

Scaling Intelligent Transportation Systems for Safer Mobility

Transforming India's mobility landscape through technology, data-driven governance, and integrated safety systems for sustainable urban transportation.

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Why ITS Matters Now



Rapid urbanisation & motorisation

India's infrastructure expansion outpacing traditional management capacity



Rising safety risks, congestion & emissions

Mobility challenges escalating beyond physical infrastructure solutions



Infrastructure capacity ≠ mobility outcomes

Building roads alone insufficient for safety and efficiency goals



ITS as a national necessity

System-level intelligence required for modern mobility management, not optional upgrade

The Urgency: Safety, Congestion & Economic Loss

1.8L

Annual Road Fatalities in India

Road traffic deaths totaling approximately 1.5 lakh annually, reflecting a severe national safety crisis.

11%

Share of Global Deaths (<3% vehicles)

India accounts for about 11% of global road fatalities despite having less than 3% of the world's vehicles.

3%

GDP Loss from Crashes & Congestion

Crashes and congestion are estimated to reduce GDP by roughly 3%, through lost productivity and increased costs.

Worsening

Worsening Urban Air Quality from Transport

Transport emissions increasingly degrade urban air quality, posing growing public health and environmental risks.

India's road safety challenge is systemic, not marginal. Despite infrastructure improvements, fatalities remain high. Congestion wastes fuel, time, and productivity while transport emissions create major public health crisis. These interconnected challenges demand system-level intelligence, not isolated interventions.

The Data Paradox: Where Accidents Really Happen

Licensed Drivers

Majority crashes involve licensed drivers: Training and licensing alone insufficient for safety

Clear Weather

70% accidents occur in clear weather: Extreme conditions are not the primary risk factor

Normal Traffic

Normal traffic conditions are most dangerous: Routine everyday travel poses greatest systemic risk

Enforcement System Limits

Enforcement alone cannot solve this: Safety failures linked to human behaviour combined with system design gaps, requiring predictive ITS intervention

Building an Integrated Safety Ecosystem

Safety is an ecosystem outcome where vehicles, roads, drivers, enforcement, emergency response, and insurance systems work together—enabled by data and technology.

Driver behaviour & profiling

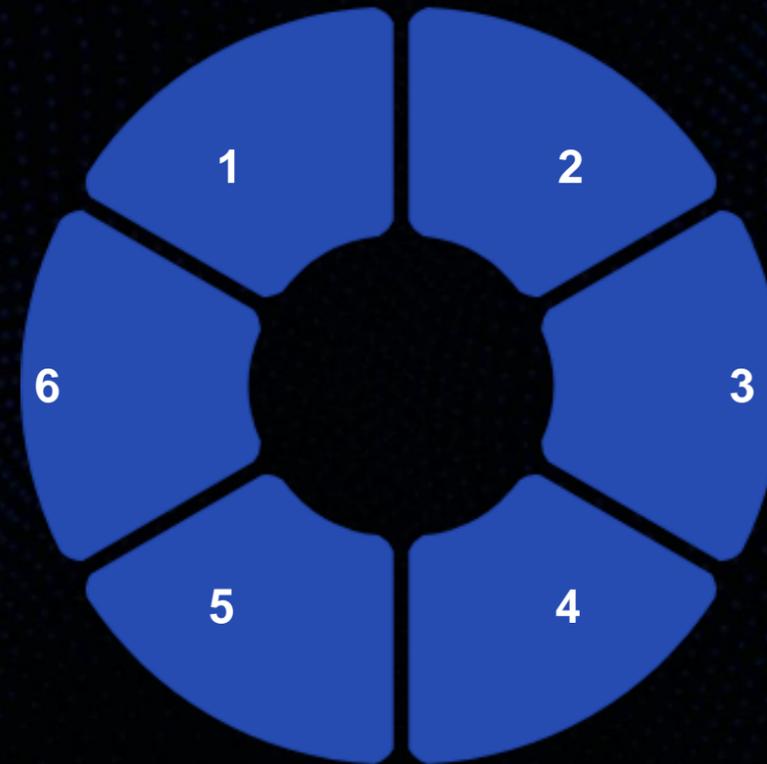
Monitoring and analyzing driver actions to inform risk mitigation and personalized safety interventions.

Insurance & data integration

Sharing anonymized data across stakeholders to align incentives, support claims, and fund preventive measures.

Emergency response systems

Rapid detection and coordinated response to incidents to reduce harm and improve post-crash outcomes.



Safer vehicles (ADAS & V2X)

Advanced driver assistance and vehicle-to-everything communication to prevent collisions and enhance situational awareness.

Intelligent infrastructure

Roadside sensors, smart signage, and connected infrastructure that adapt to traffic conditions and hazards.

Electronic enforcement

Automated compliance systems to deter risky behavior and ensure adherence to safety regulations.

Technology as a Safety Multiplier: Global Evidence

60%

Overall Crash Reduction

Overall Crash Reduction with ADAS & AI Alerts

50-60%

Rear-End Collision Decrease

Rear-End Collision Decrease

40%

V2X Prevention Rate

V2X Prevention Rate for Unimpaired Drivers



Lane-change Crash Reduction

Lane-change crashes reduced by 30–50% with AI-based warning systems



Speed-related Crash Reduction

Speed-related crashes down by 30–40% with intelligent monitoring

These are measured outcomes from global pilots and studies, not projections. The challenge is scaling adoption, not proving effectiveness.

Emerging ITS Technologies Transforming Mobility



AI-driven ATMS & predictive analytics

Learning systems that sense traffic and predict risk dynamically



Adaptive traffic signals

Real-time response to changing traffic patterns



V2V / V2I / CV2X communication

Vehicle-to-everything connectivity enabling coordinated safety



Driver Monitoring Systems & safety scoring

Behaviour-based risk assessment and intervention



Broadcast-based traffic & hazard alerts

Preventive mobility management faster than human reaction time

Global Success Stories: Proof at Scale

Sweden (Vision Zero)

Over 50% fatality reduction through embedded ITS policy and sustained operations integration

Singapore

AI traffic control systems delivering smoother traffic flow and optimized urban mobility

Japan & Korea

Comprehensive ITS and enforcement integration creating coordinated safety systems

China

AI traffic management achieving significant safety improvements and emission reductions

Scale, standardisation, and integration matter more than experimentation. Countries embedding ITS into policy see sustained results.

India's Readiness: Strong Digital Foundations

India has demonstrated ability to deploy digital infrastructure at national scale. FASTag created the backbone for data-driven mobility governance. We are ready to move from digitisation to intelligence.



FASTag

World's largest Electronic Toll Collection system operational



ATMS

Deployed on highways & urban corridors nationwide though in isolation



Digital Enforcement

e-challans system functioning



e-DAR

National accident data collection framework



Innovation ecosystem

Growing ITS talent & innovation ecosystem ready for scale deployment

Scaling ITS: What Must Happen Next

The challenge ahead is coordination, not capability. ITS must scale as a national system, not fragmented city or corridor deployments.



Interoperable national ITS standards

Unified protocols for seamless integration



Urban–highway integration

Connecting mobility systems across jurisdictions



Behaviour-linked enforcement & insurance

Data-driven accountability mechanisms



Capacity building & skills

Developing ITS workforce at scale



Sustainable funding & PPP models

Long-term financial frameworks for deployment

Role of Government, Industry & Academia

Government Leadership

- Policy frameworks & standards
- Scale deployment coordination
- Data governance infrastructure
- Regulatory enablement

Industry Innovation

- Indigenous ITS solutions
- OEM technology integration
- Private sector partnerships
- Implementation at scale

Academia Foundation

- Research & validation studies
- Talent development programs
- Innovation ecosystem support
- Evidence-based recommendations

Collaborative ecosystems deliver results. The future belongs to partnerships where research informs policy and innovation reaches scale through industry.

Thank You

*“The true success of ITS will not be measured in dashboards
but in lives saved, emissions reduced, and time returned to citizens.”*

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