

Road Safety Audit for Four Laning of Bijapur Hungund Section of Nh-50 In Karnataka

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Abstract—Road Safety Audit (RSA) is an effective and proactive approach used for identifying road safety deficiencies and minimizing accident risks on highways. In the present study, a detailed road safety audit was conducted for the four-laning project of Bijapur–Hungund section of NH-50 in Karnataka. The study evaluated the existing roadway conditions, traffic safety features, accident statistics, crash barriers, pavement markings, median openings, chevron signs, bridge approaches, and roadside hazards. Accident data analysis indicated that poor delineation, faded road markings, inadequate crash barriers, and improper warning signs were major causes of accidents and fatalities. The audit identified critical deficiencies at several locations and proposed remedial measures according to IRC and MORTH guidelines. The implementation of recommended measures such as W-beam crash barriers, thermoplastic markings, road studs, chevron boards, and cautionary signs can significantly improve road safety and reduce accident severity. The study concludes that systematic road safety audits are essential for ensuring safer highway infrastructure and sustainable transportation systems.

Index Terms—Crash Barrier, Highway Safety, NH-50, Pavement Markings, Road Safety Audit.

I. INTRODUCTION

Road transportation is one of the most important components of economic and social development in India. Rapid urbanization and increase in vehicle population have resulted in severe road safety problems. India accounts for a large percentage of global road accident fatalities due to poor road geometry, inadequate traffic control, lack of road safety measures, and improper maintenance.

Road Safety Audit (RSA) is a formal and systematic process carried out to identify potential road safety

hazards and recommend suitable mitigation measures. The present study focuses on the road safety audit of the Bijapur–Hungund section of NH-50 in Karnataka. The highway stretch experiences heavy traffic movement and contains several conflict points such as intersections, bridge approaches, curves, and median openings. The audit was conducted to identify safety deficiencies and recommend corrective measures for improving highway safety.

II. LITERATURE REVIEW

Several researchers emphasized the importance of road safety audits in reducing accident rates and improving operational safety of highways. Studies conducted on NH-65 and NH-58 identified that faded road markings, absence of crash barriers, improper median openings, and lack of warning signs were major causes of accidents.

IRC:SP:88-2019 defines Road Safety Audit as a formal examination of a road project by an independent and qualified team. Previous studies concluded that proactive safety inspections significantly reduce crash severity and improve road user safety. Researchers also highlighted that proper delineation, thermoplastic pavement markings, and installation of W-beam crash barriers are highly effective in minimizing accident risks.

III. STUDY AREA AND METHODOLOGY

The study stretch extends from Km 225.800 to Km 323.012 on NH-50 connecting Bijapur and Hungund in Karnataka. The total project corridor length is approximately 97.212 km. The highway is a four-lane

divided carriageway with paved shoulders and carries considerable traffic throughout the day.

The methodology adopted for the study included field inspections, visual observations, traffic analysis, accident data analysis, and photographic documentation. Safety deficiencies related to crash barriers, road markings, narrow bridges, pavement condition, chevron signs, road studs, and median openings were identified. The observations were compared with IRC and MORTH standards to recommend appropriate mitigation measures.

Table I: Accident Data of Bijapur–Hungund Stretch

Year	Accidents	Fatalities	Injuries
2015	182	64	201
2016	175	68	194
2017	169	61	188
2018	162	66	179
2019	158	69	172
2020	121	52	130
2021	138	57	149
2022	156	72	168
2023	171	78	182
2024	149	65	160

IV. RESULTS AND DISCUSSION

The road safety audit identified several critical safety deficiencies throughout the study stretch. Major issues included absent W-beam crash barriers, damaged barriers, faded pavement markings, lack of chevron signs, narrow bridge approaches, and improper median openings. Accident analysis indicated that the severity index was comparatively higher during night hours due to poor visibility and inadequate delineation.

The absence of crash barriers at sharp curves and embankments increased the risk of vehicles running off the roadway. Faded pavement markings reduced lane discipline and increased the possibility of side-swipe collisions. Improperly connected crash barriers near RCC barriers also created hazardous conditions. The study recommended installation of W-beam barriers, thermoplastic road markings, retro-reflective signs, road studs, rumble strips, and improved delineation to enhance highway safety.

Table II: Safety Deficiencies and Recommendations

Deficiency	Observation	Recommendation
Crash Barrier	Barrier absent at curves	Provide W-beam barriers
Road Markings	Faded/Absent	Use thermoplastic markings
Median Openings	No cautionary signs	Install warning signs
Bridge Approaches	Narrow width	Provide hazard markers
Chevron Signs	Absent at curves	Install chevron boards

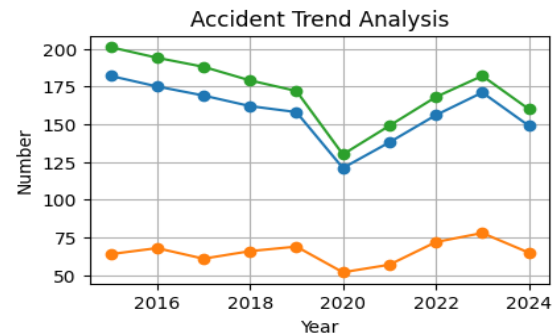


Fig.1 Accident Trend Analysis

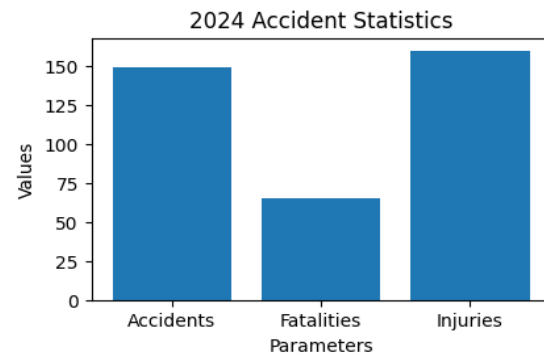


Fig.2 2024 Accident Statistics

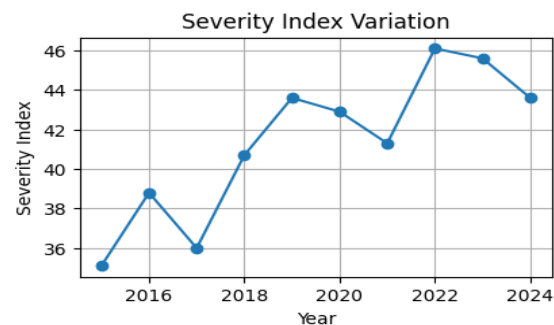


Fig.3 Severity Index Variation

V. ADVANTAGES OF ROAD SAFETY AUDIT

Road Safety Audit helps in identifying hazardous locations before accidents occur. It improves safety for all categories of road users including motorists, pedestrians, cyclists, and vulnerable users. RSA also ensures compliance with IRC and MORTH standards, reduces accident severity, minimizes economic losses, and improves overall highway performance. Implementation of safety measures enhances driver comfort, visibility, and operational efficiency.

VI. CONCLUSION

The present study concludes that Road Safety Audit is an effective tool for identifying and mitigating road safety deficiencies on national highways. The audit conducted on the Bijapur–Hungund section of NH-50 identified several critical issues related to crash barriers, pavement markings, median openings, and bridge approaches.

Implementation of the recommended safety measures such as W-beam crash barriers, thermoplastic markings, road studs, chevron signs, and hazard markers can significantly reduce accident risks and improve highway safety. Regular road safety audits and maintenance activities are essential for ensuring sustainable and safe transportation infrastructure.

REFERENCES

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- [3] IRC:35-2015 Code of Practice for Road Markings.
- [4] IRC:119-2015 Guidelines for Crash Barriers.
- [5] MORTH Specifications for Road and Bridge Works.
- [6] FHWA Road Safety Audit Guidelines.