Road Safety Audit of RBVRR TSPA Junction – Moinabad Town

[1,2]N. Naveen, [3]Dinesh Kumar Yadav
[1]Assistant Professor, K G Reddy College of Engineering and Technology, Hyderabad, India
[2](Research scholar, VELS University, Chennai, India)
[3](CEO, Texture Engineering Blueprints LLP, Nagpur, India)

Abstract: A Road Safety Audit (RSA) is the formal safety performance of an existing by an independent, multidisciplinary team. The selected area is from RBVRR TSPA Junction to Moinabad Town. The road length is of 15 Kilometers. The selected area is a part of state highway SH – 4, which connects Hyderabad – Chevella – Parigi – Kodangal of Telangana State. As it is a busy road connecting the industrial, commercial, educational areas, international Airport and Nehru ORR, has a mixed traffic which leading to the accidents. Audit had conducted following the guidelines of IRC: SP:88. Correction of Road signs, markings, message signs, delineators, hazard markers, traffic safety barriers had done based on the requirements. This paper worked for Safe roads, Self-Explaining roads, Forgiving roads& defensive driving. In conclusion, we argued that significant measures should be taken on Road Safety aspects to mitigate the accidents and ensure the safety to pedestrians and vehicular traffic.
IndexTerms- Accidents, Forgiving Roads, Pedestrians, RSA, Safety, Self-Explaining Roads.

I.INTRODUCTION

Road safety audit assess the operation of a road, focusing on road safety as it affects the users of the road. These users include pedestrians, cyclists, motorcyclists, truck/ bus drivers, on road public transport users, etc. Road traffic injuries are the No.1 cause of death among those aged 15–29. Road users are not perfect. The main cause for the accidents is road users, Confusion in drivers, fatigue, stress, negligence may lead to the accidents.

RSA is a formal process and not an informal check

- Carried out by persons who are independent of the design and the construction
- Carried out by persons with appropriate expertise, experience and training
- Restricted to road safety issues

The outcome of a road safety audit identifies any road safety deficiencies and formulation of recommendations aimed at removing/ reducing those deficiencies.

Aspects to be checked are Safety and Operational Implications of alignment and junctions, Any deviation from standards, Road safety implication on maintenance, Non-Motorized Road Users, Day and Night Trials checks, Drainage, Climate conditions, Landscaping, Services, Access, Skid resistance, Fences , Adjacent development, Bridge parapets, Local Alignment, Visibility, New / existing road surface, Safety Aids on steep hills, Road signs markings, T, X, Y-junctions, Traffic signals, Adjacent land, Pedestrians, Cyclists, Non-motorized vehicles, Signs and Lighting , Lighting, Signs, Variable message signs .

II.SITE SELECTED

The road selected for this study is existing road from RBVRR TSPA Junction to Moinabad Town.The road length is of 15 Kilometers. The selected area is a part of state highway SH – 4, which connects Hyderabad – Chevella – Parigi – Kodangal of Telangana State. As it is a busy road connecting the industrial, commercial, educational areas, international Airport and Nehru ORR, has a mixed traffic which leading to the accidents.

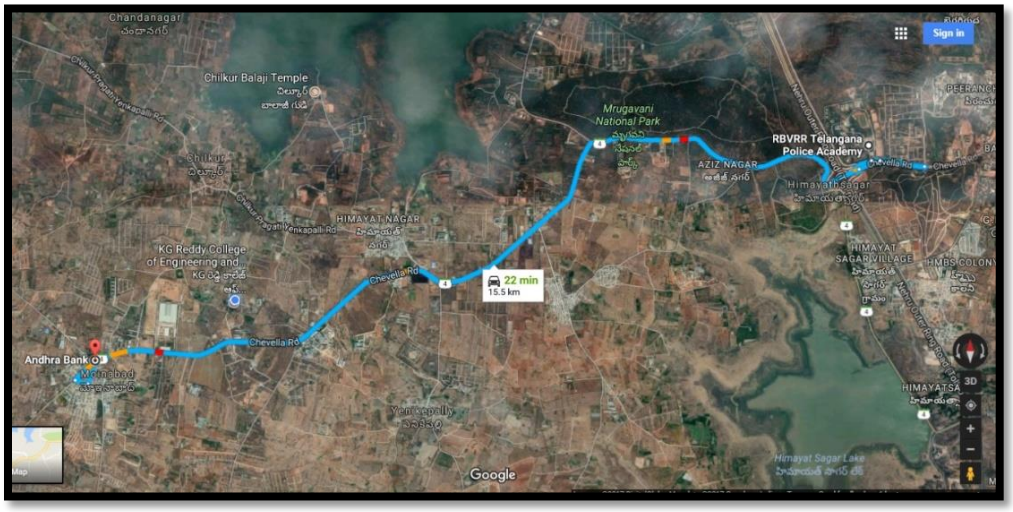

Fig 1 The above image shows RBVRR TSPA Junction to Moinabad Town.

The road stretch is busy with heavy vehicles which are used for transportation goods to various places. Substantial number of vehicles fly on this roads during nights. Night audit had also done long with day audit considering the sign boards and road markings. Black spots were detected in this study.

III.INVESTIGATIONS AND RECOMMENDATIONS

Fig 2 Retroreflective diversion boards faded

3.1 Observation

Chevron sign placed at the roundabout were faded. Direction sign board placed at the shoulder is very near to the carriageway.

Reason for Concern:

Faded sign board can't be seen during nights and driver may not know that he is going to approach the roundabout. Directional sign board causing the blind spot and as it near to the carriageway it may hurt the vehicles or the passengers sitting at the windows.

Recommendation:

New Chevron sign boards should be placed. Directional sign board should be placed adequate distance from the carriageway so that heavy vehicles will feel comfort while maneuvering.

Priority: Highly Essential

Fig 3 Horizontal curve clearly indicated by retroreflective Chevron signs.

3.2 Observation
Chevron sign placed clearly
Reason for Concern:
The signs will illuminate by the vehicle lights and give indication about the horizontal curve of the road.
Recommendation:
Provision of these signs is a better idea for safety during nights.

Fig 4 Illegal/ wrong/incorrect opening in the median.

3.3 Observation
Illegal median opening on the straight road for personal purpose likely to result in serious accidents.
Reason for Concern:
Causes disturbance to the vehicles coming with a greater speed. They even cause delay in the travel time and unrest in the driver's mind moving on the highway. These median openings cause frustration in drivers and become accident black spots.
Recommendation:
These types of medians should be closed.
Priority: Essential

Fig 5 signing boards were not placed to guide the turning.

3.4 Observation
Electrical post placed near the carriageway. Absence of the illumination and chevron sign board at a busy intersection.
Reason for Concern:
Electrical post can be a hazard during turning. Dark area at this intersection causes confusion to the drivers as it is a well channelized island.
Recommendation:
Electric pole should be removed/ relocated to less hazardous location. Chevron sign boards should be placed or else at least directions markings should be done on the road to indicate the turning provisions. This can control the drivers passage through conflict points or sections. Reflecting studs should be installed for night time driving
Priority: Highly Essential

Fig 6 Extra lane provided.

3.5 Observation
Nice extra lane is provided at curve with good road markings
Reason for Concern:
This lane gives time to the drivers to enter in to the main carriageway after encountering curve.
Recommendation:
Maintenance of this extra lane is must at the curve and turning places

Fig 7 Bus stops on the main road.

3.6 Observation
Road markings missing. Lack of pedestrian facilities and bus stops placed exactly at the junction
Reason for Concern:
Road markings should be there to guide the traffic and lane division. Zebra crossings should be there for the safety of pedestrians. Bus stops causes traffic jams on the highway and even accidents
Recommendation:
Proper road markings should be given on the road. Zebra crossing, and bus stops should be placed 60 meters away from the junction
Priority: Highly Essential

Fig 8 Median at the carriageway level.

3.7 Observation
Median height level is at the carriageway height. This is insufficient or deficient treatment of the median.
Reason for Concern:
Traffic violators may cross the road easily as the level of carriageway is same as kerb. This causes disturbances to the drivers and may lead to crashes
Recommendation:
Kerb height of 15 centimeters should be maintained to curb the traffic violations
Priority: Essential

Fig 9 Median opening at the steep curve.

3.8 Observation
Median opening at the sharp curve creating confusion to the highway drivers. This is incorrect or misplaced treatment. Uncontrolled access to premises abutting a main road can substantially impede traffic flows and create severe road safety hazards as vehicles tempt to leave, merge with cross traffic streams.
Reason for Concern:
It's like a junction main highway on the both directions, to its sides a minor road and the other side with the busy petrol bunk. The turnings from the petrol bunk and the minor road causes disturbances to the highway vehicles at the sharp curve and this causes sudden braking and nose to tail accidents, side by side collisions.
Recommendation:
Median should be closed at this point and this facility can be done at a straight road.
Priority: Highly Essential

Fig 10 Indication of speed breakers.

3.9 Observation
Indication of speed breakers and wrong placement of speed breakers, it's an incorrect and misplaced treatment.
Reason for Concern:
Speed breakers are clearly indicated prior with sign post and markings. As it is a highway there should be no speed breakers.
Recommendation:
Speed breakers should be removed from the point along with sign post indicating the speed breakers.
Priority: Essential

Fig 11 Absence of Super Elevation.

3.10 Observation
Absence of super elevation and markings on the outer curve.
Reason for Concern:
Vehicles may run out from the road at curves when there is no proper super elevation
Recommendation:
Proper super elevation need to be provided so that the road can be forgiving of the drivers errant or inappropriate behavior. Studs should be used on the center line and edge of the carriageway which guides the driver during nights.
Priority: Highly Essential

Fig 12 Inadequate and incomplete signage results in confusion.

3.11 Observation

Sign boards and advertisement boards creating confusion on driver's mind. Provision of sign boards at a shorter distance and poor maintenance of the shoulder

Reason for Concern:

The three sign boards indicating the place, curve, speed was at a shorter distance less than 10 meters distance between them. some advertisement boards along with the sign boards creates confusion to the drivers.

Recommendation:

The 10 meters distance between the sign boards should be maintained and the advertisements boards need to be removed.

Priority: Essential

Fig 13 Route indicating boards causing blind spots.

3.12 Observation

Immoderate treatment of Route signs causing blind spots for the major and minor roads.

Reason for Concern:

These blind spots are the cause for the accidents. As this is the college area students ride their bikes without noticing the vehicles coming from the major roads during turnings.

Recommendation:

Directional sign boards need to be removed or placed some distance back giving a clear angle vision.

Priority: Highly Essential

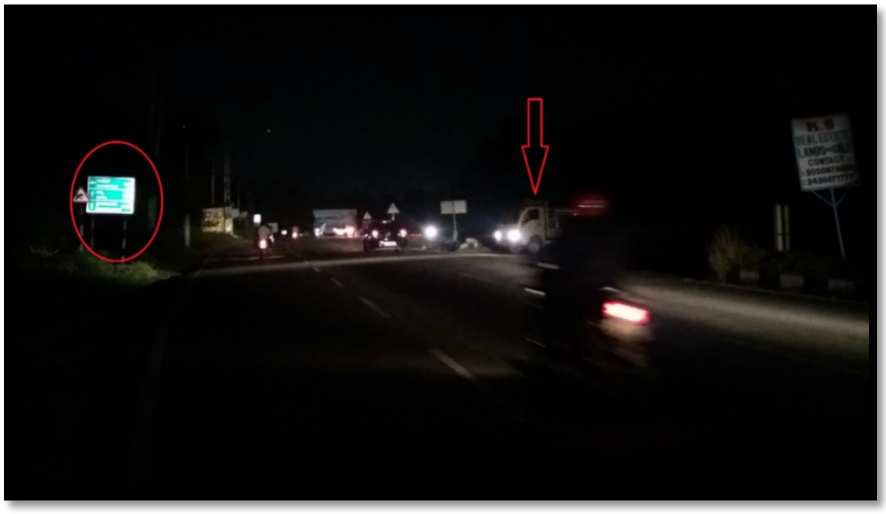

Fig 14 A junction with low illumination and wrong median break.

3.13 Observation
A junction with low illumination and wrong median break.

Reason for Concern:
The low visibility at the junction and the median break near the junction may be a hazardous and cause sudden braking and nose – to – tail accidents.
Recommendation:
Median should be closed and be provided at farer place away from the intersection. Illumination of the junction should be done with high standard of street lighting. This causes frustration in drivers and becomes accident black spots.
Priority: Highly Essential

Fig 15 chevron sign boards illuminated at the curve.

3.14 Observation
Chevron sign placed at the correct place. Light rays of the opposite vehicles causing glare to the drivers
Reason for Concern:
The signs should be used at every curve and this is highly recommended at the curves to give information about the curve
Recommendation:
Median should be raised with small plants to obstruct the lights from opposite direction/ the median width need to be increased up to 2 meters/ Glare screen can be used.

Fig 16 Chevron sign boards clearly indicating the turning.

3.15 Observation
Chevron sign boards clearly indicating the turning.
Reason for Concern:
The signs clearly indicating the roundabout with directional signs.
Recommendation:
Retro reflective signing increases Night time safety.

Priority: Highly Essential

IV.CONCLUSIONS

This paper presented a Road Safety Audit of Day and Night that highlighted issues in safety managementshowing the contents like observation, reason for concern, recommendation and priority of the issue. It examined the defects in the road safety in relation to motorized traffic and pedestrian safety. It suggested the various recommendations which are easy to do and at low cost. The audit is applied to the risks outside the framework of standards and codes. A person who understands road user behavior and human perception is also likely to be able to develop road safety audit skills.

V ACKNOWLEDGEMENTS

The authors would like to acknowledge the support of the Organizations/Institutions like Central Road Research Institute, Cyberabad Traffic Police, K G Reddy College of Engineering and Technology for their contributions and suggestions for performing this Road Safety Audit.

REFERENCES

[1] Cyberabad Traffic Police, Road User Guide
[2] Manual on Road Safety by IRC: SP: 88 – 2010
[3] Guidelines for Pedestrian Facilities by IRC: 103 – 2012
[4] Rajesh et al, Vol 6 Issue 7, 2015, Road Safety Audit of a Rural Road, ISSN 0976- 6316
[5] Shalini Kanuganti, et al, (2016), Road Safety Analysis Using Multi Criteria Approach: A Case Study in India, Elsevier
[6] Abdul Rahoof, et al (2017), Road Safety and Road Safety Audit in India: A Review, IJTRE
[7] Nicholas N Ferenchak (2014), Pedestrian Age and Gender in Relation to Crossing Behavior at Midblock Crossings in India, Science Direct
[8] Humera Banu, et al (2013), Two-Wheeler Riding Patterns, Perceptions and Aggressive Riding Behavior Among College Youth, IJIRSET
[9] Francis John Gichaga (2016), The Impacts of Road Improvements on Road Safety and Related Characteristics, IATSS Research
[10] Yuha Huvarinen, et al (2017), Road Safety Audit, Science Direct