# ROAD SAFETY AUDIT

Jainil master[1], Ajudiya Pradip[2], Gajera Viral[3], Golakiya Parth[4], Goti Femil[5]
[1]*Jainil master Assistant Professor at Civil Department Of Bhagwan Mahawir College Engg& Tech.Surat*
[2,3,4,5]*Student of B.E. Civil at Bhagwan Mahawir College of Engg. & Tech.-Surat*

***Abstract*- Road Safety Audit (RSA) is meant for accident prevention rather than accident reduction. It is a safety performance examination of an existing road or a future road by an independent audit team. The audit can be conducted at any stage of a project, starting with the project planning stage to the final design stage. It can even be conducted on roads that have already been completed and started operating. Road Safety Audit is dependent on the kind of activities and characteristics of a geographical area and can be classified into two types depending on its Applicability; namely application to Highway, Rural areas in safe people's movement is most important. RSA Toolkit attempts to integrate all the issues concerned with transportation in order to promote safety. The prime user for whom the tool kit is being prepared is city officials who are required to supervise and monitor consultant's work. This tool kit would also assist the other user Groups and civil society to monitor the improvement in rural road safety.**

***Index Terms*- Safety Audit, hot spots, density clustering, checklists**

## I.INTRODUCTION

A good road transport system is one of the best indicators of the economic and industrial development of a country and its growth. The road network in India has grown from400, 000 km in 1951 to about 4.7 million km at present. In addition, India has the second largest road network in the world, next to USA (S. Gangopadhyay, 2015).In today's world, road and transport has become an integral part of every human being. Everybody is a road user in one shape or the other. The present transport system has minimized the distances but it has on the other hand increased the life risk. Every year road crashes result in loss of lakh of lives and serious injuries to crores of people. In India itself, about eighty thousand people are killed in road crashes every year, which is thirteen percent of the total fatality all over the world (Dr. A.M. Jain, 2014). The World Health Organization estimated that 1.17 million deaths occur each year worldwide due to road traffic accidents. However, that about 70 percent of the deaths occurs in developing countries. The increased rate of fatal road traffic accident worldwide has been attributed to population explosion and increased motorization. According to a report Published by W.H.O, more than 3000 people are injured or disable every day (Gaurav Grewal, 2015).Road accidents are a human tragedy. They involve high human suffering and monetary costs in terms of untimely deaths, injuries and loss of potential income. Although we have undertaken many initiatives and are implementing various road safety improvement program the overall situation as revealed by data is far from satisfactory. During the calendar year 2010, there were close to 5 lakh road accidents in India, which resulted in more than 1.3 lakh persons. These numbers translate intone road accident every minute, and one road accident death every 4 minutes. Unfortunately, more than half the victims are in the economically active age group of 25-65 years. The loss of the main breadwinner can be catastrophic (Pawan Deshpande, 2014).

Many developing countries including India have serious road accidents problems. Fatalities rates (define as, road accidental deaths per 10,000 vehicles) are quite high in comparison to developed countries. While in Europe and North America the situation is generally improving, many developing countries face a worsening situation. Apart from the humanitarian aspects of the problem road accident cost countries of developing world at least 1% of their Gross National Product (GNP) each year – sums that those can ill effort to lose. Compared to cause of death more commonly associated with developing world deaths from road accidents are by no means insignificant. Nature of the problem in developing countries is in many ways different from that in industrialized world. The proportion of commercial and public service vehicles involved in road accidents are often much greater. Pedestrian and cyclists the most vulnerable. Lack of medical facilities in these countries is

consideredan important factor leading to high death rates (Sanjay. K. Singh, 2001)

Providing the safest travel environment is a challenge that the transportation profession continues to face. Over the years, the technology of transportation has changed from many perspectives. These include changes in vehicles, driver demographics and skills, types of other road users, improvements in safety designs, and understanding of the complex interactions needed to provide a safer traveling environment. As the changes have occurred, it has become increasingly more difficult to determine effective techniques to identify and correct safety deficiencies along the millions of existing roadway miles (Eugene M. Wilson, 2000).

Road safety audits were introduced in England in the 1980s with the publication of the Institution of Highways and Transportation guideline "The Safety Audit ofHighways".4 Later, the road safety audit was adopted by several other 30 countries including Australia, New Zealand, and Denmark. In recent years, many different guidelines on the topic of road safety audits have been published.Therefore Road safety is a main concern to reduce road accidents. A Road safety measure prevents the accidents to a minimum. Road safety can be increased by providing safety measures such as traffic calming devices; proper geometric designs of a location; traffic signs, signals, and markings; street lighting; bridges, culverts, over bridges and underpasses; ditches along the roadway; parking regulations; removing sight obstructions in the roadways; etc. Providing a safe driving environment is indeed not only a responsibility, but also the highest priority for all highway projects (Darshak V. Chauhan, et.al, 2015).

Road safety audit is essential tool to reduce the fatalities caused due to the accidents. Road safety audit (RSA) is a formal procedure for assessing accident potential and safety performance in the provision of new road schemes, or for the improvement and maintenance of existing roads. Road safety audit is an important tool towards a safer and better road environment. It is an operational tool kit for road safety engineering. Road safety audit reduces the road accidents and increases road safety. Road Safety Audit (RSA) is one of the best-proven methodologies for ensuring that various safety deficiencies are reviewed at appropriate stage in a cost effective way. The independent experts attempt to identify potentially dangerous features on the highway environment and suggest remedial measures.

## II. AIM AND OBJECTIVE

### A.AIM

The aim of study is "ROAD SAFETY AUDIT ON SAPUTARA TO WAGHAI".

### B. OBJECTIVES

Objective of study is to examine projects for potential accident elimination / reduction based on road user knowledge, attributes and skills, day/night, wet/dry road conditions.

Under the present context, Study is much easier to perform, as the Accident Black Spots based on last 6 years' accident data, has been identified. One (Audit team) needs to identify the cause of frequent accidents at such locations only, and take engineering measures to eradicate such shortfalls for which the accident was occurring.

## III.LITERATURE REVIEW

Dr. S. S. Jain, et.al, 2011 has told that Road Safety Audit (RSA) 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. It is proved that RSA has the potential to save lives. The RSA was originated in Great Britain and is well developed in countries like UK, USA, Australia, New Zealand, Denmark, Canada, Malaysia and Singapore. It is at varying stages of implementation in developing nations like India, South Africa, Thailand and Bangladesh. RSA appears to be an ideal tool for improving road safety in India, as basic and accurate data on accidents have yet to be collected.

Chetan R. Mankar, et.al, 2014 have studied road safety audit is important component in transportation planning process. Because of by 2020, road accident will be the 6th largest cause of death worldwide. Road safety is one of the main driving sources of the development of vehicular communication (VC) systems, relies on high-rate safety messaging. Safety measures should be include into transportation planning now a day the way the planning process is performed, including design, construction, operation, maintenance and analysis, is significantly affects traffic safety. Also studied the road safety audit based

on vehicular communication, design, construction, operation, maintenance and analysis of various accidents occurs in the road. In the future development providing safety to road user is very essential.

George Kanellaidis, 1999 studied about the procedure of road safety audit (RSA), which originated in Great Britain and is now being spread in several countries around the world, can be incorporated in the framework of designing, constructing, and operating road infrastructure as a means for preventing accidents. An independent team consisting of highway engineers and or traffic safety experts typically carries out RSA, which can be applied to both new and existing road facilities. This literature paper focuses on the possibilities for further enhancing the consideration of human factor-related issues in RSA guidelines. This can be achievedthrough the incorporation of quantitative Checks on consistency or driver's workload. Such tests can give more weight to the auditors' reasoning. Moreover, the scope is investigated for providing increased opportunities for road user involvement in the RSA process. Public involvement is examined from the aspect of a group's representation, appropriate RSA stages, effective procedures, and responsibility. The possible means and methods for communication between auditors and road users' representatives are also discussed.

## IV. DATA COLLECTION

Collection of the photos and videos of saputara to Waghaicheck post for the analysis the data for the road safety audit. • Collect the problem in the road for safety purpose. • Take photos of horizontal and vertical curve, valley and side vegetation.

MANY PROBLEM FOUND ON THE ROAD:

• Improper sign and marking • Sharp curve in not provide improper night vision • Improper sight distance due to vegetation • Not properly provide side shoulder • Width is not properly provide

## V. DATA ANALYSIS

| Sr no. | Chainage at | Data |
|---|---|---|
| **1.** | **0+039** | **• Sign board for horizontal curve not present • No speed limit sign board at horizontal curve** |
| **2.** | **2+040** | **• Sign board for horizontal curve not present • Improper sight distance due to encroachment by vegetation • No sign for the night vision to present the curve • No speed limit sign board at horizontal curve** |
| **3.** | **3+370** | **• Sign board for horizontal curve not present • No speed limit sign board at horizontal curve • Remove the vegetation from the side to prevent the more space for the vehicle.** |
| **4.** | **5+570** | **• Sign board for horizontal curve not present • No speed limit sign board at horizontal curve • Informatory sign board is not according to IRC standards** |
| **5.** | **8+150** | **• Sign board for horizontal curve not present • No speed limit sign board at horizontal curve** |
| **6.** | **9+080** | **• Sign board for horizontal curve not present • No speed limit sign board at horizontal curve • No sign for the night vision to present the curve** |

| | | |
|---|---|---|
| **7.** | **12+110** | **• Metal / concrete barriers are to be provided at horizontal curve, as height of embankment is more than 2.5 mt.** |
| **8.** | **15+310** | **• Improper sight distance due encroachment by vegetation<br>• The encroachment onto the road may block the sight of drivers.<br>• Metal / concrete barriers are to be provided at horizontal curve, as height of embankment is more than 2.5 mt.** |
| **9.** | **21+530** | **• There is need to provide the proper distance between the barriers** |
| **10.** | **22+580** | **• No sign for the horizontal curve<br>• No speed limit sign shown at the curve<br>• There is need to remove the vegetation from side of the road for the more space** |
| **11.** | **23+030** | **• No sign for the horizontal curve<br>• No speed limit sign shown at the curve<br>• The board is not as per the IRC guidelines<br>• Barriers are incomplete** |
| **12.** | **24+010** | **• No sign for the horizontal curve<br>• No speed limit sign shown at the curve<br>• No night sign provided** |
| **13.** | **25+510** | **• No sign for the horizontal curve<br>• No speed limit sign shown at the curve<br>• Need to provide proper width for the road<br>• Board is not stable** |


REFERENCES

1. Road Safety Audit for Kapurai - Dabhoi Section of State Highway-11: OzaDaksheshkumar, P.G. Student. Civil Transportation Engineering, Parul Institute of Engineering & Technology, P.O.: Limda, Ta: Waghodia, Dist.: Vadodara.
2. Development of Urban Road Safety Audit Tool Kit: S.M. Hassan Mahdavi M, Transportation Consultant, Tehran, Iran.
3. Agent, K., Kikiforos S., and Jones, S. (1996, June). "Development of accident reduction factors." Research Report No.KTC-96-13.Kentucky Transportation Center, Lexington, Kentucky.
4. Safety Audit of Existing Roads—Hamilton City Council.Trans fund New Zealand, Wellington, September 1997.
5. Bhalla, K., Khurana, N., Bose, D., Navaratne, K.N., Tiwari, G., Mohan, D. (2016) Official government statistics of road traffic deaths in India under-represent pedestrians and motorized two wheeler riders, Injury Prevention,doi: 10.1136/injuryprev-2016-042053.
6. Dinesh Mohan, Geetam Tiwari and KaviBhalla ROAD SAFETY IN INDIA STATUS REPORT
7. IRC 35-1997 ( members of highway specifications and standard committee)
8. IRC 67-2001 (code of practice for road signs)
9. IRC 67-2012 (code of practice for road signs)
10. Dr. S. S. Jain, et.al, 2011 has told that Road Safety Audit (RSA) is a formal procedure for assessing accident potential and safety performance of new and existing roads

11. Chetan R. Mankar, et.al, 2014 have studied road safety audit is important component in transportation planning process. 12. George Kanellaidis, 1999 studied about the procedure of road safety audit (RSA)