

Eyes on Every Mile: How NSVs Are Here to Make India's National Highways Safer

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On a crisp morning along India's bustling National Highways, a sleek white vehicle glides forward — not a police car, not a maintenance truck but something far more futuristic. Its rooftop scanners release invisible beams, high-resolution cameras quietly whirr and advanced 3D laser sensors begin mapping every inch of the road.

This is the Network Survey Vehicle (NSV) — an innovation equipped with laser profilers, GPS and cutting-edge imaging technology. With every pass, it scans the road surface for cracks, potholes and unevenness, turning highways into living digital maps. What looks like a simple drive is, in fact, a revolution in how India monitors, maintains and safeguards its National Highways.

To enhance the riding experience of commuters on India's National Highways, the Ministry of Road Transport & Highways has announced a major leap forward: the deployment of Network Survey Vehicles (NSVs) equipped with advanced 3D laser-based systems across all states and its network.

These high-tech futuristic vehicles deployed at several National Highway corridors are more than survey machines. They are digital guardians of road quality. By scanning every stretch of road, NSVs collect detailed data on road inventory and surface conditions, identifying defects in potholes and patches.



Innovation for Public Welfare

The adoption of 3D-laser technology reflects MoRTH's commitment to leveraging innovation for public good. This initiative is set to revolutionise highway maintenance, ensuring that defects are not just detected but rectified swiftly, creating smoother, safer journeys for millions of commuters.

What once took months is now accomplished in days — ensuring safer roads, faster rectifications and transparent communication across stakeholders.

From 80 km to 300 km a Day

Earlier, surveys could cover only 20 – 80 km in a single day. Today, with advanced technology, NSV surveys up to 300 km daily. This leap in efficiency means quicker detection of road defects and faster action on the ground.

Secure, Centralised Data Flow through a 3-Step Process

- Raw survey data is encrypted and transmitted to the centralised NSV centre within 48 hours.
- Expert teams, strategically deployed across five zones, monitor and report findings systematically.
- Within 10 days, raw data is transformed into actionable insights — a process that earlier stretched to 4-6 months.

Quality Assured, Digitally Delivered

Every report undergoes a rigorous Q&A process by experts before acceptance. Once validated, notices are issued to stakeholders digitally and automatically through digital platforms, eliminating human intervention and ensuring seamless communication.

AI-Powered Highway Monitoring for Smarter Maintenance

With the new NSV system, every detail captured on India's National Highways is uploaded directly to NHAI's AI-based Data Lake portal. This ensures that expert teams can analyse insights quickly and take evidence-backed repair and maintenance actions without delay.

Across Every Landscape

The surveys will span two-to eight-lane National Highways, covering diverse terrains — from busy freight corridors and traffic-heavy stretches to weather-prone regions. Conducted at regular six-month intervals, these surveys will make sure that no defect goes unnoticed.



Better Outcomes for Citizens

In the long run, this initiative strengthens asset management and road maintenance, delivering smoother rides, safer journeys and greater transparency. By harnessing AI and advanced survey technology, MoRTH is ensuring that India's National Highways are not just built but they are sustainably maintained for the public good.

An App on the Go

A newly developed mobile app empowers site inspectors to:

- View NSV findings in real time
- Post comments and geo-stamped photos during inspections
- Track rectifications directly on site

This ensures transparency and accountability at every step.

Closing the Loop with Rectification

Unlike earlier systems that stopped at monitoring, the new NSV framework ensures the process ends only after defects are fully rectified. Road maintenance agencies are held accountable until every reported issue is 100 percent resolved. This new initiative marks a decisive shift in highway management — moving from reactive fixes to proactive response. By identifying problems early, NSVs will help in reducing accidents linked to road defects and ensure smoother journeys for all. More than a technological upgrade, it now represents a bold step towards accountability, digital governance and data-driven infrastructure maintenance.

For further details, please refer to the link provided below

https://drive.google.com/file/d/1nFtKZHQFqCE7ZpSYeMZsbacvue9BHUu_/view?usp=drivesdk

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