ERA Webinar

Progress on Safety and Interoperability

Status and Way Forward

30 June 2026 – 12:00-13:30 (CEST)

EUROPEAN UNION AGENCY FOR RAILWAYS

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Agenda

Keynote speeches

Oana Gherghinescu – Executive Director, ERA

Kristian Schmidt – Director for Land Transport, European Commission/DG MOVE

Main findings

Eva Valeri – Economic Evaluation Officer, ERA

Way Forward

Safety	Interoperability				Future challenges
	ERTMS	TEN-T	VA	Data	
Pio Guido ERA	Wouter Malfait ERA	Giacomo Potenza ERA	Chris Caar ERA	Mitchell v. Balen ERA	Idriss Pagand ERA
Roman Slovak Swiss NSA		Lotte Lankveld EU Corridors	Enno Wiebe UNIFE	Reinhard Haller RNE	Julie Berckmans EEA

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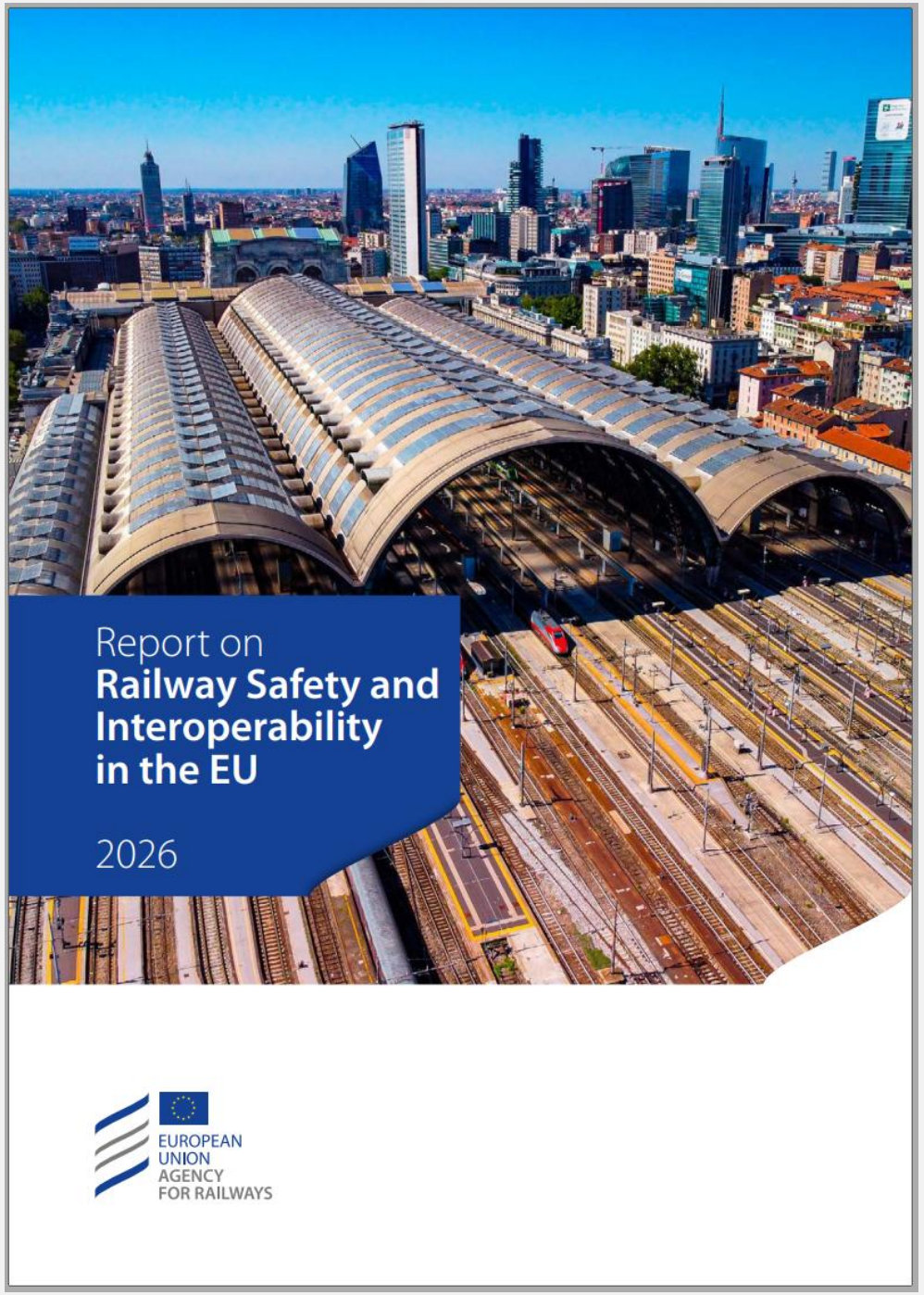
Background

- Art. 35.4 of the Agency Regulation (EU 2016/796) establishes that *'…the Agency shall monitor progress on the safety and interoperability of the Union rail system. Every 2 years it shall present to the Commission, and publish, a report on progress on safety and interoperability in the single European railway area.'*

- New / adjusted elements in the report (compared to previous editions):
  - Part A – Progress on Safety
  - Part B – Progress on Interoperability
  - Part C – Emerging challenges
  - Alignment with SPD programme



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Part A
Progress on Safety

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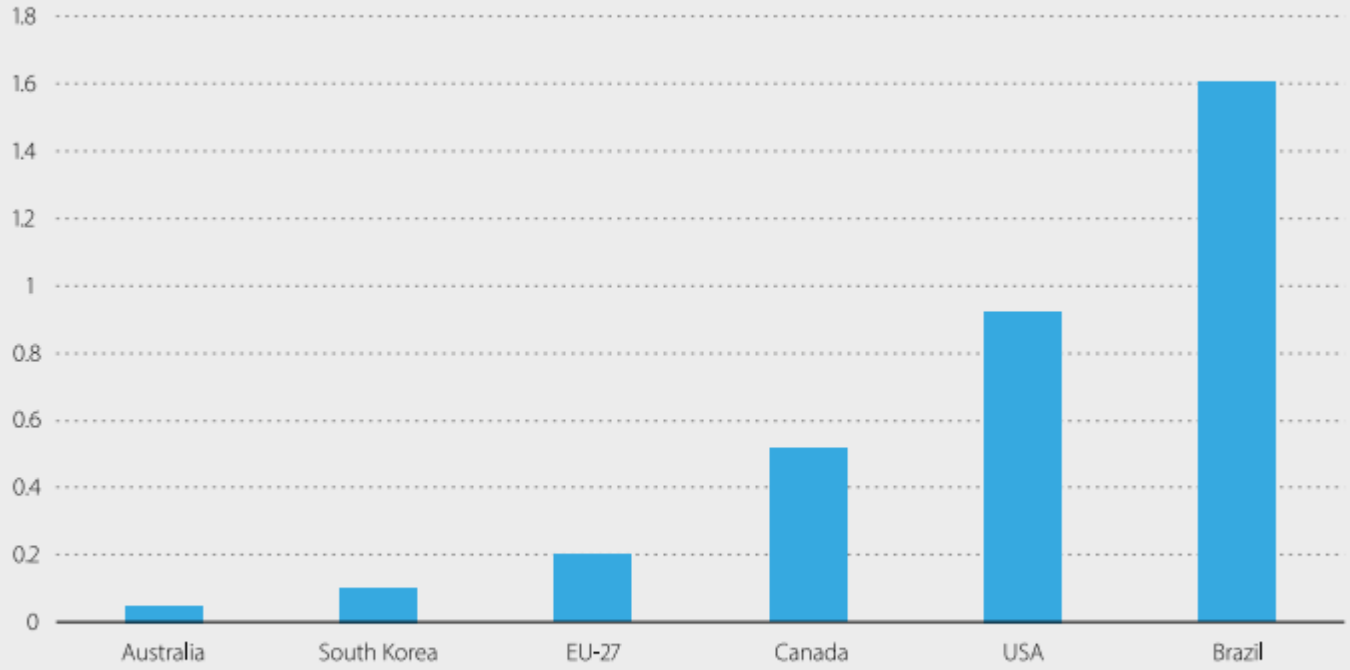
Railway safety worldwide

- The EU railway system is among the safest in the world, with very low fatality rates
- Moreover, it performs better than most transport modes, notably road-based transport

Figure A-12: Railway fatality rates for different countries worldwide (2020–2024)

All railway fatalities (excluding suicides) per million train-km



Notes: Data (referring to high-speed rail and conventional lines) for South Korea were provided by Korean Transport Safety Authority`s railway safety division for 2018-2022. Data for Australia exclude suspected suicides and were extracted from the 2025 rail safety report of the Office of the National Rail Safety Regulator.

Source: Statutory reports produced by national administrations of the jurisdictions concerned.

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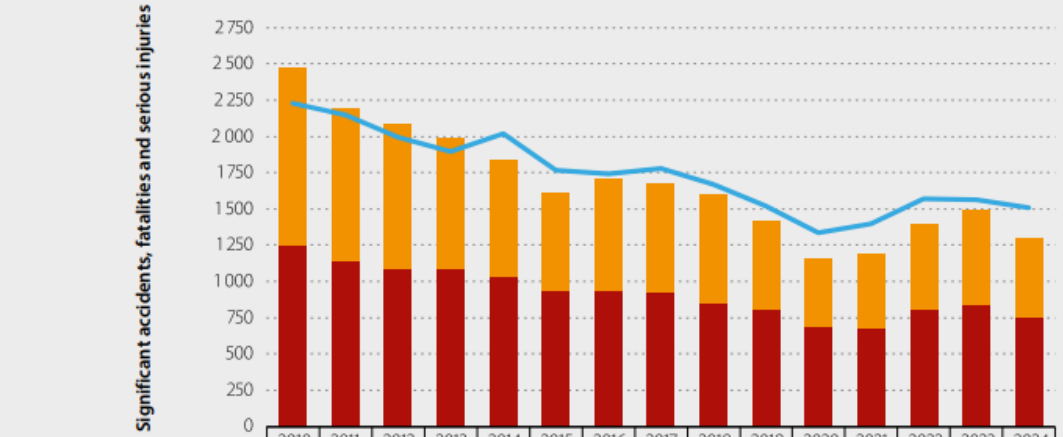
Main railway safety outcomes

1. The number of significant accidents and resulting casualties have decreased steadily since 2010; however, in 2021 and 2022, an increase was recorded. In the following years, the numbers declined again; in 2024, they reached values lower than those observed before the COVID-19 pandemic:
   - From around 6 accident per day in 2010,
   - To around 4 accident per day in 2024.

Figure A-3: Main safety outcomes (EU-27, 2010–2024)

Significant accidents, fatalities and serious injuries

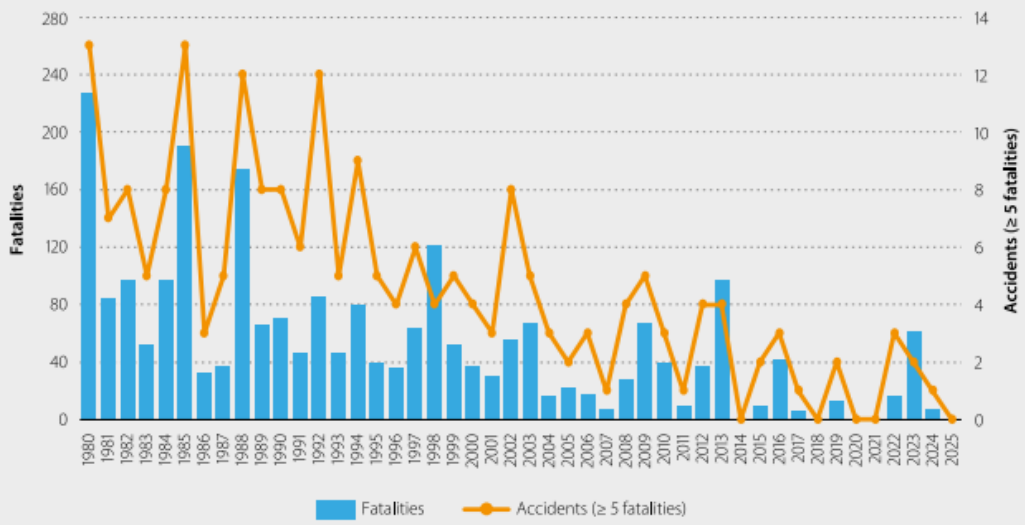


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious injuries	1 226	1 041	996	899	810	672	766	747	750	613	469	512	594	650	548
Fatalities	1 245	1 151	1 093	1 095	1 029	939	942	933	855	802	687	683	803	841	750
Significant accidents	2 230	2 146	1 994	1 896	2 022	1 764	1 742	1 778	1 671	1 518	1 336	1 395	1 567	1 565	1 507

Source: Common Safety Indicators (CSIs) as reported by National Safety Authorities (NSAs) to the Agency.

Figure A-5: Major accidents in Europe (EU-27 + CH + NO, 1980–2025)

Railway accidents resulting in five or more fatalities



Note: Data updated at 17/11/2025; data for UK available until end 2020 .

Sources: ERAIL and database of historical accidents developed by Professor Andrew Evans (Imperial College London).

2. Major railway accidents have also declined over the past 15 years, but these still occur in high-performing countries

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Types of significant accidents

Accidents to persons remain by far the most frequent type of significant accidents.

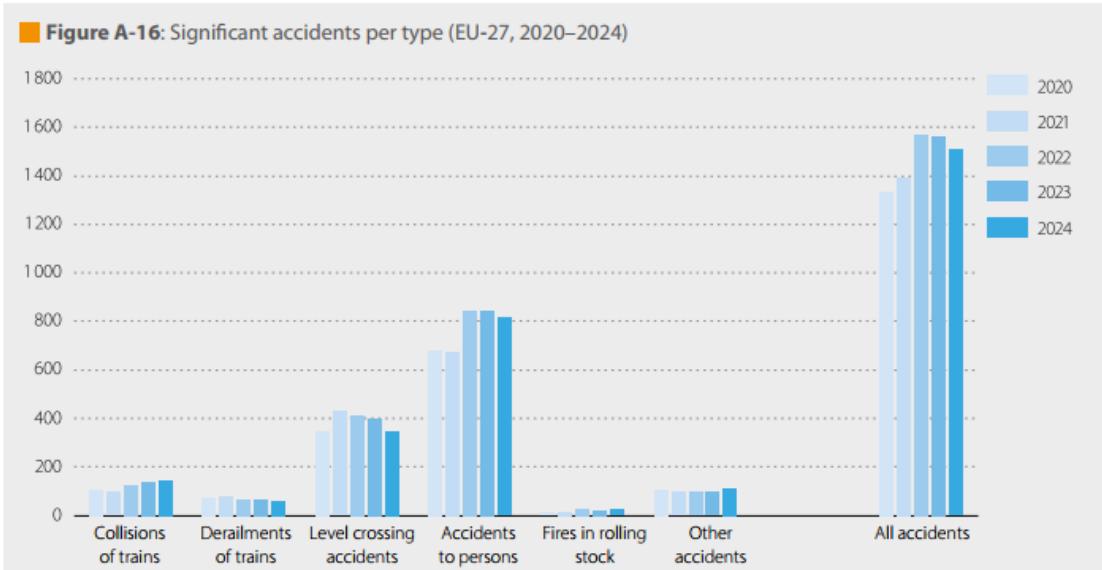
Level crossing accidents have shown a decreasing trend over recent years.

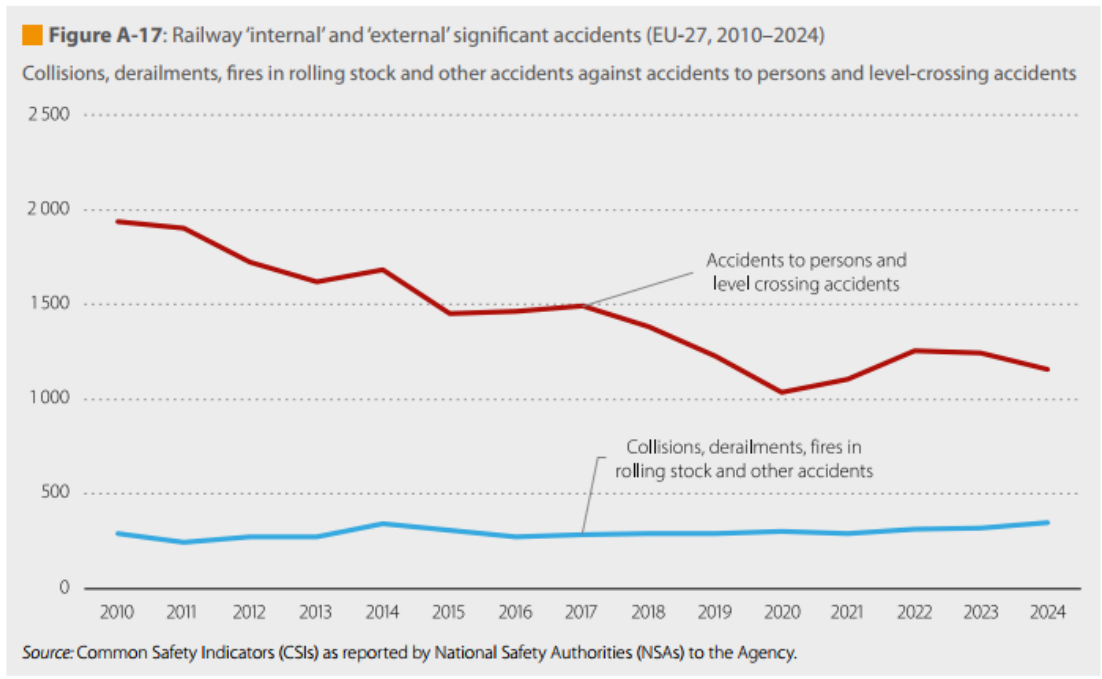
Collisions and derailments remain relatively limited in number.

External accidents dominate but have declined significantly over time.

Internal accidents remain relatively stable, with a slight increase in recent years.

Overall safety improvements are mainly driven by reductions in external events.





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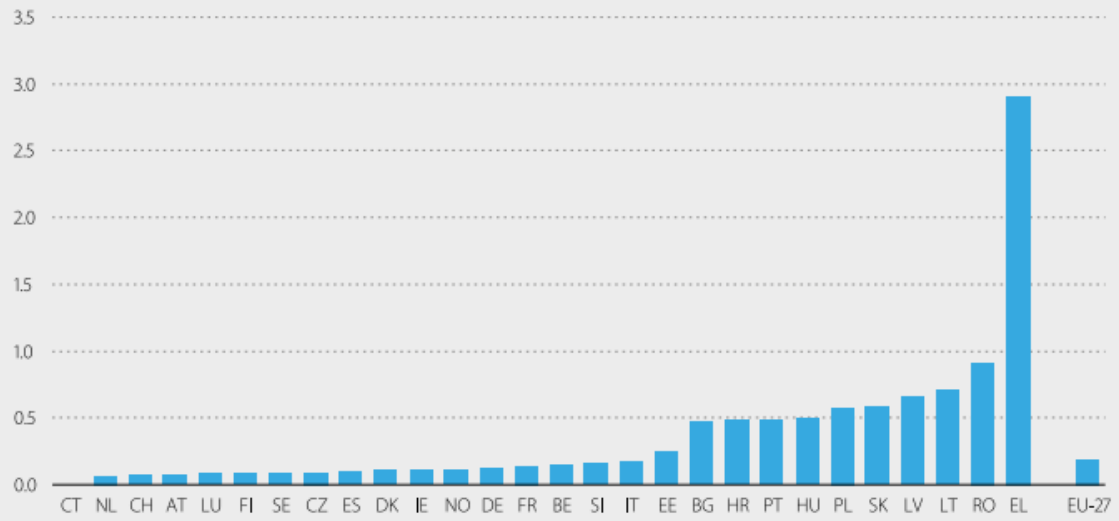
Railway fatality rates per country

The data reveal at least a 15-fold difference in fatality rates among EU countries with the lowest and the highest values and even wider 67-fold gap in passenger fatality rates.

While the overall safety level of the EU railway system is high, these differences indicate that safety performance is not yet uniform across countries, and that further progress is still needed.

Figure A-9: Railway fatality rates (EU-27 + CH + NO, 2022–2024)

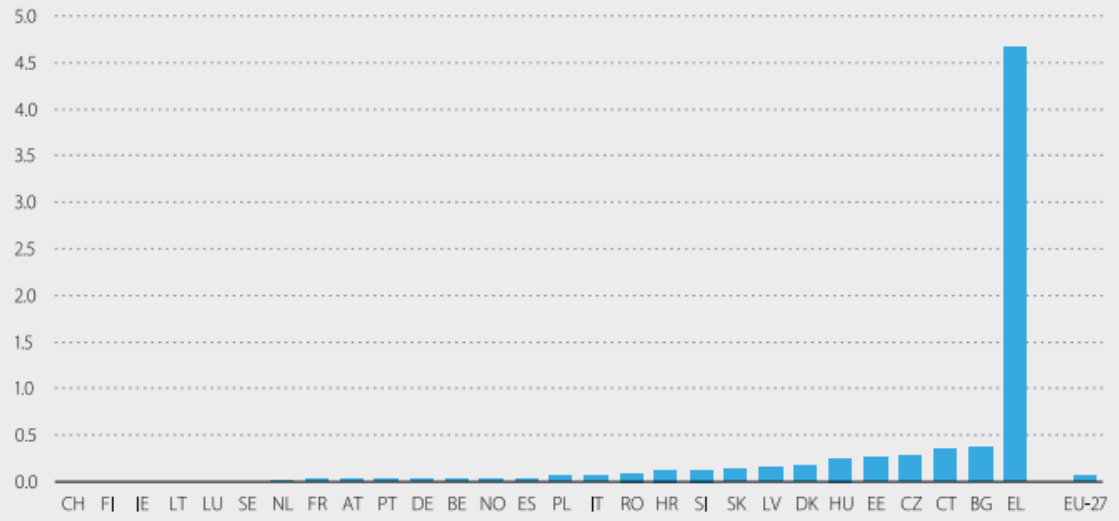
All fatalities per million train kilometers (average over 2022-2024)



Source: Common Safety Indicators (CSIs) as reported by National Safety Authorities (NSAs) to the Agency.

Figure A-10: Railway passenger fatality rates (EU-27 + CH + NO, 2014–2024)

Passenger fatalities per billion passenger kilometers (average over 2014-2024)



Source: Common Safety Indicators (CSIs) as reported by National Safety Authorities (NSAs) to the Agency.

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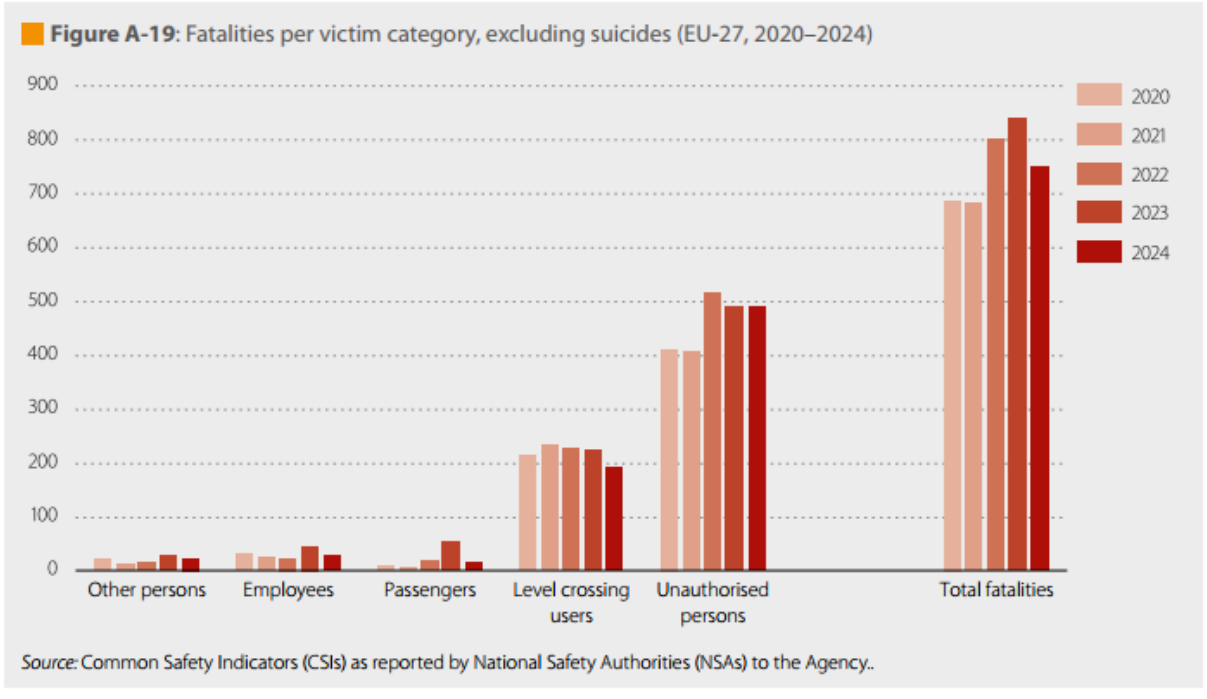
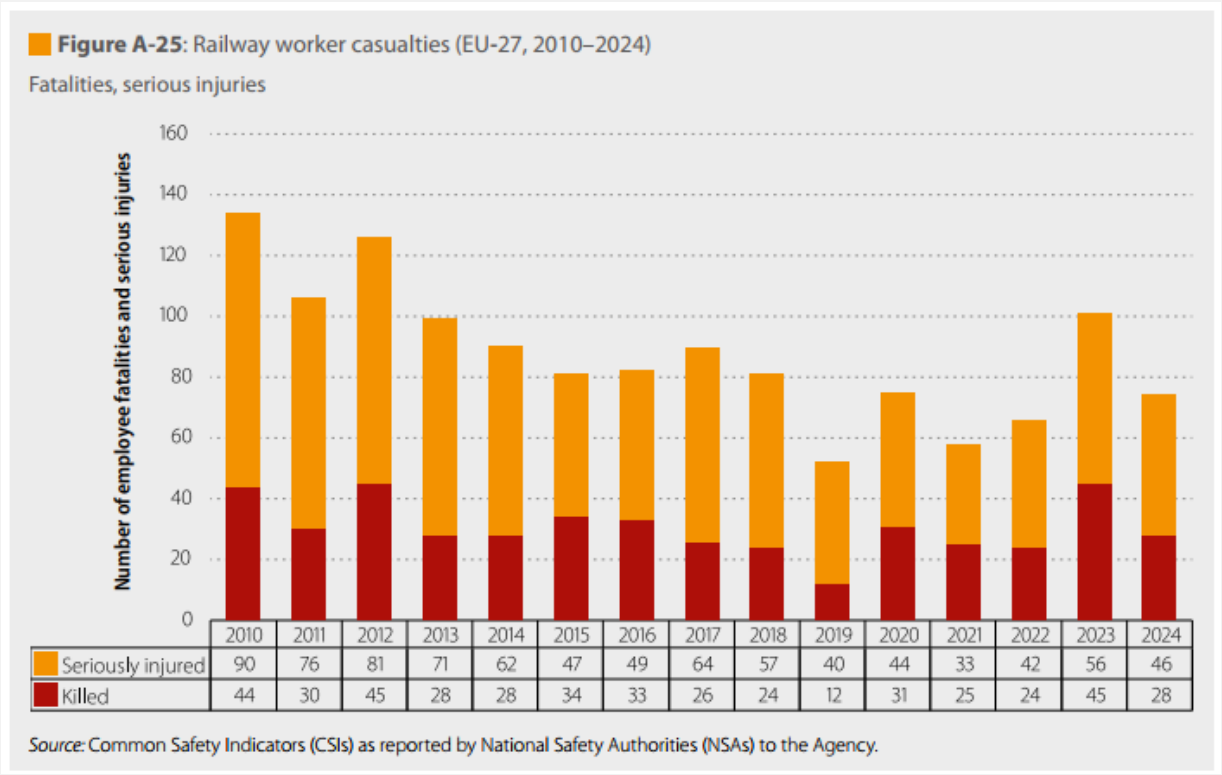
Railway fatalities per victim type



Member States reported 750 fatalities in 2024, a 11% decreased compared to 2023 mainly driven by the decrease in fatalities of passengers, LC users and employees.

Almost 70% of total EU fatalities on railway premises result from accidents to people (i.e. unauthorized persons).



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Seriously injured	90	76	81	71	62	47	49	64	57	40	44	33	42	56	46
Killed	44	30	45	28	28	34	33	26	24	12	31	25	24	45	28

No clear progress in reducing railway worker casualties in absolute terms has been observed in the last years. In 2024, 28 fatalities and 46 serious injuries were reported among railway workers in the EU-27.

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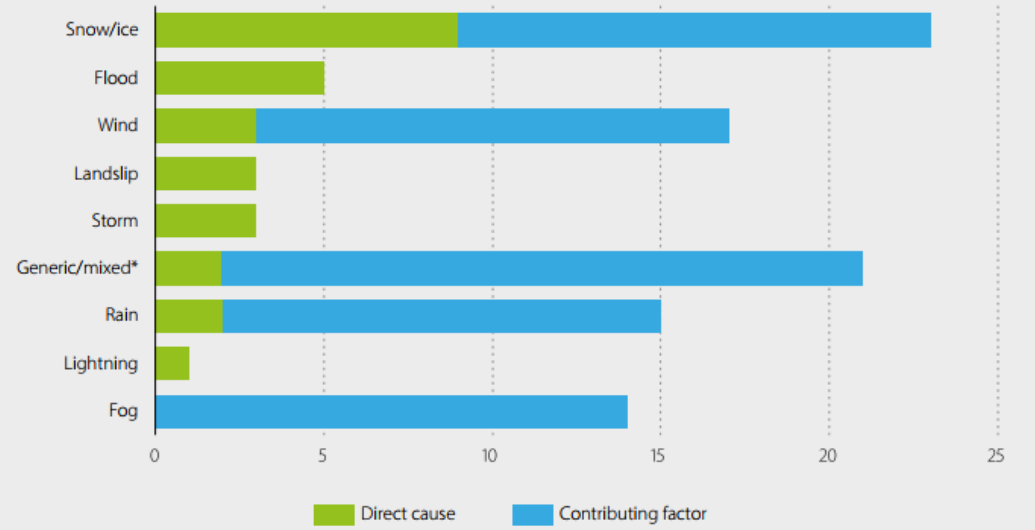
Weather-related occurrences

2026 Study

Figure A-33: Number of investigations of weather-related occurrences by cause / contributing factor (EU-27 + CH + NO, 2007–2025)



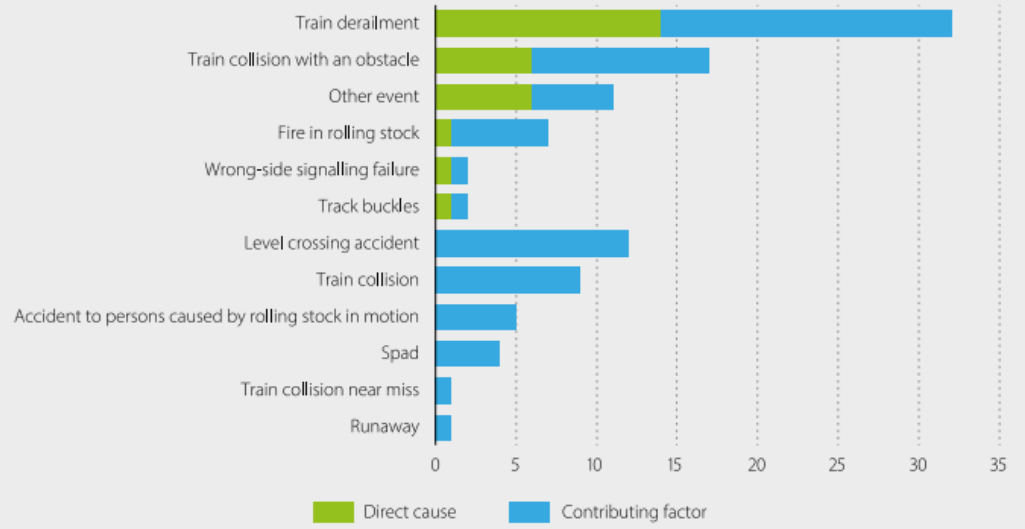
Note: Data for UK available until end 2020; (*) 'Generic/Mixed' indicates cases in which the weather event is not specified and/or with more than one weather condition.

Source: Final accident investigation reports sent to the Agency by the NIBs.

Train derailments and train collisions with obstacles are the types of occurrences most often caused, in whole or in part, by severe weather conditions or weather-related events.

The weather conditions most frequently directly causing investigated rail occurrences are snow and ice and flooding, followed by landslips, wind and storms.

Figure A-34: Number of investigations of weather-related occurrences by occurrence type (EU-27 + CH + NO, 2007–2025)



Note: Data for UK available until end 2020.

Source: Final accident investigation reports sent to the Agency by the NIBs.

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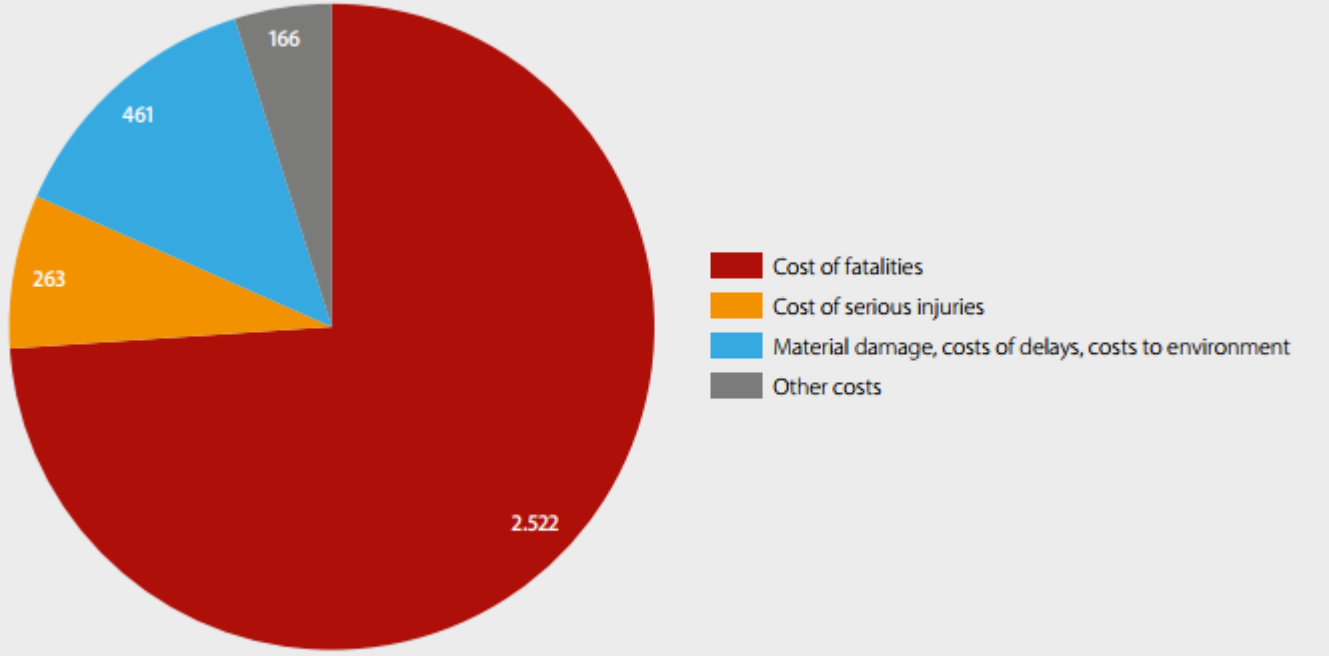
Costs of railway significant accidents

The annual economic cost of railway accidents in the EU remains high, at around €3.4 billion.

This highlights a persistent societal impact and the need for continued safety improvements.

The estimate is likely a lower bound, as it does not fully capture delay-related costs across all Member States.

Figure A-1: Estimated costs of railway accidents, million EUR (EU-27, 2024)



Notes: Other costs are those associated with modal shift, air pollution, administration, rerouting, reputational damage and productivity losses, and are estimated from unit costs developed by consultant for ERA.

Source: Common Safety Indicators (CSIs) as reported by National Safety Authorities (NSAs) to the Agency.

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Part B
Progress on Interoperability

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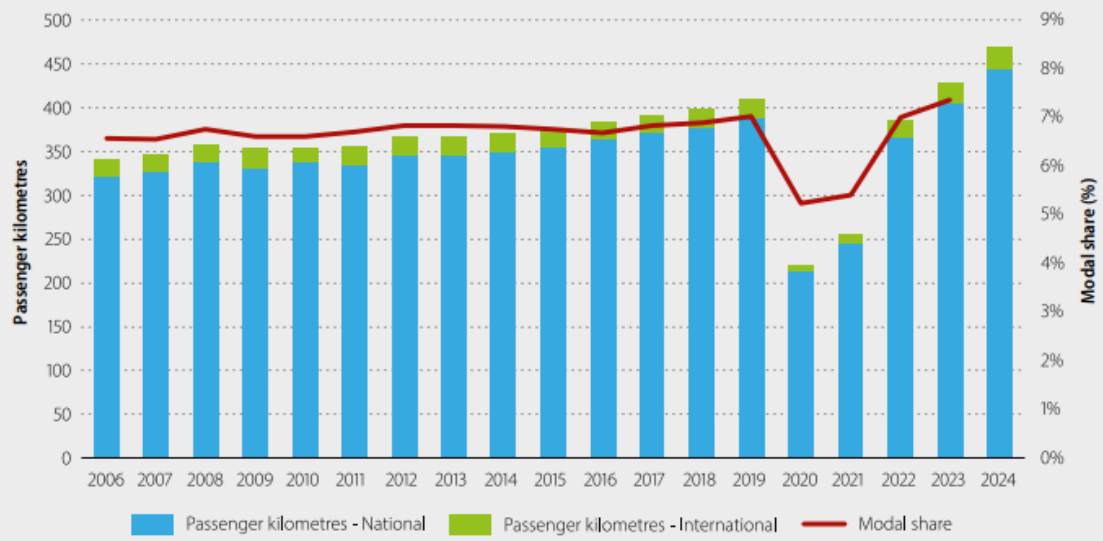
Rail transport figures

Rail passenger volumes entered a phase of sustained growth after the collapse caused by the COVID-pandemic. Passenger-km rose sharply in 2022 and continued to increase in 2023 and 2024, surpassing pre-COVID levels. By contrast, rail freight shows long-term stagnation in terms of both volumes and modal share.

International passenger activity remains a small component of total rail passenger volumes, while cross-border freight continues to represent a substantial share of overall freight movements.

Figure B-1: Rail transport figures (passengers, EU-27, 2006–2024)

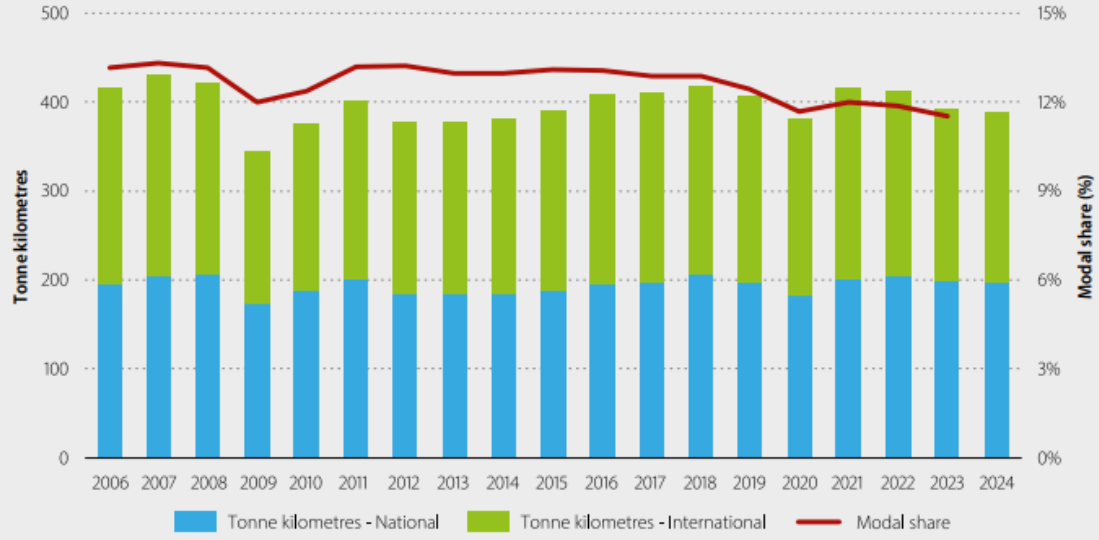
Passenger kilometres (billions) for domestic and international traffic and modal share (%)



Source: Estimations based on Eurostat tables 'rail_pa_total', 'rail_pa_quartal' and 'rail_pa_typepas', 2025 Statistical Pocketbook (Directorate-General for Mobility and Transport).

Figure B-2: Rail transport figures (freight, EU-27, 2006–2024)

Tonne kilometres (billions) for domestic and international traffic and modal share (%)



Sources: Estimations based on Eurostat tables 'rail_go_total', 'rail_go_quartal' and 'rail_go_typepas', 2025 Statistical Pocketbook (Directorate-General for Mobility and Transport).

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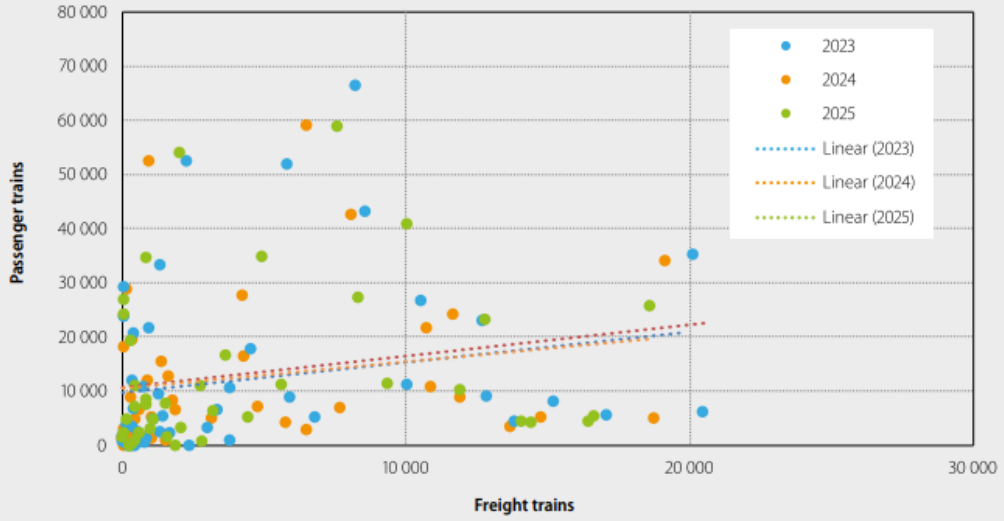
Cross borders train services/operations

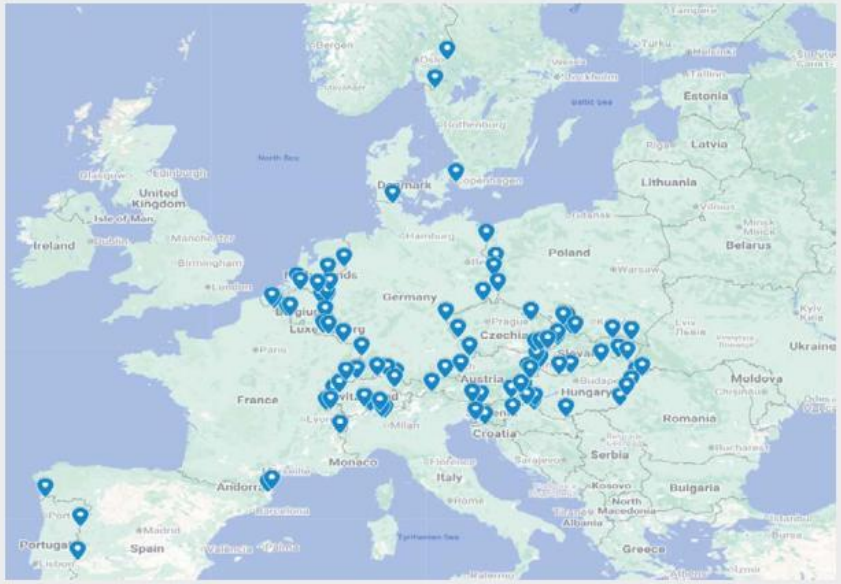
Traffic across the selected border sections in 2023–2025 varied from less than 1 to more than 56 freight trains per day and from 1 to almost 200 passenger trains per day; crossing volumes are significant for some sections but quite limited in other areas. Traffic for the majority of cross-border sections increased 20% for freight and 11% for passenger services.

Figure B-4: Number of (freight and passenger) trains crossing the selected border sections (2023–2025)



Source: RNE TIS (Train Information System).

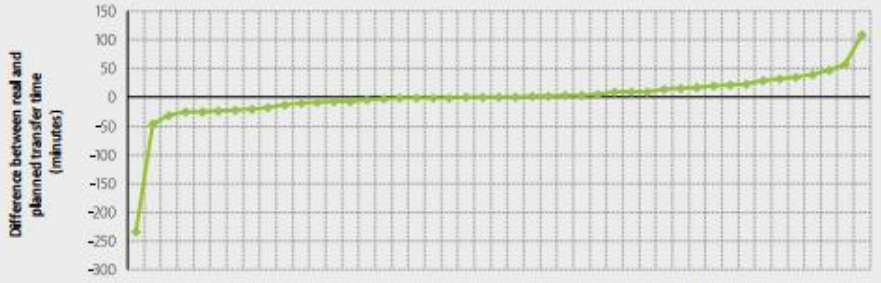
Figure B-3: Border crossing points included in the analysed dataset (location and border ID)



Source: RNE TIS (Train Information System).

For the majority of the border sections analysed, the average real transfer time for freight in 2023–2025 was lower or higher than the planned transfer time, indicating somehow a difficulty in precisely planning and respecting the timetable

Figure B-6: Difference between real and planned transfer times at selected border sections (international freight trains, 2023–2025)



Notes: For some borders the incorrect or missing data may influence the figures; only a limited sample of trains (compared to all trains crossing the border) was considered for calculations.

Source: RNE TIS (Train Information System).

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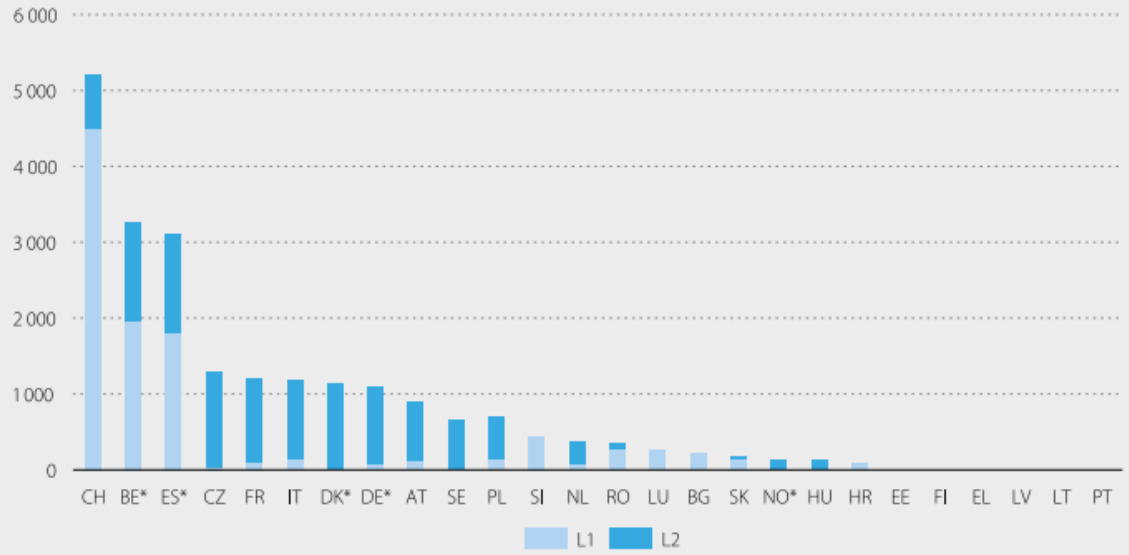
ERTMS trackside deployment

The deployment of the ETCS at EU level has been slow so far and varies considerably among Member States and among European Transport Corridors. At the end of 2025, about 22 000 km of railway lines were equipped with ETCS in the EU-27.

Figure B-18: Length of railway lines (whole network) equipped with the ETCS (EU MS + CH + NO, end of 2025)

Length in kilometers per ETCS level

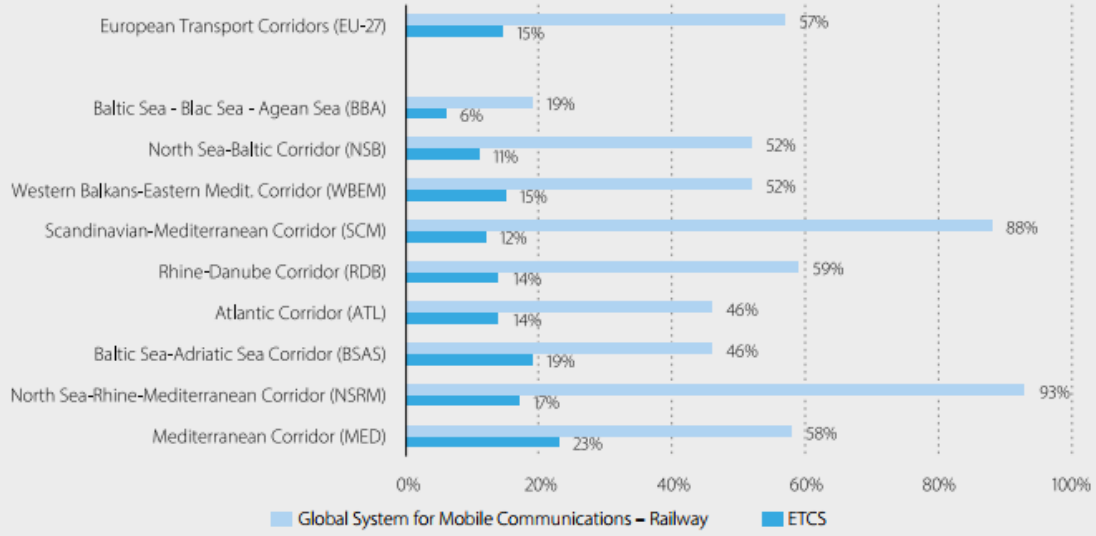


Note: * - Value/info received from IM.

Source: Register of Infrastructure (RINF), data extracted on 6 January 2026.

Figure B-19: Deployment of the ERTMS on European Transport Corridors (EU-27, end of 2024)

ETCS and GSM-R equipped lines among ETCs



Source: DMT / TENtec (Directorate-General for Mobility and Transport).

ERTMS deployment on the ETC network had reached 15 % (ETCS) and 57 % (GSM– R) at the end of 2024.

Progress has been uneven among individual corridors, the Mediterranean and North Sea–Rhine–Mediterranean corridors show the highest shares (around 23 % and 19 %, respectively), compared with 6–11 % elsewhere.

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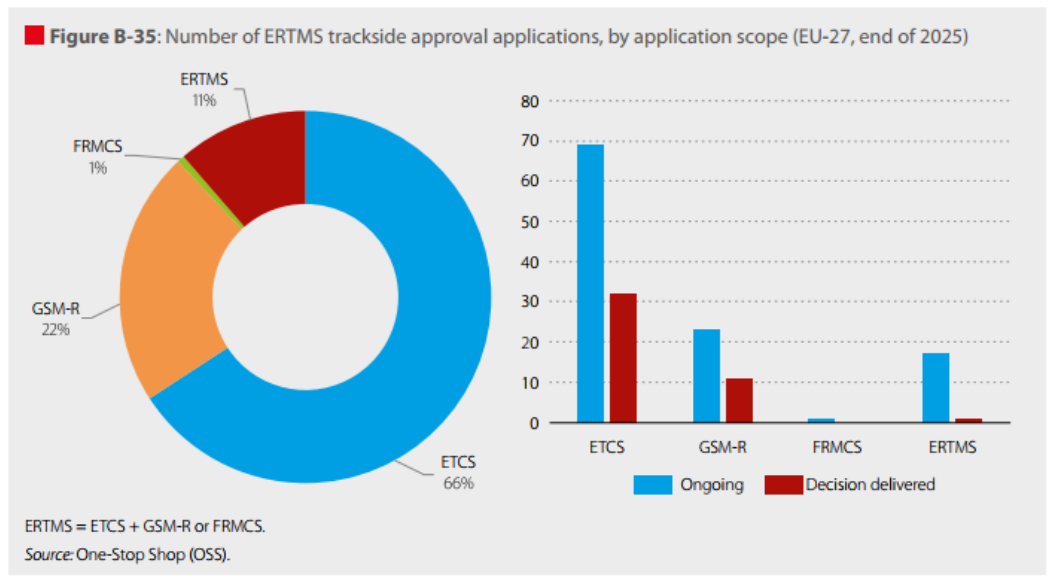
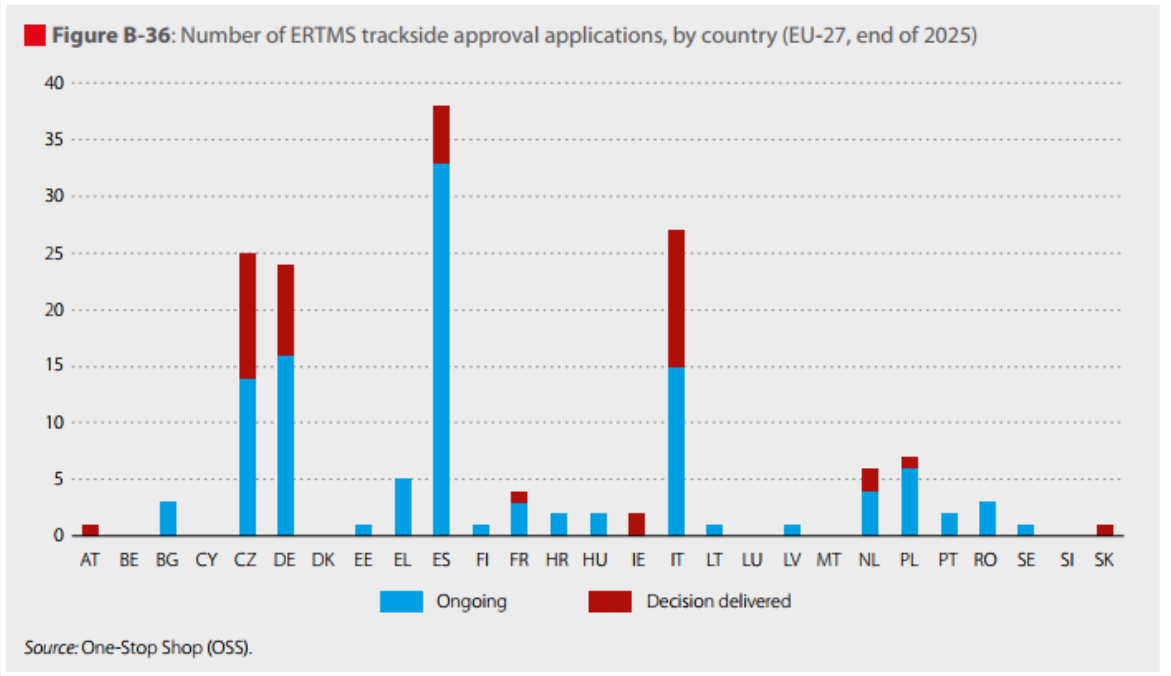
ERTMS trackside approvals

ERA had received 158 ERTMS trackside applications, of which 44 had been approved, while the ongoing applications were pending the completion (end of 2025).

This represents a substantial increase compared with the situation at the end of 2023, when only 14 approvals had been issued and around 100 applications were ongoing.





The distribution of applications by scope shows that the ETCS remains the dominant component, representing roughly two thirds of all requests.

The distribution of ERTMS trackside applications shows wide variation across Member States.

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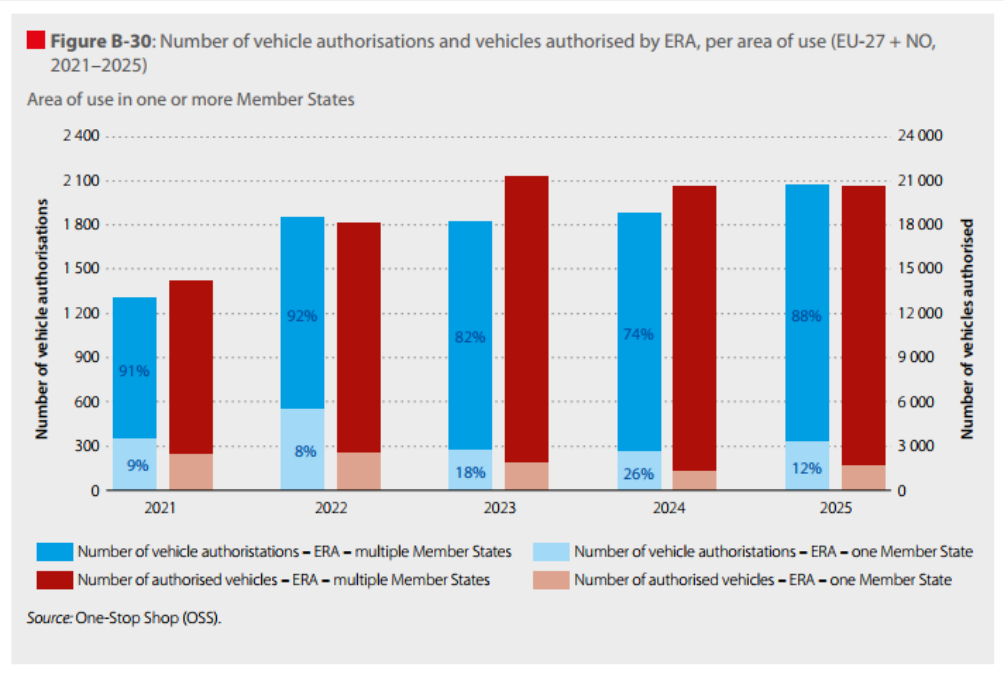
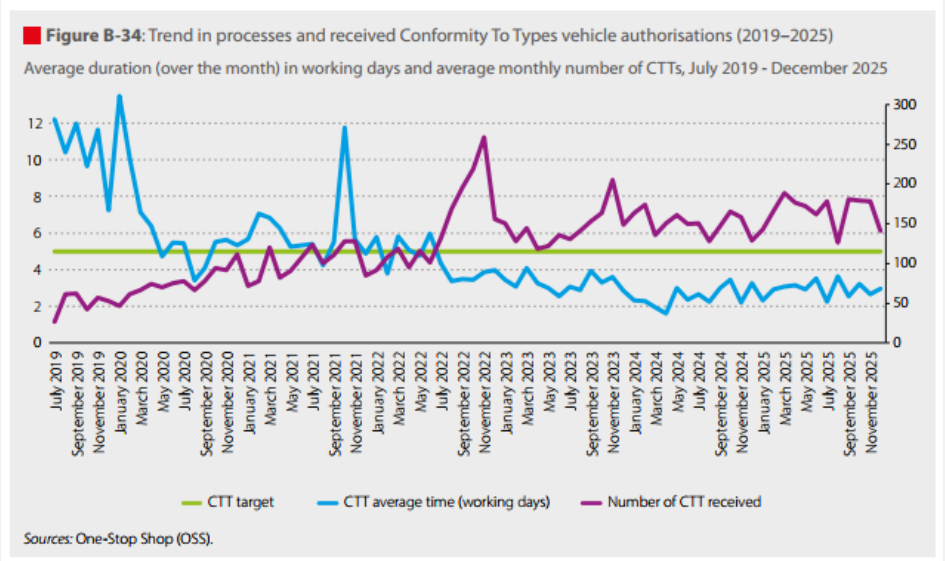
Vehicle authorisations and vehicle authorised

Around 2 000 vehicle authorisations were submitted and handled by ERA in 2025, with more than 21 000 vehicles authorised; the data demonstrate an increasing trend over the past years. Around 20 % of all vehicle authorisations handled by ERA since 2021 concerned an area of use in one country and 80 % an area of use in multiple countries.

The Agency receives approximately 60 % of all CTTs VAs in the EU, with an average time to obtain a VA in CTT well below the target cap of 5 working days.





The trends show that a higher number of CTTs corresponds to a progressive reduction in the time spent to deliver CTT-related vehicle authorisations.

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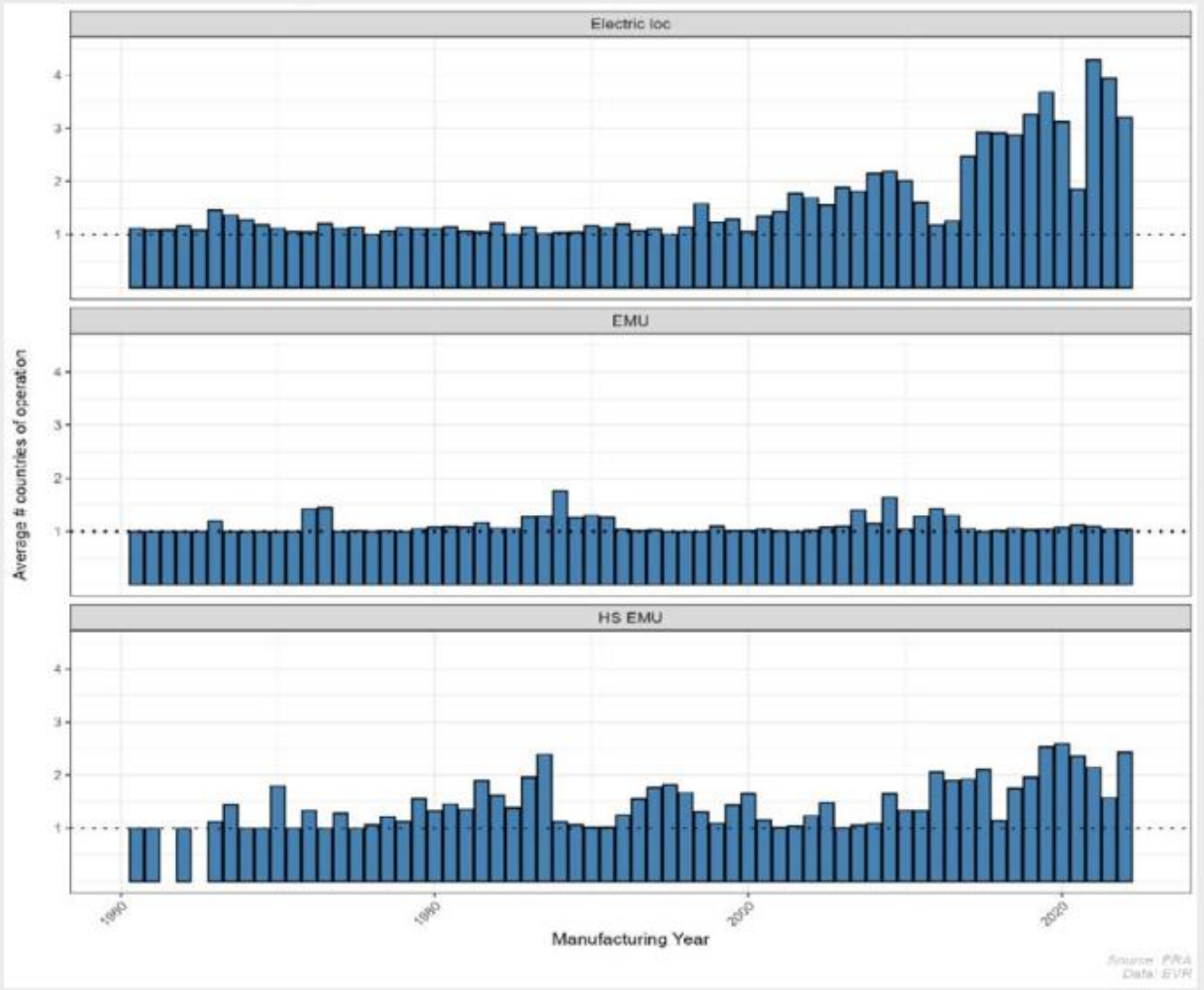
Area of use of traction vehicles

The data show a progressive increase in the average AoU for more recently manufactured electric locomotives and HS EMUs with valid registrations, suggesting that newer traction vehicles are designed and authorised for border operation.

This trend coincides with the consolidation of TSI-based requirements, the reduction of national technical barriers, the liberalisation of the railway market and the growing use of harmonised authorisation procedures.

Figure B-32: Evolution of the average area of use of different categories of traction vehicles (EU-27, 1960–2025)

Trend by manufacturing year



Source: EVR.

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Part C
Looking ahead: emerging challenges and the evolution of the report

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Emerging challenges

Proposed evolution of the Biennial Report:

- **Move to system-level analysis**, with more granular data, cross-border dimensions and performance indicators beyond accidents.
- **Strengthen support to SERA implementation**, focusing on ERTMS deployment, cross-border bottlenecks, vehicle authorisation streamline, TSI uptake and clean-up of national rules.
- **Integrate new strategic priorities**, including digitalisation, cybersecurity, cross-border operations, capacity optimisation and emerging technologies.
- **Develop a data-driven approach**, improving completeness, quality and interoperability of ERA registers to support evidence-based policymaking.
- **Expand scope to emerging EU priorities**, such as military mobility, environmental /climate, TEN-T implementation and high-speed rail development.
- …

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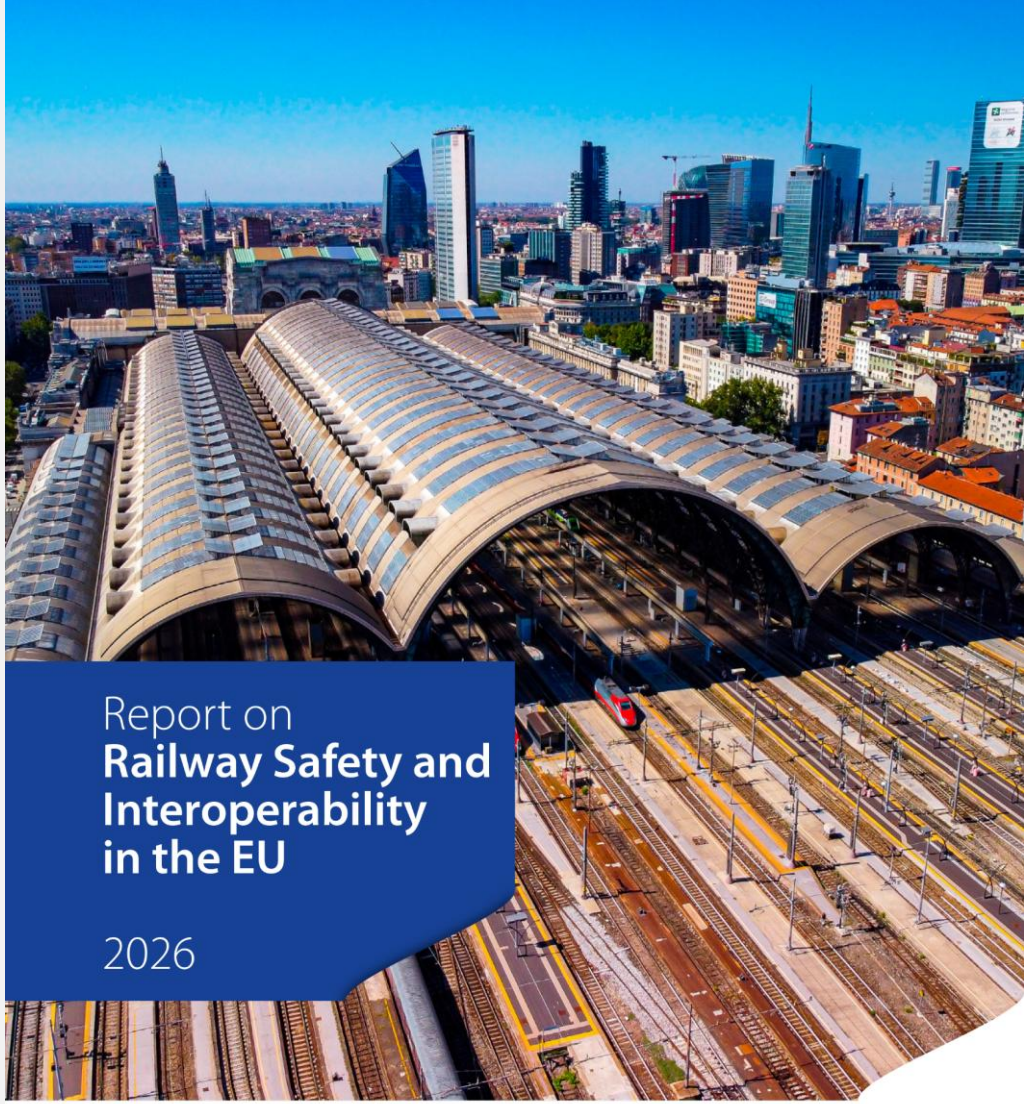

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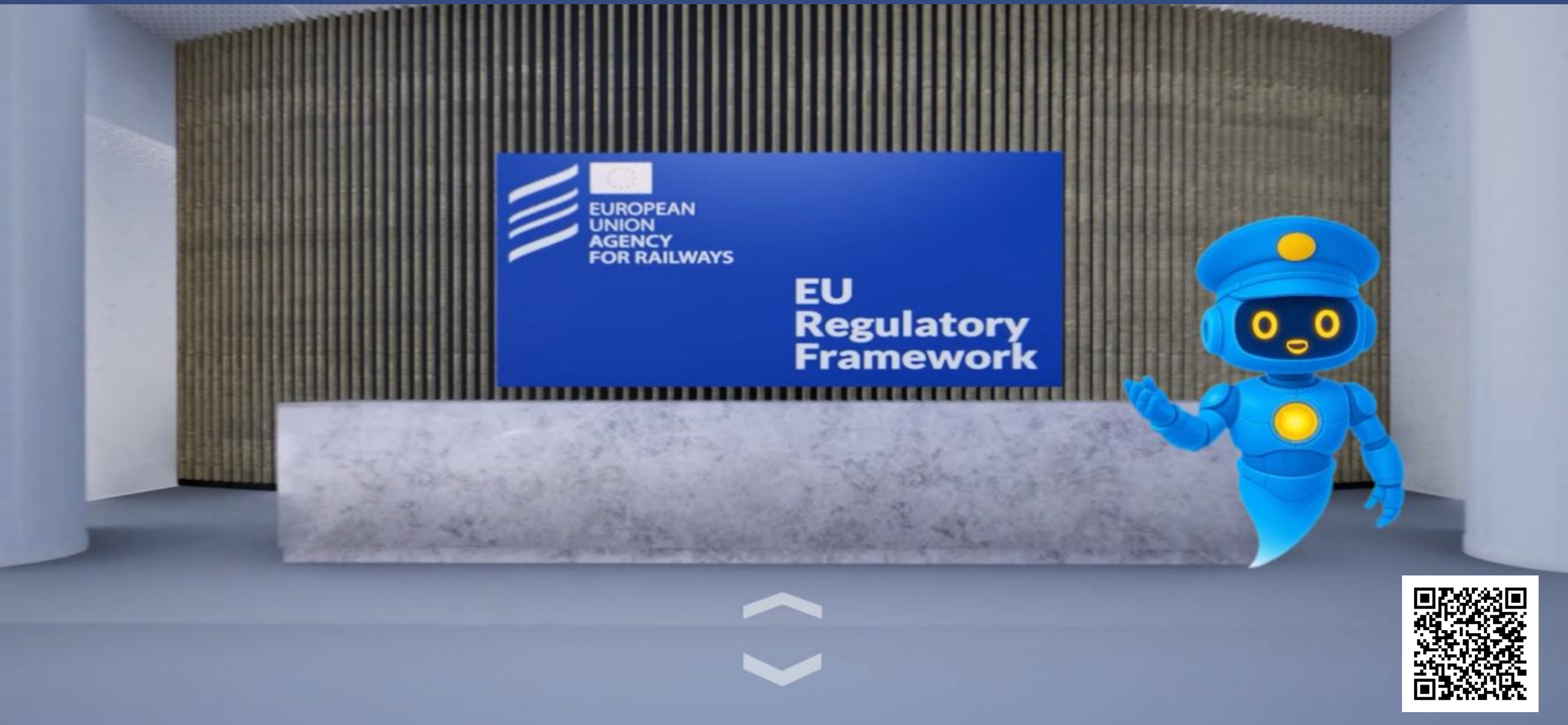
e-learning



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Webinar

Railway Vehicle Maintenance: A Shared Responsibility

15 September | 15:00 - 16:00

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