



# RAIL SAFETY REPORT

2023–2024

**onrsr**

**SAFE  
RAILWAYS  
FOR  
AUSTRALIA**

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# THE REGULATOR'S MESSAGE

Initiatives such as the National Rail Action Plan, the National Level Crossing Safety Strategy and the Rail Safety National Law Review, present opportunities for the rail industry to do things differently. At ONRSR we are embracing this sense of renewal by positioning the organisation to do its part to facilitate and champion change.

To that end ONRSR established its Strategic Directions 2024–2027, at the core of which is a new organisational purpose not only to apply risk-based regulation but also to proactively share insights and information arising from our work. And so, in support of a sector-wide sense of rejuvenation, I am delighted to present our annual ONRSR Rail Safety Report - the first iteration to present information beyond counts of notifiable occurrences.

The report, now an online resource, uses 'chain of event' details provided by operators for each notifiable occurrence to delve deeper into the why and how a set of circumstances has resulted in a rail safety incident. This is complemented by additional statistical analyses and international benchmarking that allows us to compare Australia's performance not only with traditional yardsticks, the UK and USA but also with several comparable European nations and Canada.

These are small but important first steps to evolve our data sets and transform our analysis and reporting functions so that they deliver actionable insights for those with the responsibility for managing railway operations safely. Ultimately, we want this and subsequent iterations of the report to provide a richer understanding of the safety issues challenging the industry and the safety performance of the industry in addressing them.

Where we can take the report is something I am constantly challenging the ONRSR team with, and I know they are committed to working hard not only internally but with rail operators and the wider transport and research sectors to continue its evolution. The report retains its focus on providing rail operators, duty holders, decision-makers and all other stakeholders with an understanding of the industry's safety performance – which I am pleased to note remains generally strong.

Watch this space.

**Dr. Natalie E Pelham**  
Chief Executive / National Rail Safety Regulator



# INTRODUCTION

# INTRODUCTION

## OUR VISION

# SAFE RAILWAYS FOR AUSTRALIA

## OUR VALUES

**INTEGRITY**

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**RESPECT**

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**INDEPENDENCE**

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**DILIGENCE**

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**EXCELLENCE**



## OUR PURPOSE

ONRSR's purpose is *to enhance rail safety for the Australian community through targeted, risk-based regulation and by proactively sharing insights and information arising from our work.*

Five strategic directions guide our approach:

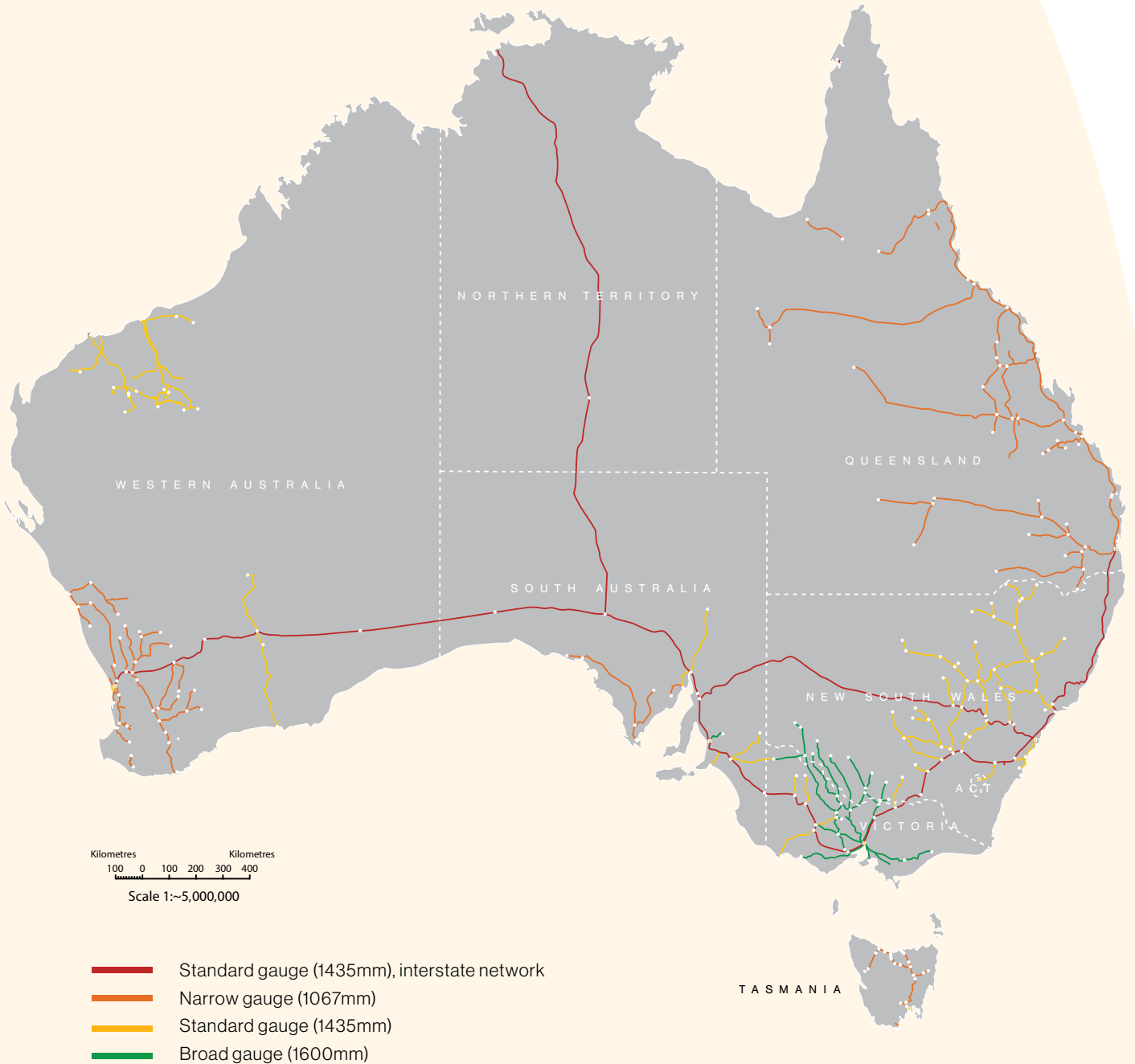
- **Leveraging data and intelligence to enhance our approach to risk-based regulation**
- Ensuring our people are valued, skilled and engaged.
- Cultivating strong and collaborative relationships with key stakeholders.
- Positioning ONRSR as a future-focused and sustainable regulator and:
- **Influencing safety practices and building safety knowledge among rail transport operators.**

ONRSR is committed to doing more with the invaluable data and intelligence we collect through occurrence reports, operator safety reports, independent investigations and the intelligence we gather through regulatory activities across the country. Our focus is on turning this rich information into data sets and publications like this report, to deliver actionable insights that are shared with the industry.

We want to inform the decisions rail transport operators are making and in doing so continue to evolve our regulatory intelligence framework and both our qualitative and quantitative data sets.

We want ONRSR's regulatory effort, and the insights contained within the pages that follow, to support delivery of measurable safety benefits to the Australian rail industry.

# NETWORK MAP



Sourced from the Australasian Railway Association

# NATIONAL RAIL SAFETY DATA SET

Collection of the National Rail Safety Data Set (NRSDS) officially commenced on July 1, 2022, and is the source for the data provided in this 2023–2024 ONRSR Rail Safety Report.

While the statistics presented in this report focus on the events of the 2023–2024 financial year, the report retains several charts that were published in previous years to show the last five years' incident counts and rates. The introduction of incident rates provides a more accurate picture of national safety performance than counts alone.

This is because a rate uses a denominator to remove the influence of variations in the scale of railway operations over time.

See table 7 in Appendix B – Scope and Methods for details on the revised NRSDS. For charts impacted by changes in definitions, labels or colour changes have been used to indicate the changes.

# ABOUT THIS REPORT

The ONRSR Rail Safety Report provides a national summary of rail safety industry performance in the 2023–2024 financial year described by safety statistics derived from rail safety occurrences (notifiable occurrences) reported to ONRSR, along with ‘chain of events’ information, and information gathered through regulatory activities. While predominantly a summary, this report does highlight specific incidents where there are opportunities for the wider industry to improve rail safety.

Each year the content of the ONRSR Rail Safety Report is reviewed to identify opportunities to add more insights and make it as digestible as possible.

Key changes to this report include:

- The addition of the NRSDS which provides more information around occurrences and what factors have contributed to them. Details on the ‘chain of events’ leading to an occurrence have been included to add more information to previous occurrence categories, including a comparison to last year’s statistics.
- The addition of six more countries to the United States of America and the United Kingdom - Canada and several European countries for comparison to Australian rail fatalities.
- A case study detailing an analysis of data gathered by ONRSR through compliance monitoring activities and associated findings.
- Specific listing of occurrences has been omitted.



# ONRSR 2023–2024 – AT A GLANCE

## NETWORK STATISTICS

PASSENGER JOURNEYS INCREASED BY **21%** IN 2023–2024 BRINGING THEM BACK UP TO PRE PANDEMIC LEVELS.

### 130.1M

COMMERCIAL  
PASSENGER  
TRAIN KM



### 31.9M

COMMERCIAL  
TRAM KM



### 488.6K

TOURIST & HERITAGE  
PASSENGER TRAIN KM

### 84.6M

FREIGHT TRAIN KM



ACCREDITED  
OPERATORS<sup>1</sup>

# 195



PASSENGER JOURNEYS

# 867.0M



TRACK KM

# 50.8K

## NOTIFIABLE OCCURRENCES

CAT A OCCURRENCES INCREASED BY **22%** IN 2023–2024, DRIVEN BY A RISE IN PROCEED AUTHORITIES EXCEEDED BY TRAMS AND A RISE IN PERSON/TRAIN INTERFACE OCCURRENCES WHERE A TRAIN DOOR WAS OPEN WITH THE TRAIN IN MOTION.

# 6331

TOTAL OCCURRENCES

## 960

CATEGORY A

## 5371

CATEGORY B

# HARM TO PEOPLE

RAIL-RELATED SERIOUS INJURIES INCREASED BY **16%** IN 2023–2024, DRIVEN BY INCREASES IN INJURIES TO WORKERS AND TRESPASSERS.



**4** PASSENGER TRAIN DERAILMENTS (RUNNING LINE)  
**0.03** PER MILLION PASSENGER TRAIN KM

**26** FREIGHT TRAIN DERAILMENTS (RUNNING LINE)  
**0.31** PER MILLION FREIGHT TRAIN KM

### KEY OCCURRENCES – TRAINS

**5** COLLISIONS BETWEEN TRAIN OR WITH ROLLING STOCK (RUNNING LINE)  
**0.02** PER MILLION TRAIN KM

**188** PAEs (PASSENGER TRAIN – DRIVER HUMAN FACTORS)  
**1.44** PER MILLION PASSENGER TRAIN KM

**3** RUNAWAYS (PASSENGER TRAIN)  
**0.02** PER MILLION PASSENGER TRAIN KM

**7** RUNAWAYS (FREIGHT TRAIN)  
**0.08** PER MILLION FREIGHT TRAIN KM

**99** PAEs (FREIGHT TRAIN – DRIVER HUMAN FACTORS)  
**1.17** PER MILLION FREIGHT TRAIN KM

## KEY OCCURRENCES – TRAMS

**19** TRAM DERAILMENTS (RUNNING LINE)  
**0.59** PER MILLION TRAM KM

**9** COLLISIONS BETWEEN TRAMS (RUNNING LINE)  
**0.28** PER MILLION TRAM KM

**126** PAEs (DRIVER HUMAN FACTORS)  
**3.93** PER MILLION TRAM KM

**1** RUNAWAYS  
**0.03** PER MILLION TRAM KM

## KEY OCCURRENCES – LEVEL CROSSINGS

**20,000+** NUMBER OF LEVEL CROSSINGS

**43** LEVEL CROSSING COLLISIONS WITH PERSON OR VEHICLE (PASSENGER / FREIGHT TRAIN)

**912** LEVEL CROSSING NEAR HITS WITH PERSON OR VEHICLE (PASSENGER / FREIGHT TRAIN)

**12** LEVEL CROSSING EQUIPMENT FAILURES / DEFECTS





# RAIL SAFETY STATISTICAL SUMMARY

The thousands of rail safety occurrences reported each year are categorised and analysed over time to build a picture of safety performance across the rail industry. This occurrence (or incident) picture provides insight into potential safety areas which may require attention at the individual operator, sector or industry level.

Notifiable occurrences are an important contribution to ONRSR's risk-based regulatory approach. These types of events, frequency, actual or potential consequences and their causal or contributing factors, form an important input into ONRSR's understanding of where rail safety risks are presenting across the industry. Events that result in more significant consequences or have the potential for greater harm are the focus of this report.

To improve rail safety and evaluate the effectiveness of risk controls, the chain of events that led up to an occurrence must be clearly understood. It is important to consider that incidents are not singular events but rather are the result of a series of sequential events. Understanding this sequence, supports the identification and interrogation of risk controls intended to prevent or reduce the impact of an incident. It also enables the identification of stronger or additional risk control measures which could improve the management of risks to safety.

The national rail safety data set introduced on 1 July 2022, requires rail transport operators to include chain (or sequence) of events information when reporting notifiable occurrences. This information along with additional data items enable a deeper analysis of incidents which can then guide actions to improve rail safety through better identification, monitoring and understanding of higher risk events – i.e. those that result in more significant consequences or have the potential for greater risk of harm – which supports good decision making and improved safety performance.

This year charts have been introduced into the Rail Safety Statistical Summary which use selected additional data items to provide further analysis and breakdowns to deliver an improved understanding of the chain of events that are associated with occurrences. Benchmarking of Australian occurrence data against international performance has again been included for the USA and UK, and extended to include Canada and several European countries which highlights selected events, judged as the more serious of the year.



## RAILWAY-RELATED FATALITIES

There were 82 fatalities reported in the 2023–2024 financial year on railways across Australia. These consisted of:

- one passenger fatality as a result of a person / train interface occurrence.
- two worker fatalities as a result of a level crossing collision with vehicle.
- one worker fatality due to a medical episode.
- five members of the public fatalities as a result of level crossing collisions.
- one member of the public fatality due to misadventure.
- six trespasser fatalities as a result of collisions with a train due to misadventure.
- 66 fatalities involving suspected suicide.

Figure 1 presents the number of railway-related fatalities by person type and incident type over the past five years.

Figure 2 presents the number of railway-related fatalities by rail person type and precursor event / likely cause, in regard to non-rail safety worker casualties, over the past two years (since the introduction of NRSDS).

**FIGURE 1:**

Railway-related fatalities by incident type, July 2019 to June 2024.

Non-passenger fatalities at level crossings are classified as Public if neither trespass nor suicide is suspected. Suspected suicides at level crossings are coded as Trespasser.

**PASSENGER**

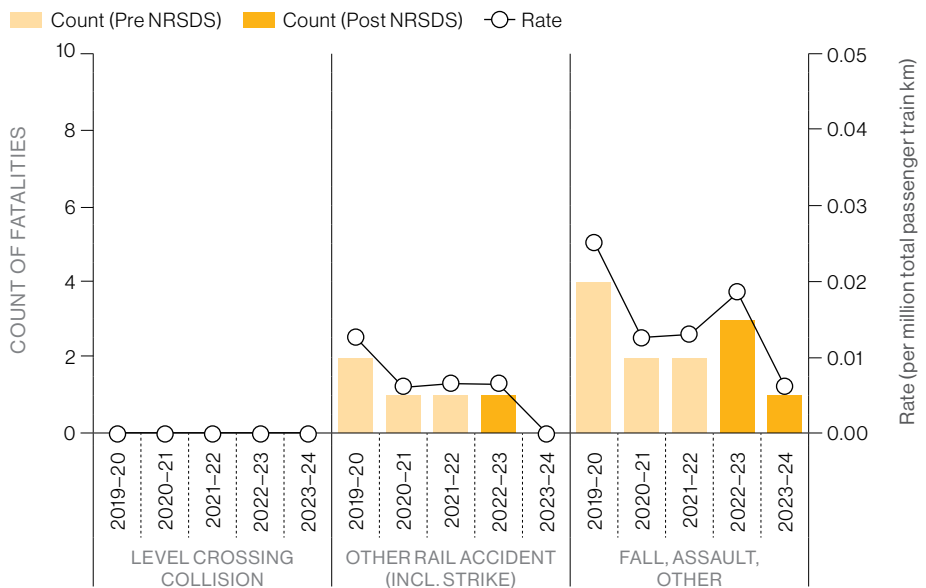
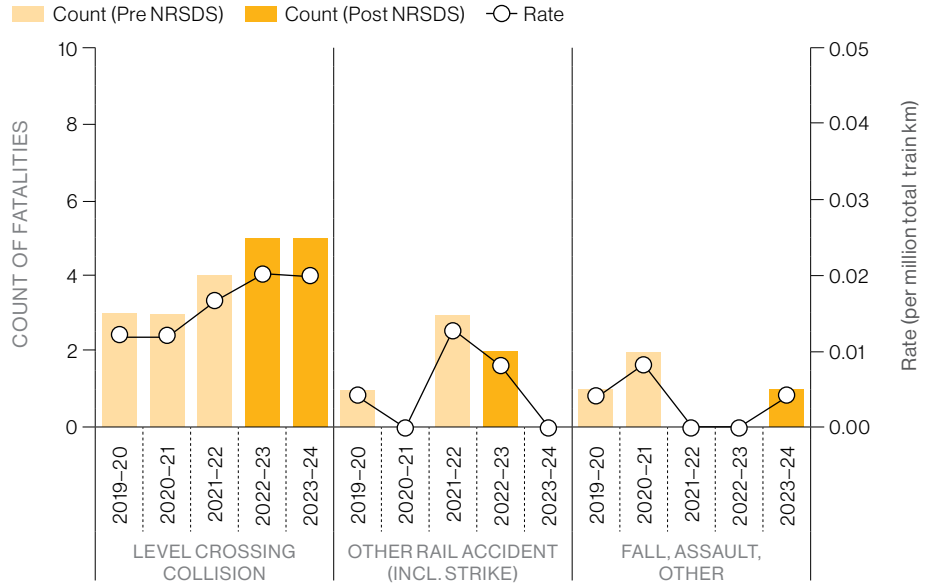


FIGURE 1 (cont.):

**PUBLIC**



**WORKER**

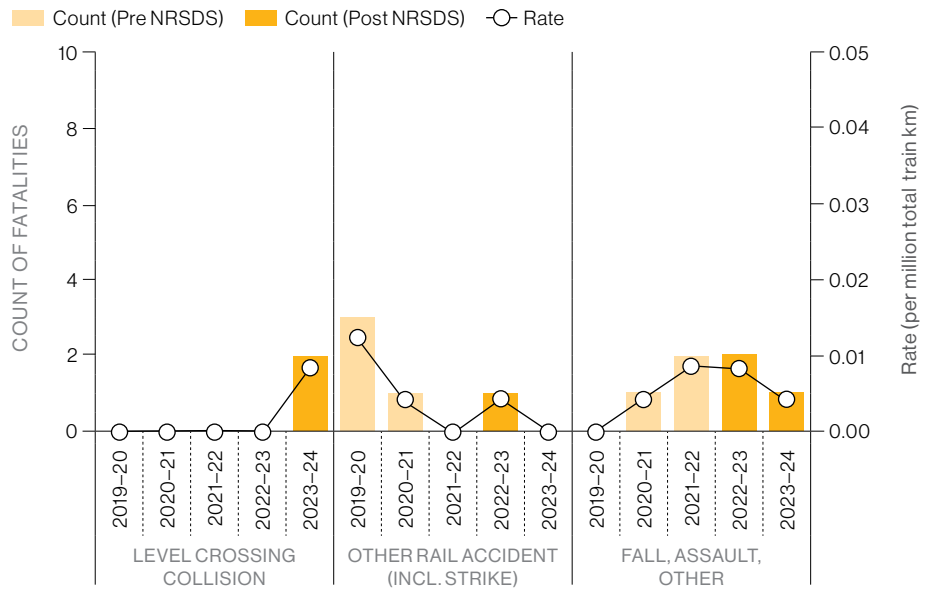
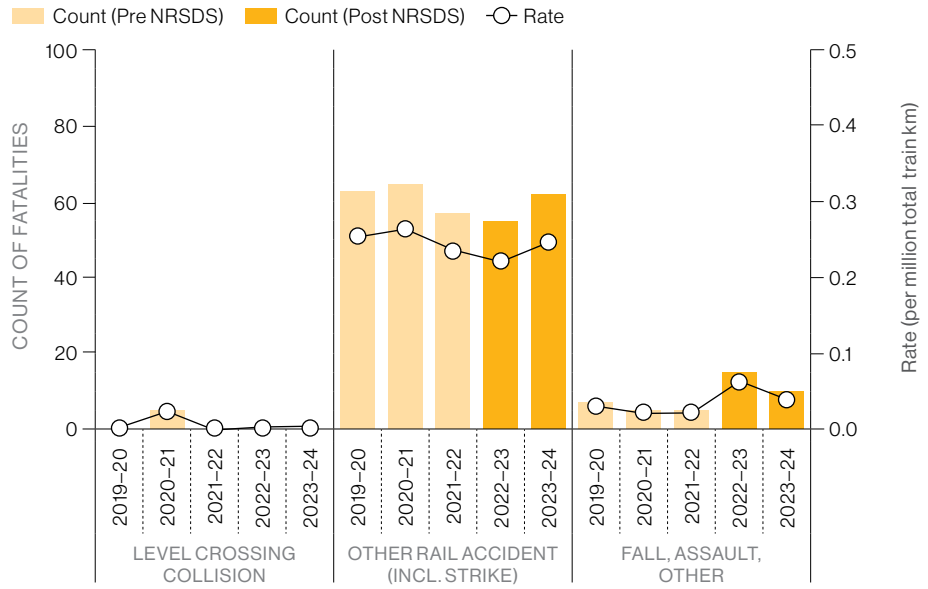


FIGURE 1 (cont.):

TRESPASSER



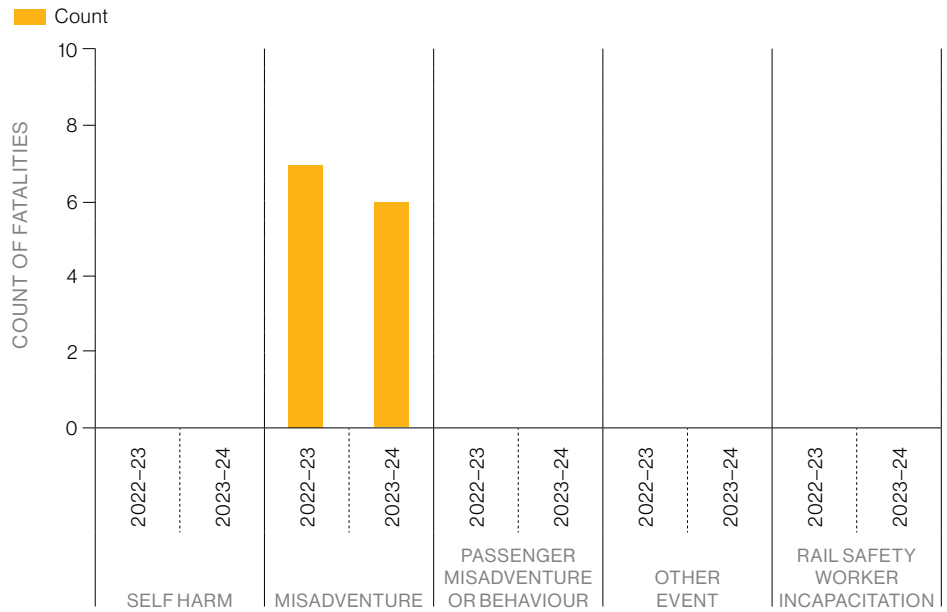
**FIGURE 2:**

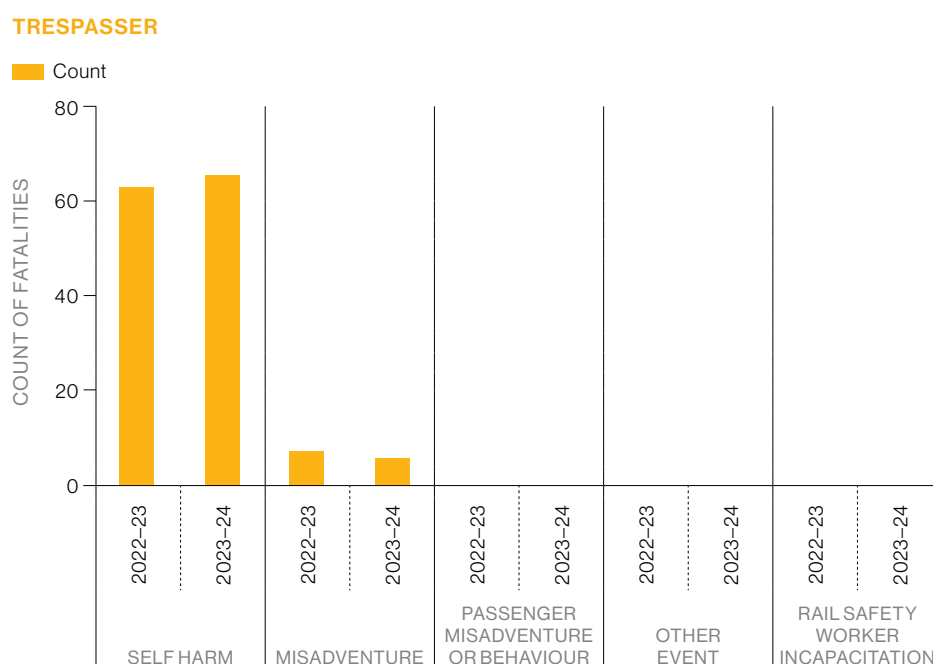
Railway-related fatalities by precursor event / likely cause, July 2022 to June 2024.

**PASSENGER**



**PUBLIC**





A comparison of the rate of fatalities between Australian railways and selected overseas railways is summarised in Table 1 and presented in Figure 3. The Australian data in Table 1 is a subset of the fatalities summarised in Figure 1 to align with the overseas data definitions. For example, local data excludes suspected suicides, as these are also excluded from overseas data.

Overall, the fatality rates for Australia are frequently similar or lower than overseas railways. Great Britain recorded the lowest average fatality rate compared to other sampled countries. For the 2023-24 reporting period, Great Britain reached a 5-year low in the fatality rate with 0.032 fatalities per million train kilometres compared to Australia's 0.064.

Due to data limitations for EU member countries, the latest complete reporting period for Germany, France, Italy, Switzerland and Spain at the time of

publication was 2022-23. During this period, all member countries sampled for the comparison recorded their highest fatality rate over a 4-year period, however for all except Italy, the rate was not substantially higher to previously observed rates. The sampled EU member country with the lowest average fatality rate, Switzerland, observed 0.069 fatalities per million train kilometres, slightly lower than Australia's average rate of 0.078.

North America documented the highest average fatality rate out of the sampled regions with the United States and Canada registering 0.925 and 0.521 fatalities per million train kilometres, respectively. The United States recorded a 5-year high and the highest fatality rate of the sampled countries for the 2023-24 reporting period with 1.079 fatalities per million train kilometres, whilst Canada remained steady in the latest reporting period.

**TABLE 1:**

Railway Fatalities – Australia, Great Britain, EU Member Countries, United States and Canada.

Fatalities involved passengers, workers, public and trespassers (excluding suspected suicide). The annual reporting period for all countries except Australia, Great Britain and United States is from January to December. The annual reporting period for Great Britain is from April to March. For reporting periods that do not coincide with the Australian financial year (July to June), the reported data is attributed to the financial year the reporting period ended in. For example, a reporting period of January 2020 to December 2020 is attributed to the FY 2020-21 column. Where a rate cannot be calculated for a reporting period, the reporting period is excluded from the total.

Statistics for Great Britain are for mainline operations only and exclude the London Underground network, trams, metros and non-mainline networks. Train kilometrage statistics for European Union member countries excludes industrial operations (including harbours), tourist and heritage services and metro, tram and light rail services. Statistics for the United States exclude fatalities on isolated networks, such as metropolitan transit systems that are not connected to the wider network. Statistics for Canada are for federally regulated railways only, include only reportable occurrences and the reported train kilometrage is estimated from mainline networks only.

		2019–20	2020–21	2021–22	2022–23	2023–24	TOTAL
	Fatalities	17	22	21	21	16	97
Australia	Train Km (million)	248.3	246.6	241.7	249.5	251.4	1,237.4
	Rate	0.068	0.089	0.087	0.084	0.064	0.078
	Fatalities <sup>1</sup>	33	28	31	22	17	131
Great Britain	Train Km (million) <sup>2</sup>	591.7	454.3	507.5	492.8	527.4	2,573.7
	Rate	0.056	0.062	0.061	0.045	0.032	0.051
	Fatalities <sup>3</sup>	136	137	103	151	N/A	527
Germany	Train Km (million) <sup>4</sup>	1,069.6	1,049.8	1,125.9	1,116.5	N/A	4,361.8
	Rate	0.127	0.131	0.091	0.135	N/A	0.121
	Fatalities <sup>3</sup>	53	44	47	64	N/A	208
France	Train Km (million) <sup>4</sup>	423.4	337.4	405.7	436.7	418.5	1,603.2
	Rate	0.125	0.130	0.116	0.147	N/A	0.130

TABLE 1 (cont.):

		2019–20	2020–21	2021–22	2022–23	2023–24	TOTAL
Italy	Fatalities <sup>3</sup>	43	43	49	69	N/A	204
	Train Km (million) <sup>4</sup>	395.8	319.5	367.7	394.6	399.7	1,477.6
	Rate	0.109	0.135	0.133	0.175	N/A	0.138
Switzerland	Fatalities <sup>3</sup>	13	16	5	18	N/A	52
	Train Km (million) <sup>4</sup>	228.9	221.4	232.7	236.3	240.1	919.3
	Rate	0.057	0.072	0.021	0.076	N/A	0.069
Spain	Fatalities <sup>3</sup>	22	13	15	21	N/A	71
	Train Km (million) <sup>4</sup>	211.2	158.2	172.3	195.6	211.8	737.3
	Rate	0.104	0.082	0.087	0.107	N/A	0.096
United States	Fatalities <sup>5</sup>	802	735	913	923	1045	4418
	Train Km (million) <sup>6</sup>	1,003.8	918.7	935.1	953.0	968.2	4,778.7
	Rate	0.799	0.800	0.976	0.969	1.079	0.925
Canada	Fatalities <sup>7</sup>	72	60	60	65	67	324
	Train Km (million) <sup>7</sup>	134.1	120.5	119.3	121.3	126.7	621.8
	Rate	0.537	0.498	0.503	0.536	0.529	0.521

## Sources:

<sup>1</sup>Office of Rail and Road, *Rail Safety Statistics, Tables 5200* (accessed 27 September 2024)

<sup>2</sup>Office of Rail and Road, *Passenger and Freight Rail Usage, Tables 1243 and 1333* (accessed 27 September 2024)

<sup>3</sup>European Union Agency for Railways (ERA), *Rail accidents victims by type of accident and category of persons involved* (accessed 9 September 2024)

<sup>4</sup>Eurostat, *Goods and passenger train traffic performance* (accessed 9 September 2024)

<sup>5</sup>Federal Railroad Administration Office of Safety Analysis, *4.08 – Casualty Summary Table* (accessed 10 September 2024)

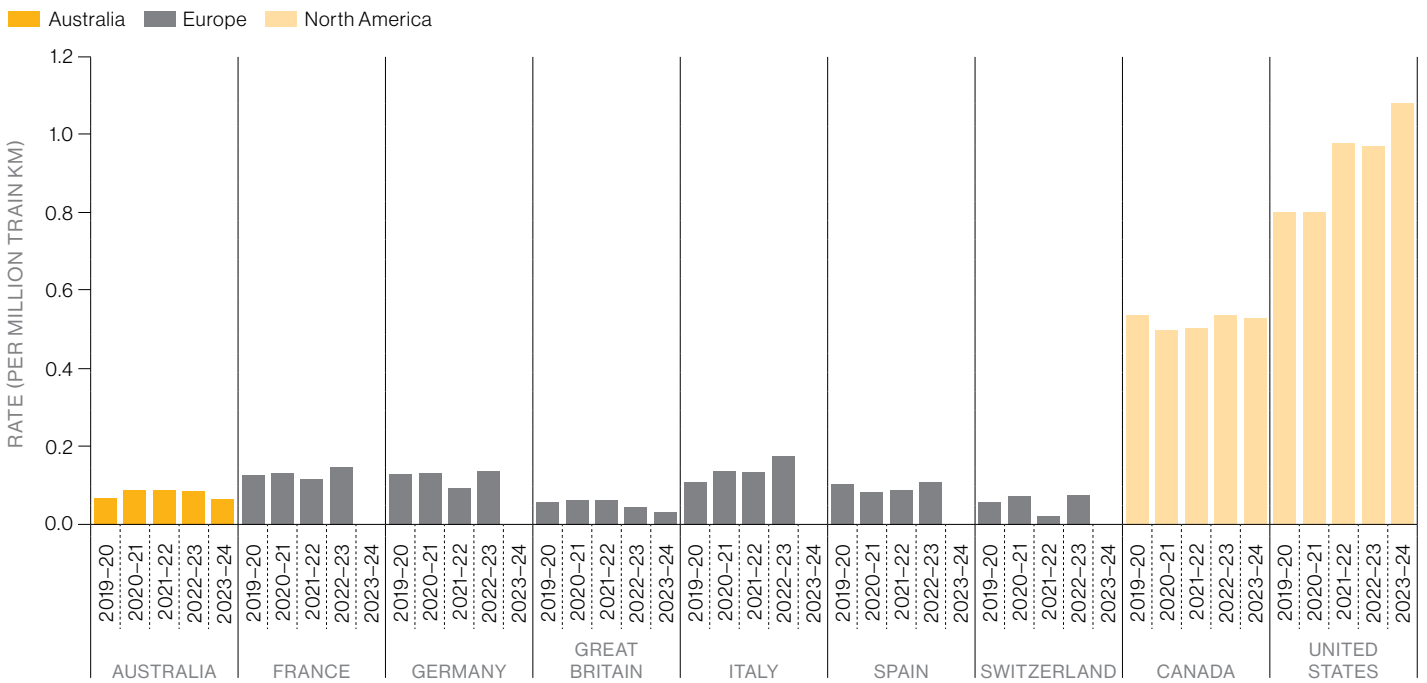
<sup>6</sup>Federal Railroad Administration Office of Safety Analysis, *1.02 – Operational Data Tables* (accessed 10 September 2024)

<sup>7</sup>Transportation Safety Board of Canada, *Rail transportation occurrences in 2023 – Table 1. Rail transportation occurrences, by accident/incident type and casualties, 2013 to 2023* (accessed 10 September 2024)

**FIGURE 3:**

Railway Fatalities – Australia, Great Britain, EU Member Countries, United States and Canada.

Due to data limitations for EU member countries, the latest complete reporting period for Germany, France, Italy, Switzerland and Spain at the time of publication was 2022–23.





## RAILWAY-RELATED SERIOUS INJURIES

There were 89 serious injuries reported in the 2023–2024 financial year on railways across Australia. This presents an increase of 12 compared to 2022–2023. Whilst the number of serious injuries to passengers remained low, there were increases in the number of serious injuries to both workers and trespassers.

Figure 4 presents the number of railway-related serious injuries by person type and incident type over the past five years.

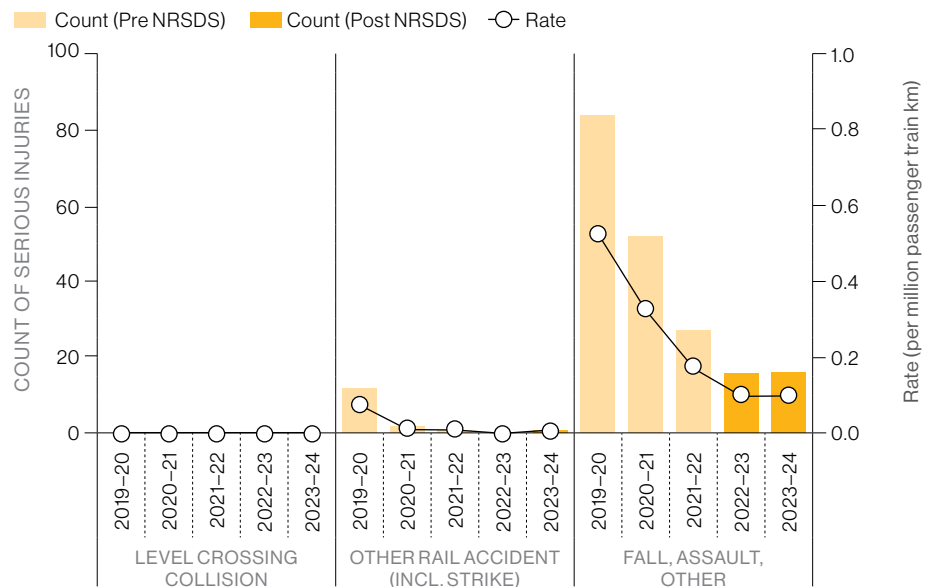
Figure 5 presents the number of railway-related serious injuries by person type, with regard to non-rail safety workers, and precursor event / likely cause over the past two years (since the introduction of NRSDS).

**FIGURE 4:**

Railway-related serious injuries, July 2019 to June 2024.

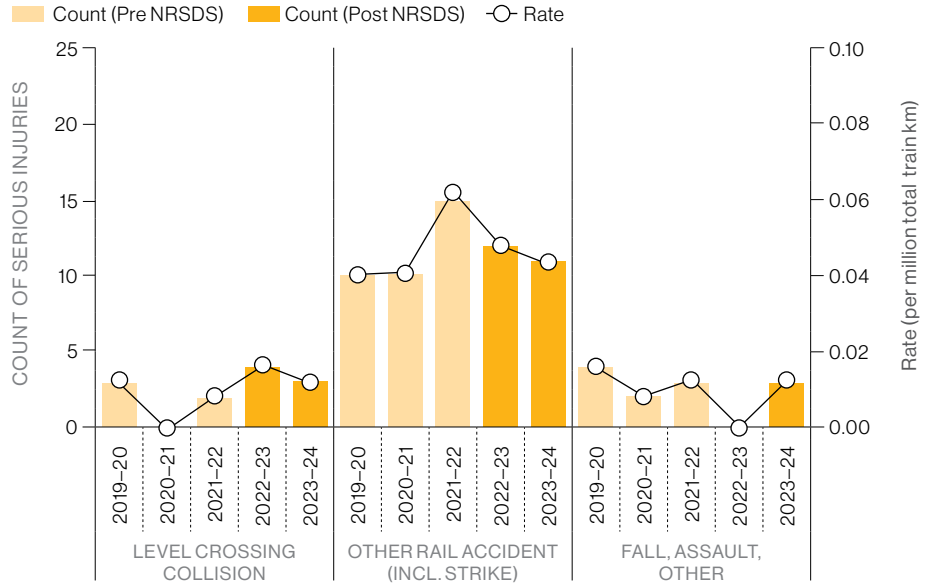
Non-passenger serious injuries at level crossings are classified as Public if neither trespass nor attempted suicide is suspected. Level crossing collision excludes attempted suicides at level crossings, which are classified as Trespasser.

### PASSENGER

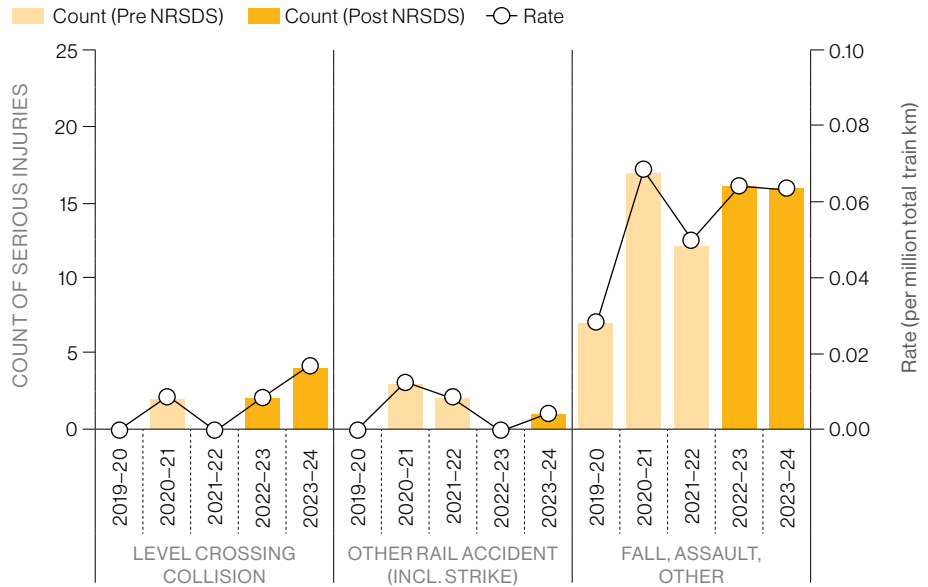


**FIGURE 4 (cont.):**

**PUBLIC**

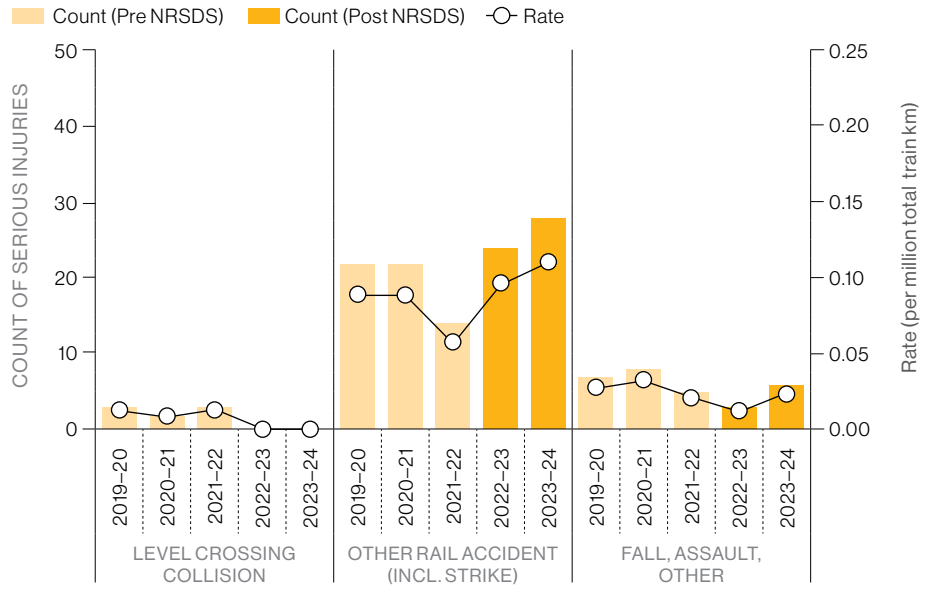


**WORKER**



**FIGURE 4 (cont.):**

**TRESPASSER**



**FIGURE 5:**

**PASSENGER**

Railway-related serious injuries by precursor event / likely cause, July 2022 to June 2024.

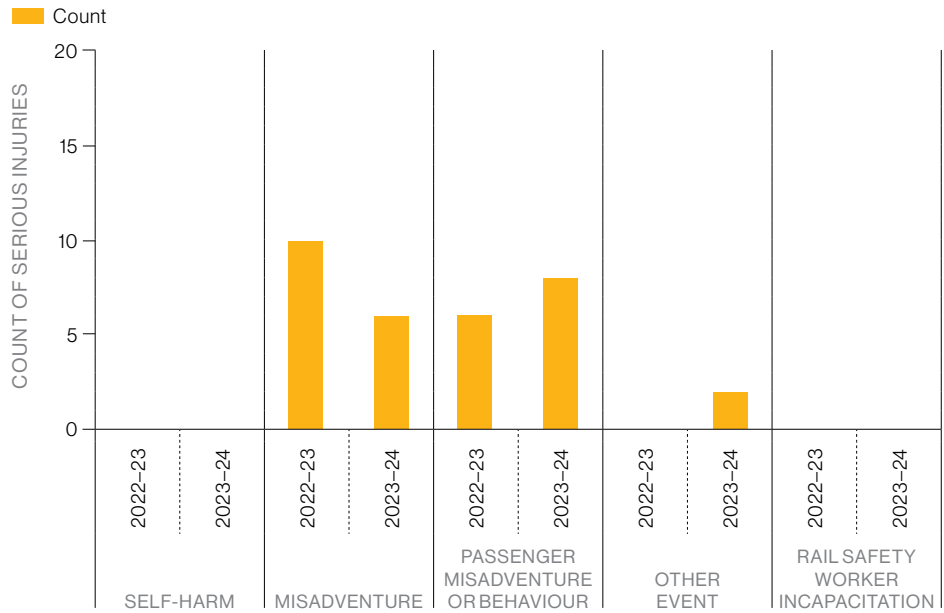
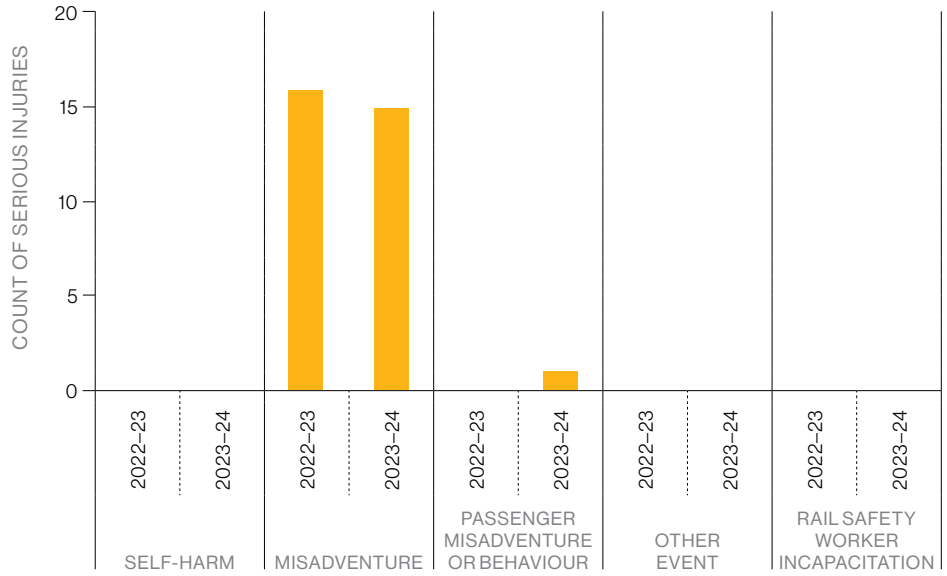


FIGURE 5 (cont.):

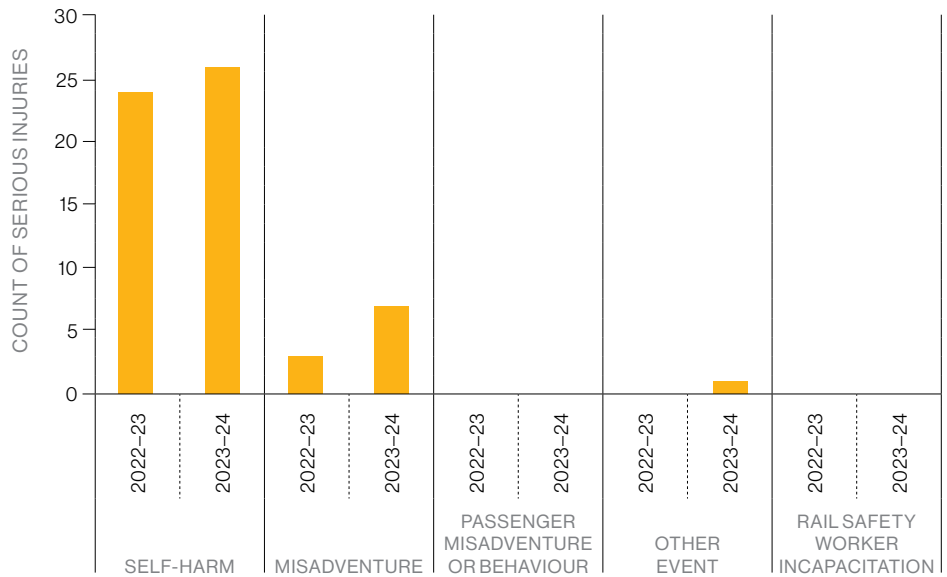
**PUBLIC**

Count



**TRESPASSER**

Count





## PASSENGER TRAIN DERAILMENTS

Passenger train derailment risk is characterised by rare events that have the potential to result in catastrophic outcomes, owing to the potentially large numbers of passengers exposed to harm.

Figure 6 presents the number of passenger trains running line derailments over the past five years. Figure 7 presents the number of passenger trains running line derailments by point of derailment and extent of derailment over the past two years (since the introduction of NRSDS).

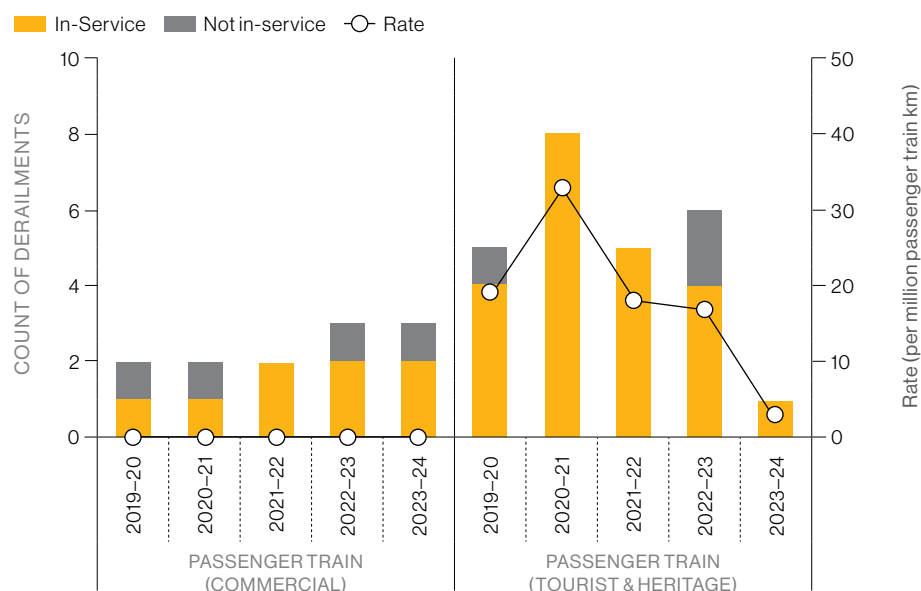
There were four running line passenger train derailments reported in the 2023–2024 financial year across Australian railways, of which three involved commercial passenger trains. Precursor events for the derailments included one collision with a road vehicle, one proceed authority exceeded, and one track irregularity. There were no injuries reported as a result of passenger train derailments in 2023–2024.

While the number of commercial passenger train derailments has remained steady in 2023–2024 compared to 2022–2023, the number of tourist and heritage train derailments has decreased significantly.

**FIGURE 6:**

Passenger Train  
Running Line  
Derailments, July 2019  
to June 2024

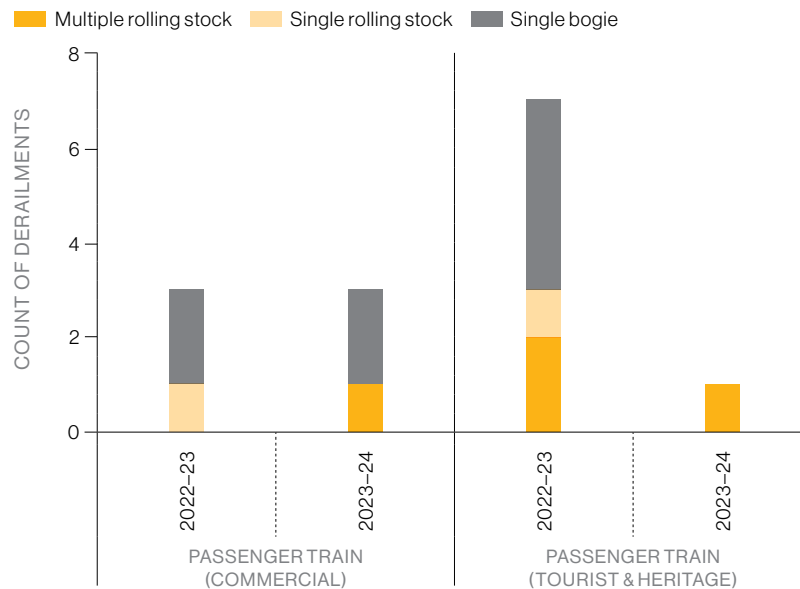
Derailment rates are articulated using the respective train km for each sector. Includes derailments of passenger trains on non-running lines affecting the safety of running lines.



**FIGURE 7:**

Passenger Train  
Running Line  
Derailments, Point of  
Derailment and Extent of  
Derailment, July 2022 to  
June 2024.

Includes derailments of  
passenger trains on non-  
running lines affecting the  
safety of running lines.

**POINT OF DERAILMENT****EXTENT OF DERAILMENT**

A comparison rate of running line passenger train derailments between Australian railways and the running line railways of Great Britain and the United States is summarised in Table 2. The Australian data in this table are a subset of the derailments summarised in Figure 4 to align with overseas data definitions more closely. They include derailments involving all in-service heavy rail passenger trains, excluding those involving tourist and heritage passenger trains.

**TABLE 2:**

Passenger Train Running Line Derailments – Australia, Great Britain and United States.

Heavy rail in-service passenger trains only, excluding tourist and heritage operations. The annual reporting period for Great Britain runs from April to March. Statistics for Great Britain are for mainline operations only and exclude the London Underground network, trams, metros and non-mainline networks. Statistics for the United States exclude derailments on isolated networks, such as metropolitan transit systems that are not connected to the wider network.

		2019–20	2020–21	2021–22	2022–23	2023–24	TOTAL
Australia	Derailments	1	1	2	2	2	8
	Train Km (million)	127.8	127.7	121.3	128.9	130.1	635.8
	Rate	0.008	0.008	0.016	0.016	0.015	0.013
Great Britain	Derailments <sup>1</sup>	0	2	2	1	3	8
	Train Km (million) <sup>2</sup>	558.4	424.3	473.7	460.9	496.0	2,413.3
	Rate	0.000	0.005	0.004	0.002	0.006	0.003
United States	Derailments <sup>3</sup>	6	4	5	7	13	35
	Train Km (million) <sup>4</sup>	106.4	84.7	100.6	109.7	115.7	517.1
	Rate	0.056	0.047	0.050	0.064	0.112	0.068

Sources:

<sup>1</sup> Office of Rail and Road, *Train Accidents by Severity*, Table 5260 (accessed 27 September 2024)

<sup>2</sup> Office of Rail and Road, *Passenger Rail Usage*, Table 1243 (accessed 27 September 2024)

<sup>3</sup> Federal Railroad Administration Office of Safety Analysis, *3.18 - Accident by State/Railroad* (accessed 10 September 2024)

<sup>4</sup> Federal Railroad Administration Office of Safety Analysis, *1.13 - Freight/Passenger Operations Ten Year Overview* (accessed 10 September 2024)



## TRAM DERAILMENTS

Tram derailments are generally less severe than passenger train derailments on the heavy rail network due to typically lower operating speeds. However, catastrophic tram derailments can still happen as evidenced by the derailment of a tram in Croydon, London in the UK in November 2016, which killed seven people and left many more injured.

Figure 8 presents the number of tram running line derailments over the past five years.

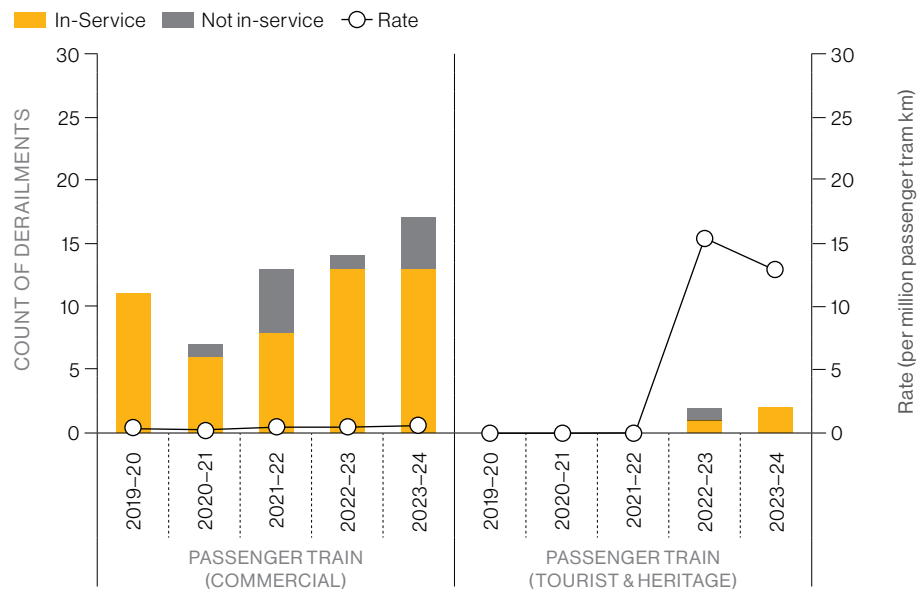
Figure 9 presents the number of tram running line derailments by point of derailment and extent of derailment over the past two years (since the introduction of NRSDS).

There were 19 running line derailments involving passenger trams in the 2023–2024 financial year in Australia. The precursor events or likely causes of these derailments for the 2023–2024 financial year are presented in Figure 10.

**FIGURE 8:**

Tram Running Line Derailments, July 2019 to June 2024.

Includes derailments of trams on non-running lines affecting the safety of running lines.

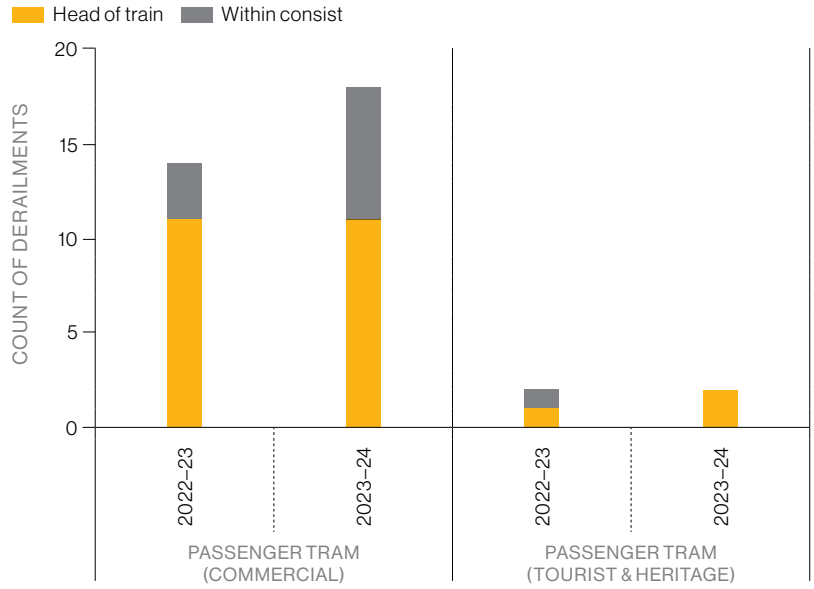


**FIGURE 9:**

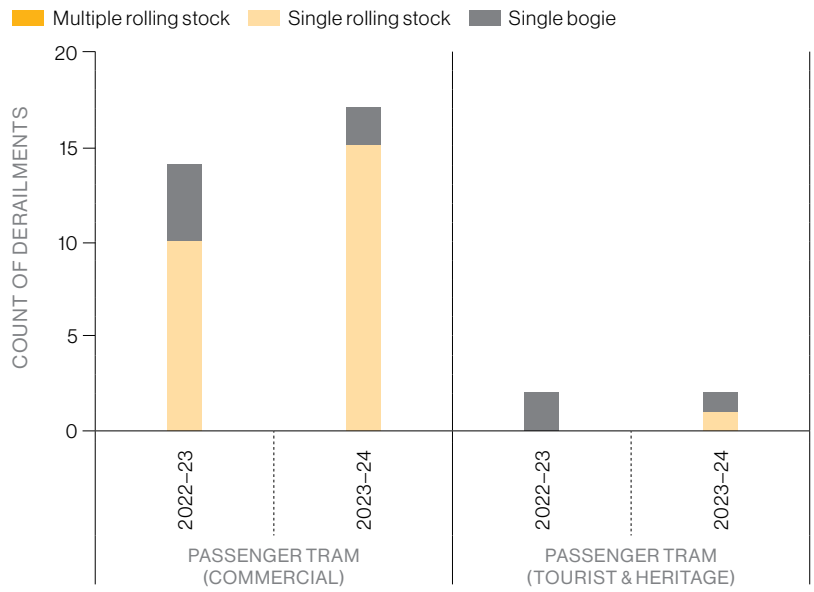
Tram Running Line Derailments, Point of Derailment and Extent of Derailment, July 2022 to June 2024.

Includes derailments of trams on non-running lines affecting the safety of running lines.

**POINT OF DERAILMENT**



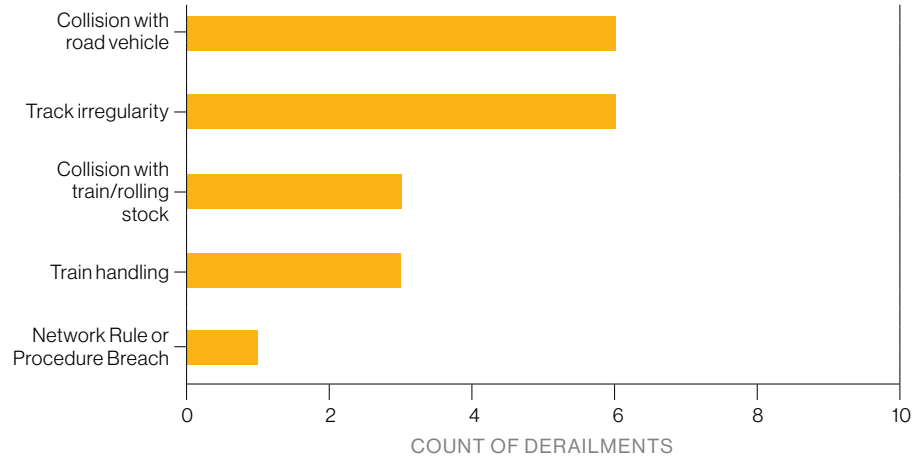
**EXTENT OF DERAILMENT**



**FIGURE 10:**

Tram Running Line  
Derailments, Precursor  
Event / Likely Cause,  
July 2023 to June 2024.

Includes derailments of  
trams on non-running lines  
affecting the safety of  
running lines.





## FREIGHT TRAIN DERAILMENTS

Freight train derailments are generally observed to have a higher frequency of occurrence but a lower consequence of event when compared to passenger train derailment. However, derailments of freight trains still expose train crews, recovery teams and, depending on the location of the derailment, members of the public to potential harm.

Figure 11 presents the number of freight train running line derailments over the past five years. Figure 12 presents the number of freight train running line derailments by point of derailment and extent of derailment over the past two years (since the introduction of NRSDS).

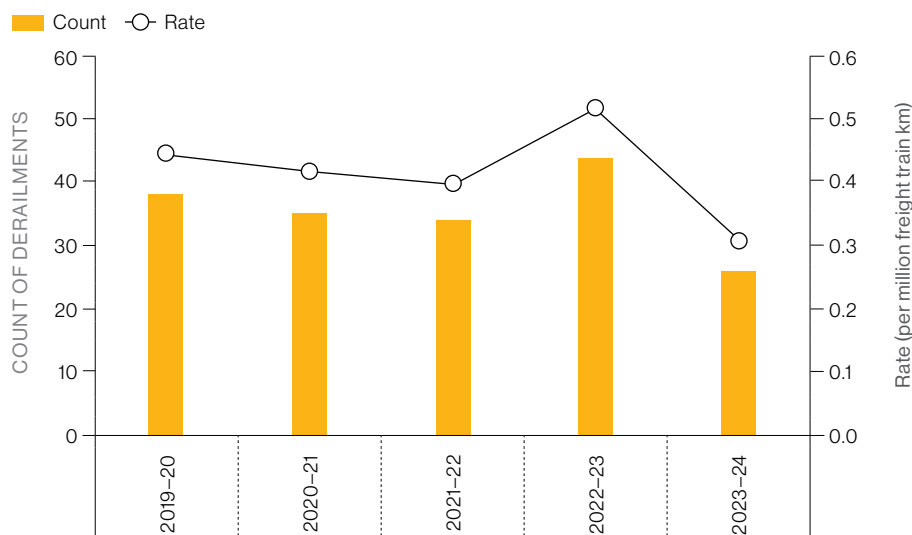
There were 26 running line derailments involving freight trains in the 2023–2024 financial year, representing a 42% decrease compared to the number reported during the previous year, the lowest value in the last five years. The precursor events or likely causes of these derailments for the 2023–2024 financial year are presented in Figure 13.

A comparison of the rate of running line freight train derailments between Australian railways and the running line railways of Great Britain and the United States is summarised in Table 3.

**FIGURE 11:**

Freight Train Running Line Derailments, July 2019 to June 2024.

Includes derailments of freight trains on non-running lines affecting the safety of running lines. Excludes uncoupled rolling stock derailments such as those involving only light locomotives and wagons.

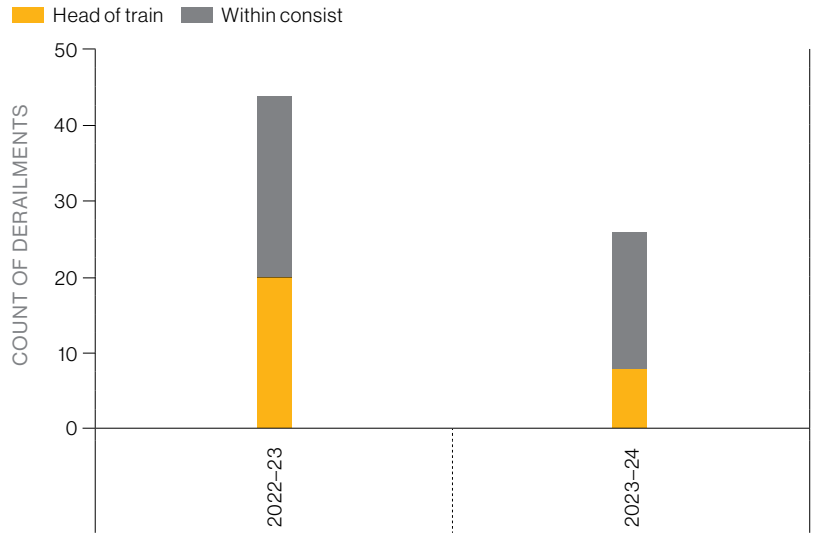


**FIGURE 12:**

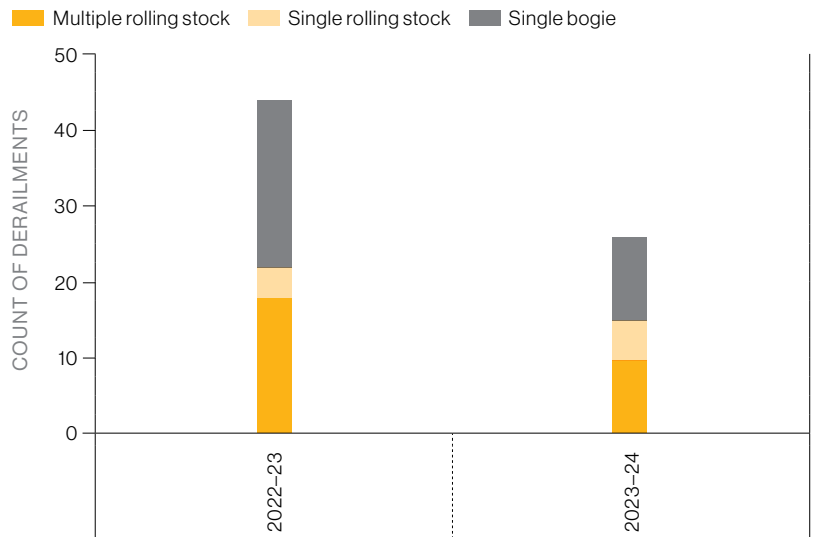
Freight Train Running Line Derailments, Point of Derailment and Extent of Derailment, July 2022 to June 2024.

Includes derailments of freight trains on non-running lines affecting the safety of running lines. Excludes uncoupled rolling stock derailments such as those involving only light locomotives and wagons.

**POINT OF DERAILMENT**

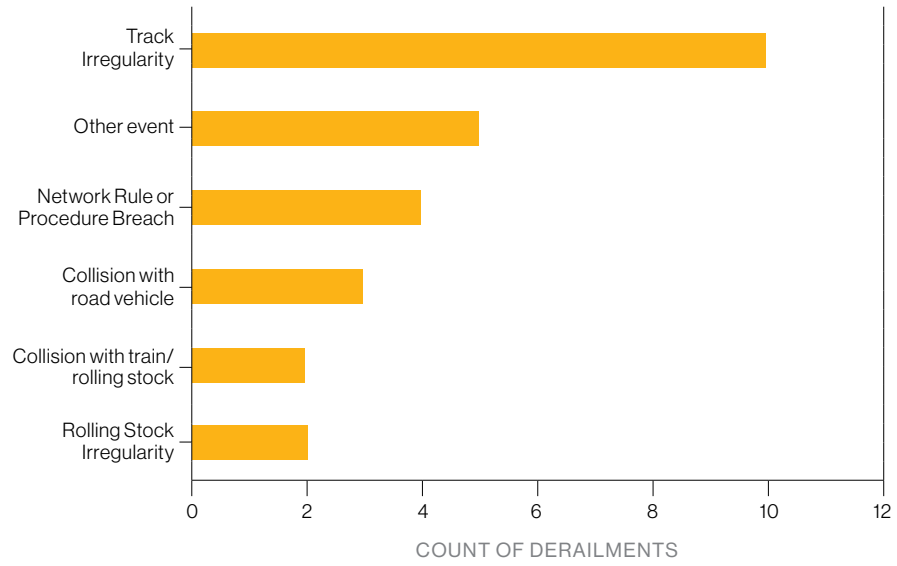


**EXTENT OF DERAILMENT**



**FIGURE 13:**  
 Freight Running Line  
 Derailments, Precursor  
 Event / Likely Cause,  
 July 2023 to June 2024.

Includes derailments of freight trains on non-running lines affecting the safety of running lines. Excludes uncoupled rolling stock derailments such as those involving only light locomotives and wagons.



**TABLE 3:**

Freight Train Running Line Derailments – Australia, Great Britain and United States.

Includes derailments of freight trains on non-running lines affecting the safety of running lines. Excludes uncoupled rolling stock derailments such as those involving only light locomotives and wagons. The annual reporting period for Great Britain runs from April to March. Statistics for Great Britain are for potentially higher-risk train accidents (PHRTAs) occurring on or affecting the running line only, and with the most potential to result in serious consequences. They exclude the London Underground network, trams, metros, and non-mainline networks. Statistics for the United States exclude derailments on isolated networks, such as metropolitan transit systems that are not connected to the wider network.

		2019–20	2020–21	2021–22	2022–23	2023–24	TOTAL
Australia	Derailments	38	35	34	45	26	178
	Train Km (million)	85.5	84.0	85.4	84.9	84.6	424.5
	Rate	0.444	0.417	0.398	0.530	0.307	0.419
Great Britain	Derailments <sup>1</sup>	9	9	2	2	0	22
	Train Km (million) <sup>2</sup>	33.3	30.0	33.8	31.9	31.4	160.4
	Rate	0.270	0.300	0.059	0.063	0.000	0.137
United States	Derailments <sup>3</sup>	279	282	276	271	253	1361
	Train Km (million) <sup>4</sup>	438.5	413.6	408.2	410.2	412.2	2,082.7
	Rate	0.636	0.682	0.676	0.661	0.614	0.653

Sources:

<sup>1</sup> Rail Safety and Standards Board, *Annual Health and Safety Report* (accessed 27 September 2024)

<sup>2</sup> Office of Rail and Road, *Freight Rail Usage, Table 1333* (accessed 27 September 2024)

<sup>3</sup> Federal Railroad Administration Office of Safety Analysis, *3.18 - Accident by State/Railroad* (accessed 10 September 2024)

<sup>4</sup> Federal Railroad Administration Office of Safety Analysis, *1.13 - Freight/Passenger Operations Ten Year Overview* (accessed 10 September 2024)



## TRAIN COLLISIONS

Collisions involving trains have the potential to be catastrophic rail safety events. The likelihood and consequences of collisions vary according to factors such as the systems used to manage train movement, the types of trains involved and the speed the trains were travelling at the time of the collision. A major determinant of risk is the involvement of a passenger train because of the potential exposure of large numbers of passengers to harm.

Figure 14 presents the number of running line collisions between trains and with rolling stock over the past five years.

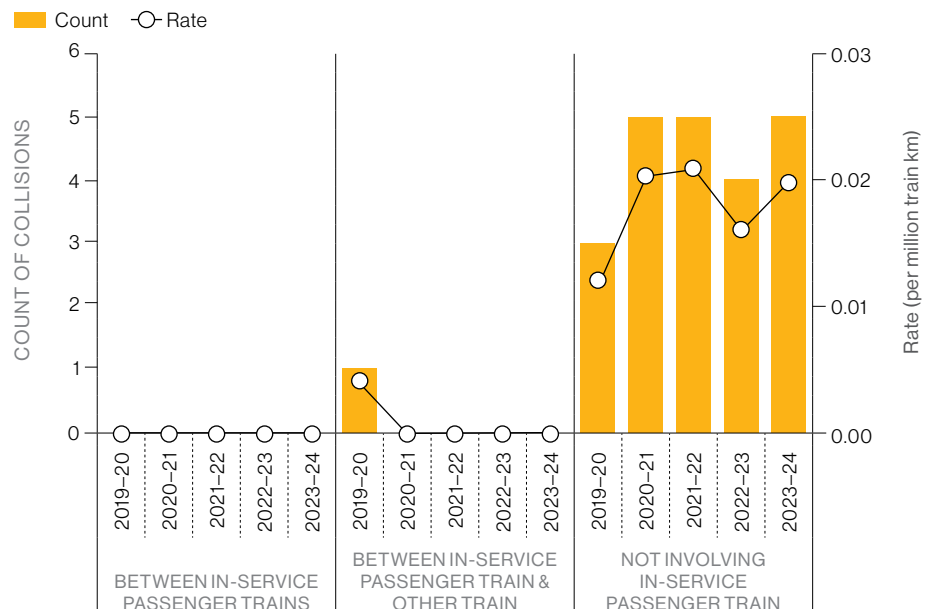
Figure 15 presents the number of running line collisions between trains and with rolling stock by type of collision over the past two years (since the introduction of NRSDS).

There were five running line collisions between trains and with rolling stock in the 2023–2024 financial year. None of these collisions involved passenger trains. No fatalities or serious injuries were reported as a result of these train collisions. The precursor events or likely causes of these collisions for the 2023–2024 financial year are presented in Figure 16.

**FIGURE 14:**

Running Line Collisions Between Trains and with Rolling Stock, July 2019 to June 2024.

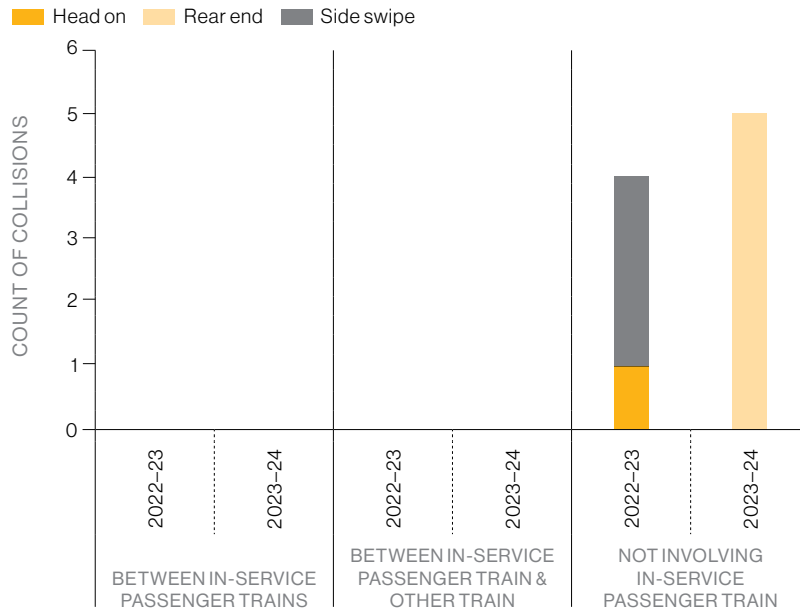
Includes collisions on non-running lines affecting the safety of running lines. Excludes commercial light rail operations. Excludes trains striking or being struck by out of gauge equipment on trains on adjacent lines. Rates are articulated using total km for the sectors represented in each reporting category.



**FIGURE 15:**

Running Line Collisions Between Trains and with Rolling Stock, Type of Collision, July 2022 to June 2024.

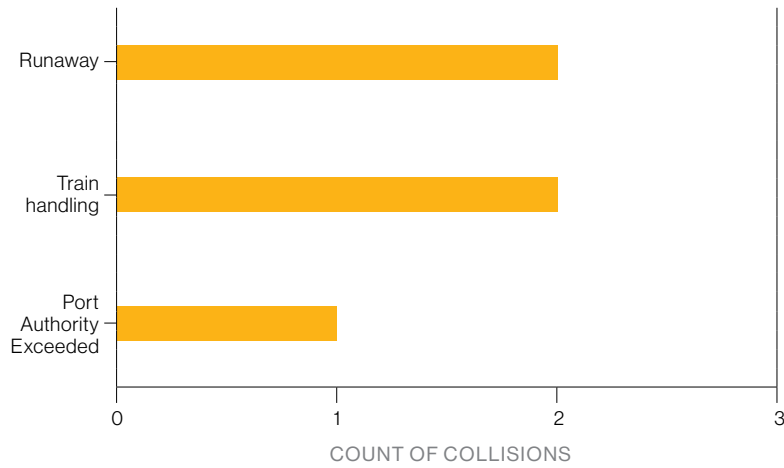
Includes collisions on non-running lines affecting the safety of running lines. Excludes commercial light rail operations. Excludes trains striking or being struck by out of gauge equipment on trains on adjacent lines.



**FIGURE 16:**

Running Line Collisions Between Trains and with Rolling Stock, Precursor Event / Likely Cause, July 2023 to June 2024.

Includes collisions on non-running lines affecting the safety of running lines. Excludes commercial light rail operations. Excludes trains striking or being struck by out of gauge equipment on trains on adjacent lines.





## TRAM COLLISIONS

Collisions involving trams, particularly with road vehicles and pedestrians are more common than in the heavy rail sector due to the sharing of public roadways in light rail operations. As a result of the typically lower operating speeds and lighter rail vehicles involved however, such collisions tend to be less severe in consequence.

Figure 17 presents the number of running line collisions between trams over the past five years. Figure 18 presents the number of running line collisions between trams by type of collision over the past two years (since the introduction of NRSDS).

Excluding out of gauge mirror strikes, there were nine running line collisions between trams reported in the 2023–2024 financial year, an increase of two from the previous year. The number of rear end collisions has doubled from three in 2022–2023 to six in 2023–2024. One worker sustained a minor injury as a result of one of these collisions. The precursor events or likely causes of these collisions for the 2023–2024 financial year are presented in Figure 19.

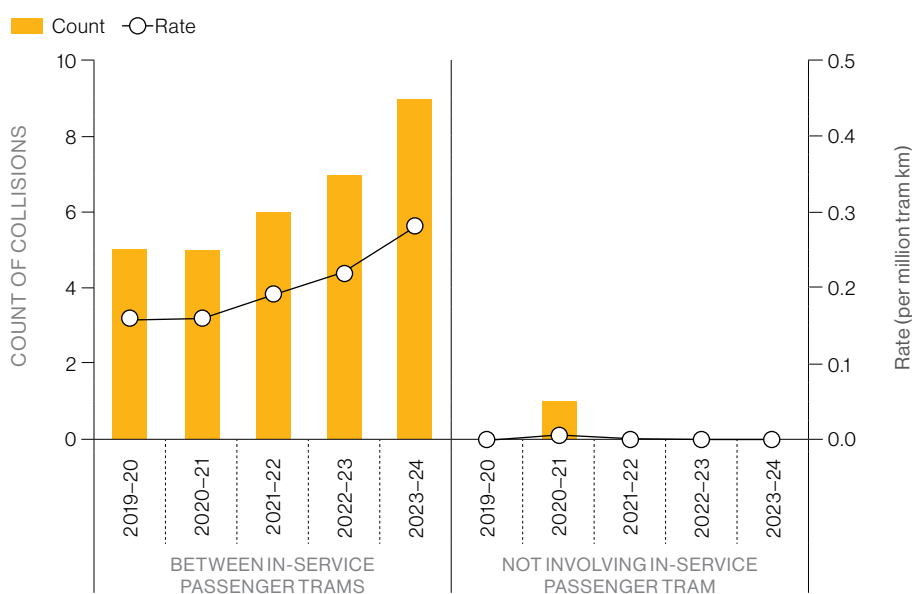
Figure 20 presents the number of significant (reportable as a Category A notifiable occurrence) running line collisions between a tram and a vehicle or a tram and a person, where the collision with a person resulted in a serious injury or fatality, over the past five years.

There were 13 significant collisions reported between a tram and a vehicle and four between a tram and a person in the 2023–2024 financial year. There were no fatalities reported as a result of these collisions. There were 12 serious injuries reported, four to pedestrians and eight to road vehicle occupants.

**FIGURE 17:**

Running Line Collisions  
Between Trams, July  
2019 to June 2024.

Includes collisions on  
non-running lines affecting  
the safety of running lines.  
Excludes trams striking or  
being struck by out of gauge  
equipment on trams on  
adjacent lines.



**FIGURE 18:**

Running Line Collisions Between Trams, Type of Collision, July 2022 to June 2024.

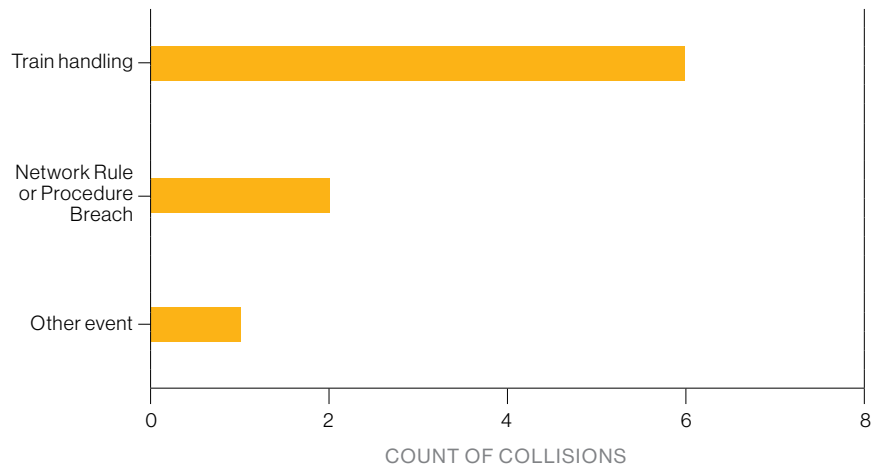
Includes collisions on non-running lines affecting the safety of running lines. Excludes trams striking or being struck by out of gauge equipment on trams on adjacent lines.



**FIGURE 19:**

Running line collisions between trams, precursor event / likely cause, July 2023 to June 2024.

Includes collisions on non-running lines affecting the safety of running lines. Excludes trams striking or being struck by out of gauge equipment on trams on adjacent lines.

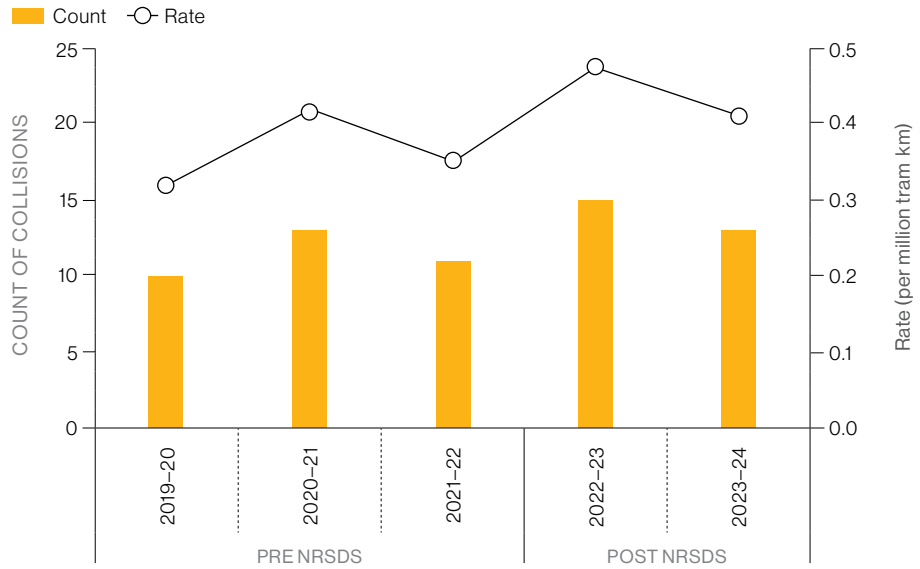


**FIGURE 20:**

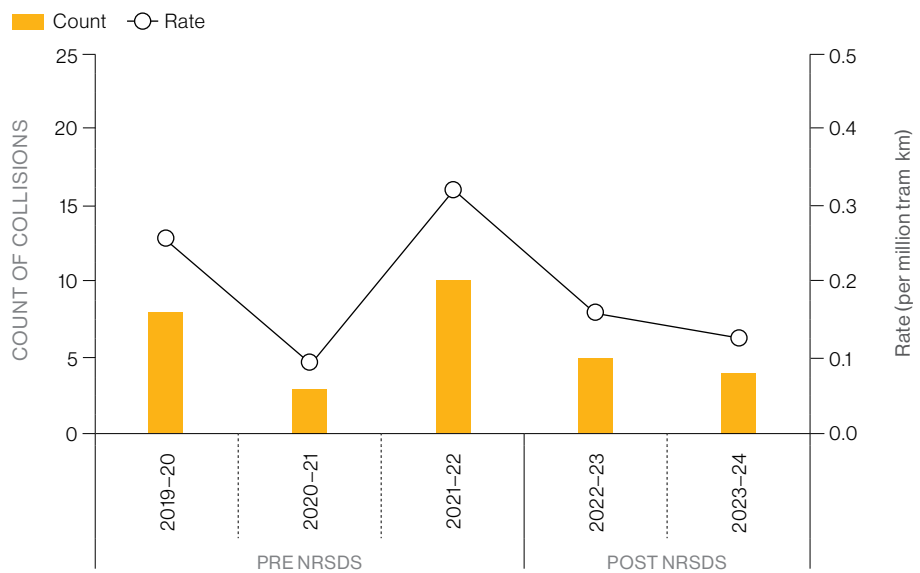
Significant running line collisions between tram and vehicle or person, July 2019 to June 2024.

Excludes collisions at level crossings.

**WITH VEHICLE NOT AT LEVEL CROSSING**



**WITH PERSON NOT AT LEVEL CROSSING**





## LEVEL CROSSING OCCURRENCES

There are more than 20,000 level crossings nationally that establish interfaces where interactions between trains and the public pose varying levels of risk to safety, depending on the nature of level crossing controls that are in place. Incidents at level crossings are the primary cause of railway-related fatalities among the general public. There were 39 level crossing collisions between a passenger or freight train and vehicle reported nationally in the 2023–2024 financial year, resulting in five fatalities and five serious injuries:

- two of the fatalities were train drivers, one was a heavy road vehicle driver, and two were road vehicle occupants.
- two of the serious injuries were train drivers and three were road vehicle occupants.

There was a decrease in the proportion of collisions that occurred at crossings protected by passive controls, such as give way signs and stop signs, from 47% in 2022–2023 to 31% in 2023–2024 .

There were four level crossing collisions between a passenger or freight train and person reported nationally in the 2023–2024 financial year, resulting in two fatalities and no serious injuries to pedestrians. None of the three collisions took place at crossings protected by passive control devices.

Figure 21 presents the number of level crossing collisions with a vehicle or a person over the past five years.

There were 475 level crossing near hits involving a passenger or freight train and a vehicle reported nationally in the 2023–2024 financial year. There were 426 level crossing near hits involving a passenger or freight train and a person in the same period.

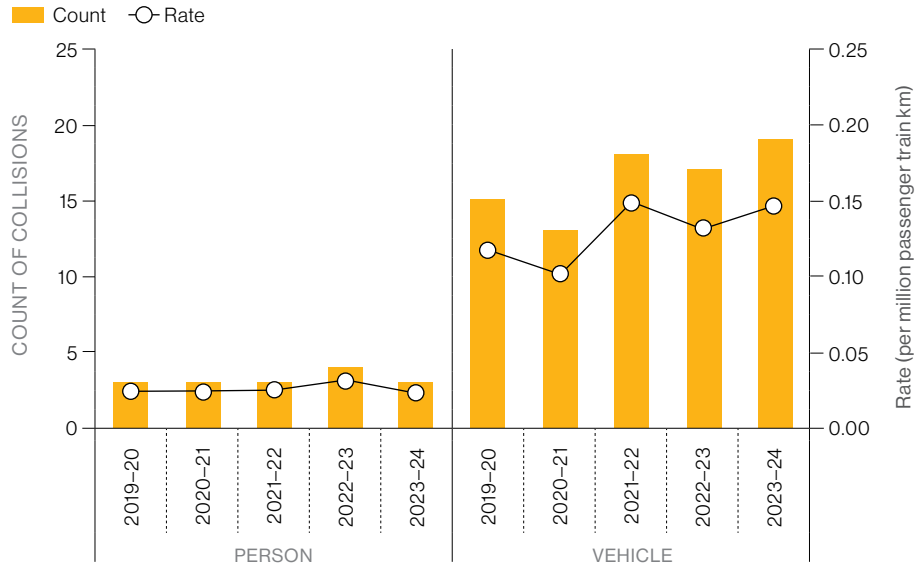
Figure 22 presents the number of level crossing near hits with a vehicle or person over the past five years.

**FIGURE 21:**

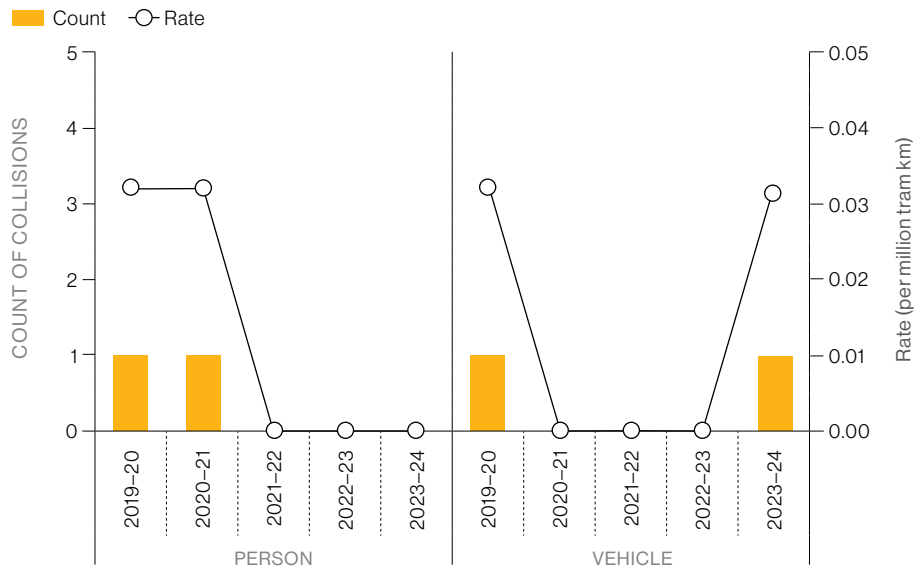
Level Crossing  
Collisions, July 2019 to  
June 2024.

Rates are expressed using  
train km for the sectors  
represented in each  
reporting category. Includes  
collisions reported at both  
public and private access  
road crossings.

**PASSENGER TRAIN (COMMERCIAL)**

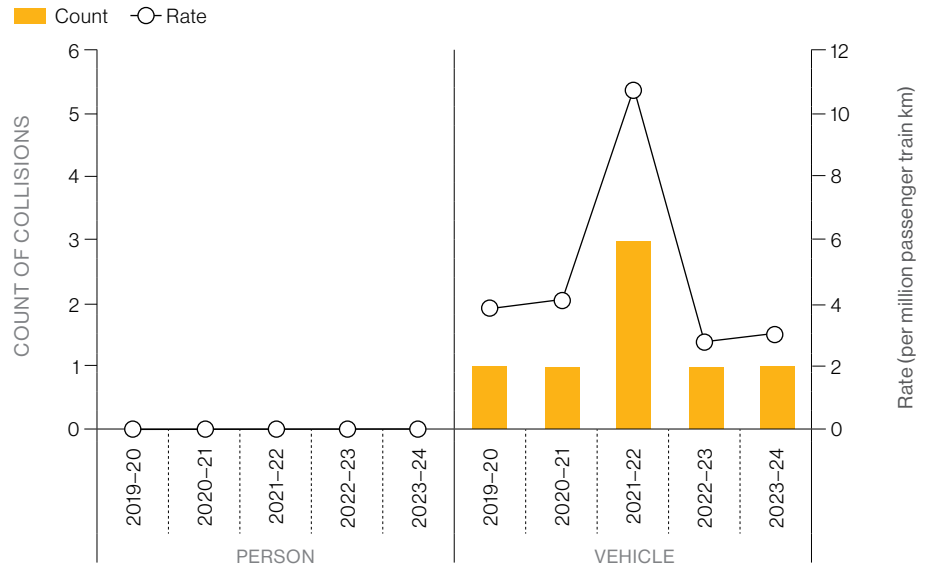


**PASSENGER TRAM (COMMERCIAL)**

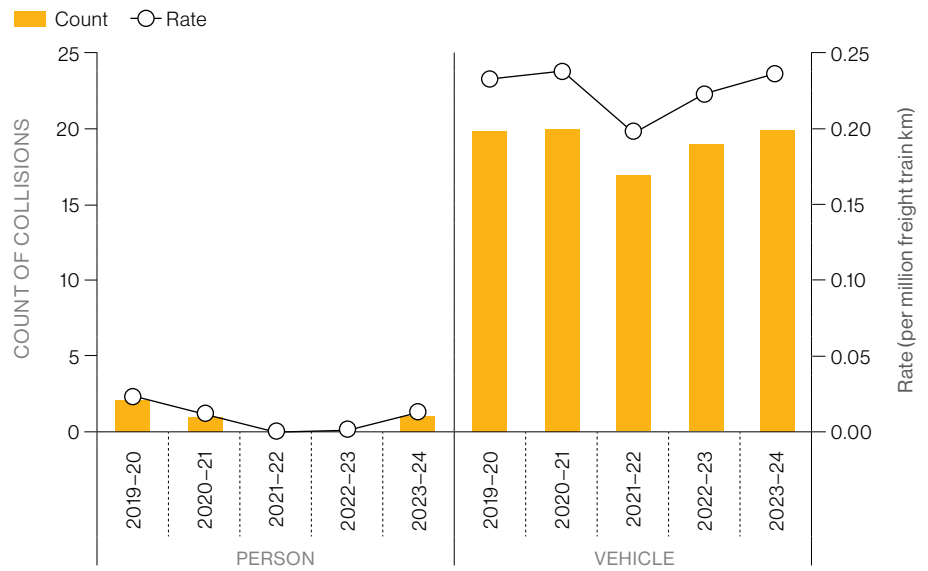


**FIGURE 21 (cont.):**

**PASSENGER TRAIN (TOURIST & HERITAGE)**



**FREIGHT TRAIN**

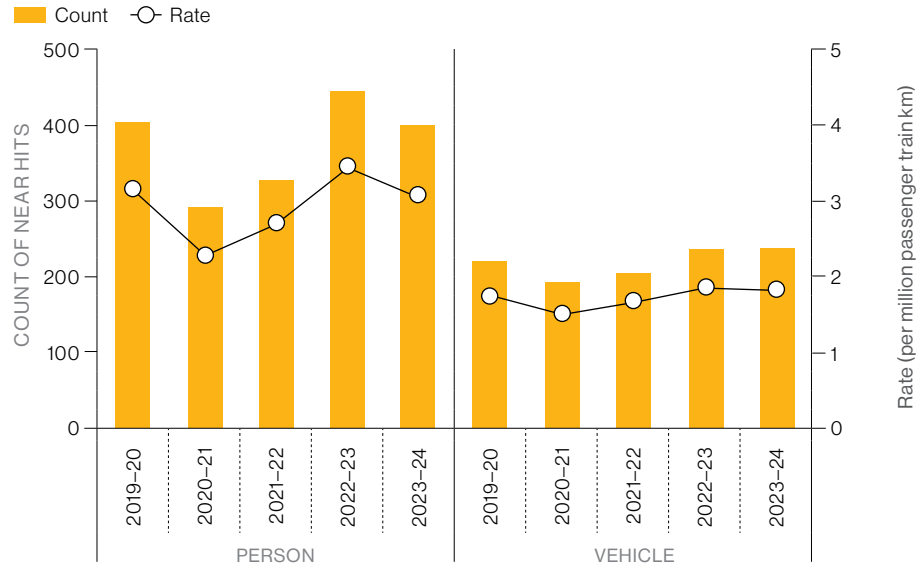


**FIGURE 22:**

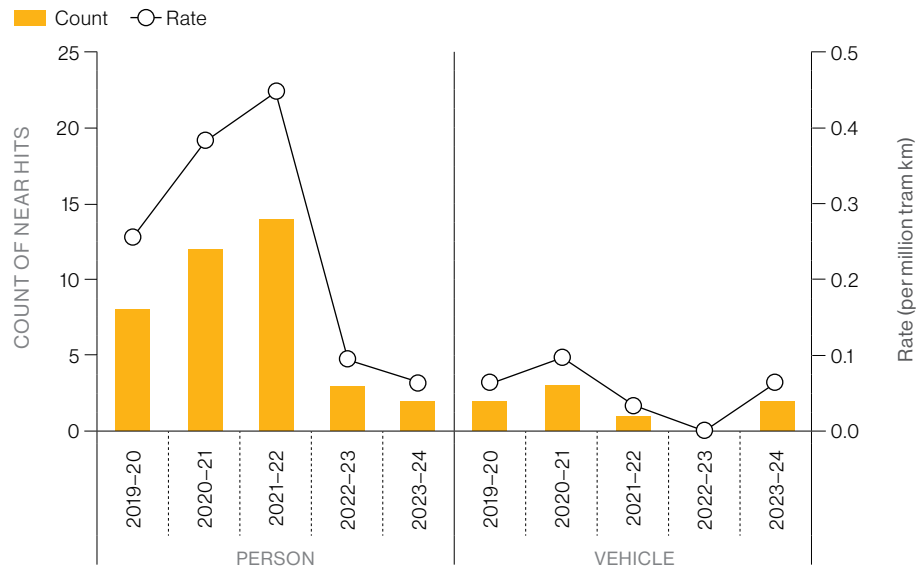
Level Crossing Near Hits, July 2019 to June 2024.

Rates are expressed using train km for the sectors represented in each reporting category. Includes near hits reported at both public and private access road crossings.

**PASSENGER TRAIN (COMMERCIAL)**

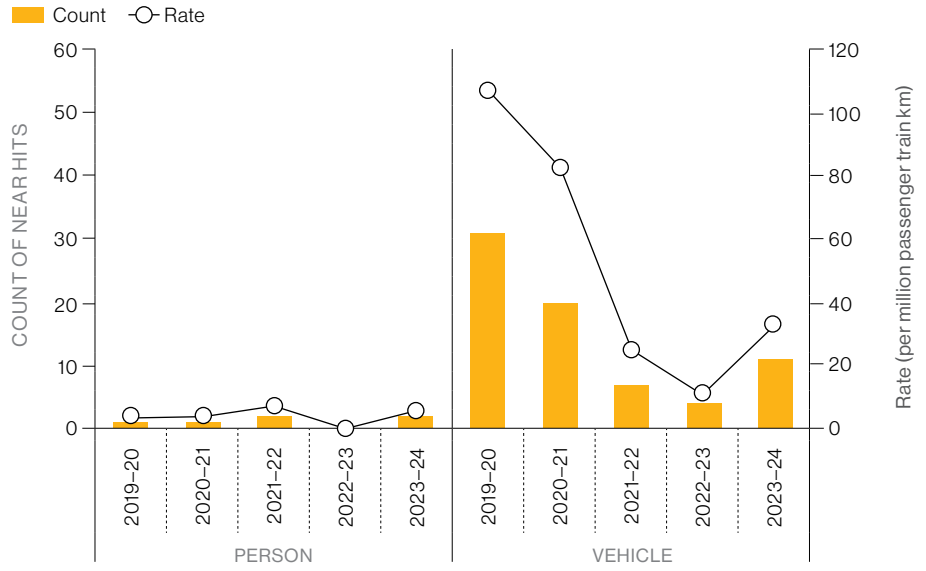


**PASSENGER TRAM (COMMERCIAL)**

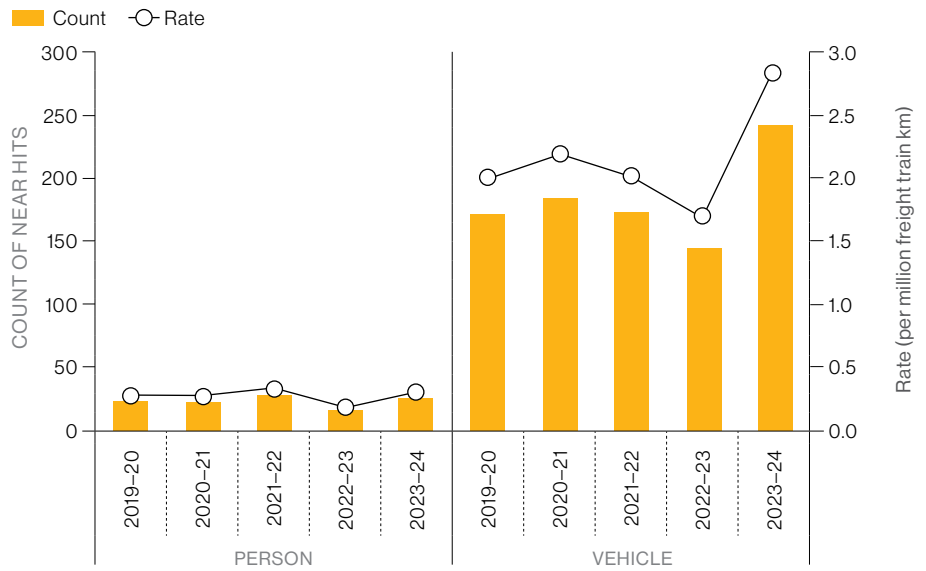


**FIGURE 22 (cont.):**

**PASSENGER TRAIN (TOURIST & HERITAGE)**



**FREIGHT TRAIN**





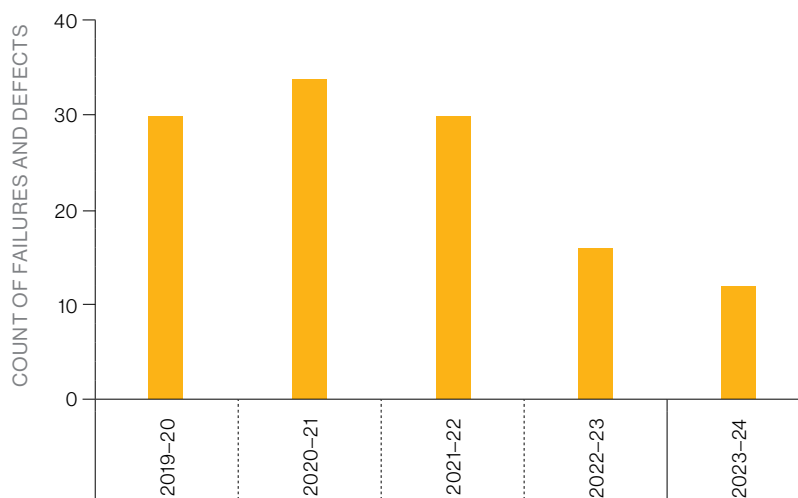
## LEVEL CROSSING EQUIPMENT FAILURES AND DEFECTS

Notification of wrong-side level crossing equipment failures and defects during 2023–2024 was at a five-year low of 12. Figure 23 depicts the failures and defects of active level crossing equipment (e.g. flashing lights and/or boom gates) and systems that failed in an unsafe way and not in accordance with their fail-to-safe design principles. These involve significant equipment failures or defects that resulted in the intended level of protection not being fully provided prior to or during the passage, or potential passage, of a train such as:

- complete failure of active warning devices, including lights and/or booms.
- late activation of warning devices.
- premature deactivation of warning devices.

**FIGURE 23:**

Wrong-Side Level Crossing Equipment Failures and Defects, July 2019 to June 2024.





## PROCEED AUTHORITIES EXCEEDED

Instances of trains exceeding the limit of their authorised movement are considered important precursors to collisions and derailments. Prior to the NRSDS, on heavy rail signalled systems these occurrences were notified as a Signal Passed at Danger (SPAD) and on light rail networks, they were notified as a Light Rail or Tram Authority Exceeded Event (LRTAE). Both have been consolidated under the Proceed Authority Exceeded (PAE) occurrence type, which captures instances where a train exceeds the limit of authority, a train proceeds without a proceed authority or proceeds whilst a restraint authority is in place.

Figure 24 presents the number of PAEs over the past five years where the proceed authority was driver related<sup>2</sup>. Figure 24 shows a 9% reduction in the number of PAEs involving commercial passenger trains and a 12% reduction in the number of PAEs involving freight trains. It also shows a 73% increase in the number of light rail PAEs, which is due to a change in reporting, reflecting a focus of regulatory attention by ONRSR, to include in the reporting of PAEs occurrences involving trams travelling onto, or being incorrectly routed onto, the wrong route that results in a potential conflict with another tram.

Since PAEs are considered important precursors to more serious incidents, figures 25 and 26 show the consequence events and response actions reported for driver related PAEs over the past two years (since the introduction of NRSDS).

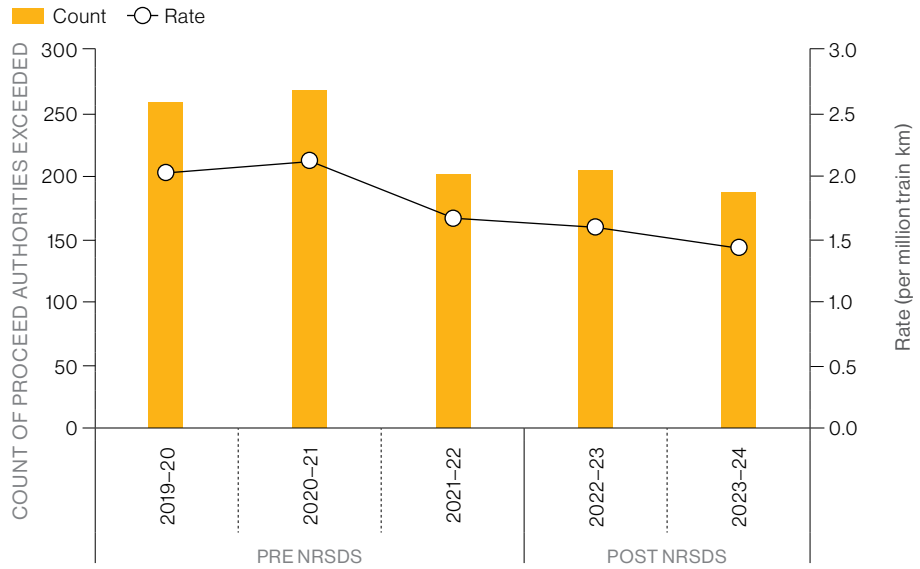
<sup>2</sup> For dates prior to the introduction of the NRSDS (1 July 2022), data shown is for occurrences classified as sub-category SPAD A1: Limit of authority missed by train crew, LRTAE A2: Light rail / tram signal passed without authority, and LRTAE: A4: Limit of authority missed by light rail / tram crew, as defined in the Reporting Requirements for Notifiable Occurrences (Version 3, ONRSR, Adelaide, 2020). For dates from 1 July 2022 onwards, data is shown for occurrences with likely cause reported as Completely missed, Started against signal, and Misjudged, as defined in the ONRSR Guidelines "Notifiable Occurrence Reporting Requirements" (Version 2, ONRSR, Adelaide, 2022) and "Occurrence Data Submission Requirements" (Version 2, ONRSR, Adelaide, 2022).

**FIGURE 24:**

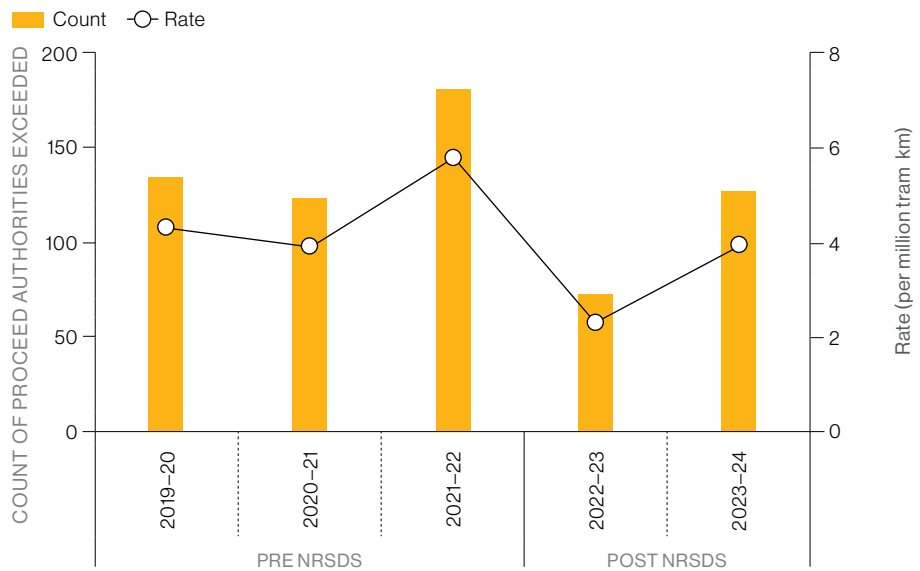
Proceed Authorities Exceeded, July 2019 to June 2024.

Data shown is for occurrences where the cause of the PAE was driver related. Rates are expressed using the respective train km for each sector.

**PASSENGER TRAIN (COMMERCIAL)**

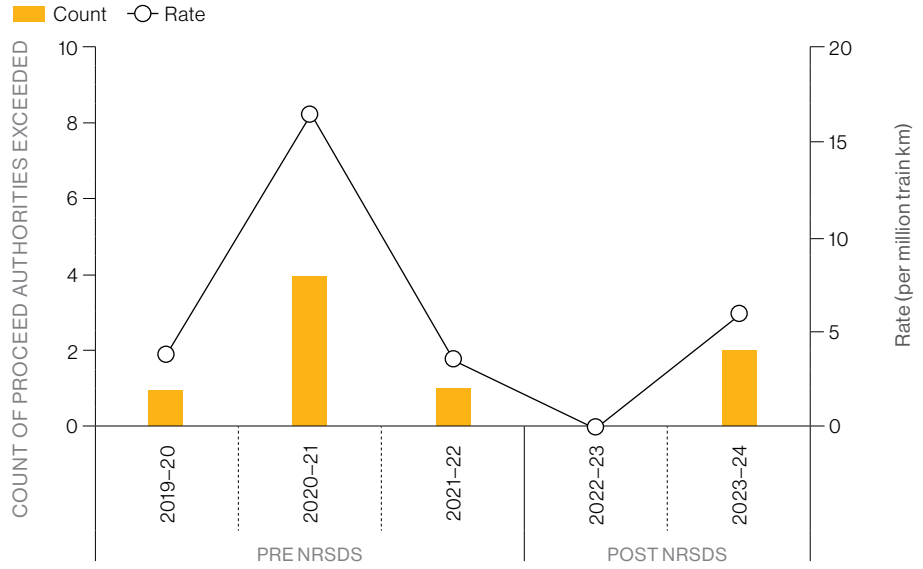


**PASSENGER TRAM (COMMERCIAL)**

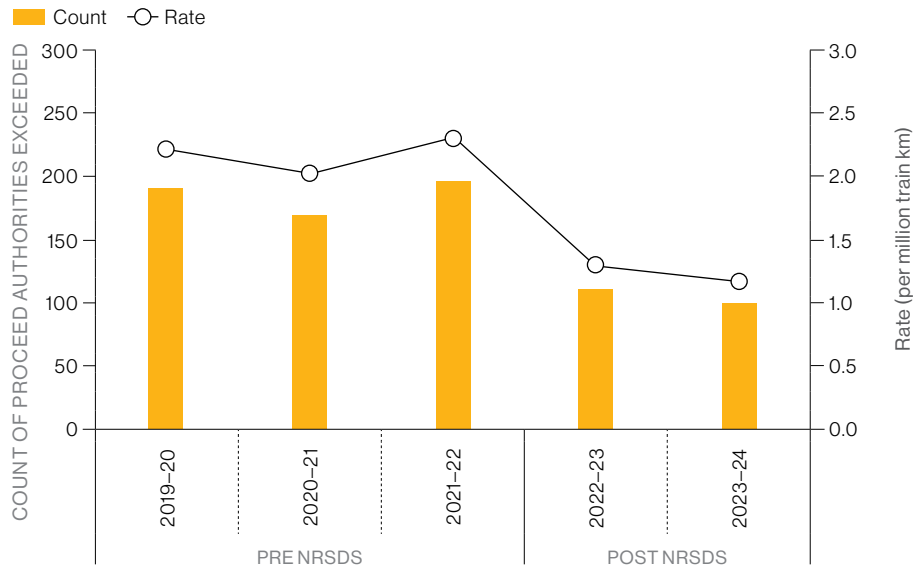


**FIGURE 24 (cont.):**

**PASSENGER TRAIN (TOURIST & HERITAGE)**



**FREIGHT TRAIN**

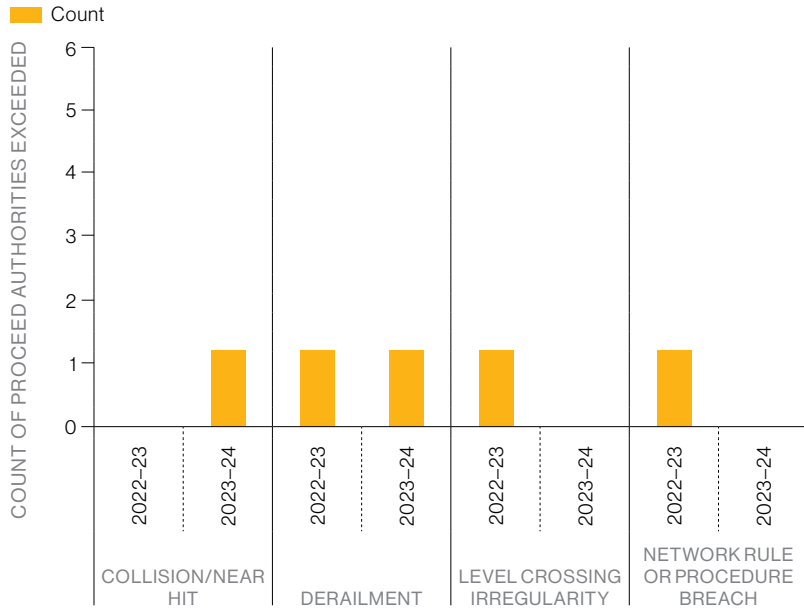


**FIGURE 25:**

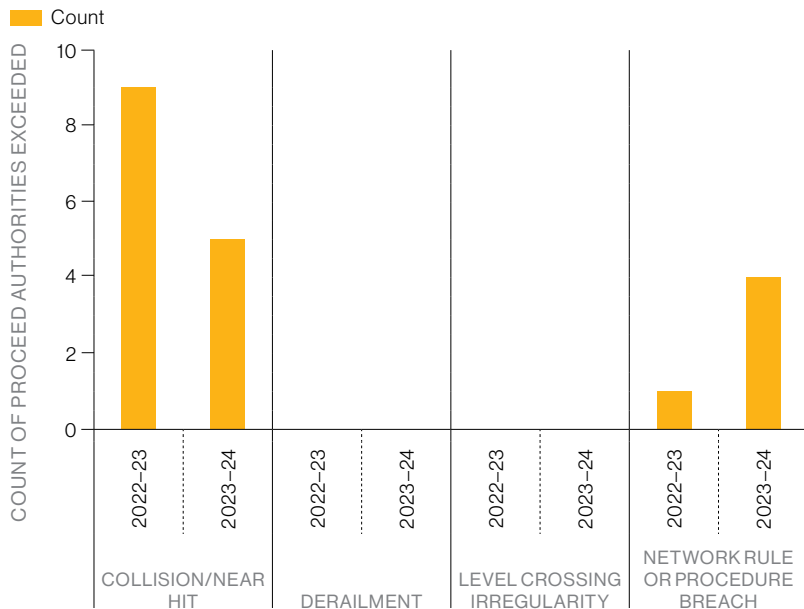
Proceed Authorities Exceeded, Consequence Event, July 2022 to June 2024.

Data shown is for occurrences where the cause of the PAE was driver related. Data only shown for those PAEs where a consequence event was reported. Excludes tourist & heritage operations.

**PASSENGER TRAIN (COMMERCIAL)**

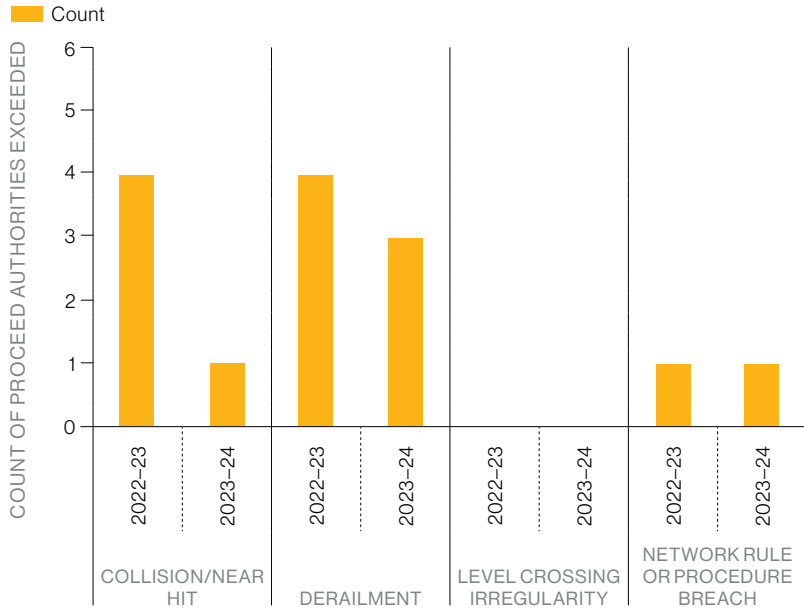


**PASSENGER TRAM (COMMERCIAL)**



**FIGURE 25 (cont.):**

**FREIGHT TRAIN**



**FIGURE 26:**

**PASSENGER TRAIN (COMMERCIAL)**

Proceed Authorities Exceeded, Response Action, July 2022 to June 2024.

Data shown is for occurrences where the cause of the PAE was driver related. Data only shown for those PAEs where a consequence event was reported. Excludes tourist & heritage operations.

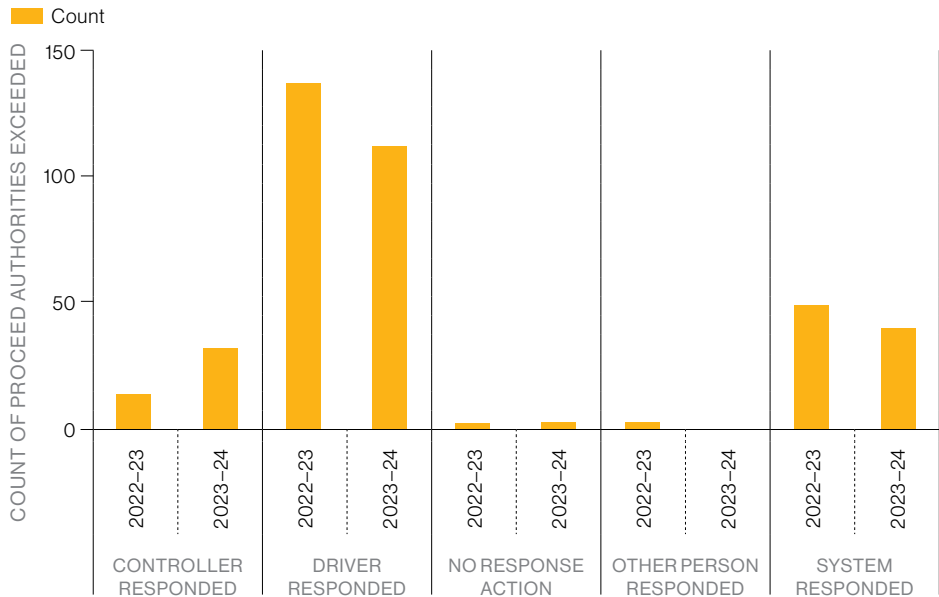
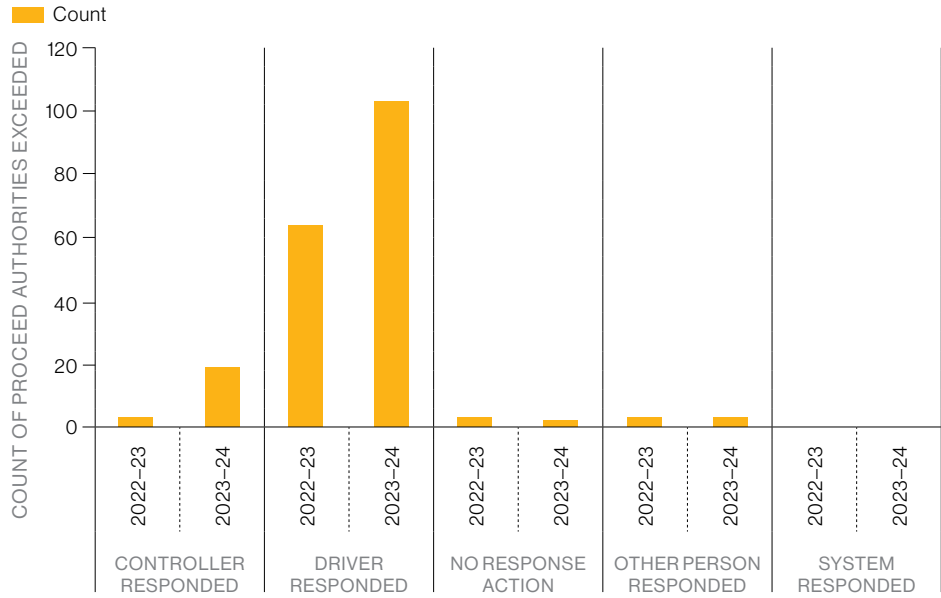
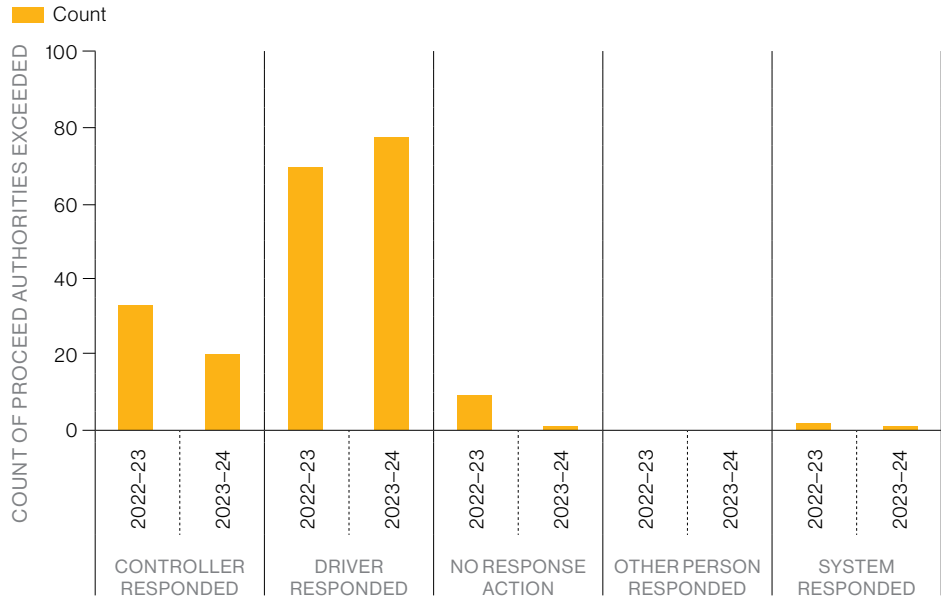


FIGURE 26 (cont.):

**PASSENGER TRAM (COMMERCIAL)**



**FREIGHT TRAIN**





## TRAIN RUNAWAYS

An uncontrolled movement of a train or rolling stock has the potential to result in a serious rail safety event with severe consequences, particularly if it leads to a collision with another train on the running line or occurs in the vicinity of people, thus placing them at risk of being struck.

Figure 27 presents the number of runaways over the past five years.

There were three runaways of a commercial passenger train reported in 2023–2024, of which two were higher risk occurrences. There were seven runaways of a freight train reported in 2023–2024, of which five were higher risk occurrences. There was one runaway of a tram reported in 2023–2024 which was not a higher risk occurrence.

Since runaways have the potential to contribute to more serious incidents, the ability to identify and respond to a runaway is an important control to mitigating this escalation. Figures 28 and 29 show the consequence events and response actions reported for runaways involving commercial passenger trains and freight trains over the past two years (since the introduction of NRSDS).

Figure 30 presents the precursor events or likely causes reported for runaways involving commercial passenger trains and freight trains over the past two years (since the introduction of NRSRS).

**FIGURE 27:**

Runaways, July 2019 to June 2024.

A higher risk occurrence includes a runaway of a train or rolling stock on or onto the running line. Also includes a runaway in a yard that occurred in proximity to people and the nature of the runaway placed them at risk of injury from the train or rolling stock. Rates are expressed using the respective train km for each sector.

### PASSENGER TRAIN (COMMERCIAL)

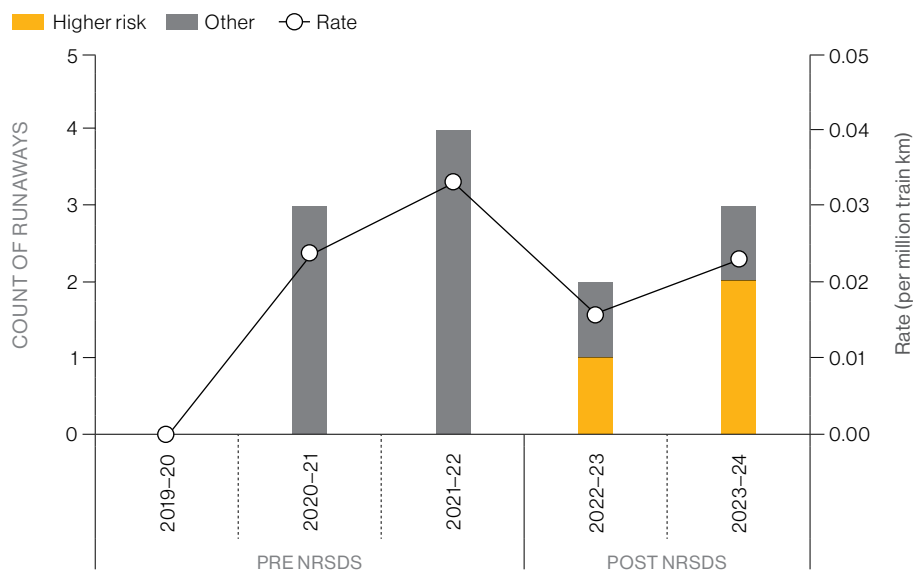
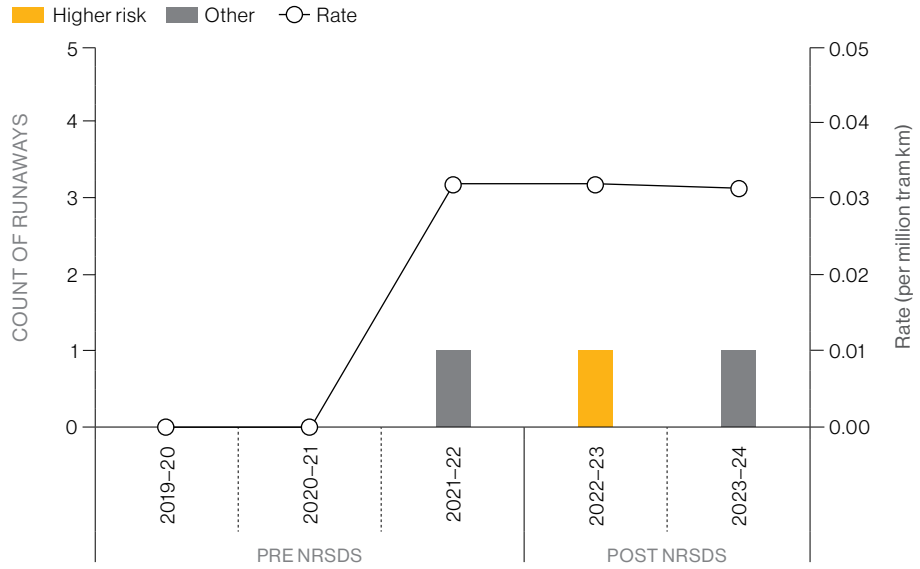
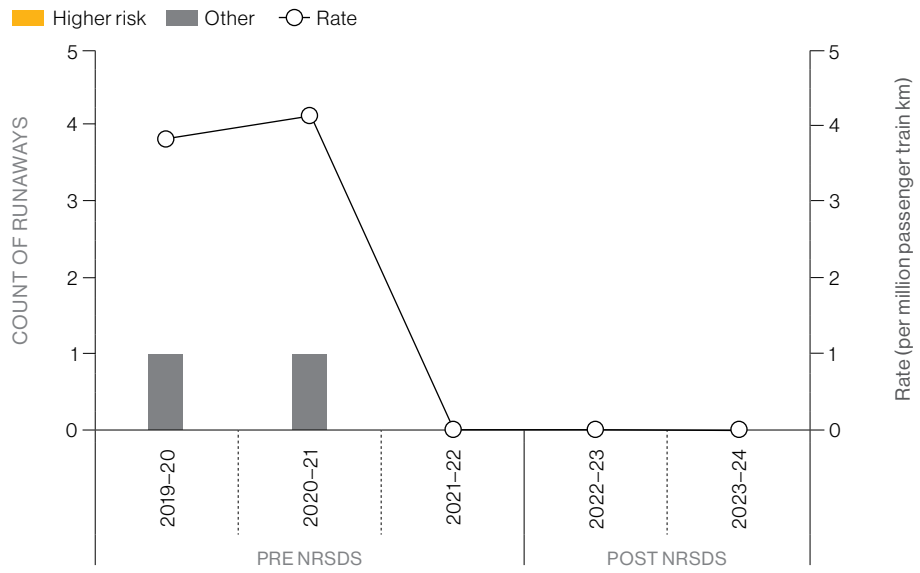


FIGURE 27 (cont.):

**PASSENGER TRAM (COMMERCIAL)**

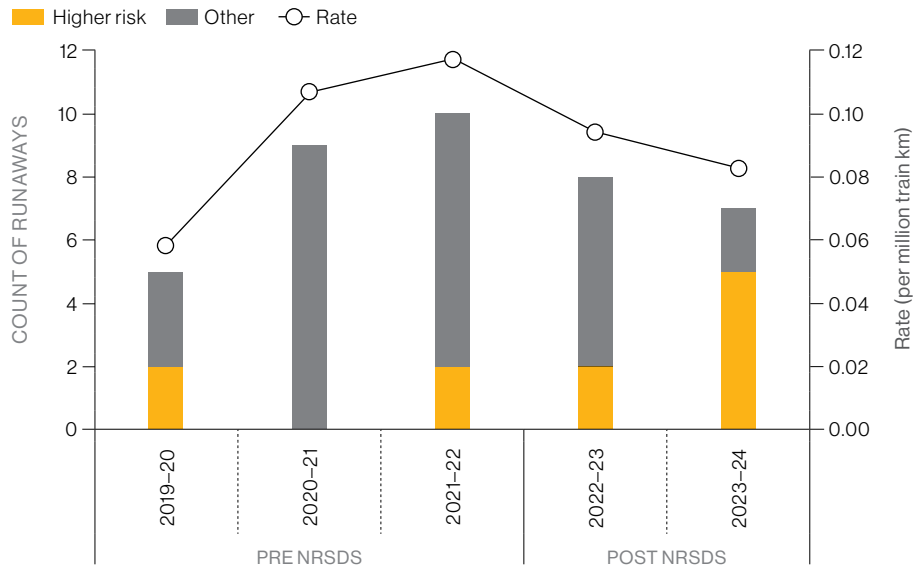


**PASSENGER TRAIN (TOURIST & HERITAGE)**



**FIGURE 27 (cont.):**

**FREIGHT TRAIN**

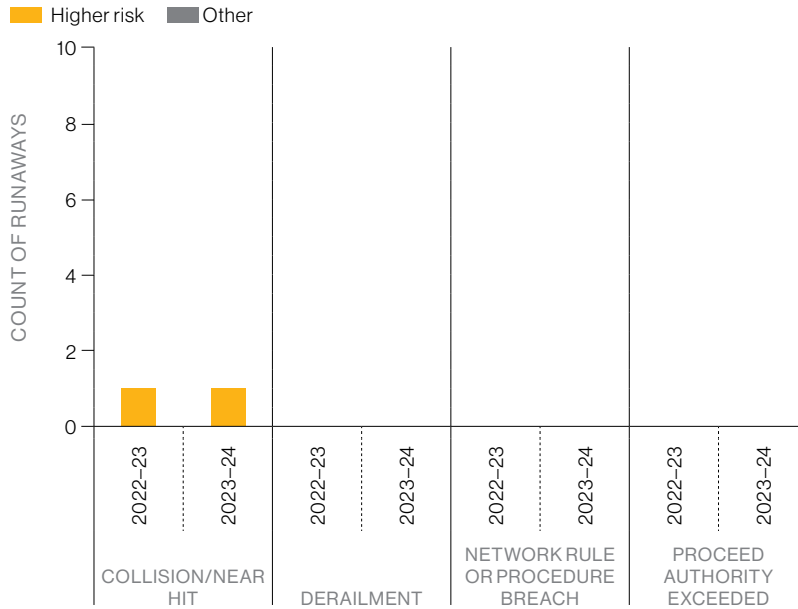


**FIGURE 28:**

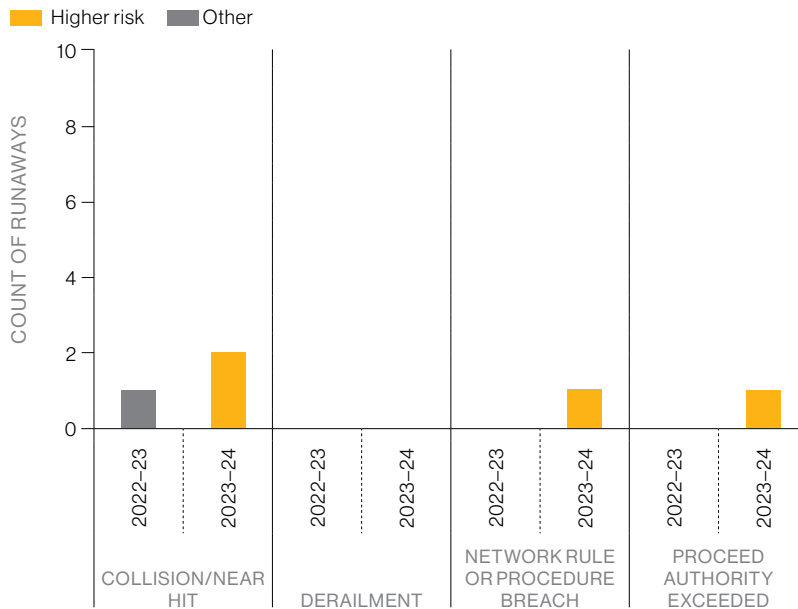
Train Runaways, Consequence Event, July 2022 to June 2024.

A higher risk occurrence includes a runaway of a train or rolling stock on or onto the running line. Also includes a runaway in a yard that occurred in proximity to people and the nature of the runaway placed them at risk of injury from the train or rolling stock. Data only shown for those runaways where a consequence event was reported. Excludes light rail and tourist & heritage operations.

**PASSENGER TRAIN (COMMERCIAL)**



**FREIGHT TRAIN**

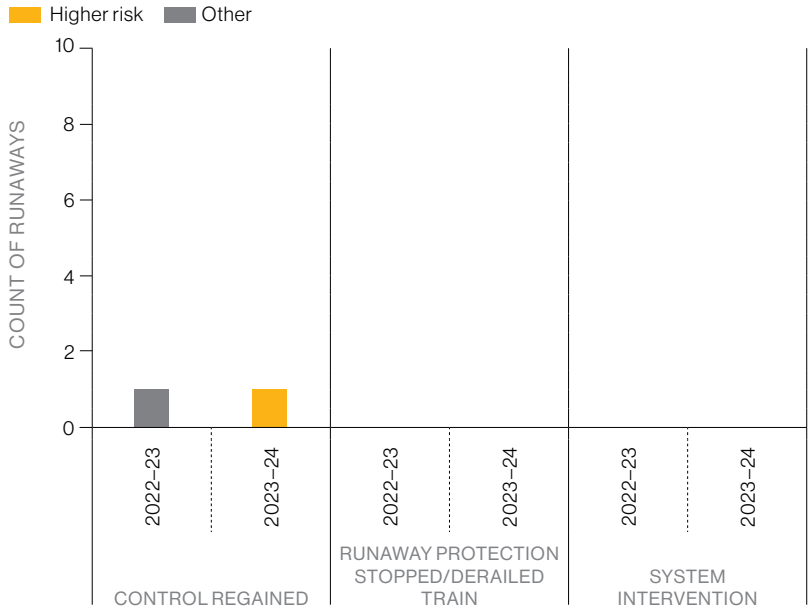


**FIGURE 29:**

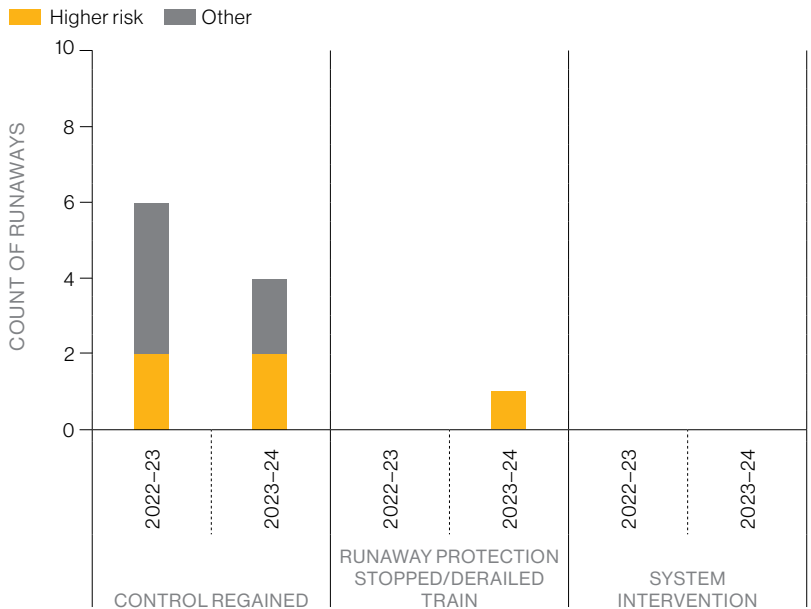
Train Runaways, Response Action, July 2022 to June 2024.

A higher risk occurrence includes a runaway of a train or rolling stock on or onto the running line. This also includes a runaway in a yard that occurred in proximity to people and the nature of the runaway placed them at risk of injury from the train or rolling stock. Data only shown for those runaways where a consequence event was reported. Excludes light rail and tourist & heritage operations.

**PASSENGER TRAIN (COMMERCIAL)**



**FREIGHT TRAIN**

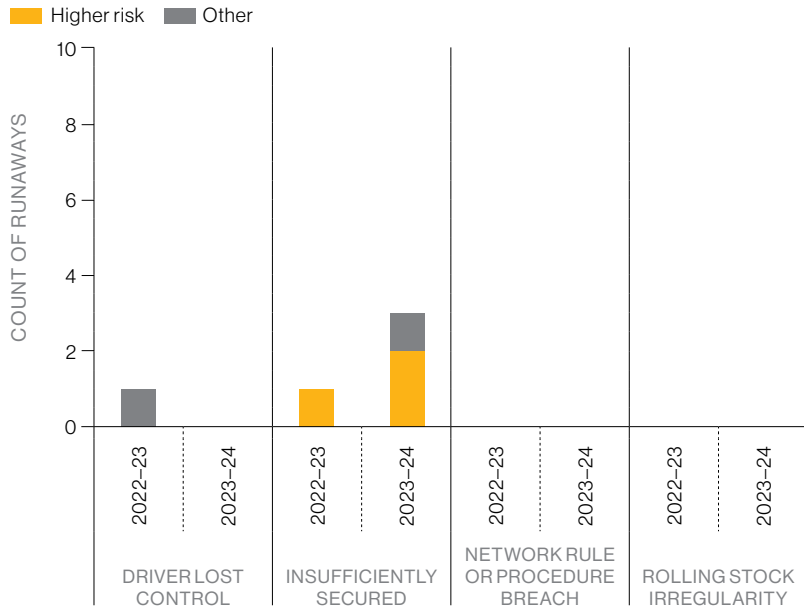


**FIGURE 30:**

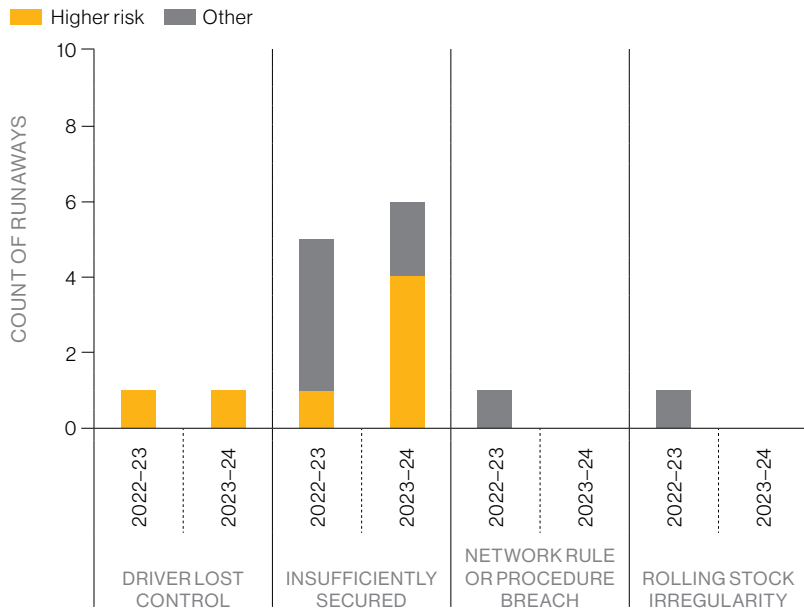
Train Runaways, Precursor Event / Likely Cause, July 2022 to June 2024.

A higher risk occurrence includes a runaway of a train or rolling stock on or onto the running line. This also includes a runaway in a yard that occurred in proximity to people and the nature of the runaway placed them at risk of injury from the train or rolling stock. Data only shown for those runaways where a consequence event was reported. Excludes light rail and tourist & heritage operations.

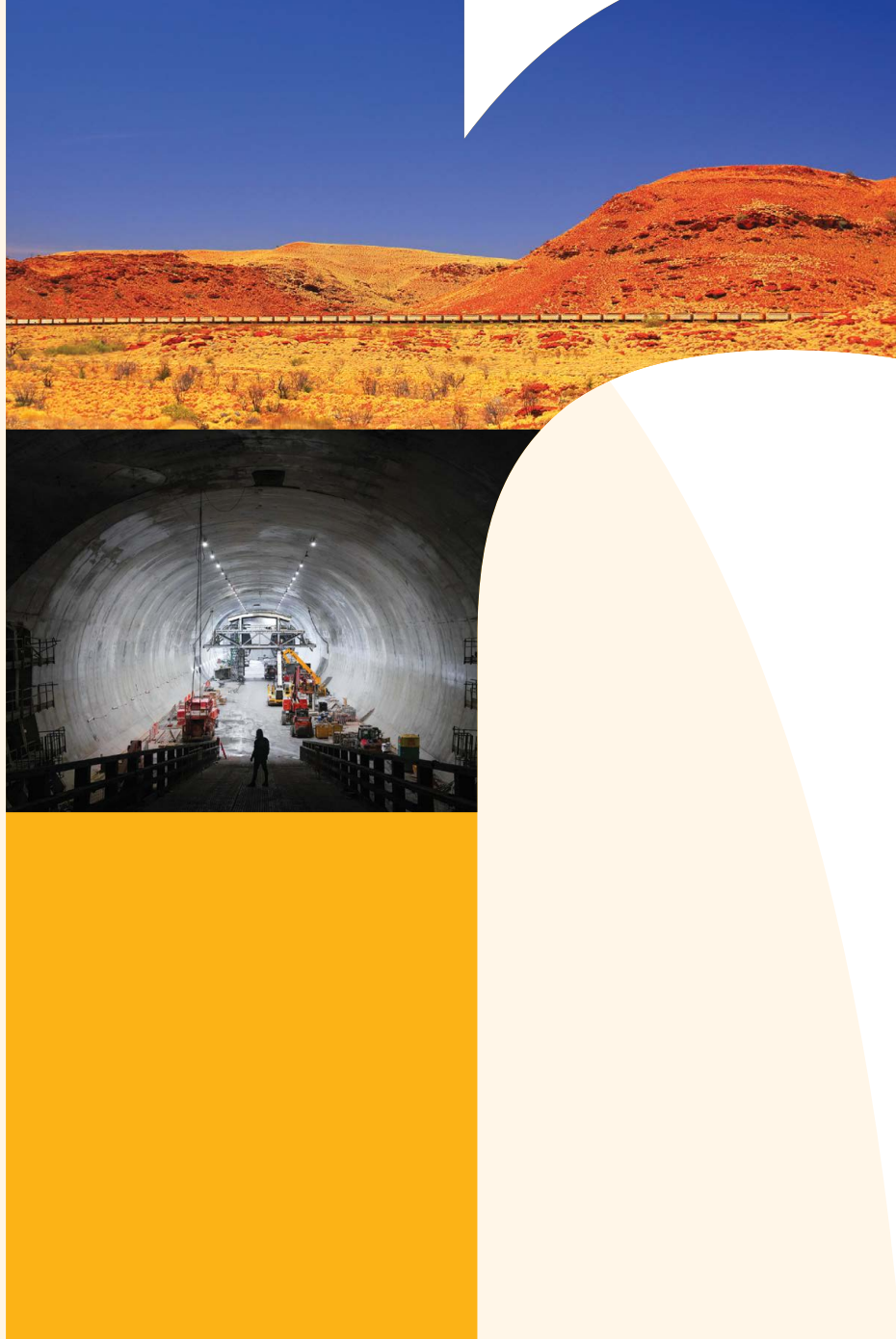
**PASSENGER TRAIN (COMMERCIAL)**



**FREIGHT TRAIN**







# DATA-DRIVEN INTELLIGENCE

# RISK-BASED REGULATION

The statistics and summaries presented in the previous chapters provide a snapshot of the rail industry's safety performance over the last financial year. Such data is a key source of information used to guide ONRSR's resources and attention. This chapter continues the series of articles presented in previous issues of the ONRSR Rail Safety Report, to advise on progress to further enhance our risk-based approach to regulation by using better evidence sources to guide decision-making.





## CASE STUDY – COMPLIANCE ACTIVITIES AND FINDINGS

Previous Rail Safety Reports have focused on presenting notifiable occurrences data only. This case study presents a mix of data sources from regulatory activity, generated by rail safety officers in the delivery of compliance monitoring activities from audits and inspections. ONRSR officers codify an activity's scope, findings, and corrective actions against elements of a safety management system or provision of the *Rail Safety National Law* (RSNL). This data was analysed to provide insight into common compliance issues across various industry sectors.

This information is presented to provide an example of the type of external reporting ONRSR could deliver on a more regular basis. Feedback on this case study is welcome and can be provided to ONRSR via [contact@onrsr.com.au](mailto:contact@onrsr.com.au).

An ONRSR strategic priority 2024–2027 is to *influence safety practices and build safety knowledge amongst rail transport operators*. To achieve this, ONRSR is developing a data set and classification to capture regulatory activities in more detail and apply advanced analytics to enable richer insights into safety management performance. As this data and its analysis matures, it will further inform regulatory decision-making and, importantly, will be distributed to the wider rail industry to assist operational safety risk management.

Table 4 and Figure 31 reflect activity statistics for compliance monitoring activities (audits and inspections) for 2023–2024, including the number of findings resulting from these activities. Activities were undertaken around Australia, as shown in Figure 32, and across the range of railway operations and operators that exist throughout the Australian rail industry.

To de-identify individual operators and to provide meaningful information, accredited operators have been assigned to a rail sector based on the core nature of the railway operations for which they are accredited, and figures were consolidated against these sectors.

**TABLE 4:**

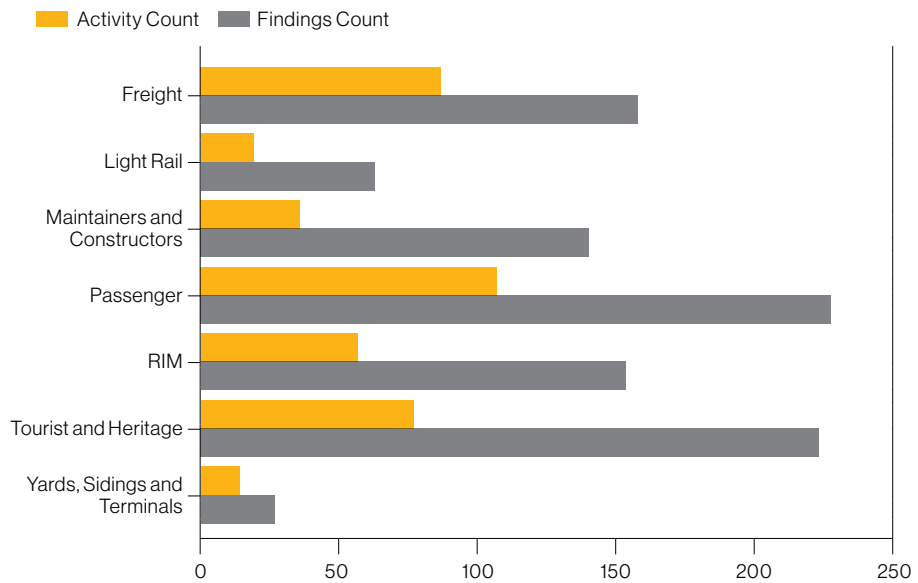
Number Of Activities and Findings by Sector, July 2023 to June 2024.

RAIL SECTOR	ACTIVITY COUNT	ACTIVITY PERCENTAGE	FINDINGS COUNT*	FINDINGS PERCENTAGE
Freight	87	22%	159	16%
Light Rail	19	5%	63	6%
Maintainers and Constructors	36	9%	141	14%
Passenger	108	27%	229	23%
Rail infrastructure manager (RIM)	57	14%	155	15%
Tourist and Heritage	77	19%	225	23%
Yards, Sidings and Terminals	14	4%	27	3%

\*The findings included in this analysis must have been issued to the operator as an observation, non-compliance report or higher order statutory notice.

**FIGURE 31:**

Activities And Findings by Sector, July 2023 to June 2024.



\*The findings included in this analysis must have been issued to the operator as an observation, non-compliance report or higher order statutory notice.

**FIGURE 32:**

ONRSR Regulatory Activity Flow Map, July 2023 to June 2024.



Both the scope of an activity and the activity findings are mapped against the safety management system (SMS) provisions in Schedule 1 of *Rail Safety National Law National Regulations 2012*.

On the following pages, Table 5 provides the top three SMS elements that were targeted through regulatory activities for each sector. Table 6 presents a summary of the common compliance issues that resulted in findings being made against the SMS elements for each industry sector.

**TABLE 5:**

Top Activity Scope SMS Elements, June 2023 to July 2024.

RAIL SECTOR	TOP THREE ACTIVITY SMS SCOPE ITEMS
Freight	General Engineering and Operational Systems Safety Requirements
	Rail Safety Worker Competence
	Risk Management
Light Rail	General Engineering and Operational Systems Safety Requirements
	Rail Safety Worker Competence
	Process Control
Maintainers and Constructors	General Engineering and Operational Systems Safety Requirements
	Process Control
	Asset Management
Passenger	Risk Management
	Process Control
	General Engineering and Operational Systems Safety Requirements
RIM	General Engineering and Operational Systems Safety Requirements
	Risk Management
	Process Control
Tourist and Heritage	General Engineering and Operational Systems Safety Requirements
	Process Control
	Rail Safety Worker Competence
Yards, Sidings and Terminals	General Engineering and Operational Systems Safety Requirements
	Procurement and Contract Management
	Rail Safety Worker Competence

**TABLE 6:**

Top Activity Findings against SMS Elements, June 2023 to July 2024.

RAIL SECTOR	TOP THREE SMS FINDINGS	COMMON ISSUES FROM SMS FINDINGS
Freight	Process Control	Plans for rail safety work activities were not correctly completed or signed off.
	Document Control Arrangements and Information Management	Procedure documentation contained inaccurate or outdated information.
	Fatigue Management	Processes or procedures were not in place to assess fatigue safety risk.
Light Rail	Risk Management	Risk assessments were either inadequate or unable to be provided.
	Document Control Arrangements and Information Management	SMS or procedure documentation contained inconsistencies regarding terminology, reference numbers and document numbers.
	Process Control	Track maintenance processes were not followed, such as how results were recorded or frequency of inspections.
Maintainers and Constructors	Document Control Arrangements and Information Management	Documents were overdue for periodic review, or documents contained outdated references.
	Process Control	Processes relating to management of rolling stock defects and test equipment were not documented, or documentation was outdated.
	Risk Management	Risk controls listed in the Risk Register were incomplete or no longer relevant.
Passenger	Process Control	Processes relating to management of rolling stock and track maintenance were not documented, or documentation was outdated.
	Document Control Arrangements and Information Management	Documents were overdue for periodic review, or documents contained outdated references.
	General Engineering and Operational Systems Safety Requirements	Errors, discrepancies, or missing details found in standards and procedure documentation.

**TABLE 6 (cont.):**

RAIL SECTOR	TOP THREE SMS FINDINGS	COMMON ISSUES FROM SMS FINDINGS
RIM	Procurement and Contract Management	Failure to demonstrate that safety requirements under the safety management system were adequately defined and documented in tender documents and contracts.
	Document Control Arrangements and Information Management	Documents were overdue for periodic review, or documents contained outdated references.
	Risk Management	Elements of interface agreement documentation were missing or incorrectly recorded.
Tourist and Heritage	Process Control	Rail infrastructure and rolling stock maintenance processes were not documented, or inspection records could not be provided.
	Risk Management	Risk controls listed in the Risk Register were incomplete, not effective, or not current.
	General Engineering and Operational Systems Safety Requirements	Track infrastructure inspection scopes, methodologies and acceptance/rejection criteria tolerances were not sufficiently detailed.
Yards, Sidings and Terminals	Rail Safety Worker Competence	Processes to ensure rail safety workers have the competency to carry out work were not in place.
	Document Control Arrangements and Information Management	Documents were overdue for periodic review, or documents contained outdated references.
	Risk Management	Risk assessments were not current to support the demonstration of managing risks to safety as far as is reasonably practicable.



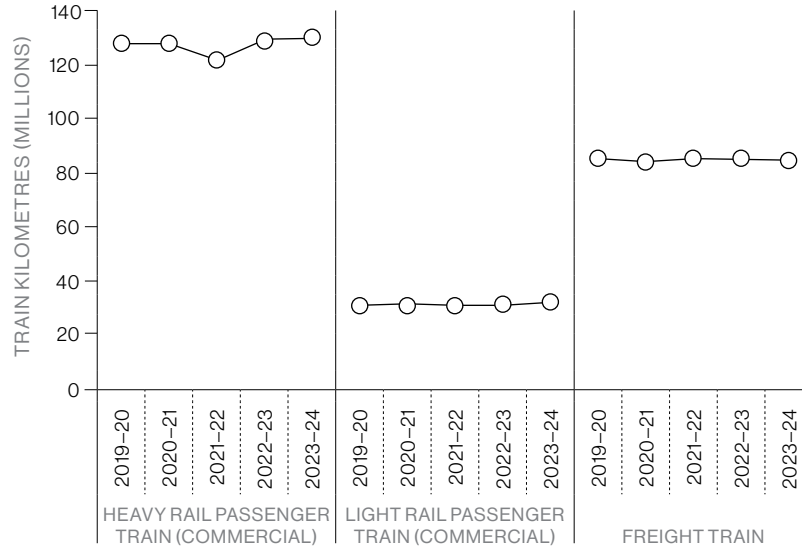
# APPENDICES

# APPENDIX A: NETWORK STATISTICS

**FIGURE 33:**

Commercial Passenger and Freight Train Kilometres, July 2019 to June 2024.

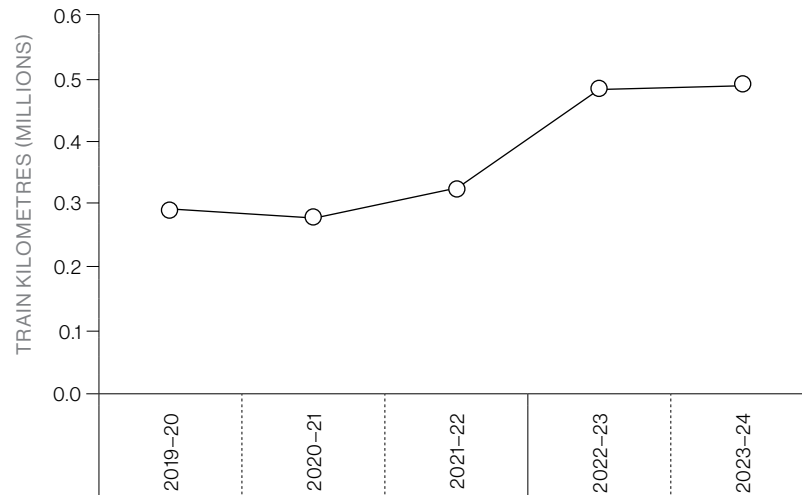
Commercial rail operations encompass all major rail operations in Australia including freight, light, and heavy rail passenger operations. The charts below exclude their associated maintenance operations (see Figure 35) and excludes tourist and heritage operations (see Figure 34).



**FIGURE 34:**

Tourist and Heritage Passenger Train Kilometres, July 2019 to June 2024.

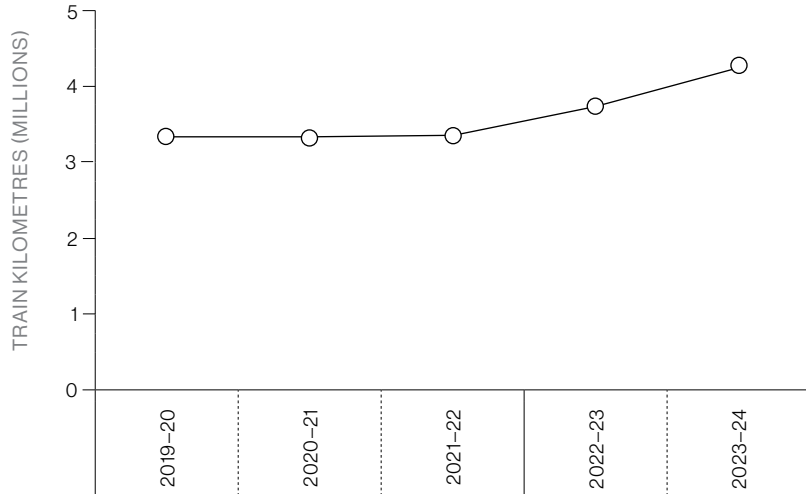
Passenger train kilometres reported by tourist and heritage operators in Victoria that transitioned under ONRSR's regulatory oversight on 2 December 2019 are included from December 2019 only.



**FIGURE 35:**

Maintenance Vehicle Kilometres, July 2019 to June 2024.

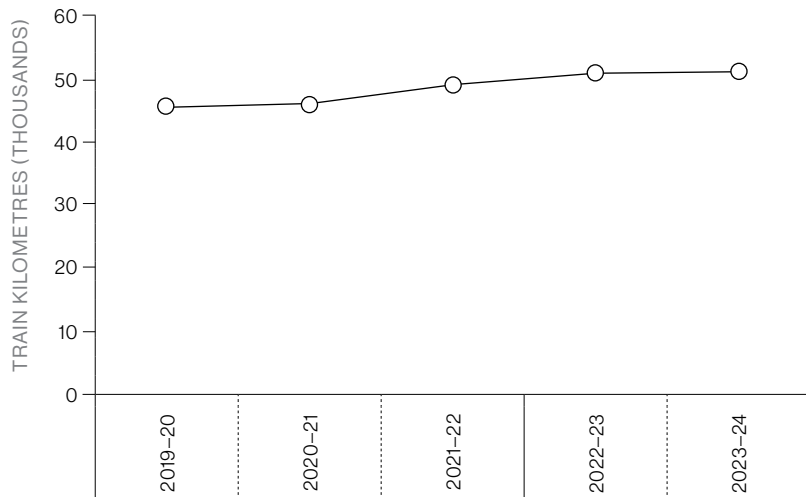
Accredited operators are required to provide monthly reports of the total kilometres travelled by any self-propelled infrastructure maintenance vehicles such as a track maintenance train or road rail vehicle. Maintenance vehicle kilometres reported by tourist and heritage operators in Victoria that transitioned under ONRSR’s regulatory oversight on 2 December 2019 are included from December 2019 only.



**FIGURE 36:**

Track Kilometres, July 2019 to June 2024.

Accredited operators are required to provide monthly reports on the length of track over which they have effective management and control. This chart depicts the total length of track reported for the month of June in each financial year.



# APPENDIX B: SCOPE AND METHODS

The scope and methods used for the presentation of data in this report are described below.

## REPORTING PERIOD

Where available, statistical trends of incident counts and rates are presented over a five-year period, from 1 July 2019 to 30 June 2024. A new data set was officially launched on 1 July 2022, under the NRSDS, and as such is the source for the data provided for the 2022–2024 period.

## GEOGRAPHIC COVERAGE

Descriptions and statistics in this report cover all railway operations in Australia.

## DATA SOURCES

The information presented in this report is principally based on notifiable occurrences — the initial written advice of a rail safety incident that a rail transport operator submits to ONRSR in accordance with section 121 of the RSNL.

Activity data (for example, train kilometres travelled) is based on monthly returns supplied by rail transport operators in accordance with section 120(3) of the RSNL. The specific information to be provided is defined in clause 56 of the National Regulations.

<sup>3</sup> Office of the National Rail Safety Regulator, *Notifiable Occurrence Reporting Requirements, Version 2, ONRSR Adelaide, 2022*

<sup>4</sup> Office of the National Rail Safety Regulator, *Reporting Requirements for Notifiable Occurrences, Version 3, ONRSR, Adelaide, 2020.*

Consistent activity data for tourist and heritage operators in Victoria (Vic.) that transitioned under ONRSR's regulatory oversight on 2 December 2019, is unavailable prior to this date. Exclusion of this data has no material effect on the statistics presented within this report as it is expected to comprise only three-tenths of one percent of total activity data over the missing period.

Data collected by previous state regulators prior to ONRSR and used in this report was gathered under different legislative regimes. A review of this data was undertaken to ensure comparability with ONRSR collected data. This applies to the data outlined below:

- Vic. – From 1 July 2018 to 1 December 2019, the following data was gathered by Transport Safety Victoria: Notifiable occurrence and activity data for the Melbourne metropolitan tram network; and notifiable occurrence data for tourist and heritage operators that transitioned under ONRSR's regulatory oversight on 2 December 2019.



## DEFINITIONS

Statistics are predominantly based on the incident definitions in the Notifiable Occurrence Reporting Requirements<sup>3</sup> for incidents from 1 July 2022, and in the Reporting Requirements for Notifiable Occurrences<sup>4</sup> for incidents prior to 1 July 2022.

Some of the statistics presented are based on definitions specific to this report to support a more meaningful risk-based analysis of critical events. In such cases these definitions are presented in the body of the report.

## DISCLAIMER

ONRSR advises the following:

### INTERNAL CONSISTENCY

Statistics for a given incident category may differ between sections of this report because definitions and top-event conventions vary according to need. For example, international benchmarking statistics have different definitions to ONRSR and hence the scope of ONRSR incidents used in these comparisons have been aligned to the benchmarking definitions.

### DATA COMPARABILITY

Issues of consistency are relevant both within the report and between this report and other information products.

The statistics in this report may differ to other sources that utilise the same data and coding specifications. This will be due in part to the data collection and preparation methods used to generate the tables and charts in this report which included identification and correction of errors in historical data.

With the launch of the NRSDS on 1 July 2022, this report combines two data sets, resulting in step changes for many occurrence types. Most notably, Category C notifiable occurrences were introduced, which operators are required to submit annually. Consequently, only Category A or B notifiable occurrences are included in this report.



**TABLE 7:**

Step Changes Relevant to The Specific Occurrence Types and Sub-Categories Presented in this Report.

OCCURRENCE TYPE	NRSDS REPORTING REQUIREMENT STEP CHANGES
Railway-related fatalities	From 1 July 2022 onwards, excludes fatalities (to members of the public, passengers, and trespassers) as a result of slips, trips or falls on railway premises, not directly associated with railway operation.
Railway-related serious injuries	<ul style="list-style-type: none"> <li>From 1 July 2022 onwards, excludes serious injuries (to members of the public, passengers, and trespassers) as a result of slips, trips or falls on railway premises, not directly associated with railway operation.</li> <li>From 1 July 2022, there are changes to the definition of a serious injury to members of the public, passengers and trespassers.</li> </ul>
Passenger train running line derailments	No step change due to NRSDS.
Tram running line derailments	No step change due to NRSDS.
Freight train running line derailments	No step change due to NRSDS.
Running line collisions between trains and with rolling stock	No step change due to NRSDS.
Running line collisions between trams	No step change due to NRSDS.
Running line collisions between tram and person	No step change due to NRSDS.
Running line collisions between tram and vehicle	From 1 July 2022 onwards, only collisions between trams and vehicles resulting in fatality or serious injury are reportable as Category A or B; prior to this all collisions between trams and vehicles were reportable as Category A or B, regardless of casualties.
Proceed authorities exceeded – heavy rail passenger	From 1 July 2022 onwards, any type of proceed authority exceedance in a yard is not reportable as Category A or B.

TABLE 7 (cont.):

OCCURRENCE TYPE	NRSDS REPORTING REQUIREMENT STEP CHANGES
Proceed authorities exceeded – light rail passenger	<ul style="list-style-type: none"> <li>From 1 July 2022 onwards, any type of proceed authority exceedance in a yard is not reportable as Category A or B.</li> <li>From 1 July 2022, only light rail proceed authority exceedances where the tram entered a worksite or level crossing, where the exceedance resulted in a near hit, where the tram proceeded whilst a restraint authority was in place, or as required by the Regulator under s121(3), are reportable as Category A or B.</li> </ul>
Proceed authorities exceeded - freight	From 1 July 2022 onwards, any type of proceed authority exceedance in a yard is not reportable as Category A or B.
Train runaways	<ul style="list-style-type: none"> <li>From 1 July 2022, runaways within a yard less than 10 metres that did not occur in proximity to people where the nature of the runaway placed them at risk of injury are not reportable as Category A or B.</li> <li>From 1 July 2022, there are changes to the definition of a “higher risk” runaway, impacting the split between these and other runaways.</li> </ul>
Level crossing collisions between train and vehicle	No step change due to NRSDS.
Level crossing collisions between train and person	No step change due to NRSDS.
Level crossing near hits between train and vehicle	No step change due to NRSDS.
Level crossing near hits between train and person	No step change due to NRSDS.
Wrong-side level crossing equipment failures and defects	No step change due to NRSDS.

## PAST AND FUTURE RELEASES

The statistics presented in this report are subject to review and amendment as more information becomes available through investigation or inquiry or as ONRSR refines its systems for data capture, validation, and reporting. This may result in variation between historical and future reports.



Level 1, 75 Hindmarsh Square  
Adelaide SA 5000  
PO Box 3461, Rundle Mall  
Adelaide SA 5000

**t** 08 8406 1500

**e** [contact@onrsr.com.au](mailto:contact@onrsr.com.au)

[onrsr.com.au](http://onrsr.com.au)

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