

DIGEST

April - June 2026

Technology | Deployment | Community

Policy | Standards



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PRESIDENT'S MESSAGE



AKhilesh Srivastava *President, ITS India Forum*

The world has the technology; the race now is to deploy it at scale, safely and inclusively. India intends to lead that race, not follow it.

Dear Members and Colleagues,

The second quarter of 2026 has reaffirmed a conviction we have long held at the ITS India Forum: that intelligent transportation is no longer a future ambition for India, but a present reality being built corridor by corridor, system by system. This quarter gave us some of the most tangible proof yet.

Engineers achieved the breakthrough of the main Zojila tunnel on NH-1—Asia's longest bi-directional road tunnel—cutting the crossing from three and a half hours to fifteen minutes and bringing all-weather connectivity to Ladakh within reach.

In parallel, the Ministry of Road Transport and Highways advanced a remarkable slate of reforms: realistic construction timelines and relief measures to keep national highway projects moving through a volatile global cost environment, the scaling of Multi-Lane Free Flow tolling at Gharaunda, and the mandating of satellite-based InSAR and LiDAR monitoring for our most fragile mountain routes. Each of these is, at its heart, an ITS story.

The Forum itself had a quarter of deep engagement. We opened the national conversation on V2X regulation, joined the Active Travel Roundtable and the 11th NHEV Working Group under the 7C · 3E framework, participated in the 5th India Space Congress, and carried our agenda into the academy with a keynote at the Second International Conference on Smart Mobility Systems. We also strengthened our own foundations—adopting a renewed structure of fourteen standing committees mapped to national missions, and welcoming Shri Sainath Gurav as Chairperson of our new Committee on Sustainable and Green Mobility.

For our Forum, the quarter's landmark was the announcement of a long-term strategic alliance with Messe Frankfurt Trade Fairs India and Virtual Info Systems to establish the ITS India Congress as a permanent national flagship, co-located with the Transport + Traffic Infratech Expo. This partnership pairs our technical depth and stakeholder network with world-class event production—and gives India's ITS community a sustainable, repeatable platform of global standard.

Our international engagement deepened further. Members represented India at the 17th ITS European Congress in Istanbul and prepared for the ITS America Conference & Expo, even as we look ahead to the 32nd ITS World Congress in Gangneung this October.

As India advances toward a USD 5-trillion economy, intelligent transportation will quietly but powerfully shape how the nation moves, trades and grows. I invite each of you to engage, contribute and lead.

Warm regards,
AKhilesh Srivastava
President, ITS India Forum

NATIONAL POLICY UPDATES

Shaping India's Road Infrastructure & Mobility Ecosystem

MoRTH · NHAI · Q2 2026

The Ministry of Road Transport and Highways (MoRTH), with its partner agencies, introduced a robust series of policy directives and infrastructure milestones through Q2 2026 — aimed at strengthening high-altitude hazard mitigation, advancing intelligent tolling networks, and accelerating the adoption of alternative fuels across the nation's mobility ecosystem.

Key Reforms & Milestones at a Glance

Policy / Infrastructure Area	Key Development
Hazard Mitigation	InSAR and LiDAR technologies mandated for hill-highway planning and real-time monitoring.
MLFF Tolling Rollout	Multi-Lane Free Flow system deployed at Gharaunda Toll Plaza (NH-44) with 200 m clear zones.
Data-Driven Policy	10-year NHAI-NCAER MoU signed to establish a dedicated highway-economics research centre.
Fleet Modernisation	PARIVARTAN scheme launched — 8% OEM discount and up to 100% state tax concessions.
Alternative Fuels	Flex-Fuel motorcycles launched to cut vehicular CO emissions by up to 77%.
Strategic Corridors	Zojila Tunnel breakthrough achieved, cutting transit time from 3.5 hours to 15 minutes.

HAZARD MITIGATION · HILL HIGHWAYS

From Reactive Response to Predictive Prevention

INSAR · LIDAR · GSI DATA · PHASED ‘SLOPE-FIRST’ CONSTRUCTION

Amajor policy shift has transitioned India's mountain-highway construction from reactive disaster response to predictive prevention.

- Mandates Interferometric Synthetic Aperture Radar (InSAR) along a 100-km stretch of the Char Dham route in Uttarakhand to track subtle ground shifts.
- Integrates Geological Survey of India (GSI) data, National Landslide Susceptibility Mapping and LiDAR terrain models into the initial planning of new hill highways.
- Enforces phased construction—the entire first year of a contract spent exclusively on slope cutting and stabilisation.
- Requires all rockfall nets and anchors, imported or domestic, to carry European Technical Assessment (ETA) certification and CE markings.



ECONOMY & POLICY

High-Tech Hazard Mitigation & Structural Engineering Reforms

MANDATING InSAR DEPLOYMENT
Tracks subtle ground shifts over a 100-km Char Dham stretch.

LIDAR-GSI DATA INTEGRATION
Combines LiDAR, GSI data, and NLSM into all initial planning.

PHASED 'SLOPE FIRST' CONSTRUCTION
First year dedicated solely to slope cutting and stabilization.

CERTIFIED STRUCTURAL REFORMS
All nets and anchors must be ETA and CE certified.

Predictive prevention in action — InSAR tracking, GSI data and LiDAR terrain models mandated across a 100-km stretch of the Char Dham route, with a year of slope stabilisation and strict ETA/CE certification.

INTELLIGENT TOLLING • MLFF

MLFF Goes Live at Gharaunda

MULTI-LANE FREE FLOW • NH-44, PANIPAT-JALANDHAR

Building on the success of FASTag, NHAI has officially deployed the Multi-Lane Free Flow (MLFF) Tolling System at the Gharaunda Toll Plaza on NH-44—charging vehicles at highway speed with no barrier at all.

- Overhead steel gantries with a strict 5.5–6.0 m vertical clearance ensure heavy commercial trucks pass unhindered.
- Local traffic rules ban parking or unauthorised stops within 200 m on either side of the MLFF gantry zone.
- A formal e-Notice legal mechanism gives owners a 72-hour window to resolve failed FASTag transactions or submit grievances.



Future of highway travel — the Gharaunda MLFF transition on the Panipat-Jalandhar section of NH-44, powered by FASTag and ANPR for seamless, non-stop journeys.

The Barrier-Free Roadmap

Inside India's Transition to Multi-Lane Free Flow Tolling

THE VISION

Physical toll booths are giving way to **Multi-Lane Free Flow (MLFF)** systems powered by AI analytics, Automatic Number Plate Recognition (ANPR), and RFID-based Electronic Toll Collection. The primary objective: eliminate highway congestion and drastically reduce national logistics costs.

01 | Phase 1: The Initial 17-Plaza Cluster

- Targeted for full completion by **September 2026**. Implementation across 17 fee plazas spread across nine key states.
- **Operational Status:** Already active at high-density corridors, including the **Choryasi plaza** on NH-48 in Gujarat and the **Mundka-Bakkarwala plaza** on UER-II in Delhi.

02 | The December 2026 National Mandate

- **Ministerial Announcement:** Speaking at the *Logistics Shakti Summit*, Union Minister Nitin Gadkari confirmed that seamless, barrier-free tolling across major national highway corridors is targeted for nationwide implementation by **December 2026**.
- **Economic Objective:** Accelerating freight movement to reduce overall national logistics costs down to single digits.

03 | Phase 2: Core Network Expansion

- Scheduled to go live by **March 2027**. Onboarding **108 additional toll plazas** into the MLFF ecosystem. National Highways Authority of India (NHAI) bidding processes are underway to secure technology vendors for infrastructure scaling.

FLEET MODERNISATION & CLEAN FUELS

Scrappage and the Flex-Fuel Push

PARIVARTAN · FLEX-FUEL FFVs · DELHI-NCR CLEAN MOBILITY

To combat transport emissions and reduce reliance on fossil fuels, two major initiatives were formalised targeting commercial and passenger fleets.

- Under the PARIVARTAN Fleet Scrappage Scheme, participating OEMs must provide a flat 8% discount on the ex-showroom price of eligible new trucks and buses.
- Manufacturer discounts are paired with federal aid — a 5% interest subvention on vehicle loans and state-level Motor Vehicle Tax waivers of up to 100% for 10 years.
- Hero MotoCorp launched India's first Flex-Fuel Motorcycles in New Delhi, advancing the national transition to Flexible Fuel Vehicles (FFVs).



EMISSIONS & INVESTMENT — BY THE NUMBERS

up to 77% targeted cut in vehicular CO emissions via the flex-fuel transition

₹1.44 lakh cr estimated foreign-exchange savings from reduced crude imports

₹9,585 cr Delhi-NCR green-corridor scheme; 2.07 lakh vehicles scrapped; NOx –85%, PM2.5 –90%

INSTITUTIONAL RESEARCH

NHAI–NCAER Transport-Economics Centre

10-YEAR MoU · APPLIED ECONOMIC RESEARCH

The quarter saw the establishment of a dedicated highway-economics research centre under a 10-year NHAI–NCAER MoU. NHAI will back its operations for the next decade, with the centre tasked with applied economic research across highway economics, modal integration, toll policy and safety-technology integration — deepening the evidence base for national mobility policy.

STRATEGIC CORRIDORS · TRANS-HIMALAYA

The Zojila Tunnel Breakthrough

NH-1 · YEAR-ROUND CONNECTIVITY

The geostrategic landscape of northern India reached a historic turning point with the breakthrough of the main tunnel at the eastern portal of the Zojila Tunnel Project on National Highway 1 (NH-1).

The Zojila Tunnel cuts travel time across the treacherous pass from 3.5 hours to just 15 minutes.

The breakthrough represents a fundamental shift in India's trans-Himalayan logistics — from seasonal access to guaranteed, year-round commercial and military connectivity along NH-1.

The 13.15-km Zojila Tunnel, a key infrastructural feat involving Megha Engineering & Infrastructures Ltd (MEIL), achieved a breakthrough on June 9, 2026, ensuring all-weather connectivity between Kashmir and Ladakh and eliminating winter isolation. This project reduces travel time, secures year-round military logistics, and fosters economic growth, with the National Highways Authority of India (NHAI) partnering with NCAER to monitor its long-term operational impact.



Strategic Infrastructure Milestone: Union Minister Nitin Gadkari, J&K LG Manoj Sinha, and CM Omar Abdullah pose at the historic breakthrough ceremony of the 13.15-km Zojila Tunnel, cementing all-weather connectivity between Kashmir and Ladakh

"This milestone marks a transformative step towards ensuring all-weather connectivity, boosting economic growth, and bringing the people of Kashmir and Ladakh closer together."

— Omar Abdullah, Chief Minister of J&K

ITS INTERNATIONAL FORUM

ERTICO · ITS EUROPE · ITS AMERICA · ITS AUSTRALIA · ITS CHINA
GLOBAL EDITION · Q2 2026 · Apr–Jun

International Forums & Global Best Practices — Global Alliances · V2X Standards · AI Integration



Across Q1–Q2 2026, ERTICO–ITS Europe, ITS America, ITS Australia and ITS China advanced cybersecurity, 6G C-ITS, V2X deployment and full-scenario AI.

GLOBAL STRATEGIC SUMMARY

 ERTICO – ITS Europe Focus: Vision 2035 & 6G-IA partnership Deliverable: Cybersecurity for SDVs & 6G C-ITS protocols.	 ITS America Focus: National V2X Plan & road safety Deliverable: 5.9 GHz C-V2X spectrum; AEB/FCW standards.	 ITS Australia Focus: ISFO 2027 & cross-sector mobility Deliverable: Drone asset audits; multi-modal open data.	 ITS China Focus: CITSE 2026 & vehicle-city integration Deliverable: Full-scenario perception & big-data chains.
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ERTICO – ITS EUROPE

Brussels · Istanbul · 35th Anniversary

Commemorating its 35th anniversary, ERTICO expanded its Vision 2035 roadmap to establish common European standards for digital and connected mobility.

- **Cybersecurity in mobility:** formally designated cybersecurity as core industrial infrastructure, with guidelines across Software-Defined Vehicles (SDVs), data privacy and transport-network resilience.



Cross-border mobility data exchange through the deployEMDS, NAPCORE, and Data for Road Safety initiatives.

- **6G-IA strategic alliance:** signed with the 6G Smart Networks and Services Industry Association at the 17th ITS European Congress in Istanbul, aligning 6G with future Cooperative-ITS (C-ITS).
- **Data-space expansion:** scaled cross-border mobility-data exchange through deployEMDS, NAPCORE and the Data for Road Safety (DFRS) initiative.

ISTANBUL — ERTICO × 6G-IA alliance aligns 6G with Cooperative-ITS at the 17th ITS European Congress.

ITS AMERICA

Washington, D.C. • Vision Zero

ITS America continued pushing policy frameworks to eliminate traffic fatalities through advanced vehicle connectivity and AI-driven monitoring.

- **National V2X Deployment Plan:** driving state-level rollout of the 5.9 GHz Direct C-V2X band for real-time safety alerts and Vulnerable Road User (VRU) detection.
- **In-vehicle safety standards:** research shows Autonomous Emergency Braking (AEB) with Forward Collision Warning (FCW) cuts front-to-rear collisions by over 50%.
- **Edge-AI traffic analytics:** real-time edge computing across highway corridors for automated incident detection and dynamic signal control.

Revolutionizing road safety with smart vision in ADAS technology!

Forward Collision Warning and Automatic Emergency Braking Reduce Front-to-Rear Crashed by 50%

BY THE NUMBERS

- 5.9 GHz Direct C-V2X safety band
- AEB + FCW → -50% rear-end crashes

ITS AUSTRALIA

Melbourne • Field Deployment

ITS Australia prioritised practical field implementations and cross-sector partnerships between transport authorities, industry and academia.

- **ISFO 2027:** co-hosting the 5th International Symposium on Freeway and Tollway Operations in Melbourne, focused on road-user charging and digital highway management.



ISFO 2027 — 5th International Symposium on Freeway & Tollway Operations, Melbourne.

- **Drone-based infrastructure audits:** standardised frameworks for autonomous drone swarms conducting high-definition surveillance of bridges and highway cut-slopes.
- **Connected mobility & open data:** expanded unified multi-modal ticketing and demand-responsive transit.

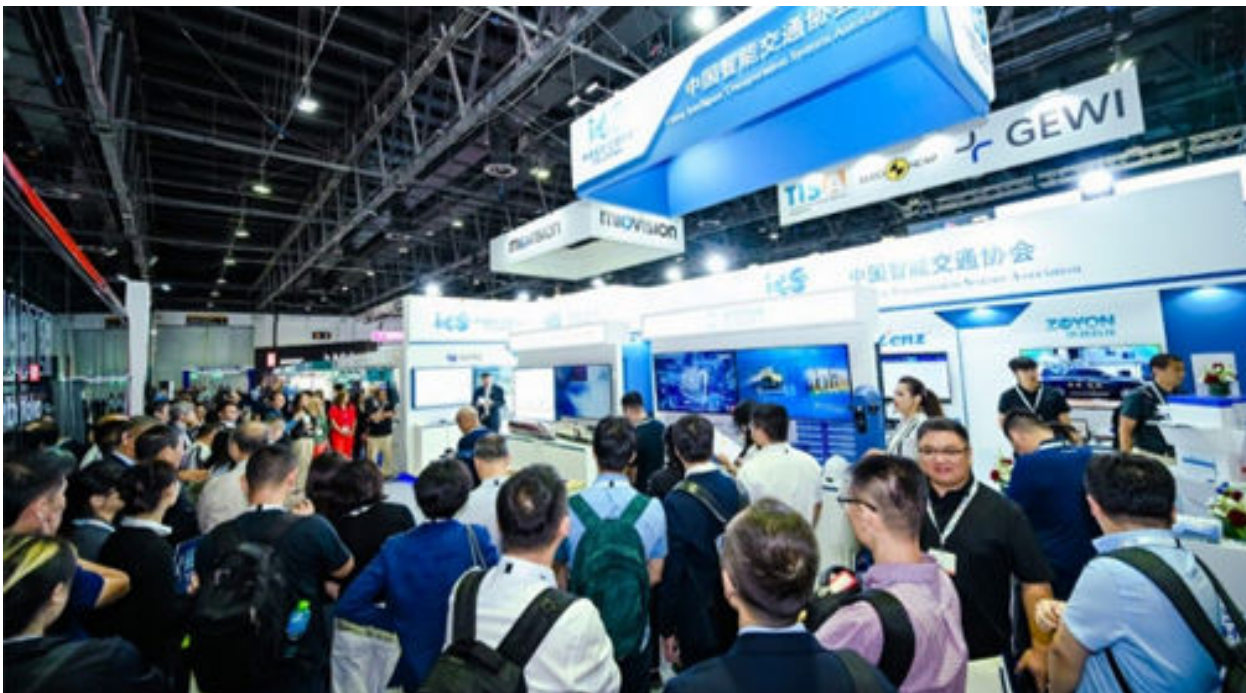
ITS CHINA

Xiamen · CITSE 2026

At the China International ITS Industry Expo (CITSE 2026) in Xiamen, ITS China showcased multi-modal AI integration across transport infrastructure.

The BRICS platform launched at CITSE 2026 to foster an open, international ecosystem for smart traffic, aiming to lower R&D barriers for over 30 nations. It focuses on sharing multimodal traffic data and deploying AI solutions for city bus networks and clean-energy logistics.

- **CITSE 2026 showcase:** 20,000 m² across six sectors — urban traffic, expressways, rail, water transport, aviation and autonomous commercial fleets.
- **Vehicle-city integration (V2X & V2G):** full-scenario perception networks linking vehicle sensor streams to smart-city management centres.
- **Supply-chain digitalisation:** international forums on clean-energy vehicle logistics, big-data integration and cross-border data governance.



CITSE 2026, Xiamen — full-scenario AI across the transport ecosystem.

Huawei and Partners Launch the BRICS Transportation Large-scale Model Sharing Incubation Platform

BY THE NUMBERS

- CITSE 2026 · 20,000 m² exhibition
- 6 operational sectors integrated

PROJECT WATCH

TENDER & DEPLOYMENT PIPELINE ON NATIONAL HIGHWAYS · IHMCL · NHAI · MoRTH · Q2 2026

The second quarter of 2026 saw a busy pipeline of Intelligent Transport Systems (ITS) procurement and deployment on India's National Highways, led largely by the Indian Highways Management Company Limited (IHMCL) and the National Highways Authority of India (NHAI). Activity clustered around three themes: modernisation and standardised operations of Electronic Toll Collection (ETC); the data groundwork for Multi-Lane Free Flow (MLFF) tolling; and a widening rollout of highway-safety and monitoring technologies.

Notably, MoRTH's own active-corrigendum pipeline on the Central Public Procurement Portal for the quarter (155 tenders) was dominated by civil works, with dedicated ITS tenders routed principally through IHMCL rather than the Ministry's direct listings.

KEY ITS MOVES AT A GLANCE

ETC O&M · 8 Plazas	FASTag → MLFF	Work-Zone Safety	Hill-Road Resilience
System Integrator to run 76 toll lanes; ANPR backup, ICD 2.5 & TMS migration, 99% uptime SLA.	VRNs validated against VAHAN — the data groundwork for barrier-free, free-flow tolling.	33 + 15 Truck-Mounted Attenuators across 681 km; MASH TL-3, rated to 100 km/h.	InSAR landslide early-warning on a 100-km Chardham stretch, feeding DPRs..

ELECTRONIC TOLL COLLECTION & ATMS · IHMCL

The Quarter's Flagship: ETC O&M at 08 Fee Plazas

IHMCL/LTE-RFP/ETC-O&M/2026/06 · ISSUED 16 APRIL 2026

The quarter's flagship ITS tender is the Limited RFP for a System Integrator to provide O&M services of the ETC System at 08 fee plazas on National Highways. The empanelment-based RFP covers 76 toll lanes across eight plazas—Palaya Gandharvakottai and Shenbagampettai (Tamil Nadu), Algadapa (Telangana), Cholasamundram (Andhra Pradesh), and Chandwad, Laling, Ghoti and Arjunalli (Maharashtra).

The scope is a useful bellwether for where highway tolling is heading. The Integrator takes over all existing ETC equipment as-is, then maintains, repairs and—where equipment is unavailable—supplies, installs and commissions it to hold a 99% uptime SLA on critical systems. Forward-looking requirements stand out: mandatory Automatic Number Plate Recognition (ANPR) cameras in every lane as an RFID backup, with FASTag details fetched from the recognised Vehicle Registration Number when a tag cannot be read; migration to ICD 2.5 and the Integrator's own Toll Management System; dual independent-ISP redundancy at each plaza; and AVC accuracy above 98%.

ETC O&M RFP — AT A GLANCE

76 / 08 toll lanes across eight fee plazas (TN · Telangana · AP · Maharashtra)

99% uptime SLA on critical systems; AVC accuracy above 98%

3 + 1 yrs contract tenure; 5% performance security; EMD Rs. 9,00,000

Also in the window. Four further IHMCL / NHAI RFPs surfaced and are entered in the watch-list on title and publication date — their detailed scope and values should be confirmed from the tender documents: an ATMS RFP for Delhi and a DL-03 package (both 20 May 2026), an ATMS RFP for the BVEC corridor (15 June 2026), and an ARC RFP (18 April 2026).

TECHNOLOGY-DRIVEN TOLLING REFORM · NHAI

FASTag VRN Validation — Groundwork for MLFF

NHAI DIRECTION · 15 APRIL 2026

On 15 April 2026, NHAI directed all FASTag issuer banks to validate the Vehicle Registration Numbers (VRNs) linked to their FASTags and to blacklist tags carrying incorrect or invalid VRNs. Many mismatches trace to tags issued before FASTag issuance was integrated with the VAHAN database.

This is the connective tissue between the ANPR-augmented lane hardware being tendered and the barrier-free tolling model on the horizon.

NHAI framed the exercise explicitly as the data foundation for Multi-Lane Free Flow (MLFF) tolling, under which enforcement—including electronic notices to non-compliant vehicles—will depend on accurate, verified vehicle identification..



HIGHWAY-SAFETY & MONITORING TECHNOLOGY · MoRTH / NHAI

A Widening Safety-Tech Rollout

APRIL 2026

- ITS within the 4E road-safety strategy: addressing a road-safety event on 9 April, the Minister of State located AI-based traffic monitoring, ITS, automated enforcement and FASTag-enabled mobility firmly within the Ministry's 4E strategy — Engineering, Enforcement, Education and Emergency Care — alongside the PM RAHAT and Rah-Veer post-crash care schemes, against roughly 1.8 lakh annual road fatalities.
- Truck-Mounted Attenuators (TMAs): a concessionaire deployed 33 TMAs and 15 towable TMAs across nine NH projects spanning 681 km in Andhra Pradesh and Gujarat — all MASH TL-3 / NCHRP 350 TL-3, rated to 100 km/h, with wig-wag directional warning lights (21 April).
- InSAR landslide early-warning: a MoRTH resilient-hill-roads workshop announced an MoU for InSAR-based landslide monitoring along a 100-km Chardham stretch, with LiDAR and UAV surveys and IIT-Roorkee real-time monitoring feeding susceptibility mapping into DPRs (30 April).
- Sensing-led wildlife monitoring: NHAI and the Wildlife Institute of India released 'Landscapes Reconnected' — 150 camera traps and 29 AudioMoth recorders over 40 days on the Delhi–Dehradun Corridor: 40,444 images of 18 species, including 60 elephant crossings, with soundscape data shaping noise-reduction design (10 April).
- Tunnel ITS: the new Khambatki Ghat twin-tube six-lane tunnel on NH-48 (Mumbai–Pune–Bengaluru) opened for trial operations at 86% progress — fitted with CCTV, improved lighting, reflectors, fire-extinguisher points and safety guard railings (27 April).

Q2 2026 ITS PROJECT WATCH

Project / Reference	Authority	Category	Key Highlights	Published
O&M of ETC System, 08 Fee Plazas	IHMCL	ETC / Tolling	SI to take over & maintain ETC across 76 lanes (TN, Telangana, AP, Maharashtra); ANPR upgrades, ICD 2.5 & TMS migration, dual-ISP redundancy; 3+1 yr; 99% SLA	16 Apr 2026
ATMS, Delhi	IHMCL / NHAI	ATMS	Advanced Traffic Management System procurement (Delhi). Scope/value to be confirmed from RFP.	20 May 2026
DL-03 Package	IHMCL / NHAI	ITS / Corridor	Delhi-region ITS package. Scope/value to be confirmed from RFP.	20 May 2026
ATMS, BVEC Corridor	IHMCL / NHAI	ATMS	ATMS for the BVEC corridor. Scope/value to be confirmed from RFP.	15 Jun 2026
ARC RFP	IHMCL / NHAI	ITS / Services	Scope/value to be confirmed from RFP.	18 Apr 2026
FASTag VRN Validation Drive	NHAI	Tolling data / MLFF	Issuer banks directed to validate VRNs against VAHAN & blacklist mismatches — data foundation for Multi-Lane Free Flow (MLFF) tolling and e-Notices	15 Apr 2026
ITS in the 4E Road-Safety Strategy	MoRTH	Policy / ITS	MoS flags AI-based traffic monitoring, ITS, automated enforcement & FASTag mobility within the 4E strategy; PM RAHAT & Rah-Veer post-crash care schemes	09 Apr 2026
Truck Mounted Attenuators (TMAs)	MoRTH / Concessionaire	Work-zone safety	33 TMAs + 15 towable TMAs across 9 NH projects / 681 km (AP & Gujarat); MASH TL-3 & NCHRP 350 TL-3, rated to 100 km/h; wig-wag warning lights	21 Apr 2026
InSAR Landslide Early-Warning	MoRTH	Geo-monitoring	InSAR monitoring & early warning on 100-km Chardham stretch; LiDAR + UAV surveys and IIT-Roorkee real-time monitoring feeding susceptibility mapping into DPRs	30 Apr 2026
NHAI-WII Wildlife Sensing Study	NHAI / WII	Sensing / IoT	150 camera traps + 29 AudioMoth acoustic recorders over 40 days on Delhi–Dehradun Corridor; 40,444 images of 18 species; soundscape-based mitigation	10 Apr 2026
Khambatki Ghat Twin-Tube Tunnel	NHAI	Tunnel ITS	6-lane twin-tube tunnel (NH-48, Mumbai–Pune–Bengaluru) opened for trial; CCTV, lighting, reflectors, fire points & guard railings; 86% progress	27 Apr 2026

Editorial note: the four IHMCL / NHAI RFPs above (ATMS Delhi, DL-03, ATMS BVEC, ARC) are logged on title and publication date only; confirm exact scope and values from the tender documents before publication.

FEATURE ARTICLES

TECH SPOTLIGHTS & EXPERT VOICES · AI/ML · SPATIAL DATA · CONNECTED VEHICLES · Q2 2026

TECH SPOTLIGHT · SPATIAL DATA

Predictive by Design

How InSAR, LiDAR and spatial data are rewriting Himalayan highway safety

For decades, safety on India's mountain highways was governed by a reactive grammar: a slope failed, a road closed, crews responded. Q2 2026 marks a deliberate rewrite of that grammar toward prediction — and intelligent transport, in its broadest sense, is the instrument of that change.

Predictive by Design: Rewriting Himalayan Highway Safety

For decades, mountain transit meant reacting to disasters after they struck. Today, a data-driven revolution is turning the tables on nature. By fusing spaceborne InSAR radar, precision LiDAR, and advanced engineering mandates, India is shifting from reactive clearing to proactive prevention—stopping landslides before they start and building a climate-resilient blueprint for the future of mountain infrastructure.

At the centre of the shift is Interferometric Synthetic Aperture Radar (InSAR). By comparing satellite radar images of the same terrain over time, InSAR can detect ground movement of just a few millimetres — the slow creep that precedes a landslide long before it is visible to the eye. Layered with LiDAR terrain models, Geological Survey of India datasets and national landslide-susceptibility mapping, this creates a living risk picture that now feeds directly into hill-highway planning on routes such as Char Dham.

The engineering reforms that accompany it are equally telling. A phased-construction mandate now devotes the first year of a hill-highway contract to slope cutting and stabilisation before carriageway works begin — an admission that in fragile geology, the road is only as safe as the mountain above it. Compliance frameworks require certified rockfall protection to international (ETA/CE) standards.

Intelligent transport is not confined to signals and tolling — in the Himalayas, spatial data may prove the most consequential part of the ITS stack.

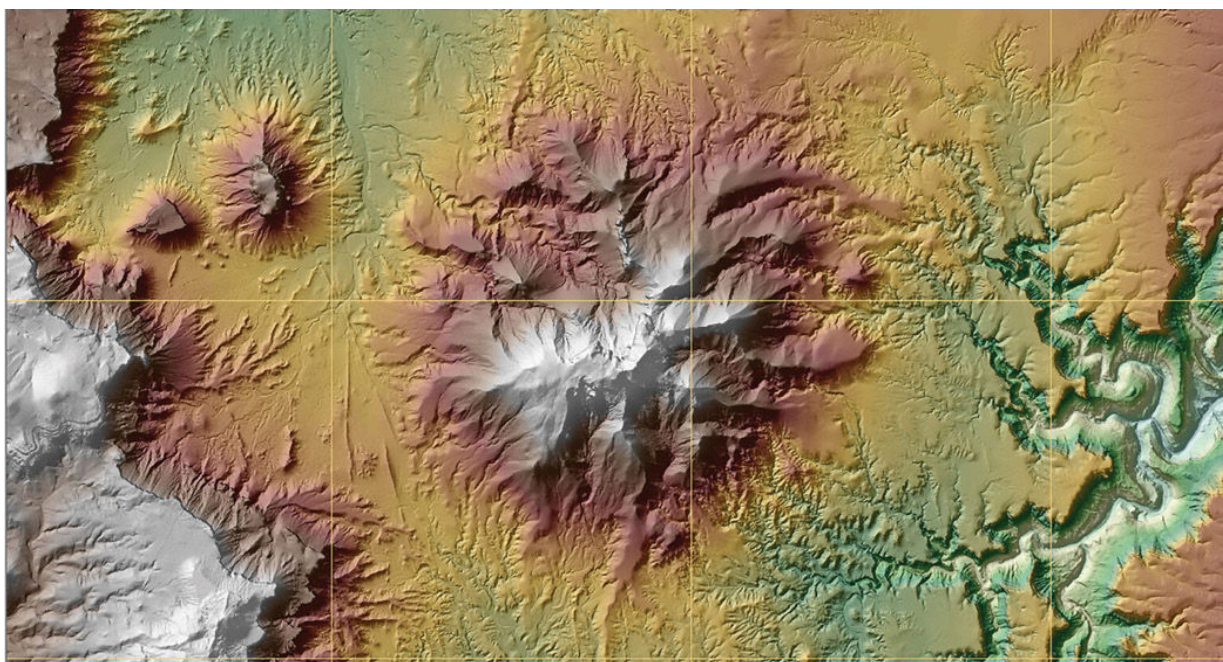


Figure 1: LiDAR-derived Digital Elevation Model (DEM) illustrating micro-topographic variances and millimetric slope creep mapped via multi-temporal satellite radar.

TECH SPOTLIGHT • TOLLING

From FASTag to Free Flow

The intelligence inside India's tolling transition

India's FASTag programme is one of the world's most successful large-scale electronic-tolling implementations, achieving near-universal electronic collection and creating a trusted digital identity for vehicles at national scale. Q2 2026 showed what that backbone was built for: the transition to Multi-Lane Free Flow (MLFF) tolling, in which vehicles are charged at highway speed with no barrier at all.

MLFF is deceptively simple to describe and demanding to deliver. It fuses Automatic Number Plate Recognition, AI-based vehicle classification, gantry sensing and account-level clearing into a single, real-time transaction — while handling exceptions, disputes and enforcement fairly. The Gharaunda deployment on NH-44 and the first MLFF agreement for Gujarat show the model moving from proof to corridor, supported by a formal e-Notice mechanism that gives motorists a defined window to resolve failed transactions.

The strategic value lies beyond convenience. Free-flow tolling minimises revenue leakage, enables fair usage-based charging and lowers operating cost — creating a sustainable financial model for highway expansion. It is also the gateway to fully digital highways: the same identity and clearing layer that prices a journey can, with consent, power compliance reminders, emergency response and personalised traveller services. The road ahead points to GNSS-based distance or corridor pricing, where tolling becomes truly continuous — India built the digital foundation first, and is now scaling the intelligence on top of it.

contract to slope cutting and stabilisation before carriageway works begin — an admission that in fragile geology, the road is only as safe as the mountain above it. Compliance frameworks require certified rockfall protection to international (ETA/CE) standards.

India's transition to Multi-Lane Free Flow (MLFF) transforms tolling from a physical barrier into a real-time, AI-powered digital transaction that reduces congestion and revenue leakage. The nation's FASTag infrastructure serves as the digital backbone for this evolution, setting the stage for future GNSS-based, continuous distance charging.



Figure 2: The first MLFF agreement, signed for the Choryasi Fee Plaza on NH-48 in Gujarat — a schematic of a multi-lane free-flow gantry mapping overhead ANPR cameras, ultra-high-frequency RFID antennas and edge localisation processing units.

ARTICLES FROM INDIA'S EXPERTS

EXPERT VOICE · URBAN MOBILITY

Delhi Metro: Transforming Urban Mobility

Since commencing operations in 2002, the Delhi Metro Rail Corporation has revolutionised public transportation across the National Capital Region. By providing a safe, reliable & environment-friendly mass rapid transit system, it has emerged as one of the largest & most advanced metro networks globally, serving as a vital mobility lifeline with seamless multimodal connectivity.



Amit Kumar Jain
DIRECTOR O&S (DMRC)



Raman Goyal
GM/Operations (DMRC)

8.19 Million
HIGHEST EVER PAS-
SENGER JORNEY

6.45 Million
AVERAGE DAILY PASSEN-
GER JORNEY

4250
TRAIN TRIPS AVER-
AGE DAILY

99.95%
PUNCTUALITY

2498
CARS COM-
MISSIONED

NETWORK OVERVIEW

Delhi Metro network spans approximately 416 km (including RMGL and NMRC) with 12 operational metro lines, serving Delhi and the adjoining cities of Noida, Greater Noida, Ghaziabad, Gurugram, Faridabad, and Bahadurgarh. The network comprises 303 stations, including 32 interchange stations that facilitate seamless connectivity across the NCR.

“Security for Women passengers remains a top priority, With exclusive coaches, reserved seating and robust helpline services. For Divyangjan, ramps, tactile path, Wheelchair-friendly AFC gates, lifts, and reserved seating make daily commuting effortlessly smooth”



DIGITAL AND SMART TICKETING

DMRC has transformed urban travel through a range of digital and smart ticketing solutions designed to make commuting faster, seamless & cashless. Commuters can travel using QR-based tickets, Virtual Smart Cards on the DELHI METRO SARTHI app, National Common Mobility Cards (NCMC) and contactless bank cards, reducing dependence on physical tokens.

LAST MILE CONNECTIVITY AND MULTIMODAL INTEGRATION

By providing direct and seamless multimodal connectivity with railways, ISBTs, Airport terminals, Namo Bharat - RRTS and other metros, DMRC has significantly strengthened last-mile connectivity and multimodal integration ensuring seamless end-to-end travel for commuters. DMRC has created a comprehensive urban mobility network that extends beyond metro stations.

FUTURE READY TECHNOLOGY AND AI INTEGRATION

DMRC is actively using Artificial Intelligence to enhance its operational efficiency, passenger safety, security, and overall service quality. DMRC has adopted following AI-based measures:

- CHETNA (Chatbot for Efficient Travel & Navigation Assistance) for interactive journey planning.
- State-of-the-art Complaint Management System to enhance passenger grievance redressal.
- AI-based systems to monitor the health of Overhead Equipment (OHE) network check the condition of train wheels and for predictive maintenance of Track Circuits.



“Delhi Metro is proud to be the 1st railway project in the world, certified by the United Nations to claim carbon credits for energy-efficient regenerative braking.”

88.4KM

Under Construction
Network (Phase –IV)

Operations & Maintenance
services provided to:



EXPERT VOICE · WALKABILITY

Walkability: The Missing Backbone of Future-Ready Indian Cities

S Umar Bhat — social reformer and mobility-reform advocate

For decades, the Indian urban dream has been paved with asphalt, designed for the internal combustion engine, and measured by the speed of vehicular flow. We have built flyovers that bypass our neighbourhoods and highways that cleave through our social fabric. But as we stand in 2026, amidst a global landscape scarred by energy volatility, soaring inflation and a deepening climate crisis, it is time to admit a hard truth: our obsession with the vehicle has left our citizens stranded.

Walkability is not a “boutique” urban design concept or a luxury for the elite. It is the fundamental infrastructure of survival and the primary metric of a truly civil society. In a world where crude oil prices fluctuate unpredictably and economic pressures squeeze the common man, the humble footpath is our most resilient asset. Our streets must serve life, not just engines.

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S Umar Bhat

The Paradigm of Active Travel

To reclaim our cities, we must pivot toward a framework of Active Travel — promoting walking, cycling and other non-motorised modes as key elements of sustainable urban mobility. By encouraging safer streets, accessible infrastructure, integrated transport systems and healthier urban environments, Active Travel directly reduces congestion, improves public health, enhances road safety and builds environmentally sustainable cities. It is the foundation upon which future-ready transit must be built.

I. The Economic Imperative: From Oil Dependency to Pedestrian Independence

The recent global instability has exposed the fragility of a transport system tethered strictly to fossil fuels. As nations grapple with energy security, the private-vehicle lifestyle is becoming an unsustainable economic burden for the Indian middle class. Inflation is not just a market phenomenon; it is a spatial one. When a city is designed so that a citizen must drive or take a motorised taxi just to buy a loaf of bread, that city layout has failed its people.

Minimising the cost of living: Walkable cities act as a natural hedge against inflation. By providing safe, high-quality pedestrian infrastructure, cities allow residents to eliminate “forced” transportation costs. In Indian commercial hubs, well-designed sidewalks do more than facilitate movement; they foster street vibrancy and local micro-economies that remain resilient to global economic shocks.

Decarbonising the last mile: India’s commitment to “Net Zero” pathways requires a radical modal shift. Walking is the most energy-efficient, zero-emission form of transport in existence. By prioritising the pedestrian within an integrated Active Travel network, we reduce the national drain on foreign-exchange reserves spent on crude oil and move steadily toward a truly Viksit Bharat.

II. Inclusive Design: A Moral Necessity

A city that is not safe for a five-year-old child or an eighty-year-old grandmother is a city that is fundamentally broken. For too long, urban planning has socially segregated those with functional diversity by designing streets that operate as obstacle courses rather than accessible pathways.

Safety for the vulnerable: While walkable neighbourhoods paradoxically see higher pedestrian density, they are associated with lower overall traffic-fatality rates when designed correctly. We must move away from rigid, car-centric engineering standards and embrace universal design that inherently considers the journey of the disabled, children and the elderly.

The “social public space”: Streets should not be mere movement corridors. They are the living rooms of our cities — places where people sit, talk and watch over their neighbourhoods. Inclusive design restores the unique vibrancy of Indian streets, turning a mundane daily commute into a meaningful social interaction.

III. Climate Resilience: The Shaded Footpath as Infrastructure

As urban heat islands intensify, walking in an Indian city can frequently feel like a feat of endurance. The widespread use of high-thermal-mass materials in roads and pavements traps heat, raising local air temperatures by several critical degrees. Comprehensive pedestrian infrastructure must double as climate infrastructure.

Walkable Urban Cool Spots (WUCS): By integrating dedicated shading, urban vegetation and cool-surface materials, planners can create localised “cool spots” that actively protect pedestrians from extreme heat.

Green infrastructure: Strategically allocated green cover can achieve up to a 2°C cooling objective in dense urban environments, provided it is seamlessly integrated into the pedestrian and cycling networks.

The canopy effect: Shaded footpaths are not a luxury; they are a public-health necessity. Natural tree shade reduces surface temperatures by up to 13°C, making the choice to walk viable even at the height of summer.

IV. The Path Forward: Making the Choice

A safer, more walkable city is a choice we must make collectively. We have struggled for decades to secure even the most basic footpaths — a reality caused by urban-planning frameworks that routinely ignore pedestrian infrastructure, leaving conditions both unsafe and inconvenient. This is no longer acceptable. To achieve a sustainable urban future, we must demand:

Mandatory accessibility standards: Following the progressive models of cities like Varanasi, we need updated city bylaws that hold planners and contractors legally accountable for building inclusive, unobstructed infrastructure.

A shift in budgetary priority: Municipal and state funding must pivot away from car-centric flyovers toward expansive, interconnected, people-centric networks.

Cultural transformation: We must reject the unsustainable lifestyle of unnecessary vehicle consumption and return to a simpler, more grounded way of living where the street is recognised as a shared, democratic resource.

Walking is a universal, affordable activity that directly supports both mental and physical well-being. It is time for India to build cities that respect the dignity of the pedestrian. Our future mobility depends on it.

Walkability is not a “boutique” urban design concept or a luxury for the elite. It is the fundamental infrastructure of survival and the primary metric of a truly civil society. In a world where crude oil prices fluctuate unpredictably and economic pressures squeeze the common man, the humble footpath is our most resilient asset. Our streets must serve life, not just engines.



EXPERT VOICE · RAIL SAFETY

An Appreciation of the Functioning of Kavach

Prof. Pradip K. Sarkar and Brajnandan Kumar

1. Introduction

Railways are a fundamental pillar of modern infrastructure, enabling the safe and efficient movement of passengers and freight over vast distances. As railway traffic density surges globally — particularly in nations like the United States, Russia, China and India — monitoring a vast and dense network becomes an urgent priority for both safety and efficiency. Railway collisions remain a severe operational threat, often causing loss of life, extensive infrastructure damage and major service disruptions. According to the Ministry of Railways, more than 38,500 railway accidents were reported from 1961 to 2019. In 2023, among all railway accidents, 56 cases were attributed to driver fault, while 43 arose from mechanical defects such as poor design, track faults and bridge or tunnel collapse.

Traditional fixed-block systems limit line capacity and complicate high-density train operation, making it technically demanding to ensure safety. To overcome these limitations, the RFID-Based Train Collision Avoidance System (TCAS) was developed. By leveraging cutting-edge radio-frequency technology, the system enhances railway safety through real-time monitoring and proactive accident prevention.



Prof. Pradip K. Sarkar



Brajnandan Kumar

2. RFID-Based Train Collision Avoidance System Framework

The framework is organised into four principal layers for reliable, seamless operation with respect to the communication system:

- a) **Field Layer** — the physical trackside hardware, such as RFID balises and signals.
- b) **Onboard Layer** — the train-mounted equipment used to read track data and apply brakes.
- c) **Data Transmission Layer** — the network enabling real-time connectivity.
- d) **Central Management Layer** — the control-centre infrastructure that aggregates data and manages network traffic.

The Central Management layer, i.e. the Traffic Management Centre (TMC), serves as the operational core of the network—aggregating position reports, movement authorities and system-health metrics to generate a unified, real-time picture of railway



operations through the Train Management System (TMS), a Conflict Detection Engine (CDE), a Data Historian & Analytics module, and redundant hot-standby infrastructure.

3. Functions of the RFID-Based TCAS

The system uses radio-frequency technology to track train locations and identify potential hazards. By continuously monitoring the network, it can issue real-time driver warnings or automatically apply the brakes to prevent accidents.

Operational functions. The TCAS runs a continuous, real-time loop of data-gathering, calculation and automated intervention. Positioning: the train's RFID reader scans a track tag, instantly acquiring its exact coordinates. Signal updates: the station TCAS wirelessly transmits the status of upcoming signals to the train. Speed monitoring: the loco computer continuously evaluates whether the train's speed is safe for the approaching signal. Collision prevention: if two trains are on a head-on course, the central system — or direct loco-to-loco radio — immediately triggers the Brake Interface Unit (BIU) to halt both trains automatically, independent of driver intervention.

Core processing logic. These primary nodes act as the “brain” of the system. Determine location and speed: when the reader activates a passive track tag, the system maps the Tag ID against the static track layout to fix an absolute location, integrating continuous odometer readings for a real-time speed-and-position profile. Analyse collision risk: the core engine evaluates position and speed against movement authorities and Temporary Speed Restriction (TSR) data, continuously calculating distance to the train ahead and time-to-collision. Control braking: on a detected hazard it issues tiered warnings via the Driver Monitor Interface (DMI), and — if safety thresholds are breached — overrides manual control to send partial, full or emergency braking commands to the BIU.

4. Conclusions

RFID-based train collision avoidance is not a future technology but proven, globally deployed safety infrastructure that underpins billions of passenger journeys every year. From the Eurobalise networks of Europe to Japan's Shinkansen, China's high-speed lines, India's Kavach system and the United States' PTC rollout, RFID technology has demonstrated its capacity to prevent collisions, reduce headways and improve railway capacity. As railways worldwide accelerate decarbonisation and capacity-expansion programmes, RFID-based collision avoidance will remain a cornerstone technology — evolving with 5G communications, AI/ML and moving-block operations to deliver safer, higher-capacity and more efficient rail networks for the 21st century.

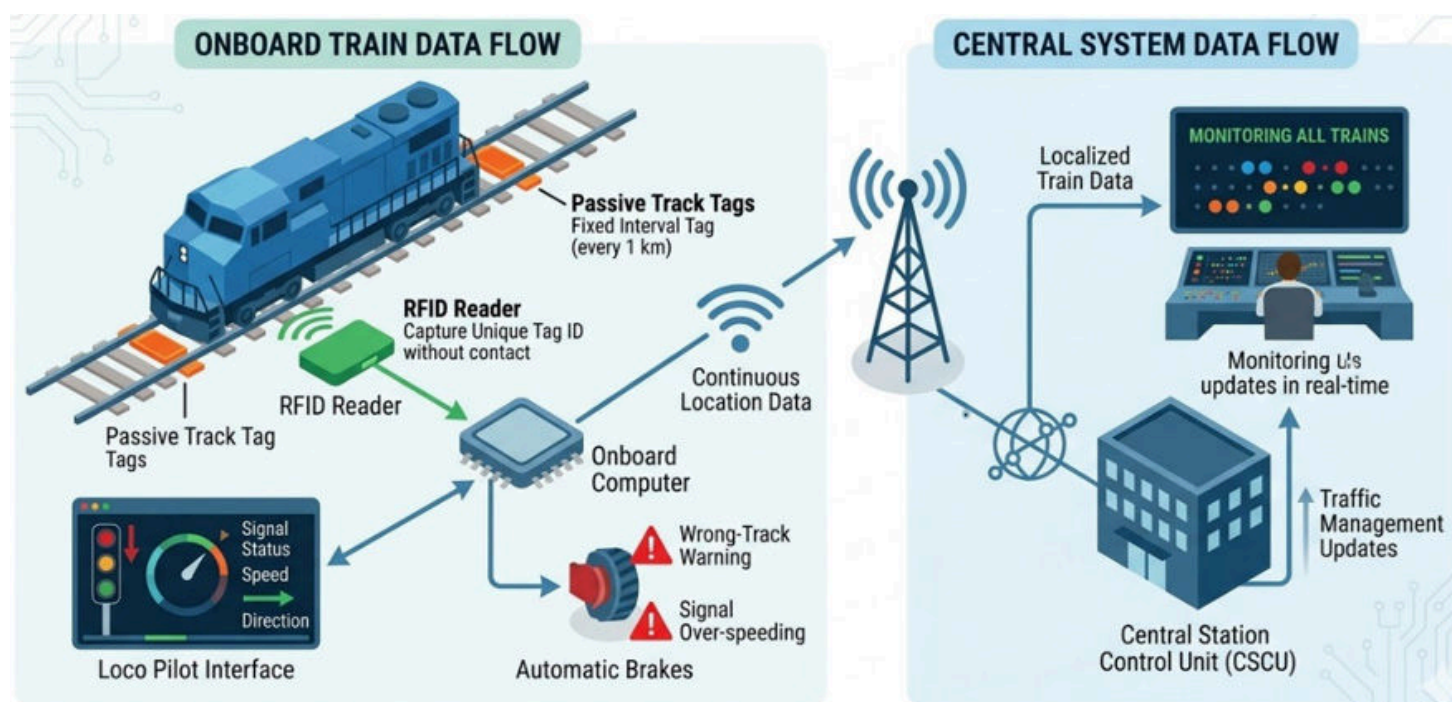


Fig 1: RFID-based Train Collision Avoidance data flow.

WORKING GROUPS & COMMITTEES

PROGRESS ON STANDARDS, SAFETY, DATA FRAMEWORKS & CROSS-SECTOR INTEGRATION · Q2 2026

Following a review against the Forum's mission, its four working pillars and the national missions it aligns to — Viksit Bharat 2047, IndiaAI, PM Gati Shakti and the National Logistics Policy — fourteen standing committees have been adopted as the Forum's committee structure. Together they span the full ITS value chain (intelligence, revenue, connectivity, safety, public transport, sustainability, freight, standards, security and capability) and extend the agenda into inclusive and foundational mobility.

NEW LEADERSHIP

New Chairperson — Committee on Sustainable & Green Mobility

EFFECTIVE 16 AUGUST 2026 · TERM TO 31 MARCH 2027

The Forum is pleased to announce the appointment of Shri Sainath Gurav, Founder and Managing Director of Sthaar Consulting, as Chairperson of the newly constituted Committee on Sustainable and Green Mobility. He brings considerable experience across intelligent transport and sustainable mobility to the role.

The ten-member Committee — five members nominated by the Chairperson and five by the Forum — has been constituted to lead India's transition to sustainable, inclusive and low-carbon mobility.

The Committee guides work across five priority areas: strengthening public transport and active travel; accelerating clean-energy and electric mobility; advancing sustainable freight and logistics; embedding circular-economy and lifecycle assessment; and unlocking green financing and MSME capacity building. Its recommendations draw on live national programmes such as PM e-Bus Sewa, PM E-DRIVE and FAME-II — keeping every output grounded in real deployment experience and aligned with India's net-zero commitments and the Viksit Bharat @2047 vision.



Shri Sainath Gurav
Chairperson

AT A GLANCE

10 member committee — 5 nominated by the Chairperson, 5 by the Forum

16 Aug 2026 – 31 Mar 2027 term of appointment

05 priority areas: public/active transport, clean-energy, green freight, circular economy, green financing

THE FOURTEEN COMMITTEES — MAPPED TO NATIONAL PRIORITIES

Complementing the Forum's standing structures, fourteen committees are aligned to India's flagship programmes and policy priorities — each tasked with translating national ambition into practical ITS outcomes.

#	Committee	Primary Theme	National Alignment
1	AI in Mobility & Predictive Traffic	AI-driven decongestion	IndiaAI · UrbanAI roadmap
2	Next-Gen Tolling & Road User Charging	Next-generation tolling	MoRTH barrier-free tolling · RUC
3	V2X & Connected Mobility	Connected-vehicle systems	C-V2X · autonomous-vehicle readiness
4	AI-Driven Road Safety	Safer mobility	'Predict, Prevent, Protect' · 50% by 2030
5	Multimodal Transit & MaaS	Integrated mobility	NCMC / One Nation One Card
6	Sustainable Green Mobility - <i>chaired by Shri Sainath Gurav</i>	Greener mobility	PM E-DRIVE · decarbonisation
7	Freight & Logistics ITS	Efficient networks	National Logistics Policy · PM Gati Shakti
8	ITS Standards & Architecture	Standards & quality assurance	National ITS Architecture · BIS · TEC · C-DAC · IRC
9	Cyber Security & Data Governance	Trustworthy mobility	DPDP Act 2023 · CERT-In
10	Capacity Building & R&D	Skilling & indigenous innovation	Make-in-India · Viksit Bharat 2047

#	Committee	Primary Theme	National Alignment
11	Women-Centric Mobility	Safe, inclusive mobility	AIS-140 · Mission Shakti
12	Inclusive & Universal Mobility	Accessible mobility for all	RPwD Act 2016 · Sugamya Bharat
13	Active Mobility (NMT)	Walking & cycling safety	Streets4People · Cycles4Change
14	GIS-Enabled Mobility	Geospatial data backbone	PM Gati Shakti · Geospatial Policy 2022

Highlighted: Committee No. 6 (Sustainable Green Mobility) is chaired by Shri Sainath Gurav, as above. Chairs are invited to confirm specific Q2 deliverables for publication.

CROSS-COMMITTEE THEMES

Safety-First Deployment Every mandate anchored to measurable safety outcomes before scale.	Interoperability Across Modes Common standards and shared data so systems work across modes and corridors.	Equity in Design Active-travel, women-centric, universal and geospatial mandates treated as foundational, not add-ons.
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ITS INDIA ACADEMY

Building the Capability Pillar

CURRICULA · CERTIFICATION · ACADEMIC PARTNERSHIPS

The Academy advanced its Capacity-Building pillar with new curricula in AI in mobility, professional ITS certification, and academic partnerships with the IITs, CRRI and South Asian University — building the workforce and indigenous-innovation pipeline that deployment at scale demands.

The Academy is strengthening its Capacity-Building pillar through a three-pronged approach—curricula, certification, and academic partnerships—to foster a skilled workforce and indigenous innovation in AI-driven mobility. Key initiatives include partnering with the South Asian University (SAU) for regional expertise, engaging IITs to translate AI and material science research into commercial EV solutions, and leveraging CSIR-CRRI for large-scale training in intelligent transportation systems. These efforts align with national infrastructure priorities, including the implementation of Multi-Lane Free Flow (MLFF) tolling, by fostering an interdisciplinary workforce bridging engineering and public policy.



An immersive exhibit bridging classical architecture with future mobility, showcasing the "Capability Pillar" workforce development pipeline.

ITS INDIA NEWS

RECENT DEVELOPMENTS ACROSS THE INTELLIGENT-TRANSPORT LANDSCAPE · Q2 2026

Around-up of the quarter's notable developments across India's intelligent-transport landscape—from urban ropeways and mass-transit policy to advances in AI, autonomy and connected-vehicle safety.

01 · URBAN TRANSIT

India's First Urban Public Transport Ropeway Nears Completion

Varanasi is set to launch India's first urban public-transport ropeway, making it one of the few cities globally to use aerial ropeways as part of its public-transport network. The project aims to reduce congestion, improve urban mobility, promote sustainable transport and enhance tourism.



India's First Urban Public Transport Ropeway Nears Completion

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02 · POLICY · SMART MOBILITY

NITI Aayog Pushes Smart Mobility for Bengaluru

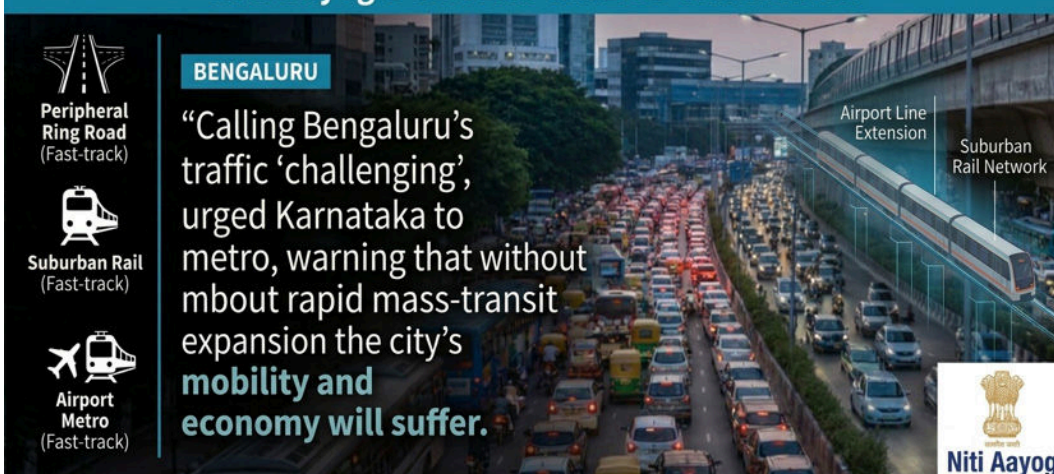
Calling Bengaluru's traffic "challenging," NITI Aayog has urged Karnataka to fast-track three major projects — the Peripheral Ring Road, suburban rail and the airport metro — warning that without rapid mass-transit expansion, the city's mobility and economy will suffer.

Expert Perspectives and Recent State Actions

Urban Planning Concerns: Transportation experts (including IISc researchers) caution that while rail networks directly ease transit, ring roads like the PRR can trigger "induced demand". Without strict land-use policies, ring roads often attract dense commercial developments that create new traffic bottlenecks.

The State's Countermeasure: Following the report, the Karnataka government launched the *Urban Mobility Mission Committee for Bengaluru (UMMCB)*. Designed as a multi-stakeholder body, it brings together government agencies, civic groups, tech park associations, and ride-hailing/delivery giants (Namma Yatri, Uber, Swiggy) to streamline data-sharing, fix last-mile connectivity, and clear immediate bottlenecks around active metro hubs.

NITI Aayog's URGENT CALL TO KARNATAKA



03 • AI & AUTONOMY

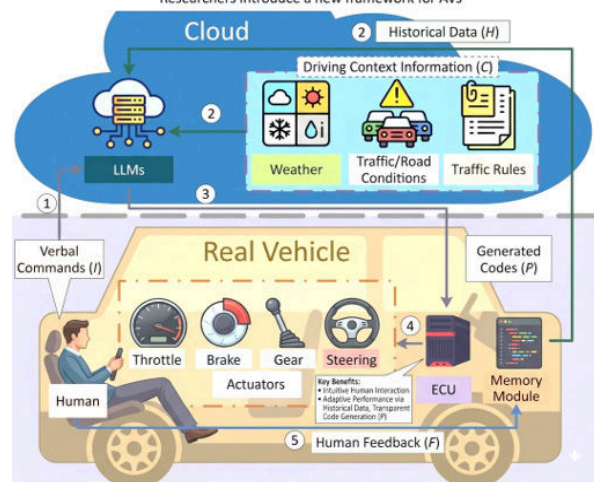
LLMs Enter Autonomous-Driving Trajectory Planning

Researchers have introduced a new Large Language Model (LLM)-enhanced trajectory-planning framework for autonomous vehicles. The technology improves route planning, real-time decision-making and safety in connected and intelligent transportation systems — underscoring the growing role of AI in future mobility.

By combining human-like spatial reasoning with high-frequency control systems, LLM-enhanced trajectory planning bridges the gap between raw sensor data and complex road decisions. These frameworks convert multi-modal inputs—like visual scenes, telemetry, and map topologies—into natural language tokens, allowing the AI to evaluate risk and predict vehicle interactions in unpredictable traffic. Ultimately, this semantic understanding helps self-driving networks handle rare edge cases and improves safety across connected urban transit systems.

REVOLUTIONIZING AUTONOMOUS DRIVING: LLM-ENHANCED TRAJECTORY PLANNING

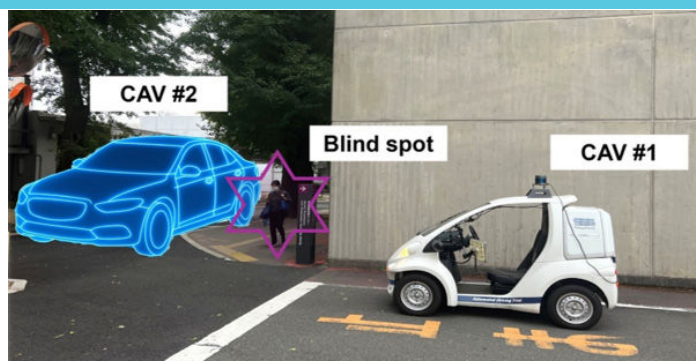
Researchers introduce a new framework for AVs



04 • CONNECTED VEHICLES

Connected Vehicles Improve Intersection Safety

A new research demonstration has successfully implemented cooperative intersection management using connected autonomous vehicles. The system enables vehicles to communicate with infrastructure and cross intersections without traditional traffic signals — improving safety and reducing delays. Cooperative intersection management uses Vehicle-to-Infrastructure (V2I) communication to turn chaotic junctions into synchronized, signal-free crossing zones. Ultimately, it lays the blueprint for zero-delay, ultra-safe traffic flow in tomorrow's smart cities.



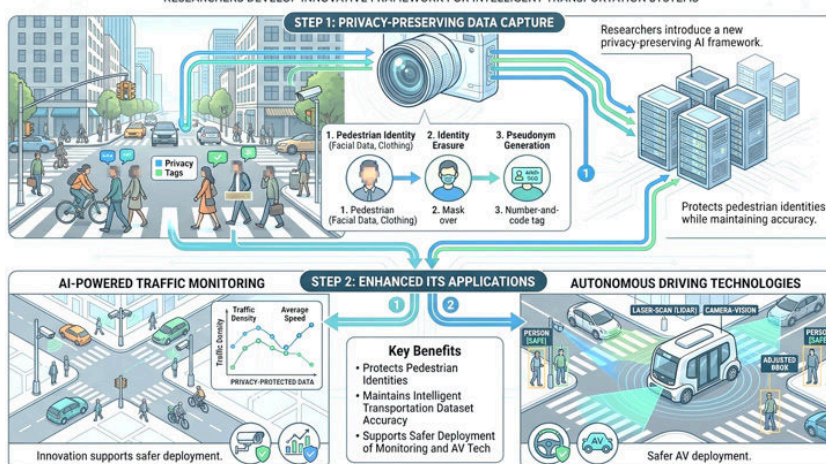
05 • AI & PRIVACY

Privacy-Preserving AI for Intelligent Transport

Researchers have developed a privacy-preserving AI framework that protects pedestrian identities while maintaining the accuracy of intelligent-transportation datasets. The innovation supports safer deployment of AI-powered traffic monitoring and autonomous-driving technologies.

AI-BASED PRIVACY PROTECTION FOR ITS

RESEARCHERS DEVELOP INNOVATIVE FRAMEWORK FOR INTELLIGENT TRANSPORTATION SYSTEMS



INDUSTRY SPOTLIGHT

LEADERS IN INTELLIGENT TRANSPORTATION SYSTEMS · MEMBER & PARTNER ORGANISATIONS · Q2 2026

This quarter's spotlight profiles five member and partner organisations advancing India's intelligent-transport ecosystem — from digital fare collection and physical AI to connected infrastructure, geospatial intelligence and V2X.

India's Intelligent Transportation System Market Set to Hit USD 2.5 Billion by 2030

The Indian Intelligent Transportation System (ITS) market is entering a phase of rapid expansion. Driven by a Compound Annual Growth Rate (CAGR) of 9.0%, the market is valued at **USD 1,621.3 million in 2025** and is projected to reach **USD 2,499.4 million by 2030**. This steady growth reflects India's massive transition toward tech-driven, sustainable, and highly efficient mobility networks.

Key Drivers of the Growth

This rapid growth is fueled by three major trends. Through the **Smart Cities Mission**, government funding is actively building centralized, data-driven municipal command centers. Concurrently, **urban congestion management** initiatives are deploying AI-driven monitoring and adaptive traffic signals to handle rising vehicle densities in metropolitan hubs. Finally, nationwide **transit modernization** policies are driving the demand for seamless electronic tolling, integrated public transit tracking, and connected EV charging grids.

As cities scale up their digital infrastructure, the deployment of advanced surveillance, collision avoidance systems, and real-time passenger information tools will remain vital to unlocking India's modern transportation network.



India's ITS Market Outlook: Visualizing the sector's steady climb toward a USD 2.5 Billion valuation by 2030, driven by automated infrastructure updates.

AFC & DIGITAL TICKETING

Hitachi Rail GTS India

Pioneering Digital Transit & Next-Gen Fare Collection

HITACHI

A key entity within the Hitachi Rail Group, Hitachi Rail GTS India (formerly Thales GTS India) specialises in multimodal integrated transportation systems, Automatic Fare Collection Systems (AFCS), payment technologies and telecommunications. Under Managing Director Pankaj Bhatia, the firm blends global digital expertise with local engineering capabilities to modernise India's urban transit landscape.

- **24+ Year Strategic Partnership:** trusted technology partner to the Delhi Metro Rail Corporation (DMRC), delivering over 10 major AFC contracts across India's largest metro network.
- **Flagship Project (DS24):** executing one of the world's largest fare-modernisation initiatives for DMRC, upgrading over 250 stations with next-generation digital ticketing and streamlined operational frameworks.

PHYSICAL AI • SMART CITIES



SenSen AI

Real-Time Physical AI & Urban Live Awareness

Listed on the Australian Securities Exchange (ASX) and founded by Indian tech entrepreneurs, SenSen AI powers Intelligent Transportation, Smart Cities and Public Safety through “Physical AI” — enabling urban infrastructure to perceive, analyse and respond to traffic events in real time.

- **Global Footprint & Strong IP:** backed by 60+ global patents in computer vision, video analytics and edge AI, with active deployments across more than 70 cities worldwide.
- **Localised Smart-City Intelligence:** delivers solutions customised for Indian roadways — traffic enforcement, parking management, dynamic policing and unified city-governance platforms.

CONNECTED INFRASTRUCTURE



Applied Information

Connected Infrastructure & Cloud Supervisory Intelligence

Applied Information is a leading developer of connected ITS technology, empowering public agencies, emergency services and transit authorities to manage roadway safety and operations via its proprietary Glance® smart-city supervisory platform.

- **Integrated Mobility Suite:** connected solutions spanning traffic-signal management, emergency-vehicle preemption, transit signal priority, wrong-way-driver detection and school-zone safety.
- **Data-Driven Safety:** connects field hardware, cloud analytics and vehicles across North America and expanding international markets to improve emergency response times and traffic efficiency.

GEOSPATIAL DEEP-TECH



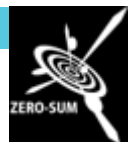
Mappls MapmyIndia

Indigenously Built Deep-Tech & Geospatial Intelligence

With over three decades of pioneering experience, Mappls MapmyIndia provides comprehensive geospatial software, location-based IoT products and deep-tech navigation APIs that power India’s modern Intelligent Transport Systems across government and enterprise sectors.

- **End-to-End ITS Capabilities:** powers real-time traffic advisories, command-and-control centres, centralised fleet tracking, EV-charger discovery and multimodal navigation.
- **Proprietary Geospatial Stack:** combines native high-definition maps with hyperlocal analytics to drive safer, smarter and location-aware mobility experiences nationwide.

V2X & TRAFFIC OPTIMISATION



Zero-Sum ITS Solutions India

V2X Pioneers & Advanced Traffic Optimisation

A Bengaluru-headquartered subsidiary of Japan’s Zero-Sum Ltd., Zero-Sum ITS Solutions India designs tailored traffic-management systems, smart-signalling networks and Vehicle-to-Everything (V2X) platforms specifically engineered for Indian traffic conditions.

- **Key Deployments:** operates and maintains the Japanese Moderato-based adaptive traffic-signalling system across Bengaluru’s Central Business District, and deployed India’s first fully automated ITS pilot on Ahmedabad’s Sabarmati Riverfront Road.
- **V2X Innovation Leader:** spearheaded ground-breaking V2X trial deployments across India — Bus Rapid Transit priority, Emergency Vehicle Priority networks and Intersection Collision Warnings—with major automotive OEMs and local authorities.

EVENTS ROUND-UP

ITS INDIA FORUM ENGAGEMENTS ACROSS THE QUARTER · APRIL – JUNE 2026

Through the second quarter of 2026, the ITS India Forum sustained an active presence across national platforms spanning connected-vehicle regulation, active mobility, electric and electronic highways, space-enabled connectivity and smart-mobility research. President Akhilesh Srivastava represented the Forum at each, carrying its agenda of safer, smarter and more sustainable mobility into policy, industry and academic forums alike.



A quarter of national engagement — delegates and dignitaries at ICSMS 26, one of five platforms the Forum joined this quarter.

WEBINAR · MAY 2026

Regulatory Framework for V2X Communication

ORGANISED BY ITS INDIA FORUM · 28 MAY 2026 · VIRTUAL

Organised by the ITS India Forum on 28 May 2026, this virtual session convened professionals from government, industry, academia and the wider intelligent-transport ecosystem to deliberate the policy and regulatory landscape needed to accelerate Vehicle-to-Everything (V2X) adoption in India. **Akhilesh Srivastava**, President, ITS India Forum, delivered the Opening Remarks and chaired the session.

A robust regulatory framework must support innovation while safeguarding safety, interoperability and scalability.

Discussions centred on building an enabling ecosystem for connected vehicles through policy support, technology standardisation, institutional collaboration and capacity building — reinforcing V2X's role in safer roads, smoother traffic and richer mobility services.

The session reinforced the significance of continued engagement between policymakers, industry leaders, technology providers, and research institutions to accelerate the deployment of connected mobility solutions. By encouraging knowledge sharing and constructive dialogue, the webinar contributed to the ongoing efforts towards building a future-ready transportation ecosystem in India.

ROUNDTABLE · 01 JUNE 2026

Active Travel Roundtable

CSOI, NEW DELHI · 01 JUNE 2026

Held at CSOI, New Delhi, **The Active Travel Roundtable 2026** convened on 1 June 2026 at the Civil Services Officers' Institute (CSOI) in New Delhi, bringing together senior policymakers, urban planners, transport specialists, and technology leaders to integrate active mobility—specifically **walking, cycling, and non-motorised transport (NMT)**—into mainstream urban transit architecture. Moving away from vehicle-centric municipal models toward human-centric networks directly supports key public sector goals: reducing urban vehicular emissions, **easing traffic congestion, and improving public health standards** across metropolitan centers.

The proceedings featured authoritative representation across administrative, industry, and academic spheres. Key addresses were delivered by **Sri Durga Shankar Mishra, IAS (Retd.)**, former Chief Secretary to the Government of Uttar Pradesh and former Secretary of the Ministry of Urban Development, alongside **Sri Ashish Kumar Srivastava, IAS**, Regional Director at SSC Prayagraj. Industry advocacy was led by **Akhilesh Srivastava**, President of the ITS India Forum, who emphasized human-centric, smart mobility frameworks. Technical evaluations and framework assessments were spearheaded by senior researchers and planners from premier institutions, including **NITI Aayog, IIT Delhi, and the Central Road Research Institute (CRRI)**.

Deliberations focused on three foundational strategic pillars required for operational efficiency. First, regarding policy execution, delegates analyzed implementation roadmaps for national active travel visions, focusing on **standardized cycling corridors and pedestrian safety protocols**. Second, on technological integration, the panel explored utilizing **Direct-to-Mobile (D2M) broadcasting** to deliver real-time commuter communications, optimize route safety, and support broader smart mobility systems. Third, regarding infrastructure restructuring, the assembly stressed that widespread civic adoption depends on **dedicated NMT routes, universal accessibility metrics, and strict road safety policy enforcement**.

The roundtable concluded with a multi-sector consensus establishing that **coordinated multi-agency frameworks** among municipal bodies, academic institutions, and industry stakeholders are mandatory to accelerate active transit adoption. The directives and insights established during this session will serve as a **foundational roadmap for upcoming national policy interventions and municipal transit upgrades**.



The Forum in session at the Active Travel Roundtable.

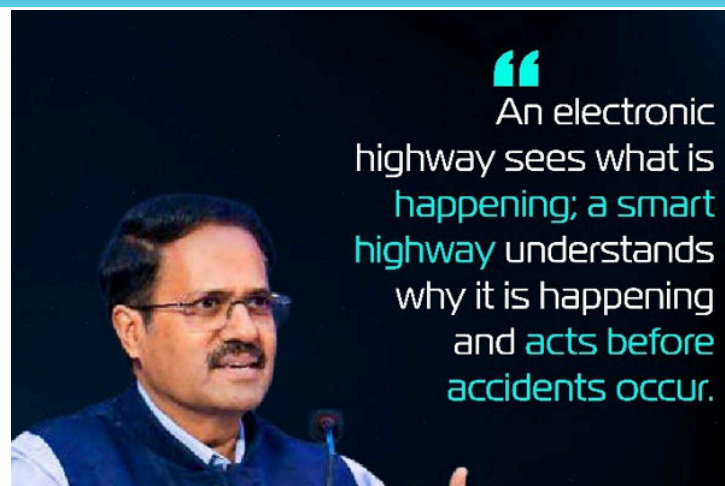
WORKING GROUP · 02 JUNE 2026

11th NHEV Working Group Meeting

3E MOBILITY · THE IMPERIAL, NEW DELHI

Convened under the 7C · 3E framework — Electric, Electronic and Efficient Highways — the meeting gathered government, industry, research institutions and the Group of Transport Experts to shape intelligent, connected and electronic mobility across India's national corridors.

Akhilesh Srivastava attended as a Speaker and Participant, sharing insights on digital technologies, intelligent transport systems and integrated mobility, building on the 10th Working Group Meeting at the Quality Council of India.



President Akhilesh Srivastava addressing the 3E Mobility working group..

SPACE CONGRESS · 15–17 JUNE 2026

5th India Space Congress 2026*LE MÉRIDIEN, NEW DELHI*

At the **5th India Space Congress 2026**, held from **15–17 June 2026** at **Le Méridien, New Delhi**, provided a prestigious platform for discussions on emerging technologies, innovation, and the growing convergence of the space and digital technology sectors. The event brought together policymakers, industry leaders, technology experts, researchers, and innovators to explore new opportunities for collaboration and technological advancement.

ITS India Forum's participation reflected the increasing significance of space-based technologies in enabling intelligent transportation systems and future mobility solutions.

Akhilesh Srivastava, President, ITS India Forum, participated in the Congress as a **Special Guest and Panel Speaker**, highlighting the transformative role of satellite technologies, digital infrastructure, and data-driven solutions in enhancing transportation efficiency, connectivity, and public safety.

The Congress encouraged dialogue on innovation, technology integration, and cross-sector collaboration to address future mobility challenges. Discussions emphasized the importance of leveraging advanced technologies to strengthen infrastructure, improve connectivity, and support sustainable development across multiple sectors.

The event successfully reinforced the value of collaboration between government, academia, industry, and technology leaders in shaping a resilient and innovation-driven future. The participation of ITS India Forum further reflected its continued commitment to promoting intelligent, connected, and sustainable mobility through technological excellence and strategic partnerships.



*India Space Congress 2026 —
“Reimagining Space.”*

CONFERENCE · 30 JUN – 01 JUL 2026

Smart Mobility Systems — ICSMS 26*IETE, NEW DELHI & OSMANIA UNIVERSITY, HYDERABAD*

Jointly hosted by IETE New Delhi and Osmania University, the two-day conference brought together leading academic and industry minds around Artificial Intelligence, Quantum Computing and Vehicle-to-Vehicle (V2V) communication. Dr. Akhilesh Srivastava (President, ITS India) called for intelligent road infrastructure — camera-enabled streets and smart signage that communicates directly with vehicles — to reduce fatalities.

Key Takeaways from the Conference

The conference highlighted critical imperatives for advancing India's smart transit and research landscape. **IETE President Dr. Sunil** emphasized building **India-first infrastructure**, advocating for scalable solutions tailored specifically to Indian road conditions, notably using **Direct-to-Mobile (D2M) communication** to deliver critical traffic and emergency alerts independent of internet connectivity. Building on smart mobility, **Dr. Akhilesh Srivastava (President, ITS India)** underscored the urgent need for **intelligent, safety-focused road infrastructure**, such as camera-enabled streets and smart signage that communicate directly with vehicles to curb traffic fatalities.

Beyond physical and digital transit networks, experts across sessions stressed the strategic importance of **protecting local innovation** by retaining intellectual property rights within India to drive national economic growth. Finally, reinforcing academic rigor, **General Chair Dr. J.K. Mondal** detailed the conference's **strict quality standards**, noting that out of 280 submitted papers, only 20 survived the peer-review process for publication by **Springer Nature**, while issuing an explicit advisory to researchers against leveraging AI tools like ChatGPT for content generation.



The 2nd International Conference on Smart Mobility Systems, jointly hosted by IETE and Osmania University.

Aligned with Viksit Bharat 2047, the conference bridged theoretical research and practical deployment, establishing a framework for indigenous, scalable intelligent transport systems that prioritise both innovation and safety.

ICSMS 26 AT A GLANCE

300 delegates in attendance

08 industry partners supporting the event

20 / 280 papers selected for Springer Nature publication

GLIMPSES OF THE QUARTER



Scenes from the Active Travel Roundtable, the 11th NHEV Working Group Meeting and ICSMS 26.

UPCOMING EVENTS

ON THE ITS INDIA FORUM CALENDAR · AUGUST – OCTOBER 2026

Looking ahead, the Forum's calendar features four flagship gatherings — three across India and the 32nd ITS World Congress in the Republic of Korea — spanning AI-driven urban safety, deployment-ready road-safety technology, national ITS dialogue, and the global stage.

SAFETY SUMMIT · 21 AUG 2026

4th Safe City & Intelligent Mobility India 2026 Summit

HOTEL LE MÉRIDIEN, NEW DELHI · 21 AUGUST 2026

Themed “AI-Driven Safety and Intelligent Mobility for Next-Gen Cities,” the 4th edition will convene senior policymakers, smart-city leaders, law-enforcement agencies, urban planners, mobility experts and technology providers to deliberate AI-enabled urban safety, resilient infrastructure and intelligent mobility — aligned with the Smart Cities Mission, Digital India, the IndiaAI Mission, Intelligent Traffic Management Systems and Safe City projects. The summit is expected to draw over 300 senior delegates from Central and State governments, Smart City SPVs, municipal and development authorities, police and transport departments, metro corporations, industry and academia.

Forum participation: Dr. Shiv Kumar, Director General, ITS India Forum, invited to chair the Technical Presentation Session — “Building Safer Roads & Smarter Mobility: AI, Intelligent Transport & Sustainable Urban Mobility” (14:15–15:30 hrs, 21 August 2026).

TECH CONCLAVE · 25–26 AUG 2026

National Road Safety Technology Conclave (NRSTC) 2026

IIT BOMBAY, POWAI, MUMBAI · 25–26 AUGUST 2026

Jointly organised by IIT Bombay and the ITS India Forum, with the guidance and inspiration of the Supreme Court Committee on Road Safety (SCCoRS), NRSTC 2026 is not a conventional conference or exhibition but a national platform connecting proven road-safety technologies with senior Government decision-makers and industry leaders. It will showcase 24+ selected, deployment-ready solutions — spanning AI, enforcement, traffic management, V2X, ADAS, connected infrastructure, fleet safety and emergency response — each assessed for cost, measurable impact, scalability and implementation experience, and supported by a formal Technology Evaluation & Recommendation process.

Why it matters: India loses over 1.77 lakh lives on its roads each year; NRSTC brings ready-to-deploy technologies and the decision-makers who can implement them into one room.

ITS CONGRESS · 07–08 OCT 2026

ITS India Congress, powered by Transport + Traffic Infratech Expo 2026

INDIA · 7–8 OCTOBER 2026

The ITS India Congress is a premier knowledge-sharing platform bringing together policymakers, transport authorities, urban planners, technology providers, infrastructure developers, researchers and mobility experts to chart the future of intelligent transportation in India. Powered by the Transport + Traffic Infratech Expo 2026, the Congress will focus on Intelligent Transport Systems, smart mobility, traffic management, road safety, connected infrastructure, digital tolling, public-transport modernisation and emerging technologies — through keynote sessions, panel discussions and industry presentations aimed at fostering collaboration, innovation and sustainable mobility.

WORLD CONGRESS • 19–23 OCT 2026**32nd ITS World Congress 2026**

**GANGNEUNG OLYMPIC PARK, REPUBLIC OF KOREA •
19–23 OCTOBER 2026**

Often called the “Transport Olympics,” the 32nd ITS World Congress—themed “Beyond Mobility, Connected World,” hosted by the Ministry of Land, Infrastructure and Transport (MOLIT) and organised by ITS Korea — is the world’s largest event dedicated to Intelligent Transport Systems.

The ITS India Forum is convening an official India Delegation, inviting government representatives, industry leaders, technology providers, researchers, smart-city professionals and start-ups to foster international col-laboration, exchange knowledge, create business opportunities and strengthen India’s presence on the global stage. Entry to the exhibition is complimentary.

Join the India Delegation:
coordinated by the ITS India
Forum (dg@itsindiaforum.com).
Programme highlights include the
Ministerial Roundtable, plenary
sessions, a global exhibition, and
technical visits & demonstrations
across Korea’s mobility ecosystem.

ITS WORLD CONGRESS 2026

महाकुंभ of ITS

GANGNEUNG
ITS World Congress 2026
Beyond Mobility Connected World

**Beyond Mobility,
Connected World**

INDIA DELEGATION
19–23 OCTOBER 2026
GANGNEUNG, REPUBLIC OF KOREA

ITS INDIA
Shaping the Future of Mobility

**ENTRY TO THE EXHIBITION
IS COMPLIMENTARY**

The Congress in Numbers

Official India Delegation to the ITS World Congress 2026, Gangneung.

+90	60,000+	190+	420+
Countries	Participants	Sessions	Exhibition Booths

CARTOON CORNER

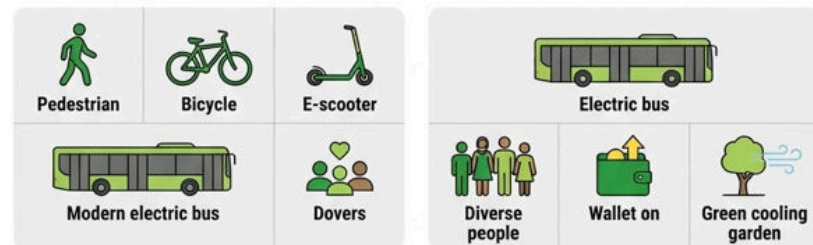
A LIGHTER LOOK AT MOBILITY · ACTIVE TRAVEL, ILLUSTRATED · Q2 2026

This quarter's illustration makes the case for active travel—walking, cycling and people-first streets—as the backbone of future-ready Indian cities. Walkability, it argues, is not a nicety but infrastructure.



WHAT IS ACTIVE TRAVEL?

A framework prioritizing walking, cycling, and non-motorised transport



The Five Pillars of Walkable Cities

1. Service Improvements

Complete streets with wide pavements, protected cycling lanes, safe crossings, and shade trees.

2. Service Improvements

Frequent, reliable public transit integrated seamlessly with walking and cycling networks.

3. Community Amenities

Playgrounds, markets, seating areas, and gathering spaces that animate streets and build social connection.

4. Land-Use Reform

Mixed-use neighborhoods with on-street parking pricing and essential services that support 15-minute walkability, retail, amenities, parks, and social services.

5. Green Infrastructure

Urban tree canopy, permeable pavements, bioswales, and cool surfaces that reduce heat and support biodiversity.

WALKABILITY IS INFRASTRUCTURE

A framework prioritizing walking, cycling, and non-motorised transport

ACTIVE TRAVEL IS THE FUTURE.

"Walkability is infrastructure. Active travel is the future." — the quarter's illustrated take on the Five Pillars of walkable cities.

COMING UP IN Q3

A TEASER OF NEXT QUARTER'S THEMES · CALL FOR PAPERS · SUBMISSION DATES

The Q3 2026 edition (July–September) will follow the road to Gangneung and the inaugural ITS India Congress, with deeper coverage of MLFF and GNSS-based road-user charging, AI in traffic management and enforcement, spatial data for resilient highways, and connected & automated vehicles.

THEMES ON THE HORIZON

MLFF & GNSS Road-User Charging	AI in Traffic & Enforcement	Spatial Data for Resilient Highways	Connected & Automated Vehicles
The next phase of barrier-free, distance-based tolling.	Machine learning across monitoring, signalling and enforcement.	InSAR, LiDAR and geospatial risk for hill roads.	V2X, cooperative driving and autonomy..

STREET REDESIGNS

PROVISIONAL Q3 LINE-UP

- **Pre-event briefing:** the ITS Australia Global Summit (Melbourne) and the 32nd ITS World Congress (Gangneung).
- **Feature:** GNSS distance-based tolling — what India's transition looks like next.
- **Expert article slot:** a call for member contributions (see below).
- **Committee deliverables round-up** and an expanded Member's Spotlight.

CALL FOR PAPERS & CONTRIBUTIONS

We Invite Member Contributions for Q3

The Forum welcomes expert articles, case studies and technology spotlights from members and partners for the Q3 2026 edition. Contributions aligned with the themes above are especially encouraged.

Where to submit: by email to the editorial team
(assistantmanager@itsindiaforum.com)

Format & deadline: Kindly submit the article not exceeding 2 pages, in Word or PDF format, for inclusion in the official publication.

DIRECTOR GENERAL'S SUMMARY

DR. SHIV KUMAR *Director General, ITS India Forum*

QUARTERLY ACHIEVEMENTS & OPERATIONAL SUMMARY · Q2 2026



Dear Members,

Q2 2026 was, above all, a quarter of delivery. On the policy front, the Ministry of Road Transport and Highways advanced a coherent agenda across our mountain highways, tolling, fleets and data — and the breakthrough of the main Zojila tunnel on NH-1 stands as a symbol of what disciplined engineering and clear policy can achieve together.

India's transition to Multi-Lane Free Flow (MLFF) transforms tolling from a physical barrier into a real-time, AI-powered digital transaction that reduces congestion and revenue leakage. The nation's FASTag infrastructure serves as the digital backbone for this evolution, setting the stage for future GNSS-based, continuous distance charging.

For the Forum, the quarter's operational highlight was the establishment of the ITS India Congress as a permanent national flagship through our alliance with Messe Frankfurt Trade Fairs India and Virtual Info Systems — a platform that will serve our ecosystem for years to come. We also renewed our committee architecture, adopting fourteen standing committees mapped to national missions and welcoming Shri Sainath Gurav to chair the new Committee on Sustainable and Green Mobility. Those committees moved from mandate to output across next-generation tolling, road-user charging, automated enforcement and V2X, while the ITS India Academy continued to widen the professional talent pipeline.

The Forum also sustained an active presence — from the V2X regulatory webinar and the Active Travel Roundtable to the 11th NHEV Working Group under the 7C · 3E framework, the 5th India Space Congress and a keynote at ICSMS 26. Internationally, our engagement deepened from the 17th ITS European Congress in Istanbul to the ITS America Conference & Expo, with our sights firmly on the 32nd ITS World Congress in Gangneung this October.

The task before us is deployment at scale — and India is well placed to lead it.

I thank our members, partners and the Ministry for a productive quarter, and look forward to carrying this momentum into Q3.

With gratitude and optimism,

Dr. Shiv Kumar

Director General, ITS India Forum

OUR MEMBERS

A GROWING GLOBAL & NATIONAL NETWORK ADVANCING INTELLIGENT MOBILITY · Q2 2026

The Forum's strength lies in its members—international collaborators, patrons, industry leaders and academic institutions advancing intelligent transport across India and the world.

INTERNATIONAL COLLABORATIONS

ITS United Kingdom



TTS Italia



ITS America



5GAA



ITS Asia Pacific



ERTICO



ITS Singapore



ITS Canada



ITS Malaysia



ITS New Zealand



ITS Thailand



ITS Indonesia



ITS Taiwan



ITS China



ITS Hong Kong



ITS Australia



IEEE



Asia-Pacific Economic Cooperation



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Qualcomm India Pvt Ltd



Arcadis IBI Group



Jio Platforms Limited



Prama



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Pvt. Ltd.



Kataline Limited



Here



MapmyIndia



Sensen



Danlaw Technologies



Hitachi



Envoys Electronics



Ador Powertron Limited



Zero-Sum ITS Solutions



DataCorp Traffic Private
Limited



ACADEMIC MEMBERS

AITD



Special Consultative Status with the United Nations

SAU



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UNIVERSITY

IIT Gandhinagar



IIT Bombay



IIT Roorkee



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TECHNOLOGY, ROORKEE

IIT Palakkad



INDIAN INSTITUTE
OF TECHNOLOGY
PALAKKAD

NIT Tiruchirappalli



IIT BHU



IIT Hyderabad



Indian Institute of Technology
Hyderabad

BITS Pilani, Hyderabad



BITS PILANI

IETE



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WheelsEye

Wizpro



EFKON India Pvt Ltd



Netradyne



Road Vision AI



Sego Automobile Solutions



Krishdha AI



Sparsh CCTV





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Indian Filter Coffee