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RAIL SAFETY REPORT 2019-2020

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THE REGULATOR'S MESSAGE



I DON'T THINK IT IS AN OVERSTATEMENT TO SUGGEST THE WORLD HAS BECOME A MORE COMPLICATED PLACE IN THE LAST 12 MONTHS. AT THE RISK OF SOUNDING SOMEWHAT CLICHÉD, THE NEED TO LOOK AFTER OURSELVES AND EACH OTHER REALLY IS MORE IMPORTANT THAN EVER.

Never losing sight of why we are here and having genuine clarity of purpose has been integral to the Office of the National Rail Safety Regulator's (ONRSR) response to the emergence of COVID-19. We have, of course, always adhered to the prevailing medical advice and delivered on our social responsibilities, but in doing so have never wavered from our fundamental focus on effective safety regulation of Australia's railways. It is one of the many reasons I am proud to present our Rail Safety Report 2019–2020 - a tool for rail transport operators around Australia to use to further strengthen their own commitment to safety during these uncertain times.

This is the first such report we have delivered since realising status as Australia's fully national rail safety regulator in December last year, following the transition to direct delivery of regulatory services in Victoria. The much-coveted milestone brought Melbourne's iconic tram network and the remainder of its tourist and heritage operations under ONRSR's jurisdiction, allowing us to complete the exclusively national statistical picture we have been developing of Australia's rail safety landscape since our first report was released in 2013–2014.

In print for the first time, this complete picture is representative of sound safety performance across the board. But, in reality 2019–2020 saw rail safety in Australia brought into focus and justifiably questioned following high-profile accidents on different sides of the country, which tragically resulted in fatalities and serious injuries. The accidents at Wallan, Victoria in February 2020 and at Jumperkine, Western Australia in December 2019 remain the subject of detailed investigations - examinations that have and will continue to produce lessons for the industry. For now though they, along with the other occurrences detailed in the pages that follow, should serve as invaluable reminders that vigilance around safety can't be assumed and that there is no time or place for complacency.



The report also charts the progress we, as a regulator, and industry collectively have made on our national priority issues – track worker safety, level crossing safety, control assurance and contractor management. Our attention to these issues along with industry's action is an example of how the co-regulatory model can work effectively and in time deliver genuine safety outcomes.

This kind of dedication to safe working and safe systems, whatever the scope and nature of the operation, is not only helping us remain resilient in the face of adversity, but will be as important as ever in the post-pandemic world where railway operations and new rail projects will play a significant part in the social and economic recovery.

Much has and will change in the months and years ahead but our collective focus on delivering safe railways for Australia can't and won't.

Sue McCarrey
Chief Executive / National Rail Safety Regulator

INTRODUCTION



ABOUT THE OFFICE OF THE NATIONAL RAIL SAFETY REGULATOR

OUR VISION:

SAFE RAILWAYS FOR AUSTRALIA

OUR VALUES:

Integrity, Respect, Independence, Diligence and Excellence.

OBJECTIVES:

Under *Rail Safety National Law* (RSNL)¹, ONRSR's objectives are to:

- > facilitate the safe operations of rail transport in Australia;
- > exhibit independence, rigour and excellence in carrying out its regulatory functions; and
- > promote safety and safety improvement as a fundamental objective in the delivery of rail transport in Australia.

¹RSNL refers to the Rail Safety National Law (South Australia) Act 2012 and Rail Safety National Law (WA) Act 2015

ABOUT THE OFFICE OF THE NATIONAL RAIL SAFETY REGULATOR

FUNCTIONS:

As defined in ONRSR's Statement of Intent ², ONRSR's key functions are to:

- > improve rail safety for the Australian community;
- > decrease the regulatory burden on the rail industry;
- > provide seamless national safety regulation; and
- > enforce regulatory compliance.

ROLE:

ONRSR performs its functions under a co-regulatory framework in which responsibility for regulation and safety is shared between industry, governments and ONRSR. The principle of shared responsibility is underpinned by specific duties defined under the RSNL. In particular, section 52 states a rail transport operator must ensure, so far as is reasonably practicable (SFAIRP), the safety of its railway operations. This duty is consistent with the principles of safety risk management generally where those responsible for safety risks must ensure all reasonably practicable measures are in place to protect people from the harm that may arise.

REGULATORY APPROACH:

ONRSR is a risk-based regulator overseeing the application of a systematic decision-making framework, which prioritises regulatory activities and informs decision outcomes, based on an assessment of risks to rail safety. It involves:

- > developing an understanding of the risks to the safety of railway operations in Australia
- > determining which of these risks ONRSR is able to influence through its regulatory activities; and
- > designing and prioritising regulatory activities and outcomes in a way that best maintains and improves rail safety.

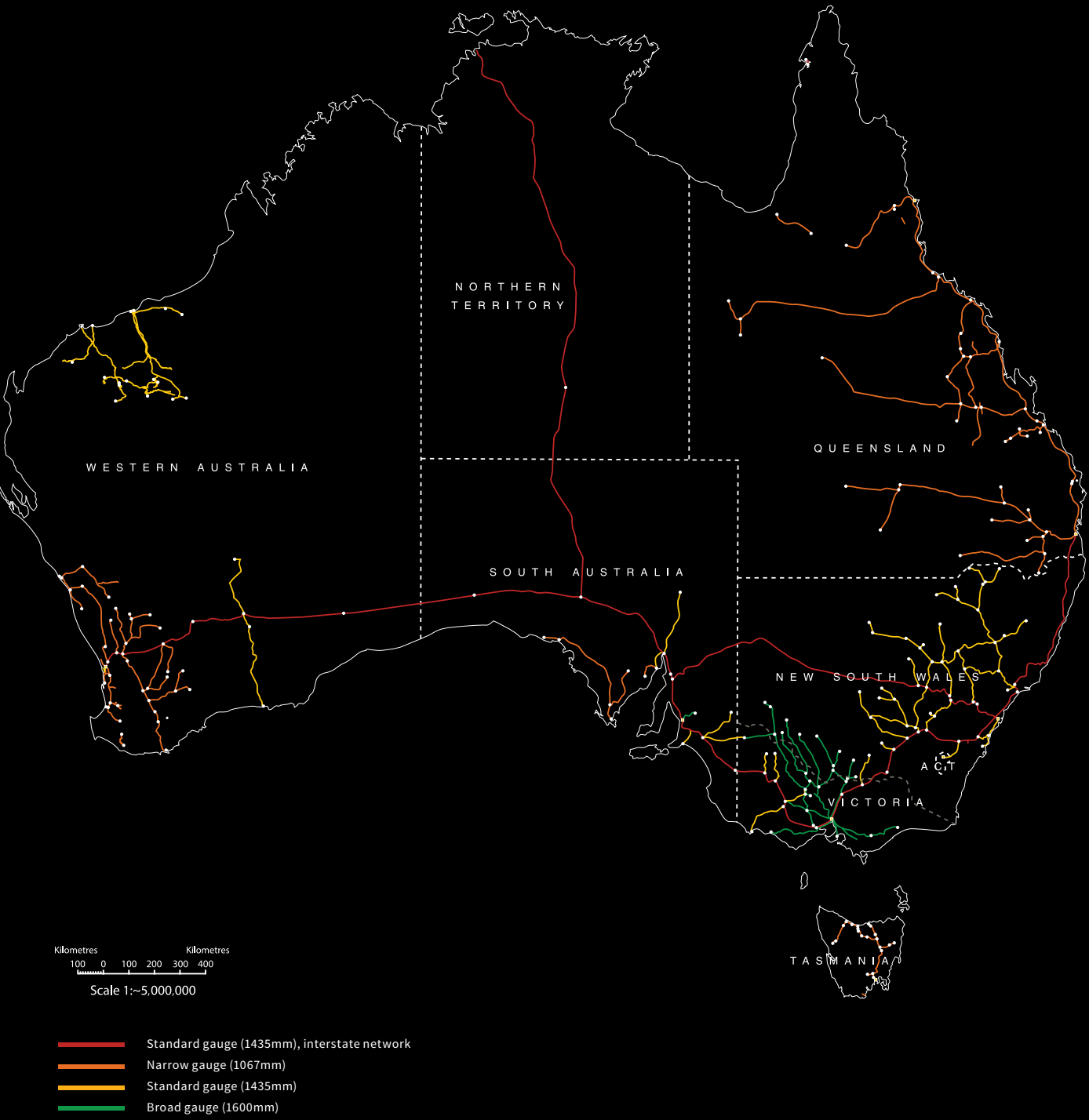
Applying a risk-based approach to regulation has parallels to the RSNL's requirement for rail transport operators to apply a risk-based approach to safety management. It also enables ONRSR to focus resources on the basis of risk and to improve the effectiveness of regulatory interactions.

The ONRSR Way³ provides further details on the key principles by which ONRSR regulates. This is supported by policies, procedures and guidelines to assist accredited parties to fulfil their obligations.

²Office of the National Rail Safety Regulator, Statement of Intent 2019 to 2022, ONRSR, Adelaide, 2019

³Office of the National Rail Safety Regulator, The ONRSR Way, Edition 2, ONRSR, Adelaide, 2020

RAIL NETWORKS OPERATING ACROSS AUSTRALIA



Sourced from the Australasian Railway Association

ABOUT THIS REPORT

ONRSR's Rail Safety Report provides a summary of rail safety performance in the 2019–2020 financial year. This performance is described in terms of safety statistics based on rail safety occurrences notified to ONRSR, and intelligence gathered through regulatory activities.

This report is designed to consider rail safety from a national perspective rather than to single out individual operators or specific incidents. It is an ongoing function of ONRSR to work with individual rail transport operators on issues that pertain specifically to them. ONRSR does, however, highlight specific examples of incidents where they demonstrate issues considered relevant to the wider industry.



HARM TO PEOPLE

RAIL-RELATED FATALITIES REACHED A 5-YEAR LOW DURING 2019-20, DRIVEN BY A CLOSE TO 25% REDUCTION IN REPORTED TRESPASSER-RELATED DEATHS



RAIL SAFETY STATISTICAL SUMMARY



OVERVIEW

A large part of ONRSR’s regulatory intelligence is gained from the thousands of rail safety occurrences reported each year. Some of these events lead to an immediate response by ONRSR while others are categorised and analysed over time to build a picture of safety performance in the rail industry. This performance provides insight into which safety areas require focus by ONRSR and which sectors and individual operators should be the subject of this focus.

Notifiable occurrences are an important input to ONRSR’s risk-based regulatory approach. The type of events, their frequency and their actual or potential consequences, assist ONRSR in understanding the rail safety risks that exist in the industry. Some events result in more significant consequences or have the potential for greater risk and these events are the focus for presentation of occurrence statistics in this report.

The statistics presented in the following sections focus primarily on the events of the 2019–2020 financial year. The report continues with several charts that have been published in previous years which show the last five years’ performance in terms of incident counts and rates. Incident rates provide a more accurate picture of national safety performance than counts alone, by accounting for variations in the scale of railway operations over time.

ONRSR has once again conducted benchmarking against international performance and highlighted selected events it has judged as the more serious of the year.

Following the transition to direct delivery of regulatory services in Victoria in December 2019, ONRSR’s Rail Safety Report now includes historical statistics for incidents on the Melbourne metropolitan tram network and several tourist and heritage operators that were previously regulated under Victorian local law. This further expands the coverage of the report, presenting a complete national picture of rail safety performance in Australia for the first time.

RAILWAY-RELATED FATALITIES

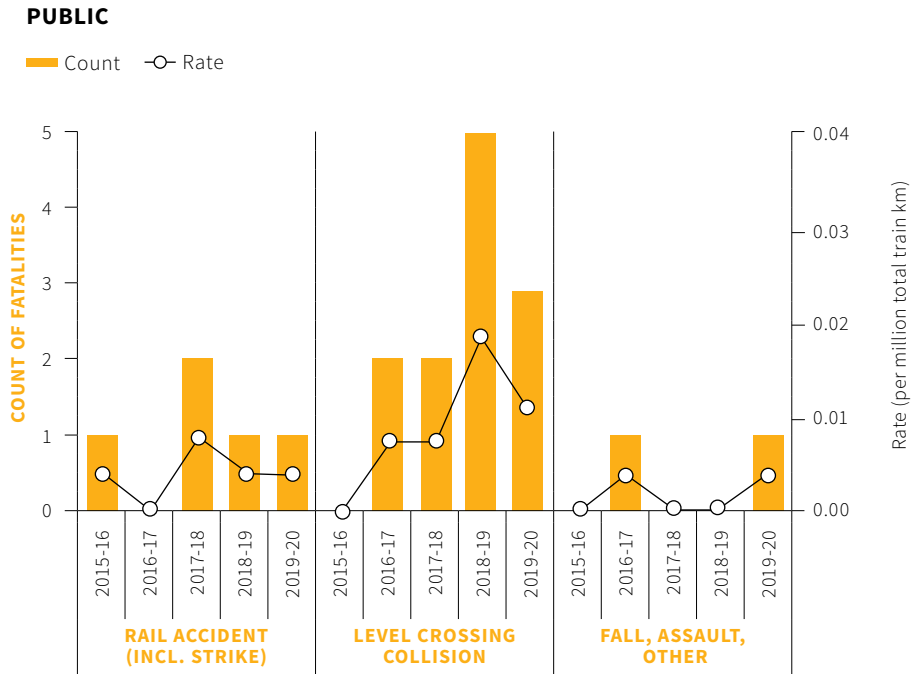
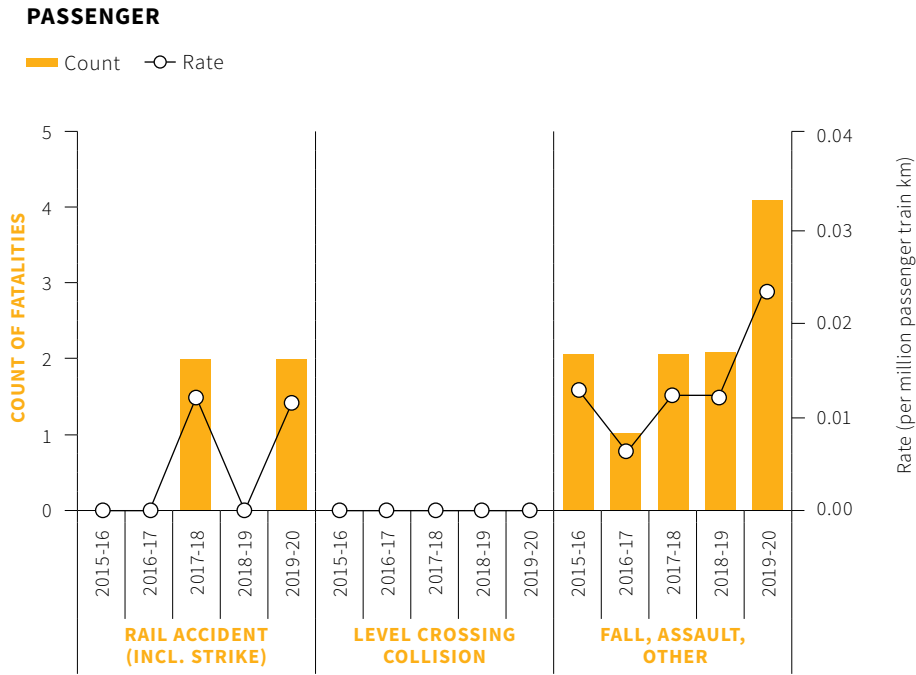
There were 84 fatalities reported in the 2019–2020 financial year on railways across Australia. These consisted of:

- > a train driver and train pilot involved in the derailment of a passenger train
- > a train driver involved in a collision between two freight trains
- > two passengers struck by trains after falling from station platforms
- > two passengers in mobility devices falling from station platforms
- > a passenger falling between a train and the station platform as a train departed
- > a passenger assaulted while on board a train
- > three members of the public involved in level crossing collisions between trains and road vehicles
- > a member of the public struck by a light rail vehicle while crossing a highway
- > a member of the public involved in a bicycle accident during which the front wheel entered a tram track
- > three fatalities involving railway trespassers struck by trains
- > 67 fatalities involving suspected suicide.

RAIL SAFETY STATISTICAL SUMMARY

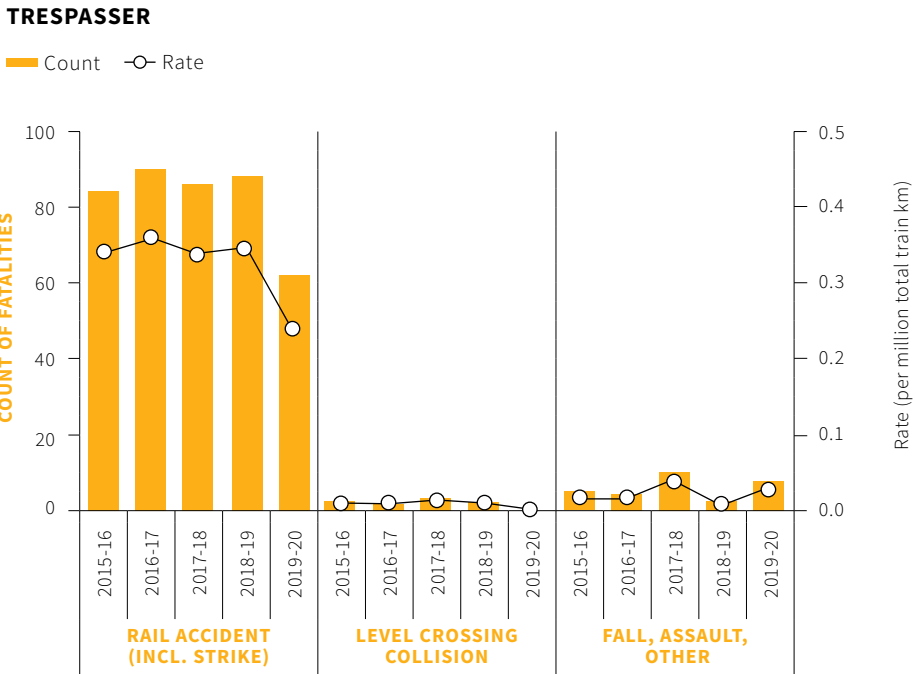
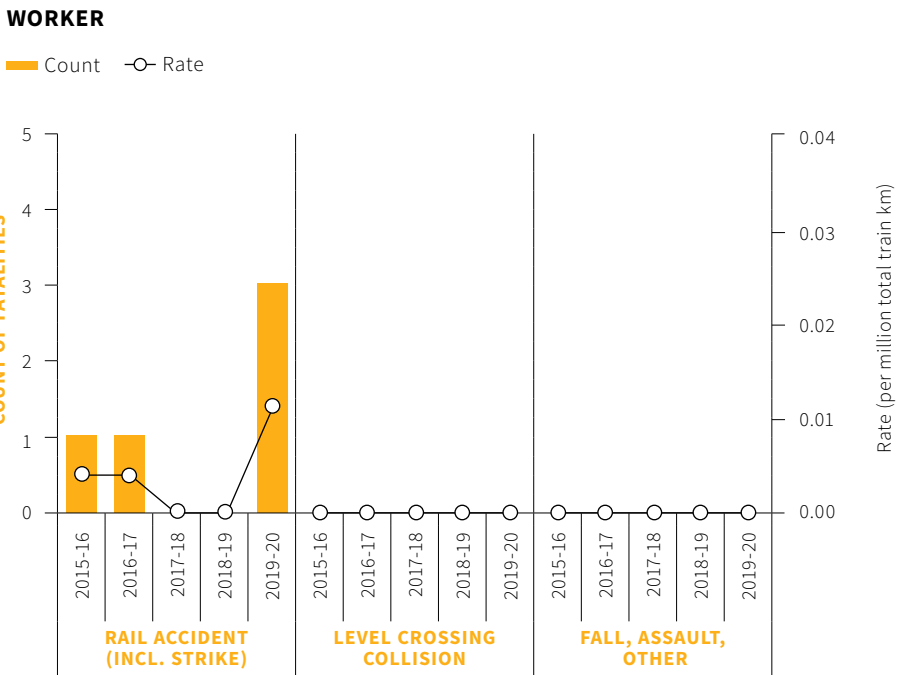
FIGURE 1:
Railway-related fatalities,
July 2015 to June 2020

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



RAIL SAFETY STATISTICAL SUMMARY

FIGURE 1 (CONT.):



RAILWAY-RELATED FATALITIES (CONT.)

A comparison of the rate of fatality between ONRSR-regulated railways and selected overseas railways is summarised in Table 1. The ONRSR-based data in this table is a subset of the fatalities summarised in Figure 2 to align with the overseas data definitions. For example, local data excludes suspected suicide as these are also excluded from overseas data.

TABLE 1: Railway fatalities – Australia, Great Britain and United States

Fatalities involving passengers, workers, public and trespass (excluding suspected suicide). The annual reporting period for Great Britain runs from April to March. Statistics for the United States exclude fatalities on isolated networks, such as metropolitan transit systems that are not connected to the wider network.

		2015-16	2016-17	2017-18	2018-19	2019-20	5 YEAR
AUSTRALIA	Fatalities	16	18	18	20	17	89
	Train Km (million)	246.8	251.4	253.6	252.9	259.0	1,264
	Rate	0.065	0.072	0.071	0.079	0.066	0.070
GREAT BRITAIN ¹	Fatalities ¹	46	36	49	43	31	205
	Train Km (million) ²	557.7	555.9	554.1	563.9	584.0	2,816
	Rate	0.082	0.065	0.088	0.076	0.053	0.073
UNITED STATES	Fatalities ³	770	761	796	882	868	4,077
	Train Km (million) ³	1,133.9	1,135.2	1132.4	1130.3	996.7	5,528
	Rate	0.679	0.670	0.703	0.780	0.871	0.737

Sources:
¹ Office of Rail and Road, Data Portal, Table 5220, Mainline fatalities only (accessed 30 September 2020). Note – historical data has been refreshed and incidents re-categorised since publication of the 2018-19 ONRSR Rail Safety Report
² Office of Rail and Road, Data Portal, Tables 1243 and 1333 (accessed 3 September 2020), Mainline freight and passenger train km
³ Federal Railroad Administration Office of Safety Analysis: online database query (accessed 14 September 2020) <http://safetydata.fra.dot.gov>

TABLE 2: Railway-related fatalities, excluding trespass or suspected suicide, July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
10/07/2019	A cyclist travelling on a road lost control after the front wheel made contact with the tram tracks. The cyclist sustained fatal injuries.	Newcastle East, NSW
31/08/2019	A passenger alighted from a train then attempted to reboard the train as it departed. The passenger fell between the station platform and train and sustained fatal injuries.	Hurlstone Park, NSW
3/09/2019	A pedestrian was crossing Burwood Highway and was struck by a light rail vehicle. The pedestrian was fatally injured.	Burwood, Vic.
4/10/2019	A person fell from a station platform onto tracks and was struck by an approaching train while attempting to climb back onto the platform. The person sustained fatal injuries.	Fairy Meadow, NSW
7/10/2019	A person in a mobility device fell off a station platform onto the track sustaining fatal injuries.	Osborne Station, SA
10/10/2019	A person fell from a station platform onto tracks. A member of public tried to assist the person and signalled the driver of an approaching freight train. The train driver applied the brakes but was unable to stop and prevent a collision. The person sustained fatal injuries.	Rockdale, NSW
6/12/2019	A passenger on board a train was allegedly assaulted by another passenger and was taken to hospital. The passenger later passed away.	Wyong, NSW
24/12/2019	A freight train passed a signal at danger and collided with the rear of a stationary grain train. The driver of the freight train sustained fatal injuries. Further information is provided on page 20.	Jumperkine, WA
11/01/2020	After a train service departed the station platform, a person in a mobility device fell from the station platform onto the tracks and was injured. The person later passed away.	Greenwood Station, WA
20/02/2020	A passenger train travelling from Sydney to Melbourne derailed while traversing a set of points. Two workers in the driver's cabin sustained fatal injuries. Several passengers were transported to hospital for treatment to injuries. Further information is provided on page 20.	Wallan, Vic.
27/02/2020	A freight train collided with a road vehicle at a level crossing with passive traffic control equipment. The driver and a passenger in the road vehicle were fatally injured.	Mallala, SA
19/04/2020	A freight train collided with a truck at a level crossing with passive traffic control equipment. The driver and sole occupant of the truck sustained fatal injuries.	Culburra, SA

RAIL SAFETY
WORKER
FATALITIES
2019-2020

The deaths of three rail safety workers in the past year, the first at Jumperkine, Western Australia in December 2019 and two more at Wallan, Victoria in February 2020, were felt across the Australian rail industry and indeed the broader community. They are tragic reminders of why the national regulator will continue to demand absolute vigilance from rail transport operators in the management of safety risks.

In both cases ONRSR immediately deployed rail safety officers to the scenes, commencing investigations that focused on the safety procedures and systems the operators and rail infrastructure managers had in place. These investigations will ultimately inform a decision on whether breaches of *Rail Safety National Law* contributed to the incidents. At Wallan, where a passenger train carrying more than 150 people derailed, specialist track, rolling stock and signalling engineers were also deployed, while National Rail Safety Regulator, Sue McCarrey attended the site. Immediate action was taken via the issuing of a Prohibition Notice to the Australian Rail Track Corporation which was not lifted until safe working arrangements at Wallan were revised.

While the Australian Transport Safety Bureau has released preliminary reports into both incidents, ONRSR’s ongoing investigations are necessarily complex, limiting the amount of information that can be made public at this time.

For now, ONRSR extends its sympathies to the families and friends of the two rail safety workers who lost their lives at Wallan, the 12 people that were injured and the dozens of passengers, responders and members of the public impacted by what was a very public and distressing incident. Our thoughts are also with the family of the freight train driver who died at Jumperkine, his friends and colleagues.

It is now vitally important, not only for those involved but for all rail safety workers, the wider industry and the travelling public, that ONRSR ensure the Wallan and Jumperkine incidents are investigated thoroughly and pursued comprehensively to generate the best possible rail safety outcome for all concerned.



RAILWAY-RELATED
SERIOUS INJURIES



There were 152 serious injuries reported in the 2019–2020 financial year on railways across Australia, the majority of which were as a result of passenger slips, trips and falls.

Figure 2 presents the number of railway-related serious injuries by person type over the past four years. The rise in passenger serious injuries attributed to rail accidents in 2019–2020 is as a result of the passenger train derailment at Wallan, which involved eight reported serious injuries to passengers as well as the two worker fatalities.

FIGURE 2:
Railway-related serious injuries, July 2016 to June 2020

Non-passenger serious injuries at level crossings are classified as Public if neither trespass nor attempted suicide is suspected. Level crossing collision excludes attempted suicide at level crossings, which are classified as Trespasser. Historically comparable serious injury data is only available from 1 July 2016 due to a change in the way serious injuries were classified in June 2016.

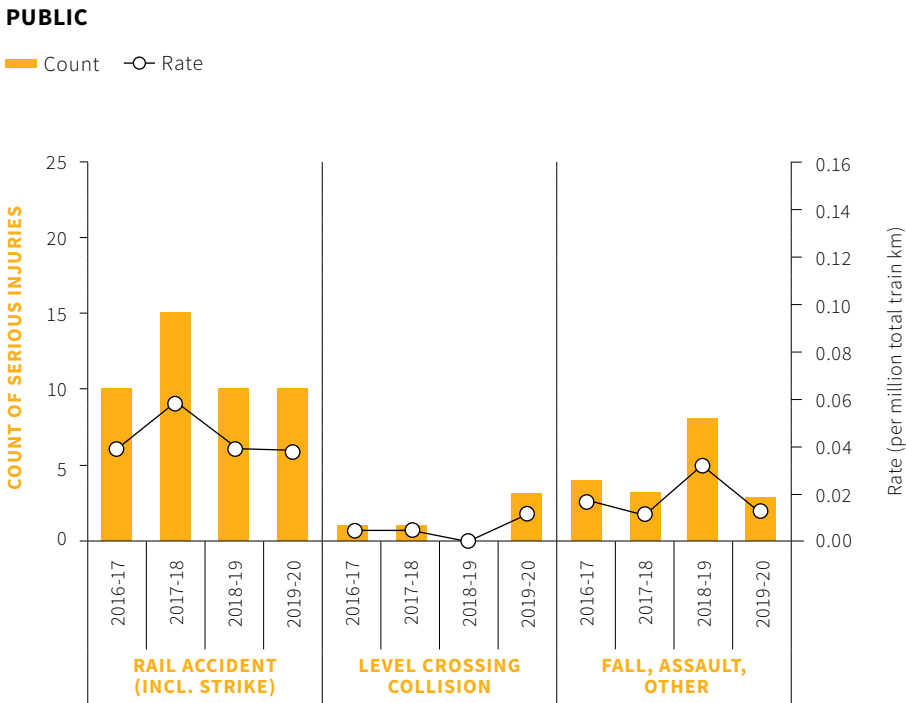
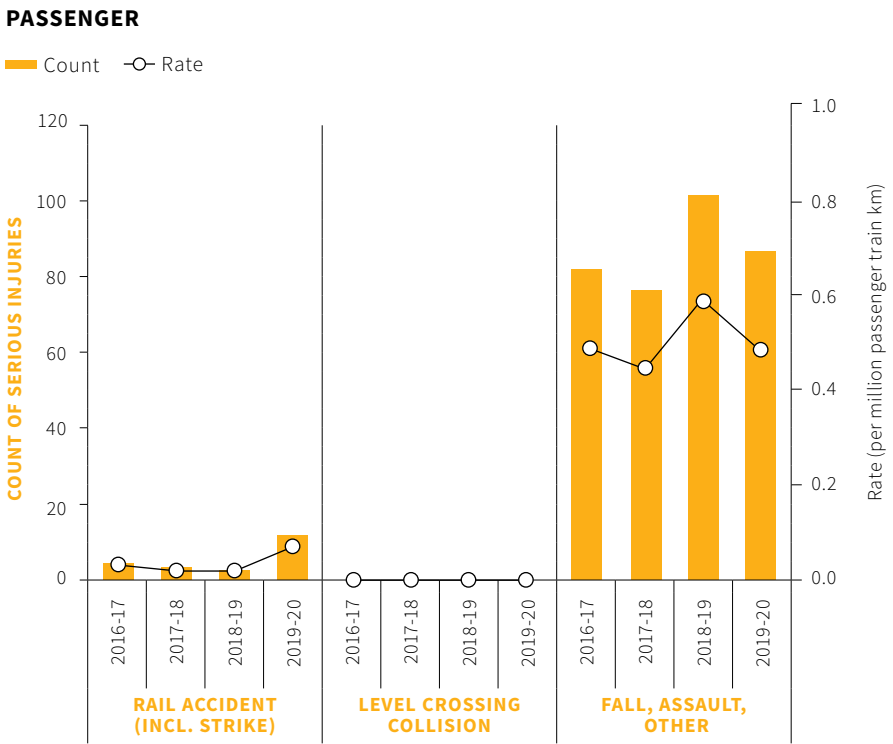


FIGURE 2 (CONT.):

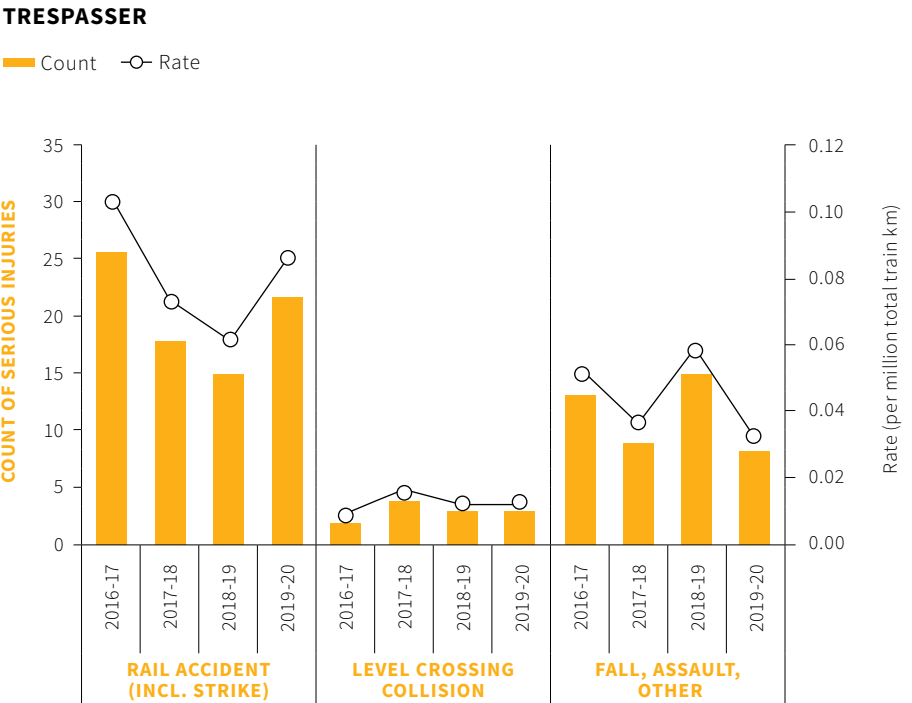
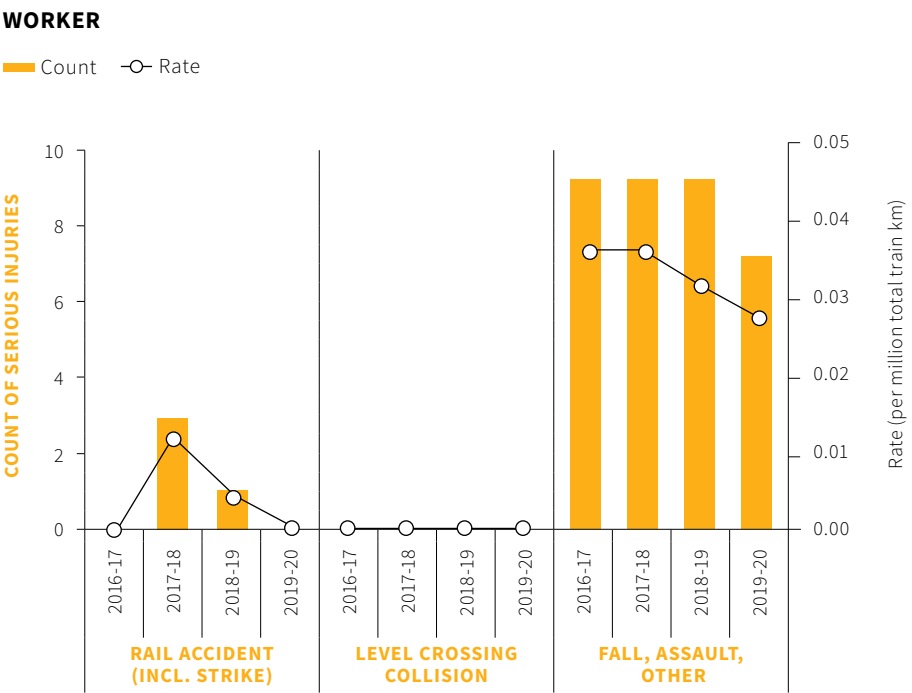


TABLE 3:
Selected railway-related
serious injuries,
July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
14/07/2019	A young child fell from a passenger carriage of a stationary tourist and heritage train after leaning against a door. The child fell onto the station platform and then between the platform edge and on to the track. The child was taken to hospital for treatment.	Lakeside Station, Vic.
21/07/2019	A person was found unconscious on tracks after falling from the station platform. The person was taken to hospital for treatment.	Bundaberg, Qld.
26/07/2019	A person wearing headphones walked into the path of an approaching tram and was struck and seriously injured.	Hawthorn, Vic.
8/08/2019	A person fell from a station platform onto the tracks and was struck by an approaching train while trying to climb back onto the platform. The person was taken to hospital for treatment.	Beecroft, NSW
10/08/2019	A rail worker sustained facial injuries while attempting to place a clamp on track. The Royal Flying Doctor Service transported the worker to hospital for treatment.	Nullarbor, SA
12/08/2019	A light rail vehicle struck a person attempting to cross at a pedestrian crossing. The person sustained serious injuries and was transported to hospital.	Braddon, ACT
24/10/2019	A train struck a person using a pedestrian crossing at a station. The person sustained serious injuries and was transported to hospital.	Woodlands Park Station, SA
9/11/2019	A worker using handheld machinery caught a finger in the device resulting in a serious hand injury.	Newman, WA
7/12/2019	A worker sustained a serious injury after their hand was caught in the tail gate of a truck in the rail corridor.	Ashfield, NSW
17/12/2019	A person fell off a station platform onto tracks into the path of an oncoming train. The driver was unable to stop the train to avoid a collision. The person sustained serious injuries.	Town Hall Station, NSW

TABLE 3 (CONT.):

DATE	DESCRIPTION	LOCATION
26/12/2019	A pedestrian wearing headphones was struck by a tram as it departed a stop. The pedestrian sustained serious injuries.	St Kilda, Vic.
30/01/2020	A person on a mobility device collided with infrastructure on a station platform and then fell off the platform edge onto tracks. Passengers and staff provided assistance and the person was taken to hospital.	Dandenong Station, Vic.
18/02/2020	A truck collided with a freight train at a level crossing with passive traffic control equipment. The train then derailed and a fire broke out. The driver of the truck was taken to hospital for treatment. The truck was destroyed and the track infrastructure was damaged.	Bribbaree, NSW
20/02/2020	A passenger train travelling from Sydney to Melbourne derailed while traversing a set of points. Two workers in the driver's cabin sustained fatal injuries. Several passengers were transported to hospital for treatment.	Wallan, Vic.
2/04/2020	A passenger coach collided with a train at a level crossing with active traffic control equipment. A passenger on the coach was transported to hospital for treatment to injuries. There was extensive damage to the coach, the train locomotive and level crossing infrastructure.	Corio, Vic.
19/04/2020	A technician working on a train in a yard fell and sustained a serious leg injury. The worker was taken to hospital for treatment.	Mayne, Qld.

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.

There were seven running line passenger train derailments reported in the 2019–2020 financial year on railways across Australia, five of which involved tourist and heritage trains travelling at low speed. Of the two commercial heavy rail passenger train derailments, one was in-service at the time – the derailment at Wallan discussed on page 20.

FIGURE 3:
Passenger train
running line derailments,
July 2015 to June 2020

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

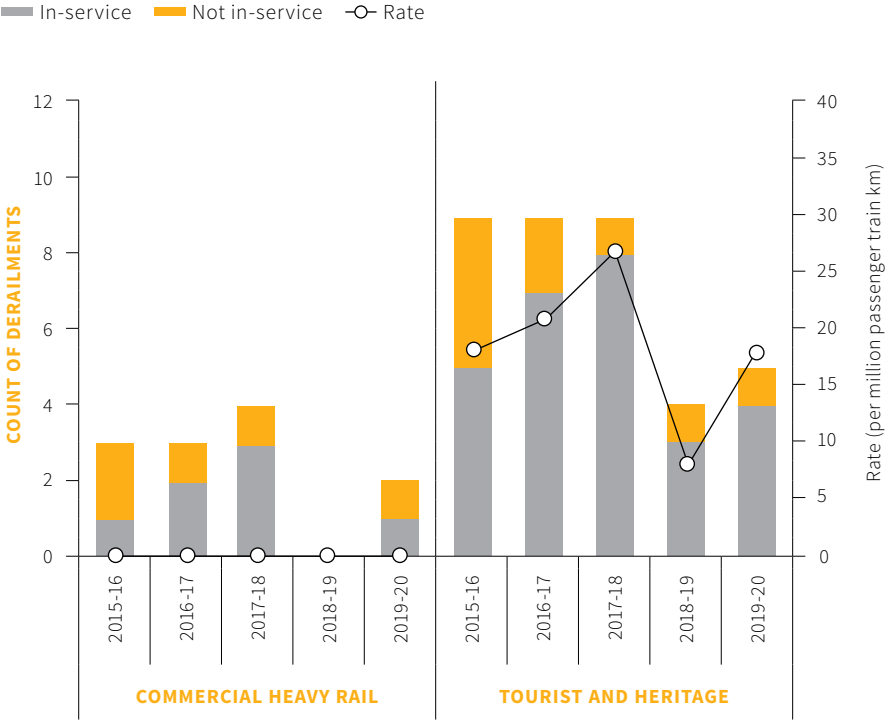


TABLE 4:
Passenger train running
line derailments,
July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
7/09/2019	The locomotive of a tourist and heritage passenger train derailed on a curve. There were no reports of injuries or significant damage.	Don River, Tas.
15/09/2019	A passenger train travelling out of service passed a signal at danger and derailed after traversing a set of catch points.	Redfern, NSW
3/10/2019	The wheels of a passenger carriage of a tourist and heritage train derailed at low speed. There were no reports of injuries or significant damage.	Milang, SA
4/01/2020	A passenger carriage of a tourist and heritage train derailed after travelling over a wooden chock. There were no reports of injuries or damage.	Cobdogla, SA
13/02/2020	The locomotive of a tourist and heritage passenger train derailed on a curve. There were no reports of injuries or significant damage.	Camp Spur, Tas.
20/02/2020	A passenger train travelling from Sydney to Melbourne derailed while traversing a set of points. Two workers in the driver's cabin sustained fatal injuries. Several passengers were transported to hospital.	Wallan, Vic.
11/06/2020	An out of service tourist and heritage tram was reversed into position and when it failed to clear points two wheels derailed. There were no reports of injuries or damage.	Portland, Vic.

A comparison of the rate of mainline passenger train derailments between ONRSR regulated railways and the mainline railways of Great Britain and the United States is summarised in Table 5. The ONRSR data in this table are a subset of the derailments summarised in Figure 3 to more closely align with overseas data definitions. They include derailments involving all in-service heavy rail passenger trains, with the exception of those involving tourist and heritage passenger trains on isolated lines.

RAIL SAFETY STATISTICAL SUMMARY

TABLE 5:
Passenger train running
line derailments - Australia,
Great Britain and United States

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

		2015-16	2016-17	2017-18	2018-19	2019-20	5 YEAR
AUSTRALIA	Derailments	1	2	3	0	2	8
	Train Km (millions)	126.5	127.0	131.9	135.0	138.7	660.1
	Rate	0.008	0.016	0.023	0.000	0.014	0.012
GREAT BRITAIN	Derailments ¹	3	2	2	1	0	8
	Train Km (millions) ²	522.8	521.9	521.2	530.3	550.8	2,647
	Rate	0.006	0.004	0.004	0.002	0.000	0.003
UNITED STATES	Derailments ³	6	3	7	2	5	23
	Train Km (millions) ³	174.9	179.9	182.7	183.7	165.2	886.4
	Rate	0.034	0.017	0.038	0.011	0.030	0.026

Sources:
¹Office of Rail and Road, Data Portal, Table 5260, Mainline derailments
²Office of Rail and Road, Data Portal, Tables 1243 (accessed 3 September 2020), Mainline passenger train km
³Federal Railroad Administration Office of Safety Analysis: online database query (accessed 18 September 2020) <http://safetydata.fra.dot.gov>

RAIL SAFETY STATISTICAL SUMMARY

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.

There were 11 running line derailments involving passenger trams in the 2019–2020 financial year in Australia with the most common cause being collisions with road vehicles. No fatalities or serious injuries were reported as a result of these derailments. It is suspected that the downward trend in the number of tram derailments reported over the past five years is predominantly due to investments in the Melbourne metropolitan tram network, which is the largest tram network in the world. These include the phased introduction of more modern trams since 2013–2014, now estimated to comprise over 50% of the fleet, track upgrades over the past two years and enhanced training for drivers on human factors.

FIGURE 4:
Tram running line
derailments (commercial),
July 2015 to June 2020

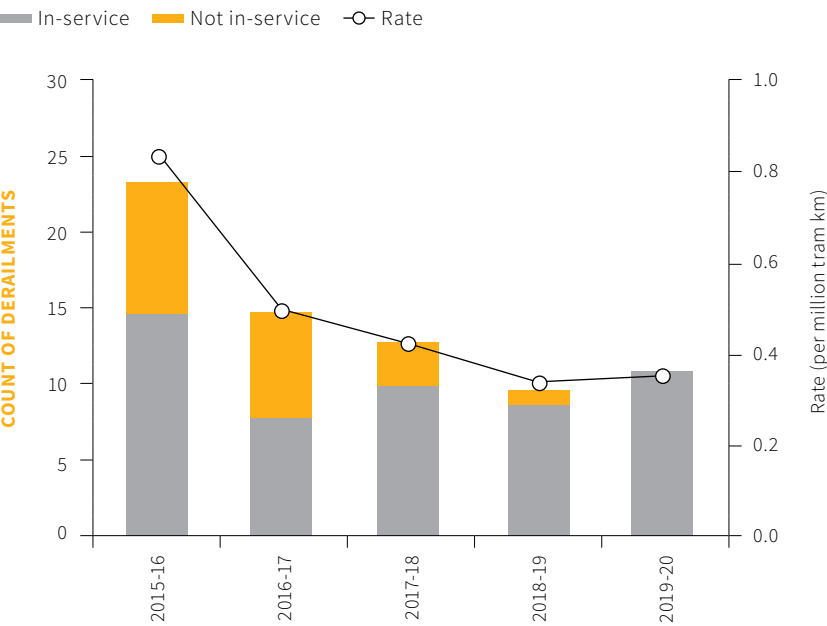


TABLE 6:
Tram running
line derailments
(commercial),
July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
14/09/2019	A road vehicle turned against a red traffic light and collided with a tram resulting in a derailment. The two occupants of the road vehicle sustained injuries and were transported to hospital for treatment. No tram passengers were injured.	Docklands, Vic.
17/09/2019	The front bogie of a tram derailed as it passed through a junction. There were no passengers on board at the time.	St Kilda, Vic.
4/10/2019	The rear bogie of a tram derailed as it passed through a set of points. There were no injuries reported.	Southbank, Vic.
6/10/2019	A road vehicle reversing out of a driveway collided with a tram causing it to derail and strike fencing. The driver of the road vehicle was taken to hospital. Some tram passengers were treated for minor injuries. There was extensive damage to the road vehicle and tram.	Kew, Vic.
16/01/2020	A tram derailed while traversing a set of points. There were no reports of injuries.	Bundoora, Vic.
26/01/2020	A road vehicle collided with a light rail vehicle at a road intersection causing the light rail vehicle to derail. There were no reports of injuries.	Surry Hills, NSW
1/02/2020	A burst water main resulted in debris on tram tracks that contributed to the derailment of a tram. There were no reports of injuries.	Middle Park, Vic.
2/02/2020	A road vehicle collided with a tram resulting in the tram derailing. There were no injuries reported.	Kew, Vic.
11/02/2020	The rear bogie on a tram derailed while in service. There were no reports of injuries.	Parkville, Vic.
11/03/2020	A tram derailed on the running line. There were no reports of injuries to passengers. There was some damage to the tram.	Windsor, Vic.
3/05/2020	After departure from a terminus, the front of a tram travelled on the incorrect track resulting in a running line derailment. There were no reports of any injuries.	Docklands, Vic.

FREIGHT
TRAIN
DERAILMENTS

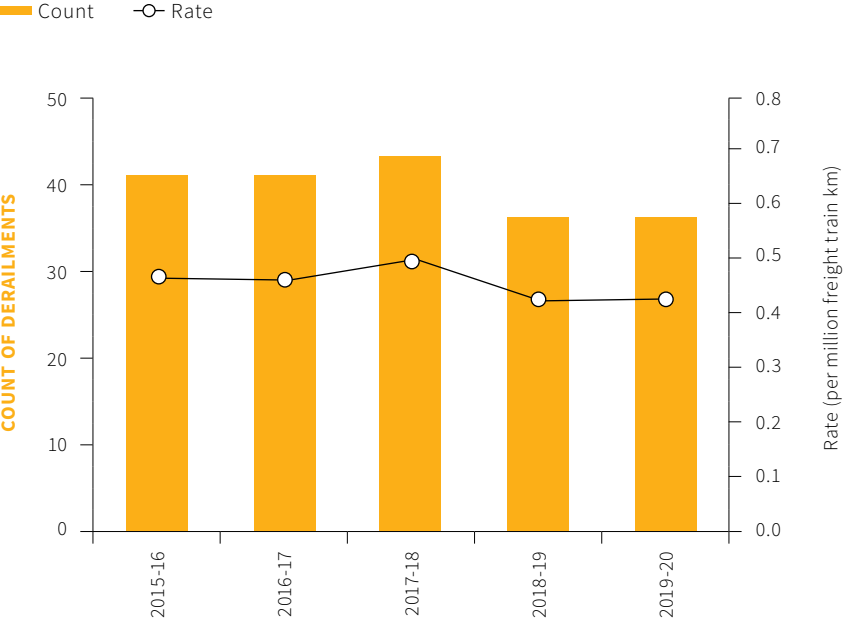


Freight train derailment risk is generally observed to have a higher frequency of occurrence but a lower consequence of event when compared to passenger train derailment. However, derailments of freight trains still expose train crews, recovery teams and, depending on the location of the derailment,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

There were 36 running line derailments involving freight trains in the 2019–2020 financial year, which is the same number as that reported in the previous financial year. No injuries or fatalities were reported as a result of these derailments.

FIGURE 5:
Freight train running
line derailments,
July 2015 to June 2020

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.



RAIL SAFETY STATISTICAL SUMMARY

TABLE 7:
Selected freight train
running line derailments,
July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
7/07/2019	Three wagons on a freight train derailed at a crossing loop. There was damage to a section of track which was replaced.	Tunbridge Crossing Loop, Tas.
2/09/2019	Six wagons of a freight train derailed on the running line.	Miling - Bindi Bindi, WA
17/09/2019	Three wagons on a coal train derailed due to a track buckle.	Tycanba, Qld.
20/12/2019	A locomotive of a freight train derailed while traversing a set of points.	Midland – Kalgoorlie, WA
23/12/2019	Five wagons on the rear of a loaded freight train derailed on the running line.	Mingela, Qld.
14/01/2020	A screwed journal caused wagons on a freight train to derail. Sparks from the train led to a fire which was contained. There was some damage to approximately 2.5km of track.	Euabalong West, NSW
29/01/2020	Several wagons of a freight train derailed. A passenger train travelling from Albury to Melbourne on an adjacent track collided with a freight container that was fouling the track after the derailment. A fire broke out at the rear of the derailed train. Emergency services attended and several passengers were assessed and treated on site. There was extensive damage to rolling stock.	Barnawartha, Vic.
2/03/2020	Nine wagons on a ballast train derailed near a bridge resulting in significant damage to the rolling stock and bridge.	Greenmount, Qld.
3/03/2020	12 wagons of a grain train derailed on the running line causing damage to track infrastructure.	Millendon, WA
22/03/2020	Three wagons on the rear of a freight train derailed on the running line and travelled approximately 4.5 km causing damage to rolling stock and track infrastructure.	Leonino Road, NT
4/04/2020	A washaway of approximately 50 metres of track caused a derailment of the locomotive and two wagons of a freight train.	Geurie, NSW
28/06/2020	Two wagons of a freight train derailed at a set of points on approach to a yard and fouled adjacent tracks.	Junee, NSW

RAIL SAFETY STATISTICAL SUMMARY

TABLE 8:
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.

		2015-16	2016-17	2017-18	2018-19	2019-20	5 YEAR
AUSTRALIA	Derailments	41	41	43	36	36	197
	Train Km (millions)	88.29	89.62	87.99	85.12	85.54	463.6
	Rate	0.464	0.457	0.489	0.423	0.421	0.451
GREAT BRITAIN	Derailments ¹	6	3	3	9	9	30
	Train Km (millions) ²	34.88	33.98	32.88	33.62	33.15	168.5
	Rate	0.172	0.088	0.091	0.268	0.271	0.178
UNITED STATES	Derailments ³	249	281	279	303	270	1,382
	Train Km (millions) ³	811.7	813.5	808.6	807.5	705.9	3,947.2
	Rate	0.307	0.345	0.345	0.375	0.383	0.350

Sources:
¹Rail Safety and Standards Board, Annual Safety Performance Report 2019/20, RSSB, UK, 2020, Mainline derailments
²Office of Rail and Road, Data Portal, Table 1333 (accessed 3 September 2020), Mainline freight train km
³Federal Railroad Administration Office of Safety Analysis: online database query (accessed 18 September 2020) <http://safetydata.fra.dot.gov>

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 (for example, signal-based, train order working), 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.

There were four running line collisions between trains and with rolling stock in the 2019–2020 financial year, one of which was the fatal incident at Jumperkine discussed on page 20.

FIGURE 6:
Running line collisions
between trains and
with rolling stock,
July 2015 to June 2020

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

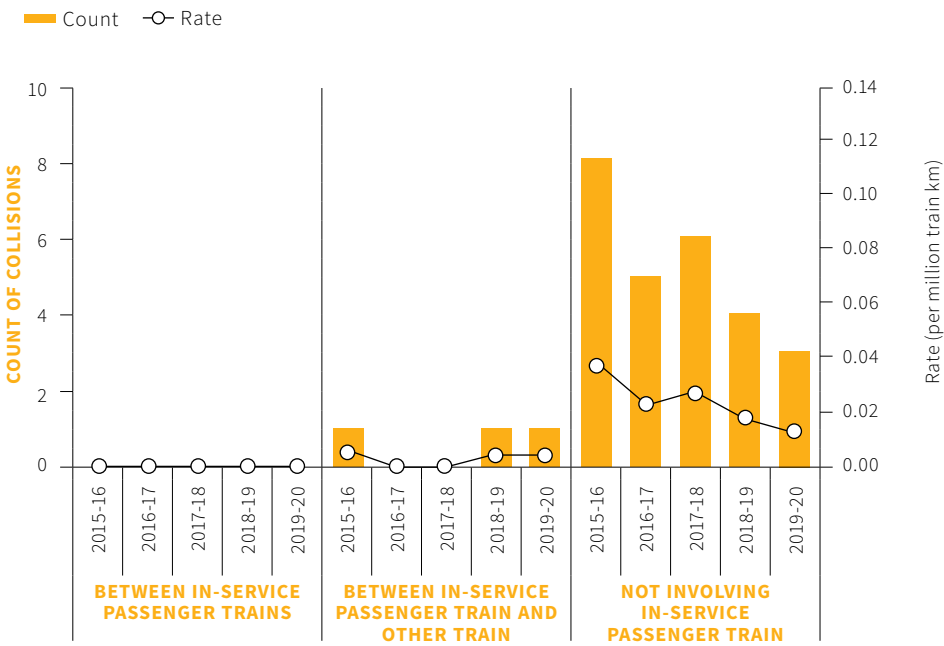


TABLE 9:
Running line collisions
between trains and
with rolling stock,
July 2019 to June 2020

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

DATE	DESCRIPTION	LOCATION
24/12/2019	A freight train passed a signal at danger and collided with the rear of a stationary grain train. The driver of the freight train sustained fatal injuries.	Jumperkine, WA
29/01/2020	Several wagons of a freight train derailed. A passenger train travelling from Albury to Melbourne on an adjacent track collided with a freight container that was fouling the track after the derailment. A fire broke out at the rear of the derailed train. Emergency services attended and several passengers were assessed and treated on site. There was extensive damage to rolling stock.	Barnawartha, Vic.
9/02/2020	As a convoy of track machines was about to commence travelling, one vehicle collided with the rear of another at low speed. There were no reports of injuries.	Kyneton Station, Vic.
5/05/2020	At a station platform a train rolled back a short distance and collided with a stationary train behind it. There were no passengers on board either train.	Newcastle Interchange, NSW

TABLE 10:
Selected other running line collisions, July 2019 to June 2020

Includes selected collisions between trains and infrastructure, road vehicles or persons not at level crossing.

DATE	DESCRIPTION	LOCATION
17/10/2019	A freight train collided with a utility vehicle that was stuck on track in the rail corridor. The occupants of the vehicle exited and attempted to signal the driver of the oncoming train. The train driver applied emergency braking however was unable to avoid a collision. There were no reports of injuries.	Dooen, Vic.
19/10/2019	A freight train collided with a road vehicle that was stuck in ballast in the danger zone while mustering cattle. The road vehicle was unoccupied at the time of the collision.	Stirrat – Moura, Qld.
30/05/2020	A passenger train failed to stop at a station, passed a signal at danger and collided with heritage level crossing gates which were closed against rail traffic. The driver of the train and 2 passengers were taken to hospital for treatment of minor injuries.	Ballarat, Vic.
7/06/2020	The driver of a road vehicle lost control crashed through fencing and came to a stop on train tracks. The occupants of the road vehicle were able to evacuate before an approaching train collided with the vehicle. There were no reports of injuries.	Welshpool, WA
16/06/2020	An out of gauge wagon on a freight train collided with station platforms at three locations. Workers nearby notified train control and the train was diverted to a crossing loop.	North Coast Line, NSW
30/06/2020	A contractor was attempting to leave the rail corridor in a road vehicle and reversed into the danger zone while performing a three-point turn. An oncoming train collided with the vehicle. There were no reports of injuries.	Dutton Park, Qld.

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 with 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.

Excluding out of gauge mirror strikes, there were five running line collisions between trams reported in the 2019–2020 financial year, representing the lowest number of annual collisions across the five-year period covered by this report. No fatalities or serious injuries were reported as a result of these collisions. It is suspected that the downward trend in the number of tram collisions observed in Figure 7 is linked to investments in the Melbourne metropolitan tram network, predominantly the phased introduction of more modern trams since 2013–2014.

There were 979 collisions reported between a tram and a road vehicle and 47 between a tram and person in the 2019–2020 financial year. This represents a 14% and 13% reduction in collisions respectively compared to the previous year, likely related to reduced pedestrian and road vehicle traffic as a result of COVID-19 movement restrictions, particularly in Melbourne. There was one fatality and eleven serious injuries reported as a result of these collisions.

FIGURE 7:
Running line collisions between trams (commercial), July 2015 to June 2020

Excludes trams striking or being struck by out of gauge equipment on trams on adjacent lines.

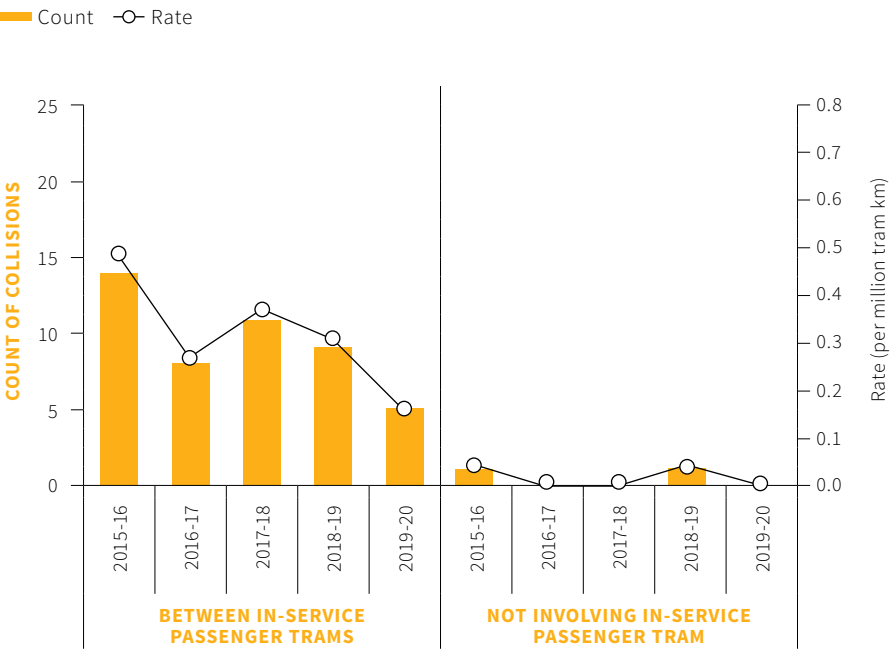


TABLE 11:
Running line collisions
between trams
(commercial),
July 2019 to June 2020

Excludes trams striking or
being struck by out of gauge
equipment on trams on
adjacent lines.

DATE	DESCRIPTION	LOCATION
2/08/2019	Due to incorrect setting of points, a tram took the wrong route when departing a stop and collided with an oncoming tram. There were no reports of injuries.	Thornbury, Vic.
6/08/2019	A tram making a turn failed to brake and collided with the rear of a stationary tram at a stop. Two persons were treated for minor injuries. There was significant damage to both trams.	Carlton, Vic.
20/02/2020	A tram collided with another tram at low speed. There were no injuries. Both trams sustained minor damage.	Brunswick St, Vic.
23/05/2020	A tram collided with another tram at low speed. There were no injuries or damage.	Flinders St, Vic.
1/02/2020	A tram collided with a stationary tram at low speed. There were no injuries or damage.	Swanston St, Vic.

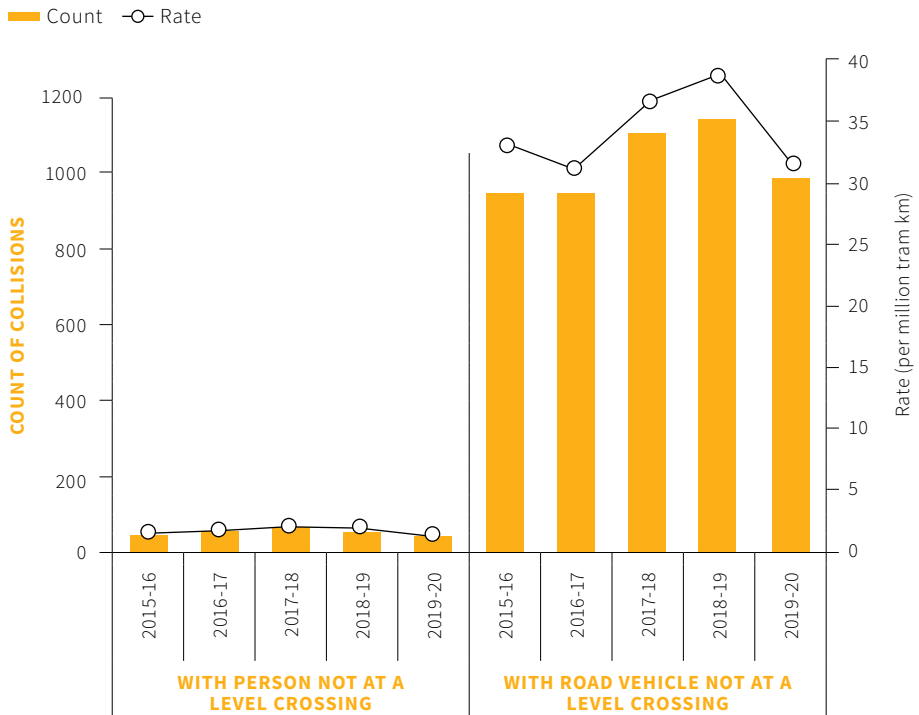
TABLE 12:
Other selected running line
collisions involving a tram
(commercial),
July 2019 to June 2020

Includes selected collisions
between tram and infrastructure,
person or road vehicle.

DATE	DESCRIPTION	LOCATION
9/01/2020	On approach to a set of points, a tram operator expected the tram to travel straight, however the tram turned right and collided with a road vehicle travelling in the same direction. There were no reports of injuries.	Kew, Vic.
6/03/2020	A person walked from a platform onto a pedestrian crossing and into the path of a tram resulting in a collision. The person was reportedly wearing headphones. The person was transported to hospital for treatment of a suspected minor injury.	Carlton, Vic.
11/03/2020	A wire on overhead electrical equipment failed behind a tram and fell to the road colliding with two road vehicles. There were no reports of injuries.	Thornbury, Vic.

FIGURE 8:
Running line collisions
between tram
(commercial) and road
vehicle or person,
July 2015 to June 2020

Excludes collisions at
level crossings.

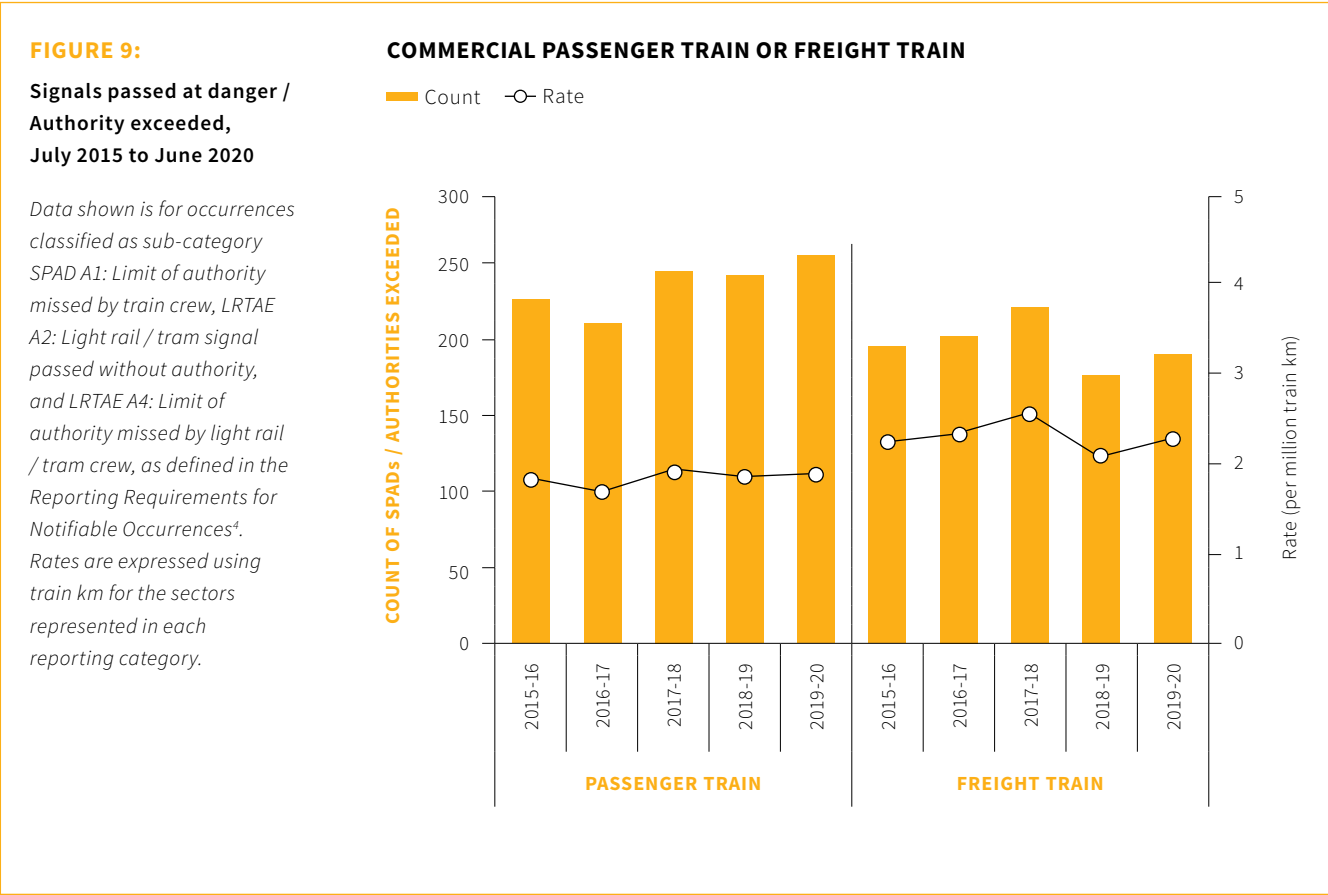


SIGNALS PASSED AT DANGER AND AUTHORITIES EXCEEDED



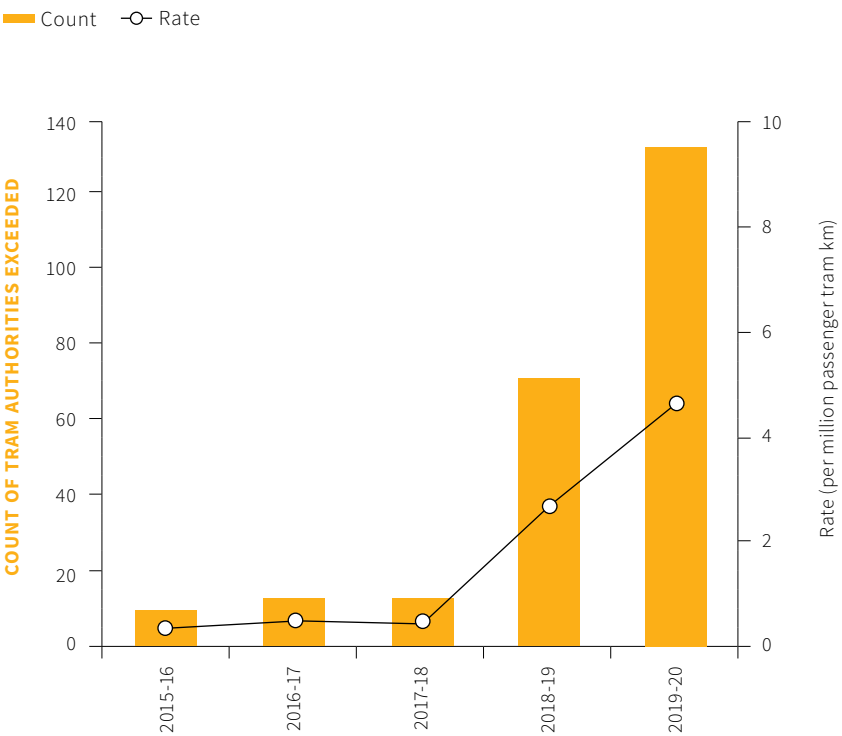
Instances of trains exceeding the limit of their authorised movement are considered important precursors to collisions and derailments. On heavy rail signalled systems these occurrences are notified as a Signal Passed At Danger without authority (SPAD). On light rail networks, they are notified as a Light Rail or Tram Authority Exceeded event (LRTAE).

The increase in light rail authority exceedances since 2018–2019 depicted in Figure 9 is largely explained by the testing and commissioning of new light rail networks, the expansion of existing networks, and the introduction of new reporting requirements, which came into effect on 1 July 2018. The trend continued in 2019–2020 as more of Australia’s light rail networks expanded.

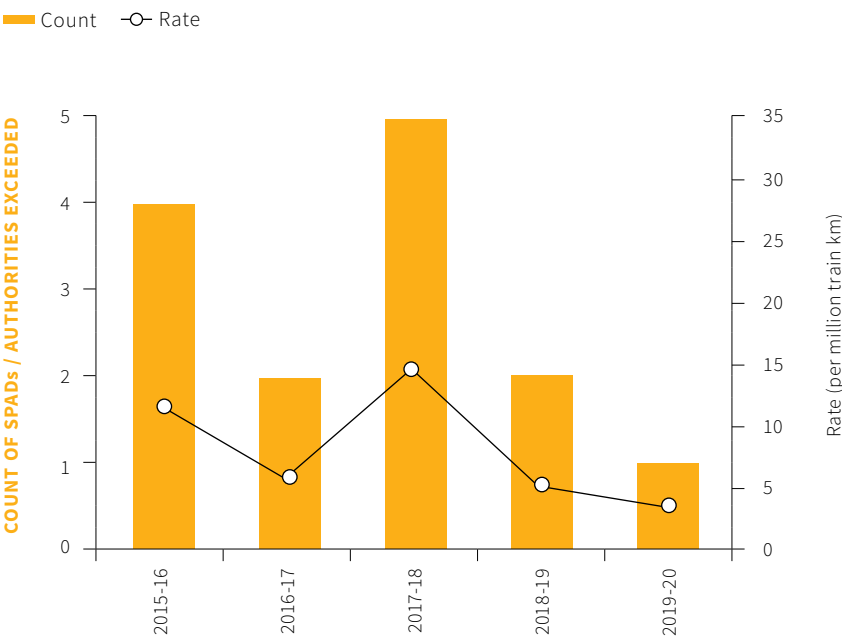


*Office of the National Rail Safety Regulator, Reporting Requirements for Notifiable Occurrences, Version 3, ONRSR, Adelaide, 2020.

FIGURE 9 (CONT.): COMMERCIAL PASSENGER - LIGHT RAIL



TOURIST & HERITAGE PASSENGER TRAIN



TRAIN FIRES



There were 88 fires on freight or passenger trains and trams reported in 2019–2020, 50% of which occurred on heavy rail passenger trains, approximately 44% on freight trains and approximately 6% on trams. Passenger train fires were primarily due to a mix of rolling stock faults and arson whereas freight train fires were predominantly associated with locomotive faults. There were no fatalities or serious injuries reported as a result of these fires.

FIGURE 10:
Fires on trains,
July 2015 to June 2020

Rates are expressed using train km
for the sectors represented in each
reporting category.

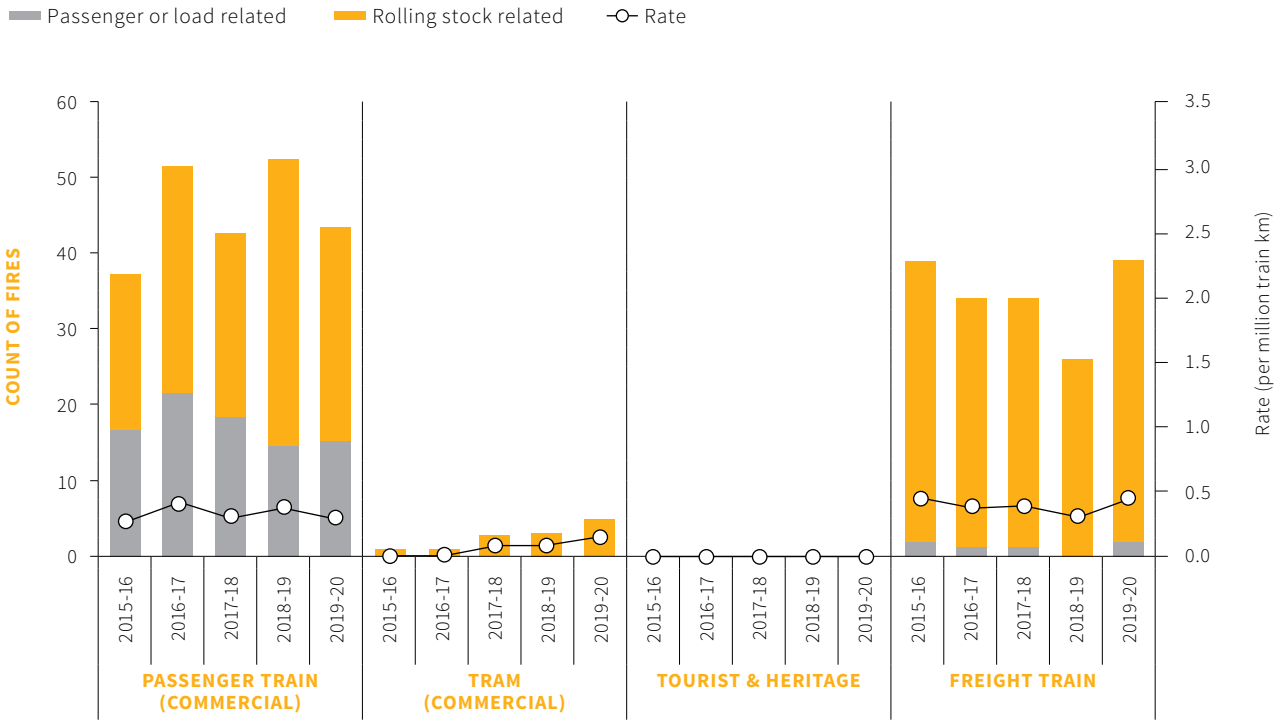


TABLE 13:
Selected occurrences
involving fire,
July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
15/07/2019	A battery on a shunt vehicle exploded within a testing and commissioning building. There were no reports of serious injuries but some minor property damage.	Dandenong, Vic.
29/10/2019	An auxiliary generator on a passenger train caught on fire. The train crew was able to stop the train, evacuate passengers and extinguish the fire.	Melbourne, Vic.
1/11/2019	An excavator working in the rail corridor made contact with overhead electrical infrastructure. The resulting sparks caused a grass fire. People and equipment were moved to safety and the fire was extinguished.	Harristown, Qld.
22/11/2019	With several wagons of a coal train on fire, the train stopped so emergency services could attend to extinguish the fire.	Bluff, Qld.
5/01/2020	The catenary wire of the overhead electrical infrastructure failed, struck a train and started a grass fire in the rail corridor. Emergency services attended, extinguished the fire and the passengers on board the train were safely evacuated.	Hornsby, NSW
3/04/2020	A roof-mounted battery of a light rail vehicle experienced an uncontained failure while the vehicle was stabled in a yard. Two trams sustained minor damage and there were no injuries.	Randwick, NSW
18/05/2020	Smoke from an electrical component on a passenger train was reported. The train stopped at a nearby station and all passengers were evacuated.	North Melbourne, Vic.
30/05/2020	A train crew drove a train through a blast cloud from a mining operation in the vicinity. Network control was not informed of the blast prior to it occurring. The crew members attempted to minimise in cab exposure to dust and fumes and were taken to hospital for precautionary monitoring.	Kinrola, Qld.

OTHER NOTEWORTHY OCCURRENCES

TABLE 14:
Other noteworthy occurrences, July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
1/07/2019	A worker performing yard shunting duties was walking adjacent to the track when he was struck by a brake handle of a wagon. The worker sustained minor leg injuries.	Manildra, NSW
31/07/2019	During switching from remote control to manual control, a train rolled away backwards through a rail network within the Whyalla steelworks. The train eventually came to a stop after travelling approximately 6km. There was no reports of injuries or damage to infrastructure.	Whyalla, SA
22/09/2019	An empty bauxite train was not able to effectively brake and proceeded through a turnout and collided with a rake of wagons that were being loaded. The driver was initially trapped in the vehicle however was freed after sustaining minor injuries. There was substantial damage to rolling stock.	Weipa, Qld.
26/09/2019	A driver of a tourist and heritage passenger train lost temporary control of the train on descent due to a brake issue. There were no reports of any injuries.	Rinadeena – Lynchford, Tas.
26/10/2019	After disembarking a train at a station platform, a young child travelling with family fell between the station platform and train. A family member attempted to pick up the child as the train departed. The child was not injured however the family member was taken to hospital for treatment to injuries.	Gosnells Station, WA
30/10/2019	A freight train parted in the Adelaide Hills and the 3 locomotives and 25 wagons continued travelling for approximately 30km while 27 wagons remained stationary at the point of separation. The incident was identified by another rail crew performing a roll by inspection. A blockage in the train brake pipe contributed to a failure of the automatic brakes to apply after the train parted.	Adelaide Hills, SA
23/11/2019	A rake of 30 loaded freight wagons ran away for approximately 600 metres while the locomotives were changing ends at a crossing loop. The wagons came to a stop in a siding.	Bordertown, SA

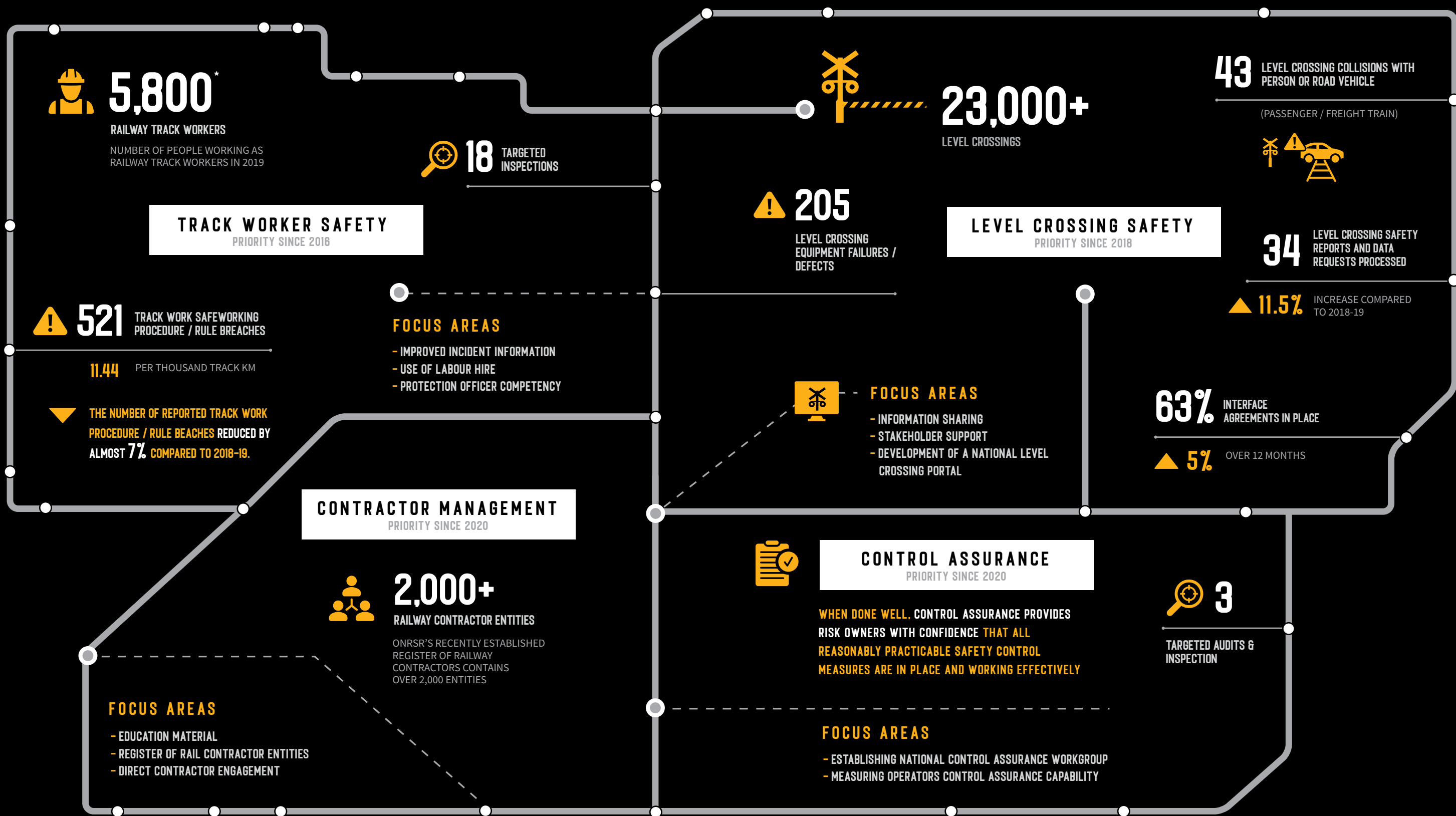
TABLE 14 (CONT.):

DATE	DESCRIPTION	LOCATION
26/01/2020	A freight train stopped on approach to a bridge which was covered with flood water. The track ballast in advance of the bridge had washed away. The train crew evacuated the train. There were no reports of injuries.	Prairie, Qld.
1/04/2020	A loaded freight train entered a section of track occupied by a track machine without authority. The freight train was able to stop approximately 100 metres from the track machine.	Monger, WA
20/04/2020	A contractor undertaking vegetation management in the rail corridor lost control of a tractor, which rolled away and fouled the track. An oncoming train was able to stop before a collision occurred. There were no reports of injuries.	Beenleigh, Qld.
3/06/2020	A pair of banking locomotives were on a return journey after banking a train up a hill. On a descent, the locomotives lost control of braking and derailed on a curve. The two rail crew were taken to hospital for treatment for minor injuries. The locomotives were destroyed.	Kankool, NSW



NATIONAL PRIORITIES

NATIONAL PRIORITIES 2019-2020 AT A GLANCE



*Source: joboutlook.gov.au



A national priority for ONRSR is defined as a rail safety area of regulatory focus that applies to multiple jurisdictions and operators and warrants a sustained period of regulatory attention. ONRSR targets its priority areas using tailored regulatory solutions, typically through operator-centric national compliance projects or industry-wide, education and information sharing programs.

This section of the report covers ONRSR’s current national priorities:

- > **Level Crossing Safety**
- > **Track Worker Safety**
- > **Contractor Management**
- > **Control Assurance**

LEVEL CROSSING
SAFETY



There are more than 23,000 level crossings in Australia and at all of them there exists a level of risk to safety – indeed, other than suicide and trespass, accidents at level crossings are the primary cause of railway related fatalities among the general public.

There were 37 level crossing collisions between a freight train, passenger train or tram and a road vehicle reported in the 2019–2020 financial year, the majority of which involved a freight train. More than 60% of these collisions occurred at crossings protected by active control devices, such as bells, lights and boom gates. There were three fatalities and two serious injuries reported as a result of these collisions, all affecting road vehicle occupants.

There were 6 level crossing collisions between a freight train, passenger train or tram and a person reported in the 2019–2020 financial year, resulting in four serious injuries to members of the public. Five of the six collisions took place at crossings protected by active control devices.

All rail safety stakeholders, including the general public, have a role to play in improving safety at level crossings and ONRSR continues to advocate for co-operation between all parties that will ultimately help reduce the rate of fatalities and serious injuries. ONRSR also continues to support the work being done by governments and industry to remove level crossings and their commitment to a policy of no new level crossings.

For the past twelve months, ONRSR, on behalf of the National Level Crossing Safety Committee (NLCSC), has been developing a National Level Crossing Portal. In time, this will allow for level crossing safety data to be available to a range of rail safety stakeholders, on demand, through a self-serve online portal. The data sets will assist decision makers in government, industry and among other stakeholders to be better informed when making safety investment and planning decisions or undertaking research. Significant progress is being made on stage one of the portal which will initially incorporate ONRSR occurrence data and some ALCAM data. With stakeholder engagement on the development and implementation of the first stage ongoing, a mid-2021 completion and launch date is being targeted.

LEVEL CROSSING
EQUIPMENT FAILURES
AND DEFECTS



ONRSR was notified of 205 level crossing equipment failures and defects during 2019–2020. ONRSR’s risk-based analysis of these occurrences is presented in Figure 13, which highlights the higher risk occurrences that accounted for almost 15% of all failures and defects reported. These involve equipment failures or defects resulting in:

- > complete failure of active warning devices;
- > late activation of warning devices; or
- > premature deactivation of warning devices.

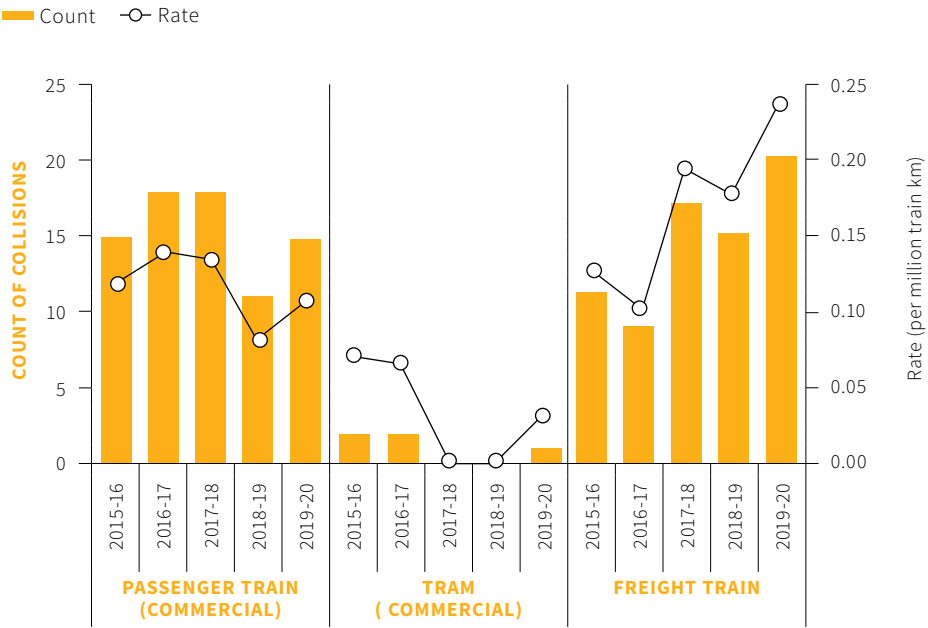
Examples of other level crossing equipment failures and defects reported to ONRSR include:

- > failure of road boom(s) to fully lower but other active warning devices operational;
- > failure of pedestrian gate(s) to close or boom(s) to lower;
- > partial failure of flashing lights (individual lamp failures);
- > failure of audible warning devices (bells, sirens);
- > damaged / missing passive warning devices (e.g. signs);
- > defective locking mechanism on emergency escape gates; and
- > failure of pedestrian ‘don’t walk’ warning light(s).

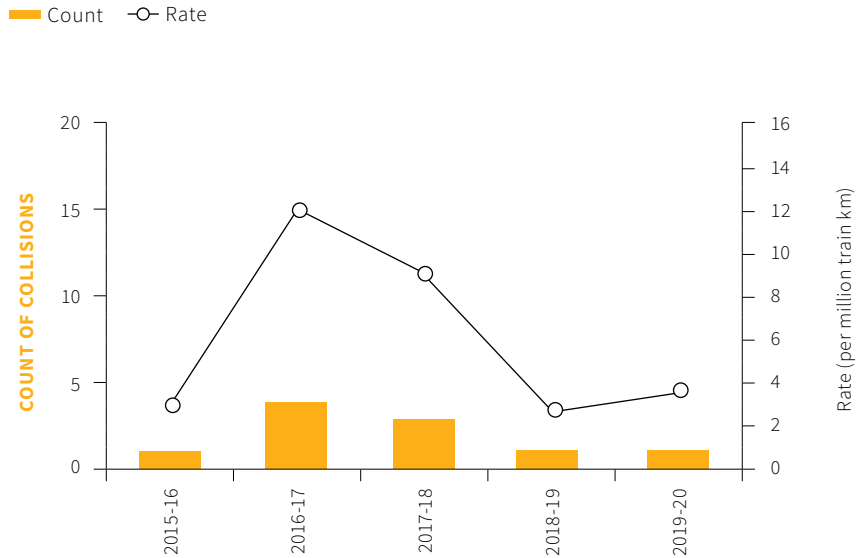
FIGURE 11:
Level crossing
collisions between
train and road
vehicle, July 2015
to June 2020

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 AND FREIGHT



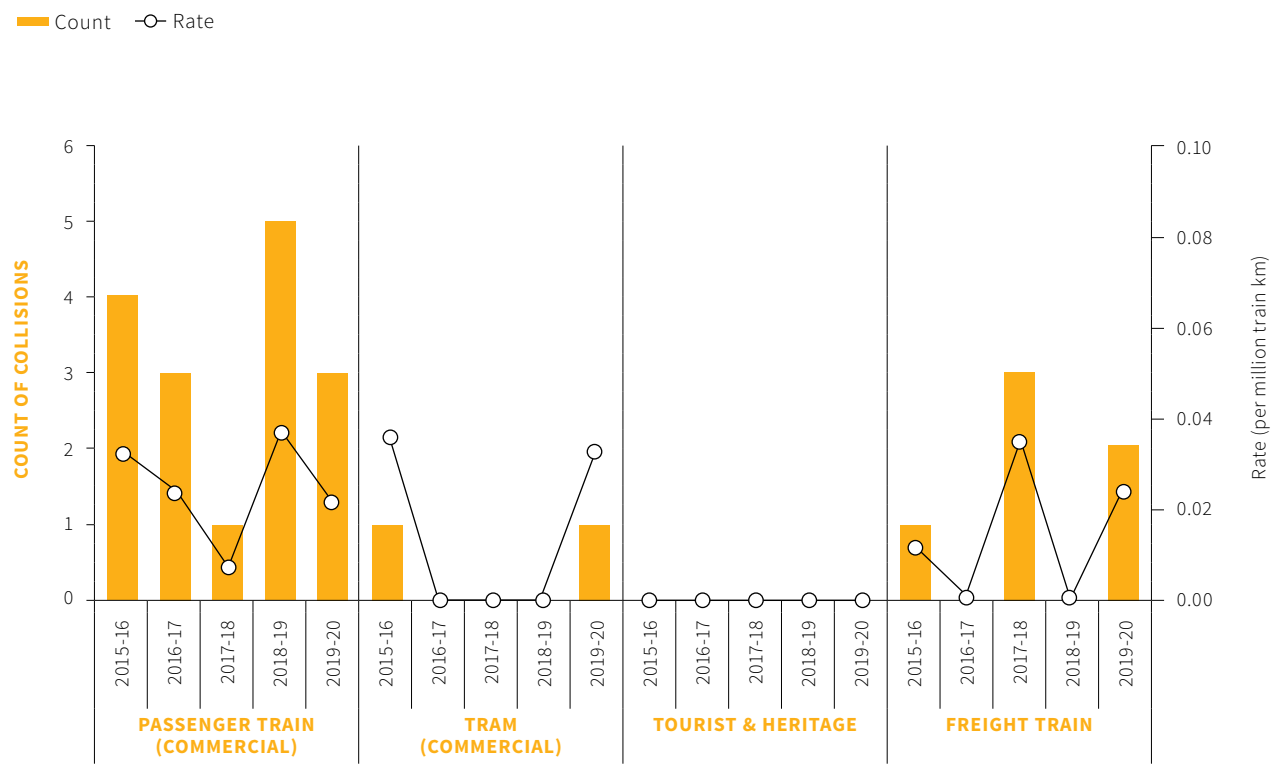
TOURIST AND HERITAGE



NATIONAL PRIORITIES

FIGURE 12:
Level crossing collisions
between train and person,
July 2015 to June 2020

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



NATIONAL PRIORITIES

FIGURE 13:
Level crossing
equipment failures
and defects,
July 2015 to June 2020

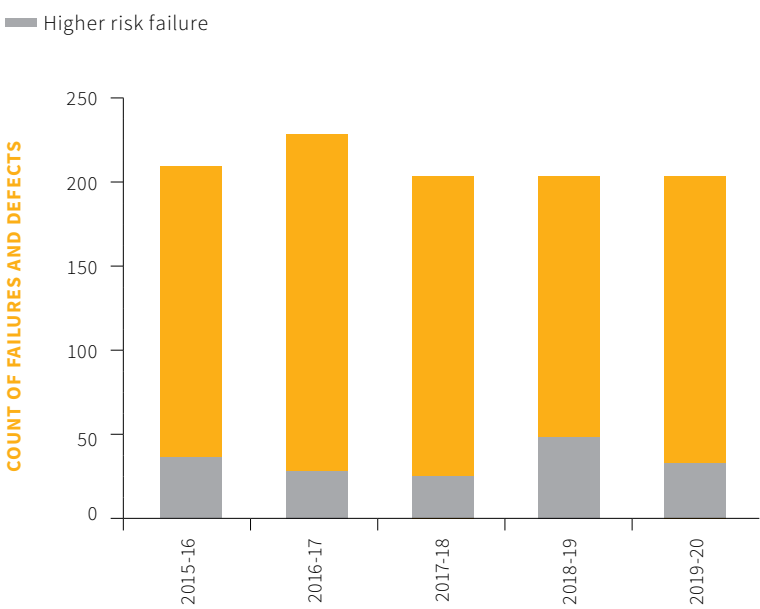


TABLE 15:
Selected level
crossing collisions,
July 2019 to June 2020

DATE	DESCRIPTION	LOCATION
2/07/2019	A person was struck by a freight train at a level crossing protected by active traffic control equipment. The person received treatment in hospital for serious injuries.	Stawell, Vic.
24/10/2019	A train struck a person using a pedestrian crossing at a station. The person sustained serious injuries and was transported to hospital.	Woodlands Park Station, SA
25/11/2019	A truck collided with a grain train at a level crossing protected by passive traffic control equipment. There were no reports of injuries. There was damage to the truck and rolling stock.	Oakvale, Vic.
29/01/2020	A person using a pedestrian maze way protected by active traffic control equipment was struck by a light rail vehicle. The person sustained serious injuries and was transported to hospital for treatment.	Plympton, SA
18/02/2020	A truck collided with a freight train at a level crossing with passive traffic control equipment. The train then derailed and a fire broke out. The driver of the truck was taken to hospital for treatment. The truck was destroyed and there was damage to track infrastructure.	Bribbaree, NSW
27/02/2020	A freight train collided with a road vehicle at a level crossing with passive traffic control equipment. The driver and a passenger in the road vehicle were fatally injured.	Mallala, SA
6/03/2020	A freight train collided with a person at a level crossing with active traffic control equipment. The person sustained serious injuries.	Henty, NSW
2/04/2020	A passenger coach collided with a train at a level crossing with active traffic control equipment. A passenger on the coach was transported to hospital for treatment to injuries. There was extensive damage to the coach, the train locomotive and level crossing infrastructure.	Corio, Vic.
19/04/2020	A freight train collided with a truck at a level crossing with passive traffic control equipment. The driver and sole occupant of the truck sustained fatal injuries.	Culburra, SA
19/06/2020	A grain train collided with a road vehicle at a level crossing protected by active traffic control equipment. The sole occupant of the road vehicle was taken to hospital for assessment but was not injured. There was substantial damage to the road vehicle and level crossing infrastructure.	Bordertown, SA
29/06/2020	A road vehicle collided with a passenger train at a level crossing with active traffic control equipment. The sole occupant of the road vehicle was treated for minor injuries. There were no injuries to passengers on the train.	Edwardstown, SA

TRACK WORKER
SAFETY



With 521 track work procedure and rule breaches reported in the 2019–2020 financial year, the number of occurrences continues to be a significant concern and a key reason the issue remains a national priority for ONRSR. Although this represents a 7% reduction on the previous year, the number of higher risk occurrences involving near misses or workers in the danger zone without appropriate protection remained broadly the same.

In 2019–2020 ONRSR focussed its compliance and enforcement efforts in two key areas – gathering better quality data from operators when they report occurrences and conducting regulatory activities that assess track worker protection arrangements. To support this approach a range of new internal tools, designed to refine data capture capabilities and better identify track worker safety hot spots, were developed for use by rail safety officers.

In an effort to increase awareness of the safety issue among track workers themselves, ONRSR increased the number of inspections conducted, assessing not only the legality of protection arrangements in place but also the overall competency of the rail safety workers implementing them. A key target of the revised inspection regime was addressing ONRSR’s concerns regarding the use of labour hire workers, particularly in emergency situations.

ONRSR is continuing to prioritise the protection of track workers. Dedicated in field inspections and improved data analysis will continue to headline the approach along with an emphasis on determining which occurrences are investigated – and to what level. Monitoring of operators’ risk assessments and controls will also be a key activity along with closer scrutiny of what self-assurance operators are generating through their own reviews of track worker safety strategies and outcomes, including learnings from incident investigations. ONRSR will conduct audits of those operators it considers to have the highest track worker safety risk profile but also expects RTOs to challenge themselves to fully understand their own risks and to consider what proven technology exists to help manage them SFAIRP.

SUPPLEMENTARY
DATA FOR TRACK
WORK SAFEWORKING
RULE AND PROCEDURE
BREACHES

ONRSR trialled the collection of supplementary information for track work procedure or rule breaches reported between September 2019 and September 2020, with the aim of enabling rail safety officers to make better informed decisions and undertake appropriate activities following such occurrences. Additional data was collected and analysed for 321 occurrences over this period, with summary findings outlined below and in Figure 15:

- > in 56% of cases the protection officer involved in the breach was a contractor.
- > in almost 6% of cases the protection officer was not qualified to undertake the level of protection.
- > internal investigations were initiated by operators in over 92% of the breaches reported.
- > a third of cases occurred while worksite protection was being implemented or removed.
- > over 40% of reported breaches were unique in nature and did not fall within a common theme. The most common type of breach amongst the remaining breaches was worker(s) in the danger zone before the worksite was setup or after it was fulfilled, which accounted for approximately 23% of breaches overall.
- > the most common types of breach associated with the lookout working method were use of an incorrect worksite protection method (47%) and inadequate communications (25%).

FIGURE 14:
Track work
safeworking rule and
procedure breaches,
July 2015 to June 2020

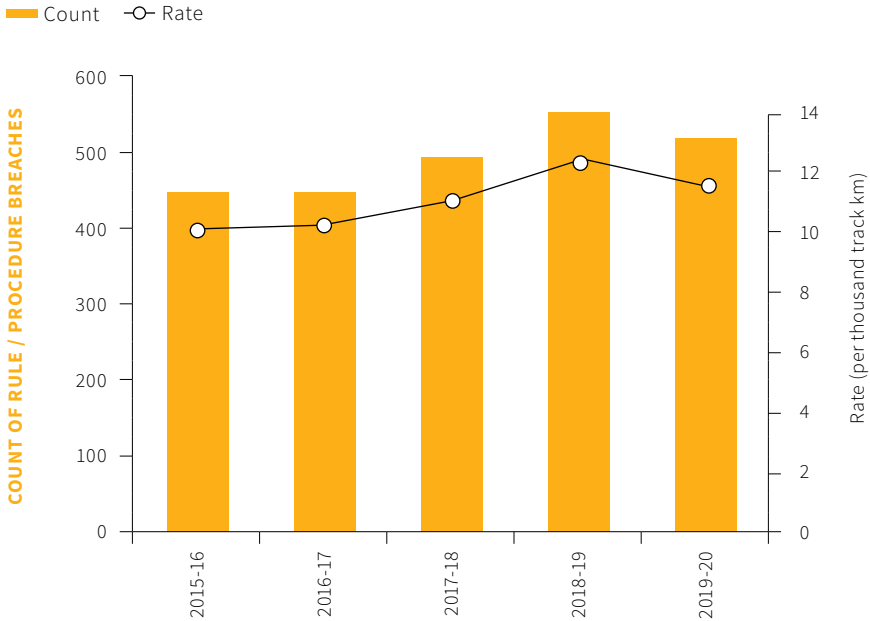
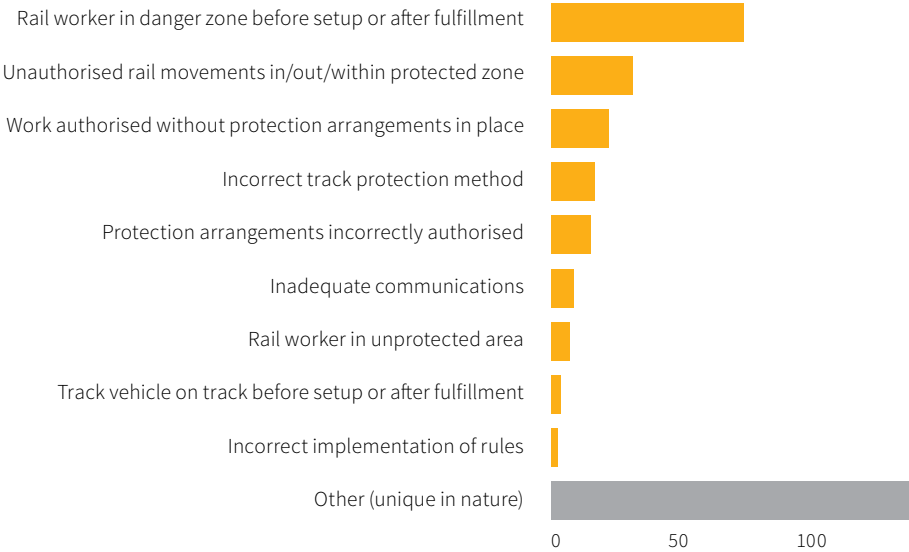


FIGURE 15:
Nature of track work
safeworking rule and
procedure breaches,
9 September 2019 to
8 September 2020

Includes only those
breaches where
supplementary data
was provided by the
notifying operator.



NATIONAL PRIORITIES

CONTRACTOR MANAGEMENT



2019–2020 was the first year that the issue of contractor management was an ONRSR national priority. This followed a period where nationally, regulatory activities had identified several concerns. In many cases contractors were unaware of their safety duties, some operators were unable to gain assurances about the adequacy of work performed for them, confusion reigned over who had effective management and control in some circumstances, while some contracted workers were simply failing to meet competency requirements.

As a first step in addressing these concerns ONRSR has spent the past 12 months developing internal education material for rail safety officers. These new resources will be used to inform and guide an increasing number of interactions ONRSR officers are having with contractors around the country following the decision to give contractor management national priority status. Simultaneously a register of all contractors working within the Australian rail industry has been established and so far more than 2,000 have been identified. A process to record all the necessary organisational and operational information on each of these entities is now underway as a forerunner to a more formal period of contractor engagement and education. In a subsequent phase ONRSR will focus more intently on compliance activities such as audits and inspections that are based on the intelligence and information ONRSR has generated in relation to contractors and the education and advice provided.

ONRSR’s intention to engage directly with contractors is not an approach that has been widely used in Australia to date, but it is one that has many potential benefits - particularly in relation to ensuring all parties are aware of their safety obligations. Through open lines of communication, it is ONRSR’s expectation that the full range of benefits can be exploited, including of course, significant improvements in overall safety performance.

NATIONAL PRIORITIES

CONTROL ASSURANCE



The second of ONRSR’s new national priorities, control assurance, when done well provides risk owners and duty holders with confidence that all reasonably practicable safety control measures are in place and working effectively. In the lead up to its adoption as a national priority, ONRSR’s regulatory activities had identified inconsistent or inadequate control assurance practices by operators across all sectors of the rail industry.

An initial focus in addressing this issue has been on bringing together a national workgroup of subject matter experts from each of the ONRSR offices around the country. The group has since been working on measuring rail transport operators’ effectiveness in relation to control assurance by examining their overall capability, the systems they have in place and their processes for implementing them. The data collection effort will continue into 2021 and will inform some initial benchmarking and development of targeted education packages for industry. Ultimately this intelligence will establish a means by which ONRSR can measure an operator’s ongoing performance in relation to control assurance.

In time ONRSR aims to be in a position to set a standard for what is expected of operators’ safety management systems with regard to control assurance.



DATA-DRIVEN INTELLIGENCE

DATA-DRIVEN INTELLIGENCE



The statistics and summaries presented in the previous chapters provide a snapshot of the rail industry's safety performance over the last financial year. This information is important for monitoring and reporting safety performance across the rail industry, acting as a key source of regulatory intelligence used to direct ONRSR's resources and attention. This chapter continues the series of articles presented in previous issues of the Rail Safety Report, providing an update on ONRSR's progress to further enhance the data-driven element of its risk-based approach to regulation.

DATA-DRIVEN INTELLIGENCE

SAFETY THEMES

Together with the observations, knowledge and experience of regulatory staff, rail safety data is a critical input into ONRSR's decision making. Over the past 12 months ONRSR has continued to strengthen its data management and analysis practices, enabling the use of a wider range of data to identify rail safety issues requiring ONRSR's attention.

An example of ONRSR's expanded intelligence approach is the 2020 safety themes analysis. This exercise involved the analysis of occurrence data and accident investigation reports to identify key systemic factors contributing to hazardous rail safety events. The safety themes identified in this work helped inform ONRSR's 2020–2021 regulatory work program. The key steps involved in this exercise were:

- > **Identify Rail Safety Risks:** Several quantitative risk models from Australia and overseas were reviewed to identify a complete set of major accident types and proximate precursor events applicable to Australian rail operations.
- > **Map Occurrences:** Approximately 70,000 occurrences notified over the 2018 and 2019 calendar years were reviewed and mapped to the set of accident types and precursors referred to above. The data was then summarised across sections of the industry.
- > **Review Accident Investigations:** More than 80 operator investigation reports were shortlisted for an analysis of contributing factors using a qualitative, system-based causal analysis technique. The shortlisting was based on the findings of the occurrence-based analysis but was also informed by factors such as the quality of investigation reports.
- > **Identify Safety Themes:** The key contributing factors identified in each investigation report were categorised into a set of safety themes. These themes were then aggregated and summarised within and across sectors of the industry.

More than 40 different safety themes were identified from the incidents investigated. Table 15 lists the 10 most common themes identified across the industry.

In summary, the analysis reinforced some of the themes historically highlighted by ONRSR that routinely receive regulatory attention, for example, risk management, procedural non-compliance and competency management. However, the combined application of risk-based occurrence categorisation and systems-based causal analysis of accidents, has highlighted a wider range of systemic influences on safety performance, such as organisational learning, safety critical communications and human factors aspects of design.

TABLE 16:
Key safety themes
identified from an
analysis of accident
investigation reports

The ten most common
themes across the industry,
identified from an analysis
of 87 accident investigation
reports covering a range of
incidents from 2018 and 2019.

SAFETY THEME		DESCRIPTION
Operational error		Unintentional acts with unintended outcomes (human error). Five key types of error were observed, including incorrect perception of information (e.g. a signal aspect or stopping distance) and slips / lapses in task execution (e.g. a data entry error).
Design		The design of equipment or work system contributed to the risk or failed to control the risk as expected. This included error-inducing design and non-error tolerant design, as well as mechanical engineering deficiencies.
Deficient procedures		The operating rule or procedure was found to be insufficient to manage the risk it was intended to control or was difficult to follow, for example, ambiguous, conflicting or impractical.
Procedural non-compliance		Instances of non-adherence to rules and procedures for managing risk, where it appeared (or was assumed) there was a decision not to comply even if the outcome was unintended.
Safety interface management		Failures to identify or manage a shared risk, or to safely transfer a risk between parties at an inter-organisational level.
Safety critical communication		Failures in the verbal communication or understanding of safety critical information; effectively a failure to reach shared understanding.
Investigation process		The investigation was insufficient to discover the cause, or the recommended action(s) would not prevent a reoccurrence, taking into consideration the level of investigation reviewed.
Risk management		A risk was not clearly identified, managed or controlled at an organisational level, giving rise to a question of whether the risk was being managed SFAIRP.
Competency management		The competence management system failed to manage the risk(s) it was designed to control including not working as intended, for example, personnel not being competent for the task(s) they perform.
Maintenance		Failures in the maintenance process including non-adherence to maintenance schedules and maintenance process-related malfunctions or defects.

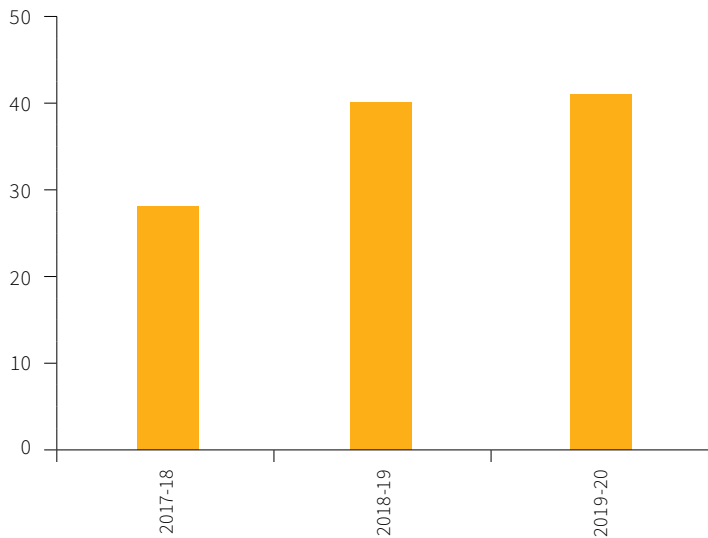
DATA SHARING

With initiatives such as the National Level Crossing Portal (page 51) and the National Rail Safety Data Strategy (page 69), ONRSR is also progressing its commitment to increase the amount of data available to rail transport operators and other key stakeholders to better support rail safety investment decision-making across the industry.

The National Level Crossing Portal is the first opportunity for ONRSR to exploit its cloud-based information management and technology platform to introduce secure, self-service access to rail safety data for relevant external parties. The aim of this is to ensure that decision makers have access to the national safety data they need, when they need it, overcoming some of the constraints and limitations associated with current data reporting.

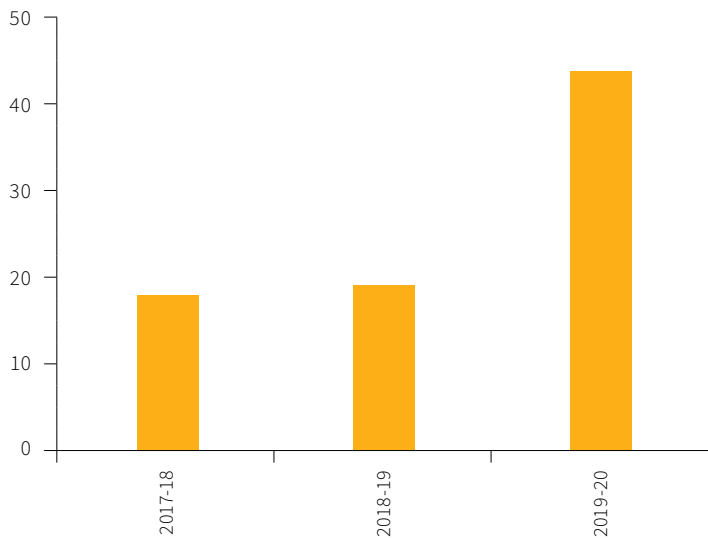
Throughout 2019–2020 ONRSR has also seen continued growth in both the number of rail safety data reports it issues to external stakeholders, and the number of external stakeholder-related data requests it has processed. Figures 16 and 17 depict growth of 46% and 144%, respectively since the 2017–2018 financial year. New products introduced in 2019–2020 include safety data dashboards for members of the ONRSR CEO Industry Reference Group and a new version of the SPAD / LRTAE occurrence report for members of the Rail Industry Safety and Standards Board (RISSB) SPAD Working Group. These products build on the data deliverables and feeds already provided to the general public, TrackSAFE, government transport departments, the Australian Transport Safety Bureau, the Australian Rail Risk Model (page 69), and level crossing committees around the country.

FIGURE 16:
Scheduled rail safety data reports issued to external stakeholders, July 2017 to June 2020



Source: ONRSR RegIS Reporting Log.

FIGURE 17:
Requests to provide rail safety data to external stakeholders processed by ONRSR, July 2017 to June 2020



Source: ONRSR RegIS Request for Information Log. Excludes Freedom of Information requests.

NATIONAL RAIL SAFETY DATA STRATEGY

Implementation of the strategy, being jointly led by ONRSR and the Australasian Railway Association (ARA), has continued to be a focus for ONRSR during 2020.

The overarching vision of the data strategy is establish a single source of reliable, accessible national rail safety data to support risk-based regulation and rail safety decision-making by stakeholders. The vision is supported by the principle of ‘report once, utilise many times’ and will be achieved by delivering on three key themes: better focussed national data; better quality data; and better consistency and comparability.

A critical review of current legacy reporting requirements and data needs for all stakeholders is underway, with industry consultation resuming in October 2020 following an extended delay due to the COVID-19 pandemic.

AUSTRALIAN RAIL RISK MODEL (ARRM)

Launched by RISSB in November 2017, ARRM is an objective, quantitative tool that provides the rail industry with a comprehensive picture of safety risk. Now at version 4, it has processed more than 150,000 occurrence records provided to RISSB by ONRSR for incidents from July 2015 to June 2019, in support of more than 70,000 individual risk estimates⁵.

ONRSR continues to support the development of ARRM and encourages operators to utilise the model as an additional and vital source of risk information to inform safety investment decisions.

⁵Rail Industry Safety and Standards Board website (accessed 11 October 2020), <https://www.rissb.com.au/safety-tools/armm/>

APPENDICES



APPENDIX A: NETWORK STATISTICS

FIGURE 18:
Commercial passenger and freight train kilometres, July 2015 to June 2020

The rising trend in heavy rail passenger train kilometres is primarily due to the growth of metropolitan passenger train services on existing networks around Australia and the introduction of new systems such as the Sydney Metro, which began operations in May 2019.

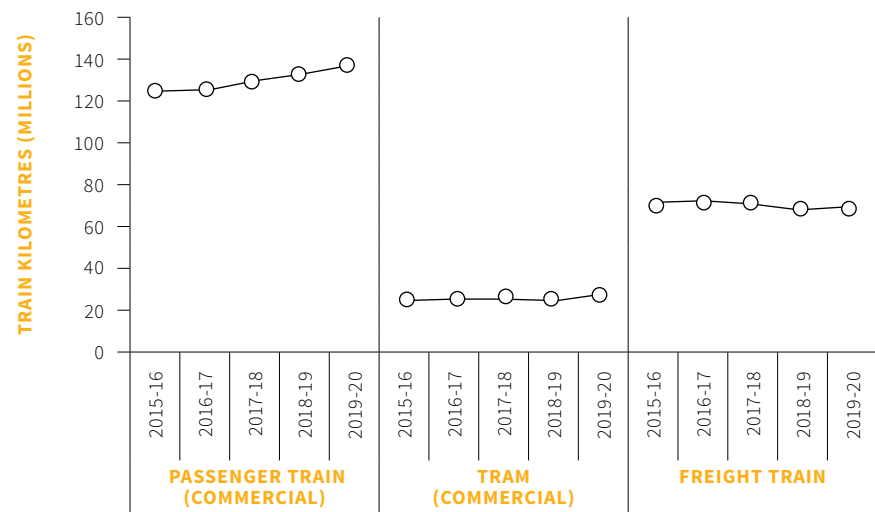


FIGURE 20:
Maintenance vehicle kilometres, July 2015 to June 2020

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.

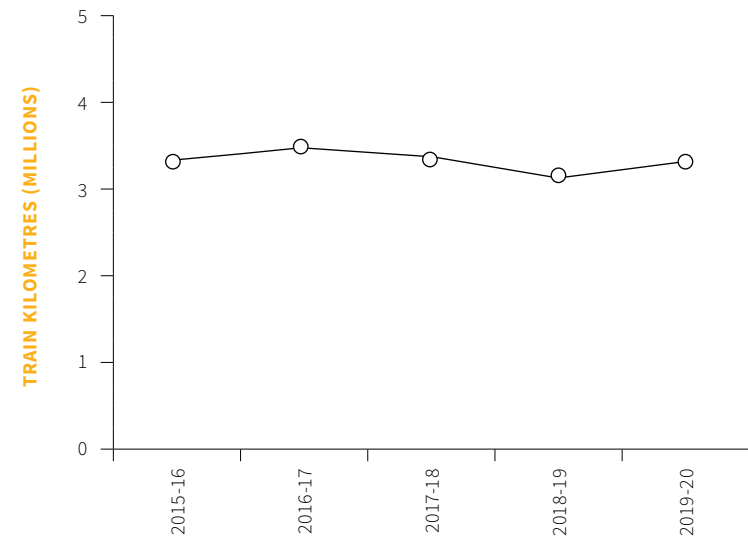


FIGURE 19:
Tourist & heritage passenger train kilometres, July 2015 to June 2020

The reduction in tourist and heritage passenger train kilometres reported in the 2019-2020 financial year is due to COVID-19 restrictions, which led to the suspension of several operations. 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.

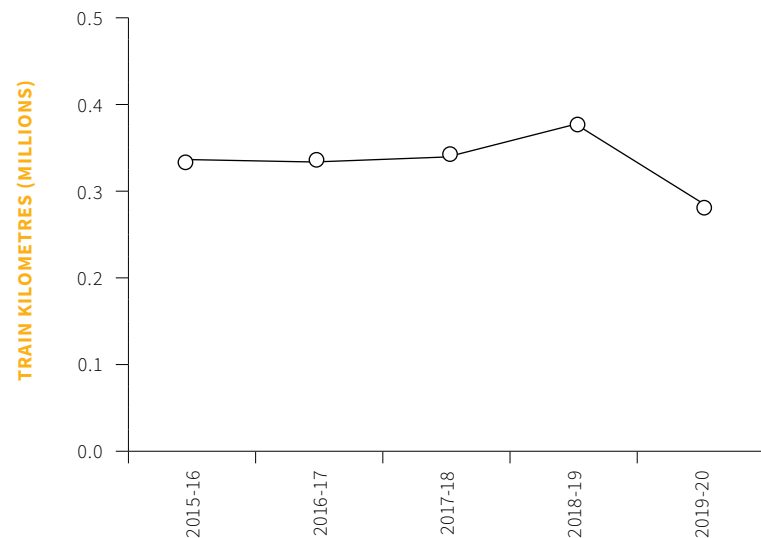
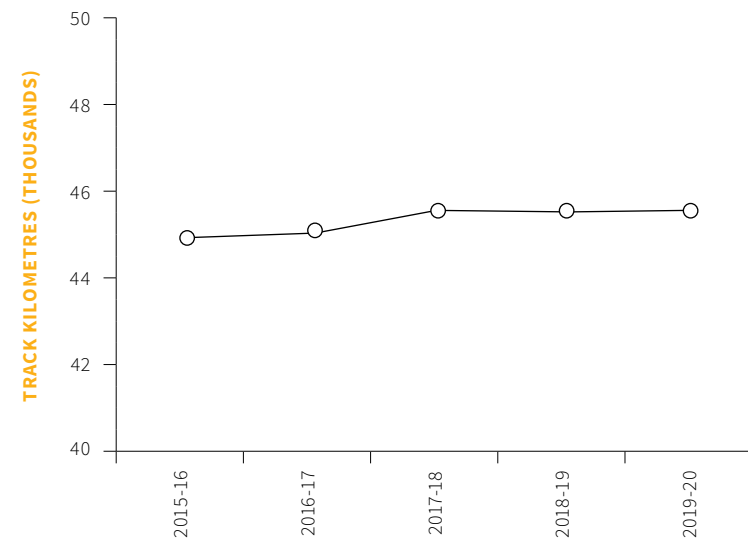


FIGURE 21:
Track kilometres, July 2015 to June 2020

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. Track kilometres reported by tourist and heritage operators in Victoria that transitioned under ONRSR's regulatory oversight on 2 December 2019 are included from 2019-2020 period only.



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 2015 to 30 June 2020. The incident descriptions summarised in this report apply to the period 1 July 2019 to 30 June 2020.

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. Extracts of the notifiable occurrence data presented can be downloaded from the National Safety Data area of ONRSR’s website.

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.

Activity data for rail operations in Western Australia (WA) is unavailable prior to 2 November 2015. To enable more consistent and relevant reporting of occurrence rates and network statistics a pro rata calculation of activity data is used for rail operations in WA for the 2015–2016 financial year.

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 were collected 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:

- > **WA** – notifiable occurrence data from 1 July 2015 to 1 November 2015 was collected by the WA Department of Transport, Office of Rail Safety.
- > **Qld.** – notifiable occurrence and activity data from 1 July 2015 to 30 June 2017 was collected by the Qld. Department of Transport and Main Roads.
- > **Vic.** – From 1 July 2015 to 1 December 2019, the following data was collected 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 of the national occurrence classification guideline which is date dependent. For data collected between 1 July 2015 to 7 June 2017 incident definitions are based on those in the Occurrence Classification Guideline (OC-G1), 2013⁴. For data collected since 8 June 2017, and for all SPAD/LRTAE data, incident definitions are based on the Reporting Requirements for Notifiable Occurrences⁵.

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.

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.

⁴Office of the National Rail Safety Regulator, Classifying Notifiable Occurrences. Occurrence Classification Guideline (OC-G1), Version 1.1, ONRSR, Adelaide, March 2013.
⁵Office of the National Rail Safety Regulator, Reporting Requirements for Notifiable Occurrences, Version 3, ONRSR, Adelaide, 2020.

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