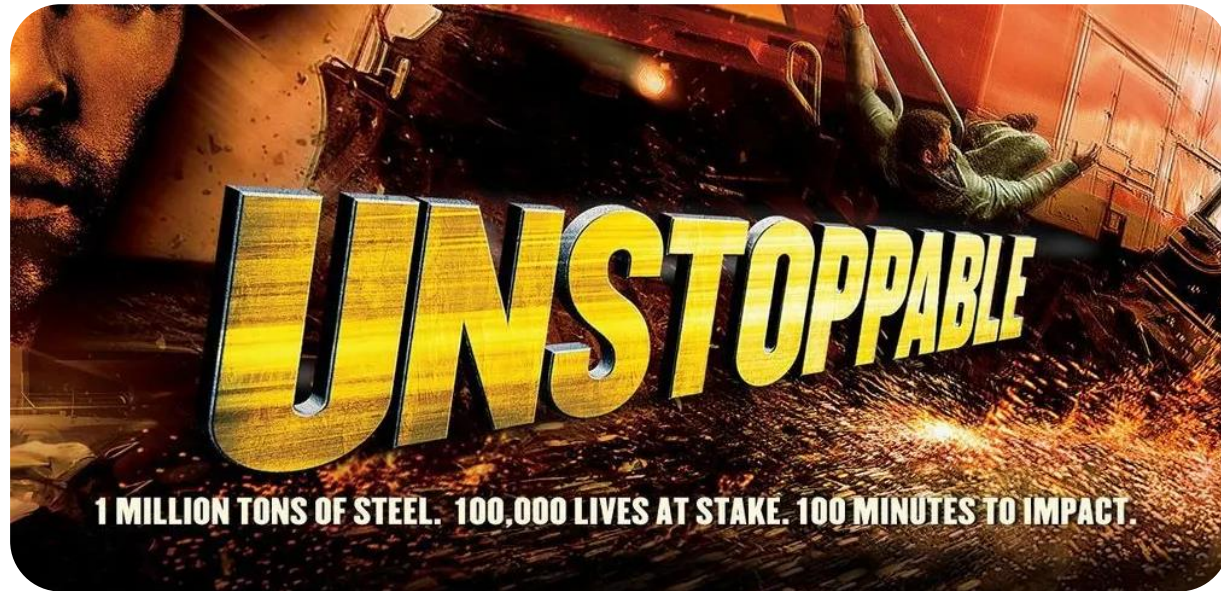


# CYBER RESILIENCY AND RAIL TRANSPORTATION

*the present, the future, and  
the challenges*









# - rail .... as a global industry

## Economic Impact

- The global railroad market was valued at **\$589.9 billion in 2024** and is projected to reach **\$781.2 billion by 2030**, growing at a **CAGR of 4.8%**
- The passenger rail segment alone is expected to hit \$431.8 billion by 2030, while freight rail is growing at 4.5% CAGR .

## Freight and Logistics

- **Rail is a backbone for long-distance cargo transport**, especially in large economies like the U.S., which has a rail network of 250,000 km.
- Rail freight helps reduce highway congestion and is more cost-effective for bulk goods .

## Environmental Benefits

- Trains produce **four times less carbon emissions** than cars, making them a significantly greener option.
- The industry has seen a **15% increase in fuel efficiency** over the past decade .
- Electrification and hybrid locomotives are being adopted widely to reduce the carbon footprint<sup>1</sup>.

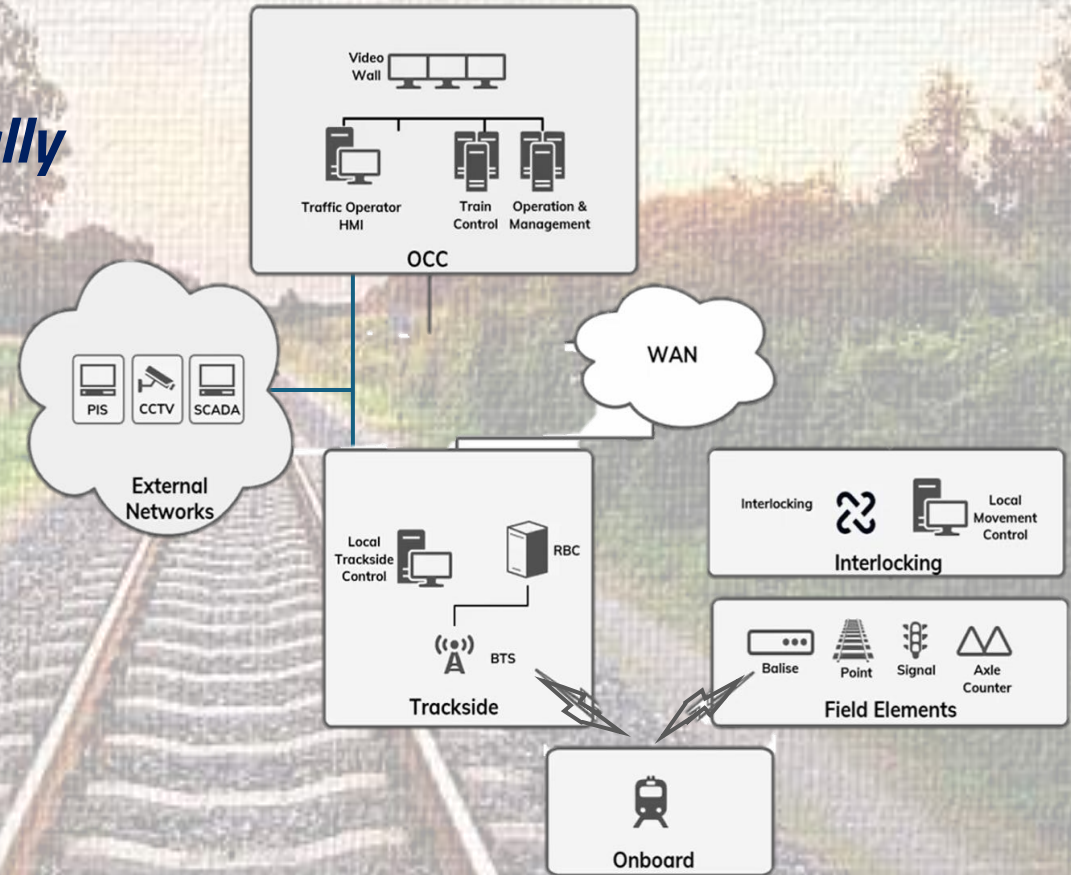
## Urbanization and Mobility

- Urban rail systems are expanding rapidly to meet the needs of growing cities.
- In 2019, **India accounted for 39% of global passenger train usage**, highlighting the importance of rail in populous nations



# - the present

- *critical infrastructure sector*
- *highly regulated*
- *complex, interconnected, moving and geographically distributed systems*
- *evolving threat landscape*
- *in middle of modernization and digitization.*
- *loosely connected OT and IT layers*
- *cybersecurity compliances:*
  - *CLC TS 50701*
  - *IEC 62443*





TECHNOLOGY | CYBERSECURITY

## Transportation and shipping reported as second most targeted sector

Angel Coker Jones  
May 8, 2025 | Updated May 13, 2025

Cybersecurity threats in the transportation and shipping sectors are on the rise.

Advanced persistent threat (APT) detections targeting the U.S. in Q1 2025 were 2.4 times or 136% higher than the level seen in Q4 2024, according to a recent report by AI-powered cybersecurity firm Trellix. [The CyberThreat Report: April 2025](#) shows that among those APTs, the telecommunications was the top targeted sector, receiving 47% of all detections, followed by transportation and shipping at 36%.

- the present

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## Cyber Attacks on Railway Systems Increase by 220%

TUE | AUG 20, 2024 | 9:18 AM PDT

Cyberattacks on railway systems have increased by more than 200 percent in the last five years, with incidents increasing worldwide over the last decade.

"We've seen a 220% increase in railway-associated cyberattacks over the last five years," said [Col. Cedric Leighton](#), CNN Military Analyst; USAF (Ret.); Chairman, Cedric Leighton Associates, LLC. "In fact, over a 10-year period, we've seen cyber incidents impacting railway systems in countries as diverse as Belgium, France, Poland, the Czech Republic, Germany,



By [Col. Cedric Leighton](#)  
Read more about the author



DR Dark Reading

## Pro-Iranian Attackers Claim to Target Israeli Railroad Network

The pro-Iranian Cyber Avengers hacktivist group has claimed to have hit yet another Israeli public service, supposedly revealing information about the...

28 Nov 2023

IK The Kyiv Independent

## '89 hours of non-stop work' — Ukrainian Railways' battle against a cyberattack by 'the enemy'

It would take 89 hours of non-stop work to get the computer systems back online, and even now the company's servers are struggling with demand.

1 month ago

RT Railway Technology

## Belarus hackers attack train systems to disrupt Russian troops' movement

Belarus hackers attack train systems to disrupt Russian troops. The aim of the attack was to buy more time for Ukrainians to resist Russia's

ep Electropages

## Cyber Attack on UK Train Station WiFi Sparks Safety Concerns

The recent cyber-attack on the train network, originating from within, underscores a critical vulnerability in public WiFi systems and exposes...

12 Nov 2024



SecurityWeek

## Cyberattack Causes Trains to Stop in Denmark

Cyberattack Causes Trains to Stop in Denmark ... Trains stopped in Denmark on Saturday as a result of a cyberattack. The incident shows how an...

4 Nov 2022

TC The Cyber Times

railway-news.com

## Global Cyber Attack Hits Deutsche Bahn

The global Trojan attack began affecting the company Friday night and into Saturday. It has hit digital passenger information displays in stations.

13 Mar 2017

MT The Moscow Times

## Mass Cyberattack Disrupts Online Services for Russian Railways

"Our website and mobile application have been subjected to a mass DDoS attack," Russian Railways said on Telegram. "We're working to restore..."

1 month ago





# - *the future*

## emerging technology

*AI and Automation*

*Modern Infrastructure*

grading physical and digital infrastructure.

*Sustainability Initiatives*

Alternative fuels and energy-efficient technologies.

*Health and Safety Technologies*

enhanced air filtration systems and contactless solutions.

*Advanced Cybersecurity Measures*

Implementing robust cybersecurity frameworks, including upgrading to Secure Protocols

## standards and compliances

### **IEC 63452**

a future railway cybersecurity international standard that will build upon IEC 62443 and TS 50701, aiming to unify cybersecurity management in railway systems.

### **TSA Security Directive 1580/1582**

focuses on strengthening cybersecurity measures for passenger and freight railroads.

### **The Cyber Resilience Act (CRA)**

European Union regulation aimed at strengthening cybersecurity for digital products and services,

### **Network and Information Security Directive 2 (NIS2)**

European regulation mandating strong cybersecurity measures and incident response plans for organizations across member states.



# - *the challenges*

## *technology*

- *legacy systems, Long Lifespan of Systems , and retrofitting of new technology*
- *lack of standardisation around how devices communicate and connect, securely, with wider networks.*
- *wireless communication and insecure protocols*
- *patching and updates*

## *operation / management*

- *supply chain security*
- *balance between safety & operational requirements, business competitiveness and cybersecurity*

## *people*

- *shortage of railway system aware cybersecurity professionals*
- *Human error, lack of security awareness, and insider threats also contribute to the risk landscape.*
- *Too many chefs in kitchen*



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SPANS MORE THAN  
100 COUNTRIES

**\$8.4B**  
2022 REVENUES

**~25K**  
GLOBAL EMPLOYEES

**~50**  
COUNTRIES WITH  
WABTEC OPERATIONS

FORTUNE 300  
COMPANY

**~23K**  
GLOBAL LOCOMOTIVES  
IN OUR INSTALLED BASE

**7K**  
PATENTS



FREIGHT EQUIPMENT



FREIGHT SERVICES



TRANSIT



DIGITAL INTELLIGENCE



COMPONENTS AND  
INDUSTRIAL SOLUTIONS

20% of the world's freight is moved by a Wabtec locomotive.

Wabtec has helped customers save \$1.3 billion in fuel to date, while slashing 3.8 million metric tons of CO2 .

Wabtec provides products and components to virtually every major rail transit system around the world.

One in five freight rail cars in operation have Wabtec products on them.