GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

LOK SABHA
UNSTARRED QUESTION NO. 494
TO BE ANSWERED ON 22.07.2026

RAILWAY MODERNISATION ACROSS COUNTRY

494. THIRU DR. S JAGATHRATCHAKAN:

Will the Minister of RAILWAYS be pleased to state:

(a) the details of the progress registered under modernisation programmes covering high-speed and semi-high-speed train systems including sleeper variants of advanced trainsets designed to improve long-distance rail travel and strengthen passenger mobility across the country;

(b) the current status of implementation relating to manufacturing, testing, deployment and expansion of such train services along with the railway corridors identified for their introduction;

(c) the details of the impact anticipated from these initiatives on travel time, network capacity, operational efficiency, regional connectivity and the overall passenger travel experience;

(d) the details of the infrastructure and technological upgrades undertaken by the Government for supporting the operation of advanced train systems, including track improvements, signalling modernisation and safety enhancement measures; and

(e) the initiatives proposed by the Government for accelerating railway modernisation while improving efficiency, safety, passenger comfort and the quality of long-distance rail services across the country?

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (e) Modernisation of Indian Railways (IR) across country is a continuous & ongoing process subject to operational requirement, safety/security requirement, technical feasibility, commercial viability, resource availability, etc. and aims at improving safety/security, capacity,

speed, operational efficiency, passenger comfort, environmental sustainability & adoption/development of advanced technologies.

Semi-High Speed Train system: Indian Railways (IR) is focussed on providing affordable, good quality services to all sections of society. With a view to improve travel experience of the passengers, Indian Railways have introduced indigenously designed and manufactured Vande Bharat (Sleeper & Chair Car), Amrit Bharat, Namo Bharat Rapid Rail services with modern coaches, advanced safety features and passenger amenities.

A. Vande Bharat train services (Chair Car): After the launch of 1st semi-high speed train service on 15 February 2019 on the New Delhi–Kanpur–Prayagraj–Varanasi corridor, Vande Bharat (VB) services have expanded rapidly across the national rail network and now, 162 VB train services are operating at present.

Indigenously designed and manufactured Vande Bharat trains with modern coaches, advanced safety features and passenger amenities have been introduced. These trains have the following features:

- **Jerk Free Semi-Permanent couplers.**
- **Fitted with KAVACH.**
- **Centrally controlled Automatic Plug Doors and Fully Sealed wider gangways.**
- **Emergency Alarm Push buttons and Talk Back Units on all Coaches.**
- **Improved fire safety – Aerosol based fire detection and suppression system in electrical cabinets and lavatories.**
- **Higher acceleration with design/operating speed of 180/160 KMPH.**
- **Driver-Guard communication with voice recording facility & Crash hardened memory.**
- **Air conditioning units provided with indigenously developed UV-C lamp based disinfection system for deactivating 99% harmful bacteria**

from conditioned air to improve the hygiene standards inside the passenger area.

- **Better Ride Comfort.**
- **CCTVs in all Coaches.**
- **For Divyangjan passengers special lavatory in the driving coaches on each end.**
- **Coach condition monitoring System (CCMS) display with remote monitoring.**

At present, 81 pairs Vande Bharat train services (Chair Car) are being operated on the Indian Railways network, as listed below:-

SN	Train No. and Name
1	22435/22436 Varanasi - New Delhi Vande Bharat Express
2	22439/22440 New Delhi - Sri Mata Vaishno Devi Katra Vande Bharat Express
3	20901/20902 Mumbai Central - Gandhinagar Capital Vande Bharat Express
4	22447/22448 New Delhi – Amb Andura Vande Bharat Express
5	20607/20608 MGR Chennai Central – Mysuru Vande Bharat Express
6	20825/20826 Bilaspur - Nagpur Vande Bharat Express
7	22301/22302 Howrah - New Jalpaiguri Vande Bharat Express
8	20833/20834 Visakhapatnam - Secunderabad Vande Bharat Express
9	22223/22224 Chhatrapati Shivaji Maharaj (T) – Sainagar Shirdi Vande Bharat Express
10	22225/22226 Chhatrapati Shivaji Maharaj (T) – Solapur Vande Bharat Express
11	20171/20172 Rani Kamlapati – Nizamuddin Vande Bharat Express
12	20701/20702 Secunderabad - Tirupati Vande Bharat Express
13	20643/20644 Chennai - Coimbatore Vande Bharat Express
14	20977/20978 Ajmer - Chandigarh Vande Bharat Express

15	20633/20634 Kasargod - Thiruvananthapuram Vande Bharat Express
16	22895/22896 Howrah - Puri Vande Bharat Express
17	22457/22458 Anand Vihar - Dehradun Vande Bharat Express
18	22227/22228 New Jalpaiguri - Guwahati Vande Bharat Express
19	20911/20912 Indore - Nagpur Vande Bharat Express
20	22229/22230 Chhatrapati Shivaji Maharaj (T) - Madgaon Vande Bharat Express
21	22349/22350 Patna - Ranchi Vande Bharat Express
22	20661/20662 Bengaluru - Dharwar Vande Bharat Express
23	20173/20174 Rani Kamlapati - Rewa Vande Bharat Express
24	22549/22550 Gorakhpur – Prayagraj Vande Bharat Express
25	12461/12462 Jodhpur - Sabarmati Vande Bharat Express
26	22925/22926 Ahmedabad – Okha Vande Bharat Express
27	20665/20666 Chennai Egmore - Tirunelveli Vande Bharat Express
28	20677/20678 Chennai – Narsapur Vande Bharat Express
29	20703/20704 Kacheguda - Yesvantpur Vande Bharat Express
30	20631/20632 Mangaluru - Thiruvananthapuram Central Vande Bharat Express
31	26963/26964 Udaipur – Asarva Vande Bharat Express
32	22347/22348 Howrah - Patna Vande Bharat Express
33	20835/20836 Rourkela - Puri Vande Bharat Express
34	20897/20898 Howrah - Ranchi Vande Bharat Express
35	22415/22416 Varanasi - New Delhi Vande Bharat Express
36	20641/20642 Bengaluru Cantt. - Coimbatore Vande Bharat Express
37	20645/20646 Madgaon - Mangaluru Vande Bharat Express
38	20705/20706 Nanded – Chhatrapati Shivaji Maharaj (T) Vande Bharat Express
39	22477/22478 New Delhi - Sri Mata Vaishno Devi Katra Vande Bharat Express

40	22425/22426 AyodhyaCantt. – Anand Vihar Vande Bharat Express
41	22487/22488 Delhi - Amritsar Vande Bharat Express
42	22961/22962 Mumbai Central - Ahmedabad Vande Bharat Express
43	20707/20708 Secunderabad - Visakhapatnam Vande Bharat Express
44	20663/20664 Mysuru - Chennai Vande Bharat Express
45	22233/22234 New Jalpaiguri - Patna Vande Bharat Express
46	22469/22470 Khajuraho – Nizamuddin Vande Bharat Express
47	22231/22232 Kalaburagi - Bengaluru Vande Bharat Express
48	20841/20842 Bhubaneswar - Visakhapatnam Vande Bharat Express
49	22345/22346 Patna - Gomti Nagar Vande Bharat Express
50	20887/20888 Ranchi - Varanasi Vande Bharat Express
51	22545/22546 LucknowJn - Dehradun Vande Bharat Express
52	22489/22490 Varanasi - Meerut City Vande Bharat Express
53	20627/20628 Chennai Egmore - Nagercoil Vande Bharat Express
54	20671/20672 Madurai - Bengaluru Cantt. Vande Bharat Express
55	22499/22500 Deoghar - Varanasi Vande Bharat Express
56	22309/22310 Howrah – Jamalpur Vande Bharat Express
57	20871/20872 Howrah - Rourkela Vande Bharat Express
58	20893/20894 Tatanagar - Patna Vande Bharat Express
59	20891/20892 Tatanagar – Brahmapur Vande Bharat Express
60	22303/22304 Howrah - Gaya Vande Bharat Express
61	20669/20670 Hubballi - Pune Vande Bharat Express
62	20673/20674 Chhatrapati Shahu Maharaj (T) Kolhapur - Pune Vande Bharat Express
63	20101/20102 Secunderabad - Nagpur Vande Bharat Express
64	20829/20830 Durg - Visakhapatnam Vande Bharat Express
65	21893/21894 Tatanagar - Patna Vande Bharat Express

66	21895/21896 Tatanagar - Patna Vande Bharat Express
67	20175/20176 Banaras - Agra Cantt. Vande Bharat Express
68	26901/26902 Sabarmati - Veraval Vande Bharat Express
69	26401/26402 Jammu Tawi - Srinagar Vande Bharat Express
70	26403/26404 Jammu Tawi - Srinagar Vande Bharat Express
71	26501/26502 Patliputra - Gorakhpur Vande Bharat Express
72	26751/26752 Belagavi - KSR Bengaluru Vande Bharat Express
73	26405/26406 Amritsar - Shri Mata Vaishno Devi Katra Vande Bharat Express
74	26101/26102 Pune - Ajni Vande Bharat Express
75	26301/26302 Jogbani - Danapur Vande Bharat Express
76	26481/26482 Jodhpur - Delhi Cantt. Vande Bharat Express
77	26471/26472 Bikaner - Delhi Cantt. Vande Bharat Express
78	26461/26462 Delhi - Firozpur Cantt. Vande Bharat Express
79	26651/26652 KSR Bengaluru - Ernakulam Vande Bharat Express
80	26505/26506 Khajuraho - Banaras Vande Bharat Express
81	26503/26504 Saharanpur - Gomtinagar Vande Bharat Express

B. Vande Bharat train services (Sleeper): For long distance travel the Sleeper variant of Vande Bharat Express has been indigenously designed and developed. Two such trains have already been manufactured and after extensive trials, these trains have been introduced on Indian Railways. The first Vande Bharat Sleeper service viz. 27575/27576 Howrah - Kamakhya Vande Bharat Sleeper Express has commenced regular operation w.e.f. 22.01.2026.

To improve travel experience of the passengers and set new benchmarks in terms of safe and comfortable journey, these train sets have been provided with modern coaches having advanced safety features and passenger amenities like:

- **Jerk-Free Semi permanent couplers and Anti Climbers.**
- **Fitted with KAVACH.**
- **Higher acceleration with design/operating speed of 180/160 KMPH.**
- **Crashworthy Design of Car body complying with EN standards.**
- **Fire barrier doors at the end of each coach for compliance of Fire Safety standards.**
- **Aerosol based fire detection and suppression system in electrical cabinets and lavatories.**
- **Regenerative braking system for energy efficiency.**
- **Air conditioning units provided with indigenously developed UV-C lamp based disinfection system for deactivating 99% harmful bacteria from conditioned air to improve the hygiene standards inside the passenger area.**
- **Centrally controlled Automatic Plug Doors and Fully Sealed wider gangways.**
- **CCTVs in all coaches.**
- **Emergency talk-back unit for communication between Passenger and Train Manager/Loco Pilot in case of emergency.**
- **For Divyangjan passengers special lavatory in the driving coaches on each end.**
- **Centralized Coach Monitoring System for better condition monitoring of passenger amenities such as Air conditioning, Saloon Lighting etc.**
- **Ergonomically designed ladder for ease of climbing on to upper berths.**

The Vande Bharat trains reflect IR's strategic shift towards modern, efficient, and passenger-centric rail services, supported by continuous infrastructure upgradation and indigenous manufacturing capability. Through the expansion of new-generation trainsets, diversified variants, and improved onboard services, Vande Bharat is strengthening regional

connectivity and improving the quality of inter-city travel. These trains underscore the role of rail infrastructure as a critical enabler of economic integration, sustainable mobility, and inclusive national development.

C. Namo Bharat Rapid Rail service: Namo Bharat Rapid Rail has been introduced to enhance the travelling experience of suburban and regional commuters for inter-city short distance movement by harnessing the features of Vande Bharat Trains. The prominent features of Namo Bharat Rapid Rail are as follows:

- **Centrally controlled Double Leaf Automatic Sliding Doors.**
- **CCTVs for safety and passenger surveillance.**
- **Modular interior with Cushioned Seats and Sealed Flexible Gangway.**
- **Emergency Talk Back System.**
- **Continuous LED lighting with Energy Efficient lighting system.**
- **FRP Modular Toilets with vacuum evacuation.**
- **Fully Air-Conditioned trains with AC Driver cab.**

At present, 02 pairs of Namo Bharat Rapid Rail services are being operated on the Indian Railways network, as listed below:-

SN	Train No. and Name
1	94803/94804 Jaynagar - Patna Namo Bharat Rapid Rail
2	94801/94802 Ahmedabad - Bhuj Namo Bharat Rapid Rail

D. Amrit Bharat train services: To provide affordable means of transportation to the low and middle income families, Indian Railways have introduced Amrit Bharat services that are fully non-AC modern trains. The present composition of Amrit Bharat consists of 11 General Class coaches, 8 Sleeper Class coaches, 01 Pantry Car and 02 Luggage cum Divyangjan coaches. High Speed and enhanced Safety standards are the hallmarks of these trains with following enhanced features and amenities:

- **Better aesthetics of seat and berths with enhanced look & feel on the lines of Vande Bharat Sleeper.**
- **Jerk Free Semi-Automatic Couplers.**
- **Improved Crashworthiness in coaches by provision of crash tube.**
- **Provision of CCTV system in all coaches.**
- **Improved designs of toilets.**
- **Improved design of Ladder for ease of climbing on to the berth.**
- **Improved LED Light fitting & Charging Sockets.**
- **Provision of EP assisted braking system.**
- **Aerosol based fire suppression system in toilets and electrical cubicles.**
- **USB Type-A and Type-C mobile charging sockets.**
- **Emergency Talk Back system for two-way communication between Passenger and Guard/Train Manager.**
- **Non-AC pantry with enhanced heating capacity.**
- **Fully sealed gangways with quick release mechanism for easy attachment and detachment.**

As present, the following 36 pairs of Amrit Bharat Express services are being operated on the Indian Railways network:

SN	Train No. and Name
1	11015/11016 Lokmanya Tilak (T) - Saharsa Amrit Bharat Express
2	13697/13698 Gaya - Delhi Amrit Bharat Express
3	15293/15294 Muzaffarpur - Charlapalli Amrit Bharat Express
4	15557/15558 Darbhanga - Anand Vihar (T) Amrit Bharat Express
5	15561/15562 Darbhanga - Gomtinagar Amrit Bharat Express
6	15567/15568 Bapudham Motihari - Anand Vihar (T) Amrit Bharat Express
7	22361/22362 Rajendranagar (T) - New Delhi Amrit Bharat Express
8	13433/13434 SMVT Bengaluru - Malda Town Amrit Bharat Express

9	13435/13436 Malda Town - Gomtinagar Amrit Bharat Express
10	15133/15134 Chhapra - Anand Vihar (T) Amrit Bharat Express
11	14047/14048 Sitamarhi - Delhi Amrit Bharat Express
12	14627/14628 Saharsa - Chheharta Amrit Bharat Express
13	19623/19624 Madar - Darbhanga Amrit Bharat Express
14	16601/16602 Erode - Jogbani Amrit Bharat Express
15	19021/19022 Udhna - Brahmapur Amrit Bharat Express
16	15671/15672 Kamakhya - Rohtak Amrit Bharat Express
17	20609/20610 New Jalpaiguri - Tiruchchirappalli Amrit Bharat Express
18	16597/16598 SMVT Bengaluru - Alipurduar Amrit Bharat Express
19	11031/11032 Panvel - Alipurduar Amrit Bharat Express
20	16107/16108 Tambaram - Santragachi Amrit Bharat Express
21	13065/13066 Howrah - Anand Vihar (T) Amrit Bharat Express
22	22587/22588 Sealdah - Banaras Amrit Bharat Express
23	20603/20604 New Jalpaiguri - Nagercoil Amrit Bharat Express
24	15949/15950 Dibrugarh - Gomti Nagar Amrit Bharat Express
25	16121/16122 Tambaram - Thiruvananthapuram Central Amrit Bharat Express
26	16329/16330 Nagercoil - Mangaluru Amrit Bharat Express
27	17041/17042 Charlapalli - Thiruvananthapuram North Amrit Bharat Express
28	16619/16620 Podanur - Dhanbad Amrit Bharat Express
29	16357/16358 Nagercoil - Charlapalli Amrit Bharat Express
30	15673/15674 Charlapalli - Kamakhya Amrit Bharat Express
31	17065/17066 Charlapalli - Shalimar Amrit Bharat Express
32	22589/22590 Banaras - Hadapsar Amrit Bharat Express
33	22111/22112 Lokmanya Tilak(T) - Ayodhya Amrit Bharat Express

34	14663/14664 Amritsar - New Jalpaiguri Amrit Bharat Express
35	19725/19726 Khatipura - Darbhanga Amrit Bharat Express
36	11431/11432 Pune - Danapur Amrit Bharat Express

E. Hydrogen train: As a step towards developing new technology, Indian Railways' first hydrogen train "NaMo Green Rail" has been launched on 17.07.2026 to demonstrate the use of hydrogen powered train technology in Railways. It establishes the commitment of Indian Railways towards alternative energy-powered train travel.

This project involved designing from first stages, prototype manufacturing and first-time development of hydrogen traction technology in Indian Railways. Prominent features of Hydrogen Train-set are as below:

I. Designed and developed in India demonstrating IR's commitment to Atmanirbhar Bharat.

II. Presently, it is the world's longest (10 coaches) and most powerful (2400 kW) Hydrogen Train-set on Broad Gauge platform.

III. The train-set comprises two Driving Power Cars (DPCs) of 1200 kW each, totaling 2400 kW along with eight passenger cars.

IV. Zero CO_2 emissions; only emission is water vapour.

V. Major step in development of next generation fuel technology in Railways.

High Speed Train System: Presently, the Mumbai-Ahmedabad High Speed Rail (MAHSR) Project (508 km) is under execution. 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:

Item	Progress
Piers	452 kms.
Girder	356 kms.
Track Bed	209 kms.
OHE Masts	190 kms.

The progress of stations is given below:-

SN	Station	Status
1	Sabarmati	Foundation works completed, Platform slab & roof structural works and finishing works are in progress.
2	Ahmedabad	Structural works completed and finishing works have been taken up.
3	Anand/Nadiad	
4	Vadodara	Foundation work completed, structural works and finishing works have been taken up.
5	Bharuch	Structural works completed and finishing works have been taken up.
6	Surat	
7	Bilimora	
8	Vapi	
9	Boisar	Foundation works have been taken up and in advanced stage. Structural works have been taken up.
10	Virar	
11	Thane	
12	BKC (Mumbai)	This is an underground station. Foundation works almost completed and Base Slab has been taken up.

The progress on the River Bridges is as under:-

SN	River Name	Status
1	Sabarmati River (480m)	Sub-Structure work completed, Superstructure work has been taken up.
2	Meshwa River (120m)	Bridge construction completed.
3	Vatrak River (280m)	
4	Mohar (Shedhi) River (160m)	
5	Mahi River (720m)	11 out of 12 wells completed; 5 spans launched.
6	Vishwamitri River (80m)	Bridge construction completed.
7	Dhadhar River (120m)	
8	Narmada River (1366m)	21 out of 25 wells completed; 4 spans launched.
9	Kim River (120m)	Bridge construction completed.
10	Tapi River (720m)	Foundation work has been taken up, 10 out of 12 wells completed.
11	Mindhola River (240m)	Bridge construction completed.
12	Purna River (360m)	
13	Ambika River (200m)	
14	Venganiya River (200m)	
15	Kaveri River (120m)	
16	Kharera River (120m)	
17	Auranga River (320m)	
18	Par River (320m)	
19	Kolak River (160m)	
20	Daman Ganga River (360m)	
21	Darotha River (80m)	

22	Jagani River (360m)	Foundation works have been completed.
23	Vaitarna River (2320m)	12 Pile Cap and 11 Pier (out of 58) completed.
24	Ulhas River Branch (120m)	Temporary Access Bridge (TAB) completed to start the foundation work.
25	Desai Khadi River Bridge (400m)	Geo-technical Investigation (GTI) has been completed and Design work has been taken up.

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.

On the Surat–Vapi section (97 km) entire civil works including river bridge construction, have been completed and 86% of the track bed has been laid. Further, to strengthen national transport infrastructure, provide a fillip to regional connectivity, economic growth, tourism, investment and employment generation, and encourage modal shift from road and air transport to rail, the Government has announced the development of the following seven new High-Speed Rail (HSR) corridors in the Union Budget 2026-27: -

i) Mumbai – Pune

ii) Pune – Hyderabad

iii) Hyderabad – Bengaluru

iv) Hyderabad – Chennai

v) Chennai – Bengaluru

vi) Delhi – Varanasi

vii) Varanasi – Siliguri

Being highly capital intensive, the decision to sanction any HSR Corridor/ Project depends on many factors such as outcome of DPR, techno-economic feasibility studies and availability of resources such as financing options etc.

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

Indigenisation & Capacity Building:

- **Long-span steel truss girders are being fabricated in Indian workshops, supported by analytical specialized and field measurements to strengthen domestic HSR design capability.**
- **Heavy construction machinery used for full-span launching has been specialized 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 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.**

Rolling Stock

- **Atmanirbhar Rolling Stock being developed in association with BEML. This will place Bharat in list of select countries which can design, build High Speed Trainsets.**

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 been set up in Gujarat.**

Safety and security:

- **Civil engineering structures are being 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).**

Further, as a step toward modernization of railway across country, some major technologies deployed/piloted over IR are as follows:

1. **Machine Vision Inspection System (MVIS): MVIS is an Artificial Intelligence (AI)/ Machine Learning (ML) based system which generates alert on detecting any hanging, loose or missing components of moving trains.**
2. **Wheel Impact Load Detector (WILD): WILD is a way-side inspection system that measures the impact of wheel on track to identify the defective wheel in Rolling Stock.**
3. **Integrated Track Monitoring Systems (ITMS): ITMS are deployed for comprehensive inspection and monitoring of Railway tracks. The ITMS utilizes machine learning and image processing to monitor and detect**

defects in railway track components such as rails, sleepers, and fastenings. The data from ITMS is analysed for urgent and planned maintenance of track. Presently four (04) ITMS are deployed for track recording and monitoring of IR track.

4. **Modernisation and improvement of Signalling infrastructure: IR is continuously modernizing current infrastructure of its signalling system as under:**

   I. **Electrical/Electronic Interlocking Systems with centralized operation points and signals in place of old mechanical signalling have been provided at 6671 stations as on 30.06.2026, out of which Electronic Interlocking have been provided at 3954 stations.**

   II. **Interlocking of Level Crossing Gates (LC) has been provided at 10395 Level Crossing Gates upto 30.06.2026 for enhancing safety at LC Gate.**

   III. **Complete Track Circuiting of stations to enhance safety by verification of track occupancy by electrical means has been provided at 6671 stations up to 30.06.2026.**

   IV. **Axle counters for automatic clearance of Block Section, Block Proving Axle Counter (BPAC) are provided to ensure complete arrival of train without manual intervention before granting line clear to receive next train and to reduce human element. These systems have been provided on 6085 Block Sections upto 30.06.2026.**

   V. **Automatic Block Signalling (ABS) that enhances line capacity within existing track infrastructure has been provided at 7464 Route Km upto 30.06.2026.**

   VI. **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). Kavach was adopted as National ATP system in July, 2020. Based on**

deployment of Kavach version 3.2 on 1465 Route Km 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. After extensive and elaborate trials, Kavach Version 4.0 has been successfully commissioned on 2,490 Route Kilometres as on 13.07.2026, covering the high density Delhi- Mumbai and Delhi- Howrah routes.

5. Modernisation and improvement of track infrastructure: The following measures are being taken by IR to upgrade railway tracks:

I. Modern track structure consisting of 60kg, 90 Ultimate Tensile Strength (UTS) rails, Wider and heavier Pre-stressed Concrete Sleepers (PSC) with elastic fastening, fan-shaped layout turnout on PSC sleepers and H-beam Sleepers on girder bridges are being used while carrying out primary track renewals.

II. The Thick Web Switches and Weldable Cast Manganese Steel (CMS), Crossings are being used in turnout renewal works.

III. Supply of 260m long rail panels have been increased to avoid welding of joints, thereby improving safety.

IV. Thick Web Switch Expansion Joints (SEJs) are being used in place of earlier Conventional/Improved SEJs.

V. Adoption of better welding technology for rails i.e. Flash Butt Welding.

VI. Adoption of mechanized system for track maintenance using high output plain tampers and points & crossing tampers for improved maintainability & reliability of track.

VII. Deployment of state-of-the-art modern machines including Rail Grinding Machines to further improve asset reliability.

VIII. Mechanisation of track laying activities through use of track machines.

IX. Interlocking of Level Crossing (LC) Gates for enhancing safety at LC gates.

X. Use of advanced Phased Array technology of testing of rail and welds.

XI. Adoption of portable Track Measuring Trolley for continuous recording of track parameters in yards.

XII. Using web enabled Track Management System (TMS) for integration and data analytics of the track inspection records received through various sources to enable precise maintenance inputs.

6. Amrit Bharat Stations: Amrit Bharat Station Scheme has been launched 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 of Indian Railways. The master planning, keeping in view the necessity of each station, includes:

I. Improvement of access to station and circulating areas

II. Integration of station with both sides of city

III. Improvement of station building

IV. Improvement of waiting halls, toilets, sitting arrangement, water booths

V. Provision of wider foot over bridge/subway to commensurate with passenger traffic

VI. Provision of lifts/escalators/ramps

VII. Improvement of platform surface/ provision of platform shelter

VIII. Provision of kiosks for local products through schemes like 'One Station One Product'

IX. Parking development

X. Amenities for Divyangjans

XI. Better passenger information systems

XII. Provision of air concourse, executive lounges, Multimodal integration, landscaping, etc.

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

So far, 1340 stations have been identified for development under Amrit Bharat Station Scheme, out of which following 261 stations have been completed:

Aishbagh Junction, Alnavar, Amb Andaura, Ambasamudram, Ambikapur, Amgaon, Anandpur Sahib, Anara, Angamali for Kaladi, Ashoknagar, Ayodhya Dham Junction, Bachhrawan, Badami, Bagalkot, Baheri, Baijnath Paprola, Balaghat, Balangir, Balod, Balrampur, Banmankhi, Bantawala, Barabhum, Baramati, Bareilly City, Baripada, Barmer, Barpali, Begumpet, Beohari, Bhaktinagar, Bhanupratappur, Bhilai, Bhind, Bijnor, Bimalgarh, Bommidi, Bundi, Byculla, Chaibasa, Chalakudi, Champa, Chanda Fort, Chandil, Changanassery, Chennai Park, Chhindwara, Chidambaram, Chinchpokli, Chinna Salem, Chirayinkeezh, Chunar Junction, Coonoor, Cumbum, Cuttack, Dakor, Daliganj, Dallirajhara, Dauram Madhepura, Dausa, Deeg, Derol, Deshnoke, Devlali, Dhampur, Dharwad, Dhule, Digha, Dongargarh, Eluru, Fatehabad, Fatehnagar, Fatehpur, Fatehpur Shekhawati, Ferok, Gadag, Gangapur City, Garbeta, Gauriganj, Giridih, Godda, Godhra Junction, Gogameri, Gokak Road, Gola Gokarnath, Gomtinagar, Gotan, Govardhan, Govind Garh, Govindpur Road, Govindpuri, Guruvayur, Hafizpet, Haibargaon, Haldia, Haldibari, Hapa, Harpalpur, Harrawala, Hathras City, Hi-Tech City, Himayatnagar, Hodal, Hosapete, Idgah Agra Junction, Izzatnagar, Jaisalmer, Jalandhar Cantonment Junction, Jalpaiguri Road, Jam Jodhpur, Jam Wanthali, Jangaon, Jind Junction, Joychandi Pahar Junction, Junnor Deo, Kahalgaon, Kakinada Town Junction, Kalka, Kalyani Ghoshpara, Kamakhyaguri, Kanalus Junction, Karaikkudi Junction, Karamsad, Karimnagar, Katni South, Katrasgarh, Kedgaon, Kesinga, Khairthal,

Khalilabad, Khambhaliya, Khariar Road, Koppal, Kosamba Junction, Kotdwar, Kulitturai, Kuttippuram, Lasalgaon, Limbdi, Lohardaga, Lonand Junction, Madhupur Junction, Mahbubabad, Mahe, Mahuva, Mailani Junction, Majbat, Malkapur, Mambalam, Manaparai, Mandal Garh, Mandawar Mahwa Road, Mandi Dabwali, Mangalagiri, Mannargudi, Matunga, Mavelikara, MCS Chhatarpur, Mithapur, Modinagar, Mohanlalganj, Morappur, Morbi, Muktsar, Munirabad, Muri Junction, Murtizapur Junction, Nainpur Junction, Namakkal, Nandura, Narmadapuram, Narwana Junction, Netaji Subhash Chandra Bose Itwari Junction, Nidadavolu Junction, Nilambur Road, Okha, Orai, Orchha, Pakur, Palani, Palitana, Panagarh, Panki Dham, Paramakkudi, Parappanangadi, Parel, Parlakhemundi, Phaphamau Junction, Pirpainti, Piska, Pokhrayan, Pollachi Junction, Polur, Porbandar, Pratapnagar, Prayag Junction, Raj Nandgaon, Rajgarh, Rajmahal, Rajula Junction, Ramagundam, Ramgarh Cantonment, Ramghat Halt, Ranibennur, Rayanapadu, Sabaur, Saharanpur Junction, Sahibganj, Salempur, Samakhiyali, Samalpatti, Sanchi, Sankarpur, Sarona, Sahibzada Ajit Singh Nagar Mohali, Savda, Seoni, Shahad, Shajapur, Shamli, Shivanarayanpur, Shivpuri, Sholavandan, Shoranur Juuction, Shridham, Siddharth Nagar, Sihor Junction, Simultala, Siuri, Sojat Road, Somesar, Sri Bala Brahmeswara Jogulamba, Srirangam, Srivilliputtur, St.Thomas Mount, Subramanya Road, Sullurpeta, Suraimanpur, Swaminarayan Chappia, Talcher, Tamluk, Tanakpur, Thalassery, Thawe, Thiruvarur Junction, Tikamgarh, Tirur, Tiruvannamalai, Tripunithura, Tuni, Udagamandalam, Ujhani, Urkura, Utran, Vadakara, Vadala Road, Vidisha, Vindhyachal, Vriddhachalam Junction, Wadakancheri, Warangal.

The activities for development at other stations have also been taken up at good pace and progress of some of the stations is as below:

- **Bhubaneswar station: The works of new West side and East side station building, air concourse, elevated driveway at West and East side and**

extension of foot over bridge have been completed. The works of improvement of platform surface, improvement of circulating area, platform shelters, lifts and escalators have been taken up.

- **Chhatrapati Sambhajinagar station: The works of new post office building and parcel office, new Railway Protection Force and Government Railway Police building at North side have been completed. The works of new arrival and departure building at South side, new waiting hall, toilet, air concourse, 6 m wide foot over bridge, through roof, new underground tanks at North and South sides, new sewage treatment plant at North and South side, new electrical sub-station building have been taken up.**
- **Gaya station: The work of new arrival building at second entry has been completed. The works of new departure building at second entry, new arrival and departure building at main entry, new platform no. 8, new platform shelters, air concourse and improvement of circulating area have been taken up.**
- **Nagpur Junction station: The works of relocation of passenger reservation system building and booking offices, and improvement of parking on the main entry side have been completed. The works of construction of new admin building, departure building and basement parking on main entry side, construction of departure building and unified basement on second entry side, new air concourse, improvement to platform surfacing on platform 8, and new platform shelters have been taken up.**
- **Rameswaram station: The works of revamping Multi Functional Complex building into retiring rooms, structural works of East and North terminal building, parcel office, departure forecourt, arrival forecourt, substation building and sewage treatment plant have been completed. The finishing works of East terminal building, North terminal building,**

departure forecourt, sewage treatment plant, arrival forecourt, platform shelter and improvement of waiting hall have been taken up.

- **Tirupati station: The works of new South side station building (G+3+Basement), structural works of new North side station building, air concourse, underground and overhead water tanks, sewage treatment plant, rainwater harvesting, ramp to foot over bridge, lifts and escalators have been completed. The finishing works of station building, connecting bridge, approach road and platform shelters 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 / modernisation of stations including under 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 station-wise or state-wise. The fund allocation of ₹ 11,972 crore has been made for the financial year 2026-27 under Plan Head – 53 and expenditure (up to June, 2026) of ₹ 4,633 crore has been incurred so far.

7. **Road over Bridges / Road under Bridges (ROB/RUB): In order to improve safety and efficiency of train operations, Level Crossings (LCs) are eliminated either by providing Road over Bridges / Road under Bridges (ROBs/ RUBs) in lieu of LCs or through direct closure (for low traffic LCs) or by diversion of road traffic to nearby ROB/RUB/LC depending upon the site conditions.**

All Unmanned level crossings (UMLCs) on Broad Gauge (BG) network of Indian Railways have been eliminated in 2019.

No. of ROBs / RUBs constructed on Indian Railways during the period 2004-14 viz-a-viz 2014-26 (Upto May'26) is as under:

Period	ROBs / RUBs constructed
2004-14	4,148 Nos
2014-26 (Upto May'26)	14,451 Nos.

Sanctioning of works of Road over Bridge (ROB)/Road under Bridge (RUB) in lieu of Level crossings (LCs) is a continuous and dynamic process of Indian Railways. Such works are prioritised and taken up on the basis of their impact on safety in train operations, mobility of trains & impact for road users and feasibility etc.

As on 01.06.2026, 4,993 Nos. ROB / RUB works are sanctioned at a cost of approx. ₹ 1,17,492 Cr. on Indian Railways which are at various stages of planning and execution.

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