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The Role of Safety Audit in Night Travel Sleeper Buses in Karnataka “A Study"

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Abstract: The rapid rise of private sleeper buses in Karnataka has transformed the way people travel between cities, making overnight trips more comfortable and convenient for travelers. However, fires, crashes, and mechanical failures that repeatedly occur indicate that there are still issues with vehicle safety and adherence to regulations. This paper critically analyzes the relevance of Safety Audits commonly utilized for road infrastructure to the sleeper bus transportation system in Karnataka. Utilizing the Road Safety Audit framework established by Huvarinen et al. (2017) and situating it within the Indian regulatory context, the study examines the integration of safety audits with established standards, including AIS-119 and the Motor Vehicles Act (1988, as amended in 2019). The study argues that regular, organized, and interdisciplinary safety audits can proactively identify mechanical, operational, and human-factor risks in private sleeper buses, thereby preventing accidents and enhancing public confidence in long-distance bus transportation. The paper concludes by proposing a state-specific audit model and offering policy recommendations to improve operational safety and compliance by fostering collaboration between regulatory agencies and private operators.

Keywords: *Safety Audit, Night Travel, AIS-119 (Automotive Industry System), Motor Vehicles Act, Passenger Safety, Audit Framework, Accident Prevention, Transportation Governance.*

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I. INTRODUCTION

Night travel on private sleeper buses has become a big part of Karnataka's intercity transportation scene. These buses connect major cities like Bengaluru, Hubballi, Mangaluru, Mysuru, and Belagavi. They serve both urban and semi-urban populations seeking affordable and convenient overnight travel options. But underneath their comfort is a sense of safety concerns. Frequent fires, mechanical failures, and passenger deaths have raised questions about the safety of these vehicles.

The 2013 Haveri bus fire, the 2023 Hubballi sleeper coach accident, and the 2025 Kurnool sleeper bus fire, in which several passengers died when the bus caught fire following a crash, are all examples of how poorly designed, inspected, and enforced vehicle regulations can lead to tragic consequences. Investigations into these events often reveal that a combination of poor maintenance, faulty wiring, the use of materials that fail to extinguish fires, and tired drivers is to blame. These incidents are not isolated; they demonstrate that sleeper buses are not correctly built, operated, or monitored.

The challenge is not just to ensure that people follow the rules, but also to adopt a proactive, systematic, and audit-based approach to safety management. A purely regulatory model that only examines what happened after an incident and punishes those responsible does not address the root of the problem, which lies in the vehicle's design, its use, and the government's oversight. Road Safety Audits (RSAs) have become proactive tools for identifying potential problems in transportation systems before accidents occur worldwide. RSAs started in the UK in the 1980s and then spread to Europe, North America, and parts of Asia. They focus on user perception, human factors, and risk-based evaluation, not just technical compliance. In India, the Ministry of Road Transport and Highways (MoRTH) and the Indian Roads Congress (IRC) have made rules for auditing road infrastructure. However, these rules don't apply much to fleet-based passenger systems, especially private sleeper buses. This paper argues that the RSA methodology can be effectively tailored for the sleeper bus industry in Karnataka, establishing a systematic approach to assess design, maintenance, and operational safety, thereby averting tragedies similar to those experienced in Haveri, Hubballi, and Kurnool.

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II. LITERATURE REVIEW

➢ *Global Frameworks for Safety Audits*

According to Huvarinen et al. (2017), adherence to engineering standards alone does not guarantee road safety. Their study in *Transportation Research Procedia* emphasized that human error and the interaction between *person–vehicle–environment* account for nearly 27% of road accidents. The authors proposed the Road Safety Audit (RSA) as an advanced tool for identifying accident risks by assessing human perception, road conditions, and environmental variables.

The RSA framework differs from traditional inspections in its multidisciplinary scope and preventive intent. Rather than verifying compliance with manuals and codes, auditors evaluate how users experience the system under fatigue, darkness, or glare. Findings from RSA applications in Finland and Russia demonstrated that modest interventions (better lighting, pedestrian crossings, warning signage) could produce high benefit–cost ratios and payback periods as short as four to six months.

The Federal Highway Administration (2007) and Swedish Transport Administration (2012) similarly noted that systematic audits reduce accident frequency and severity by improving risk visibility at every design and operational stage. These studies established RSAs as integral to the "Vision Zero" strategy, which seeks to eliminate fatalities by focusing on human-centered safety design.

➢ *Indian Context*

In India, road safety audits were first institutionalized under the MoRTH Road Safety Audit Manual (2018) these primarily cover highway geometry, intersections, and construction safety but overlook fleet-specific safety risks. At the same time, passenger-vehicle safety regulations are governed by the Automotive Industry Standard (AIS-119), which mandates fire-retardant materials, emergency exits, and electrical safety features in sleeper coaches. However, enforcement remains inconsistent—especially among smaller private operators.

The Motor Vehicles (Amendment) Act, 2019 strengthened penalties and introduced provisions for vehicle recalls, but did not formalize an audit mechanism for commercial fleets. Thus, India's regulatory ecosystem lacks the continuous, independent oversight characteristic of safety audits.

For Karnataka, where night-time passenger volume exceeds 2.5 million monthly across intercity routes, this gap translates directly into heightened accident risk. Therefore, adapting the RSA model to bus operations can complement existing standards and shift governance from reactive enforcement to proactive prevention.

➢ *Role of Audit*

The recent tragic bus incidents—most notably the Kurnool fire on 24 October 2025, where an illegally converted sleeper bus collided with a motorcycle and burst into flames, killing about 19–20 passengers Deccan Chronicle+2India Today+2, and the Jaisalmer (Rajasthan) fire on 14 October 2025, which claimed around 20 lives when a newly-bought AC sleeper bus caught fire due to a suspected short circuit and trapped passengers because the door jammed Hindustan Times+2India TV News+2 — starkly underline systemic safety failures in long-distance overnight coach services. In Karnataka, too, the Raichur incident, where a state-run sleeper coach overturned near Sath Mile Cross, injuring nine passengers The Times of India, highlights the urgent need for proactive risk management. These tragedies collectively demonstrate how weak enforcement and poor compliance with design standards — such as proper emergency exits, fire detection and suppression systems, and approved structural conversions — can have catastrophic consequences. By incorporating regular, rigorous safety audits, transport authorities can identify and rectify dangerous modifications (such as unauthorized sleeper conversions), enforce fire-safety norms (like window hammers, adequate exits, and fire-retardant materials), and ensure that even newly procured buses comply with safety standards before they are commissioned for long-haul night travel. Such audits could act as a critical preventive mechanism, bridging the gap between regulation and real-world safety and potentially preventing future loss of life.

➢ *Objectives of the Study*

- To know the importance of safety audit of night travelers in Karnataka
- To understand the role of safety audit in night travel buses
- To examine the existing safety audit and monitoring systems currently implemented in Karnataka.

III. METHODOLOGY

This paper adopts a qualitative and conceptual research approach using secondary data, academic literature, and regulatory documentation.

➢ *Data Sources*

The primary reference is Huvarinen et al.'s (2017) *Road Safety Audit* framework, complemented by studies from the Federal Highway Administration (2007), NHTSA (2005), and MoRTH(Ministry of Road Transport and Highways)guidelines. National and state-level sources, including Karnataka RTO reports, accident data, and AIS-119 standards, form the empirical foundation. The study employs comparative synthesis, aligning global RSA principles with the operational context of Karnataka's private sleeper buses. The process involves:

- Mapping RSA stages (design, pre-opening, operation, post-accident) onto the bus lifecycle;
- Identifying gaps in existing safety protocols
- Proposing adaptations that fit India's legal and institutional framework.

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➢ *Theoretical Framework: Road Safety Audit Adaptation*

The RSA operates on the premise that accidents stem from the *interaction* between human behavior, vehicle characteristics, and the surrounding environment. For sleeper buses, this triad becomes even more critical, as travel occurs predominantly at night, when visibility, alertness, and response times are compromised.

➢ *RSA Stages, Sleeper Bus Equivalents, and Key Safety Focus Areas*

Table 1 RSA Stages, Sleeper Bus Equivalents, and Key Safety Focus Areas

RSA Stage	Sleeper Bus Equivalent	Focus Areas
Design Stage	Bus body design and construction	AIS-119 compliance, fire safety materials, emergency exits, wiring layout
Pre-Operation Stage	Vehicle certification by RTO	Safety inspections, braking tests, night visibility, signage
Operational Stage	Day-to-day functioning	Maintenance logs, driver rest hours, over-speeding checks, night conditions
Post-Accident Stage	Forensic evaluation	Root cause analysis, electrical failure tracing

Source: Researcher

This structure mirrors the RSA's preventive logic, identifying potential risks before they escalate into accidents.

➢ *Audit Principles for Sleeper Buses*

- Independence – Audits should be conducted by accredited third-party experts, not by operators themselves.
- Human-Centric Assessment – Passenger perception, evacuation ease, and psychological comfort must be evaluated alongside engineering factors.
- Lifecycle Auditing – Continuous assessment across design, operation, and incident stages ensures sustained compliance.
- Interdisciplinary Review – Teams must include mechanical engineers, fire-safety experts, and behavioral scientists.
- Documentation and Feedback – Each audit should generate actionable recommendations linked to enforcement timelines.

IV. DISCUSSION AND FINDINGS

A synthesis of accident case studies and official reports reveals several recurring weaknesses in Karnataka's sleeper bus system.

- Non-compliance with AIS-119 — many private operators retrofit standard buses without adhering to fire and structural norms.
- Electrical Hazards — Improper wiring and overloading often ignite fires in air-conditioned coaches.
- Driver Fatigue — Night driving without adequate rest or co-driver support leads to lane drift and collisions.
- Poor Emergency Design — In several accidents, passengers could not locate or open emergency exits, especially from upper berths.
- Lack of Night Visibility — Inadequate lighting and worn reflectors exacerbate nighttime hazards.
- Weak Regulatory Oversight — RTO inspections are irregular, and certification largely depends on paperwork rather than technical audits.

➢ *Correlation with Global Findings*

Huvarinen et al. (2017) emphasized that 27% of accidents result from failures in the person–road–vehicle interface. Karnataka's sleeper-bus context mirrors this, with human fatigue, poor design, and insufficient monitoring interacting to produce high-risk conditions. Adopting the safety-audit approach can directly address these interactions by shifting responsibility from post-accident accountability to pre-incident prevention.

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➢ *Economic Implications*

Applying Huvarinen's cost-benefit model, even modest improvements—such as better illumination, speed monitoring, and staff training—yield substantial economic returns. Preventing just five fatal incidents annually (valued at approximately ₹12 crore in social cost) would justify the state-wide implementation of audit systems costing a fraction of that amount.

V. POLICY IMPLICATIONS AND RECOMMENDATIONS

➢ *Institutional Integration*

A Safety Audit Cell for Sleeper Buses (SACSB) should be established under the Karnataka State Transport Department. This body would:

- Certify third-party auditors;
- Maintain a centralized database of audit results; and
- Coordinate with Fire and Emergency Services for inspection follow-ups.

Audit findings should be publicly accessible to promote transparency and accountability among operators.

➢ *Technical Measures*

- Enforce dual emergency exits with luminous signage.
- Install smoke detection and fire suppression systems in all coaches.
- Require use of low-flammability materials certified under AIS-119.
- Implement real-time driver fatigue monitoring using telematics.
- Conduct annual structural and electrical integrity tests.

➢ *Human Resource Development*

- Regular fire evacuation and safety drills for staff.
- Mandatory driver training programs emphasizing defensive and night driving.
- Integration of safety-audit modules in RTO licensing curricula.
- Incentivization through Safety Compliance Ratings tied to insurance premiums.

➢ *Legal Reforms*

Amendments to the Karnataka Motor Vehicle Rules should mandate annual third-party audits as prerequisites for renewal of vehicle fitness certificates. Non-compliant operators should face suspension of permits and penalties proportional to risk severity.

➢ *Passenger Engagement*

Passengers can act as stakeholders in safety monitoring. Mobile applications linked to booking platforms may collect user feedback on perceived safety, emergency accessibility, and driver behavior—forming part of continuous audit data.

VI. CONCLUSION

Safety audits offer a paradigm shift in India's approach to transportation safety—from reactive crisis management to preventive, data-driven governance. Adapting the Road Safety Audit methodology to Karnataka's sleeper bus sector provides a structured and evidence-based mechanism for reducing accidents, improving compliance, and protecting lives.

By merging the technical rigor of AIS-119, the legal authority of the Motor Vehicles Act, and the procedural discipline of RSA frameworks, Karnataka can pioneer a model of passenger transport safety governance for other Indian states.

Beyond compliance, institutionalizing safety audits nurtures a culture of accountability, transparency, and continuous improvement qualities essential for a rapidly modernizing transport ecosystem. As passenger expectations and mobility demands rise, such proactive systems will ensure that the convenience of overnight travel no longer compromises human safety.

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