

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
LOK SABHA
UNSTARRED QUESTION NO. 496
TO BE ANSWERED ON 22.07.2026**

IMPLEMENTATION AND PROGRESS OF KAVACH 4.0 IN RAILWAY NETWORK

†496. SHRI ASHISH DUBEY:

SHRI RADHESHYAM RATHIYA:

SHRI DILIP SAIKIA:

SHRI PRAVEEN PATEL:

DR. HEMANT VISHNU SAVARA:

SHRI JASHUBHAI BHILUBHAI RATHVA:

SHRI CHAVDA VINOD LAKHAMSHI:

SHRI AVIMANYU SETHI:

SHRI MUKESHKUMAR CHANDRAKAANT DALAL:

SHRI VIJAY KUMAR DUBEY:

SHRI DILESHWAR KAMAIT:

SMT. KAMLESH JANGDE:

DR. MANNA LAL RAWAT:

SHRI P P CHAUDHARY:

SHRI SHASHANK MANI:

Will the Minister of RAILWAYS be pleased to state:

- (a) the progress made in deployment of Kavach 4.0 including the kilometers of routes covered and the number of locomotives equipped therewith as on date in the country particularly in Rajasthan;**
- (b) the railway zones and high-density corridors identified for implementation during the year 2025-2026 and 2026-2027, year and zone-wise;**
- (c) whether any timeline has been fixed for the network-wide deployment of Kavach and if so, the details thereof; and**
- (d) the measures taken to expedite the installation and commissioning of Kavach across Railway network?**

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (d):

- 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 1,465 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 2,490 Route Kilometres as on 13.07.26, covering the high density Delhi- Mumbai and Delhi-Howrah routes as below:**

SN	Section	Progress (Route Km)
(1)	Delhi-Mumbai route: 1,344 Rkm	
i	Tilak Bridge - Junction cabin – Palwal – Mathura –Nagda –Vadodra-Virar section (Except Mangalmhudi – Panchpipliya) [Passes through Rajasthan also]	1,248
ii	Vadodara – Ahmedabad section	96
(2)	Delhi – Howrah route: 1,146 Rkm	
i.	Chipyana - Tundla - Kanpur - Subedarganj section	563
ii.	Kanpur – Lucknow section	71
iii.	DDU(FOC)-Bhabua Road section	50
iv.	Sasaram - Pheser section	43
v.	Gaya -Sarmatarn- Nimiaghat section	159
vi.	Chota Ambana - Bardhaman – Howrah section	260

- 10. In addition, track side Kavach implementation work is being taken up on 21,937 RKM covering all GQ,GD,HDN and identified sections of Indian Railways including sections passing through Rajasthan.**

11. The total Progress of key items of Kavach on Indian Railway sections are as under:-

SN	Item	Progress
i	Laying of Optical Fibre Cable	11,253 Km
ii	Installation of Telecom Towers	1,668 Nos.
iii	Station Data Centre	958 station
iv	Installation of Track side equipment	7,721 RKm
v	Provision of Kavach in Loco	6,045 Nos.

12. In addition, work for installation of Kavach in 7,435 Locomotives and 1,200 EMU/MEMU has been taken up.

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 more than 94,000 technicians, operators and engineers have been trained on Kavach technology. This includes about 57,000 Loco Pilots & Assistant Loco Pilots. Courses have been designed in collaboration with IRISSET.
