The Indian EXPRESS
JOURNALISM OF COURAGE

Cracks in slabs, surface deformations, rutting to potholes: How construction defects in National Highways keep India's road accident numbers high

A series of significant defects identified in various National Highway (NH) projects across India from 2019-20 to 2023-24 have a direct bearing on the creation of 'black spots' or hazardous points on the NH, where accidents take place repetitively.

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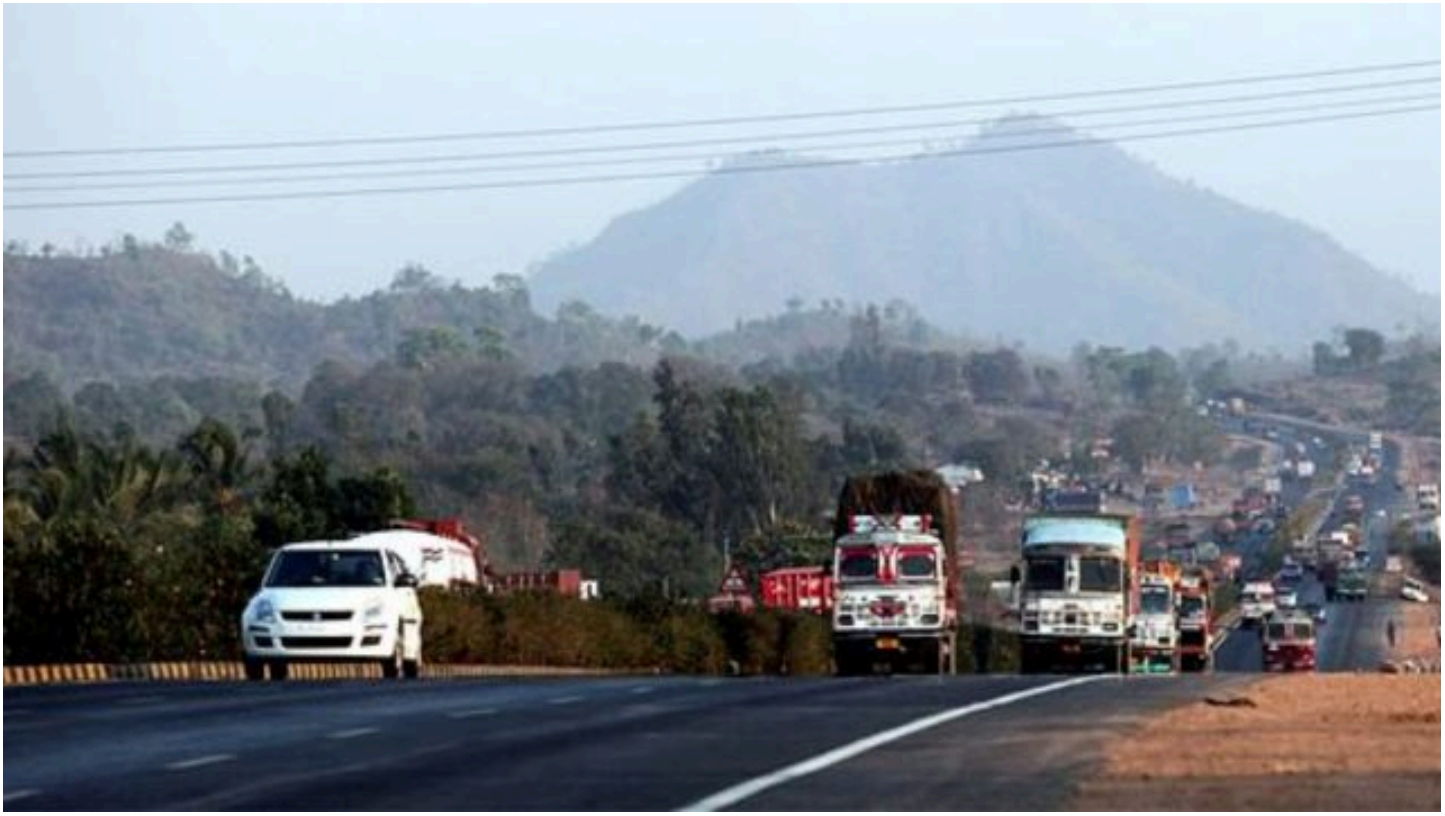
New Delhi | Updated: April 6, 2025 08:39 IST

5 min read



Settlements in highways mean displacement of the pavement surface or the underlying soil, which results in an uneven or depressed surface. (Express archive photo)

On January 14, 2025, a 28-year-old woman died and her husband suffered critical injuries after the SUV crashed into a divider on the newly-constructed Delhi-Meerut Expressway (DME). The police officials said that both were wearing seatbelts and the car suddenly flipped over when the driver applied the brakes and the vehicle hit the divider.

A week later, on January 23, at least 10 people were killed and more than 15 sustained injuries after the truck they were travelling in toppled and fell into a 50-m-deep valley in Karnataka's Uttara Kannada district. The accident took place near the Gullapur village under the Yellapur taluk, which is part of National Highway 63, when the victims were on their way to the Kumta market from Savanur to sell vegetables.

From the fractures or fissures that develop in the concrete slabs used for pavement construction, surface undulations or deformations, potholes from water stagnation and uneven riding surface — a series of significant defects identified in various National Highway (NH) projects across India from 2019-20 to 2023-24 have a direct bearing on the creation of 'black spots' or hazardous points on the NH, where accidents take place repetitively.

The information provided by the Minister of Road Transport and Highways, Nitin Gadkari, in Rajya Sabha on April 2, in response to a query regarding highway construction quality and measures to address deficiencies, listed out some 59 major damages or defects identified on

different national highways in 15 states during this period. He also provided the details of action taken in these cases which includes the penalty imposed on the contractors.

Earlier, on March 6, in a conference on road safety, Gadkari said that engineers and consultants involved in roadbuilding and the "substandard" detailed project reports (DPRs) produced by them were responsible for continuing road accidents, where India has among the highest numbers in the world. "The most important culprits are civil engineers. I do not blame everybody, but after 10 years of my experience, I have come to this conclusion. Culprits are those who are making DPRs. Because of small civil engineering mistakes, there are hundreds of deaths," said Gadkari.

According to the minister's reply in Parliament, the defects are of mainly four categories, namely, pavement issues, retaining wall issues, bridge and structure defects, and other construction & maintenance deficiencies

The defects have been identified through various inspections and audits conducted by consultants, executing agencies such as the National Highways Authority of India (NHAI), the National Highways & Infrastructure Development Corp Ltd (NHIDCL), Border Roads Organisation (BRO), the public works departments (PWDs), and third-party auditors.

For example, in Arunachal Pradesh, a significant retaining wall (RE wall) — which is designed to hold back soil, rocks or other material – collapsed on the Papu-Yupia-Hoj-Potin section of NH-713A and NH-13 in 2021-22.

The contractor initiated rectification work and faced a penalty of 5 per cent of the contract value. In Andhra Pradesh, settlements in structure approaches on NH-71 and defects in RE wall construction on NH-16 were addressed through rectification work, with the recovery of

Rs 10.99 lakh in damages from the concessionaire in the latter case. Both projects are under Bharatmala Pariyojna on Hybrid Annuity Mode (HAM).

Settlements in highways mean displacement of the pavement surface or the underlying soil, which results in an uneven or depressed surface. Similarly, surface undulations, which means irregular surface deformations, in flexible and rigid pavements on NH-9 and NH-4, respectively, in Andhra Pradesh were rectified based on methodologies suggested by the Central Road Research Institute (CRRI) and the Indian Institute of Technology (IIT) Tirupati, along with recoveries totaling Rs 3,57,92,366 imposed on the EPC contractor for NH-9.

Several projects experienced issues with concrete pavements. In Chhattisgarh, cracks in cement concrete panels were reported on NH-200 (New NH-130) and NH-30, with panel rectifications and replacements undertaken at the contractors' expense. Similar cracking problems affected projects in Karnataka, Maharashtra, Uttar Pradesh and West Bengal on various NH sections, leading to rectification work, extended Defect Liability Periods (DLP), and, in some cases, contract terminations.

The Delhi-Vadodara Expressway encountered issues such as rutting and settlements across multiple packages in Haryana and Rajasthan. NHAI imposed penalties on contractors for delayed maintenance and engaged IIT Kharagpur for detailed studies for permanent rectification. A notable incident on the Amritsar-Jamnagar Economic Corridor in Rajasthan involved the failure of a nose structure, which is designed to prevent erosion and damage to the highway embankment, during bridge launching, resulting in a Rs 1 crore penalty on the contractor and the debarment of fabrication and designer team for two years.

Apart from this, bridge infrastructure also faced challenges. In Maharashtra, damages were observed in the slab of a major bridge on NH-06 (New NH-53), requiring reconstruction based on an audit by the Visvesvaraya National Institute of Technology (VNIT), Nagpur. A minor bridge in the Andaman & Nicobar Islands experienced punching in the deck slab and other quality issues, leading to rectification at the contractor's expense and initiation of debarment proceedings.

These defects also highlight the challenges inherent in large-scale infrastructure development such as National Highways. India's NH count has significantly increased from 91,287 km in 2014 to 1.46 lakh km at present.

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