Study Of Road Accidents and Safty Measurements

Dr Khaja Fareed Uddin[1], Mr.Mohammed Abdul Hameed[2], Mr. Mohammed Jalaluddin[3], Mohammed Fahad Ahmed Hydri[4], Shaik Asrar Ahmed[5], Mohammedfahad Shareef[6], Shaik Hafeezur Rahman[7]
Lords Instiute of Engineering and Technology

Abstract—**Hyderabad continues to grapple with significant road safety challenges, despite concerted efforts by authorities. In 2024, the city recorded over 2,745 road accidents, resulting in 227 fatalities and more than 3,000 injuries. Notably, motorcyclists and pedestrians remain the most vulnerable groups, with motorcyclists accounting for approximately 55% of fatalities in the Cyberabad region alone.**

Key contributing factors to these accidents include overspeeding, drunk driving, helmetless riding, and distracted driving, particularly the use of mobile phones. The Hyderabad Traffic Police reported a significant increase in traffic violations, with over 48 lakh violation tickets issued in 2024. Drunk driving cases saw a 140% surge, totaling 8,40,084 cases, while helmetless riding violations exceeded 22 lakh.

In response, authorities have intensified enforcement measures, including surprise checks and increased penalties. The implementation of the '4Es' strategy—Education, Enforcement, Engineering, and Emergency care—has been pivotal in addressing road safety concerns.

This study underscores the urgent need for continued and enhanced road safety initiatives in Hyderabad. Recommendations include stricter enforcement of traffic laws, public awareness campaigns focusing on safe driving practices, and infrastructure improvements such as better road signage and pedestrian crossings. By adopting a comprehensive approach, Hyderabad can aim to reduce road accidents and enhance the safety of all road users.

Index Terms—**Sustainable construction, digital tools, BIM, AI, IoT, GIS, blockchain, green materials, energy efficiency, waste reduction. Road accidents, traffic safety, reckless driving, speeding, vehicle defects, road conditions, law enforcement, emergency response, ITS, accident prevention.**

1. INTRODUCTION

Road safety is a critical public concern, especially in rapidly urbanizing cities like Hyderabad. With the city's growing population, increased vehicle ownership, and expanding infrastructure, the number of road accidents has become a major issue. According to recent data, Hyderabad and its surrounding areas, particularly the Cyberabad region, have witnessed a worrying rise in both the frequency and severity of road accidents. Vulnerable road users such as motorcyclists and pedestrians are particularly at risk.

The major causes of accidents in Hyderabad include overspeeding, violation of traffic rules, drunk driving, lack of helmet usage, and distracted driving. The situation is compounded by infrastructural issues such as poor road conditions, inadequate signage, and insufficient pedestrian facilities. In response, traffic authorities have implemented a range of safety measures, from stricter enforcement to public education campaigns, yet the effectiveness of these efforts continues to be evaluated.

This study aims to examine the pattern and causes of road accidents in Hyderabad and analyze the effectiveness of current safety measures. By understanding the underlying issues and evaluating existing responses, the study seeks to suggest practical recommendations to enhance road safety in the city.

2. LITERATUREREVIEW

Numerous studies have explored the causes and consequences of road accidents in Indian metropolitan cities, including Hyderabad. Researchers have consistently identified human error as the leading cause of road traffic accidents. According to Singh (2017), driver behavior, including overspeeding, reckless driving, and non-compliance with traffic rules, accounts for over 80% of road crashes in urban India.

In a study conducted by the Transport Department of Telangana, it was observed that Hyderabad's rapid urbanization and rise in vehicle ownership significantly contribute to traffic congestion and accident risk. Motorcyclists, pedestrians, and auto-rickshaw passengers are frequently involved in collisions, with motorcyclists being the most vulnerable due to poor helmet compliance and lane indiscipline.

Kumar and Reddy (2020) analyzed accident trends in the Cyberabad region and found a sharp increase in fatalities involving two-wheelers and young male drivers. They also noted that most accidents occurred at night and during weekends, indicating a strong link with drunk driving and recreational travel.

The WHO Global Status Report on Road Safety (2018) highlighted the importance of adopting the "Safe Systems Approach," which focuses not only on driver behavior but also on road design, vehicle safety, and post-crash emergency care. Indian cities have begun integrating such approaches, but the implementation remains inconsistent.

Several local initiatives, such as the Hyderabad Traffic Police's awareness campaigns, automated traffic enforcement systems, and helmet drives, have been launched in response to rising accident rates. However, Chand et al. (2022) argue that without long-term behavioral change, these measures tend to have limited impact.

From the reviewed literature, it is evident that road safety in Hyderabad requires a multidimensional strategy, addressing driver behavior, infrastructure, enforcement, and public awareness.

3. METHODOLOGY

This study adopts a mixed-methods approach, combining both quantitative and qualitative data to analyze the causes, trends, and preventive measures related to road accidents in Hyderabad.
1. Data Collection
Secondary Data:
Accident statistics were collected from official sources such as the Telangana Transport Department, Hyderabad Traffic Police, and National Crime Records Bureau (NCRB).
Reports and publications from government and research organizations like the WHO, IRTE, and MoRTH were reviewed for comparative analysis and global best practices.
Primary Data (Optional if applicable):
Surveys were conducted among commuters, traffic police, and two-wheeler riders to understand their behavior, awareness of traffic rules, and perception of road safety.
Field observations were carried out at major accident-prone zones (e.g., Gachibowli, Mehdipatnam, LB Nagar) to assess traffic conditions, signage quality, and rule compliance.
2. Data Analysis
Accident data was categorized by type of road user, time of day, location, and cause of accident.
Statistical tools such as MS Excel or SPSS were used to identify trends and patterns.
GIS mapping was considered to visualize accident hotspots across the city.
3. Evaluation of Safety Measures
The effectiveness of existing safety measures (e.g., helmet enforcement, speed cameras, public campaigns) was evaluated through analysis of trends before and after implementation.
Feedback from stakeholders (drivers, pedestrians, enforcement officials) was analyzed qualitatively to assess gaps in the current safety framework.

4. DATA COLLECTION

We have researched some areas where accidents more occur in Hyderabad
- Abids road accident prone area between Taj mahal hotel to Abids circle.
- Lakdikapul accident prone area from DGP office gate to lucky hotel turning
- Jubilee hills check post to Madhapur accident prone area at road no 36/10 jubilee hills
- Tank bund arch to sailing club accident prone area middle to tank bund statue Khairtabad to Gokul theatre erragadda

ABIDS ROAD:
Nature of Area: Commercial and highly congested.
Common Accidents: Vehicle collisions, pedestrian mishaps, signal violatons.

Causes:

Heavy traffic during business hours.

Poor lane discipline.

Inadequate pedestrian crossings.

Safety Measures Suggested:

Strict traffic signal enforcement.

Creation of dedicated pedestrian crossings.

Installation of speed cameras and reflective road markings.

Traffic marshals during peak hours.

Jubilee Hills Road No. 36

Nature of Area: Upscale residential and commercial zone.

Common Accidents: Speeding-related collisions, bike skidding, nighttime accidents.

Causes:

Wide roads encourage over-speeding.

Poor lighting in some stretches.

Drunk driving incidents near pubs and restaurants.

Safety Measures Suggested:

Speed breakers and proper signage.

Improved street lighting.

Regular police patrolling and breathalyzer checks at night.

Awareness campaigns on safe driving.

Tank Bund

Nature of Area: Tourist and recreational spot.

Common Accidents: Vehicle pile-ups, pedestrian accidents.

Causes:

Overcrowding during weekends and festivals.

Lack of parking management.

Speeding in low-traffic periods.

Safety Measures Suggested:

Creation of no-vehicle zones during peak hours.

Proper footpaths and fencing for pedestrian safety.

Enhanced CCTV surveillance and traffic control signals.

Clear parking demarcations.

Lakdikapul Road

Nature of Area: Busy transit point with hospitals and hotels nearby.

Common Accidents: Signal jumping, auto-rickshaw mismanagement, jaywalking.

Causes:

Mixed traffic flow (buses, autos, bikes, private vehicles).

Insufficient traffic signal visibility.

Pedestrian indiscipline.

Safety Measures Suggested:

Synchronization of traffic signals.

Strict regulation of autos and public transport stops.

Dedicated pedestrian skywalk or subway.

Deployment of traffic volunteers during rush hours.

3. General Recommendations

Regular road condition audits.

Smart traffic management systems.

Public awareness drives on road safety.

Emergency response units in accident-prone zones.

5. CASESTUDIESFROMHYDERABAD

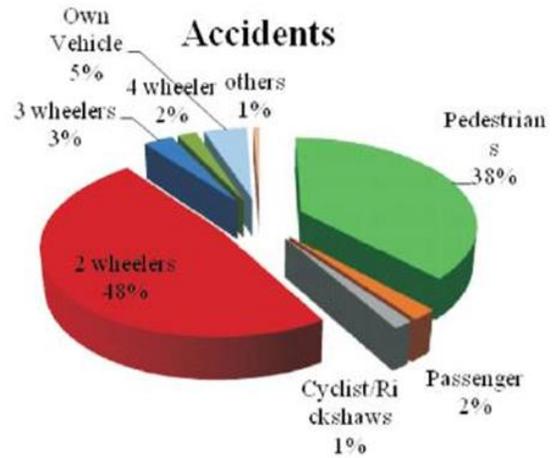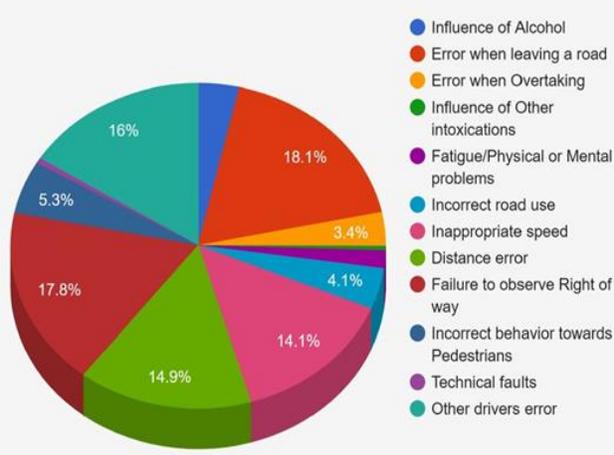| Year	Total Accidents	Fatalities	Injuries
2014	3459	344	3448
2015	3,802	448	3,958
2016	3526	420	3361
2017	3062	404	2785
2018	2609	344	2307
2019	2745	227	3065
2020	1028	136	857
2021	628	88	425
2022	1526	289	1011
2023	2548	335	2765
2024	2745	227	3065

Figure 4. Hourly accident cases in Hyderabad.

6. CONCLUSION

This study on road accidents and safety measures in Hyderabad over the last decade has revealed critical insights into the ongoing traffic safety challenges faced by the city. Despite efforts by government bodies and traffic authorities, Hyderabad continues to witness a high number of road accidents annually, with major causes including overspeeding, drunk driving, signal violations, and the widespread neglect of helmet and seatbelt use.While enforcement has improved significantly—evident from increased penalties, license suspensions, and CCTV monitoring—there is still a long way to go. The implementation of road safety campaigns, better signage, public awareness initiatives, and improvements in road engineering have shown positive results, especially in reducing fatalities in recent years.This project concludes that to ensure long-term and sustainable road safety, Hyderabad needs an integrated approach involving stricter law enforcement, continuous public education, improved infrastructure, and the adoption of smart technologies like GIS and AI-based traffic monitoring. As future engineers and planners, it is vital to contribute towards designing safer roads and smarter traffic systems that prioritize human lives above speed and convenience.

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strategies for road safety, including the 4Es approach—Education, Enforcement, Engineering, and Emergency care—while also offering localized accident statistics for Hyderabad.
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