

SIAM

Society of Indian Automobile Manufacturers

Building the Nation, Responsibly



Analysing **INDIA'S** IMPERATIVES FOR **ROAD SAFETY**



SAFE (a SIAM initiative)

Society for Automotive Fitness & Environment



CONTEXT PAPER

SEPTEMBER 2026

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About SIAM

The Society of Indian Automobile Manufacturers (SIAM) is an apex national body representing all major vehicle and vehicular engine manufacturers in India. It is a society with charitable objectives registered under the Societies Registration Act, 1860. Its objectives include enhancing the contribution of automobile industry to the growth and development of Indian economy, assisting the automobile industry to meet its social obligations and encouraging the efficiency of industry in general and automobile industry particularly in India. SIAM focuses on activities related to improvement of environment and ensuring safety and protection of automobile vehicle users and public at large. Recognising these objectives, SIAM has been granted registration under the Income Tax Act, 1961 as an institution with charitable purpose.

To meet these objectives, SIAM works closely with stakeholders in the formulation of the economic, environment and commercial policies, regulations and standards relating to automobiles. It provides economic and statistical information as well as technical and public policy services to the stakeholders on behalf of Indian Automobile Industry. It publishes Monthly Industry Statistics, Monthly Commodity Price Monitor and other periodic reports. SIAM organises seminars and workshops on the subjects of topical relevance and interest to the industry. It also carries out various public policy activities, particularly in the field of Road Safety and Environment.

SIAM works closely with various Government departments, both at Central and State level and with international bodies like International Organisation of Motor Vehicle Manufacturers (OICA), International Motorcycle Manufacturers Association (IMMA) and coordinate with other counterpart international associations.

SIAM, jointly with ACMA and CII, organises the Auto Expo – The Motor Show, an exhibition showcasing the trends in the Automobile Industry.

SIAM aims to promote Sustainable Mobility through focused initiatives and campaigns on जैविक पहल (Bio Initiative), हरित हाइड्रोजन (Hydrogen Mobility), गैसगतिशीलता (Gas based mobility), विद्युतीकरण (Electrification), चक्रीयता (Circularity) and सुरक्षितसफर (Safe Journey) in alignment with Sustainable Development Goals, 2030 and Net Zero by 2070.

About SAFE

In order to achieve advancement of Inspection and Certification (I&C) of vehicles and increased safety on roads, the Society of Indian Automobile Manufacturers (SIAM) has incorporated an independent body, Society for Automotive Fitness & Environment (SAFE) with membership from Industry, Testing Agencies and NGOs.

SAFE works to spread awareness among the various stakeholders on the concerns of in-use vehicles which would lead to safer vehicles and cleaner environment.

SAFE organizes inspection clinics for in-use vehicles and training workshops in various parts of the country for technicians in the area of pollution checking. These programmes are aimed at creating awareness amongst vehicle owners on importance of regular maintenance of their vehicles. It is one of the most effective ways to control emission levels from vehicles in the country.

In addition, SAFE also organizes conferences, seminars and interactions on these subjects with State Governments and other stakeholders.

SAFE has also commenced various initiatives for imparting road safety education to students, drivers and the general public at large. Through Road Safety Awareness Programmes, SAFE tries to apprise the community on traffic rules and also to inculcate correct and responsible attitude towards fellow road users.

SAFE is a catalyst in the automobile industry's endeavour to fulfil its commitment towards a cleaner and a safer environment and will continue to support and enhance the industry's role as a responsible corporate citizen in the country.

Executive Summary

India's road safety ecosystem is undergoing a significant transformation, driven by stronger policy focus, rapid technology adoption, improved institutional coordination, and growing state-level innovation. With over 1.7 lakh lives lost and approximately 4.8 lakh road accidents recorded in 2024, and road crashes estimated to cost the country around 3.14 percent of GDP, the urgency of this transformation cannot be overstatedⁱ. This paper highlights that while India continues to face a substantial road safety challenge due to rising motorisation, with more than 20 million vehicles being added to a fleet of approximately 400 million, expanding highway infrastructure, and with increasing mobility demand, there is also clear evidence of states building more proactive, data-driven, and integrated road safety systems through targeted interventions across infrastructure safety, enforcement, emergency response, behavioural awareness, and institutional governance.

A major theme emerging across the paper is the increasing shift from reactive accident response toward preventive and systems-based road safety management. India's alignment with the UN Decade of Action for Road Safety and adoption of the Safe System Approach are encouraging state governments to focus simultaneously on safer infrastructure, safer vehicles, safer road users, technology-enabled enforcement, and stronger post-crash care systems. At the national level, interventions such as the Motor Vehicles Amendment Act, the Integrated Road Accident Database (iRAD), eDAR systems, cashless treatment frameworks, and intelligent enforcement technologies are creating the foundation for a more coordinated and evidence-based road safety ecosystem.

The paper places strong emphasis on the role of states as the primary drivers of implementation and innovation. At the central level, complementary initiatives such as Bharat NCAP, the PM E-Drive scheme, and the Zero Fatality Corridor programme continue to strengthen the national safety framework. This paper analyses the status of road safety and the various interventions undertaken by the state governments of Madhya Pradesh, Odisha, Bihar, Assam, and Himachal Pradesh.

Madhya Pradesh emerges as one of the strongest examples of institutional and data-led road safety transformation. Through the World Bank-supported Integrated Action Programme, the state has implemented corridor-based engineering interventions, black spot rectification, community-led awareness programmes, emergency care strengthening, and integrated governance mechanisms. Its adoption of iRAD, extensive enforcement initiatives, and measurable improvements in pilot districts demonstrate how targeted interventions can significantly improve road safety outcomes.

Odisha reflects a strong model of policy-led institutional strengthening. The Odisha State Road Policy, 2025 establishes a comprehensive governance framework integrating road safety audits, digital bridge monitoring systems, and road asset management platforms. The state has also strengthened enforcement through Intelligent Enforcement Management Systems, expanded emergency response infrastructure, and introduced community-based recognition programmes such as the Mukhyamantri Sadak Suraksha Yojana Samman. Odisha's increasing use of analytics, integrated dashboards, and partnerships with institutions such as IIT Madras indicate a growing focus on technology-enabled governance and long-term institutional capacity building.

Bihar's approach highlights the integration of road safety into large-scale infrastructure expansion and rural connectivity programmes. The Bihar State Highways Programme and Mukhya Mantri Gramin Sadak Unnayan Yojana incorporate safety engineering measures such as crash barriers, zebra crossings, traffic calming systems, and safer bridge infrastructure. The state is also rapidly strengthening AI-enabled enforcement systems, trauma care infrastructure, emergency response mechanisms, and school-level awareness campaigns. Bihar's emphasis on integrating safety into both highways and rural roads demonstrates a more holistic mobility safety approach.

Assam and Himachal Pradesh demonstrate how states are adapting road safety strategies to challenging terrain and regional mobility conditions. Assam has focused on integrated enforcement, black spot rectification, emergency care expansion, and data-driven governance across critical Northeast transport corridors. Himachal Pradesh, meanwhile, has adopted a terrain-sensitive road safety framework emphasising safer hill-road engineering, tourism corridor safety, vehicle tracking systems, emergency trauma response, and driver sensitisation for mountainous conditions. Both states illustrate the increasing maturity of decentralized and context-specific road safety planning in India.

Overall, the paper highlights that India is steadily moving toward a more resilient, technology-enabled, and collaborative road safety ecosystem. With stronger institutional coordination, expanding use of digital systems, safer infrastructure investments, and increasing behavioural awareness initiatives, states are creating scalable models that can accelerate India's progress toward safer and more sustainable mobility outcomes.



Background

Global Road Safety Landscape

Road safety is a critical global public health and development priority, with road traffic injuries being one of the leading causes of death worldwide, particularly among individuals aged 5–29 years. According to the United Nations and the World Health Organization (WHO), road traffic crashes cause nearly 1.2 million preventable deaths and 50 million injuries each yearⁱⁱ, with millions more suffering long-term disabilities. To address this, the UN has launched the Decade of Action for Road Safety (2021–2030) under the Global Plan for Road Safety, targeting a 50% reduction in road traffic deaths and injuries by 2030. The Global Plan emphasizes a “Safe System Approach”, which focuses on making roads, vehicles, and users safer while strengthening post-crash response systems. It highlights five key pillars: safe road infrastructure, safe vehicles, safe road users, safe speeds, and effective post-crash care, supported by strong governance and data systems. Additionally, the plan outlines Voluntary Global Performance Targets, which include measurable goals such as improving helmet and seatbelt usage rates, reducing speed-related risks, enhancing vehicle safety standards, and strengthening emergency care and trauma response systems.

UN General Assembly Resolution 74/299 declared a
Decade of Action for Road Safety 2021–2030,
with the target to reduce road traffic deaths & injuries

**BY AT
LEAST 50%** during that
period

Figure 1: UN Road Safety Targetsⁱⁱⁱ



Figure 2: Voluntary performance targets for road safety risk factors and service delivery mechanisms^{iv}

In India, rapid economic growth and rising income levels have led to a sharp increase in vehicle ownership, with millions of vehicles being added annually. Two-wheelers and passenger vehicles achieved robust sales volumes of 21.4 million^v and 4.7 million^{vi} units respectively in FY 26, reflecting year-on-year growth of 13.4 percent and 13 percent. Other vehicle categories also recorded healthy double-digit growth during the period. This growth in vehicle population has placed additional demand on road infrastructure, which is still evolving in terms of capacity, quality, and safety design. Compounding these are behavioural and systemic challenges such as over-speeding, non-compliance with traffic regulations, inadequate driver training, mixed traffic conditions, and limited enforcement coverage, all of which contribute to higher accident risks.

India's Road Safety Landscape

India witnessed more than 4.8 lakh road accidents and 1.8 lakh fatalities due to road accidents in 2024^{vii}, representing a substantial share of global deaths even though overall vehicle ownership remains comparatively lower than in advanced economies. Early estimates from MoRTH indicate that road accident fatalities in India may have reached approximately 1.7 lakh in 2025. Major urban centers such as New Delhi also recorded a 4.2 percent increase in road accident fatalities compared to 2024^{viii}, underscoring the continued need for comprehensive, sustained, and multi-stakeholder road safety interventions.

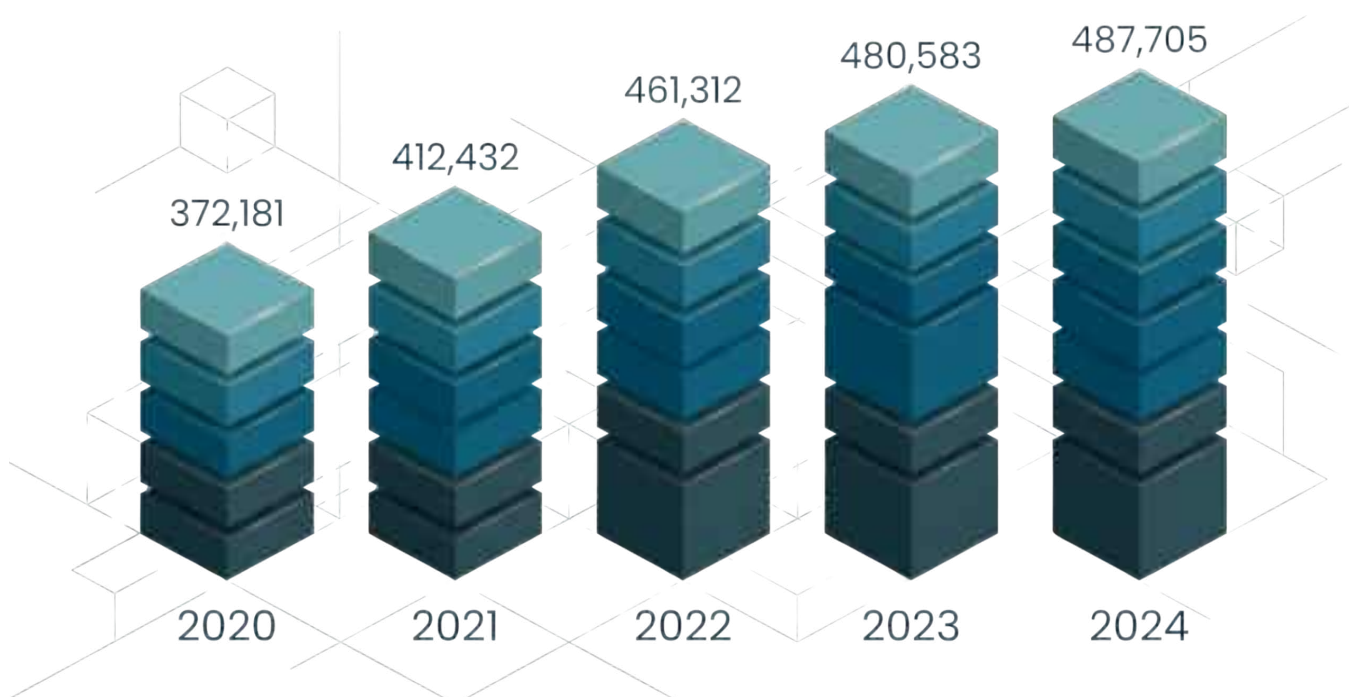


Figure 3: Road Accidents in India, 2020 to 2024

Global Technologies for Road Safety

As road safety increasingly becomes both a technology-driven challenge and opportunity, countries across the world are deploying advanced digital and vehicle technologies to build safer mobility ecosystems and reduce fatalities. Technologies such as Vehicle-to-Everything (V2X) communication, Advanced Driver Assistance Systems (ADAS), Intelligent Traffic Management Systems (ITMS), AI-enabled surveillance, automated enforcement, connected emergency response systems, and predictive traffic analytics are being adopted at scale to improve road user safety and traffic efficiency.

Globally, countries are integrating these technologies through a combination of safer vehicle standards, intelligent infrastructure, and data-driven governance. Sweden, widely regarded as one of the safest countries in the world for road safety, pioneered the “Vision Zero” approach, combining intelligent road design, speed management systems, connected infrastructure, and advanced vehicle safety technologies to systematically reduce fatalities. Similarly, Japan has deployed ITS and V2X systems extensively for collision avoidance and pedestrian safety, while Singapore leverages AI-enabled traffic management and smart surveillance for real-time traffic monitoring and enforcement. The European Union has also mandated several ADAS features such as lane departure warning, autonomous emergency braking, and driver monitoring systems in new vehicles^{ix}.

These global developments highlight the increasing role of integrated digital technologies in creating safer, smarter, and more responsive transportation ecosystems.

Some of the key emerging technologies transforming global road safety ecosystems and mobility management frameworks have been highlighted below.

Vehicle to Everything (V2X)

V2X technology enables real-time communication between vehicles and their surrounding environment, other vehicles (V2V), road infrastructure (V2I), pedestrians (V2P), and networks (V2N).

By exchanging information about speed, position, traffic signal status, road hazards, and emergency braking events, V2X creates a cooperative safety layer that extends far beyond what onboard sensors can detect. Connected safety applications enabled through V2X have the potential to reduce non-impaired driving crashes, and India is making encouraging early strides toward V2X deployment.



Figure 4: V2X technology^x

Advanced Driver Assistance Systems (ADAS)

ADAS encompasses a broad suite of vehicle-mounted electronic systems that use sensors, cameras, radar, and AI to detect potential hazards and assist or take over from the driver to prevent crashes. Key features include Automatic Emergency Braking (AEB), Lane Departure Warning (LDW), Lane Keeping Assist (LKA), Adaptive Cruise Control (ACC), Blind Spot Monitoring (BSM), Driver Drowsiness Detection, and Forward Collision Warning, and India is progressively mandating and embracing these technologies across vehicle segments.

Intelligent Traffic Management Systems (ITMS) & AI Surveillance

ITMS integrates multiple technologies like CCTV surveillance, automatic number plate recognition (ANPR), speed detection cameras, red-light violation detection (RLVD), variable message signs, and centralised command centres to actively manage traffic flow and enforce safety norms in real time. India is witnessing a significant and accelerating rollout of ITMS infrastructure across its cities, with major urban centres including Delhi, Bengaluru, Hyderabad,

Pune, and Lucknow having established sophisticated traffic management command centres that monitor thousands of junctions in real time. State governments are increasingly integrating ITMS deployments with their road safety action plans, and the Smart Cities Mission has further catalysed investment in connected traffic management infrastructure across tier-two cities. The convergence of AI-powered analytics with ITMS platforms is enabling predictive traffic management, faster incident detection, and more targeted enforcement, marking a meaningful step forward in India's journey toward data-driven urban mobility governance.

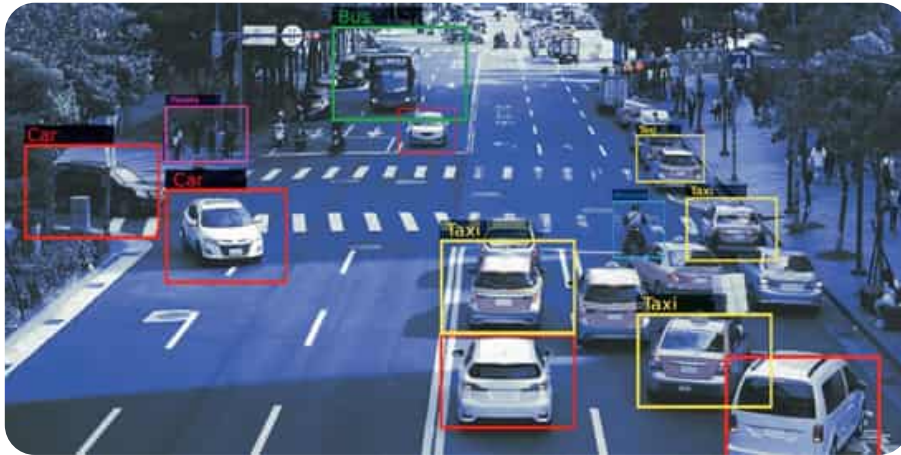


Figure 5: ITMS systems in operations^{xi}

Electronic Data Recording & eDAR Systems

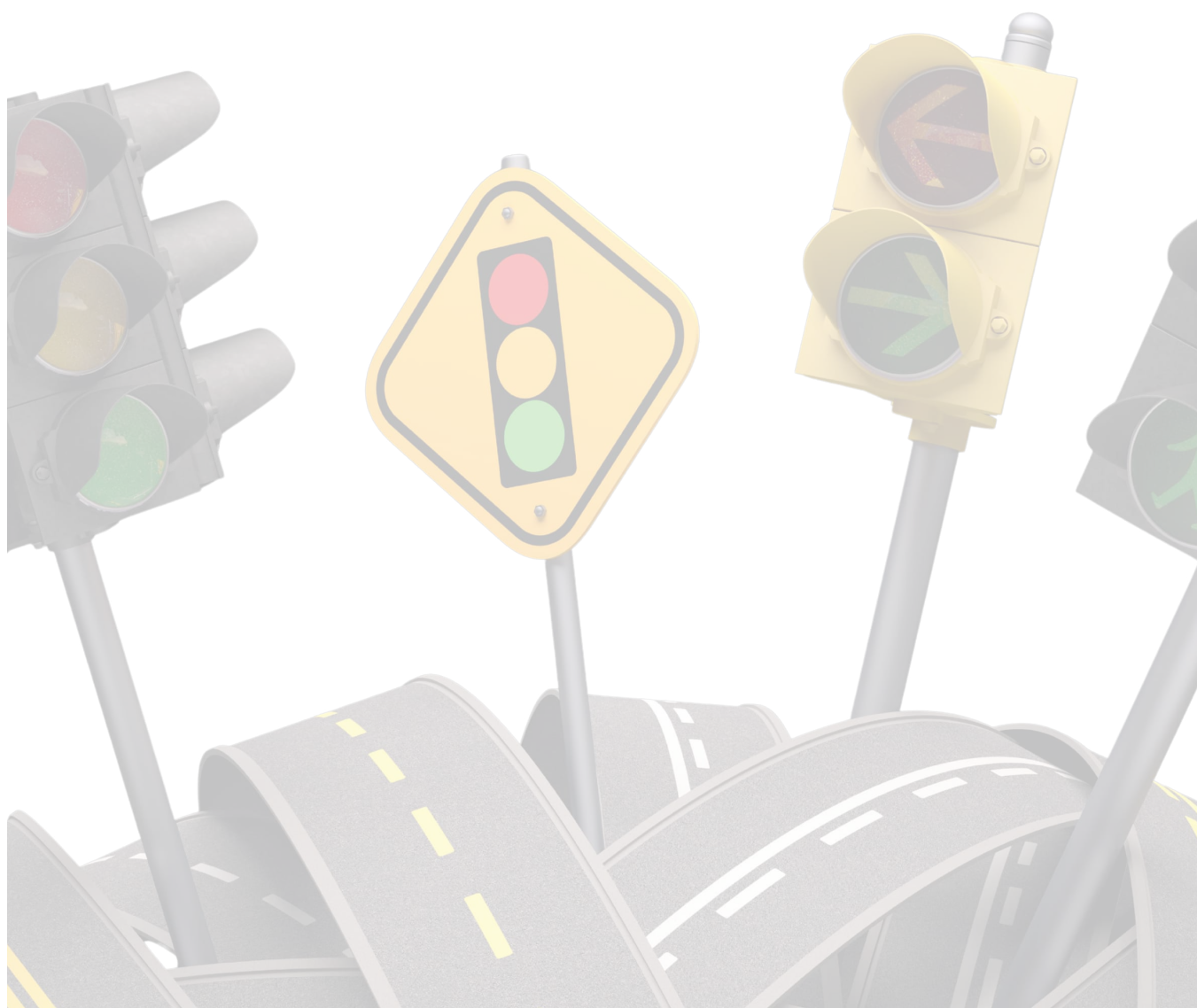
Event Data Recorders (EDRs) and Electronic Detailed Accident Reporting (EDAR) systems capture objective data about vehicle behaviour before, during, and after a crash, enabling evidence-based analysis of accident causation, with India's eDAR system now being progressively deployed across states to digitise and strengthen crash data collection.

Autonomous Vehicles (AVs) & Level 3+ Automation

Autonomous Vehicle (AV) technology enables vehicles to operate with limited human intervention using sensors, radar, LiDAR, AI, and advanced computing systems. Level 3 autonomous driving systems are already being commercially deployed in countries such as Germany, Japan, and China, while the US and UK are advancing regulatory frameworks for broader testing. AV technologies have strong potential to reduce crashes caused by human error, although challenges related to infrastructure, mixed-traffic conditions, weather reliability, and liability frameworks remain significant.

These technologies have significant potential to improve road safety outcomes by reducing human error, enhancing real-time monitoring, strengthening enforcement efficiency, and enabling faster, data-driven responses across increasingly complex and high-density mobility ecosystems.

In India, road safety is increasingly being pursued as a national priority through a combination of central and state-level interventions focused on safer infrastructure, technology-enabled enforcement, emergency response systems, institutional coordination, and behavioural awareness. Alongside national initiatives led by the MoRTH, several states have been developing localized road safety policies and targeted interventions aligned with their unique mobility patterns, geographic conditions, and accident risk profiles, contributing toward a more structured and data-driven road safety ecosystem across the country.



Madhya Pradesh



Madhya Pradesh is India's second-largest state by area, spanning more than 3 lakh sq. km., a vast landlocked expanse at the geographic heart of the country that gives it its name as the "Heart of India." Its population in 2026 is projected at approximately 9 crores, making it the fifth-most populous state in the country and accounting for over 6% of India's total population, a demographic scale comparable to a mid-sized European nation. With a population density of approximately 300 people per square kilometre, the state presents a distinctly dispersed settlement pattern that shapes both mobility demand and road safety delivery. Of this population, nearly 72% resides in rural areas, while the remaining 28% is concentrated in urban centres, led by Indore, Bhopal, Jabalpur, and Gwalior. The state's registered vehicle fleet has grown rapidly in recent years reaching more than 26 million units in 2026^{xii}, reflecting rising rural and peri-urban motorisation that is outpacing the pace of road safety infrastructure upgrades.

Madhya Pradesh consistently ranks among the states with the highest number of road accidents and fatalities in India, driven by its expansive geography and extensive network of National and State Highways. The state witnessed more than 56,000 road accidents in 2024^{xiii}.

The state serves as a critical transit corridor connecting North, West, and Central India, resulting in substantial freight and passenger vehicle movement, particularly across high-speed intercity routes. In 2024, the state recorded 14,791 road fatalities, with the associated economic impact estimated at over ₹38,000 crore annually. Of the total fatalities, nearly 32% occurred on National Highways and 22% on State Highways, while the remaining fatalities were reported across other categories of roads within the state^{xiv}.

Madhya Pradesh records an average of 33 road accidents daily, resulting in 10–11 deaths every day on national highways^{xv}. Research by IIT Madras on road accidents in MP revealed that approximately 75% of two-wheeler riders who died were reportedly not wearing helmets^{xvi}. A large share of accidents in the state is attributed to over-speeding and unsafe driving practices, especially on highways where enforcement coverage and compliance levels vary. The prevalence of two-wheelers, combined with low adherence to helmet and seatbelt usage, further contributes to high fatality rates. Additionally, mixed traffic conditions, inadequate lane discipline, and limited access control on certain highway stretches increase both the likelihood and severity of accidents.

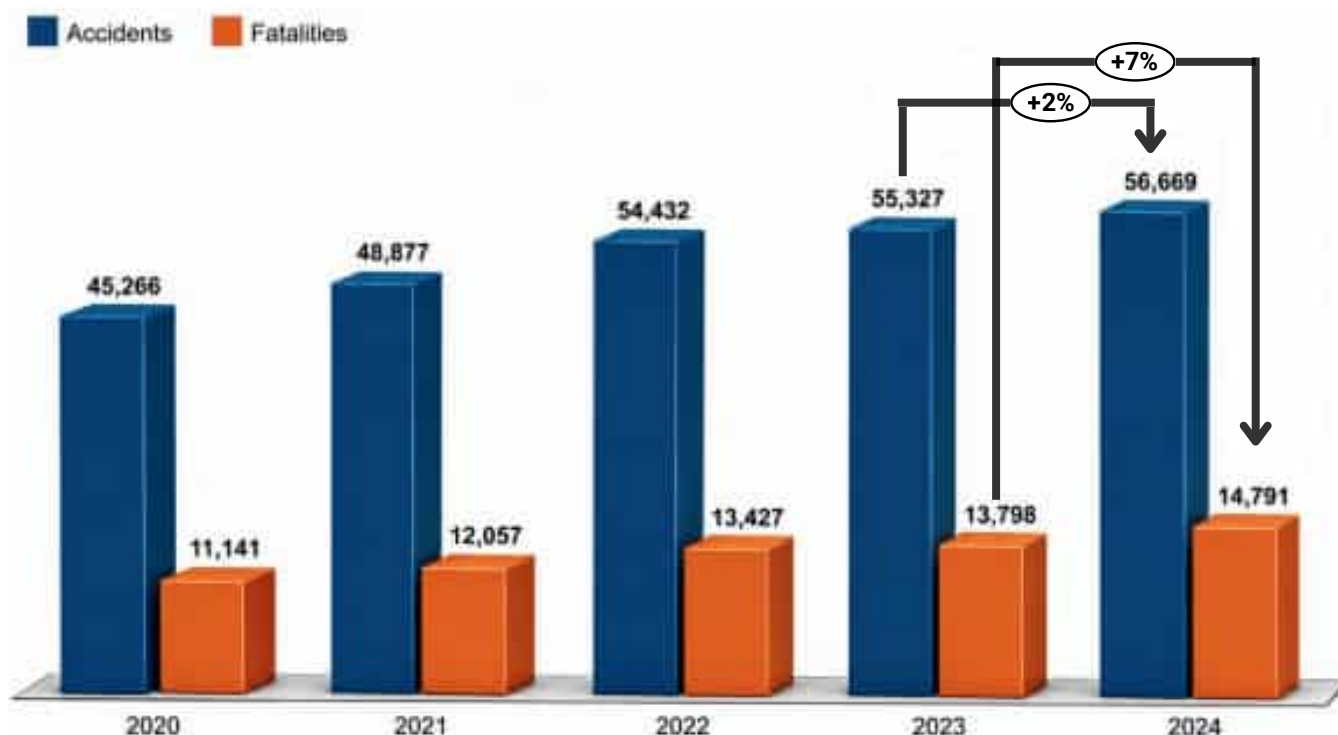


Figure 6: Road accidents and fatalities in Madhya Pradesh (2020-2024)

Despite ongoing efforts, the fatality rate per accident remains relatively high, indicating that while accident prevention measures are improving, crash severity and post-crash outcomes continue to be key challenges.

The state government has been implementing multiple road safety interventions, with the World Bank-supported road safety programme emerging as one of Madhya Pradesh's most significant institutional and infrastructure-focused initiatives.

MP Road Safety Integrated Action Programme

Madhya Pradesh has been at the forefront of evidence-based road safety reform in India, backed by the World Bank's India State Support Program for Road Safety. Madhya Pradesh was among the first six states in which the Integrated Road Accident Database (iRAD), developed by IIT Madras with Rs. 258 crores in World Bank financial assistance, was piloted and operationalised. The state has established a dedicated Road Safety Lead Agency under the Transport Department, which coordinates with Police, PWD, Health, and Education departments. Between October 2023 and March 2024, a comprehensive pilot programme in select districts resulted in a nearly 70% reduction in road accidents and an 80% decline in pedestrian-related accidents in intervention zones, demonstrating the measurable impact of targeted, community-driven road safety management^{xvii}.

Advancing Road Safety through the 5E Framework

Madhya Pradesh has been strengthening its road safety ecosystem through targeted interventions across the 5Es, Engineering, Enforcement, Emergency Care, Education and Evaluation, with a growing focus on institutional coordination and data-driven decision-making.

Engineering:

The state has undertaken a structured approach toward black spot identification and rectification, particularly on high-risk highway corridors. Under national programs led by the Ministry of Road Transport & Highways (MoRTH), using GIS mapping, several black spots were identified on highways in Madhya Pradesh, such as NH-44 between kilometres 200 and 220 and SH-27 near Indore Junction^{xviii}.

Additionally, the state has implemented road safety audits across different project stages to ensure adherence to safety standards. Notably, as highlighted by the World Bank, Madhya Pradesh has adopted a corridor-based safety approach, focusing on engineering interventions across entire stretches rather than isolated points, which has shown measurable improvements in reducing crash risks.

Location (Black Spot)	RT (Road Type)	TA (Total Accidents)	Fatalities	Key Factors (Major Contributing Factors)
NH-44 (Km 200-220)	NH	1,250	410	Over-speeding, Poor Lighting
SH-27 (Indore Junction)	SH	900	250	Traffic Congestion, Driver Distraction

RT = Road Type NH = National Highway SH = State Highway TA = Total Accidents

Figure 7: Major Blackspots in Madhya Pradesh (2016-2023)



Figure 8: Black spot identification in Madhya Pradesh

Enforcement:

Enforcement efforts in Madhya Pradesh have been strengthened through the implementation of the Motor Vehicles (Amendment) Act, 2019, along with the increasing use of technology-based systems such as speed cameras, CCTV surveillance, and e-challan mechanisms. These measures have helped improve monitoring of violations and reduce dependence on manual enforcement. In 2025, Bhopal Traffic Police launched a state-level road safety enforcement drive from September 8 to 22, in line with directives from the Supreme Court Committee on Road Safety. The campaign aimed to curb rising road accidents and fatalities through stricter enforcement of traffic regulations across Madhya Pradesh. On the first day of the drive, enforcement actions were intensified, resulting in fines totalling ₹76,900.



Figure 9: Road safety enforcement, Bhopal

At the same time, the state has focused on building the capacity of enforcement personnel. Training programs have been conducted to equip police and transport officials with practical road safety and traffic management skills. As of 2024, 175 officials have been trained, including 25 Master Trainers, who are expected to further support training across teams^{xix}. This effort is helping improve the effectiveness and consistency of enforcement on the ground.

Emergency Care:

Recognizing the high severity of road accidents, Madhya Pradesh has strengthened its post-crash response systems. Supported by the World Bank, the state has focused on addressing gaps in trauma care, especially in geographically dispersed regions such as Dhar. Dedicated interventions have been undertaken to improve response times and ensure timely medical access in high-risk corridors. Under these efforts, five advanced emergency units have been set up in Dhar, with similar upgrades in Datia and Indore. Around 200 community volunteers have been trained in first aid and CPR, while over 1,000 healthcare staff have received trauma care training^{xx}. Hospitals have also been equipped with specialized post-crash equipment to improve treatment during the critical “golden hour.”



Figure 10: Emergency care training program in Madhya Pradesh

Education:

Madhya Pradesh continues to focus on behavioural change through sustained awareness and outreach initiatives, with emphasis on improving compliance with helmet and seatbelt usage, safe driving practices, and adherence to traffic regulations. These efforts are aligned with national programs such as Road Safety Month and extend across key target groups, including school students, college youth, and commercial drivers. In parallel, capacity-building initiatives are being supported through driver training institutes and refresher programs to enhance overall driving standards.

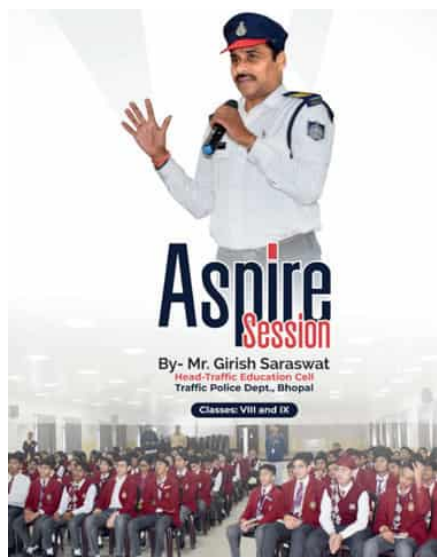


Figure 11: Road safety awareness initiatives in Madhya Pradesh

The state has also implemented a comprehensive road safety awareness program in collaboration with non-governmental and community-based organizations. As part of this effort, nearly 100 Road Safety Working Groups, comprising around 600 members, have been established to drive localized engagement^{xxi}. Campaigns address critical risk factors such as over-speeding, helmet and seatbelt usage, distracted driving, and drunk driving, while also promoting awareness of the Good Samaritan Law. Community outreach is further strengthened through innovative approaches such as street plays, workshops, and school-based programs, ensuring wider dissemination and impact at the grassroots level.

Evaluation (Data & Governance):

Madhya Pradesh is an active participant in the Integrated Road Accident Database (iRAD) initiative, enabling real-time data capture and analysis across police, transport, and health departments. This supports evidence-based policymaking and targeted interventions. The state has significantly progressed in strengthening institutional frameworks and inter-agency coordination, including the role of State and District Road Safety Committees in monitoring implementation and driving accountability.



Figure 12: Virtual sessions on iRAD Applications by Madhya Pradesh Police^{xxii}

Madhya Pradesh is making steady progress in improving road safety outcomes through a balanced focus on engineering upgrades, technology-enabled enforcement, and strengthened emergency response systems. With growing institutional capacity and data-driven governance, the state is well positioned to further reduce fatalities and build a safer, more resilient road transport ecosystem.

Odisha



Odisha is India's eighth-largest state by area, covering 1.5 lakh sq. km., and the eleventh largest by population, occupying the eastern seaboard of the subcontinent with 485 km of coastline along the Bay of Bengal. Its population in 2026 is projected to be more than 4.5 crore, having grown steadily over the past decade at a pace below the national average, a sign of demographic stabilization even as mobility demand continues to rise. With a population density of approximately 303 people per square kilometre, the state's settlement pattern reflects a predominantly dispersed rural geography interspersed with ecologically sensitive zones, tribal hinterlands, and coastal stretches that present distinct road safety management challenges. The state remains predominantly rural, with over 83% of its population living in villages, and urbanization concentrated largely in the Bhubaneswar-Cuttack corridor. The total registered vehicle fleet in Odisha stands at approximately 13 million units in 2026, a figure that, while modest in absolute terms, masks a rapidly accelerating pace of motorisation in peri-urban and district-level markets that is placing growing pressure on road infrastructure and safety systems across the state.

Odisha has been steadily strengthening its road safety ecosystem, supported by a combination of policy focus, institutional coordination, and targeted interventions across high-risk corridors. The state recorded 12,375 road accidents in 2024, with more than 6,000 fatalities^{xxiii} - a key concern, particularly on National Highways and major arterial routes that carry a significant share of freight and passenger movement.

A considerable proportion of accidents in Odisha is linked to over-speeding, accounting for ~60% of total crashes in 2024, along with behavioural factors such as low helmet and seatbelt compliance, especially among two-wheeler users. Vulnerable road users, including pedestrians and cyclists, also constitute a notable share of fatalities, particularly in semi-urban and rural areas. However, the state has shown encouraging signs of stabilization in accident growth rates, supported by sustained enforcement and awareness initiatives.

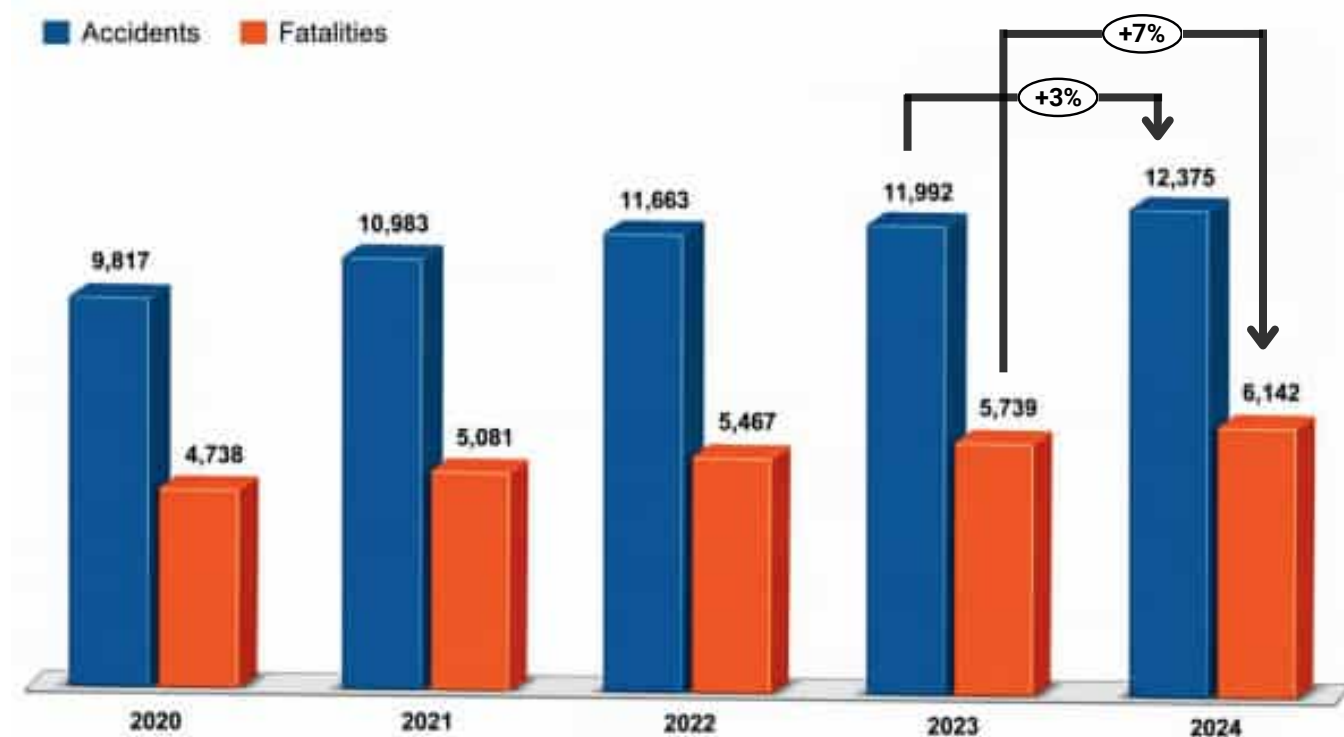


Figure 13: Road accidents and fatalities in Odisha (2020-2024)

The Odisha government has been strengthening road safety governance through the Odisha State Road Policy, 2025 and community-focused initiatives such as the Mukhyamantri Sadak Suraksha Yojana Samman.

Odisha State Road Policy, 2025

In a landmark decision in March 2025, the Odisha Cabinet approved the Odisha State Road Policy, 2025, the state's first comprehensive road sector governance framework. The policy mandates a structured institutional arrangement for road safety, including inter-departmental coordination mechanisms and mandatory road safety audits. A 'Comprehensive Online Bridge Information System (BIS)' is being developed to maintain live data on all bridges, which will be evaluated annually using advanced engineering techniques. The policy also establishes the Odisha Road Asset Management System (ORAMS) to ensure systematic maintenance and monitoring of road safety assets^{xxiv}.

Mukhyamantri Sadak Suraksha Yojana Samman

Chief Minister Mohan Charan Majhi launched the 'Mukhyamantri Sadak Suraksha Yojana Samman' in January 2026, during the National Road Safety Month, marking a transformative moment by formally embedding road safety within Odisha's good governance framework. Under this scheme, all districts, educational institutions, and private institutions are evaluated and honoured based on the concrete road safety steps they take. The state also introduced an alert bell provision at the accident-prone Kalinga Ghat as a symbolic and functional safety intervention^{xxv}.

Advancing Road Safety through the 5E Framework

Odisha is making steady progress in enhancing road safety outcomes through a balanced focus on safer road infrastructure, technology-driven enforcement, and strengthened post-crash care systems. With increasing institutional coordination, improved data-led decision-making, and sustained stakeholder engagement, the state is well positioned to further reduce road fatalities and build a safer, more resilient transport ecosystem.

Engineering:

Odisha has adopted a corridor-based approach to road safety, focusing on the systematic identification and rectification of black spots across National and State Highways. Several high-risk locations have been improved through engineering interventions such as enhanced signage, road markings, crash barriers, junction redesign, and traffic calming measures.

Road safety audits are also being increasingly institutionalized across project lifecycles to ensure compliance with safety standards and integration of safer road design principles. The state has additionally prioritized pedestrian infrastructure and safer urban road planning in accident-prone areas. In 2023, the Ganjam administration identified 26 locations across the district as black spots and accident-prone zones based on accident severity and fatality trends. Key ghat sections and highway stretches, including Badaghati, Taptapani Ghati, Balakumari Ghati, Chhatrapur, and parts of Ganjam district along National Highways, were identified for focused safety interventions and monitoring^{xxvi}.

Enforcement:



Figure 14: Implementation of Intelligent Enforcement Management System in Odisha

The state has strengthened enforcement through the implementation of the Motor Vehicles (Amendment) Act, 2019, complemented by the deployment of technology such as speed detection systems, CCTV surveillance, and e-challan platforms. In 2024, Odisha implemented the Intelligent Enforcement Management System (IEMS) to automatically identify traffic violators using cameras, radar, and other advanced technologies. In the first phase, 548 km of state and national highways were brought under IEMS, with an investment of Rs 88 crore planned over the next five years. Key corridors covered under this phase include Panikoili–Rameshwar, Bhubaneswar–Puri, Puri–Konark, and Konark–Pipili^{xxvii}.

Emergency Care:

Odisha has made significant progress in strengthening its post-crash emergency response ecosystem, with a strong focus on reducing fatalities during the critical “golden hour.” The state operates an integrated emergency response system, supported by improved deployment strategies along high-risk corridors, and by January 2026, the service had provided free and timely medical assistance to over 1.5 crore people since its launch in 2013^{xxviii}. Trauma care facilities at district hospitals are being upgraded through investments in medical infrastructure, equipment, and healthcare personnel training, while first responder programs for community volunteers and police personnel are being expanded to improve immediate accident response. Further reinforcing these efforts, the Odisha government launched the “Zero Fatality Fortnight” campaign in November 2025, combining stricter enforcement, awareness initiatives, and enhanced emergency preparedness, which contributed to a 33.5% reduction in road accident fatalities during the campaign period^{xxix}.

Education:



Behavioural change remains a central pillar of Odisha’s road safety strategy, with the state undertaking sustained awareness and capacity-building initiatives targeting high-risk groups such as two-wheeler riders, commercial drivers, and youth. Key interventions include school and college outreach programs, driver training modules, and mass media campaigns promoting helmet use, seatbelt compliance, and responsible driving behaviour.

Figure 15: Three-day training Programme by Commerce & Transport
Department of the Design Thinking Approach for Safer Roads

Community engagement is further strengthened through partnerships with NGOs and local bodies to enhance grassroots-level awareness and participation.

In parallel, Odisha is also focusing on improving technical and institutional capacity within the road safety ecosystem. During National Road Safety Month in January, the Commerce & Transport Department of the Government of Odisha organized a three-day specialized training programme on “Design Thinking for Safer Roads” for engineers from Road Owning Agencies. Conducted with technical support from RBG Labs and IIT Madras, the programme saw participation from nearly 50 engineers from NHAI and PW&D and aimed to strengthen engineering capabilities through the integration of design thinking principles, global road safety practices, and data-driven approaches into national and state road infrastructure planning^{xxx}.

Evaluation (Data & Governance):

Odisha is actively leveraging data-driven approaches to strengthen road safety governance. The state is part of the Integrated Road Accident Database (iRAD) initiative, enabling better data collection, analysis, and inter-departmental coordination. State and District Road Safety Committees play a key role in monitoring implementation and ensuring accountability. The state also signed a MoU with IIT Madras to leverage their expertise in road safety and implement IT, communication and education strategies to enhance road safety in the state. Under this initiative the state has implemented an integrated road safety dashboard with an aim to strengthen data driven planning, monitoring and accountability across all road safety stakeholders.



Figure 16: MoU between IIT Madras and Government of Odisha

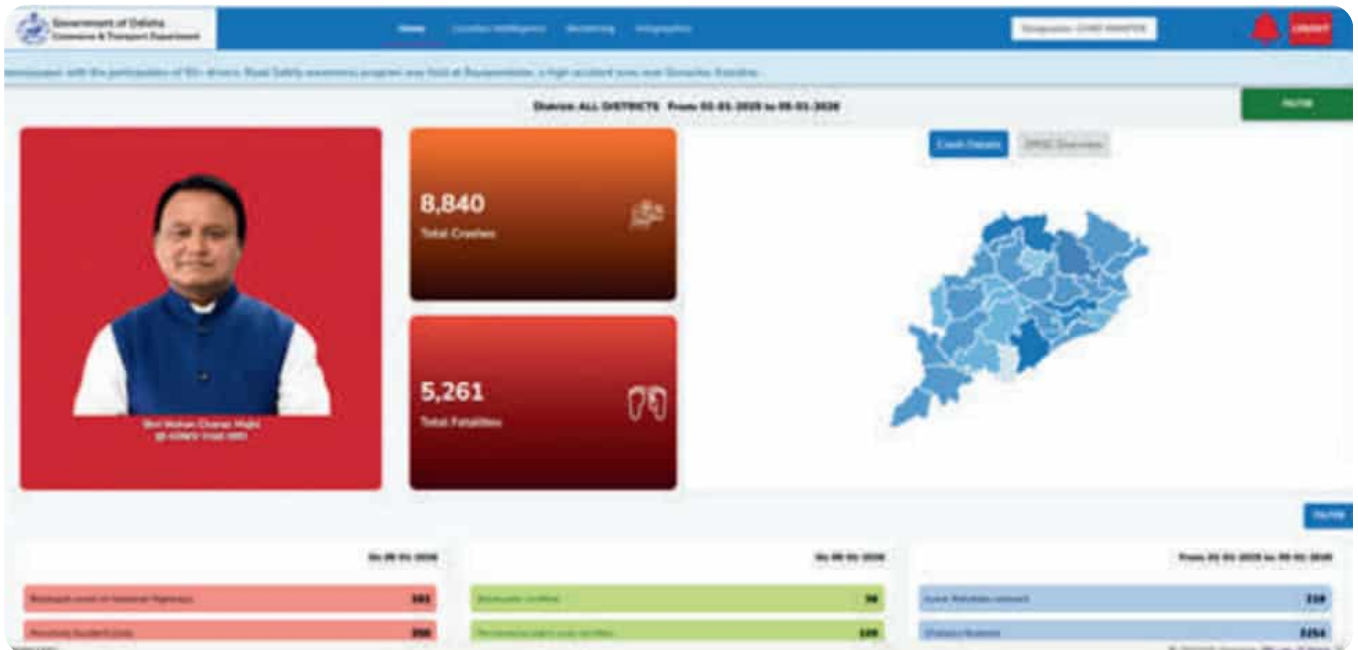


Figure 17: Integrated Road Safety Dashboard implemented by Govt. of Odisha and IIT Madras

Odisha is demonstrating consistent progress in strengthening its road safety ecosystem through coordinated efforts across engineering, enforcement, and emergency care. With increasing adoption of data-driven strategies and community-focused interventions, the state is well positioned to further reduce fatalities and advance toward a safer, more resilient and sustainable road transport environment.

Bihar



Bihar covers an area of more than 94,000 sq. km., the twelfth largest state by area, yet packs within it a population of over 13 crore by mid-2026, making it India's second most populous state and by far its most densely inhabited, with a population density of 1,388 persons per sq. km, nearly four times the national average and among the highest of any large state in the world. This extreme density, compressed into a relatively modest land area, creates a mobility environment unlike virtually any other Indian state, with intense pedestrian and mixed-traffic pressure even on rural roads. Nearly 83% of Bihar's population is rural, and almost 58% is below 25 years of age, the highest youth share of any state in India, producing a large and fast-growing cohort of first-time vehicle users who are statistically the most accident-prone demographic. Against this backdrop, the state's registered vehicle fleet stands at approximately 16 million units in 2026, a figure that understates the true scale of mobility pressure given the large volume of unregistered and informal vehicles operating across rural districts, and one that is growing rapidly as rising incomes and expanding road connectivity bring first-time vehicle ownership within reach of an increasingly large share of Bihar's young population.

Bihar remains among the states with high road fatality rates in India, driven by rising traffic density, expanding mobility demand, and infrastructure-related risks. The state recorded approximately 11,610 road accidents in 2024, resulting in more than 9,000 fatalities. Over-speeding continues to be the leading cause of accidents, accounting for nearly 80% of total crashes in 2024.

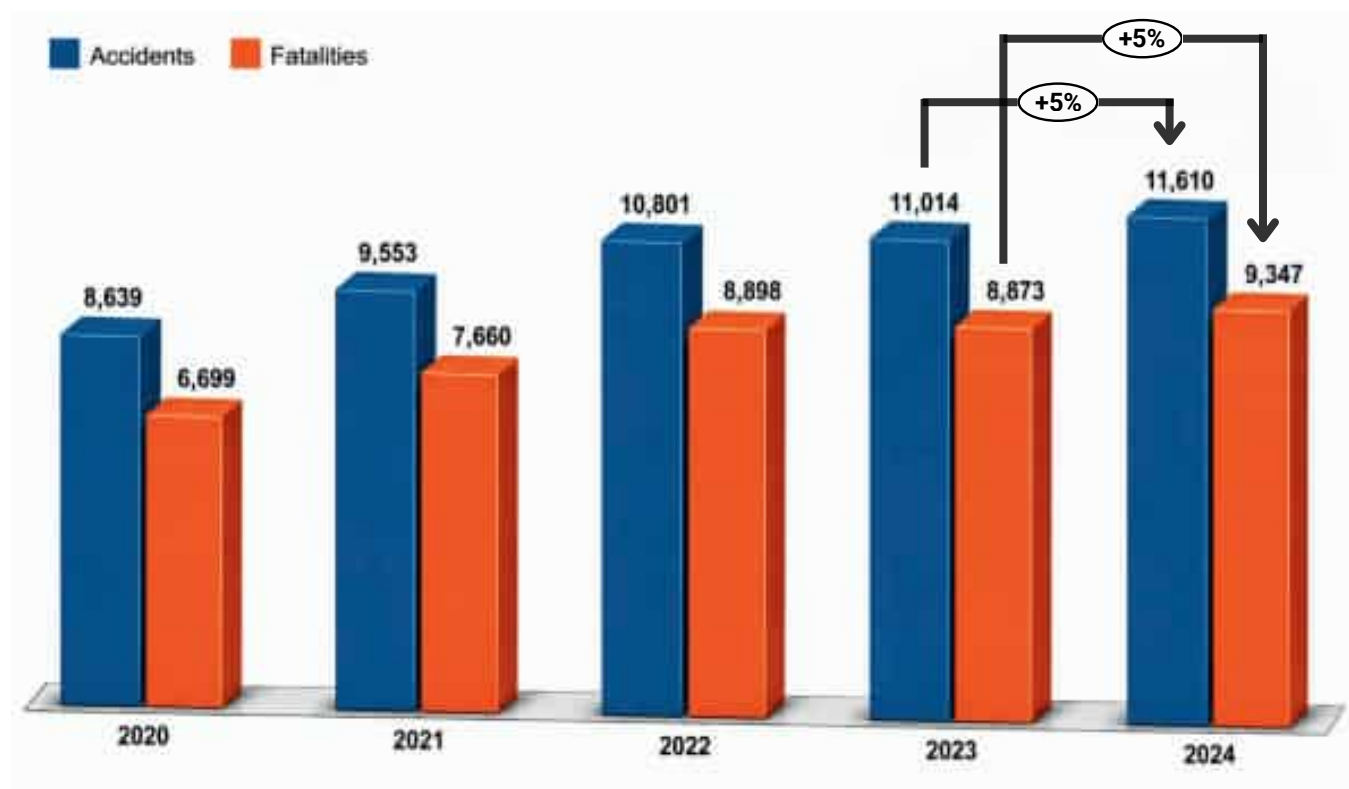


Figure 18: Road Accident and Fatalities in Bihar (2020-2024)

In response, the Government of Bihar has strengthened its institutional, infrastructure, and policy framework to improve road safety outcomes across both urban and rural regions.

Bihar State Road Safety Council & State Highway Safety Programme

The Bihar State Road Safety Council functions as the apex body coordinating road safety initiatives across transport, police, health, and infrastructure departments. Under the ADB-supported Bihar State Highways Programme, India and ADB signed a USD 295 million loan agreement in 2023 to upgrade state highways across Bihar^{xxxi}.

The programme incorporates integrated safety measures such as crash barriers, rumble strips, reflective road markings, and safer junction designs. Implemented by Bihar State Road Development Corporation Ltd (BSRDCL), the initiative also supports road safety targets focused on reducing fatalities, strengthening enforcement, and improving highway safety standards across the state.

Mukhya Mantri Gramin Sadak Unnayan Yojana (MMGSUY)

The Mukhya Mantri Gramin Sadak Unnayan Yojana integrates road safety into Bihar's rural connectivity programme by mandating safety infrastructure across rural road projects. Key interventions include signage, zebra crossings near habitations, plantation within rights-of-way, and speed calming measures. Between 2024 and 2026, the state launched programme for construction of 909 bridges aimed at improving rural connectivity, enhancing road safety, and preventing disruptions caused by unsafe crossings and seasonal flooding. Safety provisions and maintenance obligations have been integrated into the long-term monitoring and maintenance contracts for these bridge projects^{xxxii}.

Advancing Road Safety through the 5E Framework

Bihar has been making efforts in strengthening its road safety ecosystem through the 5E framework.

Engineering:



Figure 19: Zebra crossing installations in Bihar

Bihar has adopted a targeted and data-driven engineering approach to strengthen road safety and improve high-risk transport infrastructure. By early 2026, the state had identified 285 black spots, of which 227 had been rectified, while the remaining locations were under various stages of improvement^{xxxiii}. These interventions reflect a focused effort to address accident-prone corridors through a combination of short-term corrective measures and long-term infrastructure upgrades.

In parallel, Bihar has prioritized pedestrian safety through the large-scale development of zebra crossings, particularly around accident-prone stretches, schools, hospitals, and high-footfall areas. As part of this initiative, the state planned the construction and marking of nearly 14,000 zebra crossings based on a comprehensive identification exercise led by the Transport Department and the Bihar Road Safety Council, involving inputs from multiple agencies. The Rural Works Department proposed the highest number of locations at 12,858 sites, followed by the Road Construction Department with 342 locations and the National Highways Authority of India (NHAI) with 88 locations. In addition, around 9,500 zebra crossings had already been completed during earlier phases of implementation by February 2026^{xxxiv}.

Enforcement:



Figure 20: Road safety technology initiatives to improve enforcement

Bihar is strengthening its road safety enforcement ecosystem through the deployment of an integrated AI-enabled traffic management system aimed at improving compliance, monitoring, and incident detection across the state. The initiative includes the establishment of a centralized traffic management centre at the state level, supported by district-level observation and monitoring centres to enable coordinated enforcement and real-time traffic management. The system is designed to integrate advanced technologies such as AI-enabled surveillance cameras, automated e-challan systems, adaptive traffic signalling, and intelligent analytics platforms to support data-driven enforcement.

As part of the initiative, the Bihar state cabinet approved the installation of AI-enabled cameras across critical intersections and high-traffic corridors in major cities including Patna, Gaya, Bhagalpur, Muzaffarpur, and Darbhanga. These systems are expected to detect key violations such as over-speeding, red-light jumping, wrong-side driving, and non-compliance with helmet regulations through real-time video analytics, enabling automated issuance of e-challans and reducing dependence on manual enforcement. More than 1,000 cameras are planned for deployment in the initial phase and will be integrated with a centralized command-and-control infrastructure. The platform is also expected to support vehicle tracking and e-way bill verification across highways, improving transparency, enforcement efficiency, and monitoring of illegal transport activities^{xxxv}.

Emergency Care:

Recognizing the high incidence of road accidents and the importance of timely post-crash response, Bihar has undertaken several initiatives to strengthen its emergency care ecosystem. To enhance accessibility and reduce accident-related fatalities, Bihar has integrated private ambulance services into its emergency response framework. In January 2026, the government has also developed a dedicated trauma care network by designating 55 hospitals as trauma centres for the treatment of accident victims. Of these, 10 hospitals have been classified as Level II trauma centres (more than 200 beds and a dedicated 20 bed trauma unit), 35 as Level III trauma centres (at least 100 beds and 10 dedicated beds in the trauma unit), and 10 as integrated trauma and emergency service facilities, strengthening the state's capacity to provide specialized emergency care across regions^{xxxvi}. The Transport Department has additionally introduced a scheme providing free medical treatment of up to ₹1.5 lakh for road accident victims at state-run emergency trauma centres, aimed at improving access to timely healthcare during the critical "golden hour"^{xxxvii}. Bihar has also operationalized the RaahVeer Scheme, under which individuals assisting accident victims in receiving medical attention within the golden hour are eligible for a reward of ₹25,000, encouraging greater public participation in emergency response.

Education:

The state has been actively undertaking initiatives to strengthen road safety awareness and promote safer driving behaviour across different stakeholder groups. Through the Institute of



Figure 21: Education and Awareness drives at Central University of South Bihar

Driving Training and Research (IDTR), Bihar, and the Transport Department, the state has been conducting specialized training programmes for government vehicle drivers focused on road safety regulations, traffic signs, and safe driving practices. These programmes are being implemented in phases to ensure that government drivers and other categories of drivers remain updated on evolving traffic rules, road safety standards, and operational protocols. In parallel, the Bihar Transport Department has been significantly expanding its road safety awareness outreach across the state, covering more than 77,000 schools through dedicated campaigns and educational programmes focused on traffic rules, responsible commuting behaviour, and pedestrian safety by February 2026^{xxxviii}. The state has been placing particular emphasis on students, recognizing youth as one of the most vulnerable groups affected by road accidents and aiming to build long-term behavioural change through early awareness and education. Through a combination of structured driver training, institutional awareness campaigns, and school-level engagement, Bihar has been working toward improving road user behaviour and strengthening compliance with road safety norms across the state.

Evaluation (Data & Governance):

Bihar has been strengthening its road safety evaluation and governance framework through greater adoption of data-driven monitoring systems and institutional coordination mechanisms.

The state has actively implemented the Integrated Road Accident Database (iRAD) platform to enable near real-time recording and integration of accident data across police, transport, and health departments. This has improved the state's ability to monitor accident trends, identify high-risk corridors and black spots, and support evidence-based planning of road safety interventions.

Bihar is steadily strengthening its road safety ecosystem through a combination of infrastructure upgrades, technology-enabled enforcement, improved emergency response systems, and data-driven governance mechanisms. With increasing institutional coordination and sustained focus on safer mobility practices, the state is building a more structured and proactive approach toward reducing road fatalities and improving overall road user safety across high-risk corridors and urban centres.



Assam



Assam covers an area of more than 78,400 sq. km. and is the largest northeastern state by population, while being second by area, serving as the critical land bridge to all Northeast India. Its population in 2026 is estimated to be about 3.7 crore, having grown from 3.12 crore in 2011 at a decadal growth rate broadly in line with the national average. The state's population density is more than 470 people per sq. km., marginally above the national average of 382, with 86% of the population residing in rural areas, one of the highest rural shares in India, spread across an ecologically varied terrain of river plains, hills, and forest zones. This dispersed settlement pattern across geographically complex and flood-prone landscapes creates a distinctly challenging operating environment for road infrastructure maintenance and emergency response delivery. The state's registered vehicle fleet has crossed 7 million units in 2026, a figure that reflects the rapid motorisation underway across Assam's expanding district towns and highway corridors, and one that carries heightened road safety significance given that Assam's roads serve not only its own population but also function as the primary arterial network connecting the remaining seven northeastern states to the rest of the country, making road safety management in Assam a matter of regional strategic importance.

Assam serves as the gateway to Northeast India and plays a critical role in regional passenger and freight movement, resulting in increasing traffic density across key national and state highway corridors. With expanding urbanization, rising vehicle ownership, and growing interstate connectivity, the state continues to face significant road safety challenges, particularly on high-speed highways and mixed-traffic urban corridors. Assam recorded more than 7,800 road accidents annually in 2024 causing 3,300 fatalities. Over-speeding, unsafe driving behaviour, and low compliance with helmet and seatbelt usage being the key contributors to fatalities. The fatalities in Assam are majorly concentrated in nine districts, including Guwahati City, Kamrup, Nagaon, Sonitpur, and Dibrugarh – accounting for nearly half of all fatalities^{xxxix}.

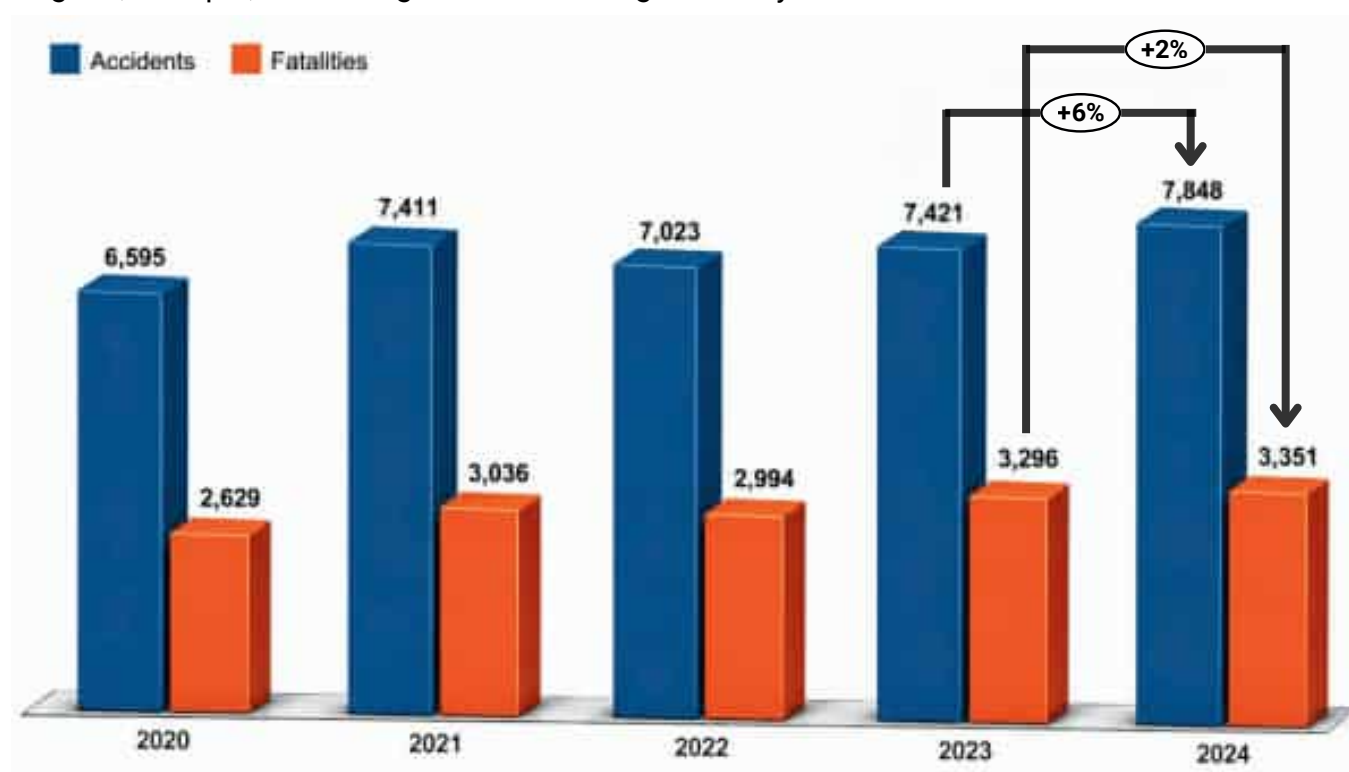


Figure 22: Road Accident and Fatalities in Assam (2020-2024)

Assam has been steadily strengthening its road safety ecosystem through targeted interventions focused on infrastructure improvement, technology-enabled enforcement, emergency response enhancement, and institutional coordination.

Assam Road Safety Action Plan

The Government of Assam developed the Assam Road Safety Action Plan (ARSAP) in alignment

with the UN Decade of Action for Road Safety, covering five pillars: Road Safety Management, Safer Roads, Safer Vehicles, Safer Road Users, and Emergency Care. Approved by the State Road Safety Council in 2015, the plan emphasizes institutional strengthening, enforcement, engineering improvements, and capacity building. Assam also notified its Road Safety Policy and proposed a State Road Safety Authority and dedicated Road Safety Fund to support long-term implementation and governance.

PM RAHAT / Cashless Treatment Scheme

Assam was among the first states to be designated as the pilot state for the PM RAHAT Scheme, formally known as the Cashless Treatment of Road Accident Victims Scheme, 2025. Under the scheme, road accident victims are eligible for cashless medical treatment of up to ₹1.5 lakh for a maximum period of seven days at designated hospitals. The scheme integrates MoRTH's eDAR platform with the National Health Authority's Transaction Management System, enabling faster claim processing, streamlined data transfer, and improved institutional coordination for emergency trauma care delivery^{xl}.

Advancing Road Safety through the 5E Framework

Assam has been adopting a multi-dimensional road safety approach aligned with the 5E framework. Through coordinated interventions across infrastructure, technology, institutional governance, and behavioural awareness, the state is steadily strengthening its capacity to address road safety challenges across urban centres and critical highway corridors.

Engineering:

Assam has been undertaking a structured approach toward improving road infrastructure safety through black spot identification, corridor improvement, and safer road engineering interventions. The state has identified multiple accident-prone locations along major corridors such as NH-27, NH-17, and key urban stretches in Guwahati for focused engineering upgrades. Corrective measures implemented across these locations include improved road signage, lane markings, installation of crash barriers, street lighting, pedestrian crossings, and junction redesign interventions. The state has also prioritized road safety audits across National Highway projects



Figure 23: Black spot identification in Assam

and urban infrastructure developments to improve compliance with road safety standards during planning and execution stages. In Guwahati, urban traffic engineering interventions such as channelization improvements, pedestrian infrastructure upgrades, and installation of traffic calming measures have been introduced at congested intersections and school zones to improve safety for vulnerable road users.

Enforcement:



Figure 24: Automatic Number Plate Recognition in Assam

Assam has been strengthening traffic enforcement through a combination of legislative measures and technology-enabled monitoring systems. The Assam Transport Department and Assam Police have increasingly adopted automated enforcement systems including CCTV surveillance, speed detection cameras, automatic number plate recognition (ANPR) systems, and e-challan platforms across major urban centers and high-risk highway corridors. Guwahati city has emerged as a major focus area for smart traffic enforcement initiatives, with AI-enabled sur-

-veillance systems deployed at several intersections to monitor violations and improve traffic management efficiency. The state has also conducted targeted enforcement drives against drunk driving, overloaded commercial vehicles, and unsafe public transport operations, particularly during festive periods and high-traffic seasons.

Emergency Care:

Recognizing the importance of timely post-crash response, Assam has been strengthening its emergency care and trauma response infrastructure across high-risk corridors and urban centres. The state operates emergency ambulance services through the nationwide emergency response network, enabling coordinated ambulance deployment and faster accident response across districts. Trauma care facilities are being upgraded in major government hospitals, to enhance treatment capacity and improve emergency medical response for road accident victims. In addition, the government has implemented a cashless treatment provision under which individuals injured in road accidents are eligible for medical treatment of up to ₹1.5 lakh for a period of up to seven days. The scheme covers accidents involving all categories of motor vehicles and applies across all categories of roads, thereby enabling clearer eligibility norms and improving access to timely trauma care services during the critical “golden hour.” Since May 2024, the government was able to provide cashless treatments to over “2600” road accident victims^{xli}.

Assam has also focused on strengthening emergency response along flood-prone and remote regions where accessibility challenges often delay medical intervention. First responder training programmes involving police personnel, civil defence volunteers, and healthcare workers are being conducted to improve stabilization and immediate care during the critical “golden hour.” In addition, the state has been promoting public awareness regarding Good Samaritan protections to encourage timely assistance to accident victims without fear of legal complications.

Education:

Behavioural change and public awareness continue to form a central component of Assam’s road safety strategy. The state has been conducting regular road safety campaigns targeting school students, college youth, commercial drivers, and two-wheeler riders to improve compliance with traffic regulations and safe driving practices. Awareness initiatives led by the Transport Department and Assam Police focus on key risk factors such as over-speeding, helmet usage, seatbelt compliance, distracted driving, and drunk driving. Assam has also been expanding driver training and testing infrastructure to improve licensing standards and strengthen driver competency. In urban centres such as Guwahati, educational institutions and civil society organizations have increasingly been engaged in promoting pedestrian safety and responsible road usage among youth populations.



Figure 25: Road Safety Awareness camp at Assam Don Bosco University



Figure 26: Accredited Driver Training Centres with Automated Driver Testing Tracks in Assam

Evaluation (Data & Governance):



Figure 27: Golaghat (Assam), Traffic enforcement dashboard, January 2026

Assam has been strengthening its road safety governance framework through improved data integration, inter-agency coordination, and institutional monitoring mechanisms. The state has

adopted the Integrated Road Accident Database (iRAD) platform to enable structured recording and analysis of accident data across police, transport, and health departments. This has supported improved identification of accident hotspots, monitoring of fatality trends, and prioritization of corrective interventions across districts and highway corridors. The State Road Safety Council and district-level road safety committees have been playing an active role in reviewing accident data, monitoring implementation progress, and coordinating interventions across departments. Assam has also been working toward improving data-driven enforcement and evidence-based planning through greater integration of analytics and digital monitoring systems. The institutional focus on coordinated governance and periodic review mechanisms is helping the state build a more structured and accountable road safety ecosystem.

Assam is steadily strengthening its road safety ecosystem through a balanced focus on safer infrastructure, technology-enabled enforcement, improved emergency response systems, and institutional coordination. With growing emphasis on data-driven governance and behavioural awareness, the state is building a more integrated and proactive approach toward reducing road fatalities and improving mobility safety across critical urban and highway corridors.

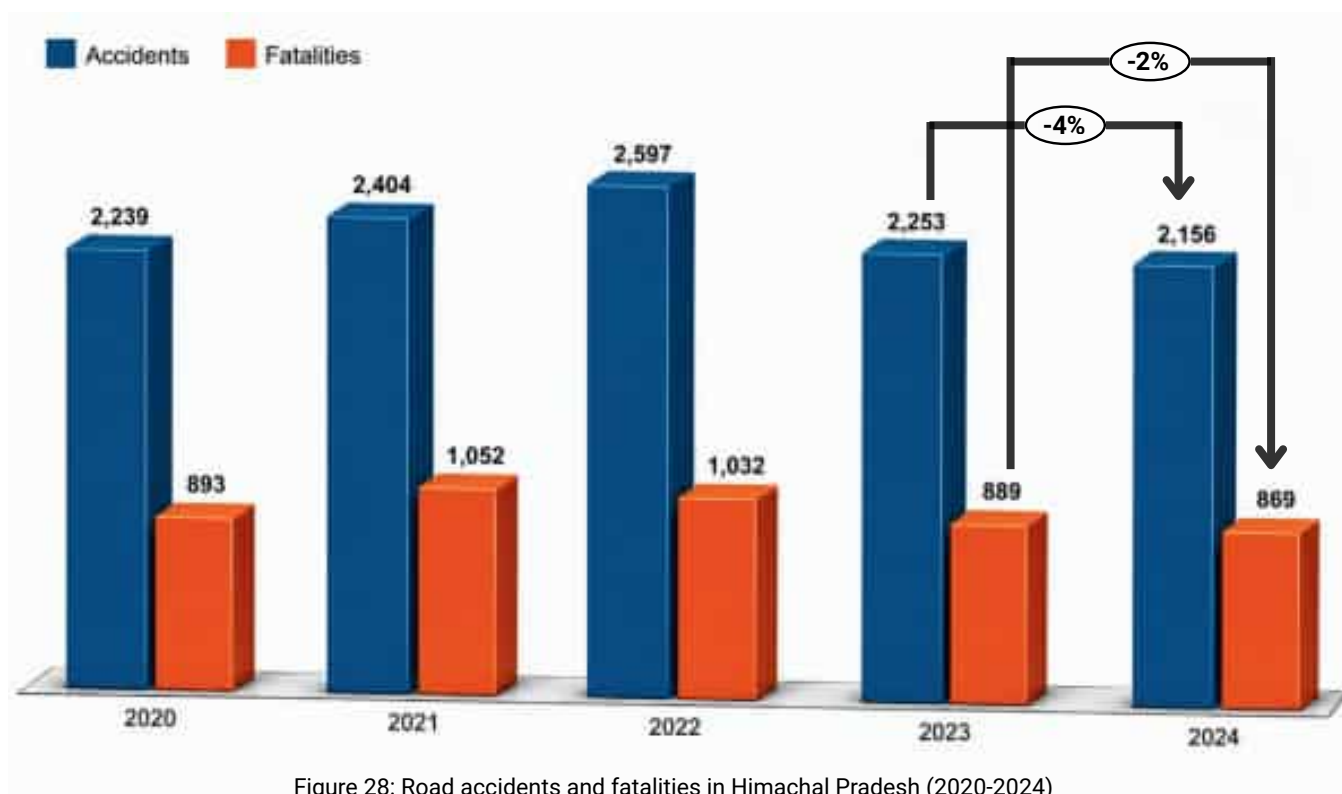
Himachal Pradesh



Himachal Pradesh covers an area of more than 55,000 sq. km., the eighteenth largest state by area, and has an estimated population of approximately 7.5 million in 2026, ranking it twenty-first among Indian states by population. It is, in absolute terms, the smallest-population state among the five covered in this paper, yet its road safety profile is disproportionately complex relative to its size. With a population density of around 136 people per sq. km., less than a third of the national average, Himachal Pradesh is among the most sparsely populated states in India, a reflection of a terrain that fundamentally constrains where people can live, how they move, and how quickly emergency services can reach them. 90% of the state's population lives in rural areas, making it the most rural state in India by urbanization share, a consequence of its mountainous terrain, which limits the formation of large urban agglomerations and spreads habitation thinly across valleys, hill slopes, and remote ridgelines. The state's registered vehicle fleet stands at approximately 2.6 million units in 2026, the smallest among the five states examined in this paper, yet this figure carries an outsized road safety significance given that Himachal's roads are simultaneously home to a large seasonal influx of tourist vehicles, long-

distance freight traffic on strategic mountain corridors, and highly vulnerable local road users navigating steep gradients, sharp curves, and weather-affected surfaces that transform even low traffic volumes into high-risk mobility environments.

The state's extensive network of hill roads, combined with increasing passenger vehicle movement and commercial transport activity, contributes to a relatively high risk of severe road accidents, particularly on narrow and winding corridors. The state recorded more than 2000 road accidents in 2024 leading to approximately 870 fatalities. These accidents are frequently associated with over-speeding, driver fatigue, dangerous overtaking, and loss of vehicle control on hilly terrain. Districts such as Shimla, Kullu, Mandi, Kangra, and Solan account for a significant share of road accidents due to high traffic movement and tourism inflows.



The Government of Himachal Pradesh is steadily strengthening its road safety ecosystem through focused interventions across infrastructure safety, technology-enabled enforcement, emergency response systems, and institutional coordination mechanisms. Road accidents and fatalities in the state have shown a gradual decline over the past five years, reflecting the impact

of sustained state and national-level road safety interventions. The state has formulated a dedicated Road Safety Policy along with an Annual Road Safety Action Plan to strengthen institutional coordination, guide targeted interventions, and support systematic implementation of road safety measures across the state.

Himachal Pradesh Road Safety Policy

The Himachal Pradesh Road Safety Policy was officially notified in 2016, to establish a framework for safer road travel and reduce accident-related fatalities. Its overarching vision is the implementation of sustainable and safe transportation for all users, including pedestrians and cyclists, to lower crash mortality. The policy's scope is multi-dimensional, covering road and vehicle engineering, stringent enforcement of the Motor Vehicles Act by the police and transport departments, establishment of road safety information database, awareness of road safety practices, and the provision of specialized trauma care services for post-crash recovery. Furthermore, it defines road safety as a shared responsibility between the government and a broad range of civil society stakeholders^{xlii}.

Road Safety Annual Action Plan (2024-2025)

The 2024–25 Annual Road Safety Action Plan received formal administrative approval following the State Level Managing Committee (SLMC) meeting held on 5 August 2024. The plan established specific performance targets including a 10% reduction in road accidents, 15% reduction in fatalities, 100% issuance of traffic challans through the e-challan application, and full-scale analysis of accident data through the iRAD platform. Building on these efforts, Himachal Pradesh has also been working toward the implementation of its subsequent road safety action plan during 2025–26, with continued focus on data-driven governance, technology-enabled enforcement, infrastructure safety improvements, and strengthened inter-departmental coordination to further improve road safety outcomes across the state. Some of the key focus areas and initiatives outlined under the road safety action plan of 2024-2025 have been highlighted below:

- **Police Department (₹6.75 crore):** Focused on electronic enforcement gadgets, ITMS surveillance, and interceptor vehicles.

- **Public Works Department (₹6.52 crore):** Dedicated to infrastructure improvements, including **black spot rectification**, crash barrier installation, and curve improvements.
- **Transport Department (₹5.15 crore):** Used for driving test tracks, public awareness campaigns, and special safety drives
- **Education Department (₹2.51 crore):** Funding for road safety clubs and IEC activities.
- **Health Department (₹1.18 crore):** Focused on upgrading trauma facilities and providing first-aid training to responders^{xliii}.

These policy interventions clearly indicate the state's growing commitment toward building a more coordinated, technology-enabled, and data-driven road safety ecosystem tailored to the unique mobility challenges of mountainous terrain and tourism-intensive corridors.

Advancing Road Safety through the 5E Framework

Himachal Pradesh has been adopting a comprehensive and terrain-sensitive approach to road safety aligned with the 5E framework. Given the unique geographical and climatic conditions of the state, interventions have increasingly focused on safer hill-road infrastructure, technology enabled monitoring, strengthened trauma response systems, and data-driven governance to improve safety outcomes across key transport corridors.

Engineering:

Himachal Pradesh has been prioritizing engineering interventions focused on improving safety across mountainous and accident-prone road corridors. The state has undertaken systematic identification and rectification of black spots along National Highways and major district roads, particularly in high-risk hill sections vulnerable to sharp turns, landslides, fog conditions, and vehicle skidding. As part of these efforts, Himachal Pradesh identified a total of 147 black spots across agencies including the Himachal Pradesh Public Works Department (HP-PWD), National Highways Authority of India (NHAI), Border Roads Organisation (BRO), and MoRTH project units, with rectification measures completed across all identified locations. HP-PWD alone identified and rectified 71 black spots, while NHAI rectified 68 locations through a combination of short-term and long-term engineering measures^{xliv}, including locations under construction and DPR-

based improvements. Engineering measures implemented across these corridors include installation of crash barriers, convex mirrors, reflective signage, parapet walls, rumble strips, slope stabilization systems, and improved drainage infrastructure. The authorities have also been carrying out road widening and geometric improvement works across critical corridors to improve visibility and reduce accident risks. In addition, the state has increasingly institutionalized road safety audits across infrastructure projects to strengthen compliance with safety standards during road planning, construction, and maintenance stages. Special focus has also been placed on improving pedestrian infrastructure and traffic management around urban tourist centres and school zones.

Enforcement:



Figure 29: Smart Camera monitoring systems in Dharamshala

Himachal Pradesh has been strengthening traffic enforcement through a combination of stricter regulatory implementation and technology-enabled monitoring systems. Given the terrain-related risks associated with hill driving, enforcement efforts have also focused significantly on commercial vehicles, tourist transport operators, and overloaded vehicles operating on steep corridors. The Himachal Pradesh Police and Transport Department have deployed CCTV surveillance systems, speed monitoring devices, and e-challan platforms across key urban centres and highway corridors to improve monitoring and enforcement efficiency. Seasonal enforcement drives are also conducted during peak tourism periods to regulate traffic movement and reduce accident risks in high-density tourist destinations such as Shimla, Manali, Dharamshala, and Kullu. In parallel, the state has been strengthening driver verification and vehicle fitness monitoring mechanisms, particularly for commercial and public transport vehicles operating on hilly routes.

Emergency Care:

Recognizing the challenges associated with accident response in remote and mountainous regions, Himachal Pradesh has been strengthening its emergency care and trauma response infrastructure across key transport corridors. Trauma care facilities are being strengthened in major government hospitals located in Shimla, Mandi, Kangra, Kullu, and Solan to improve treatment accessibility for road accident victims. The state has also focused on improving emergency response capabilities in remote and landslide-prone areas where accessibility constraints can delay critical medical intervention. Ambulance deployment strategies have been strengthened along major tourist and highway corridors, while first responder training programmes involving police personnel, healthcare workers, and disaster response teams are being conducted to improve stabilization and rescue operations during the critical “golden hour.” Himachal Pradesh has additionally been promoting awareness regarding Good Samaritan protections to encourage timely public assistance to accident victims.

Education:



Behavioural awareness and driver sensitisation continue to form a key pillar of Himachal Pradesh’s road safety strategy. The state has been conducting regular awareness campaigns targeting local drivers, commercial vehicle operators, tourists, school students, and youth populations to improve compliance with traffic regulations and promote safer driving behaviour on hill roads. The government has conducted workshops for women drivers, road safety walks, Sadak Suraksha Film Mahotsav and workshops for policymakers to enable safer road ecosystem in the state.

Figure 30: Road Safety Walk by Shri Mukesh Agnihotri, Deputy CM of Himachal Pradesh



Figure 31: Workshop for women drivers

These initiatives led by the Transport Department and Himachal Pradesh Police focus on over-speeding, safe hill driving practices, helmet and seatbelt usage, distracted driving, policymaking and enforcement and responsible tourist mobility. Road safety awareness campaigns during National Road Safety Month and peak tourism seasons include workshops, school outreach programmes, public awareness drives, and commercial driver sensitisation sessions across districts. The state has also been strengthening driver training and licensing systems to improve driver competency for hill-road conditions, including training on defensive driving techniques and emergency handling in mountainous terrain.

Evaluation (Data & Governance):



Figure 32: Command and control centre for VLTD, Himachal Pradesh

Himachal Pradesh has been strengthening its road safety governance framework through improved institutional coordination, data integration, and technology-enabled monitoring mechanisms. The state has adopted the Integrated Road Accident Database (iRAD) platform to enable structured recording and analysis of accident data across police, transport, and health departments. The platform is supporting improved identification of accident-prone corridors, monitoring of fatality trends, and prioritization of targeted interventions across districts and high risk

hill routes. The State Road Safety Council and district-level road safety committees regularly review accident trends, implementation progress, and enforcement outcomes to strengthen accountability and inter-departmental coordination.

In parallel, Himachal Pradesh has been increasingly leveraging analytics and digital systems to improve evidence-based road safety planning, particularly across tourism-driven and mountainous transport corridors. To strengthen monitoring and emergency response capabilities, the Transport Department established a centralized Command and Control Centre in collaboration with C-DAC in 2021 for the implementation of Vehicle Location Tracking Device (VLTD) systems across the state. In line with the Ministry of Road Transport and Highways (MoRTH) notification, all public service vehicles registered on or after 1 January 2019 are required to be equipped with VLTD systems and panic buttons. The initiative is aimed at improving vehicle tracking, passenger safety, fleet monitoring, and emergency response coordination across public transport networks in the state.

Himachal Pradesh is steadily strengthening its road safety ecosystem through a terrain-sensitive approach focused on safer infrastructure, technology-enabled enforcement, improved emergency response systems, and institutional coordination. With increasing emphasis on safer hill mobility, data-driven governance, and behavioural awareness, the state is building a more integrated framework to reduce road fatalities and improve transport safety across mountainous and tourism-intensive corridors.



Cross-State Road Safety Learnings & Replicable Practices

The state-level interventions highlighted in this paper demonstrate that while road safety challenges vary significantly across geographies, several implementation models offer strong replication potential across India. Madhya Pradesh's integrated multi-stakeholder road safety program, Odisha's policy-led governance framework, Bihar's AI-enabled enforcement ecosystem, and Assam's emergency care model illustrate how targeted interventions can be adapted by other states based on their specific mobility and infrastructure contexts.

A key cross-state learning is that effective road safety outcomes increasingly depend on integrated execution rather than isolated interventions. Engineering upgrades, technology-enabled enforcement, strengthened emergency response, behavioral awareness, and data-driven governance are most impactful when implemented through coordinated institutional frameworks. Himachal Pradesh's terrain-sensitive planning and Bihar's integration of safety into infrastructure expansion further reinforce that while implementation must remain context-specific, several best practices emerging across states can help accelerate national road safety progress.

Dimension	Madhya Pradesh	Odisha	Bihar	Assam	Himachal Pradesh
Engineering	Corridor-based engineering under World Bank Programme; GIS-based black spot rectification; road safety audits	Corridor-based black spot rectification; Odisha Road Policy 2025; BIS and ORAMS asset systems	285 black spots identified; 227 rectified; 14,000 zebra crossings; safer rural infrastructure	NH corridor upgrades; black spot rectification on NH-27/NH-17; urban pedestrian interventions	147 black spots rectified; crash barriers, slope stabilization, convex mirrors; hill corridor upgrades
Enforcement	Speed cameras, CCTV, e-challans; state enforcement campaigns; enforcement capacity building	Intelligent Enforcement Management System (IEMS); radar + cameras	AI-enabled traffic management; 1,000+ AI cameras; adaptive signalling; central command centre	AI surveillance, ANPR, CCTV, e-challan; targeted corridor enforcement	CCTV, e-challan, tourist corridor enforcement; commercial vehicle monitoring
Emergency Care	Advanced emergency units in Dhar, Datia, Indore; trauma care training; volunteer CPR training	Integrated emergency response; 108 ambulance; Zero Fatality Fortnight; trauma strengthening	55 trauma centres; private ambulance integration; ₹1.5 lakh free treatment; RaahVeer scheme	PM RAHAT pilot; ₹1.5 lakh cashless treatment; emergency response in remote areas	Trauma centres in key districts; strengthened hill emergency response; responder training
Education	Road Safety Working Groups; grassroots awareness; school outreach; Good Samaritan awareness	School/college campaigns; NGO partnerships; IIT Madras design thinking training	77,000+ schools covered; IDTR driver training; behavioural campaigns	Driver training centres; youth awareness; university campaigns	Safe hill driving awareness; women driver workshops; film festivals; tourism safety outreach
Evaluation & Governance	iRAD adoption; district committees; World Bank institutional coordination	iRAD + integrated dashboard; IIT Madras partnership; district governance mechanisms	iRAD-led monitoring; institutional coordination via Bihar Road Safety Council	Assam Road Safety Action Plan; iRAD; State Road Safety Council	iRAD; annual action plans; VLTD command centre; policy-led governance

Figure 33: Initiatives across the 5E Framework for Indian States

Key Takeaways for the Indian Road Safety Ecosystem

India stands at an inflection point in its road safety journey. Despite meaningful policy progress like the Motor Vehicles Amendment Act 2019, Cashless Treatment Scheme 2025, national iRAD platform, and significant infrastructure investments, the country continues to record the world's highest absolute road fatalities, with over 1.7 lakh deaths in 2025 and a trajectory that risks breaching this threshold further in 2026. To achieve the 2030 target of halving road deaths, India must accelerate both the pace and quality of its interventions, drawing deeply from global best practices. The following synthesis offers key takeaways and a forward-looking roadmap grounded in evidence.

Infrastructure as the Primary Safety Lever

India's expanding highway network is creating new opportunities to strengthen road safety through infrastructure-led interventions. Increasing emphasis is being placed on engineering measures such as crash barriers, rumble strips, safer junctions, guardrails, and grade-separated intersections across major corridors. States such as Madhya Pradesh have demonstrated the effectiveness of targeted black spot rectification programmes in improving traffic safety outcomes. These initiatives reflect a broader shift toward proactive, design-led approaches for developing safer and more resilient transport infrastructure.

Behaviour Change Remains the Hardest Mile

India is increasingly strengthening its road safety ecosystem through stricter enforcement, awareness initiatives, and behavioural interventions aimed at promoting safer driving practices. Global experiences such as Sweden's Vision Zero demonstrate that sustained improvements in road safety are achievable through long term community engagement, consistent enforcement, and stronger public awareness. Alongside infrastructure and vehicle safety advancements, India is also placing greater emphasis on cultivating responsible road user behaviour as a critical pillar for reducing accidents and improving overall mobility safety outcomes.

Data Systems are Now India's Greatest Road Safety Asset

The iRAD and eDAR platforms are strengthening India's road safety ecosystem by enabling integrated, real time accident data sharing across police, transport, health, and highway departments. These platforms are helping states adopt more data driven approaches toward identifying high risk corridors, improving emergency response, and planning targeted safety interventions. States including Bihar, Himachal Pradesh, Odisha, Madhya Pradesh, and Assam have emerged as important examples of strengthening institutional road safety readiness through digital integration and coordinated data led governance.

Post-Crash Care is a Neglected but Impactful Lever

India is increasingly strengthening post-crash response systems through initiatives focused on faster emergency care access, trauma management, and cashless treatment support for accident victims. Greater emphasis is being placed on improving hospital integration, digital processing systems, ambulance connectivity, and accessibility of trauma care facilities, particularly in remote and difficult terrain regions. States such as Himachal Pradesh and Assam highlight the importance of expanding accessible emergency response infrastructure to improve survival outcomes and build a more resilient road safety ecosystem.

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