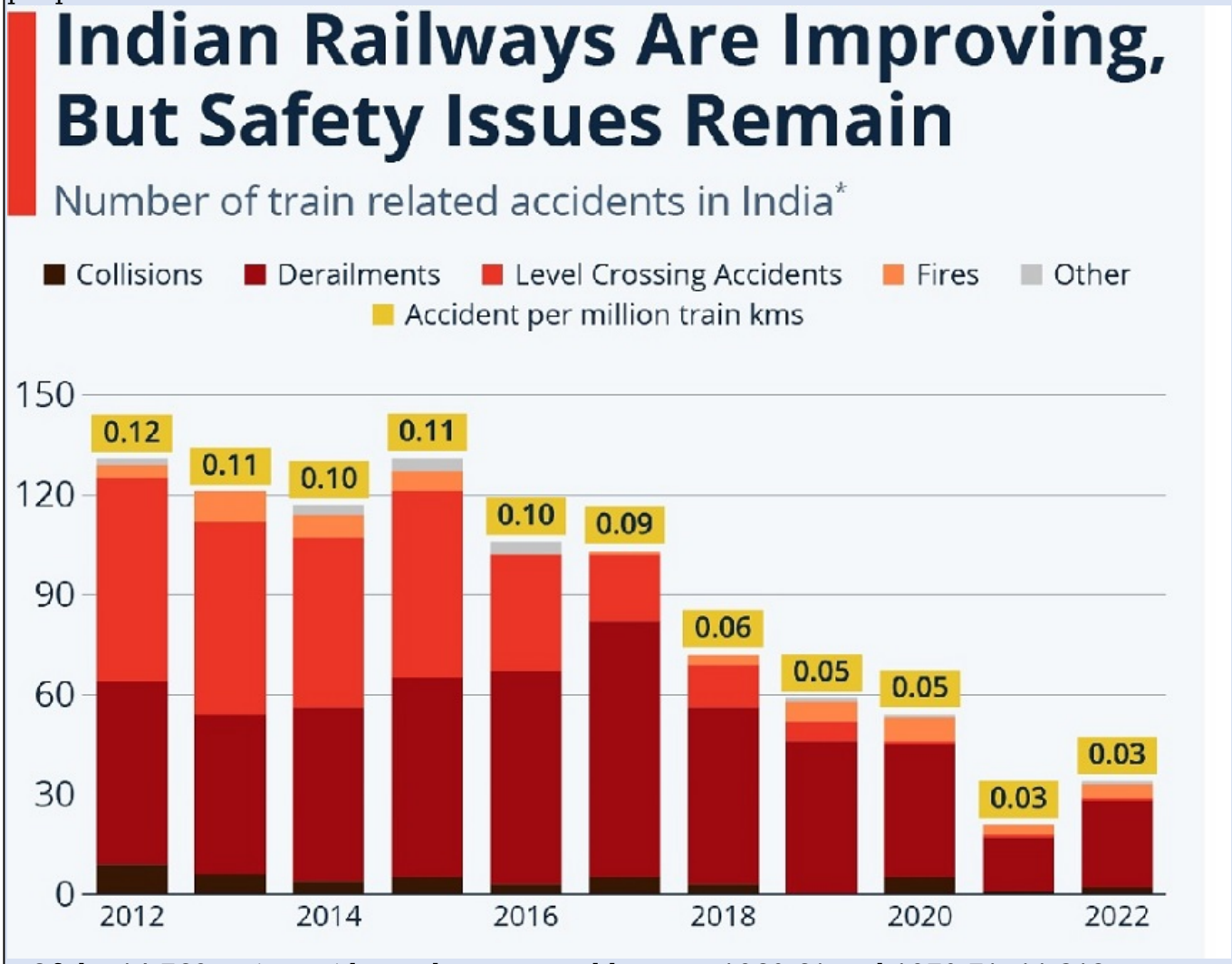
Rail Safety in India

Why in news?

The government has taken steps to enhance the level of passenger safety in Railways.

Status of train accidents

• According to data from the National Crime Records Bureau of India, 2021 saw a total of 16,431 deaths and 1,852 cases of injuries from railway accidents.
• The majority (67.7%) of these were from people falling from trains or from collisions with people on the tracks.



• Of the 14,769 train accidents that occurred between1960-61 and 1970-71, 11,312 were incidents of *derailments*.
• The 2nd most common cause is *level crossing accidents*.
• *Fire and collisions* are the 3rd and 4th most common categories of train accidents, respectively.
• **Balasore triple train collision, 2023**- The accident claimed the lives of 288 passengers in Odisha, it happened due to a change in electronic interlocking.
• This crash is the worst of its kind in India in two decades.

What are the steps taken by government for passenger safety in Railways?

Steps	About
Rashtriya Rail Sanraksha Kosh	• Launch year- 2017-18 • Aim- To reduce accidents at railway crossings, derailments, and collisions by investing in *track renewals*, telecommunications, signalling, and rolling stock.

Kavach system	• It is an *automatic train protection system* that was developed by Indian Railways to enhance the safety and efficiency of train operations. • It uses radio frequency identification, GPS, and electronic devices to monitor and control the speed, signals, and movements of trains.
Electrical/ Electronic Interlocking Systems	• These are systems that use electrical circuits and relays to *control train movements* and ensure safety. • These systems use electrically operated switches and signals to manage the routing of trains, offering a more automated and streamlined approach compared to purely mechanical systems[1].
Modern track structure	• It consists of *stronger and more durable tracks and bridges*, using Prestressed Concrete Sleeper (PSC), higher Ultimate Tensile Strength (UTS) rails, fan shaped layout turnout on PSC sleepers, Steel Channel Sleepers on girder bridges etc., • Modern track structure also uses long welded rails and switch expansion joints to provide a smooth and fast rail travel
Interlocking of Level Crossing (LC) Gates	• It is a method of ensuring the safety of *both road and rail traffic* at level crossings. • It involves the use of electrical or electronic devices to control the movement of trains and gates, such that a train cannot approach or pass through a level crossing unless the gates are closed and locked, and the gates cannot be opened unless the signals are at stop and the tracks are clear
Complete Track Circuiting of stations	• To enhance safety for *verification of track occupancy* by electrical means. • As of 2023, 6558 stations has been provided with complete track circuiting of stations.
Vigilance Control Devices	• It is a safety devices that *monitor the alertness of the loco pilot* and prevent accidents due to human error or incapacitation. • They work by requiring the loco pilot to perform certain actions or acknowledge certain signals at regular intervals, otherwise they trigger an emergency brake application.
Retro-reflective sigma boards	• They are provided in electrified territories to warn the crew about the signal ahead when visibility is low due to foggy weather. • They are mandatory for all signals in electrified territories.
GPS based Fog Safety Device (FSD)	• It is a device that helps train drivers to navigate safely in foggy weather. • It uses GPS technology to provide *real-time information* about the location and distance of the next three signals, level crossing gates and other landmarks on the route.
Detailed instructions on issues related with safety of Signalling	• Mandatory correspondence check, alteration work protocol, preparation of completion drawing, etc. have been issued.

Use of Linke Hofmann Busch (LHB) coaches	• It is a type of *passenger coach* used by Indian Railways in collaboration with German company that is designed for higher speed, safety, and comfort. • LHB coaches have many features such as stainless steel body, FIAT bogies, air suspension, disc brakes, anti-climbing couplers, and fire and smoke detection systems. • They are being manufactured by Rail Coach Factory in Kapurthala, Integral Coach Factory in Chennai, and Modern Coach Factory in Raebareli.
Web based online monitoring system of track assets	• Track database and decision support system has been adopted to decide rationalized maintenance requirement and optimize inputs.
Fire notices	• Indian Railways has displayed Statutory "Fire Notices", they are provided in every coach so as to inform 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., • 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.
Inspection	• Patrolling of railway tracks to look out for weld/rail fractures. • Inspections at *regular intervals* are carried out to monitor and educate staff for observance of safe practices. • Safety of *railway bridges* is ensured through regular inspection of Bridges.

What are the other measures implemented to ensure passenger safety?

- Maximizing supply of 130 m/260 m long rail panels for increasing progress of rail renewal and avoiding welding of joints, thereby ensuring safety.
- Laying of longer rails, minimizing the use of Alumino Thermic Welding and adoption of better welding technology for rails i.e. Flash Butt Welding.
- Monitoring of track geometry by OMS (Oscillation Monitoring System) and TRC (Track Recording Cars).
- All unmanned level crossings (UMLCs) on Broad Gauge (BG) route have been eliminated by January 2019.
- Regular counselling and training of staff is undertaken.

Reference

1. PIB- Steps taken by India for passengers safety
2. Statista- NCRB data on railway accident

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