

AN COIMISIÚN UM RIALÁIL IARNRÓID
COMMISSION FOR RAILWAY REGULATION

RAILWAY SAFETY PERFORMANCE IN IRELAND 2024



Report notice

No person may produce, reproduce, or transmit in any form or by any means this report or any part thereof without the express permission of the CRR. This report may be freely used for educational purposes. Any enquiries about this publication should be sent to the contact details below.

Prepared by: Jake Austen Byrne
Reviewed by: Emmett Davis
Approved by: Brian Higginson

Commission for Railway Regulation
Temple House
Temple Road
Blackrock
A94 Y5W5
County Dublin
Ireland

www.crr.ie
+353 1 206 8110
info@crr.ie

Contents

8	Executive summary
11	Introduction
15	Railway safety trends in Ireland
47	Public representations
51	Railway safety trends in Europe
59	Accident investigations
71	References
73	Glossary

List of figures

1	IÉ passenger journeys	16
2	Passenger train-km on the IÉ-IM network	17
3	Freight train-km on the IÉ-IM network	17
4	Personnel engaged in full time employment with IÉ	18
5	Passenger injury statistics by year	22
6	Employee injury statistics by year (Railway Operations)	23
7	Employee injury statistics by year (Railway Infrastructure)	24
8	Employee injury statistics by year (IÉ-RU ECM)	25
9	Total collisions by year	26
10	Train collision statistics detail by year, part 2	27
11	Number of level crossings by year	28
12	Level crossings by type in Ireland	29
13	Train derailments by year	30
14	IÉ SPAD by year	31
15	Rolling stock incidents by year	32
16	Broken rails by year	34
17	Broken fishplates on the IÉ network, by year	35
18	Railway bridges struck by road vehicles	36
19	Luas passenger journeys and tram-km travelled	39
20	Number of road vehicle collisions involving a tram	40
21	Road vehicle collisions per million km run	40
22	Persons coming into contact with tram	41
23	Tram derailments	42
24	Red and Green line tram SPAS	43
25	Emergency brake applications	44
26	Bord na Móna derailments and level crossing incidents/accidents	45
27	Public representations to the CRR by year	49
28	CRR public representation by category	50
29	Significant accidents, fatalities, and serious injuries (EU 27, 2010–2023)	53

30	Major accidents in Europe (EU-27 + CH + NO + UK, 1980–2024)	54
31	Railway passenger fatalities rates (2013–2023)	54
32	Fatalities per million train kilometres (average 2021–2023)	55
33	Total precursor events by country, (EU-27 + CH + NO, 2019–2023)	56

List of tables

1	IE operational fatality and injury statistics by year	19
2	Train collision statistics detail by year, part 1	27
3	OTM occurrences	37
4	NIR occurrences on Irish railway network	38
5	RAIU investigations initiated in 2024	60
6	RAIU investigation reports published in 2024	61



Foreword

The Commission for Railway Regulation (CRR) is pleased to publish its Annual Safety Performance Report for 2024. This report supplements the CRR's Annual Report to the Minister and provides further detail on the safety performance of the railway organisations operating in Ireland. In 2024, there were 14 active railway organisations that fell under the CRR's remit for Compliance, Supervision and Enforcement activities. Of these 14 active railway organisations 13 were carrying members of the public (Bord na Móna being the railway organisation that does not carry members of the public).

2024 passenger journeys for heavy rail saw a continued upward trajectory and resulted in record numbers carried with a 9.9% increase relative to 2023 levels; this resulted in total passenger journeys for heavy rail being 50.66 million. 2024 passenger journeys for light rail had a 12.44% increase from 2023 levels, with the total passenger journeys for light rail being 54.2 million. It is notable that increases in passenger numbers in 2024 for both light and heavy rail continue to demonstrate the significant uptake of passenger services. These increases are most probably linked to a change in return-to-work patterns for office working post COVID and a potential modal shift towards public transport which is very positive for the rail sector. Significant investment in rail is foreseen over the coming years in terms of new trains, stations and services and there is continued optimism that Ireland's railways will prosper in the coming decades. Increasing passenger demand for the past number of years and continued upward trajectory supports this significantly.

The Iarnród Éireann (IÉ) network safety performance continued to be consistent with previous years and with current European statistics in terms of safety performance. Safety performance indicators such as major accidents, accidents and fatality rates remain low compared with all of the other 26 EU member states. There were no passenger fatalities in 2024. Tragically in 2024 there were 12 fatal occurrences on the national railways where the fatal injury involved a train in motion and where trespass or misadventure was involved. All of these occurred on the Iarnród Éireann heavy rail network. 12 fatal occurrences fall within the 10-year data range albeit at the extreme upper end with just one other year with the same number of fatal occurrences where trespass or misadventure were involved. IÉ notify all fatalities to the CRR and subsequently the CRR Compliance, Supervision and Enforcement Department reviews each one in turn. If there are notable trends or issues arising, these are also raised at the respective Safety Performance Review Meetings (SPRMs) with IÉ Infrastructure Manager (IÉ-IM) and IÉ Railway Undertaking (IÉ-RU). The CRR are also kept updated on the outputs of the IÉ-IM and IÉ-RU Critical Incident Steering Group, which was established to identify and review whether any additional risk mitigations could potentially be put in place to address self-harm incidents on the railway.

In relation to Signals Passed at Danger (SPAD) events on the IÉ network, there were 11 events in 2024, the same as in 2023. When reviewed as part of the 10-year data set, the SPAD trendline continues on a moderate downward trajectory, which is viewed as broadly positive. However, it is of note that SPAD events appear to be plateauing in the range of 8 to 13 since 2016, and the CRR will continue to monitor this indicator closely. Each SPAD event on the IÉ network receives a separate review by the CRR, as SPAD events, due to their nature, can potentially be high consequence occurrences. Of the 11 SPADs recorded, 10 involved IÉ-RU trains and 1 involved Rhombeg Sersa Ireland (RSIE), a regulated entity which carries out on-track maintenance on the network. One of the 11 SPAD events in 2024 was risk-ranked as 'high' by IÉ. High risk SPADs are a critical accident precursor and even a single instance is considered unacceptably high. Such events receive additional focus within the CRR's post-occurrence activity reviews.

In 2024, train collisions reached a record high of 158 total collisions, representing a 375% increase since 2015. The primary driver of this increase in 2024 was a significant rise in collisions with obstacles on the line, with collisions with trees (31) and branches (7) accounting for over half of the total increase. High numbers of these collisions aligned with Storms Isha, Jocelyn, Ashley and Darragh, each of which achieved Storm Force wind speeds in excess of 100 km/hr in parts of the country. The increasing frequency and severity of storms will likely continue to influence collision numbers going forward, and the CRR is monitoring this trend in the context of network resilience and emergency preparedness. Large animal collisions, primarily involving deer, also remained high in 2024, with a very slight increase from 2023. IÉ's primary mitigation has been the continued erection of deer fencing on an annual basis, and IÉ continue to engage with the Irish Deer Commission and share data with them with a view to improving the risk management of deer adjacent to the railway line.

Of note in 2024 were a number of Road Rail Vehicle (RRV) incidents in the heavy rail sector. In 2024, there were 12 RRV incidents investigated by IÉ-IM, of which 9 were reported to the CRR. These included 4 derailments, 2 collisions, 1 possession irregularity resulting in a SPAD, 1 overturned RRV and 1 incident of an RRV colliding with a member of staff. RRVs introduce particular risks given that operatives are typically not from a railway background and are operating machines adapted for a very different environment to mainstream construction settings. This area remains a particular focus for the CRR. IÉ-IM has committed resources towards improving contractor safety, and the CRR will continue to review and follow up on RRV-related occurrences within the respective SPRMs. These incidents serve as a reminder to all staff to ensure safe systems of work are established and followed, particularly when working in an environment where live trains are in the vicinity.

Fire and smoke related incidents on IÉ-RU rolling stock increased again in 2024 to 25, the highest level since 2017 and a continuation of an upward trend observed across the 10-year period. 9 of the 25 incidents were categorised as fires, occurring primarily on 29000 DMUs, with further incidents recorded on Mark IV carriages and 22000 DMUs. In general, these were caused by fuel and oil leaks coming into contact with hot powertrain components. In 2024, IÉ-RU CME completed a bow tie analysis of fire and smoke events and developed an improvement process to reduce the likelihood of future incidents on the 29000 fleet. The CRR is monitoring the implementation of these improvements at periodic meetings. As a direct result of this continued increase in fire and smoke incidents the Compliance Supervision and Enforcement department of the CRR were considering committing more resource to review these occurrences and implement a means of notification etc.

In relation to broken rails, there were 4 reported on the IÉ network in 2024, consistent with the revised 2023 figure. While the number did not increase year-on-year, it remains higher than the levels seen between 2015 and 2022 and is a cause for ongoing concern, particularly given that no broken rails were reported in 2022. Of the 4 broken rails in 2024, 2 were formally notified to the CRR. The RAIU concluded two investigations in 2024 relating to broken rail incidents from 2023, resulting in 8 safety recommendations, the implementation of which are kept under ongoing review by the CRR. The total number of bridge strikes decreased from 99 in 2023 to 80 in 2024, which is a welcome reduction and the lowest figure since 2020. Some bridges remain more susceptible to strikes than others and these are well known to IÉ-IM, though the risk control measures can be complex to implement, involving planning and coordination with local authorities. Over-height vehicle detection systems were commissioned at UBC145 and UBC146 in 2024; unfortunately, both bridges subsequently suffered strikes, highlighting that such warning systems are dependent on road users adhering to them.

Safety performance on the Luas network was, in the main, broadly consistent with previous years. Tram Signals Passed at Stop (SPAS) decreased to 25 in 2024, following a record high year for SPASs on the network in 2023; this was a welcome development. Each SPAS event is reviewed by a CRR inspector with a relevant TDLR staff member to ensure that sufficient causal investigation is undertaken and that TDLR manage the associated safety risk. TDLR senior management also meet the CRR periodically to review SPAS trends in detail to ensure TDLR are undertaking sufficient actions to address undesirable trends. In terms of tram derailments, 2024 was a record low with no derailments recorded, which is a very positive safety outcome. Road traffic collisions involving trams increased in 2024; however, overall numbers remain significantly lower than pre-pandemic levels, with the road traffic collision rate per million tram kilometres remaining among the lowest recorded since data collection began in 2010. The majority of collisions involved either a car breaching a red light or vehicles undertaking conflicting movements with trams at junctions, with the exception of one collision, all occurring on the Red Line.

Tram contact with pedestrians or cyclists increased to 12 in 2024, up from 7 in 2023. 7 of these incidents involved contact with no injury, while the remaining 5 required on-site first aid and removal to hospital via ambulance. These incidents are subject to reviews with Safety Performance Review Meetings with Transdev. Emergency brake applications decreased slightly in 2024 to 838, down from 851 in 2023, which is a marginally positive development. However, EB application levels remain elevated and continue to reflect high levels of pedestrian incursions and road vehicle red light infringements on the network. The CRR continues to review emergency brake application trends with TDLR senior management within SPRMs, and TDLR is developing additional measures to address driver performance and pedestrian safety at key locations along the network.

In 2024, the Railway Accident Investigation Unit (RAIU) concluded 3 investigations and issued 1 Urgent Safety Advice Notice. These resulted in 14 new safety recommendations, the majority of which, 12, were directed to IÉ. The RAIU also commenced 7 new investigations in 2024, all of which involved IÉ. Each RAIU recommendation is made with a view to improving safety on the Irish railway system and should be addressed in a timely fashion by the entities responsible, to ensure the network not only remains safe but continues to improve. The CRR will continue to monitor the implementation of all outstanding RAIU recommendations as part of its ongoing compliance, supervision and enforcement activities, and will escalate the closure of recommendations where necessary.

Looking at performance in the context of Europe, Ireland continues to perform well in terms of the number of accidents when compared to European Union Agency for Railways (ERA) data up to 2023. Passenger and overall fatality rates remain among the lowest of all EU member states. Ireland performs less well, however, when it comes to the ratio of precursor events to accidents, with events such as SPADs, wrong-side signalling failures, track buckles and broken rails featuring. ERA reports continue to note concerns regarding variations in accident precursor data collection practice between Member States, and it is anticipated that further harmonisation of data collection will be implemented in the future to improve consistency and quality across the EU. The CRR remains mindful that Ireland's relatively small network – of approximately 1,680 route km – means that a single significant accident could materially alter our currently strong European ranking. Maintaining and improving safety performance as passenger numbers grow, new rolling stock is introduced, and services expand will require sustained effort and commitment from all regulated railway organisations. The CRR acknowledges the assistance of all who have provided data that has enabled the publication of this report.

Emmett Davis

Principal Inspector – Compliance, Supervision and Enforcement Department

Executive summary

This Annual Safety Performance report of the Commission for Railway Regulation (CRR) is prepared for stakeholders and the public as per the functions described in Section 10 of the Railway Safety Act 2005 as amended. The data used to compile this report is provided periodically throughout the year by the various regulated Railway Organisations (ROs). This data is requested to be provided as per a data specification provided by the CRR. This report aggregates this data and compares year on year performance along with commentary on safety performance indicators.

The CRR is the railway safety regulator in Ireland and is responsible for overseeing the safety of all ROs, which in 2024 included Iarnród Éireann – Infrastructure Manager (IÉ-IM), Iarnród Éireann – Railway Undertaking (IÉ-RU), Transdev Dublin Light Rail (TDLR) the Luas operator, Rhomberg Sersa Ireland (RSIE), Translink (NIR), Transport Infrastructure Ireland (TII), Bord Na Móna (BnM) (where their railway interfaces with public roads), the Railway Preservation Society of Ireland (RPSI), seven isolated heritage railways and a Velorail operator.

The safety performance of the Irish railway sector remains broadly positive. The data for 2024 shows a record high numbers of passenger and kilometres travelled. Safety performance indicators such as major accidents, accident and fatality rates remain low. There has been an increase in certain safety performance indicators such as collisions and fire/smoke incidents, while others such as SPADs and broken rails remain largely unchanged.

There were no passenger fatalities in 2024, however there were 12 fatal occurrences on the conventional railway network where trespass or suspicious death was indicated. All the above 12 fatalities occurred on the IÉ network. In response to the observed increased fatalities IÉ-IM and IÉ-RU have established a Critical Incident Steering Group to identify preventative measures related to self-harm incidents.

IÉ saw an increase in the number of train collisions, 158 in 2024, a further increase on what was an already high number in 2023. The data demonstrates this increase was driven by collisions with branches and trees on the line. High instances of these collisions aligned with Storms Isha, Jocelyn, Ashley and Darragh. The increase of the number and severity of storms will likely continue to have an effect on the number of collisions going forward. Collisions with large animals, mainly deer, also remained high. IÉ continue to engage with the Irish Deer Commission and are sharing data on deer strikes with them, with a view to improve the risk management of deer adjacent to the railway.

Despite recent efforts to address the high number of Signals Passed at Danger (SPADs), the annual figure has remained at 11, the same as 2023. 10 of these involved IÉ-RU trains while another Railway Undertaking (RU), Rhomberg Sersa Ireland had 1 SPAD. An indicator which has increased, fire/smoke incidents, has gone from 19 in 2023 to 25 in 2024.

TDLR's safety performance indicators saw an increase in road traffic collisions between trams and vehicles in 2024. However, overall numbers remain significantly lower than pre-pandemic levels with the Road Traffic Collision rate per million tram kilometres increasing by 0.19 in 2024. The majority of collisions involved either a car breaching a red light or involved cars undertaking conflicting movements with trams. Tram Signals Passed at Stop (SPAS) have decreased for the first time post-COVID which is a welcome development. Tram contact with a pedestrian/cyclist has increased to 12, 5 more than was reported in 2023. 5 of the 12 required on site first aid and removal to hospital via ambulance for the injured party.

Looking at performance in the context of Europe, Ireland continues to perform well in terms of the number of accidents compared to European Union Agency for Railways (ERA) data up until 2023, (via the Safety Overview as published directly on the ERA website). Ireland performs less well when it comes to the ratio of precursor events to accidents. Such events are, SPADs, wrong-side signalling failures, track buckles and broken rails. ERA reports continue to note concerns regarding variations in accident precursor data collection practice between Member States. It is foreseen that further harmonisation of the data collection will be implemented in the future to improve data consistency and quality from member states.

In 2024, the Railway Accident Investigation Unit (RAIU) concluded 3 investigations and issued 1 Urgent Safety Advice Notice. These resulted in 14 new safety recommendations, the majority of which (12) were directed to IÉ. The RAIU commenced 7 investigations in 2024, all of which involved IÉ. Each RAIU recommendation is made with a view to improve safety on the Irish railway system and should be addressed in a timely fashion by the entities responsible to ensure the network not only remains safe but continues to improve in terms of safety.



1. INTRODUCTION



1.1 Introduction

This is the sixteenth Annual Safety Performance Report produced by the CRR, prepared for the use of stakeholders and the public. This report presents a number of high-level statistics and safety performance indicators, with associated commentary on their significance. These safety performance indicators are based on the Common Safety Indicators (CSI) defined in European Union Directive 2016/798, as amended, for conventional heavy rail systems. For light rail systems (i.e., Luas) heritage railways and Velorail (those solely for historical or tourist use) additional indicators are used to analyse the risks deemed to be particular to those sectors in Ireland (see sections 2.5–2.7 for further detail).

1.2 Overview of report

Safety trends in Ireland for all railway systems are presented and discussed in Chapter 2. In Chapter 3, an overview of relevant representations received by the CRR in 2024 is presented, while in Chapter 4 the safety performance of the Irish heavy rail system is reviewed in the context of European Union (EU) member states. This chapter also includes a brief overview of significant accidents that occurred worldwide in 2024. Finally, Chapter 5 concerns the RAIU, and recommendations made arising out of their investigations. The status of each recommendation is presented along with details of the actions taken to date.

1.3 The CRR

The CRR was established on the 1st of January 2006 under the Railway Safety Act 2005. It is the independent railway safety and market regulator for heavy rail. It is also the independent safety regulator for light and tourist railways in Ireland. The CRR's role is largely defined in the EU regulatory framework for the Single European Railway Area. Under the Railway Safety Directive (EU Directive 2016/798/EC), as transposed in Statutory Instrument (S.I.) No.476 of 2020, the CRR is the National Safety Authority (NSA) for heavy rail in Ireland. The CRR is also the railway safety regulator for the light rail, heritage railways, Velorail and the interface between industrial rail systems and public highway interfaces. These systems are regulated under the provisions of the aforementioned Railway Safety Act, as amended, and are not within scope of the EU regulatory framework for heavy rail.

As stated in the 2024 – 2027 Statement of Strategy, the CRR's mission is to ensure safe, secure, accessible and sustainable railway systems through effective and efficient regulation. It advocates the participation of all stakeholders in the further development of Ireland's rail sector so that it is a safe and efficient mode of transport that benefits our society.

Further details on the role and function of the Commission may be found on the CRR website www.crr.ie.

1.4 Statistical qualification

The CRR produces this report to provide stakeholders with information regarding the safety performance of Irish railways organisations. While the CRR intends for this information to be accurate, any errors should be brought to the CRR's attention so the necessary corrections can be made.

It is important to note that the figures used in this report are intended to illustrate broad trends and are not meant to be read as exact calculations. Rounding has been used, and this could affect the overall data. The data used to compile this report is provided to the CRR periodically throughout the year by the various ROs. This report presents aggregated data and compares year on year performance with commentary on several safety performance indicators.

While the CRR has made every effort to ensure the accuracy of the data, it takes no responsibility for third party data presented in this report.



2. RAILWAY SAFETY TRENDS IN IRELAND



2.1 Introduction

The safety performance of the ROs in Ireland is presented below and is ordered with regard to the four principal railway sub-sectors that the CRR regulates: heavy rail, light rail, public interfaces (of industrial railways), and heritage railways.

2.2 Iarnród Éireann Railway (Ireland's conventional system)

2.2.1 Operational statistics

At the end of 2024, Irish Rail Iarnród Éireann – Infrastructure Manager (IÉ-IM) reported that its network comprised a total of 2,125 km of operational line, 53 km of which is electrified, and 526 km which has train protection system coverage (Continuous Automatic Warning System (CAWS), Automatic Train Protection (ATP) or CAWS & ATP)¹.

Figure 1
IÉ passenger journeys



Figure 1 shows passenger journeys continued to increase in 2024, exceeding pre-COVID-19 levels and set a record high. An Irish Rail report contributes this to a move from hybrid working to increased office attendance, major events in Dublin, and the increase in services to Belfast, Galway and Waterford.² A further increase in 2025 is expected.

1. IÉ-IM Annual Safety Report 2024. Note figures as reported within the 2024 Network Statement do not align in full with the 2024 IÉ-IM Annual Safety Report 2024. Issues remain within the reports for 2024. The CRR have highlighted where differences have been noted at the time of drafting this report and IÉ-IM have noted where the respective updates are to be implemented in future versions to ensure alignment of both reports.

2. Iarnród Éireann Annual Report: Year Ended 31 December 2024.

Figure 2
Passenger train-km on
the IÉ-IM network

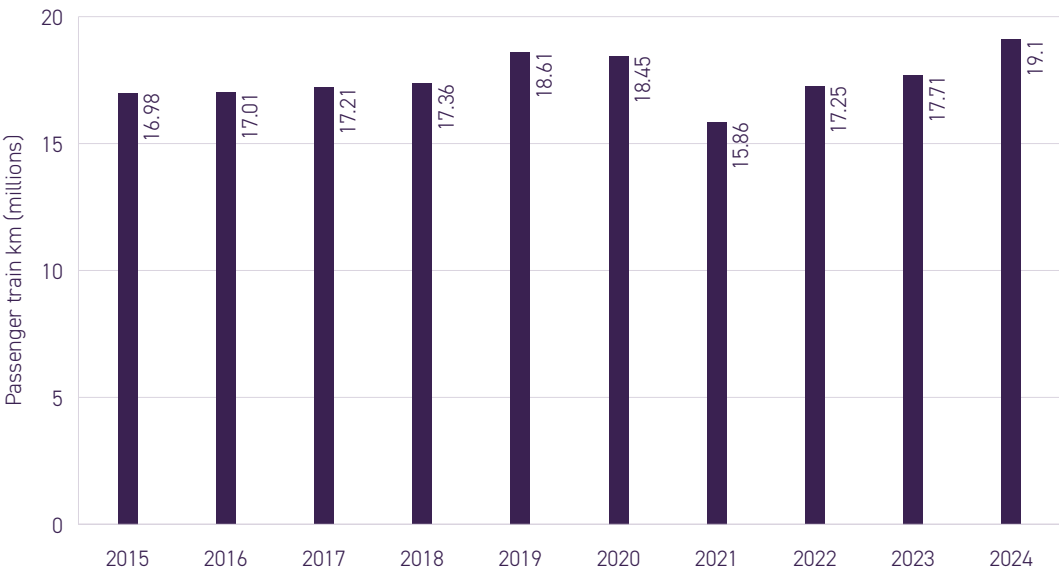


Figure 2 shows that IÉ passenger train kilometres also rose to a record high, exceeding pre-pandemic levels. This was likely supplemented by the addition of an hourly Dublin-Belfast service (15 per day per direction) and increased services on the Galway and Waterford routes.

Figure 3
Freight train-km on
the IÉ-IM network

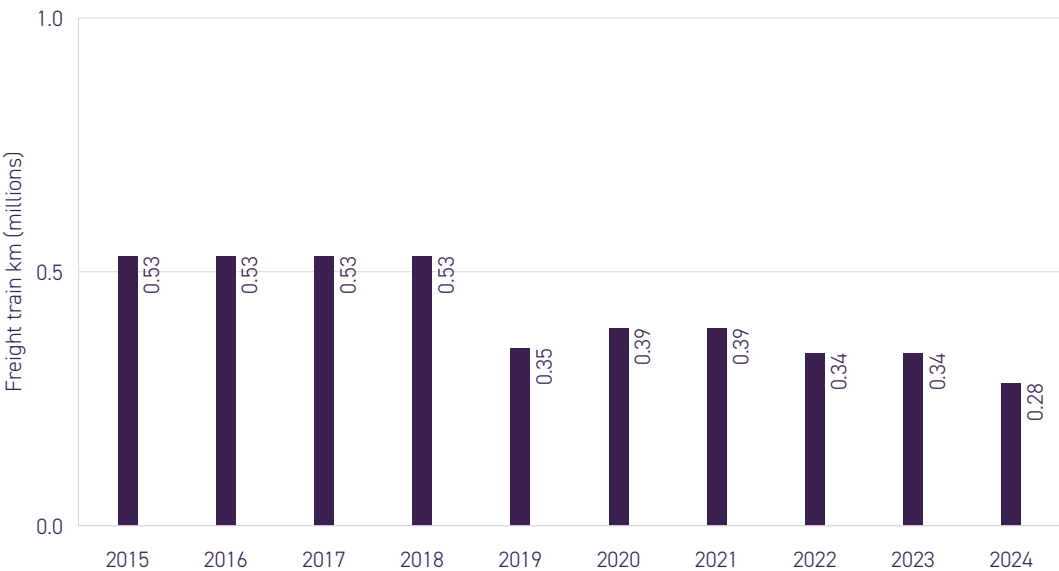
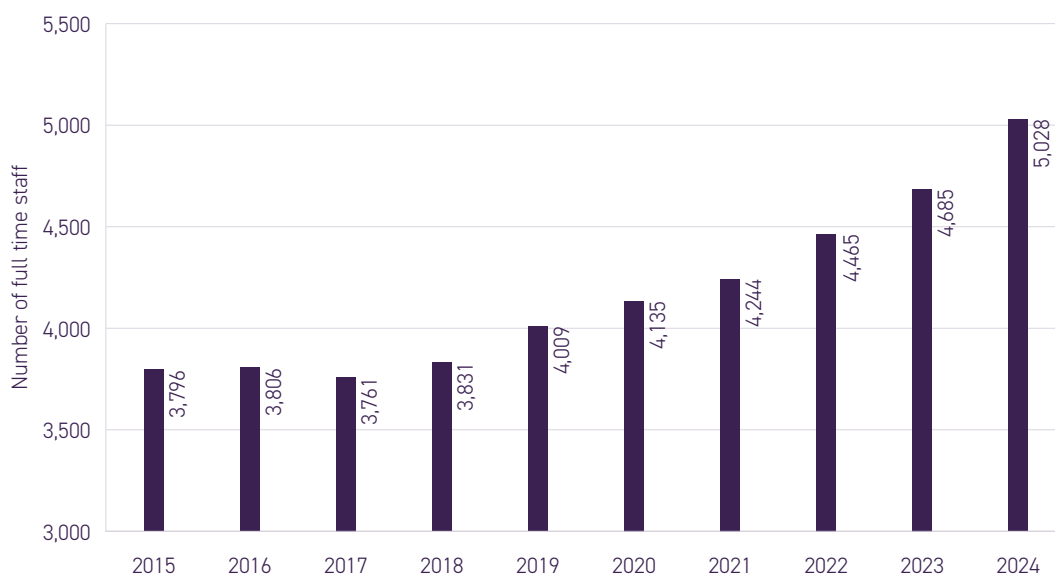


Figure 3 shows that freight kms have decreased to a historically low level. This decrease is likely due to the cessation of ore transport following the temporary closure of Tara Mines in 2023. Although the mines reopened in late 2024, the transport of ore by rail did not resume. IÉ are currently working towards increasing freight utilisation on the network through its Rail Freight 2040 Strategy (the Foynes line is expected to reopen in 2026). The second half of 2024 saw the introduction of two new Dublin Port to Ballina freight services. Irish Rail also refurbished 12 freight wagons in 2024, with 12 more to be completed in early 2025. Additionally, funding was secured for the purchase of 150 new freight wagons (expected in 2027). This indicates Irish Rail are endeavouring to increase freight services, which will potentially increase over the coming years.

Figure 4
Personnel engaged in
full time employment
with IÉ



IÉ is composed of two ROs, IÉ-IM and IÉ-RU. Figure 4 shows the number of full-time staff increased by 7% in 2024. A notable and sustained increase in staff has been observed since 2018, with the total increasing by over 30%.

2.2.2 Iarnród Éireann fatality and injury statistics

Table 1 illustrates the fatalities and lost-time injuries reported for employees, and fatalities and injuries to third parties on the IÉ railway network for the last ten years.

2.2.2.1 Fatal injuries

In 2024, there were 12 fatalities involving railway infrastructure and operation where trespass or suspicious death was indicated, an increase of 1 from 2023. This demonstrates a continued increase from the 2019–2022 period where the number was consistently in mid-single digits. Fatalities are a CSI defined by ERA and required to be reported by ROs. As a result, IÉ and the CRR monitor this indicator which is discussed at periodic meetings. IÉ-IM and IÉ-RU have established a Critical Incident Steering Group to identify preventative measures related to self-harm incidents, of which the CRR is continually updated.

2.2.2.2 Passenger injuries (customer and visitor injuries)

In line with European trends, the largest proportion of incidents occur to persons during time spent at stations, as opposed to time spent on trains. In 2024, this was no different where 51 injuries were reported by passengers travelling on a train, more than a 10% increase on 2023. Injuries to a customer or visitors to premises also increased, however, this increase (5%) has been less than recent years (10%). Injuries to a customer or visitors to premises remains the largest single category of injuries, with slips, trips and falls of various types being the primary cause. 54 injuries were reported to passengers boarding or alighting from a train, a 17% decrease from 2023. Where overcrowding issues have been highlighted these may result in follow up inspections being undertaken by the CS&E department (e.g., Inspection of Bray Airshow and Inspection of Early Morning Services from Athenry, Over Crowding).

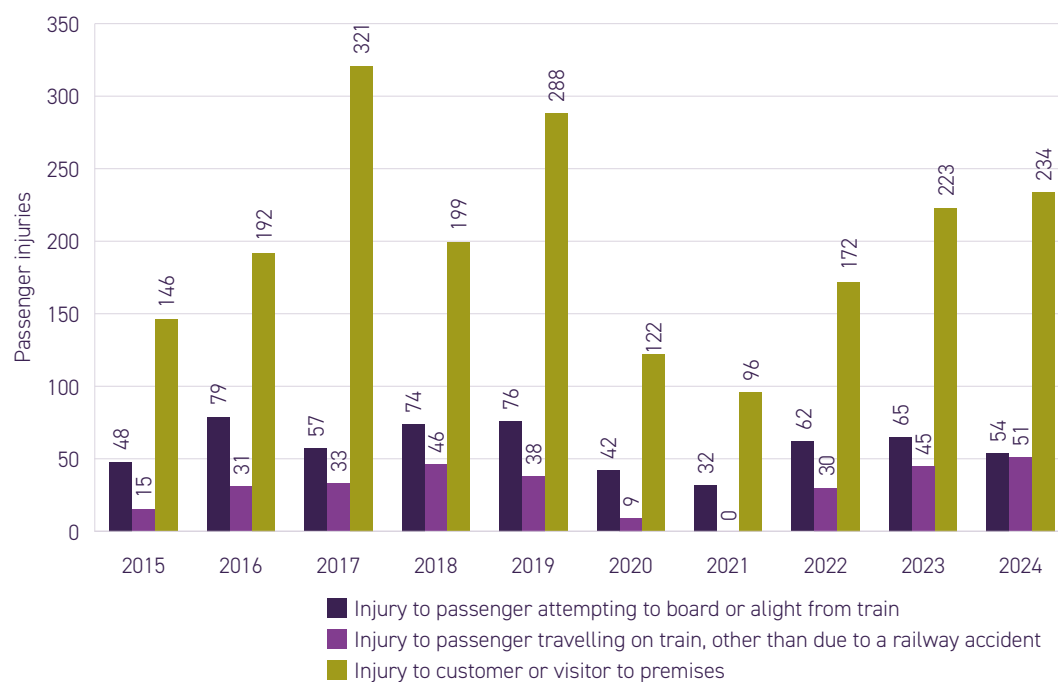
Table 1
IE operational fatality and injury statistics by year

Category	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	Trend
Railway operations: passenger fatal injuries											
Fatal injury to passenger due to a train accident, not at level crossing	0	0	0	0	0	0	0	0	0	0	
Fatal injury to passenger due to a train accident at level crossing	0	0	0	0	0	0	0	0	0	0	
Fatal injury to passenger travelling on a train, other than in train accident	0	0	0	0	0	0	0	0	0	0	
Fatal injury to passenger attempting to board or alight from train	0	0	0	0	0	0	0	0	0	0	
Railway infrastructure: third party fatal injuries											
Fatal injury to third party at a level crossing involving a train	0	0	0	0	0	0	1	0	0	0	
Fatal injury to third party at a level crossing not involving a train	0	0	0	0	0	0	0	0	0	0	
Fatal injury to employee at a level crossing due to train in motion	0	0	0	0	0	0	0	0	0	0	
Fatal injury to employee due to train in motion (other than at a level crossing)	0	0	0	0	0	0	0	0	0	0	
Fatal injury to employee not due to train in motion	0	0	0	0	0	0	0	0	0	0	
Railway infrastructure: employee fatal injuries											
Fatal injury to employee at a level crossing due to train in motion	0	0	0	0	0	0	0	0	0	0	
Fatal injury to employee due to train in motion (other than at a level crossing)	0	0	0	0	0	0	0	0	0	0	
Fatal injury to employee not due to train in motion	0	0	0	0	0	0	0	0	0	0	

Category	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	Trend
Railway operations: fatal injuries to other persons											
Fatal injury due to train in motion not at level crossing	0	0	0	0	0	0	0	0	0	0	
Fatal injury to customer or visitor, no train involved	0	0	0	0	0	0	0	0	1	0	
Fatal injury involving train in motion on railway or level crossing where trespass or suspicious death was indicated	6	2	5	12	9	4	7	5	6	11	
Railway operations: non fatal injuries to passengers											
Injury to passenger travelling on train due to a railway accident not at level crossing	0	0	0	0	0	0	0	0	0	0	
Injury to passenger travelling on train due to railway accident at level crossing	0	0	0	0	0	0	0	0	0	0	
Injury to passenger attempting to board or alight from train	45	48	79	57	74	76	42	32	62	65	
Injury to passenger travelling on train, other than due to a railway accident	18	15	31	33	46	38	9	0	30	45	
Railway infrastructure: third party non fatal injuries											
Third party at level crossing injury involving a train	0	0	0	0	1	1	0	0	0	1	
Level crossing user injury not involving a train	0	0	0	0	1	1	2	1	2	2	
Railway infrastructure: non fatal injuries to other persons											
Injury to customer or visitor to premises	205	146	192	321	199	288	122	96	172	223	
Injuries to other persons including unauthorised persons	0	1	2	6	0	2	0	0	2	3	

Category	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	Trend
Railway operations: non fatal employee injuries											
Employee lost time accident involving train movement or train accident	21	3	1	15	13	7	8	0	0	20	
Employee lost time accident while working on railway not due to train in motion	43	32	30	30	13	35	16	8	11	11	
Railway infrastructure: non fatal employee injuries											
Employee lost time accident involving train movement or train accident	0	0	0	0	0	0	0	0	0	0	
Employee lost time accident while working on railway not due to train in motion	25	6	23	22	26	24	20	33	20	20	
Employee lost time accident while working at level crossing not due to train in motion	2	0	3	1	1	0	3	0	2	2	
Entity in charge of maintenance and maintenance workshops: non fatal employee injuries											
Employee lost time accident involving train movement or train accident	0	0	0	0	0	0	0	0	0	0	
Employee lost time accident while working on railway not due to train in motion	18	13	11	10	12	15	4	11	7	5	

Figure 5
Passenger injury
statistics by year



In general, the numbers of injuries in all categories are similar to pre-2020 trends and as such an improvement or worsening in safety performance over the last 5 years cannot be derived.

Note: Injury to passengers travelling on a train due to a railway accident at and not at level crossing is not represented due to being consistently 0 in the last 10 years.

2.2.2.3 Employee injuries

Employee injuries are categorised in the first instance by the sector of the railway system in which they work:

- Railway Operations
- Infrastructure Management
- Entity in Charge of Maintenance for Railway Vehicles (ECM).³

Figure 6
Employee injury
statistics by year
(Railway Operations)

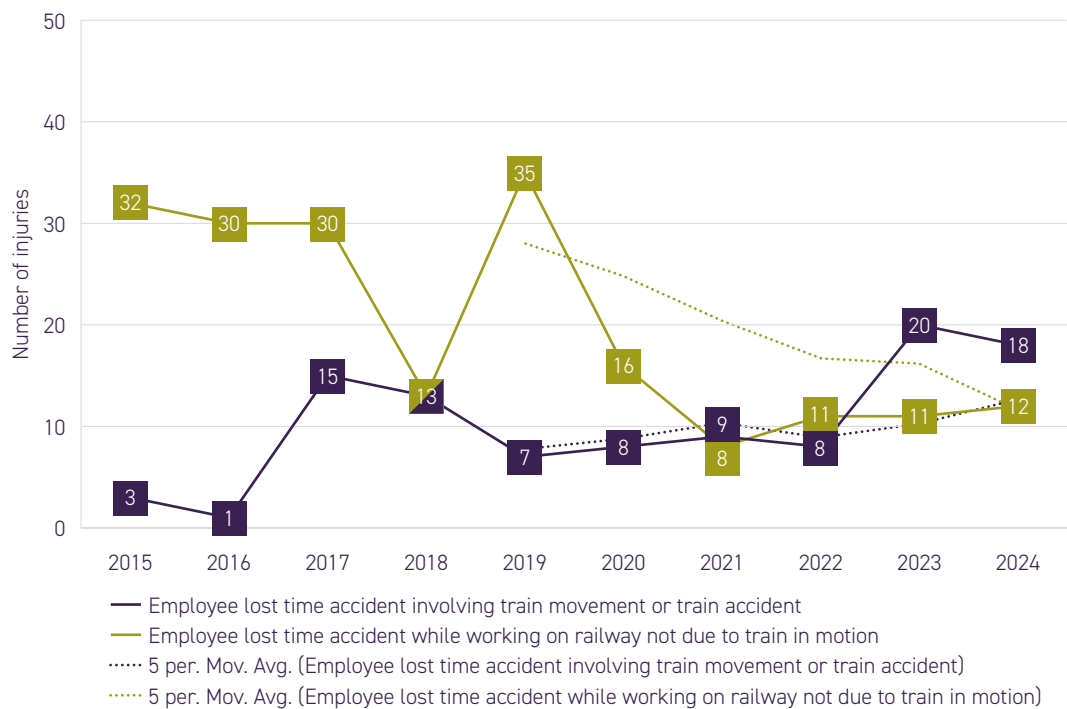


Figure 6 shows that employee lost time accidents have not changed significantly since 2023. Accidents involving a train in motion dropped by 10%, while accidents not involving a train in motion increased by 8%. It is noted however, that the 5-year average for accidents involving a train movement or train in motion is increasing.

3. ECMs are ROs that are certified to undertake maintenance of rolling stock.

Figure 7
Employee injury
statistics by year
(Railway Infrastructure)

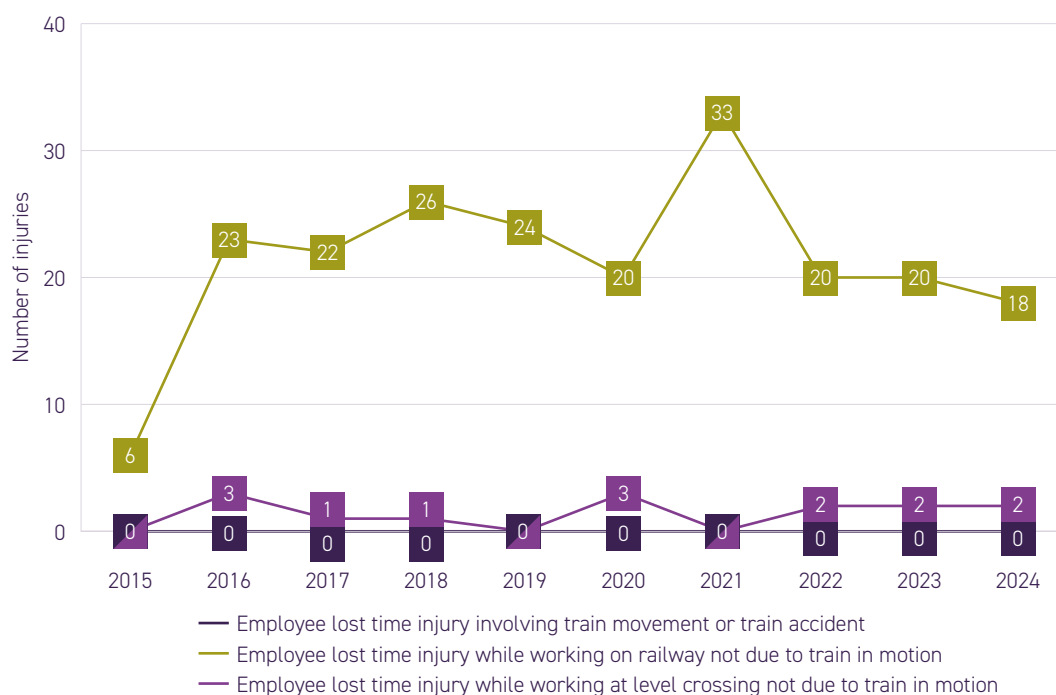


Figure 7 shows railway infrastructure accidents have improved by 10% in 2024, with 2 fewer lost time incidents. IÉ-IM has taken some action, for example there has been the roll out of a track worker safety programme in 2024. Whether this has been effective will become apparent over the coming years, if lost time incidents continue to decrease.

Figure 8
Employee injury
statistics by year
(IÉ-RU ECM)

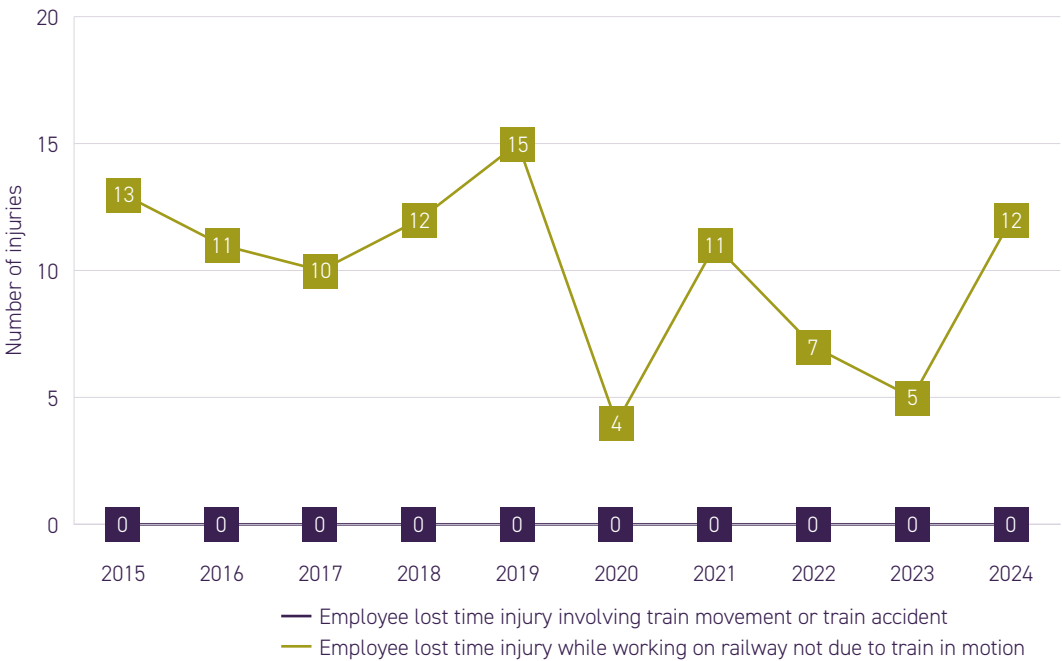


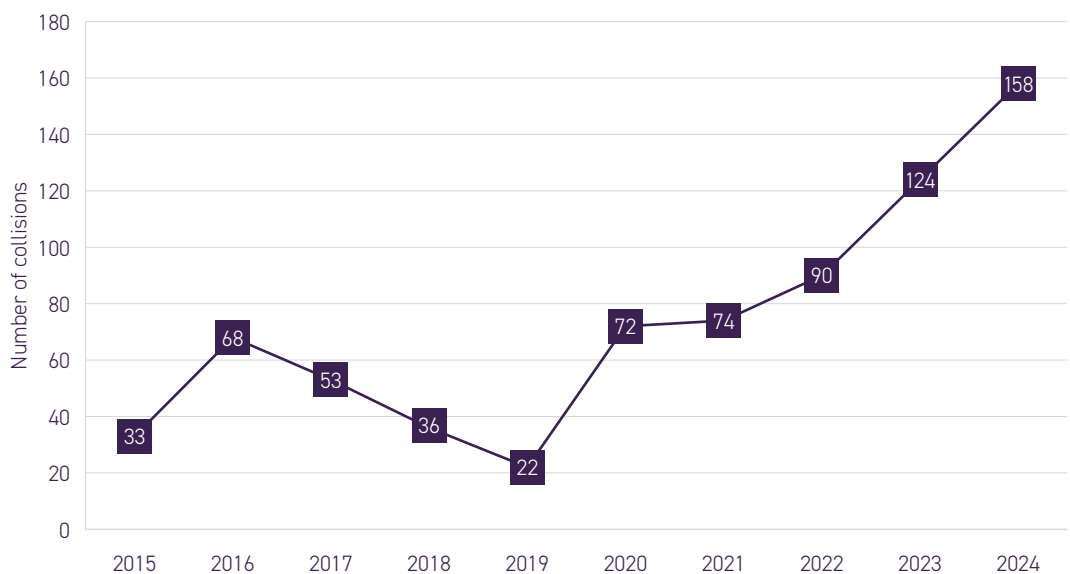
Figure 8 shows that IÉ-RU Entities in Charge of Maintenance (ECM) had a spike in accidents in 2024, rising by 140%, reversing what had been a 2-year downward trend. This is an unwelcome increase following a period of reduced injuries, and a return to pre-2020 levels. As with other injury statistics, these are low relative to the size of the operation involved. However, should this trend continue, regulatory action may be necessary.

2.2.3 Iarnród Éireann operational incident statistics

2.2.3.1 Train collisions

Train collisions can pose a significant risk to passengers, train crew, third parties, and the environment. There are several categories of train collision, e.g., collision with other trains, collision with road vehicles, with animals, with obstacles etc. Figure 9 illustrates the overall trend for collisions over the last 10 years. Figure 9 is supported by Table 2 and Figure 10 to aid understanding of the data. In Figure 10 two categories, 'Total Collisions with Obstacles on the line' and 'Train Collisions with large animals', have been separated to provide a better understanding of the risk. The overall data shows another significant increase in collisions to a record high level.

Figure 9
Total collisions by year



The data presented in Figure 9 shows 2024 had a record high number of collisions, a 375% increase since 2015.

Table 2 and Figure 10 show 2024's increase is due to collisions with 'other obstacles' on the line. In contrast, 2023's increase was driven by higher collisions with large animals. Collisions with 'other obstacles' rose by 88% compared to 2023. This increase appears to be due to a large spike in the number of collisions with trees (31) and branches (7), over half of the total number (64). High numbers of collisions aligned with Storms Isha, Jocelyn, Ashley and Darragh which all achieved Storm Force (>100 km wind speeds) in parts of the country.⁴

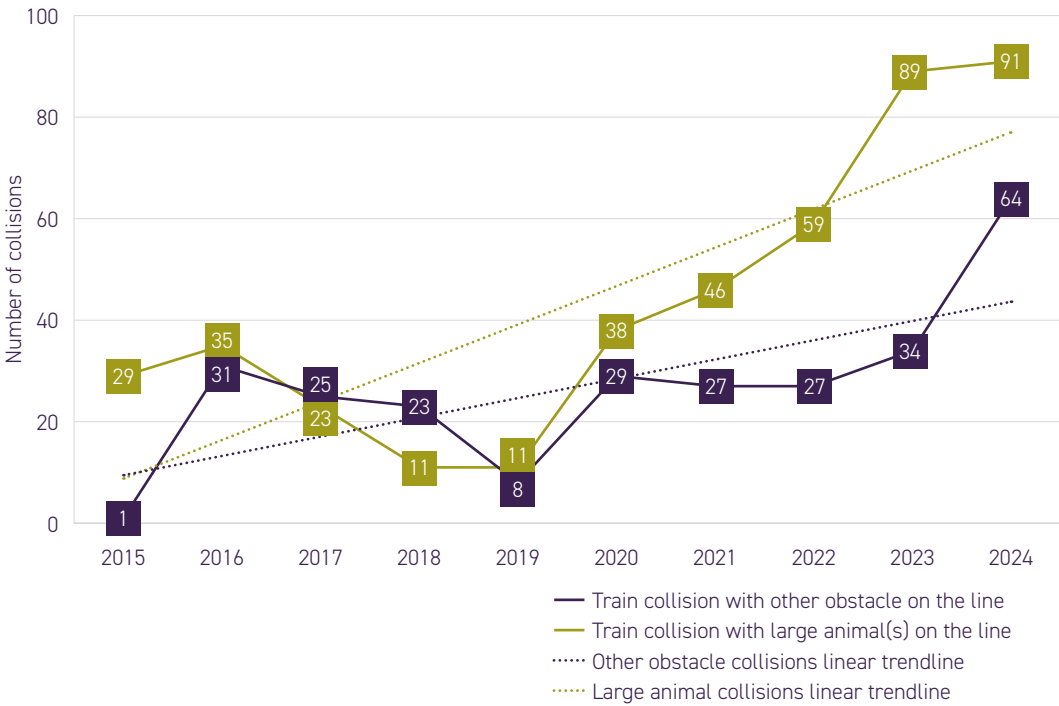
Large animal collisions increased by 2% in 2024. IÉ have stated that the increase in collisions with deer is commensurate with the overall increasing deer population in Ireland. IÉ's primary mitigation has been the erection of deer fencing. This is an activity that is carried out on an annual basis. In addition, IÉ continue to engage with the Irish Deer Commission and are sharing data with them with a view to better manage the risk of deer adjacent to the railway line.

4. See Met Éireann Storm Centre Reports for Storms Isha, Jocelyn, Ashley and Darragh.

Table 2
Train collision statistics detail by year, part 1

Category	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	Trend
Train collision with passenger or goods train on running line	0	0	0	0	0	0	0	0	0	0	
Train/railway vehicle collision in station or possession movement	1	1	1	2	1	1	4	1	4	0	
Train collision with a motor vehicle at a level crossing	2	0	0	3	1	2	1	0	0	1	
Train collision with pedestrian at a level crossing	0	0	0	0	0	0	0	0	0	0	
Train collision with attended gates at a level crossing	0	1	0	0	0	0	0	0	0	0	
Train collision with road vehicle obstructing the line (not at a level crossing)	0	1	1	0	0	0	0	0	0	0	
Train collision with other obstacle on the line	29	1	31	25	23	8	29	27	27	34	
Train collision with large animal(s) on the line	9	29	35	23	11	11	38	46	59	89	
Total	41	33	68	53	36	22	72	74	90	124	

Figure 10
Train collision statistics detail by year, part 2

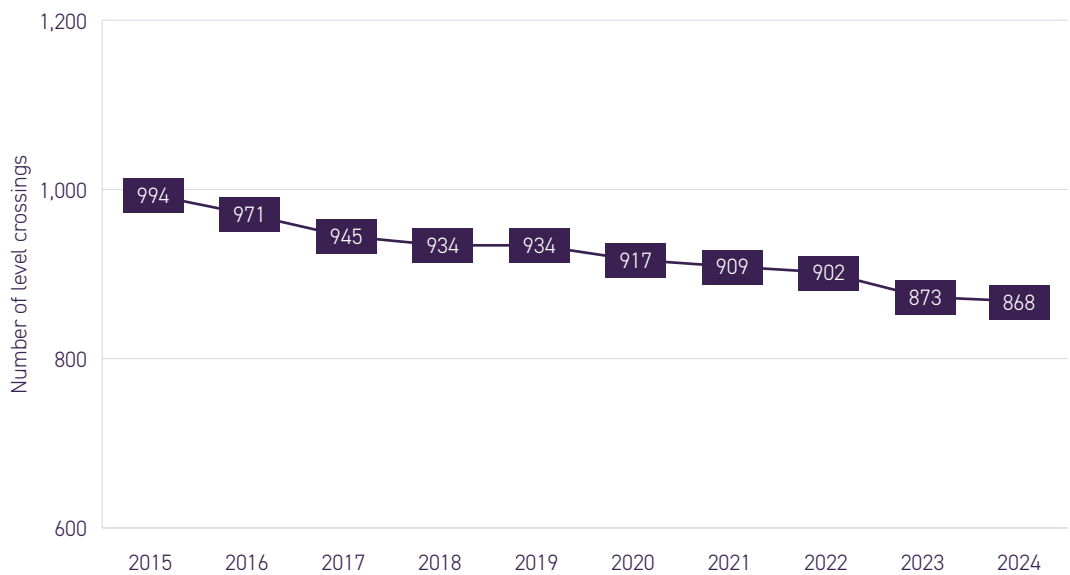


2.2.3.2 Level crossings

Level crossings remain a significant risk to the railway system and to level crossing users of all types. There were no fatal accidents at a level crossing in 2024 or incidents involving the collision between a vehicle and a train resulting in injury.

A key risk mitigation by IÉ is the removal and upgrading of level crossings in its network. Shown in Figure 11, is the decrease in the number of level crossings; down from 994 in 2015 to 868 in 2024.

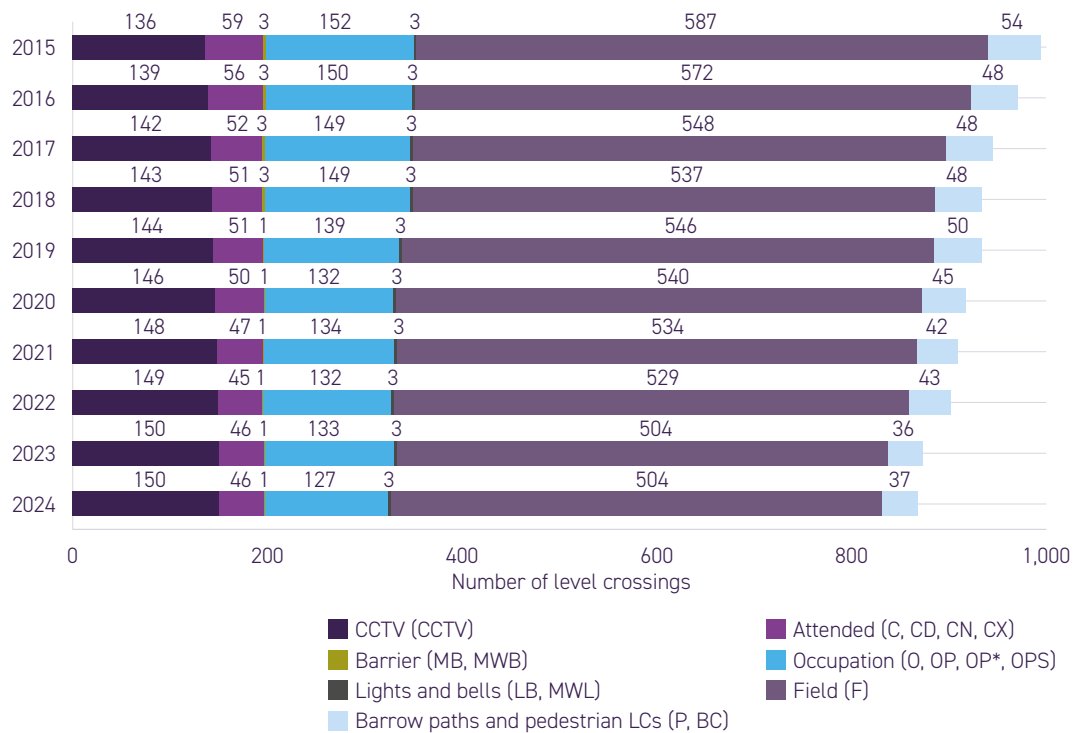
Figure 11
Number of level
crossings by year



The breakdown of level crossings by type and year in Ireland is shown in Figure 12. Occupation level crossings on public roads, that is those that require the road user to manually open and close gates, remain the highest risk type of level crossing, closely followed by similarly gated 'Field type' level crossings which are those a farmer might use if they have private land on both sides of a railway. IÉ-IM have continued to install further DSS 'Decision Support System' equipment on their highest risk user worked level crossings, with 14 further installations completed in 2024. The DSS is a set of visual and audible warnings installed at the crossing to warn users of an approaching train. A broadly similar system ('Miniature Stop Lights (MSLs)') is being installed at crossings in the UK by Network Rail.

Figure 12 demonstrates how the higher risk Occupation and Field type crossings have remained unchanged in 2024, and the lower risk CCTV type has also remained the same. IE's risk management strategy has seen continued reduction in Field crossings increases in CCTV crossings since 2015. In 2024, the share of total crossings on the network which are CCTV type has remained 17%. Occupational level crossings did decrease by 6, however an additional barrow crossing was added to the network. IE confirmed this was due to what was a field crossing, closed in 2023, having a pedestrian crossing put in place.

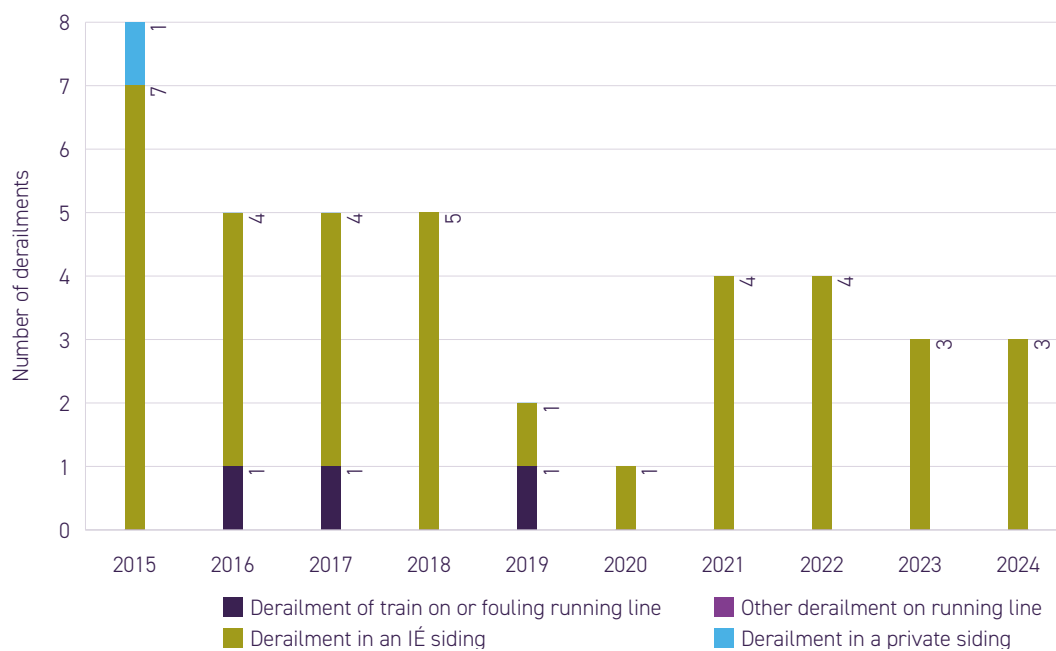
Figure 12
Level crossings by
type in Ireland



2.2.3.3 Train derailment

Figure 13 shows there were 3 train derailments in 2024, the same as 2023. These derailments were all located in IE sidings. Two of these derailments occurred at the same set of handpoints in Inchicore Works. The investigations into the causes of these derailments have been completed by IE, with safety recommendations regarding the renewal of the handpoints identified.

Figure 13
Train derailments
by year



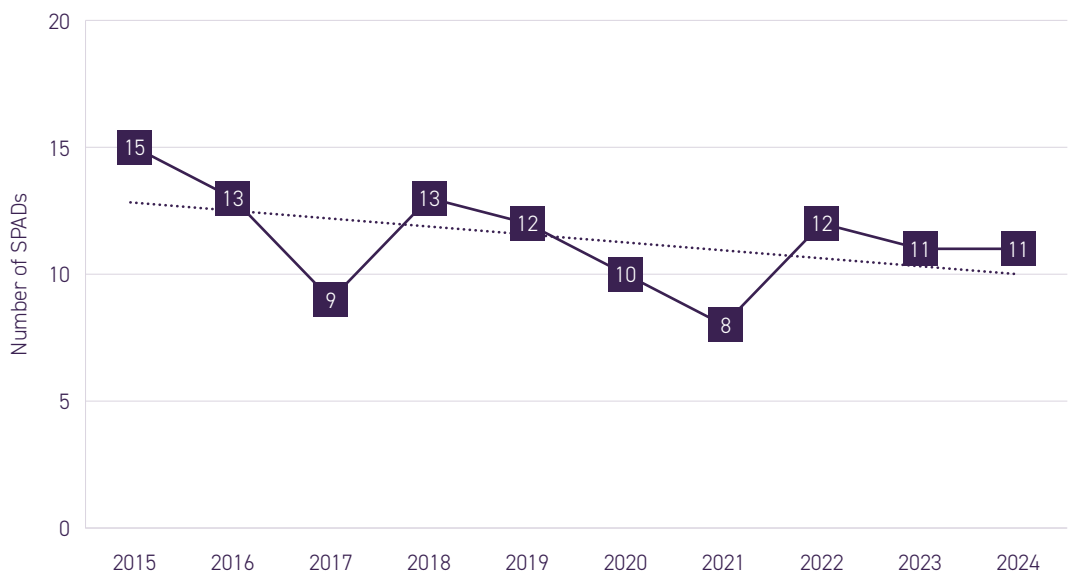
2.2.3.4 Signals Passed at Danger (SPAD)

IE-IM define a SPAD as an event where a part of a train proceeds beyond the limit of its authorised movement. SPADs are a particular precursor event that the CRR monitors during its supervisory meetings with IE-IM, IE-RU and other RUs. In 2024 the number of SPADs on the Irish network remained at 11, the same as 2023. The 10-year trend remains on a downward trajectory; however, it appears that SPAD events are plateauing in the region of 11–13 since 2016.

SPAD occurrences are investigated by the infrastructure manager and the RU involved. IE apply their own qualitative evaluation to each SPAD to assess the associated safety risk. Of the 11 SPADs on the IE-IM network, 10 involved IE-RU trains. One of the IE SPADs that occurred in 2024 was risk ranked as 'high', one less than in 2022. High risk SPADs are a critical accident precursor and even a single incident is considered unacceptably high.

RSIE, another regulated entity which carries out on track maintenance, was involved in 1 SPAD in 2024 on the IE network. This is detailed further in Section 2.3.

Figure 14
IE SPAD by year



2.2.4 Iarnród Éireann rolling stock incidents

IE operates several different fleets in provision of rail services. In 2024, IE put into service 41 new Intercity Carriages. The IE-RU fleet includes:

- Diesel Multiple Units (29000, 22000, 2800, 2600 classes), maintained in Portlaoise, Drogheda and Limerick
- Electrical Multiple Units (8100, 8200, 8500 classes), maintained in Fairview, Dublin
- Locomotives (201, 071 classes), maintained in Inchicore, Dublin
- Passenger Carriages (Mark IV and DeDietrich), maintained in Inchicore, Dublin and York Road, Belfast
- Freight wagons (of various types), maintained in Limerick.

Significant changes to the fleet are expected with the addition of a new DART Battery Electric Multiple Unit and Enterprise fleet.

Figure 15 shows several key safety performance indicators pertaining to rolling stock, specifically:

- Fire or smoke incidents
- A train dividing (parting) while in service
- Failure of rolling stock axle bearing
- Door issues.

Figure 15
Rolling stock
incidents by year



Fire and smoke related incidents increased again in 2024 to its highest level since 2017. When considered over a 10-year period the average number of smoke/fire incidents per year is showing an upward trend. 9 of the 25 incidents were categorised as fires, and occurred on 29000 DMU's (6), Mark IVs (2) and 22000 DMU's (1). Incidents of smoke were attributed to 29000s in the main, however 6 incidents occurred on Mark IVs. In general, these were caused by fuel and oil leaks. In 2024, IÉ-RU CME completed a bow tie analysis of smoke/fire events. An improvement process was subsequently developed to increase the reliability and reduce the potential of smoke/fire incidents on the 29000 fleet. The CRR is monitoring the implementation of these improvements at periodic meetings. The result of this process will become evident over time.

2.2.5 Iarnród Éireann infrastructure incidents

The IÉ-IM network, as detailed in its 2024 Network Statement, currently extends to approximately 2,400 km of operational track and includes c. 4,440 bridges, c. 1,100 point-ends, c. 970 level crossings, 146 stations, 3,300+ cuttings and embankments, 372 platforms and 13 tunnels.⁵ The network is used for both passenger and freight services, with infrastructure designed for long distance fast services, commuter services, urban high frequency services, and freight transport.

The railway network in Ireland is abundant in legacy structures such as bridges, tunnels, and station buildings, many of which are in excess of 100 years old. Given their long history and operational environment, these assets may be vulnerable to failure if not adequately maintained, resulting in significant damage to property or loss of life. There are a multitude of challenges associated with managing such a wide range of critical assets, all must be inspected and maintained at their prescribed frequencies to ensure the risk of failure is minimised.

IÉ-IM have embedded the use of a decision support tool in relation to the asset management of cuttings and embankments which risk ranks these legacy assets from a quantitative risk-based assessment approach. The input parameters for this cutting and embankment tool are continually updated as additional information becomes available (e.g., additional ground investigation information on an embankment formation). The decision support tool is continually updated and re-briefed to regional managers so additional risk mitigation measures can be considered for sensitive assets such as enhanced maintenance plans where these assets may have sensitive factors of safety.

The asset management of IÉ bridge stock is currently being developed to incorporate a quantitative assessment programme. This will have the benefit of risk ranking these bridge assets based on structural redundancy and hence allow for targeted spend for those assets with the lowest redundancies and aid in targeted interventions. At present IÉ bridge stock in nearly all instances is qualitatively managed. The benefits of the incorporation of a quantitative bridge assessment programme will enhance and further manage the risk associated with these assets.

It is important to note that this risk of failure can only be minimised (not entirely eliminated), and minimising failure risk and its subsequent effect is critical to ensuring a reliable and safe railway service; data relating to some of these is now presented.

5. Figures taken from 2024 IÉ-IM network statement (see footnote 1 on accuracy of Network Statement, this information may not reflect the current network configuration).

2.2.5.1 Broken rails and fishplates

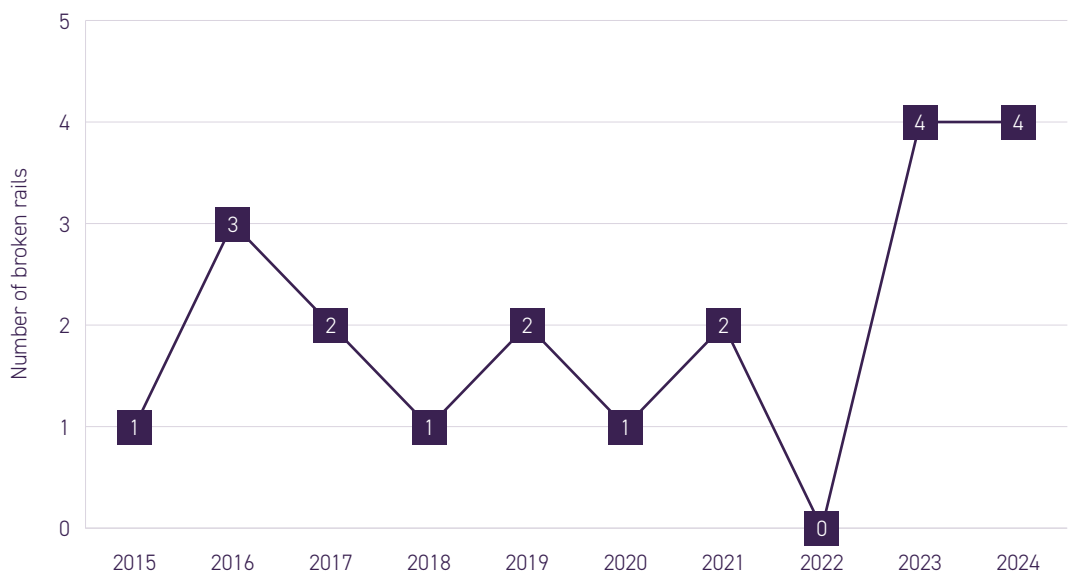
As has been noted in previous reports, the large decrease in broken fishplates over the 10-year period can be attributed to the installation of continuous welded rail (CWR) initiated under the Railway Safety Investment Programme (1998–2013) which has continued since, albeit in smaller quantities. IÉ-IM personnel visually inspect the entire track and its associated assets at least once per week. Engineers for the Infrastructure Manager are also required to inspect the track several times each year using a dedicated inspection car. The rails themselves are ultrasonically tested at least every 2 years, with the vast majority tested annually. A broken rail is defined by IÉ-IM as “any rail which is separated in two or more pieces, or any rail from which a piece of metal becomes detached, causing a gap of more than 50 mm in length and more than 10 mm in depth on the running surface”.

While preparing this report IÉ-IM informed the CRR of an error in the reported value of broken rails in 2023. There were 4 broken rails in 2023, as opposed to the 5 reported at the time. As a result, the number for 2023 shown in Figure 16 has been revised to reflect this.

In 2024, there were 4 broken rails reported, the same as in 2023. While the number did not increase, it is still higher than what was seen between 2015–2022 and is a concern considering there were no broken rails in 2022. Of the 4 broken rails, 2 were notified to the CRR.

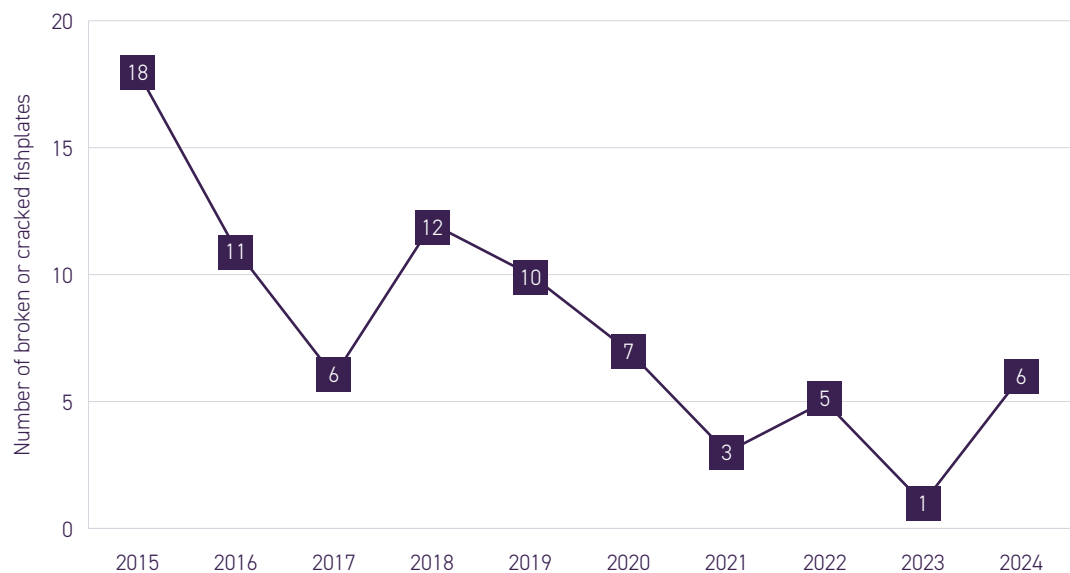
The RAIU concluded two investigations in 2024 which focused on broken rail incidents from 2023. These investigations resulted in 8 RAIU recommendations, the status of which is outlined in Section 5.4.

Figure 16
Broken rails by year



A fishplate is a special bolted connection that joins two rails together. For a fishplate to be considered broken, IÉ-IM defines “any fishplate which is separated in two or more pieces, or any fishplate in which a piece of metal becomes detached, causing a gap of more than 50 mm length and more than 10 mm in depth on the running surface”. Should one break then the rail is not continuous and could, in certain circumstances, lead to a derailment. Figure 17 shows the trend for broken fishplates continues to decrease compared to 2015. However, in 2024 6 instances of broken fishplates were recorded, a large increase compared to the all-time low of 1 in 2023. Broken fishplates are a safety performance indicator within this report, and a key performance indicator monitored by IÉ-IM. For context, in 2004, 254 broken fishplates were reported in a single year. Consequently, this increase is relatively small in that context and indicates that the risk is being managed by IÉ. The number of broken fishplates will continue to be monitored by the CRR.

Figure 17
Broken fishplates on
the IÉ network, by year



2.2.5.2 Bridge strikes

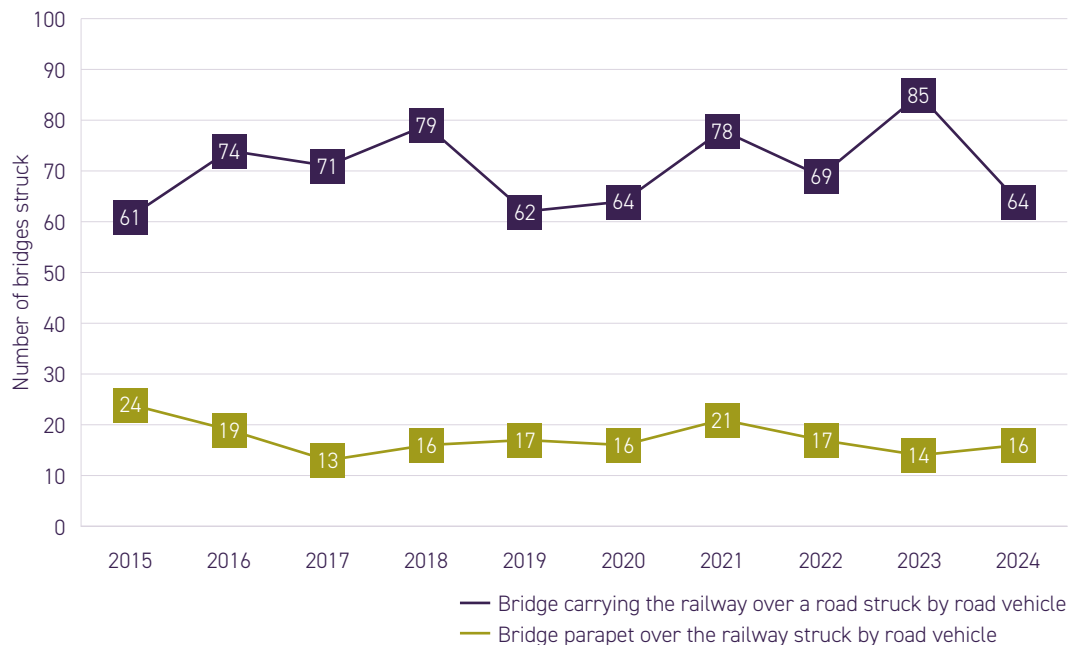
There are in excess of 4,400 bridges of varying structure types on the IÉ railway network. All must be inspected and maintained by IÉ-IM at various periodicities depending on numerous factors such as their age, type, location, and risk profile.

In terms of simple categorisation there are two categories of railway bridge to be inspected. The first is where a road is over the railway (over bridge) and the second is where the railway is over a road (under bridge). A bridge strike is where a road vehicle strikes the parapet or roadside containment of an over bridge or where a road vehicle strikes the underside of a railway bridge over a road (under bridge).

Both types of occurrences can, in certain circumstances, result in very severe consequences such as causing a track misalignment, structural weakness or failure either of which could result in a train derailment.

As referenced earlier within this report, at present the asset management of IÉ bridge stock is currently being developed to incorporate a quantitative assessment programme (see Section 2.2.5).

Figure 18
Railway bridges struck
by road vehicles



The total number of bridge strikes decreased in 2024 from 99 to 80 in total. The 10-trend remains relatively flat but over more recent years it has been creeping upwards. The drop in 2024 is the lowest since 2020. As has been previously reported some bridges are more susceptible to strikes than others and these are well known to IÉ, although the risk control measures can be reasonably complex to implement, involving planning and coordination with local authorities.

IÉ commissioned an over-height vehicle detection system in 2020 to assist in diverting over-height vehicles away from Amiens Street Bridge, a particularly vulnerable bridge in Dublin City Centre. This project proved successful in protecting this bridge from strikes and IÉ have implemented over-height detection systems at UBC145 and UBC146 in June and August 2024. Unfortunately, both bridges suffered bridge strikes following the implementation of this system, highlighting that these additional warning systems are dependent on road users heeding them. IÉ-IM are in the process of evaluating other areas where this system may be rolled out.

2.2.5.3 Third party contractors

IÉ-IM engage numerous contractors, for both labour and plant, to assist in delivering the necessary track and structures maintenance needed to keep the Irish railway network safe and operational. A significant growth area in recent years has been in mechanised track and lineside maintenance using special machines (Road Rail Vehicles or RRVs). Their use does however introduce risk given operatives are typically not from a railway background and they are using machines that have been adapted to work in a very different environment to mainstream construction settings.

Over the past number of years there has been multiple incidents involving RRVs. These have included, RRV derailments, RRVs damaging track infrastructure, RRVs injuring track workers and even a small number of incidents in which an RRV has over-turned. In 2024, there were 12 RRV incidents which IÉ-IM investigated. Of these 9 incidents were reported to the CRR. These included 4 derailments, 2 collisions, 1 possession irregularity resulting in a SPAD, 1 over-turned RRV and 1 incident of an RRV colliding with a member of staff.

This area is of particular focus for the CRR. It should be noted that IÉ-IM has committed resources towards improving contractor safety.

2.3 Rhomberg Sersa Ireland

IE-IM have, since 2014, contracted external ROs to operate and maintain their fleet of On-Track Machines (OTMs). RSIE is currently contracted to provide this service since the 8th of July 2019. RSIE have been issued a safety certificate by the CRR to operate on the Irish railway network.

In 2024, RSIE reported that they had 63 staff employed. RSIE does not operate any passenger services and completes most of its operational activity at night, outside of peak and daytime periods. RSIE stated that their OTM fleet operated 95,095 km in 2024, approximately 1,500 km lower than 2023.

Table 3 shows the reported occurrences for RSIE in 2024. No Derailments or Collisions were reported. One SPAD was reported, which was found to be due to correct processes not being followed due to human error and loss of situational awareness. The ensuing investigation recommended no further actions due to the actions already taken. The amount of railway infrastructure damage incidents decreased to 9.

The Rail infrastructure damage incidents were primarily related to operator error, such as grazing sleepers, axle counters and striking cables.

Table 3
OTM occurrences

Occurrence	2020	2021	2022	2023	2024
SPAD	1	0	1	3	1
Derailments	2	0	0	0	0
Collisions	0	0	0	0	0
Minor occupational injuries	3	4	5	2	5
Rail infrastructure damage incidents	8	6	10	12	9

2.4 Northern Ireland Railways

NIR have, since 2020, been in receipt of a full Part A Certificate for operations on the Irish railway network.

NIR's operations on the Irish railway network are the cross-border enterprise service which is operated in conjunction with IÉ-RU, and the operation of class 3000 specials.

Table 4 shows the reported occurrences for NIR in 2024. No Derailments, SPADs or collisions were reported on the Irish railway network involving NIR services.

October 2024 saw the opening of the new Grand Central Station in Belfast and the commencement of an hourly Enterprise service. Consequently, passenger numbers and NIR train kilometres on the Irish railway network increased. In 2024, NIR operated 614,928 km on the Irish railway network, carrying 1.3 million passengers.

Table 4
NIR occurrences on Irish railway network

Occurrence	2023	2024
SPAD	0	0
Derailments	0	0
Collisions	2	0

2.5 Railway Preservation Society of Ireland (RPSI)

The RPSI operate steam and diesel hauled heritage trains on the IÉ rail network and therefore hold a Safety Certificate allowing them to operate as a Railway Undertaking (RU). As an RU under the European Railway Safety Directive, they are subject to a risk-based supervision regime that is commensurate with the risks they manage and import onto the IÉ network. As an RU the RPSI has received safety certification based on the acceptance of its Safety Management System, compliance with its SMS is supervised by the CRR.

The RPSI completed a full year of mainline operations in 2024 and ran approximately 4,041 km carrying 13,413 passengers.

The RPSI reported a single incident where an RPSI steam train started a lineside fire.

2.6 Transdev (Luas) statistics

The Dublin Light Railway System, or Luas, is owned by Transport Infrastructure Ireland (TII). This includes all trams and tramway infrastructure. TDLR has been operating the Dublin light railway system, within different corporate structures since it commenced operation in June 2004. In late 2019 TDLR were contracted to continue operation of the Luas service as well as to undertake infrastructure and rolling stock maintenance.

The Luas is comprised of two lines, the Red Line which is 20.5 kms in length and has 32 Stops and the Green Line which is 24.5 km in length and has 35 Stops. Figure 19 shows passenger journeys in 2024 were a record number for the Luas, surpassing 54 million, an increase of 12.5% from 2023. Tram kilometres also increased to a record 4.39 million vs 4.31 million in 2024.

Figure 19
Luas passenger
journeys and
tram-km travelled



2.6.1 Road vehicle collisions

A significant proportion of Luas tracks co-exist with road traffic and pedestrian movements, most notably in Dublin city centre. The Luas operates primarily by 'line of sight' which is a common operational approach in light railway systems and tramways around the world. This contrasts with heavy rail, whereby the stopping distances are regularly greater than the limit of the driver's vision. Given that the Luas shares sections of the carriageway with road vehicles and other road users, there is a risk that collisions will occur.

Figure 20
Number of road vehicle collisions involving a tram

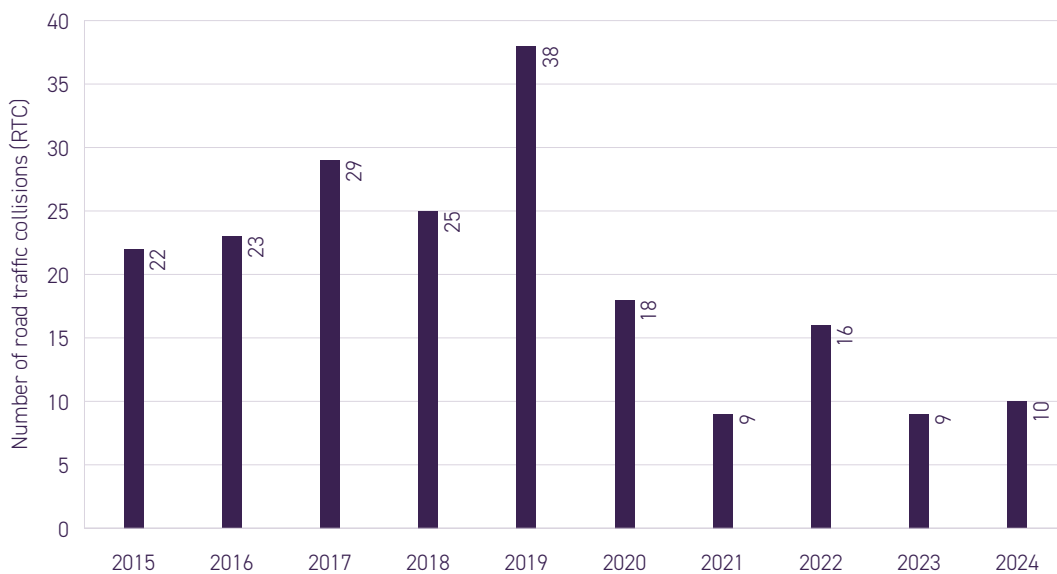


Figure 21
Road vehicle collisions per million km run

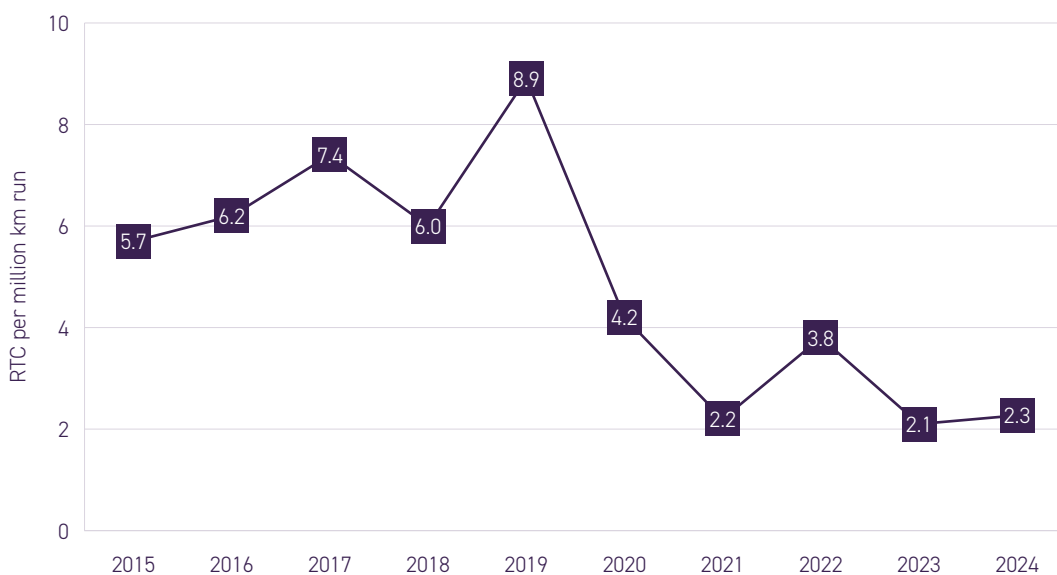


Figure 20 shows that the number of road vehicle collisions remained at a significantly lower level in comparison to pre-pandemic figures.

The majority of incidents involved conflicting movements between vehicles and trams at junctions where vehicles breached red lights. With the exception of one collision, all occurred on the Red Line.

Four years of consistently lower than average road traffic collisions per million kilometre is indicating a sustained improvement in safety performance by TDLR.

2.6.2 Tram contacts with people and cyclists

Figure 22
Persons coming into
contact with tram

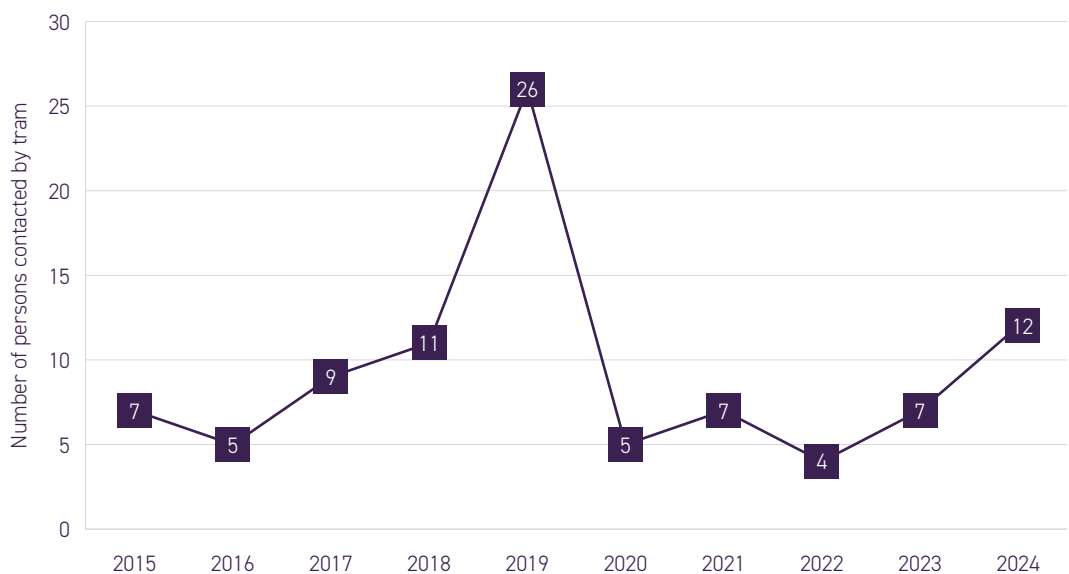


Figure 22 shows tram contact with a pedestrian/cyclist has increased to 12 in 2024 from a historically low number (4) in 2022. This suggests a trend of increasing instances of tram and pedestrian/cyclist contact following a stable period of low occurrences. It should be noted however, that this period aligns with COVID-19 when there would have been significantly fewer trams, pedestrians/cyclists in close proximity to each other. The 2024 value is similar to pre-COVID values, except for 26 in 2019. It will become apparent over the coming years whether this is an increasing trend or a return to what were common figures pre-COVID.

7 of these incidents involved contact between a pedestrian/cyclist and tram with no injury. The remaining 5 required on site first aid and removal to hospital via ambulance.

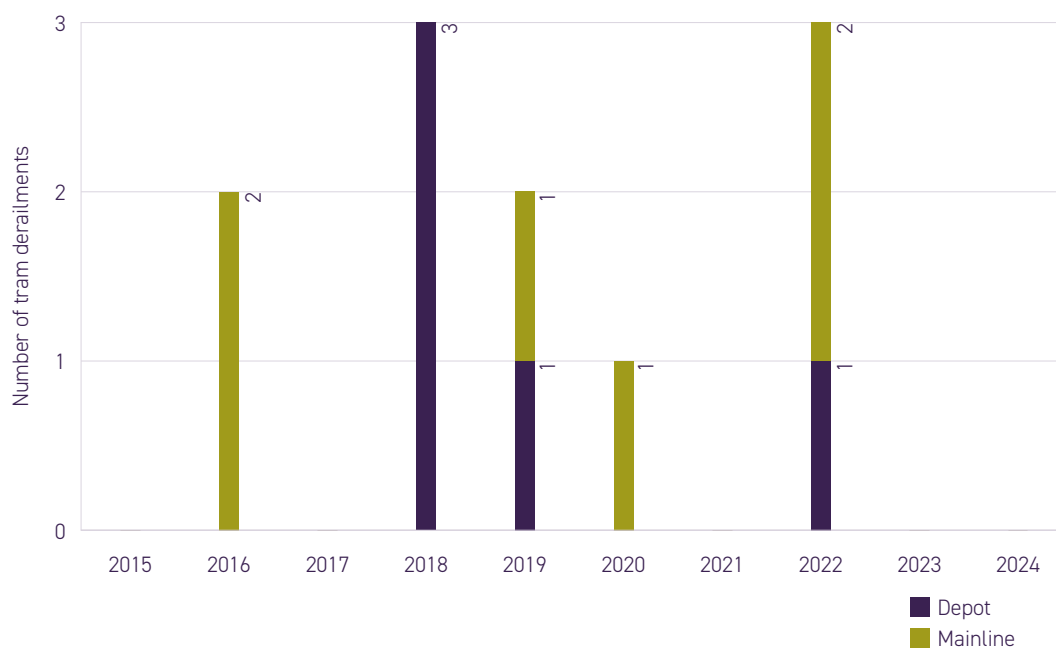
7 of these incidents involved cyclists or motorcyclists specifically, and the remaining 5 involved pedestrians.

2.6.3 Tram Derailments

There were no derailments on the mainline or in depots in 2024, continuing the positive trend from 2023.

Derailments are a strong accident precursor and another full year of operations without a derailment is a welcome result.

Figure 23
Tram derailments



2.6.4 Signals Passed at Stop

Signals Passed at Stop (SPAS) on the LUAS network is where a tram has passed a stop signal without authority. SPAS are a particular precursor event that the CRR monitors regularly during its supervisory meetings with TDLR. Figure 24 shows decrease of 5 (25%) in SPAS on the green line, and a minimal decrease of 1 SPAS (8%) on the red line in 2024. While this is a reduction in SPASs since 2023, these values are similar to SPAS incidents since 2017, COVID period excepted.

Of the SPAS reported, over half were detected at Line Signalling System locations, which are only located in a small part of the network. For the majority of the network there is no system in place to detect SPAS incidents. SPASs are also detected by tram drivers or members of the public where they are aware that the tram has exceeded the movement permitted by the relevant signal. SPASs may also be detected by railway workers on the line.

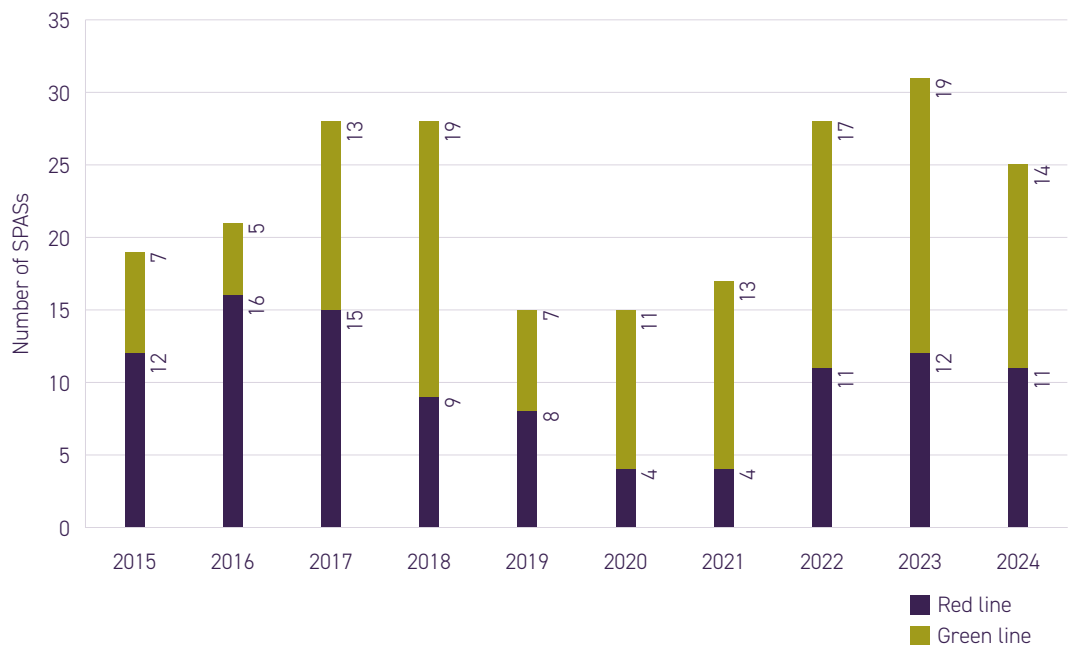
The RAIU published a trend investigation into SPAS on the LUAS network in October 2022.

This investigation resulted in fifteen recommendations for TDLR or TII to address.

One recommendation following from the investigation is that TDLR introduce a risk scoring process for SPAS on the network. The roll out of a risk ranking process is evident from TDLR's annual safety report to the CRR. This is a positive step, the CRR has noted an improvement in SPAS risk management and investigation over the last year.

Once an RAIU recommendation is closed via the CRR there can often be a duration of time before a marked improvement in a safety performance indicators metric is evident. This transition period is in many cases due to the integration of the additional risk controls which in turn will generally lead to an improvement in the safety performance indicator.

Figure 24
Red and Green line
tram SPAS



2.6.5 Tram emergency brake applications

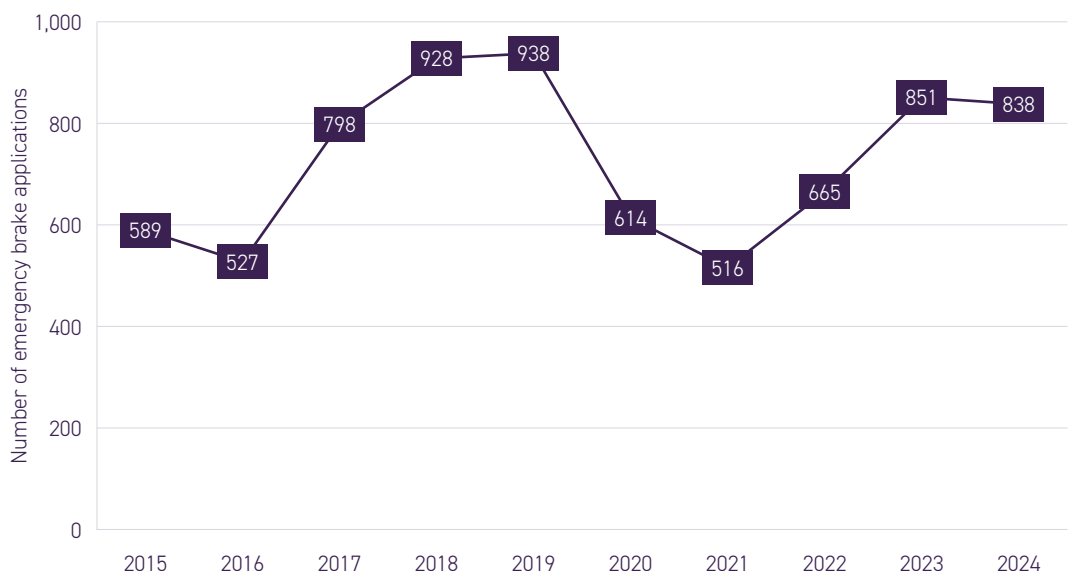
An emergency brake application is where a driver commands the tram via the interface in the cab to apply friction, electrodynamic and adhesion-independent electromagnetic braking simultaneously. This provides the maximum level of braking available to attempt to prevent a harmful incident. The number of Emergency Brake (EB) applications made by tram drivers can be a useful leading safety indicator as it can show there was potential for an unsafe condition to manifest.

In 2024, there was a total of 838 EB applications, a 1.5% decrease from 2023, arresting the increase towards pre-pandemic levels. The Green Line saw a 12% decrease (266 to 234) compared to 2023, a welcome improvement resulting in the lowest recorded levels (excluding the COVID period). However, EBs on the Red Line increased by 3% (585 to 604), the highest recorded number of EBs recorded.

TDLR figures note that 246 of these are due to technical/other issues with the tram or its operation and the remaining are attributable to cyclists/pedestrians/vehicles. The breakdown of EBs was broadly similar to 2023. The only notable difference was a decrease of 11 EBs involving cyclists.

The rolling 12-month rate of EB applications per million kilometres had been steadily increasing since early 2022. This increase continued until May 2024 when the rate began to decrease. This is indicative of an improvement in these values. It will become evident over the coming years whether this trend continues. The CRR will continue to monitor this trend as part of its supervision of TDLR.

Figure 25
Emergency
brake applications



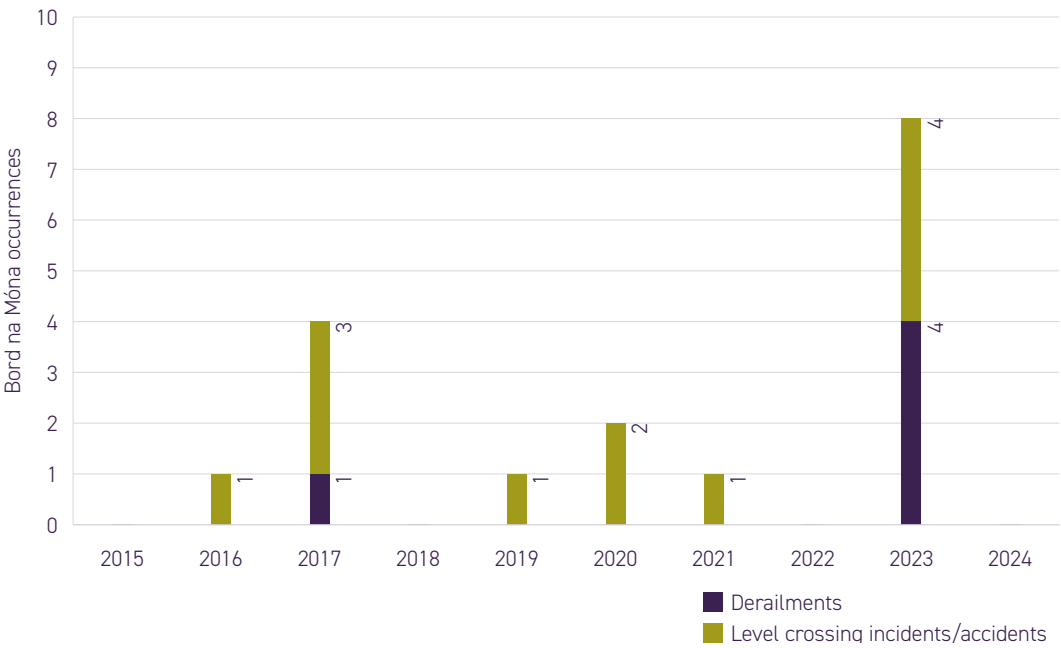
2.7 Bord na Móna industrial railway statistics

The CRR's remit in terms of its oversight of Bord na Móna (BnM) industrial railway is limited to where it interfaces with public roads. While BnM had 430 km of permanent track in 2024, it is only at its interfaces, i.e., level crossings and where there are road bridges over the industrial railway, that the CRR is involved. In terms of key infrastructure statistics there were 97 level crossings, and 52 underbridges.

The operational figures have been steadily reduced as BnM transitions away from solid fuel production. Operational level crossings have reduced from 28 to 0 and operational bridges have decreased from 27 to 0. In addition, the track kilometres have reduced significantly after peat movements by rail ceased in 2023.

Bord Na Móna reported 0 incidents in 2024, a drop from eight incidents reported in 2023.

Figure 26
Bord na Móna
derailments and
level crossing
incidents/accidents



2.8 Isolated heritage railways and Velorail

2.8.1 Isolated heritage railways

A heritage railway is defined in Irish Legislation as “a person who only operates train services or railway infrastructure of historical or touristic interest”. The CRR monitor the operations of heritage railways. They are:

- Oakfield Park Gardens Limited (Diffin Lake Railway)
- Cumann Traenach (Fintown Railway)
- Irish Steam Preservation Society CLG
- Lartigue Mono Railway
- Waterford & Suir Valley Railway Company
- The Cavan and Leitrim Railway Company
- Midlands Great Western Railway Ltd (Connemara Railway).

These seven heritage railways operated in 2024 and were subject to CRR supervision. Overall, isolated heritage railways carried a total number of 93,127 passengers in 2024. Midlands Great Western Railway reported one passenger rail accident. This incident was a low-speed derailment suspected to be due to a lamp bracket falling from the train, onto the running line causing a derailment. 16 passengers were on board at the time, with no passenger injuries reported.

2.8.2 Velorail

In 2023, the CRR certified the first Velorail in Ireland, IRD Kiltimagh CLG. A Velorail is a rail mounted, four-wheeled, human-powered vehicle.

In 2024, IRD Kiltimagh reported no customer injuries, a reduction from 1 in 2023.

3. PUBLIC REPRESENTATIONS



3.1 Introduction

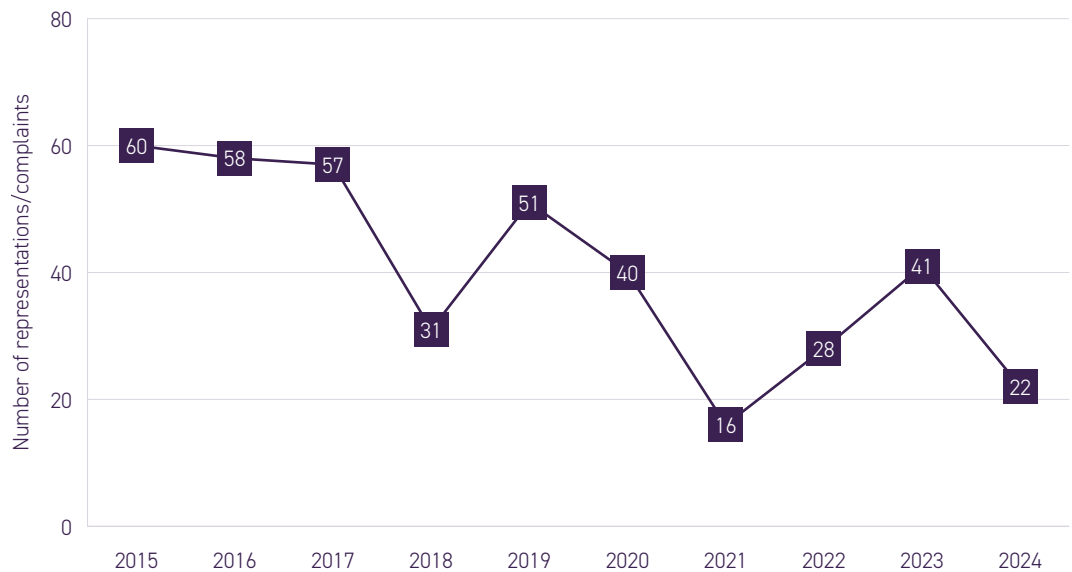
The CRR uses many inputs to undertake risk-based supervision activity. One source of information is representations received from the public, be they passengers or otherwise. Representations can be made to the CRR, with details on how to make a representation being available on our website (www.crr.ie). The contribution from the various stakeholders, including railway workers, passengers, and the public is a valuable source of information, and all contact is screened and responded to. Where issues relating to occupational health and safety arise, the CRR liaises with colleagues in the Health & Safety Authority with whom the CRR has a memorandum of understanding. Should issues be raised related to passenger services, rather than safety, the CRR directs the representation to the appropriate railway organisation or regulator (typically the National Transport Authority). If after the screening process the issues raised involves railway safety, the CRR endeavours, wherever possible, to deal with the matter directly. If necessary, the CRR will undertake inspections and/or seek information from the appropriate railway organisation(s) for further clarification, seeking resolution before responding back to the person who made the representation.

3.2 2024 Data and commentary

In 2024, the CRR received 22 representations relating to a range of safety issues, from heavy to light rail, infrastructure to rolling stock and heritage railway safety matters as shown in Figure 27. This figure remains down on pre-2021 due to a change in data reporting, which excludes representations that are non-safety related (see Figure 28 for a detailed breakdown of representation details).

Figure 27 shows that the number of safety related representations dropped significantly in 2024, reaching the lowest level since 2021. The CRR received 22 representations which raised safety concerns in relation to the rail sector. 2 of these related to safety of infrastructure, 8 related to the safety of rolling stock and 7 related to the safety of train operations. Safety of railway working made up a further 5 representations. 17 additional requests for information were received from several regulatory bodies/agencies. All representations are actioned by the CRR and receive a high degree of priority.

Figure 27
Public representations
to the CRR by year

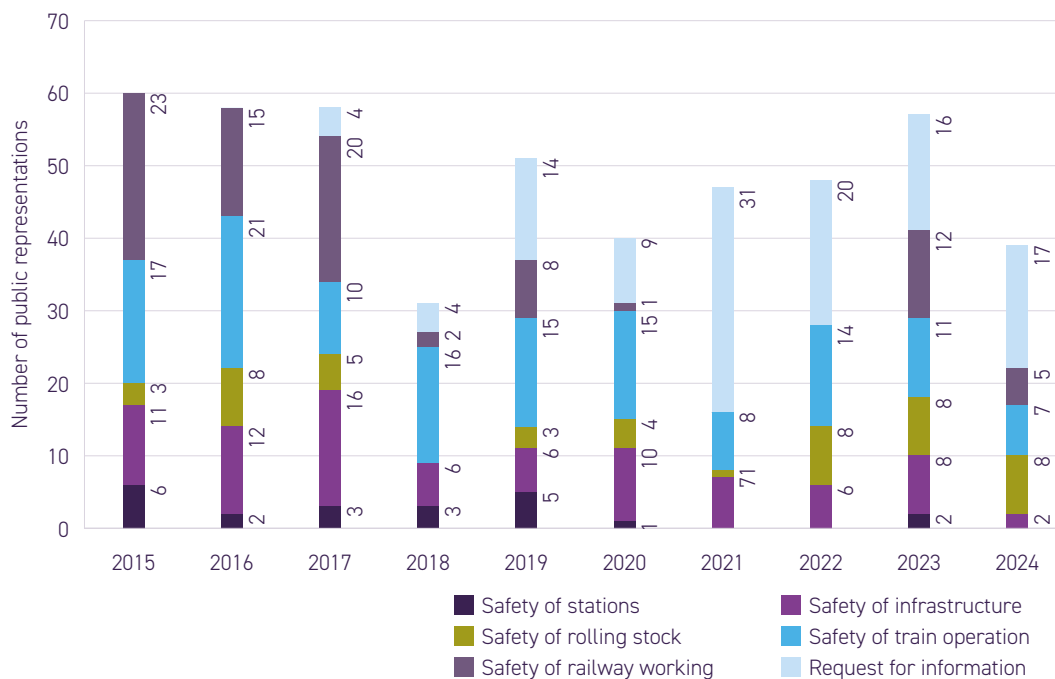


Representations from 2024 are broken down into the following categories:

- Safety at Stations: Queries relating to incidents or concerns at stations
- Safety of Infrastructure: Queries relating to Railway Infrastructure such as bridges, track, level crossings or fencing
- Safety of Rolling Stock: Queries relating to Vehicles such as train noise, carriage alignment or door operation
- Safety of Train Operation: Queries relating to operations such as train loading, excess train speed or shared running of trams
- Safety of Railway Working: Queries relating to operational activities on the railway such as network regulation or management control
- Request for information: A request to the CRR for information not specifically related to railway safety (note these are distinct from formal Freedom of Information requests and do not count towards the overall numbers in Figure 27).

The numbers of representations/complaints by category are shown in Figure 28. The primary focus of the CRR is the 22 safety related representations. These representations varied from concerns regarding the safety of structures adjacent to the railway to the overcrowding of IÉ services.

Figure 28
CRR public
representation
by category



Note that Request for Information's are not counted towards the overall figure.

4. RAILWAY SAFETY TRENDS IN EUROPE



4.1 Introduction

European Union legislation defines the CRR as the NSA for the railway network in Ireland. Each European member state has an NSA which, in accordance with the Railway Safety Directive (EU) 2016/798, has a legal obligation to report to the European Union Agency for Railways (ERA) a set of indicators that can be used to assess the development of railway safety in the EU. The NSAs gather these CSIs which are defined in legislation, annually from the RUs and IMs, which show and allow comparison of safety levels in Member States and the EU.

Some noteworthy statistics are presented from [recent reports](#) based on data up to the 2023 reporting period and, where available, up to 2024. Definitions for data categories used, where not stated, can be found in the document 'Implementation Guidance for CSIs,' which is available at <https://www.era.europa.eu/>.

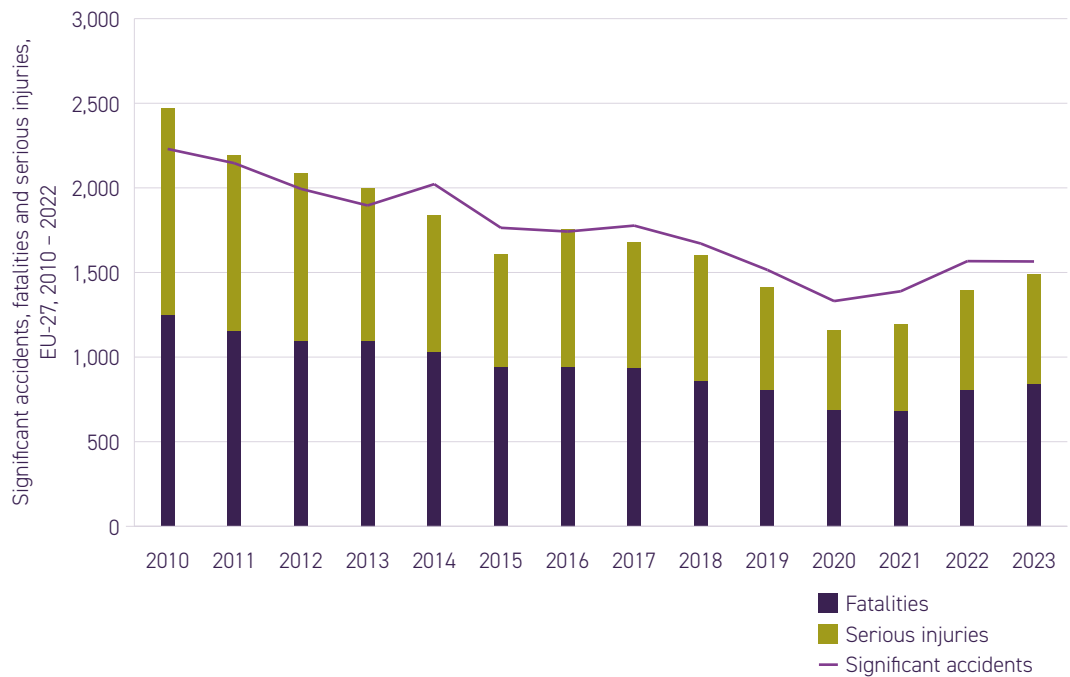
The results of the assessment of CSI's carried out by ERA have identified several areas where safety has stagnated or worsened in recent years. The headline figures such as major accidents and serious accidents decreased in 2024, following increases in 2022 and 2023, although remain down when considered over a ten-year reporting period. Notably, railway worker and passenger fatalities increased in 2023. ERA have reported in the past that, unlike the European aviation and maritime industries, railways have not yet implemented a systematic and comprehensive EU-wide safety occurrence reporting system which would allow learning across member states from not just accidents but also incidents. ERA have drafted a recommendation for the adoption of Common Safety Methods (CSM) for assessing the safety levels and the safety performance of railway operators (CSM on Assessment of Safety Level and Safety Performance). ERA have reiterated the need to implement this CSM to provide additional insight and improvement of the management of safety across Europe.⁶

4.1.1 Significant accidents and their outcomes

The Railway Safety Directive (Directive (EU) 2016/798) defines a significant accident as "any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic, excluding accidents in workshops, warehouses and depots". Figure 29 shows in 2023 (the most recently available dataset) there were 1,565 significant accidents resulting in 841 fatalities and 650 serious injuries within the European Union. The annual number of significant accidents plateaued in 2023 but remains on a downward trend when considered over the 10 years leading to 2023. Although the number of significant accidents remains lower than pre-COVID levels, serious injuries and fatalities have exceeded 2019 levels.

6. ERA Report – Safety Overview 2025

Figure 29
Significant accidents,
fatalities, and serious
injuries
(EU 27, 2010–2023)

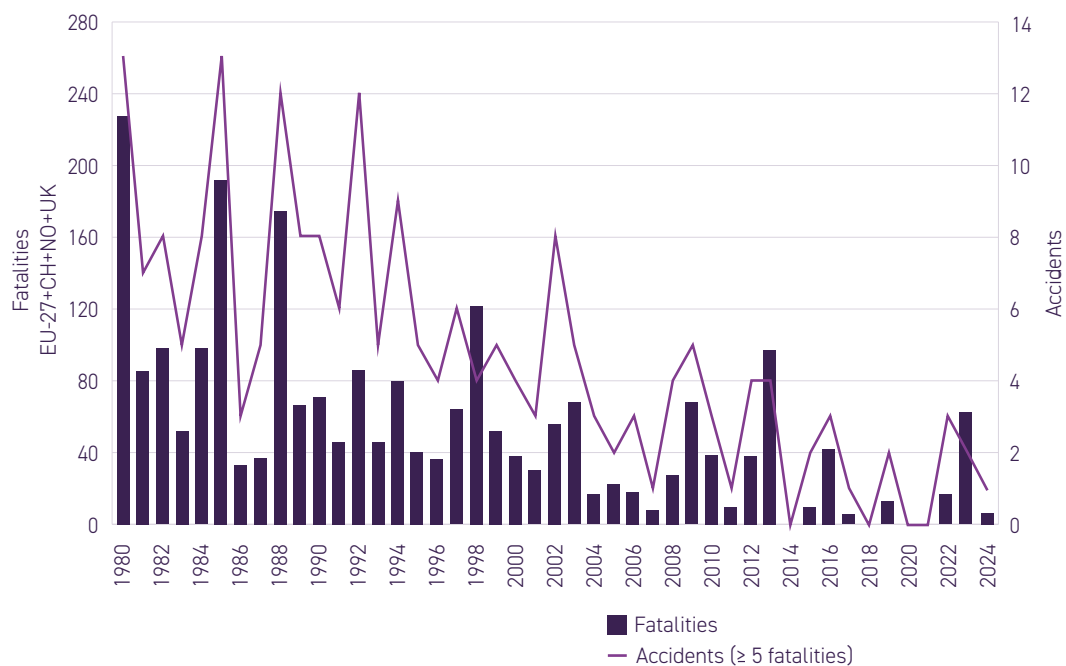


Source: ERA – Report on Railway Safety and Interoperability in the EU 2025.

4.1.2 Irish railway safety in an EU context

The latest CSI data for the EU suggests Ireland has a good safety performance, however the relatively small network (1680 route km) leaves a potential for a single major accident with multiple fatalities to alter Ireland's leading position to one that would trail most other Member States. Figure 30 shows that the trendline for major accidents across Europe has been positive since 1990, with an evident reduction in major accidents. For the most recent five years of major accident data however it is evident that trends have fluctuated. There were no major accidents in 2020 and 2021, 3 in 2022 (total of 17 fatalities), 2 in 2023 (total of 63 fatalities) and 1 in 2024 (total of 7 fatalities).

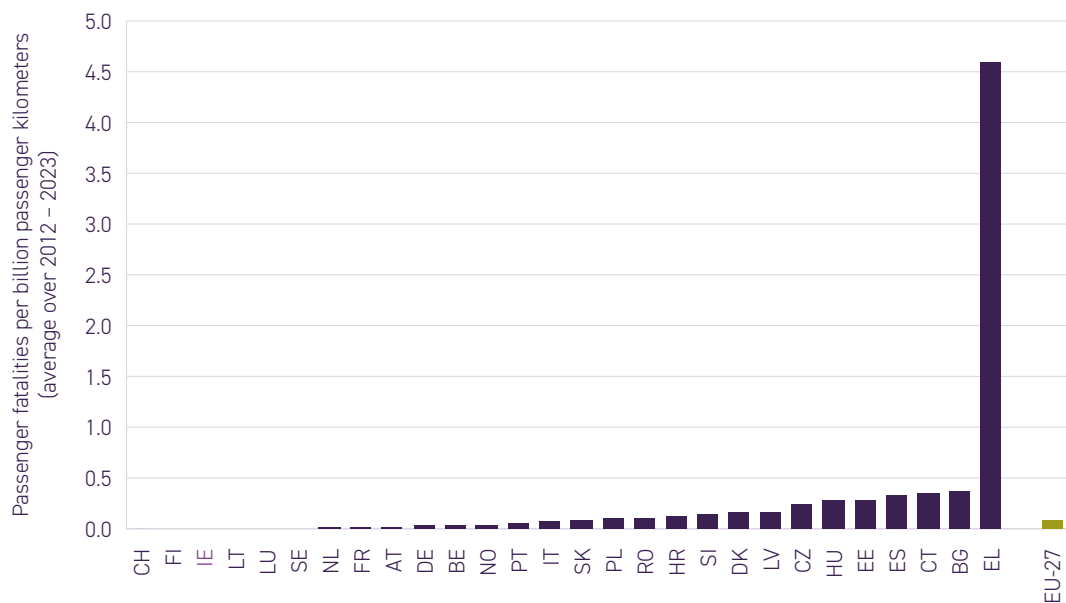
Figure 30
Major accidents in
Europe (EU-27 + CH +
NO + UK, 1980-2024)



Source: ERA – Report on Railway Safety and Interoperability in the EU 2025.

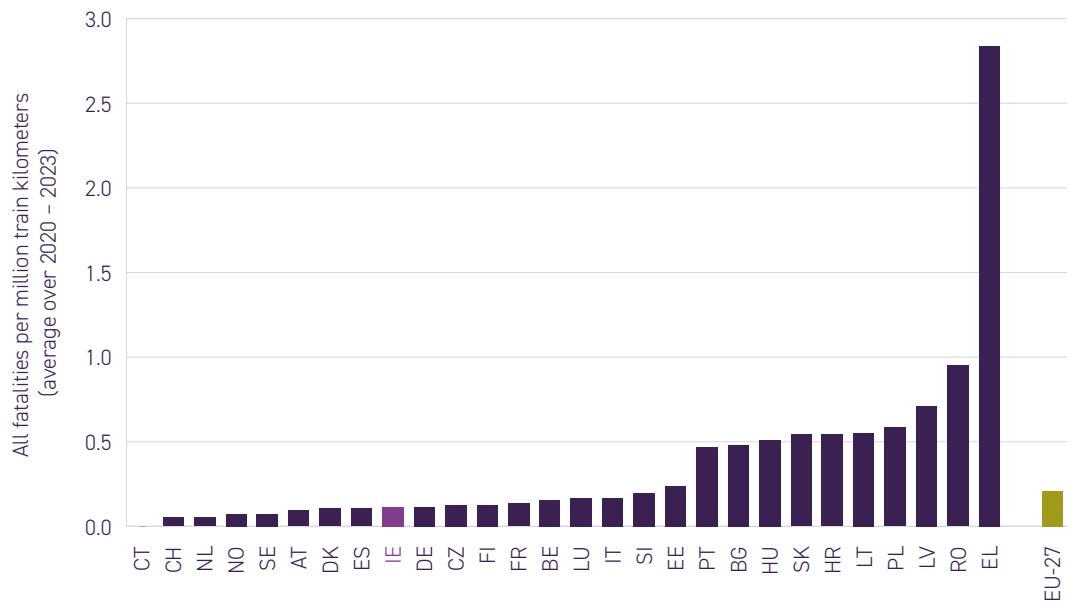
Ireland's position within Europe also remains positive in comparison to other Member States, with performance consistently well ahead of the EU level. Data for railway passenger fatality rates shown in Figure 31 show that when passenger fatalities are normalised using train kilometres travelled, Ireland is a leading country in terms of performance over the last decade.

Figure 31
Railway passenger
fatalities rates
(2013-2023)



Source: ERA – Report on Railway Safety and Interoperability in the EU 2025.

Figure 32
Fatalities per million
train kilometres
(average 2021–2023)



Source: ERA – Report on Railway Safety and Interoperability in the EU 2025.

Figure 32 shows over the period 2021–2023 Ireland is ranked highly within the EU-27 and has a normalised fatality rate (all fatalities, not just passenger) that is below the EU average. However, Ireland has climbed from 5th lowest (2020–2022) to 9th lowest (2021–2023). It is also noted that there is considerable disparity between low and high fatality rate countries, resulting in a somewhat binary categorisation of countries are generally either considerably above or below the average. Following the major accident in 2023, Greece has significantly higher fatality rates as shown in Figure 31 and Figure 32. This single major accident is an example how a member states ranking can change drastically with one single event.

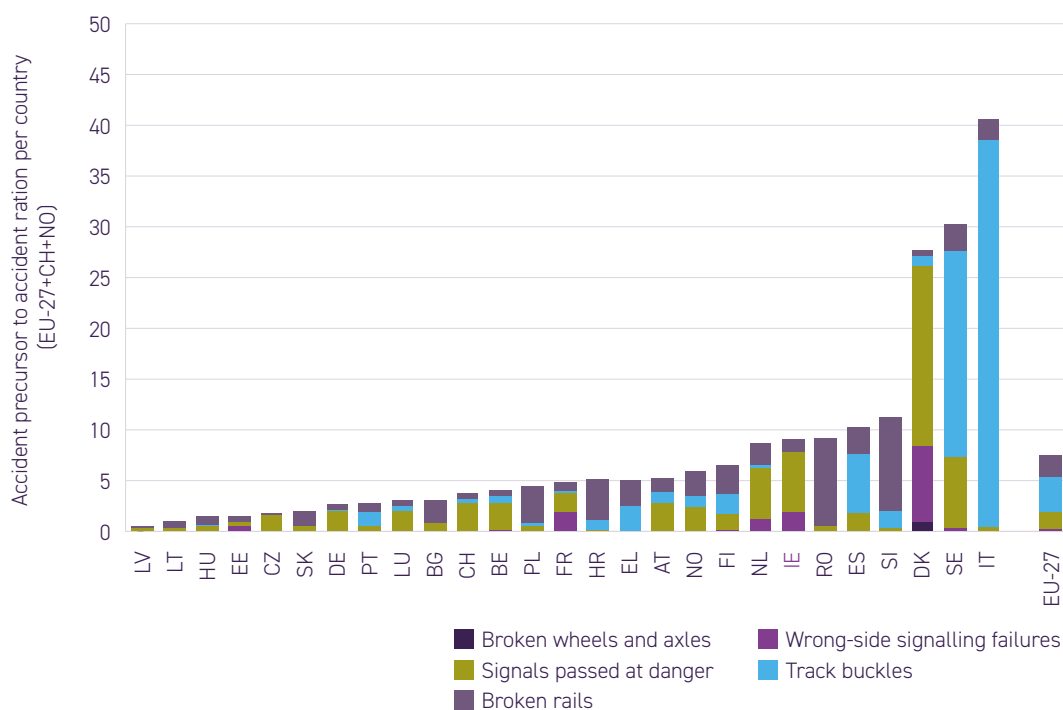
4.1.3 Precursor to accidents

Precursors to accidents are incidents that, under different circumstances, could have led to an accident. They are events whereby the overall safety of the railway system has been compromised to a point whereby an accident is more probable but may not ultimately manifest itself. Due to the causal relationship of precursors to accidents, ROs, national safety authorities and ERA monitor precursors that have no harmful consequences but under slightly different circumstances, could have led to an accident. The Railway Safety Directive requires the following precursors to be reported:

- Broken wheels and axles (on trains or wagons)
- Wrong-side signalling failures
- Signal Passed at Danger (SPAD)
- Track Buckles (track is out of alignment)
- Broken rails.

As shown in Figure 33, Ireland is 7th highest of the EU-27 plus Switzerland and Norway, in terms of the ratio of accident precursors to accidents. It is the case that, as this metric measures the ratio of accident precursors to accidents, Ireland shares the high end of the scale with other low accident rate countries. Comparisons can be made by reviewing the relative performance of similar low accident rate countries. Or identifying areas of relative weakness in comparison to other member states. Concerns regarding the quality of reporting of precursor events continues to be expressed by ERA in their most recent reports. Therefore, any comparison between Member States in terms of precursor events should be interpreted with the caveat that precursor event reporting is of varying quality from country to country.

Figure 33
Total precursor events
by country, (EU-27 +
CH + NO, 2019–2023)



Source: ERA – Report on Railway Safety and Interoperability in the EU 2025.

4.2 Major accidents worldwide

The past 3 years have been particularly sombre for the EU with several major accidents occurring from 2022 to 2024 after two years without a single major accident. One particularly tragic incident occurred in Greece on 28th February 2023 resulting in 57 fatalities, underscoring the necessity to continue improving safety performance and the significant tragedy that can unfold should even a single accident occur. The CRR is an active participant in a small number of fora with other National Safety Authorities in Europe and similar agencies worldwide regarding such incidents and endeavour to share learning points derived from investigations. What follows is a brief overview of recent accidents in other jurisdictions which the CRR considered noteworthy for the Irish railway sector.

Nové Zámky, Slovakia

Around 17:03 (local time) on 27th June 2024, an international train travelling from Prague to Budapest collided with a bus at a level crossing between Nové Zámky and Dvory nad Žitavou, Slovakia. The collision resulted in catastrophic damage to the bus, resulting in 7 fatalities and 5 seriously injured. The Ministry of Transport of the Slovak Republic investigated this level-crossing accident, determining one systematic and one causal factor related to the use of the level crossings protection device.⁷ This was the only major rail accident (i.e., with 5 or more fatalities) in the EU in 2024.

Pardubice, Czechia⁸

On 5th June 2024 at 10:49 p.m. (local time), a passenger train collided with an oncoming freight train in Pardubice, Czechia. The collision caused both trains to derail, resulting in 4 deaths and 22 injuries. The investigation into this accident is ongoing. The preliminary findings of the investigative team indicate the cause of the accident was the failure of the passenger train to stop at a signal at danger. Whether this was a result of human error, a technical defect or a combination of both has yet to be determined.

Pennsylvania, United States of America⁹

On 2nd March 2024 at about 7:11 a.m. (local time), 9 railcars derailed following the collision of three freight trains. A train collided with a stopped train, resulting in a derailment of 3 railcars which fouled the adjacent line. A minute later, a third train collided with these railcars, causing the derailment of a further 6 railcars. The accident resulted in two locomotives becoming submerged in the adjacent river, releasing diesel fuel. The National Transportation Safety Board determined the probable cause of the collision was the failure of the second train to operate in accordance with speed restriction requirements, resulting in the collision with a stopped train. Mitigations were found to not allow for human error, demonstrating that the system was vulnerable to single point human failures.

7. https://www.era.europa.eu/sites/default/files/reports/nib%20slovakia%20-%20annual%20report%202024_en.pdf, https://www.era.europa.eu/sites/default/files/2025-01/35_nov%C3%A9%20z%C3%A1mk%C3%A1mky%20-%20dvory%20nad%20%C5%BEitavou.pdf.

8. <https://di.gov.cz/tiskovy-servis/tiskove-zpravy/srazka-vlaku-v-pardubicich>

9. <https://www.nts.gov/investigations/Pages/RRD24FR009.aspx>

Talerddig, Wales¹⁰

On 21st October 2024, TfWRL train 1J25 (Shrewsbury–Aberystwyth) overran its intended stopping position at Talerddig loop on Network Rail’s single-track Cambrian line by around 1,080 metres and collided head-on with oncoming train 1S71, killing one passenger, seriously injuring three others (including the guard) and the driver of 1S71, and causing 18 further minor injuries — the first fatal train-to-train collision in the UK in over 25 years. RAIB found the overrun resulted from a combination of low wheel-rail adhesion approaching the loop, failure of both trainborne sanding systems (an automatic sander with probable electrical faults, and a manual emergency sander not activated by the driver) to counteract it, and an approach speed that couldn’t be safely reduced given the available adhesion; once past the loop, exceptionally low adhesion on a steep downhill gradient meant the train failed to decelerate despite brakes remaining applied, and no engineered overrun protection existed to stop it entering the occupied single line. The nine resulting recommendations target: trainborne sanding equipment design/maintenance/testing (RSSB and Angel Trains); Network Rail’s overrun-risk assessment methodology and future software-based train control overrun protection; improved railhead treatment to manage adhesion (building on a 2021 Salisbury accident recommendation); TfWRL driver training; passenger interior fittings standards to reduce injury risk in collisions; and ensuring all on-train staff can assist in emergencies regardless of role — alongside a learning point on clarity in safety-critical signaller-driver communications.

Oslo, Norway¹¹

On 29th October 2024 at approximately 11:04 (local time) a tram derailed at the intersection between Ngata and Storgata in Oslo, Norway. The derailed tram crashed into a shop front. The Driver and three passengers suffered minor injuries. The tram derailed due to a sudden increase in speed at a switch. The overspeed was the result of an acute illness suffered by the driver, resulting in a loss of consciousness causing the tram to be put into ‘full-thrust position’ and the ‘Deadman’s grip’ released. The ‘Deadman’s grip’ is designed to stop the vehicle with the loss of driver consciousness and was found to have performed as expected. The derailment was caused by the driver losing consciousness 8 seconds before derailling, while the ‘Deadman’s switch’ is designed to operate the brakes after 10 seconds. The Norwegian Safety Investigation Authority made no recommendations following the accident but highlighted the loss of consciousness as a result of Norovirus as a learning point.

10. <https://www.gov.uk/government/news/collision-between-passenger-trains-near-talerddig>

11. <https://nsia.no/Rail/Rail/Published-reports/2025-02>

5. ACCIDENT INVESTIGATIONS



5.1 Introduction

The RAIU is the National Investigation Body for railway accidents and incidents in Ireland. The RAIU investigate all serious accidents in addition to accidents and incidents which could have, under slightly different circumstances, resulted in a serious accident. A 'serious accident' is, in accordance with the European Railway Safety Directive (EC) 2016/798 and the Railway Safety Act 2005, 'any train collision or derailment of a train, resulting in the death of at least one person or serious injuries to 5 or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other accident with the same consequences, which has an obvious impact on railway safety regulation or the management of safety'.

The purpose of an investigation by the RAIU is to identify improvements in railway safety by establishing, in so far as possible, the cause or causes of an accident or incident with a view to making recommendations for the avoidance of similar accidents in the future, or otherwise for the improvement of railway safety. An investigation by the RAIU does not attribute blame or liability. The RAIU's investigations are carried out in accordance with the European Railway Safety Directive (EC) 2016/798 and the Railway Safety Act 2005 as amended by S.I. No.258 of 2014 and S.I. No. 430/2020.¹²

All RAIU investigation reports are made publicly available at www.raiu.ie and, due to the nature of their investigations, may contain highly technical terminology and acronyms. When reading this section, one should consult the relevant RAIU report for a full understanding of the Safety Recommendations made.

5.2 RAIU active investigations

The RAIU conducted 66 Preliminary Examination Reports and initiated 7 full investigations into railway accidents and incidents in 2024 (Table 5).

Table 5
RAIU investigations initiated in 2024

Date of incident	Details	Railway organisation
8th March 2024	Collision between two road rail vehicles, on the Athenry to Galway line	IE
28th March 2024	Operational irregularity at the 70% Mile Post (Ballybrophy), on the Cork mainline	IE
12th June 2024	Derailment of a road rail vehicle (excavator), near Ballycollin, Co. Offaly	IE
13th August 2024	Signal passed at danger without authority near Keellogues level crossing, Co. Mayo	IE
10th September 2024	Collision between a road rail vehicle and a member of IE staff, North Esk, Co. Cork	IE
11th October 2024	Reported near miss with staff, near Killiney Station (note: this will form the basis of a trend investigation into near misses with staff on the IE network)	IE
24th November 2024	Cardan shaft detachment from an intercity railcar, between Templemore and Ballybrophy	IE

12. Railway Safety Directive and the Railway Safety Act are supplemented by S.I. No. 430/2020 – European Union (Railway Safety) (Reporting and Investigation of Serious Accidents, Accidents and Incidents) Regulations 2020.

The RAIU may make some findings on safety issues that require immediate action during the early stages of an investigation. In these cases, the RAIU issue an Urgent Safety Advice Notice (USAN) Investigation Report or a Safety Advice Notice (SAN) Investigation Report. The purpose of issuing USAN/SANs is that the RAIU can make safety recommendations to Implementers and Addressees promptly. As a result of an incident at North Esk on 10th September 2024, the RAIU issued an USAN. Within this USAN four recommendations were issued regarding the uncoupling of trailers from towing Road Rail Vehicles (RRV).

5.3 RAIU investigation reports 2024

In accordance with the Railway Safety Act 2005, the RAIU endeavours to publish an investigation report not later than 12 months after the date of the incident. In 2024, the RAIU published 3 investigation reports which are listed in Table 6. The RAIU also published 1 USAN, listed in Table 7. As a result of these investigations the RAIU made a total of 14 safety recommendations which are discussed in Section 5.4.

Table 6
RAIU investigation reports published in 2024

Date report published	Date of incident	Title of report	No. of safety recommendations made	Railway organisation
18/01/2024	23/02/2023	Broken rail, Newbridge, County Kildare	3	IE-IM
22/03/2024	22/02/2023	Broken Rail near Emly, County Tipperary	5	IE-IM
12/12/2024	09/09/2023	Collision between a car and a train at Level Crossing XM190, Mayo	2	DoT & IE-IM

Table 7: Other RAIU publications in 2024

Date report published	Date of incident	Title of report	No. of safety recommendations made	Railway organisation
03/10/2024	10/09/2024	USAN 004 – IE A PRSM RRV and Trailer North Esk	4	IE-IM & RRV Contractors

5.4 RAIU Safety Recommendations 2024

The RAIU, through their accident investigations, identify whenever possible the causal factors, contributing factors or systemic factors. Having established these, the RAIU may make safety recommendations and as previously stated, 14 were made in 2024. Safety recommendations made by the RAIU are typically directed at the railway organisation or other third parties who may have had a responsibility under legislation. In addition, its recommendations are addressed to the CRR as the responsible National Safety Authority. The CRR thereafter have a responsibility for the oversight of the implementation of the safety recommendations by the entity to which they have been directed.

The CRR categorise the status of recommendations as being either 'Open,' 'Submitted,' 'FER' or 'Closed.' These are defined as follows:

Open	Feedback (Evidence) from Railway Organisation (or another party) is awaited or actions have not yet been completed.
Submitted	A Railway Organisation (or other party) has made a submission to the CRR, advising that it has taken measures to affect the recommendation and the CRR is considering whether to close the recommendation.
FER	Further Evidence Required. The CRR has reviewed a submission (or further submission) but considers that further evidence is necessary to close the safety recommendation.
Closed	The CRR has reviewed a submission (or further submission) and is satisfied that the safety recommendation has been addressed.

A summary is presented below of the actions taken (at the time of writing) in relation to the 3 RAIU Investigation Reports and 1 USAN published in 2024 where safety recommendations were made, and the status of each recommendation.

It should be noted that just because a safety recommendation is identified as being 'open' does not mean that no action has been taken, rather the RO responsible has not yet reported that they have concluded all actions they proposed to take to address the specific safety recommendation.

2024-R001**Broken rail, Newbridge, Kildare****(Report Published 18th January 2024)**

Summary	- On the morning of the 23rd February 2023, as the 07:00 hours (hrs) Newbridge to Grand Canal Dock passenger service (Train P402) travelled on the Up line near Newbridge, Co Kildare; the driver (Driver P402) saw an abnormal Continuous Automatic Warning System (CAWS) downgrade on the train's in-cab display. - At 07:11 hrs Driver P402 reported this abnormal CAWS downgrade to the Mainline Signaller. - At 07:24 hrs the driver (Driver A501) of the 06:30 hrs Carlow to Dublin Heuston passenger service (Train A501) also reported a CAWS downgrade in the same area to the Mainline Signaller. The IÉ-IM Signalling, Electrical & Telecommunications (SET) Department were advised, and an SET member of staff was dispatched to site to investigate the suspected fault. - Twenty-eight passenger trains travelled over the affected line, with drivers continuing to report abnormal CAWS downgrades as they approached the affected area; these drivers were advised to continue and obey lineside signals which were working normally. - The SET staff member discovered a broken rail at 10:52 hrs and trains were stopped on the affected line immediately. - The broken rail was found to have fractured through a flash butt welded joint. The rail had been installed on the 28th January 2023 (five days earlier). - The flash butt welding of the rail had been carried out off-site at IÉ-IM's Portlaoise Rail Welding Plant where rails are joined to make longer 'strings' of welded rail. - The mechanism of failure for the broken rail was slag inclusion in the welding process causing a lack of fusion in the toe of the rail foot. The lack of fusion created a cracking initiation point which propagated from that location, probably starting from when the rail was handled or manoeuvred during delivery or installation; the crack then progressed through the remainder of the rail section in a single rapid event due to rapid overload.
Number of recommendations made	3
Recommendation 1 (2024001-01)	IÉ-IM should risk assess whether the existing rail end cleaning equipment and processes adequately control the risk of weld contamination and identify improvements where required.
Action/s taken/ in progress	February 2024 – Action Plan submitted to CRR. January 2025 – Submission for recommendation closure made.
Status	Submitted
Recommendation 2 (2024001-02)	IÉ-IM to investigate altering the monitoring and detection parameters of the rail welding machine to be able identify and highlight possible anomalies in the welding process.
Action/s taken/ in progress	February 2024 – Action Plan submitted to CRR. April 2025 – Submission for recommendation closure made.
Status	Submitted
Recommendation 3 (2024001-03)	IÉ-IM to revise the risk assessments for the Portlaoise Rail Welding Plant to ensure risks in the production process affecting the quality of rail welds are understood and control measures are identified.
Action/s taken/ in progress	February 2024 – Action Plan submitted to CRR. January 2025 – Submission for recommendation closure made.
Status	Submitted

2024-R002

Broken Rail near Emly, County Tipperary
(Report Published 22nd March 2024)

Summary

1. On Tuesday 21st February 2023 a T3 Possession was organised on the Up and Down lines of the Dublin to Cork mainline to allow for a track section, near Emly Level Crossing (LC), to undergo track maintenance.
2. As part of the track maintenance, stressing and welding of the rails had to be undertaken in preparation for ballast cleaning.
3. The stressing of the rails was being carried out on the Up line, which involved cutting both rails which was marked by a IÉ-IM staff member, the Person in Charge of Stressing (this member of IÉ-IM staff was also the Track Delivery Unit Engineer (TDU Engineer) who supervised the works).
4. A welding contractor was engaged to carry out the welding at the site location (110 miles 355 yards), with a team comprising of a lead and second welder (the Welders) and a Weld Supervisor. Prior to the welding, the Welders placed clamps on either side of the first cut rail section and attached Rail Tensors to pull the rail ends together until the required welders gap was achieved. The rails were then anchored by the Chief Civil Engineer's (CCE) Department staff to ensure no movement of the rails, and the rail ends were welded using the Thermit® SoW-5 welding process; the first weld was 'dropped' without issue.
5. The Welders then placed the clamps on either side of the next cut location and attached the Rail Tensors in order to pull the rails ends together. On the first attempt when pressure was applied by the Rail Tensors the rails did not hold; on the second attempt, the Rail Tensors failed to pull the rail ends together; but, on the third attempt, the rail ends were pulled to the required welders gap. The Welders then waited to make sure the Rail Tensors held and once they were sure it was holding, the CCE staff fastened down the tension clamps to anchor the rails and the Welders dropped the weld without further issue.
6. The welds were inspected by the Weld Supervisor who was satisfied that there were no visible defects.
7. When the welds had cooled, the Ultrasonic Operator tested the rails, which passed the ultrasonic tests with no defects identified.
8. The T3 Possession was handed back by the Person In Charge of the Possession (PICOP) at 05:00 hrs on Tuesday the 21st February 2023 and normal service resumed on the Up line. A total of twenty-four passenger service trains passed the section on Tuesday and Wednesday morning until the fault was detected.
9. On Wednesday 22nd February 2023, at 07:56 hrs, the Signalman at Centralised Traffic Control (CTC) saw that a track circuit (LJ789 on the Up line, near Emly LC) remained occupied after the 07:00 hrs passenger service from Cork to Heuston (Train A205) passed through the location.
10. The Signalman contacted the driver of Train A205 (Driver A205) to ensure the train had passed safely through the affected section of line.
11. At 07:57 hrs the Signalman confirmed with Mallow Level Crossing Control Centre (LCCC) that there was no fault with the signalling equipment at Emly LC.
12. At 07:59 hrs the Signalman contacted the SET Department to report the track circuit fault. SET staff members deployed to the location, and checked a number of SET location cases near the location of the fault; before walking the track and finding a broken rail, at the 110 miles 355 yards (the location of the welded rail), at 10:35 hrs.
13. Just as the SET staff member had discovered the broken rail a train was approaching on the Up line. It was the 09:25 hrs passenger service from Cork to Heuston (Train A209) travelling under caution. The SET staff member stepped out to a position of safety and signalled the train to stop. Train A209 travelled over the broken rail before coming to a stop.
14. The SET member spoke to the driver (Driver A209) and told them the fault was a broken rail and the train had travelled over it. Driver A209 notified the Signalman of the broken rail and resumed their journey.
15. The Signalman contacted the SET staff member who confirmed that the track circuit fault was as a result of a broken rail.

2024-R002**Broken Rail near Emly, County Tipperary
(Report Published 22nd March 2024)****Summary (continued)**

16. Signaller took the appropriate actions and signal protection was put in place on the Up line.
17. The Signaller contacted the Permanent Way Inspector (PWI) who confirmed that they had been notified of the broken rail. The PWI attended the site of the broken rail, and the rail was clamped and plated.
18. The line re-opened at 11:30 hrs with an Emergency Speed Restriction (ESR) of 10 miles per hour (mph) (16 kilometres per hour (km/h)) in place until later that night, when the repairs were undertaken. The ESR was lifted, and normal passenger service resumed at 05:30 hrs on Thursday the 23rd February 2023.
19. A post-incident metallurgical examination of the weld found that the weld broke rapidly from defects introduced during Thermit SoW-5. The position of the defects was within the last areas to solidify (the centre of the weld) with the appearance indicating that the defects were likely to be either a hot tear or shrinkage. However, given the difficulties encountered by the Welders with the Rail Tensors, it was more likely as a result of a hot tear.

Number of
recommendations made

5

**Recommendation 1
(2024002-01)**

IE-IM CCE to update Technical Management Standard, CCE-TMS-323, Technical Standard for the Stressing of Rail, to include a more robust guidance for welders, in relation to recognising when there may be issues with the Rail Tensors; and what actions are to be taken when difficulties arise with the Rail Tensors.

Action/s taken/
in progress

May 2024 – Action Plan submitted to CRR.
January 2025 – Submission for recommendation closure made.

Status

Submission

**Recommendation 2
(2024002-02)**

IE-IM CCE should review the current suite of documents related to welding to ensure consistency across the relevant documents

Action/s taken/
in progress

May 2024 – Action Plan submitted to CRR.

Status

Open/In progress

**Recommendation 3
(2024002-03)**

IE-IM CCE should develop systems for the management and certification of rail stressing equipment (including contractor's rail stressing equipment), to ensure equipment is regularly serviced and recalibrated at a nominated frequency. These updated requirements should be reflected in the relevant documents.

Action/s taken/
in progress

May 2024 – Action Plan submitted to CRR.
January 2025 – Submission for recommendation closure made.

Status

Submitted

**Recommendation 4
(2024002-04)**

IE-IM CCE should review and update the Continuous Welded Rail (CWR) Record Sheet to include sections for recording the serial number and calibration/recalibration date of the Rail Tensors being used, the pressure gauge readings and the frequency of these checks on the pressure gauges. On completion, ensure staff are briefed on the changes, and changes should be incorporated into future training programmes for a Person in Charge of Stressing.

Action/s taken/
in progress

May 2024 – Action Plan submitted to CRR.

Status

Open/In progress

2024-R002

Broken Rail near Emly, County Tipperary
(Report Published 22nd March 2024)

**Recommendation 5
(2024002-05)**

IE-IM CCE should update CCE-TMS-323 to include guidance for the Person in Charge of Stressing, in relation to actions to be taken when difficulties are encountered with Thermit SoW-5 (including when Thermit SoW-5 can continue, be restarted or must be abandoned; and, who is responsible for this decision, the Person in Charge of Stressing or their Supervisor). On completion of the update, Persons in Charge of Stressing should be briefed and the training programme for the role revised with the new guidance.

Action/s taken/
in progress

May 2024 – Action Plan submitted to CRR.

Status

Open/In progress

2024-R003

Collision between a car and a train at Level Crossing XM190
(Report Published 9th September 2024)

Summary

At approximately 15:15 hrs on Saturday the 9th September 2023, the IE 12:45 hrs Heuston to Westport passenger service (Train A804) was approaching Prendergast's LC, asset number XM190 (to be referred to as LC XM190), located between Ballyhaunis and Claremorris (County Mayo), at a speed of 70 mph (110 km/h). The train driver (Driver A804) sounded the horn at the whistle board associated with LC XM190 on their approach. LC XM190 is an Occupational Public (OP) user worked unattended level crossing (UWLC) meaning it is guarded by metal gates across a public road; whereby a member of the public, the 'user', will have to open and shut the gates to cross the railway and continue on the road.

At the same time as Train A804 was approaching LC XM190 a car was also approaching LC XM190 from the up side (right hand side from the perspective of Driver A804). The car was travelling on a rural local road L65516 which links national road, N60, with another local road, L5551, and onto the N17. The speed limit for the local road is 80 km/h. The driver of the car (Car Driver) had taken a wrong turn at Claremorris and their satellite navigation system had diverted them onto these local roads which routed them over LC XM190 to continue on their journey.

On the approach to LC XM190 there are three 'Level Crossing with No Flashing Red Signal (with Barriers or Gates)' advance warning signs (Sign W121) located at 100 metres (m), 200 m and 300 m in advance of LC XM190. In addition, there is a 'Warning Railway Crossing Ahead Stop before you Cross the Railway' sign, a mandatory Stop Sign (Sign RUS 027), and a 'Warning Trains' sign mounted on poles at LC XM190.

The gates at LC XM190 were left open to road traffic by a previous unknown user of LC XM190.

When Driver A804 saw the car approaching LC XM190 they sounded the train horn again. Driver A804 could see that the car was travelling 'a bit fast' and made a full service brake application and continued to sound the horn. On realising the car was not going to stop, Driver A804 made an emergency brake application.

2024-R003
Collision between a car and a train at Level Crossing XM190
(Report Published 9th September 2024)

Summary (continued)

As Train A804 slowed, Driver A804 saw that the car was also slowing while arriving onto LC XM190, with the car coming to a 'standstill' on the railway line. There was insufficient time to bring Train A804 to a stop before reaching LC XM190 and Train A804 collided with the car (at the time of the collision the coupler was in the extended position as a result of issues with retracting couplers on the Intercity Railcar (ICR Fleet)).

The car sustained substantial damage on impact and was propelled approximately 31 metres (m) into an adjacent field landing on the passenger side. The front of Train A804 came to a stop 310 metres past the centre of LC XM190. Driver A804 contacted the Mayo Line Signaller requesting emergency service and followed all other post-accident procedures correctly.

The two occupants of the car sustained injuries (the passenger sustained life-changing injuries) and were treated at the scene before being airlifted to hospital for treatment.

Number of recommendations made

2

Recommendation 1 (2024003-01)

The Department of Transport should continue to trial the new design sign (Sign W126), in consultation with the relevant stakeholders, with a view to replacing Sign W121 in the Traffic Signs Manual. The RAIU maintain that the advance warning signs on the approaches to OP Type level crossings should portray the hazard (i.e., the road user is approaching a live railway) and indicate the severity of not adhering to the warning (i.e., possible collision with a train).

Action/s taken/ in progress

March 2025 – Action Plan submitted to CRR.

Status

Open/In progress

Recommendation 2 (2024003-02)

IE-IM should replace their 'Warning Trains' sign, located at OP Type level crossings, to the new proposed advance warning sign (Sign W126), once included in the Traffic Signs Manual.

Action/s taken/ in progress

February 2025 – Action Plan submitted to CRR.

Status

Open/In progress

USAN 004**IE A PRSM RRV and Trailer North Esk
(Report Published 3rd October 2024)**

Summary	On the 10th September 2024, during a T3 Possession on the Cork to Cobh and Midleton Lines, an IE-IM member of staff from the CCE Department was undertaking the role of Person in Charge of a Road Rail Vehicle (PIC-RRV). At approximately 02:50 hrs the PIC-RRV was unhooking the draw bar from the Trailer and clearing some scrap pallet timber from the Trailer. The PIC-RRV did not give an instruction to the RRV Operator (RRVO) of the RRV Excavator to off-track. The RRVO was in the process of raising its rail wheels allowing the road wheels back to ground level (offtracking) when the RRV moved forward striking the PIC-RRV from behind; the forward momentum of the RRV Excavator carried the PIC-RRV forward until coming into contact with the stationary Trailer. The PIC-RRV suffered minor cuts to their legs and sought medical attention the next day. It should be noted that the accident was reported internally on the 10th September, however, the seriousness of the occurrence was not identified until the 12th September when the CCTV footage was obtained. IE-IM then notified the RAIU.
Number of recommendations made	4
Recommendation 1 (USAN 004 – 001)	IE-IM should review the IE Rule Book Section Q Part 1 and consider the inclusion for the coupling and un-coupling Trailers to/from towing RRVs. The review should consider at a minimum, for coupling and uncoupling Trailers: – The RRVO is responsible for the coupling/uncoupling procedures; – Only trained and assessed competent RRVOs are allowed to undertake the coupling/uncoupling procedures for Trailers; – The RRVO must have been given permission from an PIC-RRV prior to undertaking coupling/uncoupling procedures for Trailers; – A PIC-RRV must be present and verify that the RRVO is carrying out the procedures correctly.
Action/s taken/ in progress	October 2024 – Action Plan submitted to CRR. January 2025 – Submission for recommendation closure made.
Status	Submitted
Recommendation 2 (USAN 004 – 002)	The RRV Contractors, supported by IE-IM, must develop procedures for the safe coupling and uncoupling of Trailers to and from towing RRVs this should include a process to remove the need for a ground operative to be in between an RRV and a trailer during the coupling/uncoupling process*†.
Action/s taken/ in progress	October 2024 – Action Plan submitted to CRR. June 2025 – Submission for recommendation closure made.
Status	Submitted

* Best practice should be considered, for example, Code of Practice for Trailers and Attachments with OTP, COP0014, Issue 7, Dec 2018; published by the Rail Safety and Standard Board (RSSB) on behalf of Mechanical & Electrical Engineering Networking Group (United Kingdom).

† Part of the development should consider whether a trestle (or other propped mechanism) could be used to support the draw bar during the coupling of RRVs, to remove the requirement for a ground operative to be present between two RRVs, when one is moving.

USAN 004
IE A PRSM RRV and Trailer North Esk
(Report Published 3rd October 2024)

Recommendation 3 (USAN 004 – 003)	IE-IM, based on the procedures produced, should determine what mandatory procedures should be included in the IE Rule Book, e.g., a functional brake text must be carried out for the coupling procedures.
Action/s taken/ in progress	October 2024 – Action Plan submitted to CRR.
Status	Open/In progress
Recommendation 4 (USAN 004 – 004)	RRVO Training Instructors should update the RRVO training for RRVOs for the operation, coupling and uncoupling of Trailers to/from towing RRVs. This should include as a minimum: – Procedures for the safe coupling and uncoupling Trailers; – The different braking mechanisms associated with Trailers; – How to carry out a function brake test; – How to release the braking pressure; – The IE Rule Book rules of coupling and uncoupling Trailers; – Practical training in relation to the above. When RRVOs have received this training, this should be recorded by their employer and on a new RRV Competency Card, to ensure only competent RRVOs are allowed to undertake the coupling and uncoupling procedures for Trailers and that RRV Competency Cards can be inspected on site[‡].
Action/s taken/ in progress	October 2024 – Action Plan submitted to CRR.
Status	Open/In progress

[‡] It is noted that RRVOs must carry a CSCS Card (where relevant), an RRVO Theory Competence Certificate (issued by IE-IM), a Personal Track Safety Card (issued by IE-IM) and a Safe Pass. IE-IM and the RRV Contractors should determine how best to record competencies for presentation on site.

5.5 RAIU Recommendations Summary

For further details on the status of RAIU Safety Recommendations please consult the CRR's Annual Report to the Minister for Transport, which is available on our website, www.crr.ie.

It should be noted that many safety recommendations made by the RAIU may require strategic planning, engineering design, public consultation, planning permission and/or government funding, all of which may result in it taking several years to fully 'close' a safety recommendation.

6. REFERENCES



6.1 Documents used

- CRR (2025) Annual Report 2024. Dublin: CRR
- ERA (2025), Safety Overview 2025
- Iarnród Éireann, Iarnród Éireann Annual Report Year Ended 31 December 2024
- IÉ-IM (2025), IÉ-IM Annual Safety Report-2024
- IÉ-IM (2024) Network Statement
- IÉ-RU (2025), IÉ-RU Annual Safety Report-2024
- Met Éireann Storm Centre Reports
- Ministry of transport of the Slovak republic, NIB ANNUAL REPORT 2024
- Ministry of transport of the Slovak republic, Final investigation report.
- Railway Preservation Society of Ireland (2025), RPSI Annual Safety Report-2024
- Rhomberg Sersa Ireland, Annual Report to the Commission for Railway Regulation (CRR) for Jan-Dec 2024
- Norwegian Safety Investigation Authority, Report on tram derailment at the intersection between Nygata and Storgata in Oslo on 29 October 2024
- Translink (2025), Annual Safety Report to the Commission for Railway Regulation 2024.

7. GLOSSARY



BNM	Bord na Móna
CRR	Commission for Railway Regulation
CSI	Common Safety Indicators
CWR	Continuous Welded Rail
DMU	Diesel Multiple Unit
DSS	Decision Support System
EB	Emergency Brake
ECM	Entity in Charge of Maintenance
ERA	European Union Railway Agency
IÉ IM	Iarnród Éireann Infrastructure Manager
IÉ RU	Iarnród Éireann Railway Undertaking
NIR	Northern Irish Rail
NSA	National Safety Authority
OTM	On Track Machine
RAIU	Railway Accident Investigation Unit
RPSI	Railway Preservation Society of Ireland
RRV	Rail Road Vehicle
RSIE	Rhomberg Sersa Ireland
RTC	Road Traffic Collision
SPAD	Signal Passed at Danger
SPAS	Signal Passed at Stop
TDLR	Transdev Dublin Light Rail
TII	Transport Infrastructure Ireland

The CRR is grateful to Neil Dinnen for permission to use his copyright images in this report



Commission for Railway Regulation
Temple House
Temple Road
Blackrock
A94 Y5W5
County Dublin
Ireland
www.crr.ie
+353 1 206 8110
info@crr.ie