Review Based on Highway Road Safety in Prone Areas

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Abstract **- RSA (Road Safety Audit) is a formal procedure for assessing accident potential and safety performance of new and existing roads. RSA is an efficient, cost effective and proactive approach to improve road safety. The study aims to review the secondary data of road safety for bicycles, motors, pedestrians' walkers etc and discussed it thoroughly which has been worked out by the researchers in the past. It will lead helpful to identify the road safety factor responsible for the risk in the highway. The methods or remedies identified by the researchers are also studied for the betterment. The review based on the safety had been useful for marking safety measures.**

INTRODUCTION

Road accidents are unwelcome events that result in bodily harm or death. These deaths and injuries have significant social and economic consequences. Although the number of road fatalities has decreased in recent years, over a million people are still involved in car accidents. In 2014, approximately 26,000 people died in road accidents in Europe (EU-28). More than half of all road fatalities are caused by people inside motor vehicles; the remainder are caused by pedestrians, cyclists, or motorcyclists. Road traffic fatalities and injuries impose significant social and economic costs. Furthermore, many occupational fatalities occur as a result of road traffic and transportation accidents. In addition to professional drivers, other workers, for whom driving is not their core activity, are also frequently required to travel by road, e.g. all commuting workers also use the road. Road users endanger one another. Young people between the ages of 15 and 24 face the greatest risk in traffic: they account for 11% of the population but account for 17% of all road fatalities. Pedestrians, cyclists, moped riders and motorcyclists have a higher injury rate per kilometer of travel than other road users. Work-related traffic accidents on the road can occur in any type of traffic. Different types of traffic face different risks on the road, and when they all share the same space, these risks multiply. Human error is frequently blamed for car accidents. While it may be impossible to prevent people from making mistakes, these errors do not have to be fatal. The traffic environment must be designed so that human errors do not have serious consequences. Factor responsible for the risk in highway as -

- Sliding or skidding of the car or bikes
- Burst of tire
- Toddler Climbs Out of Car Seat
- Baby Starts Wailing
- Fog Clouds
- Bicyclists

FACTOR RESPONSIBLE FOR ACCIDENTS IN HIGHWAY

Road Markings

On paved roads, road surface markings are used to guide and inform drivers and pedestrians. The uniformity of markings is important in reducing confusion and uncertainty about their meaning, and efforts are underway to standardize such markings across borders.

Fig. 1 Markings done for safety

Roadside hazards

Trees, rock outcrops, street furniture such as signs and electricity poles, stalls set up too close to the road, ravines, gorges, and open drains are examples of roadside hazards.

Fig. 2 Roadside Hazards for safety

Limited stopping sight distance

One of several types of sight distance used in road design is stopping sight distance. It is the minimum distance a vehicle driver must be able to see in order to stop before colliding with something in the roadway, such as a pedestrian in a crosswalk, a stopped vehicle, or road debris. Inadequate sight distance can have a negative impact on the safety or operation of a roadway or intersection.

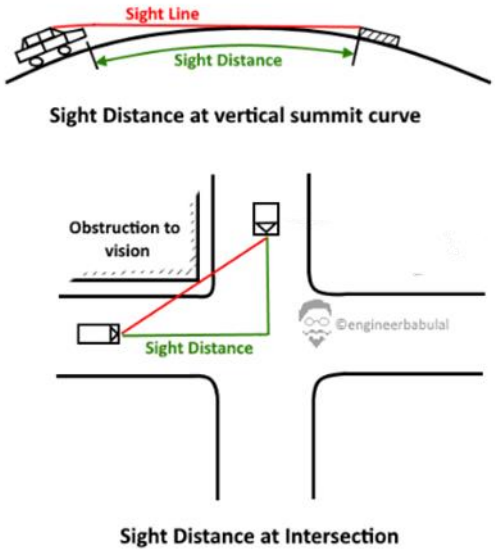

Fig. 3 Stopping Sight Distance detail for safety

Pedestrian Safety Risks

Pedestrians have a diverse set of characteristics and needs, including walking speed, spatial requirements, mobility issues, and cognitive abilities. Pedestrian danger zones where a collision could occur: At an intersection (where a pedestrian is crossing), in the middle of a block (where a pedestrian is crossing), and along the road (where pedestrian is not trying to cross).

Necessity of Examine Road Safety Audit

Public agencies may wish to conduct pedestrian-oriented RSAs in addition to using the traditional RSA as a tool to improve the safety performance of facilities under their jurisdiction. Though all RSAs may include a review of pedestrian and bicycle safety, a pedestrian-focused RSA may be undertaken to address an identified pedestrian safety issue that may have resulted from insufficient consideration of pedestrian needs during the planning and design process. A pedestrian-focused RSA can also be performed on projects that are in the planning or design stages. Projects with a significant pedestrian component include those near major pedestrian generators such as transit stations, multi-family housing, schools, school bus stops, assisted living facilities, or in a downtown area or commercial district. Work zones are another area that could benefit from an RSA. Artistic streets Off-street paths (which may include walkways or pedestrian/bicycle bridges).

Traffic Signal Sign Used for Safety Purpose in Highways

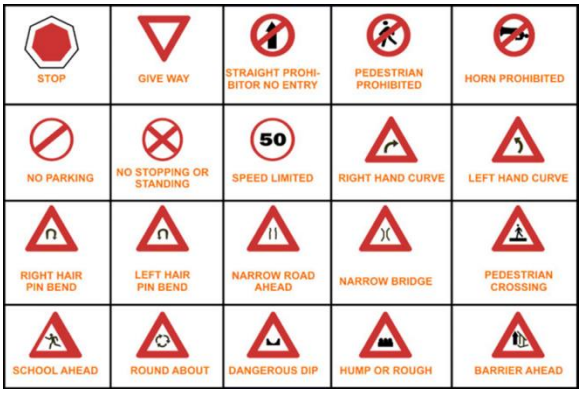

Fig. 4 Traffic Signal Safety Sign (www.pixshark.com)

2. LITERATURE SURVEY

The study by Dr. S. S. Jain et al [1] aims to evaluate the Road Safety Audit of a section of four-lane Major Highways (NH)-58 and will focus on evaluating the benefits of proposed actions that have resulted from deficiencies identified during the audit process. That after an RSA, it was found that trucks are parked on the highway, lowering the overall width of the

carriageway and poses serious traffic hazards to high-speed moving traffic. Access and service lanes are also inadequate and must be managed to improve immediately. Facilities for the most vulnerable road users (VRUs), namely pedestrians and cyclists, are lacking near habitation and must be given preference. This resulted in the conclusion that all unauthorized median openings should be closed and adequate provisions for crossing local people made as a matter of priority. Because these are the locations where the most accidents occur, all undeveloped major and minor intersections must be developed with adequate lighting provisions as soon as possible. Pedestrian guardrail should be installed along the service road's footpath and at bus stops.

The study by Yeonsoo Jun et al.[2] attempts to propose and implement a method for determining the relative importance of experimental variables for virtual road safety audits using a driving simulator. Experts completed a survey for the analytic hierarchy process method, a multiple criteria decision-making process, as a method. The results showed that the alternatives "work zone and crash handling" and "sign and marking" have a slight advantage over the other variables. The "pavement and drainage" variable is the least important for VRSA evaluation. Overall, the study's findings can provide a basic decision-making model as well as useful insights for designing an experiment for virtual road safety audits. RSA was first used when the UK government passed the "Road Traffic Act (1974),"[3] which replaced the 1972 act. The "Road Traffic Act (1974)"[3] includes a clear statement regarding local governments' duty to promote road safety. Measures to reduce the possibility of crashes became mandatory in the UK after repeated amendments to the law. The following documents are part of the process: the design standard HD 19/90, the advice note HA 42/90, and the highway safety audit guidelines (Proctor, Belcher, & Cook, 2001). RSA has been introduced internationally, including in the Republic of Korea, in an effort to reduce the number of crashes. Furthermore, practical experience with RSA has proven to be effective and profitable. RSA documents have evolved as a result of technical changes, compliance with amended rules, knowledge transfer, and governance issues (Bornsztein & Pietrantonio, 2002)[4].

Hugo Pietrantonio et al.[5] discuss current perspectives on the use of road safety audits (RSAs) as a tool for improving road safety and propose a new method of study for detailed evaluation of some features that can influence their effectiveness. This can be seen in the practical application of RSAs to existing road reviews or inspections. The case study's main findings can be summarised as clear support for teamwork in field observation as well as employing less-experienced personnel in field observation. The study also emphasises the importance of priority-setting procedures and criteria. These findings are applicable to the selection of alternative RSA procedures in agencies responsible for promoting or enforcing RSA and in professional teams carrying out RSA tasks.

Tummala Bharat Kumar [6] discovered that a road safety audit is a formal methodology for determining accident potential and safety potential in the development of new road schemes as well as schemes for improving and maintaining existing road facilities. The two main strategies in road safety are accident prevention and accident reduction. In this case study, we examine the NH-65, a major highway that connects VIJAYAWADA and HYDERABAD from the 270th to the 247th kilometers. The highway sees a lot of traffic throughout the day and has a lot of conflict points like villages and industries. A detailed analysis of the NH-65 will be performed from the standpoint of safety and geometric design aspects. The purpose of the paper is to identify flaws, improve design aspects, and increase the credibility of the roads.

Omkar Gholap[7] is conducting a road study from "A.T.E.S. Faculty of Polytechnic, Akole to M/S. R. V. Traders Godown, Shekaiwadi (K.G.Road SH 44)." During the day, there is a lot of traffic on the road, and there are some black spots where accidents happen all the time. A detailed analysis of the road from "Agasti College, Akole to M/S R.V. Traders, Akole" is carried out using data collection methods such as traffic volume study, accidental data collection, potholes on the road data collection, road safety signs and symbols, public questionnaire survey, and so on. The study's goal is to inspect the road in terms of safety measures, road scenarios, and any type of flaws, and to recommend mitigation and preventive measures for the selected section of road for audit. (Sanjay Kumar Singh 2017)[8], (Murat Gunduz 2018), (Rahul Goel 2018), (Hitesh Kumar 2017) [9], (Shalini Kanuganti

2017), and (Abdul Rahoof 2017)[10] investigated accident injury severity and proposed measures. (Athanasios Galanis 2017)[11], (Dinesh Mohan 2017), (Francis John Gichaga 2017)[12], and (Luca Persia 2016) [13] have studied road types and assessed road safety management and road improvement schemes. Lorenzo Domenichini 2018 [14] investigated the effect of vehicle speed reduction on urban road safety.

Sophia Vardaki [15] describes the method used in a road safety audit of the Attica Freeway ("Attiki Odos"), the RSA findings and recommendations, the improvements made by the freeway operator to improve safety, and the pilot safety treatments proposed with a view to broader implementation in order to mitigate similar problems at other locations.

3. CONCLUSIONS

After studying the articles, the safety against the problems have been explored by different researcher made great impact in development of highway. Further, this study can be utilized for road safety audit for different locations subjected to risk.

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