



Ensuring Railway Safety

For Prelims: [Railway Infrastructure](#), [Kavach](#), [National Rail Plan](#), [Depreciation Reserve Fund](#), [Extra-Budgetary Resources](#), [Dedicated Freight Corridors](#), [NITI Aayog](#), [High-Speed Rail Corridors](#), [Railway Safety Authority](#), [Rashtriya Rail Sanraksha Kosh](#), [Railway Infrastructure Authority of India](#), [Railway Accident Investigation Board](#), [Railway Infrastructure Company](#), [Kakodkar Committee](#).

For Mains: Steps needed for ensuring railway safety.

[Source: TH](#)

Why in News?

Recently, there has been a **spate of accidents** across railway zones after which the government has called for **urgent steps** to prevent them.

What is the Status of Railway Accidents?

- **Decrease Over the Decades:** In the **1960s**, the number of railway accidents was significantly higher, with an **annual average of 1,390**.
 - Over the last decade, this number dropped to **around 80 accidents per year**, indicating a notable improvement in safety measures and operational efficiency.
- **Recent Trends in Consequential Accidents:** Despite the reduction in **overall accidents**, there were still **34 consequential accidents in 2021-2022, 48 in 2022-2023, and 40 in 2023-2024**.
 - A **consequential accident** injures and/or kills people, damages [railway infrastructure](#), and disrupts rail traffic.
- **Primary Causes of Accidents:** According to public records, **55.8%** of all accidents involving trains have been due to the failure of **Railway staff** and another **28.4%** due to failures on the part of **non-staff people**. **Equipment failure** accounted for **6.2%**.
- **Signalling Failures in Major Accidents:** Both the **Balasore (2023)** and **Kavaraipettai (2024)** railway accidents were attributed to [signalling system errors](#).

What are the Causes of Railway Accidents?

- **Inadequate Safety Technologies:** [Kavach](#) has the potential to prevent collisions by **automating** braking and issuing alerts, its limited deployment makes it ineffective on a larger scale.
 - By February 2024, the Railways had installed '**Kavach**' on **1,465 route km, or 2% of its total route length**.
- **Signalling System Failures:** Faulty signalling systems have directly caused some major accidents, including the **Balasore and Kavaraipettai incidents**.
 - **Since 1990-1991**, the Railways has classified nearly 70% of all major accidents as derailments due to **signalling errors**.

- **Network Congestion:** High levels of congestion on the railway network are highlighted as a significant safety issue.
 - According to the [draft National Rail Plan](#), nearly **30%** of the railway network is utilised to **more than 100% capacity** exacerbating the safety risks.
- **Insufficient Track Maintenance:** The Railways needs to keep up existing equipment, including **replacing tracks and wagons** and maintaining trackside infrastructure.
 - But in the **2023-2024 budget**, **capital outlay** for track renewal dropped to **7.2%**.
 - Appropriations to the [Depreciation Reserve Fund](#) also fell **96%** between 2014-19.
- **High Operating Ratio:** The **operating ratio (OR)** in 2024-2025 is estimated to be **Rs 98.2**, a small improvement from **2023-2024 (Rs 98.7)** but a decline from **Rs 97.8 in 2016**.
 - A higher OR leaves **less for capex** and makes the Railways more dependent on **budgetary support** and [Extra-Budgetary Resources \(EBRs\)](#).
 - This financial tension results in underfunding for **critical safety upgrades** and infrastructure improvements.
 - OR is the amount the Railways spends to earn Rs 100.
- **Slow Infrastructure Development:** Of the [Dedicated Freight Corridors \(DFCs\)](#) the government mooted in 2005, only the [eastern DFC](#) is **fully operational**.
 - The **western DFC** is **partly ready**; the east coast, **east-west sub-corridor**, and **north-south sub-corridor DFCs**, amounting to 3,958 km, are still in **planning**.
 - Such a demand and supply gap of infrastructure compounds the safety problem.
- **Off-Setting of Loss:** As per [NITI Aayog](#), freight rates increased **more than thrice** as fast as passenger rates in 2009-2019 but Railways' freight profit is **offset significantly by passenger losses**.
 - In **2019-2020**, the revenue from passenger services was a little over **Rs 50,000 crore** and losses were **Rs 63,364 crore**.
- **Prolonged Working Hours:** One key cause of railway accidents, especially [Signal Passed at Danger \(SPAD\)](#) cases, is loco pilots' extended working hours.
 - Manpower shortages force them to **exceed the 12-hour duty limit**, causing fatigue and increasing the risk of human error.

What Recommendations have various Committees made to Enhance Railway Safety?

- **Rakesh Mohan Committee (2010):**
 - Revamp the accounting system to **align with Indian GAAP** ([Generally Accepted Accounting Principles](#))
 - Focus on **long-distance and inter-city transport**, speed upgrades, and [High-Speed Rail corridors](#) for passenger services
 - Develop **logistics parks** at key network hubs
- **Kakodkar Committee (2012):**
 - Establishing a statutory [Railway Safety Authority](#)
 - Forming a non-lapsable [Rashtriya Rail Sanraksha Kosh \(RRSK\)](#) of Rs. 1 lakh crores over **5 years** for safety projects.
 - Adopting advanced technologies for **track maintenance and inspection**.
- **Bibek Debroy Committee (2014):**
 - Establishing a [Railway Infrastructure Authority of India](#).
 - **Outsourcing** non-core activities.
- **Vinod Rai Committee (2015):**
 - Setting up an **independent Railway Safety Authority** with statutory powers
 - Forming a [Railway Accident Investigation Board](#) for impartial inquiries
 - Establishing a separate [Railway Infrastructure Company](#) for owning and maintaining railway assets

What are the Steps taken for Railway Safety?

- [Kavach System](#)
- [Rashtriya Rail Sanraksha Kosh \(RRSK\)](#)
- [Eliminated Unmanned level crossing](#)

- **GPS-based Fog Safety Devices**

What can be Done to Prevent Railway Accidents?

- **Addressing Loco Pilot Vacancies:** Indian Railways faces about **18,799 loco pilot vacancies**. Immediate action is needed to **fill these positions** to prevent overworking pilots and **reduce errors from stress and exhaustion**.
- **Implement 'Kavach' Anti-Collision System:** The **Railways must expedite the installation of Kavach** on more routes, especially **high-traffic and high-risk sections**, to prevent future collisions.
- **Address Network Congestion:** Prioritising **Dedicated Freight Corridors (DFCs)** and completing pending projects can help **distribute traffic more evenly** and reduce congestion.
- **Independent Railway Safety Authority:** Creating an independent **Railway Safety Authority** as recommended by the [Kakodkar Committee](#) would ensure a more **specialised and independent** approach to railway safety oversight.
- **Work Hour Regulations:** Stricter **enforcement of work hour limits** and ensuring that crew members have **adequate rest** are essential to reduce human errors.
- **Improve Signal Infrastructure:** Investments in advanced **signal and communication technologies** can drastically reduce the chances of accidents caused by **signal failures**.
- **Installation of Fencing Along Tracks:** Installing **fences along railway tracks** in high-risk areas could prevent **cattle runovers** that have been a cause of derailments.
- **Increasing Passenger Revenue:** Increasing **passenger fares** judiciously or **improving the efficiency of passenger services** could help mitigate losses.

Drishti Mains Question:

Q. Assess the significance of infrastructure development, including the completion of Dedicated Freight Corridors (DFCs), in improving railway safety and operational efficiency.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. Consider the following communication technologies: (2022)

1. Closed-circuit Television
2. Radio Frequency Identification
3. Wireless Local Area Network

Which of the above are considered Short-Range devices/technologies?

- (a)** 1 and 2 only
- (b)** 2 and 3 only
- (c)** 1 and 3 only
- (d)** 1, 2 and 3

Ans: (d)

Mains

Q. The setting up of a Rail Tariff Authority to regulate fares will subject the cash strapped Indian Railways

to demand subsidy for obligation to operate nonprofitable routes and services. Taking into account the experience in the power sector, discuss if the proposed reform is expected to benefit the consumers, the Indian Railways or the private container operators. **(2014)**

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