



EVENT REPORT

National Road Safety Technology Conclave 2026

Organised by ITS India Forum in collaboration with IIT Bombay

“Best, Most Promising and Proven ITS Technologies for Road Safety”



**25-26
AUGUST 2026**



**IIT BOMBAY,
POWAI, MUMBAI**

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Executive Summary

The National Road Safety Technology Conclave 2026 (NRSTC 2026) was organized by ITS India Forum in collaboration with IIT Bombay on 25 and 26 August 2026 at IIT Bombay, Powai, Mumbai, under the theme ***"Best and most promising ITS Technologies for Road Safety."***

The conclave was designed as a platform for structured deliberations where technology developers demonstrated their solutions directly to government decision-makers, state law enforcement, highway authorities in the presence of member and chairman of Supreme Court Committee on Road Safety (SCCoRS).

The **National Road Safety Technology Conclave 2026**, brought together over 250 high-level delegates from central ministries, 16 state governments, academia, and industry. The gathering brought together Directors General and Inspectors General of Police, Transport Commissioners, and Joint and Deputy Commissioners graced by the presence of Justice Abhay Manohar Sapre, chairman and Shri Sanjay Bandyopadhyay, member of Supreme Court Committee on Road Safety (SCCoRS).

Across four Technology Showcase sessions held on Day 1 and a full-day multi-stakeholder *Manthan* on Day 2, the conclave demonstrated **28+ indigenous road safety technologies**, spanning low-cost retrofit ADAS, connected vehicle (V2X) systems, AI-driven traffic management, and real-time pothole and driver health tracking. Demonstrating that policy alignment, data access, and procurement reform alongwith technological advancement are necessary for nation-wide deployment of technology for road safety.

The Conclave resulted in significant outcomes that will form the basis for formal submissions and recommendations to the concerned authorities and government departments across various States in India. A key outcome was the recognition of India's growing road safety technology ecosystem, with more than 29 indigenous, cost-effective and field-relevant technologies identified that are designed to address the country's diverse and mixed-traffic conditions and have potential for wider adoption.

The deliberations and *Manthan* cross-examination also highlighted key challenges at both the industry and government levels, including technology validation, standardisation, certification, procurement, field deployment, scalability and institutional coordination. Addressing these gaps through stronger Government-Industry-Academia collaboration can facilitate faster adoption of proven technologies and support the advancement of safer, smarter and technology-enabled mobility in India.

To accelerate implementation, the majority of developers are keen to conduct cost-free pilots and offered to authorities, requiring only a mandate, designated test corridor, a nodal officer, and basic operational access. Unlocking public data infrastructure including VAHAN, e-challan, eDAR, iRAD, and insurance registries remains a vital prerequisite for scaling these solutions under a standardized access framework. Finally, while innovation is currently weighted toward commercial fleets, four-wheelers, and urban intersections, urgent policy and developmental focus must pivot toward two-wheelers, pedestrians, and rural roads, which continue to account for the highest share of India's road fatalities.

1. INTRODUCTION

1.1 Background

India recorded over 1.83 lakh road deaths in 2025 which is the highest toll of any country in the world. Road crashes cost the Indian economy an estimated 3.14% of GDP annually. Despite sustained investment in road engineering, enforcement, and public awareness campaigns, the fatality count continues to climb.

Road safety remains a critical component of India's transport and urban development agenda, with road crashes continuing to impose significant social and economic costs on individuals, communities, and the wider economy. Addressing this challenge requires a coordinated approach that brings together safer infrastructure, effective enforcement, responsible road-user behaviour, efficient emergency response systems, and the appropriate application of technology.

In view of the present scenario, the **National Road Safety Technology Conclave (NRSTC) 2026**, organised by **ITS India Forum in collaboration with IIT Bombay**, provided a national platform for government authorities, police and transport officials, academia, industry, and technology innovators to examine practical and scalable solutions for improving road safety. Held at IIT Bombay on **25-26 August 2026**, the conclave focused on moving beyond discussion towards the identification, evaluation, and deployment of field-tested road-safety technologies.

The conclave brought together representatives from **16 State Governments**, central government institutions, academic organisations, industry, and technology developers. More than **28 indigenous road-safety technologies** were presented across areas including artificial intelligence, advanced driver-assistance systems, intelligent traffic management, vehicle safety, infrastructure safety, mobility data, and emergency response.

Supreme Court Committee on Road Safety (SCCoRS) Chairman, Justice Abhay Manohar Sapre, and Member, Shri Sanjay Bandyopadhyay, IAS (Retd.), graced NRSTC 2026 two-day event with their presence, signalling the highest possible level of institutional urgency. They contributed valuable insights and guidance to the presenters, delegates, and government officials, thereby strengthening the overall deliberations.

A key focus of NRSTC 2026 was to create a structured interface between technology developers and the authorities for road-safety implementation. The discussions therefore considered not only the technological capabilities of proposed solutions, but also their real-world deployment, evidence of effectiveness, scalability, institutional requirements, and pathways for adoption. This approach positioned the conclave as a platform for connecting innovation with implementation and strengthening collaboration among stakeholders across the road-safety ecosystem.

1.2 About NRSTC 2026

National Road Safety Technology Conclave 2026 was organised by ITS India Forum in collaboration with IIT Bombay, at IIT Bombay, Powai. The 2-day event was held on 25th and 26th August, 2026 which gave an opportunity to the industry to showcase their technologies in the field of intelligent mobility in front of the dignitaries and delegates and bridge the gap between technology development efforts to deployment. Every developer was asked the same five questions: the problem addressed, the solution, the evidence, what they need from government/other stakeholders, and what they will commit to deploying if they get it.

250+	28+	~16	4
Delegates from central ministries, state governments, IITs, industry, and academia	Indigenous road safety technologies demonstrated	State governments represented — DGPs, IGs, Transport Commissioners, and senior officials	Technology showcase sessions on Day 1, followed by a full-day Manthan on Day 2

Day 1: Technology Showcase

On the first day (25th August) four moderated sessions were held each comprising 8-minute presentations followed by 4 minutes of Q&A per presenter. The Jury panel assessed all 29 technologies across the day.

Day 2: Manthan

A structured cross-examination, Manthan means a deep churning or deliberation in which SCCoRS, and officials from 16 state governments examined every technology developer on their deployment readiness, the credibility of their commitments, and the minimum viable pilot they could begin immediately.

1.3 Organising Bodies

ITS India Forum

The ITS India Forum (ITS India Industry Growth Forum) is a Section 8 non-profit think-tank established in September 2023 to accelerate the development, adoption, and deployment of Intelligent Transportation Systems (ITS) and sustainable mobility across India. Driven by the vision of creating safer, smarter, and greener transport networks aligned with national priorities under Viksit Bharat 2047, the Forum serves as a neutral, collaborative bridge between government ministries, industry leaders, academia, start-ups, and research bodies. Governed by a dedicated Board of Governors, an Executive Committee, a Secretariat, and specialized Technical Working Groups including dedicated panels on Road Safety, AI, and Connected Mobility (V2X) the organization focuses on policy advocacy, indigenous technology innovation, standards development, and robust capacity-building initiatives.

As the organizing body for the National Road Safety Technology Conclave 2026, the Forum brings significant institutional expertise and high-level national and global credibility. Domestically, it collaborates closely with central bodies such as MoRTH, NHAI, NITI Aayog, and others to shape policies and regulatory frameworks for electronic enforcement, Advanced Traffic Management Systems (ATMS), and V2X communications. Globally, ITS India represents the country on the Boards of the ITS Asia-Pacific Forum and the ITS World Congress, alongside maintaining more than 20 international MoUs and academic partnerships with premier institutions like IITs, CSIR-CRRI, and South Asian University. This extensive ecosystem enables the Forum to lead critical dialogues, showcase cutting-edge safety technologies, and establish actionable roadmaps for transforming road safety across India.

IIT Bombay

Indian Institute of Technology Bombay (IIT Bombay), recognized globally as an Institute of Eminence, stands at the forefront of technical education, cutting-edge research, and translational innovation in India. With decades of pioneering contributions to engineering, data science, and urban infrastructure, the institute serves as a vital bridge between high-impact academic research and real-world policymaking. Its state-of-the-art multidisciplinary research centers and technological incubators have consistently driven indigenous innovations tailored to solve complex national challenges, making it a cornerstone for transformative public-sector initiatives.

As a core constituent of the Organising Committee for the National Road Safety Technology Conclave 2026, IIT Bombay provided the overarching academic rigor, technical validation, and strategic direction essential to convening this national platform. Leveraging its deep expertise in transportation systems, intelligent traffic management, artificial intelligence, and crash-data analytics, the institute facilitated critical dialogues among technologists, policymakers, and enforcement authorities. Through its leadership, IIT Bombay continues to champion evidence-based solutions, driving the deployment of scalable, indigenous technologies aimed at drastically reducing road traffic fatalities across the nation.

1.4 Key Objectives

1. To demonstrate 28+ deployment-ready road safety technologies before India's road safety decision-makers, state police leadership, transport commissioners, highway authorities, judiciary, and central ministries in a single structured setting.
2. To apply the Five-Question Framework to every presenter ensuring every demonstration produced a documented problem statement, solution description, evidence base, government ask, and deployment commitment.
3. To use the Day 2 Manthan process to cross-examine developers on their deployment readiness and commitments.
4. To identify and document the different barriers faced by both industry and government for implementation of the technologies showcased.
5. To formally compile the conclave's shortlisted proposals, specific asks, and way forward.
6. To produce a sequenced action output distinguishing decisions that states can take independently, decisions requiring central government resolution, and actions achievable in the coming years.

2. EVENT OVERVIEW

The National Road Safety Technology Conclave 2026 (NRSTC 2026) was held over two consecutive days at IIT Bombay, Powai, Mumbai. The programme was deliberately split into two distinct formats: a full-day Technology Showcase on Day 1, in which developers presented their solutions before a jury and a delegation of government decision-makers, followed by a half-day Manthan on Day 2, during which the same developers engaged in detailed discussions and deliberations with delegates from various government departments across different states on deployment readiness and commitment.. The design ensured that every technology placed before the conclave was not only seen, but tested against the question of what it would take to put it on the road.

2.1 Event at a Glance

Particulars	Details
Event	National Road Safety Technology Conclave 2026 (NRSTC 2026)
Theme	Best, Most Promising and Proven ITS Technologies for Road Safety
Day 1	Tuesday, 25 August 2026 (0900–1800 Hrs) – Technology Showcase (Full Day)
Day 2	Wednesday, 26 August 2026 (0900–1415 Hrs) – Manthan (Half Day)
Venue	IIT Bombay, Powai, Mumbai
Organised by	ITS India Forum in collaboration with IIT Bombay
Technologies showcased	29 technologies across four moderated sessions on Day 1
Presentation format	8-minute presentation followed by 4 minutes of Q&A per presenter
Participation	250+ delegates from central ministries, 16 State Governments, the IITs, industry and academia
Apex presence	Justice Abhay Manohar Sapre, Chairman, SCCoRS, and Shri Sanjay Bandyopadhyay, IAS (Retd.), Member, SCCoRS – present for the full two days
Evaluation mechanism	Five-Question Framework, jury assessment on Day 1, and SCCoRS-led cross-examination on Day 2

Table 2. Event details at a glance

2.2 Structure of the Conclave

Every presenter at NRSTC 2026 was asked the same five questions, and every presentation was structured around them. This common framework made the twenty-nine technologies directly comparable to one another and converted each demonstration into a documented, on-record submission:

- **The problem addressed** – the specific road safety failure the technology targets.
- **The solution** – what the technology does and how it works in Indian conditions.

- **The evidence** – deployment history, measured outcomes.
- **The ask** – what is required from Government or other stakeholders to proceed.
- **The commitment** – what the developer will deploy if that ask is met.

Day 1 focused on addressing the first three questions through the Technology Showcase, where innovative solutions were presented and examined. Day 2 was devoted almost entirely to the fourth and fifth questions, bringing developers, highway authorities, police officers, and transport officials together in a closed-door Manthan session for rigorous cross-examination, discussion, and assessment.

3. Day 1 – 25 August 2026: Technology Showcase

Day 1 comprised an Inaugural Session followed by four moderated technology sessions. Dr. Shiv Kumar from ITS India Forum and Professor Archak Mittal from IIT Bombay welcomed all the delegates and set the context of the conclave.

Delegates were informed that the two-day programme had been deliberately structured to ensure that no technology was merely presented; every solution would also be subjected to rigorous questioning and assessment. – Day 1 against a jury, Day 2 against the officials who would have to evaluate the solution and authorise its deployment. The Committee introduced the Five-Question Framework binding on every presenter, and placed on record the scale of participation: over 250 delegates, 16 State Governments, and 29 technologies scheduled across four moderated sessions.

This was followed by addresses by **Akhilesh Srivastava, President, ITS India Forum; Anil Chikara; Shri Sanjay Bandyopadhyay, IAS (Retd.), Member, SCCoRS; and Justice Abhay Manohar Sapre, Chairman, SCCoRS.** The addresses highlighted the prevailing road-safety challenges in India and emphasised the potential of emerging technologies, including Artificial Intelligence (AI), Big Data, and advanced data analytics, to strengthen road-safety management. Particular emphasis was placed on leveraging these technologies to transition from **reactive approaches to predictive and preventive analysis**, enabling more proactive identification of risks and supporting data-driven interventions to enhance road safety and mobility.

Opening Remarks – Mr. Akhilesh Srivastava, President, ITS India Forum

He welcomed all the delegates and emphasised the significance of the conclave in addressing pressing road safety challenges and exploring the role of technology in shaping effective solutions.

"We need to trust these GenZ efforts and go beyond discussion on road safety and move to action on the ground. These technologies are maturing, and their impact is already visible locally. What is needed now is to consolidate, bringing that momentum together into action at the India level,"

- Akhilesh Srivastava, President, ITS India Forum.

Shri Sanjay Bandyopadhyay, IAS (Retd.), Member, SCCoRS

Shri Sanjay Bandyopadhyay, IAS (Retd.), emphasised that road safety must move beyond conventional measures towards **technology-driven, data-led and evidence-based** interventions. He highlighted the importance of integrating technology, enforcement, infrastructure and institutional coordination to address the complex challenges of road safety. He called upon innovators, government agencies and stakeholders to focus on solutions that are scalable, measurable and capable of delivering tangible reductions in road crashes and fatalities.

Hon'ble Justice Abhay Manohar Sapre, Chairman, SCCoRS

Justice Abhay Manohar Sapre, Chairman of the Supreme Court Committee on Road Safety, underscored the seriousness with which the Committee approaches its mandate to improve road safety across the country. He emphasised the need for sustained institutional efforts, effective implementation, inter-agency coordination, and the adoption of technology-driven approaches to strengthen road safety outcomes.

"Road accidents are avoidable: it is not the will of God"

-Hon'ble Justice Abhay Manohar Sapre, Chairman, SCCoRS



Image set 1: Inaugural Session and dignitaries — Day 1, 25 August 2026

Time	Programme Item	Speaker / Designation
0900–0903	Welcome & Opening	–
0903–0908	Welcome Address	Organising Committee
0908–0915	Opening Remarks	President, ITS India Forum
0915–0922	Address	Director, IIT Bombay
0922–0937	Special Address	Member, SCCoRS
0937–0942	Inaugural Address	Chairman, SCCoRS
0942–0945	Vote of Thanks & Transition to Next Session	–

Table 3. Day 1 — Inaugural Session programme

The Inaugural Session on the morning of 25 August 2026 set the terms on which the rest of the conclave was conducted.

The Technology Showcase then commenced, with each presenter given eight minutes to present their solution, followed by four minutes for questions from the jury and the audience. A jury panel assessed all 29 technologies throughout the day. The evening was reserved for the jury's deliberations, an address by Hon'ble Justice Sapre to the students, and networking.

3.3 Session 1

S.No.	Solution Presented	Company name
1	Spandan	Gahan AI
2	AI-Based Near-Miss Detection and Road Safety Analytics Platform	ARCADIS
3	Plug & Play ADAS Retrofit	Aha Automotive Innovations
4	Advanced Intelligent Transportation System CCTV	Prama India Pvt. Ltd.
5	V2X Emergency Services – Above and Below Ground	Danlaw Technologies India Ltd.
6	iBrake	Sego Automobile Solutions Pvt. Ltd.
7	Envoys Active & Passive Speed Enforcement System & Smart VMD	Envoys Electronics Pvt. Ltd.

Table 4. Session 1 — technologies showcased

Presentation Summaries

1. Spandan (Gahan AI)

- **Problem addressed:** Camera-only perception degrades in rain, fog and dust, and imported radar is calibrated for European highway environments rather than Indian mixed traffic.
- **Solution:** Automotive-grade 77 GHz radar fused with camera and inertial inputs through a proprietary AI fusion algorithm, building a three-dimensional occupancy map of the vehicle's surroundings and issuing collision alerts at ranges of up to 150 metres.
- **Validation:** Stated TRL-8 certification, ten patents, and on-road validation in India against monsoon clutter, dust storms and heterogeneous two-wheeler-dense traffic.
- **Policy relevance:** Positioned as a direct prerequisite for India's 2027 ADAS mandate under Bharat NCAP, on the argument that without indigenous supply the country faces permanent import dependence for a safety-critical sensor.

2. AI-Based Near-Miss Detection and Road Safety Analytics Platform (ARCADIS)

- **Problem addressed:** A location's risk is conventionally established from a crash record that accumulates over years and remains incomplete and under-reported.
- **Solution:** Computer vision applied to conflict analysis rather than asset condition – tracking road users in junction camera video, measuring surrogate safety indicators such as post-encroachment time, and classifying conflicts as vehicle-to-vehicle, vehicle-to-pedestrian or vehicle-to-cyclist.
- **Evidence:** Its Asset Image Recognition system has been deployed for highway inspection with Rijkswaterstaat in the Netherlands since 2018, recognising close to 95 per cent of road defects, repairs, traffic signs, streetlights and markings.

3. Plug & Play ADAS Retrofit (Aha Automotive Innovations)

- **Problem addressed:** India's ADAS requirements apply prospectively to new vehicles, leaving an existing parc of several crore cars and commercial vehicles built with no driver assistance entirely untouched.
- **Solution:** Universal plug-and-play driver assistance devices for vehicles already on the road; the NexCruise line installs without workshop modification and adds cruise control together with coast and efficiency modes.
- **Pricing and coverage:** Priced from approximately ₹19,900 and offered for both internal combustion and electric models.
- **Market position:** Factory-fitted systems account for close to 90 per cent of the Indian ADAS market today, but retrofit is projected to be the faster-growing segment by a wide margin.

4. Advanced Intelligent Transportation System CCTV (Prima India Pvt. Ltd.)

- **Solution:** ANPR cameras at intersections reading number plates and reporting lane-level flow in real time, radar and ANPR-based speed enforcement linked to automated ticketing, and signal controllers drawing on the same camera feeds.
- **Platform:** A central video management platform with an Advanced Traffic Management System layer that also handles violation payment workflows.

- **Portfolio:** Speed detection, mobile enforcement, toll plaza monitoring and AI-based sensing, showcased most recently at the TrafficInfraTech Expo.
- **Why it matters:** The video management software integrates third-party cameras, so much of the required capability can run on camera infrastructure States have already purchased.

5. V2X Emergency Services – Above and Below Ground (Danlaw Technologies India Ltd.)

- **Capability base:** The January 2024 acquisition of Australian V2X specialist Cohda Wireless extended that capability across automotive, smart-city and underground mining applications; the origin of the above-and-below-ground framing.
- **Solution:** Roadside units supporting standards-compliant, secured communication between vehicles, signals, pedestrian crossings and vulnerable road users.
- **Indian deployment:** A V2X green corridor demonstrated in Bengaluru, giving ambulances priority signal clearance at junctions and extendable to public transport.
- **Recognition:** The project received a national award for innovation in vehicle safety, presented to the company's chairman by the Union Minister for Road Transport and Highways in February 2026.

6. iBrake (Sego Automobile Solutions Pvt. Ltd.)

- **Problem addressed:** Rear-end collisions, the single most common crash type on Indian roads, against a national record of a crash roughly every 1.2 minutes and a death every 3.5 minutes.
- **Solution:** A retrofittable device that signals the following vehicle at the moment of deceleration, rather than waiting for the brake pedal to be pressed.
- **Safety margin:** Gives the driver behind roughly an additional second of warning – the interval in which most rear-end impacts are either avoided or made survivable.
- **IP position:** Developed in collaboration with Growficiency, with patents held in India and the United States (IPO 374617; USPTO 18206656).
- **Market:** Offered for commercial vehicles and fleets as well as private cars, framed as an investment in collision prevention rather than damage mitigation.

7. Envoys Active & Passive Speed Enforcement System & Smart VMD (Envoys Electronics Pvt. Ltd.)

- **Active enforcement:** 3D radar and ANPR-based red light and over-speed violation detection, in which a detected violation produces a challan.
- **Passive management:** Radar-triggered vehicle-actuated displays that show drivers their own speed and moderate behaviour without any penalty, deployed for night-time speed management across eighteen countries.
- **Smart VMD:** Variable message signs extended beyond static warnings to real-time congestion, incident, weather and journey-time information.
- **Wider portfolio and track record:** Adaptive traffic control systems, variable speed limit signs, tunnel lane and advisory signage and the binding control room software, delivered as prime contractor and consortium partner to smart cities, municipal corporations and State police departments.

The presentation paired two complementary approaches to speed: active enforcement, in which a detected violation produces a challan, and passive management, in which a radar-triggered display shows drivers their own speed and moderates behaviour without any penalty, the latter deployed for night-time speed management across eighteen countries.

3.4 Session 2

S. No.	Technology	Organisation
1	ePath Digital Platform	Arcadis
2	Emergency Vehicle Priority (EVP)	Onnyx Electronisys Pvt. Ltd.
3	JioHumsafar by JioThings	Jio Platforms Ltd.
4	Highway Saathi	Metro Infrasy
5	V2X Road Safety Broadcast Service for Indian Highways	Zero-Sum ITS Solutions India Pvt. Ltd.
6	RoadAthena	HanuAI Private Limited
7	Car / Bike Interceptors	DataCorp Traffic Private Limited

Table 5. Session 2 — technologies showcased

Presentation Summaries

1. ePath Digital Platform (Arcadis)

- **Approach:** Digital platforms that sit above an agency's existing field infrastructure and turn it into a single operating picture.
- **inSIGHT:** An advanced traffic management system drawing real-time situational awareness from camera, traffic and weather sensor feeds, adopted by the Nevada Department of Transportation to replace legacy freeway management software.
- **Travel-IQ:** A traveller information platform capturing, validating and publishing travel-impacting events- roadworks, incidents, restrictions to agency websites, third-party navigation apps and personalised alerts, while giving police, fire and public works departments a shared view of the same event.
- **Safety alerting:** Supports active pedestrian crossings and remote intersection conflict alerting in both urban and rural settings.
- **Evidence:** On Atlanta's North Avenue smart corridor, an Arcadis-designed intelligent transportation system was associated with a reduction in crashes of 20 to 35 per cent across different sections.

2. Emergency Vehicle Priority (EVP) (Onnyx Electronisys Pvt. Ltd.)

- **Solution:** Signal controllers programmed to clear a path for ambulances, fire tenders and police vehicles through congested junctions, extended to full green corridors by the adaptive traffic control platform.

- **Pedestrian protection:** The same priority logic is built into an adaptive pedestrian crossing system, which yields to an approaching emergency vehicle without weakening pedestrian protection.
- **Incident detection:** An automatic incident detection system identifies an incident in real time and warns approaching motorists, addressing the secondary crashes that follow a first collision.
- **Argument made:** Enforcement alone cannot deliver road safety, and long red phases on empty approaches actively encourage signal jumping – an argument for adaptive control as a safety measure rather than only a congestion measure.

3. JioHumsafar by JioThings (Jio Platforms Ltd.)

- **Solution:** A connected fleet and driver safety platform built end to end within the group devices, LTE connectivity, cloud platform and portals which the company presents as its principal reliability advantage.
- **Hardware and standards:** AIS-140 compliant and ARAI-certified telematics hardware with edge computing over 4G and 5G.
- **Capability:** Real-time location tracking, geofencing, video telemetry and drive analytics, issuing alerts to the driver at the moment of risky behaviour rather than only reporting it afterwards to a fleet manager.
- **Fleet layer:** Fuel monitoring, preventive maintenance, trip scheduling, driver profiling and remote vehicle locking.
- **Recognition and relevance:** Winner of the Large Corporates category at the FICCI Road Safety Awards; commercial fleets are where a single operator can mandate safety technology across thousands of vehicles at once, without waiting for individual owners to act.

4. Highway Saathi (Metro InfrasyS)

- **Solution:** A highway companion for commuters, delivered as a mobile application and as a voice-interactive on-board unit, with voice input available for every reporting function.
- **Features:** FASTag and monthly pass recharge, incident and congestion hotspots with a user reporting facility, posted speed limits and over-speeding notifications, highway condition reporting, wayside amenities including hospitals, estimated journey times and SOS alerts.
- **Post-crash function:** A user can report a crash with photographs from the app, and the report reaches the nearest hospital, ambulance service and police station simultaneously.
- **Deployment:** Made mandatory for travel on the Yamuna Expressway; the model uses the commuter's own phone to close the post-crash notification gap on corridors where the concessionaire already operates toll and traffic infrastructure.

5. V2X Road Safety Broadcast Service for Indian Highways (Zero-Sum ITS Solutions India Pvt. Ltd.)

- **Deployment:** Implemented what it describes as India's first fully automated ITS pilot in Ahmedabad, later extended to the Sabarmati Riverfront Road under a self-sustaining model that funds maintenance through advertising on roadside LED displays.

- **Demonstrated capability:** A public transport vehicle priority system demonstrated in January 2022 with the approval of Ahmedabad Janmarg Ltd., a special purpose vehicle of the Ahmedabad Municipal Corporation; related work on the same corridor allows an approaching ambulance to trigger a signal from several hundred metres away.
- **Institutional milestone:** In December 2024 the C-DAC centres at Hyderabad and Thiruvananthapuram, under MeitY, signed a transfer of technology agreement for its 5G C-V2X platform, co-owned with TiHAN, covering collision avoidance, emergency braking and seamless tolling.
- **Why it matters:** Bears directly on the conclave's ask for spectrum allocation and agreed standards for vehicle-to-vehicle communication, without which each city procures a system that cannot speak to the next.

6. RoadAthena (HanuAI Private Limited)

- **Solution:** An AI road survey and asset management platform applying computer vision to road video to detect potholes and cracks, classify pavement condition, and build an automated inventory of signs, lane markings and barriers with location data attached.
- **Analytics:** Feeds predictive maintenance forecasting and budget prioritisation through a GIS dashboard covering the whole network.
- **Accuracy and IP:** Around 90 per cent detection accuracy, with two filed patents on a proprietary dataset and trained model built to minimise false positives.
- **Standards and commercial model:** References IRC 67 on road safety signage and IRC 35 on road markings; offered as software charged per kilometre surveyed, as a platform bundled with capture hardware, or as APIs processing third-party data, including a subscription for fleet operators wanting road condition ahead of a trip.

7. Car / Bike Interceptors (DataCorp Traffic Private Limited)

- **Core unit:** A roof-mounted 4D radar unit paired with a high-speed video camera, detecting speed violations across multiple lanes at up to 200 km/h within a 300-metre range and tracking approaching and receding vehicles simultaneously.
- **Distinguishing capability:** Detects while the enforcement vehicle is itself in motion, rather than only from a stationary position – which extends enforcement to stretches where no fixed gantry or camera exists.
- **Evidence record:** Each capture carries date, time, unit identifier, posted limit, measured speed, distance, direction and vehicle image, transmitted to a central server over LAN, Wi-Fi, fibre or 4G.
- **Wider range and deployment:** Handheld radar devices with ANPR engines detecting up to 250 km/h, and detection of helmet, seat belt, triple riding and wrong-way violations integrated in real time with e-ticketing; Chennai Traffic Police became the first force in South India to deploy the company's interceptor vehicles.

3.5 Session 3

S. No.	Technology	Organisation
1	AI-Enabled Black-Spot Enforcement, Response & Predictive Safety System	Sensen Video Intelligence Pvt. Ltd.
2	Driver Monitoring and ADAS Technology	Netradyne Technology
3	Glance	Applied Information, Inc.
4	Intelligent Speed Assist	HERE Technologies
5	HumSafer	Good Mind Private Limited
6	FAST: Digital Twin-Based Adaptive Traffic Signal Control	ITSPE
7	Proactive Road Safety Infrastructure Assessment & Countermeasure Planning using iRAP Methodology and Hawkeye NSV Systems	Indian Road Survey & Management Pvt. Ltd.
8	Intelligent Traffic Management and Enforcement System	SCITA

Table 6. Session 3 — technologies showcased

Presentation Summaries

1. AI-Enabled Black-Spot Enforcement, Response & Predictive Safety System (SenSen Networks Ltd. / Sensen Video Intelligence Pvt. Ltd.)

- **Problem:** 18,203 identified black spots; 13,795 on national highways and over 4,400 on state highways behind 1,09,218 deaths across three years, on highways carrying close to 60 per cent of road deaths over a fraction of the network. The three-year figure is the presenters' own derivation using six deaths per black spot rather than the ten-death definition.
- **Today's model:** Reactive: crash, police response, investigation, engineering review, fix, then wait for the next incident with enforcement that stays manual and intermittent and near-misses that go uncaptured.
- **Solution:** Road Safety Net runs measure and detect, enforce, respond, prevent: lidar and ANPR capture in a trailer-mounted unit, near-miss analytics, machine-learning models to predict events, continuous audit of interventions taken, and integration with VAHAN and e-Challan.
- **Evidence:** A 100-day live trial in Pune alongside a 42-site heavy-vehicle deployment on the Australian NHVR network – wrong-side driving offences down from over 30 to single digits, violations down around 70 per cent with a repeat-offender rate under 5 per cent, 10,500 challans issued end-to-end through the live e-Challan API with no false challans, and road utilisation efficiency up 15 per cent.
- **Commitment:** Pilot operational within two months of approval, validated sites converted to permanent installations between months six and twelve, and state-to-national scale-up from year two, with MoRTH-identified black spots in Maharashtra the preferred location.

2. Driver Monitoring and ADAS Technology (Netradyne Technology)

- **Problem:** Human error behind 80 per cent of road accidents, with drowsiness, fatigue, phone use, seat-belt non-compliance and tailgating going unnoticed, and the absence of accurate accident data weakening policy-making.
- **Solution:** A four-camera AI unit that monitors driving behaviour, coaches the driver in real time, and analyses 100 per cent of drive time rather than sampling event snippets.
- **Architecture:** Telematics signals- hard braking, acceleration, hard turns, high g-force, speed threshold and U-turn detection beneath an inward-facing driver monitoring camera covering seat-belt compliance, drowsiness, distraction and phone use, and a vision-based outward ADAS layer handling collision warning, following distance, posted speed validation, traffic signal compliance and weaving, feeding a cloud-connected system with a proprietary driver rating.
- **Indian position:** Designed, manufactured and developed in India; the company is among the top patent filers in the deep-tech start-up space per Nasscom.
- **Evidence:** Commercial rather than governmental deployments with IndianOil SkyTanking, Reliance, Hindustan Unilever, Nestlé, Mahanagar Gas and Shell covering over 88 million minutes monitored and 56 million kilometres analysed, with one-year reductions of 89 per cent in phone distraction, 50 to 75 per cent in speeding, roughly 96 per cent in seat-belt violations and 88 to 100 per cent in hard acceleration.

Netradyne addressed human error, which its opening slide put behind 80 per cent of road accidents, arguing that drowsiness, fatigue, phone use, seat-belt non-compliance and tailgating currently go unnoticed and that the absence of accurate accident data weakens policy-making.

3. Glance (Applied Information, Inc.)

- **Problem:** Against 177,175 lives lost on Indian roads in 2024, nearly twenty every hour, school beacons, signal cabinets, emergency corridors and bus routes run largely unmonitored.
- **Consequence today:** A beacon can fail, a signal drift out of sync or a cabinet fault with nobody at the agency knowing until a complaint arrives or a crash reveals it; engineers depend on manual site visits and public complaints, and field crews are sent out blind – a widening gap as the network grows faster than the staff available to monitor it.
- **Solution:** Remote monitoring and management of the roadside estate, live across more than 1,900 agencies in North America, covering 270 school beacons in Gwinnett County, Georgia alone and more than a tenth of all US school zones, alongside a C-V2X deployment with the Texas Transportation Institute.
- **Evidence:** A 90 per cent fall in beacon-malfunction complaints in Gwinnett County, a roughly 43 per cent reduction in first-responder travel time in El Cajon, California, and 10 to 12 seconds saved per intersection through emergency vehicle preemption; the demonstration lab in Alpharetta, Georgia is open to evaluators in person or virtually.

4. Intelligent Speed Assist (HERE Technologies)

- **Problem:** 45 per cent of the 1,83,382 road deaths recorded in 2025 attributed to over-speeding, citing MoRTH's Road Accidents in India 2025, against signage on rural and under-maintained stretches that is frequently missing, faded, obscured or inconsistent.

- **Why cameras alone fall short:** A static sign cannot express a limit that changes with time of day, weather or vehicle class, and camera-only ADAS inherits that blind spot exactly, so drivers on unmarked rural roads, informal urban streets and shifting construction zones receive no reliable speed guidance.
- **Solution:** A cloud-updated, location-aware map layer delivering speed limits including conditional, variable and vehicle-class-specific limits directly into a vehicle's onboard or connected ISA system, merged and refreshed daily from map data with AI/ML change detection, vehicle sensor inputs and government source data from RTOs and MoRTH notifications.
- **Indian alignment:** Calibrated against Indian signage and road classes, with data residency aligned to the DPDP Act and India's geospatial data guidelines, and designed to plug into the AIS-184 ADAS mandate and the draft Bharat NCAP 2.0 framework.
- **Evidence:** Deployed across 27 EU countries as the technology base OEMs rely on for compliance with the EU ISA mandate, in continuous commercial operation since 2022 across more than 200 million vehicles and over 70 OEM brands; against a pre-2022 baseline in which speeding caused 30 per cent of EU fatal crashes, regulatory analysis projects up to a 20 per cent cut in accidents and up to 50 per cent fewer fatalities where ISA is mandated.

5. HumSafer (Good Mind Private Limited)

- **Problem:** 78.4 per cent of all road accidents in India attributed to driver fault, citing MoRTH via PRS Legislative Research; trucks killed 32,362 people in 2024, 18.3 per cent of all road deaths from 4.4 per cent of India's vehicles, with over-speeding alone accounting for 1,24,522 deaths.
- **Structural gap:** India rates the vehicle and engineers the road but licences the driver once, for life. GPS units and cameras stay with the vehicle, so a driver's record is lost when he changes trucks, and an unsafe driver dismissed by one operator is hired the following week by another.
- **Solution:** A mobile application that detects over-speeding, drowsiness and fatigue through on-device AI and issues a spoken correction in the driver's own language within about three seconds; whether he heeds the alert or ignores it moves his Safe Driving Score, so the score trains the driver rather than merely rating him.
- **Indian design:** Built in India for Indian trucks, with zero hardware and no capital expenditure because it runs on the phone the driver already owns – which reaches market vehicles and not only owned fleets – and built ready to link to VAHAN and Sarathi.
- **Evidence:** Pan-India across client fleets on national and state highways, including Tata Steel and Hindustan Unilever outbound, with Tata Steel's July 2024 vendor circular making HumSafer a condition for own and market drivers. Platform data for 2020 to 2026 reports roughly 40 per cent lower accident risk, a threefold improvement in over-speeding alert adherence within three months of onboarding, and 40 per cent less cargo damage, across more than 2 lakh drivers onboarded and over 10 crore kilometres recorded.

6. FAST: Digital Twin-Based Adaptive Traffic Signal Control (ITS Planners & Engineers Private Limited / ITSPE)

- **Problem:** ₹1.47 lakh crore lost annually to urban congestion in Delhi, Mumbai, Bengaluru and Kolkata alone, set against 1.77 lakh road deaths a year, a large share of them at urban junctions.

- **Diagnosis:** Today's adaptive signals optimise one junction at a time, measuring queues on their own approaches without seeing where those vehicles came from or what the decision does two junctions downstream, so congestion is pushed around the network rather than resolved. Meanwhile cities procure video analytics that generate dashboards nobody operates, signal plans go unrevised for years, and roadworks are permitted without modelling cumulative impact.
- **Solution:** An adaptive control algorithm driven by a live Digital Twin (a continuously self-calibrating replica of the whole network) that models origin-destination demand rather than vehicle counts, optimises a corridor as one system, and runs offline to test schemes, diversions and roadworks before they reach the street.
- **Indian position:** Wholly indigenous IP, calibrated for heterogeneous weakly lane-disciplined traffic, engineered to work with partial detector coverage, and deployed as an add-on to ATCS already installed in more than 20 Indian cities, with the client retaining full data ownership.
- **Evidence:** One week of continuous live operation on the MG Road corridor in Warangal, across the MGM and Pochamma Maidana junctions run as one coordinated corridor and measured against fixed-time control on the same junctions 332 additional vehicles, or 3.0 per cent, through the morning peak and 182 more, 1.7 per cent, through the evening, with corridor speed held level, at a capital cost of ₹5 lakh per junction and no new hardware category introduced.
- **Ask and commitment:** A MoHUA mandate that cities prioritise traffic management operations rather than the procurement of unused analytics, nominated saturated corridors for three-month pilots measured jointly against the existing baseline, institutional access to origin-destination datasets, and a KPI-based operations standard. In return, a pilot corridor operational within three months of approval and a full nominated city network live within nine, with no civil works or hardware lead time.

7. Proactive Road Safety Infrastructure Assessment & Countermeasure Planning using iRAP Methodology and Hawkeye NSV Systems (Indian Road Survey & Management Pvt. Ltd.)

- **Problem:** Road authorities lack continuous, objective data on hidden geometric risks, unshielded roadside hazards, deficient skid resistance and faded night markings, so public funds are spent reactively without benefit-cost prioritisation and pavement friction deterioration goes undetected until loss-of-control crashes occur.
- **Solution:** Instrumented survey in place of visual inspection, high-speed Network Survey Vehicles capturing more than 50 safety-critical attributes every 100 metres, continuous T5 skid safety testers measuring friction, and iLINE retroreflectometers auditing line marking against IRC-35:2015.
- **Analysis:** Those attributes drive an iRAP star rating by road-user category and a Safer Roads Investment Plan engine that matches identified risks against more than 90 countermeasures and ranks them by benefit-cost ratio.
- **Evidence:** A completed assessment of the 32.1 km Theog-Kotkhai corridor in Shimla district for HPRIDC and HPPWD rated 96 per cent of the length one-star; the highest risk band for both vehicle occupants and motorcyclists, and produced 24 interventions costing an estimated ₹18.93 crore over twenty years and saving 511 fatal and serious injuries at an overall benefit-

cost ratio of 4.0, with curve delineation and chevron signage returning 12.0 and centreline rumble strips 18.0.

- **Indian execution:** Described as fully indigenous, operated by over 100 Indian engineers with domestic server data sovereignty.

8. Intelligent Traffic Management and Enforcement System (SCITA / Scita Solutions)

- **Problem:** Detection is not enforcement, and the chain breaks at several identifiable points unclear, covered or tampered plates defeat identification; not every detected violation becomes challan-ready evidence; network, power and camera downtime interrupts capture; manual review and audit introduce delay; and limited penalty recovery erodes deterrence.
- **Solution:** An Intelligent Enforcement Management System closing that chain in five stages, roadside sensing through 4D speed radar, enforcement cameras and IR illumination; an edge processing unit performing vehicle detection and tracking, ANPR, violation classification and edge-level validation; roadside connectivity over 4G, 5G or fibre; a central platform handling event, violation, evidence and audit management alongside safety analytics; and enforcement output through e-challan integration with a full audit trail.
- **Indian content:** The radar, analytics, roadside units and speed displays are indigenous, with HSRP and non-HSRP identification and day-night operation built for Indian conditions.
- **Evidence:** Across Bengaluru ITMS and the Odisha IEMS in July 2026, 79.54 million vehicles were detected and 11.40 million found in violation, averaging about 2.57 million detections a day across 231 locations and 400 radars, with 876,654 events audited and sent for challan in Bengaluru alone.
- **Footprint:** 642 enforcement locations and 1,210 ANPR deployments across a dozen states.

3.6 Session 4

S. No.	Technology	Organisation
1	Connected Commercial Vehicle (CCV) Protocol	National Highways for Electric Vehicles (NHEV)
2	Crash Scene CoPilot	Crash Scene CoPilot (Vihaan Upadhyay)
3	SATARK – Smart ANPR Targeting Alert Real-time Kaaryavahi	Crashfree India
4	AI-Powered Dashcam and Fleet Intelligence Operating Software	Cautio
5	Phone base: AI-enabled Knowledge-driven Smart Ecosystem for Road Safety	Worldcon Technology Pvt. Ltd.
7	DRISHTI: Data-driven Roadway Incident & Safety Hazard Tracking Intelligence Data Analytics for Promoting Safety	IIT Madras

Table 7. Session 4 — technologies showcased

Presentation Summaries

1. Connected Commercial Vehicle (CCV) Protocol (National Highways for Electric Vehicles / NHEV)

- **Problem:** Fragmentation rather than technology – driver fatigue and distraction, no live view of where a vehicle is, delayed accident response that costs the golden hour, systems working in silos, and financiers, insurers and load providers operating without visibility of the asset.
- **Solution:** A standardised digital operating framework that turns a commercial vehicle into a connected, monitored, safety-aware, energy-aware and service-supported asset.
- **Seven elements:** Connected vehicles, connected drivers, connected infrastructure, 24×7 command-centre monitoring, predictive uptime and roadside support, verified tamper-proof operational data, and end-to-end cargo visibility – each mapped to a specific response and operational outcome.
- **Roadside assistance layer:** Delivered with Crossroads Helpline, in highway RSA since 1999, on a hub model placing a hub roughly every 50 km with nine technicians per hub per day across three shifts and a two-hour handover overlap, targeting field response under 30 minutes and 99.5 per cent hub uptime.
- **Evidence and scale-up:** Phase 1 is already live on Delhi–Agra, Delhi–Jaipur and Chennai–Trichy – 18 hubs, 183 personnel, 829 km – scaling through 10 corridors in years one to two to all 26 NHEV corridors and 5,500 km, at 137 hubs and 1,382 personnel.

2. Crash Scene CoPilot (Vihaan Upadhyay, Individual Student Innovator, Guwahati, Assam)

- **Problem:** An underreporting gap of 31 per cent – roughly 180,000 fatalities recorded by NCRB against a WHO estimate near 260,000 for India in 2024 – located in the reporting act itself.
- **Diagnosis:** eDAR is meant to be the single source of truth, but officers filling it routinely leave out collision nature, road geometry and weather, so black-spot correction, speed limits and ITMS deployment are decided on generic data.
- **Solution:** An AI voice assistant that takes an officer's natural on-scene narration in his own language and returns a structured, iRAD/eDAR-compatible report in real time, then conversationally prompts for whatever is missing.
- **Indian stack:** A speech engine fine-tuned in-house on Assamese voice data from serving Assam Police, field extraction on Sarvam AI – an Indian sovereign model – with all data held on Indian soil and the application running on an ordinary mobile phone.
- **Evidence:** Trained on more than 1,000 minutes of real crash narration from serving officers and running in selected Guwahati police stations, reporting a word error rate under one per cent and over 95 per cent of eDAR fields filled.

3. SATARK – Smart ANPR Targeting Alert Real-time Kaaryavahi (Crashfree India)

- **Proposition:** Detection without consequence is not enforcement.
- **Problem:** 64 per cent of e-challan fine value issued in India since 2019 is still unpaid – over ₹42,000 crore in penalties that never landed – with 94 per cent of Delhi's 2024 challans outstanding on a Lok Sabha reply, and 56 per cent of registered vehicles uninsured.

- **Illustration:** Three fatal crashes were shown – Jaipur in November 2025, the Bhankrota LPG tanker collision, and the Kurnool bus fire on NH-44 – in each of which the offending vehicle carried pending challans visible in public records before the crash.
- **Solution:** An ANPR scan checked against live government records through ULIP with no caching – RC status, pending challans, insurance, PUCC, fitness and stolen or blacklisted status – applying thresholds the police themselves set per city, pushing an alert to a field officer's app and to a public compliance billboard, and logging every interception with an audit trail. Owner name, chassis and engine numbers are masked, so enforcement targets the vehicle's record rather than the person.
- **Evidence:** Live at Rambagh Circle in Jaipur, Trinity Circle in Bengaluru and Sohna Chowk in Gurugram, having screened over 5.4 lakh vehicles, identified more than ₹53 crore in pending challans and recorded over 600 interceptions, with detection to interception in about a minute in Jaipur.

4. AI-Powered Dashcam and Fleet Intelligence Operating Software (Cautio)

- **Problem:** India can already detect risk; the missing piece is verified action – the loop between alert, action and evidence – against 78 per cent of road accidents attributed to driver fault.
- **Second problem:** In ambiguous incidents the truck or bus is treated as a proxy for fault, leaving the driver facing arrest and the fleet carrying claims and downtime without objective evidence.
- **Solution:** Five layers – an edge AI dashcam combining driver monitoring and ADAS across road and cabin views; India-trained firmware performing on-device inference for real-time alerts; a Fleet OS software layer for evidence and analytics; a 24x7 command centre providing human validation and escalation; and a roadmap toward insurance priced on driving behaviour rather than vehicle age.
- **Indian position:** Described as MeitY-backed and free of China-origin or third-party dependency in the safety stack.
- **Evidence:** Deployment across 22 or more states and 130 cities with over 15,000 vehicles protected, more than 20 crore kilometres of Indian road data analysed and 33 lakh commercial trips safeguarded, yielding over 1,250 high-risk interventions – one demonstration showed seven seconds of microsleep detected and the driver woken by command-centre intervention.

5. Phone base: AI-enabled Knowledge-driven Smart Ecosystem for Road Safety (Worldcon Technology Pvt. Ltd.)

- **Premise:** Treat the smartphone already in the vehicle as the safety device – India has an active base of 750 to 800 million smartphone users against 260 million two-wheelers and 50 to 70 million cars.
- **Problem:** 4,80,583 accidents and 1,72,890 fatalities in 2023, with national highways accounting for 63,112 of those deaths and over-speeding implicated in roughly 68 per cent of fatalities, against an ecosystem split across driver behaviour, vehicle movement, road condition, weather and emergency response with no continuous real-time alerting to the road user.
- **Solution:** The KSEMAI platform combines those signals at journey level from phone sensors, GPS, camera and weather data to produce real-time safety alerts, a journey safety score, road

roughness and pothole detection, fatigue and drowsiness monitoring, crash detection, forward-collision and vehicle-to-pedestrian warnings and emergency assistance – software-first, requiring no dedicated roadside hardware.

- **Evidence:** Stated candidly: no independent field-deployment outcome has yet been claimed, and current evidence is functional validation of the live V2.0 platform, which anyone can test.
- **Commitment:** An operational pilot with baseline risk mapping within six months of approval, additional corridors at twelve months, and multi-state readiness at eighteen.

6. DRISHTI: Data-driven Roadway Incident & Safety Hazard Tracking Intelligence Data Analytics for Promoting Safety (IIT Madras)

- **Problem:** The structural problem underlying almost every other presentation at the conclave – road safety data sits with multiple agencies in disconnected silos, and each new technology deployed generates more data and deepens the fragmentation.
- **Solution:** An integrated repository bringing together crash, roadway, vehicle, driver, exposure, injury-control and citation and adjudication data, with the models and algorithms to turn it into predictive analytics and a decision support tool, so that interventions, day-to-day operations, infrastructure planning and policy all rest on the same evidence base.
- **Evidence:** The team's Community Maps platform for Wisconsin and the High Injury Network developed for the City of Madison under Vision Zero, where data-driven street redesign and context-sensitive speeds accompanied a 58 per cent fall in fatalities and a 26 per cent fall in serious injuries between 2020 and 2024.
- **Commitment:** To develop and demonstrate a DRISHTI pilot for a State at the Department of Civil Engineering, IIT Madras, over three years – data warehouse and visualisation in year one, models and algorithms in year two, and a decision-support dashboard in year three.





Image set 2: Day 1 at NRSTC 2026

Address to Students – Hon'ble Justice Abhay Manohar Sapre, Chairman, SCCoRS

In the evening of Day 1, following the jury meeting, the Chairman addressed students of IIT Bombay at the Civil Engineering Department. The session placed road safety before the next generation of engineers and planners. His key address include:

- **Accidents are Avoidable:** Justice Sapre declared that road accidents are entirely preventable engineering and human failures, completely rejecting the fatalistic excuse that they are the "will of God."
- **The Zero-Fatality Mission:** He issued a direct mandate to the audience, stating, "*Zero fatality on the road is my mission,*" asserting that every life lost to a crash is a preventable tragedy.

He advised the engineering community to step up, explicitly telling the students, "*You IITians can play a significant role in this,*" by turning technology into life-saving technology development.

4. Day 2 – 26 August 2026: Manthan

Day 2 was structured as Manthan – a deep churning or deliberation. Rather than a fresh round of presentations, the entire morning was given over to a detailed discussion in which every technology developer was examined by SCCoRS, MoRTH and officials from the participating State Governments on deployment readiness, the credibility of their commitments, and the minimum viable pilot they could begin immediately. The session closed with a valedictory brief on the outcome of the evaluation.

Programme Item	Participants
Manthan – SCCoRS-led cross-examination; companies examined on deployment readiness and commitment	SCCoRS / State Transport Authorities

4.1 Manthan: Purpose, Method and Conventions

Manthan was a structured deliberation rather than a second round of presentations. Road-safety technologies shortlisted through the open call were questioned, one at a time, by senior officials of transport, police, PWD, highways departments and academia from States across the country. Written evaluations were received for sixteen solutions from twenty-one evaluators. Three conventions govern how that record is reported here.

First, the deliberations were held under a closed-door convention, so evaluator identities are withheld by design and attribution is limited to the level of the jury or of a State delegation.

Second, expressions of pilot or procurement interest reflect written remarks made by members of a delegation during the event: they indicate an opening to be pursued through the State Government concerned, not a committed order.

The account that follows is deliberately technology- and company-agnostic in its general findings. Its purpose is to set direction for the sector rather than to endorse individual products; each presenting company has separately received its own consolidated feedback.

4.2 What Came to Manthan

The solutions that came before the panel clustered, into five categories:

- **Enforcement and compliance:** AI camera networks, two-wheeler and interceptor enforcement units, and black-spot-focused violation detection feeding e-challan systems.
- **Vehicle- fitted safety systems:** aftermarket driver-assistance systems for the existing fleet, deceleration-triggered braking alerts, and platforms that fuse vehicle and road data to warn drivers in real time.
- **Driver behaviour and fleet monitoring:** camera- and radar-based driver monitoring, fatigue and health-event detection, and driver-scoring platforms, aimed mainly at commercial fleets.
- **Traffic and road network:** adaptive traffic-signal control, connected devices and data systems to monitor, control, and optimize vehicle movement safely.

- **Emergency response and Crash data:** adaptive traffic-signal control, emergency-vehicle priority at signals, and video analytics that identify near-miss conflicts before crashes occur.



Image set 3: Manthan cross-examination and State delegations — Day 2 at NRSTC 2026

4.3 What Earned the Panel's Confidence

Three things recurred wherever the panel responded warmly:

- **Evidence from the field.** Deployments and pilots in Indian cities and states counted for more than any specification sheet. Evaluators repeatedly asked what a solution had already done rather than what it could do.
- **A clear entry use case.** School buses and State Transport Undertaking fleets emerged independently, across several delegations, as the natural first market the duty of care is unambiguous, the fleets are supervised, and procurement runs through a single authority.
- **Affordability and indigenous engineering.** Solutions built and trained on Indian road conditions, and priced for Indian operators, drew visibly stronger interest than imported capability presented at global price points.

4.4 The Readiness Bar Set by the Panel

The most consistent output of Manthan was not a verdict on any one company; it was a de facto readiness standard for road-safety technology entering public deployment in India. Recurring across the evaluations, it comes to six requirements:

- **Medical and exposure clearance before in-cabin sensing is piloted.** Any technology that senses the human body continuously must carry certification from a recognised medical institution, with radiofrequency exposure demonstrated to be within ICNIRP/SAR limits — health-safety compliance, distinct from spectrum compliance.
- **Automotive-grade certification for anything that touches vehicle control.** The jury asked for qualification against functional-safety and cybersecurity standards — ISO 26262 and ISO 21434 and the applicable AIS standards, including AIS 140 for tracking platforms and AIS 189/190 for advanced systems. Retrofit devices that actuate braking need explicit regulatory clarity before road use.
- **Cybersecurity, VAPT and data protection wherever a system touches signals, enforcement or driver data.** End-to-end encryption, vulnerability assessment and penetration testing, and clarity on custody of the data were treated as preconditions for public-infrastructure deployment, not as enhancements.
- **Pilots with published evidence before procurement.** Delegations offered pilots generously, but the expectation is structured trials with documented before-and-after results at meaningful scale in one case the jury asked for a pilot covering more than a thousand drivers and effectiveness shown against a counterfactual, not activity counts alone.
- **Affordability for the private operator.** Recurring per-vehicle prices quoted during the deliberations were repeatedly flagged as out of reach for the private commercial operators who make up most of the fleet. A capability that only State fleets can afford will not move national numbers.
- **Interoperability.** Alignment with IRC codes, integration with existing State and national systems rather than parallel stacks, and movement towards a standardised data layer were asked of new entrants and established players alike.



Image set 4: Manthan cross-examination and State delegations — Day 2, 26 August 2026.

4.5 What the States Asked For

The demand signal was unambiguous. Written interest in pilots, trials or procurement was recorded for fourteen of the sixteen solutions, from at least seven State delegations including Rajasthan, Uttarakhand, Tamil Nadu, Gujarat, Madhya Pradesh, West Bengal and Bihar and in two cases extended to direct purchase intent. Delegations converged on black spots and high-risk junctions as the infrastructure priority, and on school and State-transport fleets as the vehicle-side priority. They also set terms: proposals routed through State Governments, transparent pricing per vehicle or per junction, and pilot results they can verify before scaling.



Image 5: Chairman SCCoRS and other delegates at Manthan- Day 2

4.7 Technologies for Manthan at a glance

These technologies are categorized according to the function they serve:

ENFORCEMENT AND COMPLIANCE

1 Integrated Road Safety & ITS

A UNIFIED PLATFORM FOR SAFER ROADS

- Integrated Road Safety & ITS – Prama India.
- ANPR, over-speed and red-light violation detection, incident, and traffic monitoring on one command platform.
- Central control panel, traffic monitoring on one command platform.

ONE PLATFORM
MULTIPLE SOLUTIONS
SAFER INDIA

2 Video analytics for enforcement – SenSen Video Intelligence

AI-POWERED VIDEO ANALYTICS FOR INTELLIGENT ENFORCEMENT

- Video analytics for enforcement – SenSen Video.
- AI-based detection of violations, vehicle classification and traffic analytics.
- Accurate, real-time insights for proactive enforcement.
- Scalable for highways, urban roads and smart cities.

3 JioHumsafar by Jio Platforms Ltd.

CONNECTED FLEET AND DRIVER SAFETY PLATFORM

- End-to-end connected fleet and driver safety platform.
- AIS-140 compliant and ARAI-certified telematics hardware.
- Real-time tracking, driver behaviour alerts, and driver profiling.
- Supports government and enterprise fleets.

4 SATARK – Crashfree India

FROM DETECTION TO ACTION FOR SAFER ROADS

- ANPR scan checked live against VAHAN, license plates.
- VAHAN, Insurance, challan, and fitness records.
- Alerts an officer via officer, digital public status, digital billboard.

5 SCITA – Intelligent Traffic Enforcement Management System

AI-POWERED INTELLIGENT TRAFFIC ENFORCEMENT

- AI-powered end-to-end road safety platform.
- Real-time violation detection, evidence capture and validation.
- 4D speed radar, enforcement cameras and AI analytics.
- Integrated e-challan and enforcement workflow.

Image 6: Technologies in Category 1

VEHICLE- FITTED SAFETY SYSTEMS

1 CAR.OS RETROFIT ADAS – Aha Automotive retrofit

- Plug-and-play systems, like controlling car anti-theft and collision systems, are highly adaptable.

100 million
data available

iCAT approval
approval

2 iBrake (ADIS) – Sego Automobile Solutions

- Brake light activation when braking automatically can reduce brake fade and prevent wheel-lock conditions.

140 million
data points

Brake activation data **+38%**

3 Drwig Spandan – Gahan AI

- In-cabin radar is a major type of multi-faceted in-cabin-radar. Combining description, location, camera, and driver awareness functions.

TRL-8 | Price: \$400

Image 7: Technologies in Category 2

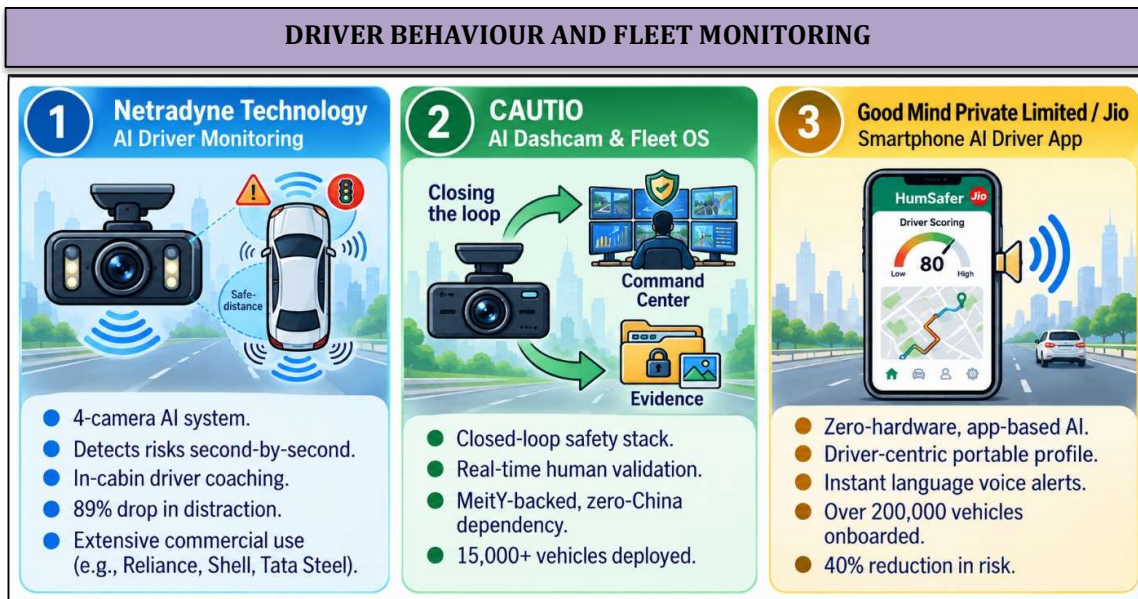


Image 8: Technologies in Category 3

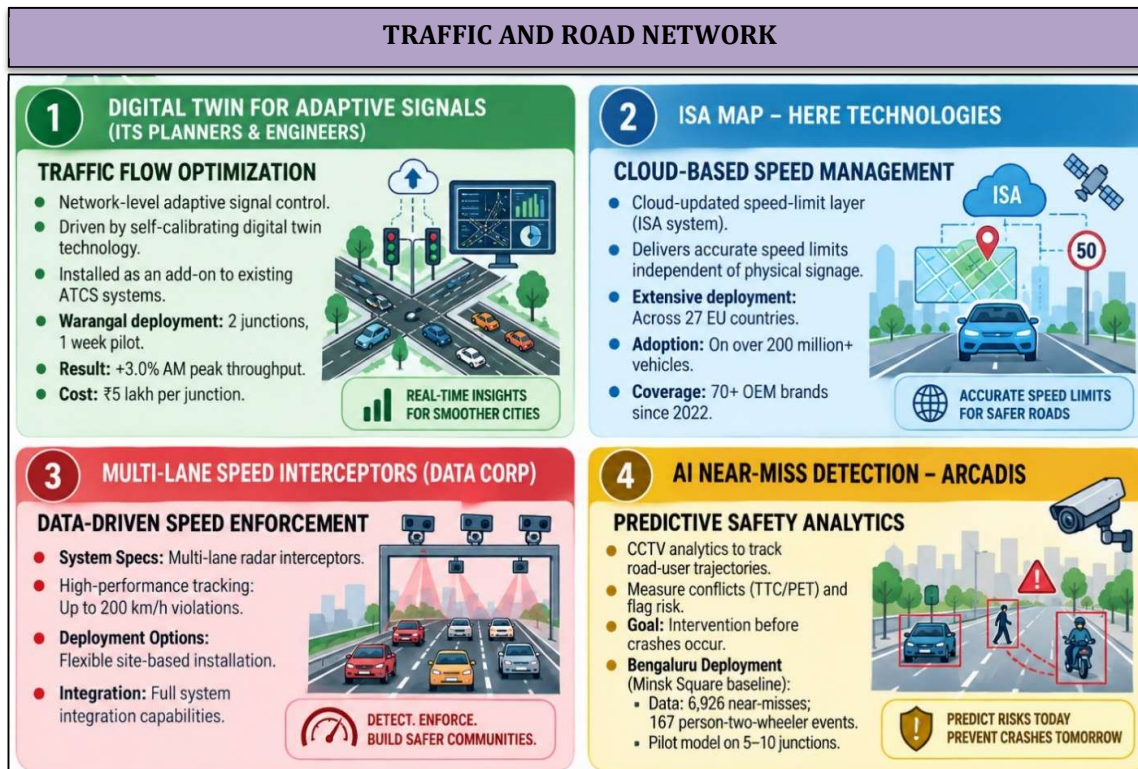


Image 9: Technologies in Category 4

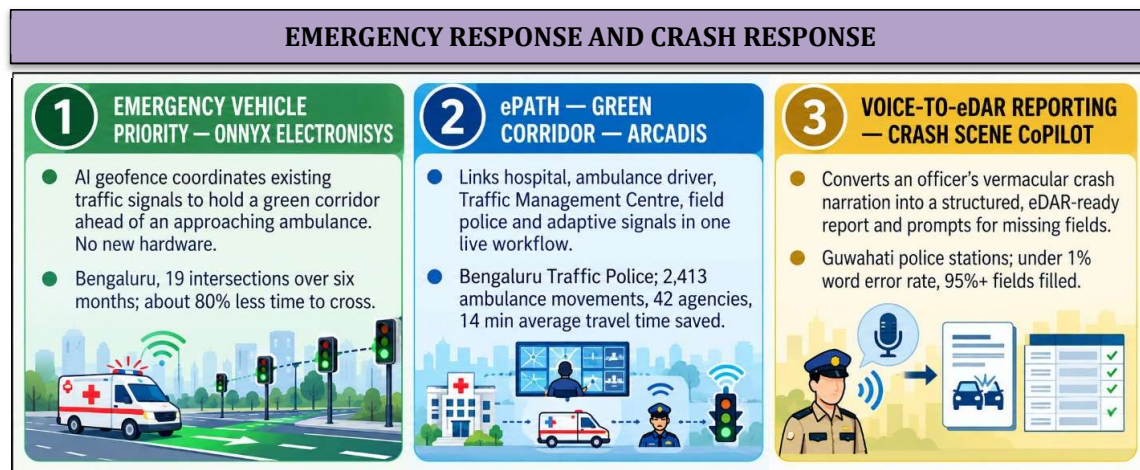


Image 10: Technologies in Category 5

4.8 What Each Presenter Asked of Government

Transcribed from the ASK slide of each submission, under the four headings of the NRSTC template. Read down each column, the question the session put to the room was how many of these are in fact the same decision, and which can be taken by a State as against those that need the Centre.

Policy / mandate

Presenter	Ask
HERE	Recognise map-based ISA as a compliance pathway in draft Bharat NCAP 2.0.
Gahan AI	Accept in-cabin radar alongside cameras in STU procurement specifications.
Sego	MoRTH/BIS retrofit mandate for ADIS on heavy and mineral-transport fleets.
Cautio	Mandate DMS across commercial vehicles — cabs, buses, logistics, State fleets.
Jio Platforms	Make risk-scored dispatch and in-vehicle DMS a condition of operation.
ITSPE	MoHUA mandate that cities prioritise traffic operations, not procurement.
Crashfree India	MoRTH advisory operationalising the Supreme Court's 2026 INSC 793 directions.
Crash Scene CoPilot	Recognise vernacular voice intake as an approved eDAR reporting mode.
Prama India	Encourage AI-ITS and ANPR across highways and smart cities.
Onnyx	State permission and nomination of officers to pilot on existing signals.
Arcadis (Near-Miss)	Recognise TTC, PET and Conflict Index as evidence for black-spot review.

Presenter	Ask
Arcadis (ePath)	A common operating framework for emergency medical priority across agencies.

Table 11. Government asks — policy and mandate

Corridor / pilot access

Presenter	Ask
Gahan AI	One STU depot, 50–100 buses, 12 months. Hardware self-funded.
HERE	About 270 km of NH-48 Delhi–Jaipur, or a comparable State corridor, for 6 months.
ITSPE	Saturated corridors in metro and Tier-1 cities for 3-month pilots.
Sego	Direction to scale across TGMDC trucks on the NH-163 corridor.
Crashfree India	One NH toll-plaza pilot, plus fast-track municipal permissions.
Cautio	NHAI and State networks; 1–3 month pilots scaling to 5,000 vehicles.
Jio Platforms	Notify highest-risk corridors first; no roadside works required.
Onnyx	Any operational signalised intersections; 45-day staged demonstration.
Crash Scene CoPilot	Endorsement to extend from Guwahati to all Assam Police districts.
Prama India	National highways, smart city corridors and State transport projects.
Arcadis (Near-Miss)	5–10 high-risk junctions, with access to existing camera feeds.
Arcadis (ePath)	Cities and priority medical corridors using existing ambulance fleets.

Table 12. Government asks — corridor and pilot access

Data access

Presenter	Ask
Sego	VAHAN API to link braking events to e-challan and compliance systems.
HERE	MoRTH and State speed notifications, VAHAN vehicle class and e-challan data.
Cautio	VAHAN API, challan information, challan payment access, weather reports.
Crashfree India	Insurance Information Bureau API access for State-police deployments.
Crash Scene CoPilot	Direct eDAR/iRAD write API access, to remove manual re-entry.
Onnyx	Signal controller API through PWD; ambulance GPS API through Health.

Presenter	Ask
ITSPE	Origin–destination and mobility datasets held by State and central agencies.
Jio Platforms	Pass incident data between vehicle, State control room and road authority.
Gahan AI	Crash and FIR data tagged for driver medical incapacitation — not recorded today.
Prama India	Integration with vehicle databases, command centres, ERSS and enforcement.
Arcadis (Near-Miss)	CCTV feeds, junction geometry, volumes, signal timing and crash records.
Arcadis (ePath)	ATCS APIs, junction plans, signal status and ambulance movement data.

Table 13. Government asks — data access

Spectrum / standards

Presenter	Ask
Sego	C-V2X allocation at 5.9 GHz, so the installed base upgrades by firmware alone.
Gahan AI	Confirm the in-cabin radar band; include it in occupant-monitoring standards.
HERE	Recognise map-based speed data as a valid ISA input in vehicle standards.
Crashfree India	National SOP for ANPR interception and public displays — plate and status only.
ITSPE	A KPI-based operations standard: peak throughput, journey time, plan currency.
Prama India	Alignment with national ITS, smart city and road safety guidelines.
Arcadis (Near-Miss)	Common TTC, PET, conflict classification, privacy and video retention rules.
Arcadis (ePath)	An open, vendor-neutral EVPS interface across TMC and signal systems.
Crash Scene CoPilot	None — software only, running on standard Android devices.

Table 13. Government asks — Spectrum/Standards

4.9 Solution-wise Feedback

Every solution presented in Manthan was evaluated in writing by the technical jury and by senior officials of transport, police, PWD and highways departments from States across the country. This compendium consolidates that feedback, one solution at a time, in the order of presentation, subject to the reporting conventions set out at the head of this section.

1. Spandan — Gahan AI

Contactless, radar-based in-cabin system that detects driver incapacitation — cardiac or respiratory — in commercial vehicles, with no camera, no wearable and no personal data capture.

Panel reception

One of the most widely commented solutions of Manthan. Interest was broad and genuine, evaluators from at least four States engaged with it in writing and nearly every one of them attached the same condition: medical validation before deployment.

What resonated

- The contactless, camera-free approach; no wearable, no personal data was seen as well suited to Indian commercial fleets.
- The Uttarakhand delegation identified State transport buses and mining dumpers as ready use cases, spanning driver fatigue, behaviour and cardiac events.
- The Madhya Pradesh delegation rated the solution excellent; other senior delegates called it very good and saw a pilot as ready to launch.

Concerns and asks

- Medical clearance is the gate. Delegations and the jury independently asked for certification of continuous radar exposure by a recognised medical institution (AIIMS was suggested), and one delegation advised bringing a medical professional onto the team before designing the pilot.
- The jury asked for clarity on ICNIRP/SAR exposure limits for UWB and automotive radar — health-safety compliance, as distinct from spectrum compliance.
- The jury asked for pilots covering more than 1,000 drivers with a submitted technical report, and suggested initial testing on government vehicles.

Pilot and procurement interest

The Rajasthan delegation recorded pilot interest twice over, conditional on medical certification; Tamil Nadu invited a demonstration in the State; Uttarakhand pointed to its transport-undertaking buses and mining fleets.

Suggested next steps

Secure medical and exposure-safety certification before anything else. Then structure a 1,000-plus-driver pilot with a State Transport Undertaking, on government vehicles first, and publish the results.

2. AI-Based Near-Miss Detection — Arcadis

AI video analytics that identifies near-miss conflicts before crashes occur, enabling proactive treatment of junctions and corridors.

Panel reception

Consistently positive. The panel read this less as an enforcement product and more as a road-engineering decision tool — and valued it for exactly that.

What resonated

- Application to junctions, multi-leg intersections, black spots and congestion points was endorsed across several delegations.

- The Uttarakhand delegation saw it as a tool to improve road design, citing junction locations such as Haldwani as the kind of site where it would apply.
- Tamil Nadu recommended it for pilot study; Rajasthan sought a pilot; junction-upgrade piloting was specifically suggested.

Concerns and asks

- Analyses and recommended treatments should follow IRC codes, in the jury's view.
- The jury assessed that adaptability and scalability need strengthening before wide deployment.
- Access to road video feeds from city authorities is the practical dependency; the jury flagged that these feeds need to be arranged for the solution to work at scale.
- The jury asked that data from the ePath application be shared for independent evaluation.

Pilot and procurement interest

Written pilot interest from the Tamil Nadu, Rajasthan and Uttarakhand delegations, oriented towards junction and black-spot treatment.

Suggested next steps

Structured before-and-after junction pilots with a city or State authority, IRC-aligned recommendations, and shared evaluation data from existing deployments.

3. Plug & Play ADAS Retrofit — Aha Automotive Innovation

Indigenous plug-and-play retrofit bringing active safety to India's existing vehicle fleet, trained on Indian road conditions.

Panel reception

High engagement and a genuinely divided room: strong enthusiasm for what affordable retrofit ADAS could mean for India's existing fleet, matched by the sharpest safety-certification questions of the event. The path forward is regulatory before it is commercial though the throttle-control layer is already past that bar.

What resonated

- Affordability relative to OEM ADAS was noted approvingly cheaper than built-in ADAS, and therefore worth considering for implementation.
- The Uttarakhand delegation pressed for consideration on State transport buses, trucks and mining dumpers; Rajasthan called it very useful and argued for extensive use across private and commercial cars; Madhya Pradesh found it good, with room to improve.
- The indigenous build, trained on Indian roads, was valued in itself.
- The throttle-control module is iCAT certified and already field-deployed, 2,500+ customers and 200 lakh+ km clocked giving the panel a live, de-risked reference point rather than a concept pitch.

Concerns and asks

- The central question raised: what is the road-legal status of an aftermarket actuator on a vehicle's brakes? Functional safety is unproven in the panel's view this applies specifically to the brake-actuation features (AEB, ACC, Traffic Jam Assist), which are not yet certified; the throttle-control product already carries iCAT certification and field validation.
- The jury asked for qualification against automotive safety and security standards — ISO 26262, ISO 21434 and the applicable AIS standards, including AIS 189 and AIS 190 before deployment. This certification requirement is scoped to the brake-control feature set.
- Several delegations held that trials, testing and formal approvals must precede any pilot, and advised pursuing homologation centrally rather than State by State. For brake-control features, certification before pilot is the agreed sequencing.

Pilot and procurement interest

Interest recorded from Uttarakhand and Rajasthan, contingent on certification and approvals. The throttle-control product, being iCAT certified, can proceed directly to pilot; brake-control features (AEB, ACC, TJA) require certification to be completed first.

Suggested next steps

Immediately, advance pilot deployment of the iCAT-certified throttle-control product with interested States (Uttarakhand, Rajasthan). On a parallel track, a certification roadmap with a recognised automotive test agency, regulatory clarity on retrofit brake actuation, and controlled demonstrations for AEB/ACC/TJA in that order before those features enter pilot.

4. Advanced ITS / CCTV Portfolio — Prama India

Intelligent transportation system portfolio spanning enforcement, monitoring and transport management for cities, highways and law-enforcement agencies.

Panel reception

The panel engaged with this as an established, at-scale player rather than a new entrant — the questions were about assurance and evidence, not viability.

What resonated

- The jury noted multi-sector presence, more than 250 major systems integrated, presence in over twenty States, technically strong indigenous camera manufacturing, and detection coverage of 34 violation types.
- The Rajasthan delegation reported extensive existing use in the State and recommended it; Madhya Pradesh rated it excellent; Uttarakhand noted night-vision capability and suitability for smaller towns and cities.
- Tamil Nadu recommended a pilot study.

Concerns and asks

- The jury flagged data protection and cybersecurity as challenges that need to be demonstrably addressed; sensor components remain imported even where camera manufacture is indigenous.

- Rajasthan will take a view after seeing the performance of the Bhilwara deployment through RAJDMS the panel wants performance evidence from live deployments published, not asserted.
- An academic delegate questioned the system-integrator-led route to market, which makes the merit of individual features harder for buyers to judge; Gujarat advised routing proposals through State Governments; one senior delegate asked for more thorough scrutiny.

Pilot and procurement interest

Beyond existing deployments, Tamil Nadu recommended a pilot; Rajasthan's continued use is linked to documented performance of the current deployment.

Suggested next steps

Publish performance evidence from live deployments, obtain cybersecurity certification and VAPT for public-infrastructure use, and engage State Governments directly alongside integrator channels.

5. iBrake — Sego Automobile Solutions

Patented deceleration-to-brake-light and vision-AI platform aimed at cutting rear-end collision risk.

Panel reception

Measured. The panel saw a real, sharply defined problem being addressed, and wanted more evidence before going further.

What resonated

- Value on trucks and dumpers was noted by the Uttarakhand delegation, and Rajasthan saw particular usefulness for night driving.
- Tamil Nadu was open to considering a pilot study.

Concerns and asks

- The jury regarded the scope as narrow, and asked how false positives are handled, how sensors are calibrated, and whether an FMEA has been done.
- The jury asked for the concept to be proven through more pilots, with a technical report submitted.
- Delegates asked for more literature and analysis, and for clearer positioning relative to full ADAS; one noted that rear-facing brake-light coverage alone needs service improvement.

Pilot and procurement interest

Conditional consideration from Tamil Nadu; use-case interest from Uttarakhand and Rajasthan.

Suggested next steps

A documented fleet pilot and a technical dossier, calibration method, FMEA, false-positive rates with published results.

6. Emergency Vehicle Priority — Onnyx Electronics

AI system that detects and prioritises ambulances at traffic signals, building a coordinated green corridor for emergency response.

Panel reception

The problem statement resonated across the room delegations called the solution excellent and promising while the panel's hard questions converged on security and control.

What resonated

- Rajasthan called it much useful for emergency movement and offered a pilot; another senior delegate found the technology promising.
- The Uttarakhand delegation named cities of the scale of Dehradun, Haldwani, Roorkee and Haridwar as where signal-level ambulance priority would matter.
- Tamil Nadu recommended it for pilot study.

Concerns and asks

- The jury was unwilling to take remote control of live traffic signals on trust: vulnerability assessment and penetration testing, and high-security inspection of the software, were set as preconditions and the assumption that legacy signal infrastructure can be remotely controlled was challenged.
- An academic delegate flagged a workflow gap: no mechanism was described for registering a route before the journey begins, including the leg to fetch the patient.
- Gujarat asked for transparent pricing per vehicle and per traffic point.

Pilot and procurement interest

Rajasthan offered piloting; Uttarakhand's named cities indicate city-scale pilot appetite, conditional on security assurance.

Suggested next steps

Security certification and integration with a signal authority in one pilot city; a defined route-registration workflow; published pricing.

7. JioHumsafar — JioThings, Jio Platforms

Predictive risk platform combining IoT sensing and vision-based driver assistance to warn drivers by voice.

Panel reception

Positive, with a consistent pilot-first refrain: the panel recognised the integration ambition and wanted the concept proven on the road rather than in architecture.

What resonated

- The jury saw particular potential in hazardous-goods transport and ambulances, and counted the voice-prompt interface as an edge.

- The Uttarakhand delegation pointed to hazardous-cargo vehicles as a fit; delegates across States were open to trials.
- The attempt to integrate multiple systems into one platform was itself noted as the distinctive strength.

Concerns and asks

- One delegation found the proposition ambiguous as presented — a concept demonstrated in a vehicle rather than a concrete deployable proposal.
- The jury's key ask: a unified, standardised data layer rather than a proprietary stack.
- The jury asked for multi-State pilots with interoperability between States demonstrated, and for integration with AIS 140 to be discussed.
- Delegations advised structured collaboration with State Governments, beginning with pilots.

Pilot and procurement interest

Rajasthan asked to host a pilot; several other delegations recorded pilot-first interest.

Suggested next steps

A two- to three-State pilot with published interoperability results, AIS 140 alignment, and a contribution to the standardised data layer the jury asked the sector for.

8. Road Safety Net — SenSen Video Intelligence

Camera- and sensor-agnostic AI software that measures traffic, detects violations and heavy-vehicle non-compliance, auto-generates e-challans and triggers crash-response alerts.

Panel reception

A compact but favourable record. Rajasthan called it a premier technical solution for road safety and black spots, and the jury noted the existing deployment in Pune.

What resonated

- Application to black spots and vulnerable locations was endorsed by the Uttarakhand delegation, which also saw a fit for transport-undertaking and school buses with electronically assisted enforcement.
- Gujarat proposed one pilot in every State; Tamil Nadu was open to considering a pilot study.

Concerns and asks

- One senior delegate flagged cost as a constraint on trial-basis implementation.
- Rajasthan asked for the loop to be closed: black-spot correction followed by post-rectification analysis, so that detection demonstrably leads to treatment and measured improvement.

Pilot and procurement interest

Written interest from Tamil Nadu, Uttarakhand, Rajasthan and Gujarat, the last proposing a pilot in every State.

Suggested next steps

State pilots with a transparent cost model and published before-and-after evidence at treated black spots.

9. Driver Monitoring and ADAS — Netradyne

Real-time driver-behaviour monitoring and alerting — over-speeding, drowsiness, distraction, mobile-phone use with driver scoring.

Panel reception

Among the strongest receptions at Manthan. Madhya Pradesh called it “a must”; Rajasthan a premier technical solution for driver tracking; other delegates recommended trials, and the jury noted its scalability. The asks are about fit for the Indian market.

What resonated

- The school-bus application stood out, the Uttarakhand delegation described a camera-and-control-room safety model with driver marking for school buses.
- Driver scoring was noted by the jury, along with relevance to electric-vehicle fleets.
- Rajasthan asked to host piloting in Jaipur, seeing it as a good solution for managing drivers.

Concerns and asks

- Affordability: at ₹25,000 per vehicle per month as cited during deliberations, an academic delegate judged the solution unaffordable for most private operators — the largest part of the fleet.
- The jury set preconditions of end-to-end cybersecurity certification, data encryption, data privacy and demonstrated false-positive handling.
- The Uttarakhand delegation raised driver-data requirements for technology of this kind; Gujarat suggested added features such as driving-licence-linked driver details and seat-vibration alerts for drowsiness.
- A presentation note from one delegation: engage the medical and behavioural questions raised during deliberations, and avoid positioning the product by criticising existing government systems.

Pilot and procurement interest

Rajasthan (Jaipur) requested piloting; trials were recommended by other senior delegates.

Suggested next steps

An India-priced tier for private operators, cybersecurity and privacy certification, and a school-bus or State-fleet pilot that converts the strongest use case into evidence.

10. Intelligent Speed Assist — HERE Technologies

Location-based speed-limit data powering in-vehicle Intelligent Speed Assistance.

Panel reception

The written record is thin, and pointed: the panel found the proposition ambiguous as presented

and wanted a visible, demonstrable solution rather than a description of a data capability.

Concerns and asks

- The panel could not evaluate outcomes from a data layer alone; it asked, in effect, to be shown the system working.

Suggested next steps

Bring a working in-vehicle demonstration on Indian roads — with an OEM, fleet or State partner — together with quantified accuracy of speed-limit data across Indian road classes.

The brevity of this entry reflects the written record of the session, not a considered rejection of the technology.

11. FAST: Digital Twin-Based Adaptive Signals — ITSPE

Digital-twin-based adaptive traffic-signal control.

Panel reception

The most divided verdict of Manthan. It was argued that the gains from network-level optimisation are substantial and recommended the solution strongly; other evaluators questioned cost and robustness in the same breath.

What resonated

- Prior work at Dehradun was noted by the Uttarakhand delegation, including signals on networks feeding national highways.
- Rajasthan and Tamil Nadu were open to pilots, and one delegation said it may consider State implementation.
- The network-level congestion argument pursuing a global optimum rather than junction-by-junction fixes was found much to recommend by an academic delegate.

Concerns and asks

- Rajasthan found the solution too costly as presented.
- One senior delegate's blunt assessment was that the system has many loopholes and did not impress.
- The jury pointed to the real-world constraint: traffic-signal hardware is difficult to maintain, and any control layer inherits that burden.
- The jury asked for more data to strengthen the digital twin, followed by multi-State aggregation; another delegate asked for more scrutiny.

Pilot and procurement interest

Openness from Rajasthan, Tamil Nadu and Uttarakhand, tempered by cost.

Suggested next steps

A costed case from an operating corridor — capital and maintenance costs against measured delay and safety gains — is the strongest answer to both the cost and the robustness doubts.

12. Crash Scene CoPilot — Individual Innovator (Vihaan Upadhyay)

AI voice assistant that converts an officer's vernacular crash narration into a structured, eDAR-ready report.

Panel reception

The panel received this as a promising individual initiative and responded with encouragement: the Tamil Nadu delegation appreciated the young innovator's initiative and advised that, as the vernacular language capability matures, he approach established solution providers so the tool finds a route into real crash-reporting workflows.

Suggested next steps

Mature multilingual support, then pursue integration with established crash-investigation and reporting platforms rather than standalone deployment. A mentorship opportunity is seen here, and continued engagement is encouraged.

13. SATARK — Crashfree India

AI-powered intelligent traffic enforcement and voluntary compliance platform built on ANPR.

Panel reception

The written record is brief but positive: the recommendation on file is for a pilot study.

Pilot and procurement interest

Tamil Nadu recommended a pilot study.

Suggested next steps

Pursue a structured pilot with an enforcement agency, and bring a fuller technical dossier — detection performance, evidence quality, integration with e-challan systems — to the next evaluation round.

14. AI Dashcam and Fleet Intelligence — Cautio

Full-stack AI dashcam and fleet-intelligence platform for commercial mobility.

Panel reception

The cleanest written record of Manthan: every substantive comment was positive, and school buses emerged as the consensus entry point across delegations and jury alike.

What resonated

- Bihar mentioned it would be very helpful for school buses; Uttarakhand called it important for school vehicles and trucks; Rajasthan offered school-bus piloting in the State.
- The jury noted driver monitoring combined with two-way communication and a 24×7 call-centre model, endorsed the school-bus focus, and assessed strong commercial scalability including ambulance and school-bus segments.
- Tamil Nadu recommended a pilot study; trials were recommended by other senior delegates; Rajasthan valued the driver-behaviour tracking.

- An academic delegate went further, proposing that it be placed in head-to-head competitive procurement against an established international player for a large order a signal of confidence in its readiness.

Concerns and asks

- Minimal in the written record. The jury suggested discussing integration with AIS 140.

Pilot and procurement interest

Written interest from Rajasthan, Bihar and Uttarakhand, centred on school buses; trial recommendations beyond that.

Suggested next steps

Convert the school-bus consensus into one or two documented State pilots, align with AIS 140, and publish the results.

15. Enforcement Bikes and Interceptors — Data Corp

Camera-equipped two-wheeler and interceptor units for on-road enforcement with e-challan-grade evidence.

Panel reception

The broadest engagement of any solution at Manthan — written comments from more delegations than any other entry — including the event's most direct procurement signals.

What resonated

- The West Bengal delegation stated intent to buy; Uttarakhand indicated transport and police interest in purchasing camera devices for existing vehicles.
- The jury noted detection of ten violation types, mobile-phone use prominent among them, with e-challan-grade evidence, and assessed strong commercial scalability.
- Gujarat welcomed the offer of free demonstration and piloting; the enforcement value was endorsed across delegations; Madhya Pradesh suggested linkage to licence-renewal policy; Bihar suggested involving the insurance sector through IRDA; an academic delegate saw application across national road corridors.

Concerns and asks

- Rajasthan asked for the comparative advantage over its existing interceptor fleet to be established before adoption.
- An academic delegate pressed for effectiveness evidence against a counterfactual — more challans is not yet fewer crashes.
- The jury asked for data encryption to be proved, VAPT done thoroughly, and data security addressed.
- One senior delegate asked for more scrutiny.

Pilot and procurement interest

Purchase intent from West Bengal and Uttarakhand; pilot interest from Gujarat, Rajasthan and others.

Suggested next steps

A comparative pilot against incumbent interceptor equipment in one State, a data-security audit, and an evidence pack linking enforcement activity to crash outcomes.

16. HumSafer

Driver-safety platform built around trip-level driver scoring and coaching, delivered through a mobile application.

Panel reception

Positive and practical, anchored by a completed pilot with the Uttarakhand transport undertaking.

What resonated

- The driver-score approach was noted by the jury.
- The Uttarakhand delegation cited the completed pilot with its transport undertaking; Rajasthan welcomed piloting in Jaipur and found the driver-scoring method good.
- Rajasthan found it very useful; trials were recommended by a senior delegate.

Concerns and asks

- Uttarakhand flagged the quoted price of ₹35 per driver per day as costly at fleet scale.
- Gujarat noted the mobile-app form factor — a consideration for enforcement-grade or fleet-integrated use.

Pilot and procurement interest

A completed Uttarakhand pilot on record; Jaipur piloting welcomed by Rajasthan.

Suggested next steps

Publish the results of the completed pilot, revisit fleet-scale pricing, and take up the Jaipur invitation.

Technologies at a glance

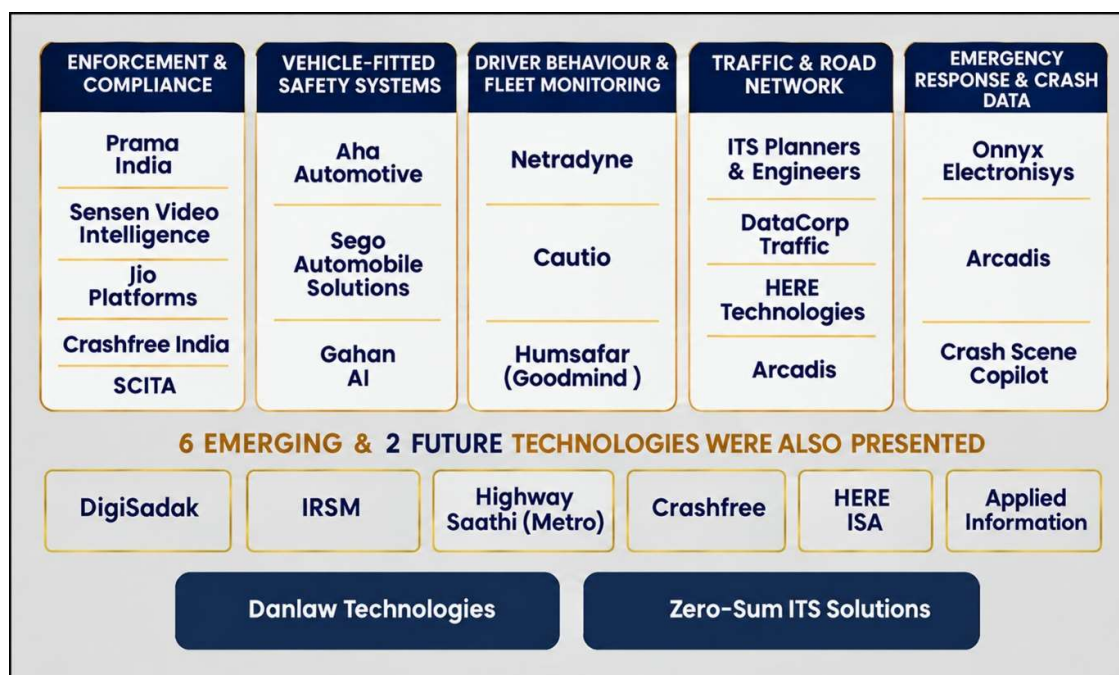


Image 5: Selected Technologies at NRSTC 2026.

Written interest in pilots, trials or procurement was recorded solutions evaluated, from at least seven State delegations, Rajasthan, Uttarakhand, Tamil Nadu, Gujarat, Madhya Pradesh, West Bengal and Bihar and in two cases extended to stated purchase intent. Delegations converged independently on black spots and high-risk junctions as the infrastructure priority, and on school buses and State Transport Undertaking fleets as the vehicle-side priority, on the reasoning that the duty of care is unambiguous, the fleets are supervised, and procurement runs through a single authority.

4.10 Common Industry Asks from the Government

The most useful output of the two days was not a verdict on any individual product. It was a shared diagnosis, arrived at from both sides of the room, of why deployment-ready technology is not being deployed. This section separates that diagnosis into three parts: the structural challenges identified, what industry asked of Government, and what Government asked of industry in return.

A. What industry asked of Government

The asks recorded across the two days were consistent, modest in cost, and largely administrative. The majority of developers stated a willingness to conduct pilots at no cost to the exchequer, requiring only the following:

- **A designated test corridor.** A specified stretch of road, junction or fleet on which a pilot may lawfully operate for a defined period.
- **An authorised nodal officer.** A single named official per State, empowered to approve access, coordinate across departments and receive results – the single most frequently repeated ask of the conclave.
- **Basic operational access.** Permission to mount equipment, connect to existing camera and signal infrastructure the State has already paid for, and operate for the duration of the trial.

- **A standardised data access framework.** Structured, rule-based access to VAHAN, e-challan, eDAR, iRAD and insurance registries under uniform terms, rather than case-by-case negotiation.
- **A central certification route.** A defined pathway with a recognised automotive test agency – for retrofit safety systems, and regulatory clarity on aftermarket brake actuation, established once centrally rather than negotiated in each State.
- **Outcome-based procurement language.** Model tender clauses that permit safety outcomes, service-level performance and software-led solutions to be procured, including provision for performance-linked payment.
- **A common evidence template.** A single reporting format for pilots so that results are comparable across States and across solutions, and so that a trial completed in one State is usable evidence in another.
- **A defined funding pathway.** Clarity on the source of funds for pilots and for scaling, including the role of the Road Safety Fund, State budgets and the insurance sector.
- **Proposals routed through State Governments.** Several delegations asked that engagement run through State Governments directly alongside system-integrator channels, so that the merit of individual solutions remains visible to the buyer.

B. What Government asked of industry

The panel set out, in effect, a de facto readiness standard for road safety technology entering public deployment in India, summarised below and applicable to new entrants and established players alike.

Requirement	Scope and expectation
Medical and exposure clearance	Any technology that senses the human body continuously must carry certification from a recognised medical institution, with radiofrequency exposure demonstrated within ICNIRP/SAR limits – health-safety compliance, distinct from spectrum compliance – before any in-cabin pilot.
Automotive-grade certification	Qualification against ISO 26262 (functional safety) and ISO 21434 (cybersecurity), and the applicable AIS standards – AIS 140 for tracking platforms, AIS 189 and AIS 190 for advanced systems – for anything that touches vehicle control.
Cybersecurity, VAPT and data protection	End-to-end encryption, vulnerability assessment and penetration testing, and clarity on custody of data, treated as preconditions wherever a system touches signals, enforcement or driver data – not as enhancements.
Pilots with published evidence	Structured trials with documented before-and-after results at meaningful scale, and effectiveness demonstrated against a counterfactual. Activity counts – more challans issued – are not evidence of fewer crashes.
Affordability for the private operator	Pricing tiers reachable by the private commercial operators who make up most of the fleet, not only by State-owned fleets.

Requirement	Scope and expectation
Interoperability, not islands	Alignment with IRC codes, integration with existing State and national systems rather than parallel proprietary stacks, and movement towards a standardised data layer for the sector.

Table 14. Readiness bar — what Government asked of industry

4.11 Closing Address and Valedictory Session

The Valedictory Session was held immediately following the conclusion of Manthan, and took the form of a brief on the outcome of the evaluation delivered to the full assembly of delegates before the networking lunch.

The closing remarks returned to the conclusion the two days had produced: that India's obstacle to deploying road safety technology nationally is no longer a technical one. Twenty-nine technologies had been demonstrated, sixteen formally evaluated, and written interest in pilots or procurement recorded for fourteen of them from at least seven State delegations. What remained outstanding was administrative: the nodal officers, the test corridors, the data access and the procurement language without which recorded interest does not become a deployment.

The Supreme Court Committee on Road Safety, present throughout both days, undertook to facilitate the conversion of recorded interest into structured pilots between States and presenting companies, under a common evidence template so that results are comparable across States and across solutions. The readiness bar set by the panel would be built into pilot terms and would inform the next call for solutions. Delegates were thanked, the closed-door convention governing evaluator identities was reaffirmed, and the session closed with the theme under which the conclave had been convened: Innovate. Collaborate. Save Lives.

5. OUTCOMES AND WAY FORWARD

This section consolidates what NRSTC2026 record contains– the consensus findings of the conclave, the commitments and interest placed on file, the sequenced actions that follow, and the formal submissions through which they will be pursued.

5.1 Findings

Five findings emerged with sufficient agreement across the jury, the State delegations and the Supreme Court Committee on Road Safety to form the basis of formal submissions to the Government of India.

- **The ecosystem is growing for national deployment.** More than 28 indigenous, cost-effective technologies were demonstrated, specifically calibrated for Indian mixed traffic conditions and built to run on camera and signal infrastructure that States have already paid for.
- **Developers will pilot at no cost if minimally enabled.** The majority of presenting developers stated willingness to conduct cost-free pilots, requiring only a designated test corridor, an authorised nodal officer and basic operational access.
- **Public data infrastructure must be unlocked under a standardised framework.** Access to VAHAN, e-challan, eDAR, iRAD and insurance registries under uniform, rule-based terms is a prerequisite for validating solutions and for scaling them beyond a single State.
- **Policy focus must pivot to where the fatalities are.** Innovation is currently weighted towards commercial fleets, four-wheelers and urban intersections, while two-wheelers, pedestrians and rural roads continue to account for the highest share of India's road deaths. Future calls for solutions must be directed accordingly.
- **A sector readiness standard.** Six requirements – medical and exposure clearance, automotive-grade certification, cybersecurity and data protection, published pilot evidence, affordability for private operators, and interoperability – now constitute a de facto entry standard for road safety technology in public deployment in India.
- **Individual feedback issued.** Each presenting company has separately received its own consolidated feedback drawn from the written evaluations.

5.2 Sequenced Actions

The conclave's recommendations are set out below in the sequence in which they can realistically be executed, neither requiring fresh legislation or a new scheme.

Track	Action
Nominate one site	A corridor with stated kilometre markers, a State transport undertaking depot, or a defined set of high-risk junctions. This is the single most common request made by presenters and costs the State nothing to grant.
Designate a nodal officer	Designate a nodal officer, with name, designation, telephone number and electronic mail address. Deployments are most often delayed for want of an identified point of contact rather than for want of a decision.

Track	Action
Identify the source of funds	Identify the source of funds before selecting a technology. Several presenters have offered to meet the cost of pilot hardware themselves, and that in certain cases no State expenditure is required at all.
Baseline and commitment to measurement	Fix a baseline and commit to measurement. Two to three months of before-deployment data, and a published before-and-after comparison. Without this a pilot establishes nothing, and no other State can learn from it.

Table 15: Sequenced actions by track

6. CONCLUSION

The National Road Safety Technology Conclave 2026 was convened to test a proposition: that India's failure to reduce road deaths is no longer explained by an absence of technology. Over two days at IIT Bombay, 29 indigenous technologies were demonstrated before more than 250 delegates from 16 State Governments, central ministries, the IITs and industry; sixteen were formally deliberated in the presence of Supreme Court Committee on Road Safety and State authorities on second day i.e. 26th August 2026.

What the conclave established, and what distinguishes it from the discussion that has preceded it, is the specificity of the key challenges at different levels and providing solutions at ground level. The detailed discussions and deliberations led to in- depth understanding as to how to move towards deployment and scalability of these technologies.

Developers asked for a corridor, a nodal officer and data access, and offered pilots at no cost to the exchequer. The panel asked in return for medical and automotive certification, cybersecurity assurance, published evidence against a counterfactual, prices the private operator can meet, and interoperability.

The conclave therefore shifted the focus from technological availability to institutional readiness. Its outcomes point towards a clear next step: translating demonstrated solutions into structured pilots, supported by defined responsibilities, measurable outcomes, data access and appropriate procurement frameworks.



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