

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
RAJYA SABHA
UNSTARRED QUESTION NO. 1720
ANSWERED ON 13.02.2026

SAFETY ENHANCEMENTS AND PROGRESS OF HIGH-SPEED RAIL PROJECT

1720 SHRI KAPIL SIBAL:

Will the Minister of RAILWAYS be pleased to state:

- (a) the current status of Kavach system deployment across the railway network as of January 2026;
- (b) progress and any revised timelines for dedicated freight corridors and Mumbai- Ahmedabad high-speed rail; and
- (c) measures to improve passenger safety and station redevelopment in view of ongoing priorities?

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (c): Safety is accorded the highest priority on Indian Railways. As a consequence of various safety measures taken over the years, there has been a steep decline in the number of accidents.

Number of Consequential Train Accidents has reduced as shown in the table below:-

Year	Consequential Accidents
2014-15	135
2025-26 (upto 31.01.2026)	12 (90% lesser)

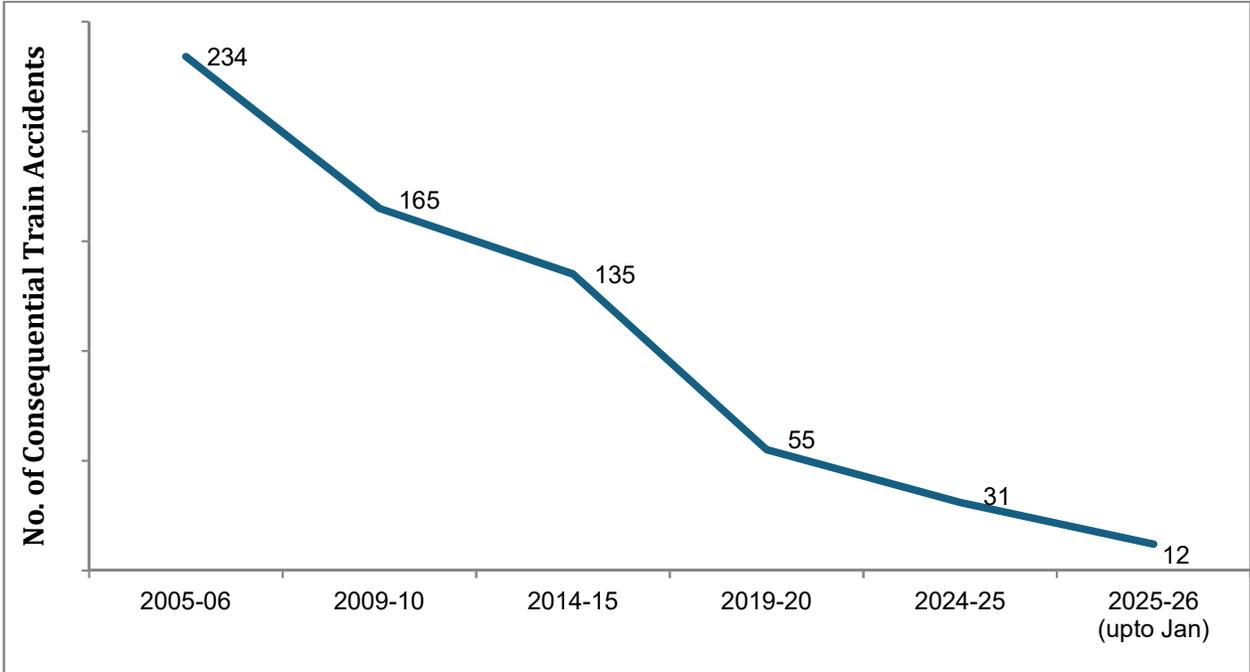
Another important index showing improvement in safety in train operations is Consequential Accidents Index, the details of which are as under:-

Consequential Accident Index:-

Year	Accident Index
2014-15	0.11
2024-25	0.03 (73% lesser)

This index measures number of consequential accidents as a ratio of total running Kilometers of all trains.

$$\text{Accident Index} = \frac{\text{No. of consequential accidents}}{\text{No. of trains X million kilometers}}$$



The various safety measures taken to enhance safety in train operations are as under:-

1. On Indian Railways, the expenditure on Safety related activities has increased over the years as under:-

Expenditure/Budget on Safety related activities (Rs. in Cr.)				
2013-14	2022-23	2023-24	2024-25	2025-26
39,200	87,336	1,01,662	1,14,022	1,17,693

2. Electrical/Electronic Interlocking Systems with centralized operation of points and signals have been provided at 6,660 stations up to 31.12.2025 to reduce accidents due to human failure.
3. Interlocking of Level Crossing (LC) Gates has been provided at 10,097 Level Crossing Gates up to 31.12.2025 for enhancing safety at LC Gates.
4. Complete Track Circuiting of stations to enhance safety by verification of track occupancy by electrical means has been provided at 6,665 stations up to 31.12.2025.
5. Detailed instructions on issues related with safety of Signalling, e.g. mandatory correspondence check, alteration work protocol, preparation of completion drawing, etc. have been issued.

6. System of disconnection and reconnection for S&T equipment as per protocol has been re-emphasized.
7. All locomotives are equipped with Vigilance Control Devices (VCD) to improve alertness of Loco Pilots.
8. Retro-reflective sigma boards are provided on the mast which is located two OHE masts prior to the signals in electrified territories to alert the crew about the signal ahead when visibility is low due to foggy weather.
9. A GPS based Fog Safety Device (FSD) is provided to loco pilots in fog affected areas which enables loco pilots to know the distance of the approaching landmarks like signals, level crossing gates, etc.
10. Modern track structure consisting of 60kg, 90 Ultimate Tensile Strength (UTS) rails, Prestressed Concrete Sleeper (PSC) Normal/Wide base sleepers with elastic fastening, fan shaped layout turnout on PSC sleepers, Steel Channel/H-beam Sleepers on girder bridges is used while carrying out primary track renewals.
11. Mechanisation of track laying activity through use of track machines like PQRS, TRT, T-28 etc. to reduce human errors.
12. Maximizing supply of 130m/260m long rail panels for increasing progress of rail renewal and avoiding welding of joints, thereby improving safety.
13. Ultrasonic Flaw Detection (USFD) testing of rails to detect flaws and timely removal of defective rails.
14. Laying of longer rails, minimizing the use of Alumino Thermic Welding and adoption of better welding technology for rails i.e., Flash Butt Welding.
15. Monitoring of track geometry by OMS (Oscillation Monitoring System) and TRC (Track Recording Cars).
16. Patrolling of railway tracks to look out for weld/rail fractures.
17. The use of Thick Web Switches and Weldable CMS Crossing in turnout renewal works.
18. Inspections at regular intervals are carried out to monitor and educate staff for observance of safe practices.
19. Web based online monitoring system of track assets viz. Track database and decision support system has been adopted to decide rationalized maintenance requirement and optimize inputs.
20. Detailed instructions on issues related with safety of Track, e.g. integrated block, corridor block, worksite safety, monsoon precautions, etc. have been issued.
21. Preventive maintenance of railway assets (Coaches & Wagons) is undertaken to ensure safe train operations.

22. Replacement of conventional ICF design coaches with LHB design coaches is being done.
23. All unmanned level crossings (UMLCs) on Broad Gauge (BG) route have been eliminated by January 2019.
24. Safety of Railway Bridges is ensured through regular inspection of Bridges. The requirement of repair/rehabilitation of Bridges is taken up based upon the conditions assessed during these inspections.
25. Indian Railways has displayed Statutory “Fire Notices” for widespread passenger information in all coaches. Fire posters are provided in every coach so as to educate and alert passengers regarding various Do’s and Don’ts to prevent fire. These include messages regarding not carrying any inflammable material, explosives, prohibition of smoking inside the coaches, penalties etc.
26. Production Units are providing Fire detection and suppression system in newly manufactured Power Cars and Pantry Cars, Fire and Smoke detection system in newly manufactured coaches. Progressive fitment of the same in existing coaches is also underway by Zonal Railways in a phased manner.
27. Regular counselling and training of staff is undertaken.
28. Concept of Rolling Block introduced in Indian Railways (Open Lines) General Rules vide Gazette notification dated 30.11.2023, wherein work of integrated maintenance/ repair/replacement of assets is planned up to 52 weeks in advance on rolling basis and executed as per plan.

The details of the Safety related works related to better maintenance practices, Technological improvements, better infrastructure and rolling stock etc. undertaken by Railways are tabulated below:-

S.N.	Item	2004-05 to 2013-14	2014-15 to 2024-25	2014-25 Vs. 2004- 14
Technological Improvements				
1.	Use of high-quality rails (60 Kg) (Km)	57,450 Km	1.43 Lakh Km	More than 2 times
2.	Longer Rail Panels (260m) (Km)	9,917 Km	77,522 Km	Nearly 8 times
3.	Electronic Interlocking (Stations)	837 Stations	3,691 Stations	More than 4 times
4.	Fog Pass Safety Devices (Nos.)	As on 31.03.14: 90 Nos.	As on 31.03.25: 25,939 Nos.	288 times
5.	Thick Web Switches (Nos.)	Nil	28,301 Nos.	

Better Maintenance Practices				
1.	Primary Rail Renewal (Track Km)	32,260 Km	49,941 Km	1.5 times
2.	USFD (Ultra Sonic Flaw detection) Testing of Welds (Nos.)	79.43 Lakh	2 Crore	More than 2 times
3.	Weld failures (Nos.)	In 2013-14: 3699 Nos.	In 2024-25: 370 Nos.	90 % reduction
4.	Rail fractures (Nos.)	In 2013-14: 2548 Nos.	In 2024-25: 289 Nos.	More than 88% reduction
Better Infrastructure and Rolling Stock				
1.	New Track KM added (Track Km)	14,985 Km	34,428 Km	More than 2 times
2.	Flyovers (RoBs)/Underpasses (RUBs) (Nos.)	4,148 Nos.	13,808 Nos.	More than 3 times
3.	Unmanned Level crossings (Nos.) on BG	As on 31.03.14: 8,948	As on 31.03.24:Nil (All eliminated by 31.01.19)	Removed
4.	Manufacture of LHB Coaches (Nos.)	2,337 Nos.	42,677	More than 18 times

Implementation of Kavach:

1. Kavach is an indigenously developed Automatic Train Protection (ATP) system. Kavach is a highly technology intensive system, which requires safety certification of highest order (SIL-4).
2. Kavach aids the Loco Pilot in running of trains within specified speed limits by automatic application of brakes in case Loco Pilot fails to do so and also helps the trains to run safely during inclement weather.
3. The first field trials on the passenger trains were started in February 2016. Based on the experience gained and Independent Safety Assessment of the system by Independent Safety Assessor (ISA), three firms were approved in 2018-19, for supply of Kavach Ver 3.2.
4. Kavach was adopted as National ATP system in July, 2020.

5. Implementation of Kavach System involves following Key Activities:
 - a. Installation of Station Kavach at each and every station, block section.
 - b. Installation of RFID Tags throughout the track length.
 - c. Installation of telecom Towers throughout the section.
 - d. Laying of Optical Fibre Cable along the track.
 - e. Provision of Loco Kavach on each and every Locomotive running on Indian Railways.
6. Based on deployment of Kavach version 3.2 on 1465 Rkm on South Central Railway and experience gained, further improvements were made. Finally, Kavach specification version 4.0 was approved by RDSO on 16.07.2024.
7. Kavach version 4.0 covers all the major features required for the diverse railway network. This is a significant milestone in safety for Indian Railways. Within a short period, IR has developed, tested and started deploying Automatic Train Protection System.
8. Major improvement in Version 4.0 includes increased Location Accuracy, Improved Information of Signal Aspects in bigger yards, Station to Station Kavach interface on OFC and Direct Interface to existing Electronic Interlocking System. With these improvements, Kavach Ver.4.0. is planned for large scale deployment over Indian Railways.
9. After extensive and elaborate trials, Kavach Version 4.0 has been successfully commissioned on 1297 Route Kilometres, covering the high density Delhi- Mumbai and Delhi-Howrah routes. On the Delhi-Mumbai route Kavach ver 4.0 has been commissioned on Junction cabin-Palwal-Mathura-Nagda section (667 Rkm), Vadodara- Virar section (336 Rkm) and Vadodara - Ahmedabad section (96 Rkm), and on the Delhi-Howrah route Kavach ver 4.0 has been commissioned on Gaya Sarmatanr section (93 Rkm) and Howrah-Bardhaman section (105 Rkm).
10. Further, track side Kavach implementation work has been taken up on 23,360 RKM covering all GQ, GD, HDN and identified sections of Indian Railways.
11. Progress of key items of Kavach on High density routes including Delhi- Mumbai & Delhi-Howrah corridors as on 30.01.26 are as under:

SN	Item	Progress
i.	Laying of Optical Fibre Cable	8570 Km
ii.	Installation of Telecom Towers	938 Nos
iii.	Station Data Centre	767 Station

iv.	Installation of Track side equipment	5672 Rkm
v.	Provision of Kavach in Loco	4154

12. Tender has been finalised for equipping 6,300 Electric Locomotives with Kavach version 4.0 and another tender for equipping 2,679 Diesel Locomotives is under finalisation.
13. Specialized training programmes on Kavach are being conducted at centralized training institutes of Indian Railways to impart training to all concerned officials. By now about 48,000 technicians, operators and engineers have been trained on Kavach technology. This includes about 45,000 Loco Pilots & Assistant Loco Pilots. Courses have been designed in collaboration with IRISSET.
14. The cost for provision of Track Side including Station equipment of Kavach is approximately Rs. 50 Lakhs/Km and cost for provision of Kavach equipment on locomotives is approximately Rs. 80 Lakh/Loco.
15. The funds utilized on Kavach works so far up to Dec'25 is Rs. 2,573.36 Crores. The allocation of funds during the year 2025-26 is Rs. 1673.19 Crores. Requisite funds are made available as per the progress of works.

Dedicated Freight Corridors (DFC):

Ministry of Railways has taken up construction of two Dedicated Freight Corridors (DFC) viz. Eastern Dedicated Freight Corridor (EDFC) from Ludhiana to Sonnagar (1337 Km) and the Western Dedicated Freight Corridor (WDFC) from Jawaharlal Nehru Port Terminal (JNPT) to Dadri (1506 Km). The work on EDFC has been completed and commissioned. In WDFC, 1404 Rkm out of total 1506 Rkm has been completed and commissioned. The balance work on WDFC from Vaitarna-JNPT section (102 Rkm) has been taken up.

DFC has contributed to creating additional paths on the conventional network by diverting freight traffic to EDFC and WDFC. Presently, 406 average trains per day are being run on these corridors.

Mumbai-Ahmedabad High Speed Rail (MAHSR):

The Mumbai-Ahmedabad High Speed Rail (MAHSR) Project (508 km) is under execution with technical and financial assistance from Government of Japan. The Project is passing through the States of Gujarat, Maharashtra and Union Territory of Dadra & Nagar Haveli with 12 stations planned at Mumbai, Thane, Virar, Boisar, Vapi, Billimora, Surat, Bharuch, Vadodara, Anand, Ahmedabad and Sabarmati.

Entire land (1389.5 Ha.) for MAHSR project has been acquired. All Statutory Clearances have been obtained. All 1651 utilities have been shifted. The delay in land acquisition in the State of Maharashtra has impacted the project till 2021. The land acquisition picked up in 2022 in Maharashtra.

The progress of various major items so far is as under:

Gujarat:

Item	Progress
Foundation	352 kms.
Piers	352 kms.
Girder Casting	342 kms.
Girder Launching	331 kms.
Track Bed Construction	152 kms.
OHE Masts Erection	121 kms.

Maharashtra:

Item	Progress
Foundation	74 kms.
Piers	65 kms.
Girder Casting	9 kms.
Girder Launching	3 kms.

Out of total 12 stations, foundation works has been completed at 8 stations (Vapi, Bilimora, Surat, Bharuch, Anand, Vadodara, Ahmedabad, and Sabarmati). In Maharashtra section, foundation work is in progress at 3 stations (Thane, Virar, Boisar) and excavation work at BKC station is near completion and Casting of base slab started.

17 river bridges have been completed. Work is in advance stage for 4 major river bridges (Narmada, Mahi, Tapti and Sabarmati) in Gujarat & in progress in 4 river bridges in Maharashtra. Work on Depots (Thane, Surat and Sabarmati) is in full swing.

Civil works at Bandra Kurla Complex (BKC) are in progress. Excavation works have achieved about 91% progress, and concreting works are at various stages, with 100% completion of the basement slab at Level-4. The work of the under-sea tunnel (approximately 21 km) has commenced, out of which 4.8 km of tunnel between Ghansoli and Shilphata in Maharashtra has been completed.

Bullet train project is a very complex and technology intensive Project. Timelines for the completion of the project can be reasonably ascertained after the completion of all associated works of Civil Structures, Track, Electrical, Signalling, Telecommunication and supply of Trainsets.

Station Development :

Ministry of Railways has launched **Amrit Bharat Station Scheme for redevelopment of stations** with a long-term approach.

The scheme involves preparation of master plans and their implementation in phases to improve the stations. The master planning includes:

- Improvement of access to station and circulating areas
- Integration of station with both sides of city
- Improvement of station building
- Improvement of waiting halls, toilets, sitting arrangement, water booths
- Provision of wider foot over bridge/air concourse commensurate with passenger traffic
- Provision of lift/escalators/ramp
- Improvement /Provision of platform surface and cover over platforms
- Provision of kiosks for local products through schemes like ‘One Station One Product’
- Parking areas, Multimodal integration
- Amenities for Divyangjans
- Better passenger information systems
- Provision of executive lounges, nominated spaces for business meetings, landscaping, etc. keeping in view the necessity at each station.

The scheme also envisages sustainable and environment friendly solutions, provision of ballastless tracks etc. as per necessity, phasing and feasibility and creation of city centre at the station in the long term.

So far, 1,337 stations have been identified for development under the Amrit Bharat Station Scheme. Development works at railway stations under Amrit Bharat Station Scheme have been taken up at a good pace. Till now, works have been completed at 172 stations. Names of stations completed so far are as following:

Alnavar, Amb Andaura, Ambikapur, Amgaon, Anandpur Sahib, Anara, Ayodhya Dham, Badami, Bagalkot, Baijnath Paprola, Balrampur, Bantawala, Barabhum, Baramati, Bareilly City, Baripada, Barmer, Barpali, Begumpet, Beohari, Bhanupratappur, Bhilai, Bhind, Bijnor, Bimalgarh, Bommidi,

Bundi, Chanda Fort, Chalakudi, Changanassery, Chennai Park, Chidambaram, Chinchpokli, Chinna Salem, Chirayinkeezh, Cuttack, Dakor, Derol, Deshnoke, Devlali, Dharwad, Dhule, Dongargarh, Fatehabad, Fatehpur, Fatehpur Shekhawati, Gadag, Gangapur City, Godda, Godhra Jn., Gogameri, Gokak Road, Gola Gokarnath, Gomti Nagar, Govardhan, Govind Garh, Govindpuri, Govindpur Road, Hafizpeta, Haibargaon, Haldia, Hapa, Harpalpur, Hathras City, Hodal, Idgah Agra Jn., Izzatnagar, Jaisalmer, Jam Jodhpur, Jam Wanthali, Joychandi Pahar, Junnor Deo, Kakinada Town, Kalyani Ghoshpara, Kamakhyaguri, Kanalus Jn., Karaikkudi Jn., Karamsad, Karimnagar, Katni South, Kedgaon, Khairthal, Khambhaliya, Khalilabad, Koppal, Kosamba Jn., Kulitturai, Kuttipuram, Lasalgaon, Limbdi, Lohardaga, Lonand Jn., Mahe, Mahuva, Mailani, Mandal Garh, Mandawar Mahwa Road, Madhupur, Manaparai, Mandi Dabwali, Mangalagiri, Mannargudi, Matunga, M.C.S. Chhatarpur, Mithapur, Morappur, Morbi, Muktsar, Munirabad, Muri Jn., Murtizapur Jn., Nainpur Jn., Nandura, Narmadapuram, Netaji Subhash Chandra Bose Itwari Junction, Okha, Orchha, Palitana, Panagarh, Panki Dham, Parel, Parlakhemundi, Pirpainti, Piska, Pokhrayan, Pollachi Jn., Polur, Porbandar, Rajgarh, Rajmahal, Rajula Jn., Ramghat Halt, Rayanpadu, Saharanpur Jn., Sahibzada Ajit Singh Mohali, Sahebgunj, Samakhiyali, Samalpatti, Sanchi, Sankarpur, Savda, Seoni, Shahad, Shajapur, Sholavandan, Shoranur Jn., Shridham, Siddharth Nagar, Sihor Jn., Siuri, Sri Bala Brahmeswara Jogulamba, Srirangam, Srivilliputtur, St.Thomas Mount, Sullurpeta, Suraimanpur, Swaminarayan Chappia, Talcher, Tamluk, Thawe, Thiruvarur Jn., Tiruvannamalai, Tuni, Ujhani, Urkura, Utran, Vadakara, Vadala Road, Vidisha, Vriddhachalam Jn., Wadakancheri, Warangal.

Good progress has been achieved at the stations where works have been taken up and progress of some of these stations is given below:

- **Tirupati station:** The structural works of the new second entry (south side) station building and air concourse have been completed. The structural works of the new main entry (north side) station building, finishing works at south side station building, air concourse, platform shelters, lift, escalators have been taken up.
- **Nellore station:** The structural works of station buildings on both sides and air concourse have been completed. The works of subway extension, construction of sewage treatment plants, overhead water tank and finishing works of station buildings and air concourse have been taken up.
- **Puri Station:** The structural work of the new station building has been completed. The works of development of the circulating area and finishing works of the new station building have been taken up.
- **Kota Junction station:** The structural works of the front departure hall, front arrival hall, rear side station building have been completed. The works of finishing of new station building, construction

of air concourse, through roof work, platform refurbishment and circulating area development have been taken up.

- **Bhubaneswar station:** The structural work of the West side and East side station building, structural work of air concourse, construction of sewage treatment plant and underground sump tank have been completed. The works of elevated driveway, extension of Foot Over Bridge, platform refurbishment, lifts, escalators and finishing works have been taken up.

Further, development / redevelopment / upgradation / modernisation of stations on Indian Railways is a continuous and ongoing process and works in this regard are undertaken as per requirement, subject to inter-se priority and availability of funds. Development / redevelopment / upgradation / modernisation of a station is carried out based on category of station/condition/traffic handled etc.

Development / Upgradation of railway stations is complex in nature involving safety of passengers & trains and requires various statutory clearances such as fire clearance, heritage, tree cutting, airport clearance etc. The progress also gets affected due to brownfield related challenges such as shifting of utilities (involving water/sewage lines, optical fibre cables, gas pipe lines, power/signal cables, etc.), infringements, operation of trains without hindering passenger movement, speed restrictions due to works carried out in close proximity of tracks and high voltage power lines, etc. and these factors affect the completion time.

Further, development / upgradation / modernization of stations including Amrit Bharat Station Scheme is generally funded under Plan Head-53 'Customer Amenities'. The details of allocation and expenditure under Plan Head-53 are maintained Zonal Railway-wise and not work-wise or station-wise or state-wise. The fund allocation of ₹ 12,120 crore has been made for the financial year 2025-26 under Plan Head-53 and expenditure (up to December, 2025) of ₹ 9,660 crore has been incurred so far.
