GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

LOK SABHA
UNSTARRED QUESTION NO. 1863
TO BE ANSWERED ON 11.02.2026

SECURITY AND ARCHITECTURAL DESIGN OF HIGH-SPEED RAIL CORRIDORS

†1863. SHRI IMRAN MASOOD:

Will the Minister of RAILWAYS be pleased to state:

(a) whether the Government has taken any steps to improve the security and architectural design of high-speed rail corridors in the country;

(b) if so, the details thereof including the implementation of AI-enabled surveillance/anti-drone patrolling on sensitive tracks; and

(c) if not, the reasons therefor?

ANSWER

MINISTER OF RAILWAYS, INFORMATION & BROADCASTING AND ELECTRONICS & INFORMATION TECHNOLOGY

(SHRI ASHWINI VAISHNAW)

(a) to (c): Presently, the Mumbai-Ahmedabad High Speed Rail (MAHSR) Project (508 km) is under execution with technical and financial assistance from Government of Japan. The MAHSR project is planned and constructed on a elevated viaduct. The design for stations on the corridor provides for security measures like controlled entry points, baggage scanners, DFMDs (Door Frame Metal Detectors), CCTV(Close Circuit Television) cameras etc.

The experience and technical capabilities being developed through the MAHSR project, particularly in track construction, signalling, Rolling Stock manufacturing & maintenance, project management etc. are poised to provide a robust foundation for capability building, indigenisation and successful execution of bullet train projects in India. These include the following:

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Indigenization & Capacity Building:

- **Long-span steel truss girders are being fabricated in Indian workshops, supported by analytical modelling and field measurements to strengthen domestic HSR design capability.**
- **Heavy construction machinery used for full-span launching has been indigenised and is now being manufactured in India.**
- **Most slab track materials and specialized track machines are being developed and produced by Indian manufacturers, boosting domestic manufacturing capability.**
- **Design variations and detail regarding dynamic analysis are being handled by Indian agencies in collaboration with IITs, with advanced dynamic analysis tools and design charts developed to build long-term HSR expertise.**

Innovation:

- **Full-span launching method adopted for the first time in India for launching 40 m prestressed box girders (~1000 MT), enabling faster launching within 16 hours.**
- **Indigenous noise barriers being installed along the elevated corridor to minimise noise for nearby residents.**
- **Advanced simulation tools for OHE-pantograph interaction and Simulation model for designing of traction power supply developed with IIT Delhi for accurate design and planning.**
- **Underground station is being constructed with provision for a future 90 m high building on the same foundation.**
- **Indigenously developed Rail Turnover Prevention Device (RTPD) introduced to enhance safety during derailments.**

Training:

- **Indian Engineers and Skilled workers (approx. 1000 nos.) have been trained for Japanese methodology and presently, track works are being executed under their supervision.**
- **A Special Track training facility has been created at Surat for training and regular refresher courses.**

Stations:

- **HSR stations are being designed as city gateways reflecting local identity, with advanced security features such as controlled entry points, baggage scanners, Door Frame Metal Detectors (DFMDs) and Closed-Circuit Television (CCTV) surveillance.**
- **Safety-focused design includes anti-vibration measures, wind-pressure management in station roofs and provisions like anti-vibration hangers, clamps and bolting plates integrated during construction.**
- **Passenger convenience is ensured through ample parking, drop-off areas and seamless multimodal connectivity with coordinated city master planning.**
- **Sustainable and energy-efficient features aligned with Indian Green Building Council (IGBC) Platinum standards.**

Geo-technical investigation:

- **Greater emphasis has been put on Geo Technical Investigations (GTI) to be sure of structural adequacy and to rule out possibility of geological surprises.**
- **The GTI has been generally carried out at 100 m, and at shorter intervals in case of special structures.**
- **A new geo tech lab has also been been set up**

Safety and security:

- **A high level of security has been adopted for operational areas and buildings housing sensitive equipment to ensure passenger safety.**
- **Civil engineering structures are designed and constructed as per best international practices, with designs validated by a Japanese High-Level Committee.**
- **To enhance earthquake safety, structures have been designed considering relevant seismic zones, with steel and damper stoppers provided on viaducts and bridges to prevent dislodgement, along with installation of an Earthquake Early Warning System (EQEWS).**

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