and particularly electric one is fast, saving, comfortable, flexible, and pocket friendly for both passengers and goods transport from a safety and reliability point of view (Sanguesa, 2021). Tire defects may result from external impact from potholes, debris, nails, etc., under- or over-inflation, and age-related behavior. All tires, including spare tyres, should be replaced after six years from the date of manufacture (Garg, 2006). The driving metrics for road safety are speed and lane positioning. The combined effects of pavement design elements shoulder width, guardrail, and roadway geometry (curvature), are causes for Regional Transport Office (Bassat,2021). Insufficient street illumination (mainly at night), increases the chances of fog, Smog, smoke, and dust-related RTAs that are at times severe. The danger and its severity surge in head-on collisions and rear-end collisions. High speed, roads without separators, undivided roads, roads without Kerbs/ sidewalks, and SH or ODR roads are more likely increases the frequency and severity (Srivastava, 20190). It is essential to continue to prioritize road safety and implement comprehensive measures to prevent road accidents and fatalities in the future.

A. The Vision Zero Approach

While growth in road network will be limited (due to physical constraints), a constant increase in the number of vehicles on roads may lead to congestion and road fatalities. So, one must understand that in accident prevention, Zero Accident Vision proposes that all accidents can be prevented and it offers a basis for learning from previous accidents and improving processes, product, way of working, attitude etc. People need to realign their focus on dedication, interaction, attitude, and knowledge. It is the basis for inspiring and innovation in improving safety. The Vision Zero is based on the belief that road crashes are not inevitable but can be prevented through a combination of measures that address the causes of accidents. Road design and construction should be according to the needs of all road users, including pedestrians and cyclists. Vehicles should be designed and maintained to meet high safety standards like speed limits should be enforced effectively as per the need of road environment and community. Road safety awareness, education, training, and enforcement should be used to encourage safe behavior among all road users, including drivers, pedestrians, cyclists, and students.

The Vision Zero approach advocates that the road system should be designed to minimize the impact of human mistakes. It acknowledges that road safety is a collective responsibility among various stakeholders, including, transportation providers, community groups, and the government agencies hence requires collaboration among all. Many countries around the world has been successful in reducing road fatalities and serious injuries by adoptingthe Vision Zero approach.

The Vision Zero approach acknowledges that road safety is a shared responsibility among all stakeholders involved in the road system, including road users, road designers, and policymakers. The approach analysis the data to identify the root causes of accidents and to guide decision-making on interventions and policies. It attempts to prevent traffic accidents and prioritized human life and health over mobility and convenience. Hence, the Vision Zero approach recommends safety the top priority in all road design and planning decisions.

The approach calls for continuous monitoring and evaluation of road safety interventions to ensure that they are effective in reducing accidents and injuries. Overall, the Vision Zero approach to road safety is a holistic and proactive approach that seeks to prevent accidents before they happen by addressing the underlying causes of accidents and prioritizing safety in all road design and planning decisions.

B. Vision Zero Initiative in INDIA

Modernization of work practices, especially using artificial intelligence and transformational leadership are the main enablers for a successful strategy and friendly preventive measure to prevent recurrence rather than penalizing. So, what effectively need to institutionalize is the big-ticket idea of 'Better & Safer Roads' and a sense of responsibility towards each other's' safety. The Vision Zero approach to road safety has gained traction in India in recent years as the country continues to grapple with a high rate of traffic fatalities and serious injuries.

While India has not yet officially adopted the Vision Zero approach, several Indian cities and states have launched their own initiatives that incorporate the principles of Vision Zero. The unfortunate distinction of having the most road accident fatalities worldwide has been attained by India. Around the world, especially in India, road safety is becoming a key social concern (Sivakumar, 2021).

Tamil Nadu has initiated "Zero Accident Mission", Mumbai adopted Vision Zero approach Bengaluru and Pune also introduced Vision Zero initiatives to diminish the number of road accidents. The mission includes a range of measures such as improving road infrastructure, increasing enforcement of traffic laws, redesigning roads to improve safety and promoting awareness of road safety through education campaigns, to reduce traffic fatalities and serious injuries on the roads. Though, there is significant challenges to implementing the Vision Zero approach in all the cities of India, due to inadequate road infrastructure, poor enforcement of traffic laws, and a lack of awareness among road users about safe driving practices. However, the Vision Zero approach offers a comprehensive and inclusive framework for addressing these challenges and improving road safety in India.

V. CONCLUSION

Safe work and the ethical attitude of management should go together (Safety leadership) and helping to push a positive or proactive safety culture, where the importance of safe working practices is clear and the working mind-set of all levels of employees is focused on creating safe work. Such approach enhances the productivity, quality, operational efficiency and prevent injuries. A successful "Zero Accident Goal" combines the idea of a commitment-based approach to safety leadership driven by concern and respect for the workforce, as differed to a compliance-based approach, where motivation arises from adhering to legislation and cost-cutting.

A 'clear safety message' from top management boosts safety performance and culture. Commitment should be regarded not any as a formal (written) commitment, but as active and visible support, from senior management. "Zero Accident Vision" policies should be closely linked to company strategies, including core goals, mission, and vision and/or broader commitments to zero accident. The idea of safety must be communicated to the entire workforce to influence the safe behaviors of the entire community and society at large.

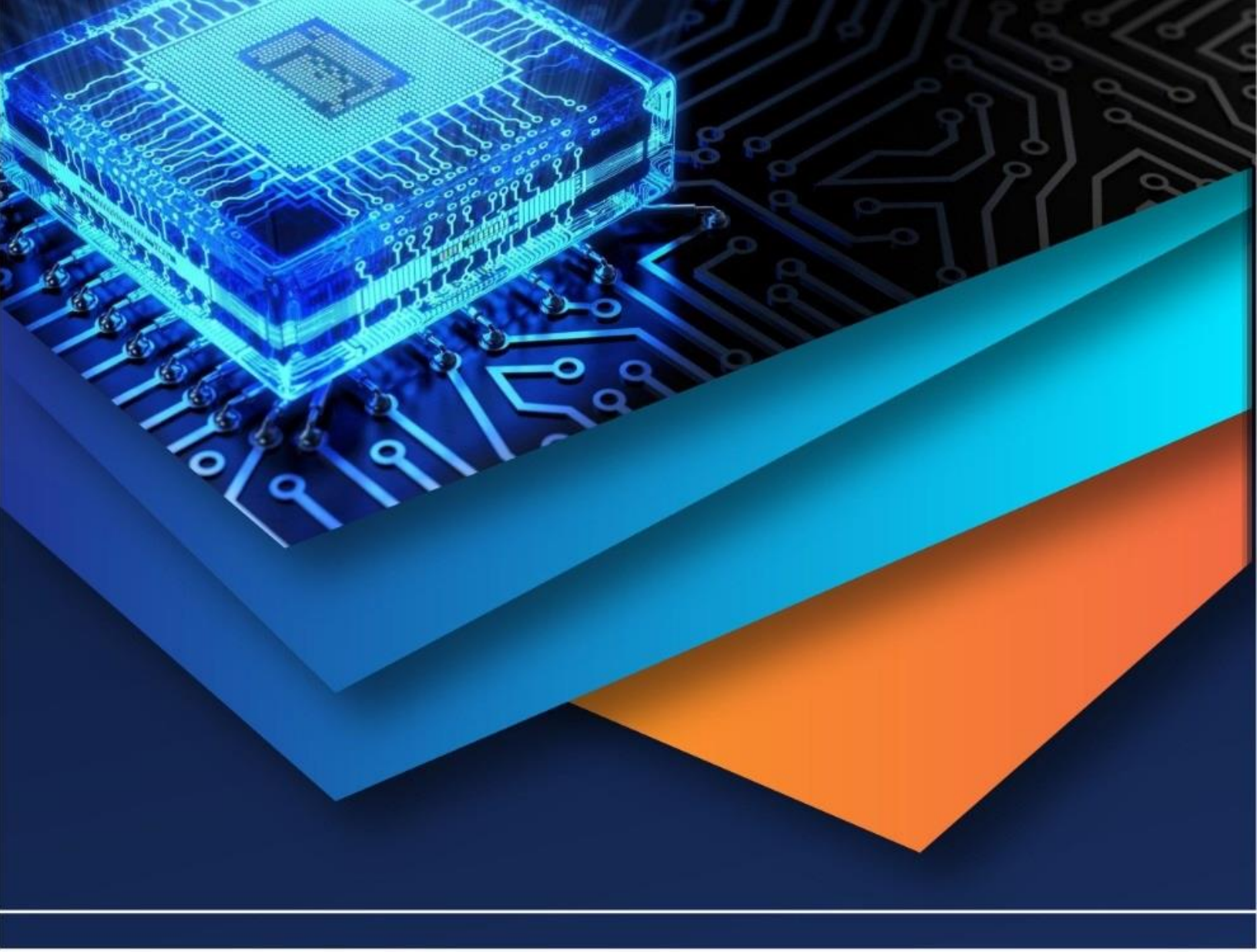
Empowerment for safety is key areas that potentially has the greatest impact on achieving "Zero Accident" target. If India really wants to achieve "Zero Accident Goal" people must focus on "Proactive safety culture" where risks are not only managed but unexpected risks are also predicted, accepted, and effectively dealt and where the wish to improve safety levels is increasing nonstop which indicates robust and collective safety ethics, involvement, and ownership by the entire workforce.

Adequate education and training for safety are necessary to ensure the safety competencies in several safety aspects. People need to strengthen a collective mind-set for safety culture development which enable individual to demonstrate personal commitment. People must also consider the behavioral factors that are more important than other safety arrangements because whatever arrangement for safety are to be made, they are to be followed by individual users of the road. Vision Zero proposes that all road accidents can be prevented and offers a basis for learning from accidents and improving processes should they occur.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

REFERENCES

[1] Accidental fatalities in India. National Crime Records Bureau, Ministry of Home Affairs, Indian Govt., New Delhi; 2021. Available:/en.wikipedia.org/wiki/Haddon_Matrix
[2] AlHamad S, Almallah M, Naser MN, Alhajyaseen WKM, de Roos MP. Examining the role of road safety audits worldwide: Exploring road safety expert's opinions. Int J Inj Contr Saf Promot. 2022; 23:1-10.
[3] Bassat TB, Shinar D. Effect of shoulder width, guardrail and roadway geometry on driver perception and behaviour. Accident Analysis and Prevention.43, 2142–2152
[4] Dash et al.; Trailblazing Road Safety and Commuter's "Vision Zero Planning" in NH-55 (Angul Sector), J. Appl. Sci. Technol., vol. 41, no. 47, pp. 14-33, 2022
[5] Naci H, Chisholm D, Baker TD. Distribution of road traffic deaths by road user group: a global comparison. Inj Prev. 2009;15(1): 55-9.
[6] Garg N, Hyder AA. Road traffic injuries in India: a review of the literature. Scand J Public Health. 2006;34(1):100-9.
[7] Ministry of road transport and Highways, Road accidents in India; 2020; MoRTH, New Delhi. 2020 Available:https://morth.nic.in/sites/default/files/RA_2020.pdf
[8] Ministry of Road Transport and Highways; Ministry of Statistics and Programme Implementation; Insurance Regulatory and Development Authority of India; PRS, 2019 Available: https://morth.nic.in/
[9] NCRB report, 2021. Available: https://ncrb.gov.in/sites/default/files/ADSI-2021/adsi2021_Chapter-1A-Traffic-Accidents.pdf
[10] PRS India, Legislative Research; Institute for Policy Research Studies, 2017 Available: https://prsindia.org/billtrack/prs-products/overview-of-road-accidents-in-india-2684
[11] Sanguesa JA, Torres-Sanz V, Garrido P, Martinez FJ, Marquez-Barja JM. A review on electric vehicles: Technologies and challenges. smart cities. 2021;4:372–404. Available: https://doi.org/10.3390/smartcities4010022
[12] Shah SAR, Ahmad N, Shen Y, Pirdavani A, Basheer MA, Brijs T. Road Safety Risk Assessment: An Analysis of Transport Policy and Management for Low-, Middle-, and High-Income Asian Countries. Sustainability. 2018; 10(2):389. Available: https://doi.org/10.3390/su10020389
[13] Sikdar PK. Road safety scenario in India and global strategy for managing road safety. International Seminar on Road Safety: Current Scenario & Way Forward 28-29 October 2022; 2022.
[14] Sivakumar, Krishnaraj. Road Traffic Accidents (RTAs) Due To Drunken Driving In India, Challenges In Prevention international journal of research in management and Technology. 2021;2: 401-406**.**
[15] Srivastava A, Gaikwad S, Pagdal P, Bhattacharya S. A study on awareness of road traffic accidents and their basic management among medical students of Government Medical College, Maharashtra, India. CHRISMED J Health Res. 2019;6:216-21.
[16] The recommendations of the National Police Commission - 1977, the Ministry of Home Affairs constituted a Task Force in 1985 the National Crime Records Bureau (NCRB) 2021.
[17] World Health Organisation (WHO) Delivering Road Safety in India; Leadership Priorities and Initiatives to 2030, 2020



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)