

Elevating the use of our national rail safety data:

What's next?

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3 March 2025





rail
safety
regulator

By the numbers...



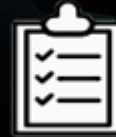
~200

Accredited
Operators



280+

Inspections per year



90+

Audits per year



1000+

Site Visits per year



50+

Thousand
Track KM



Approx.

2000

Non-accredited
duty holders



25+

Open Investigations



Approx.

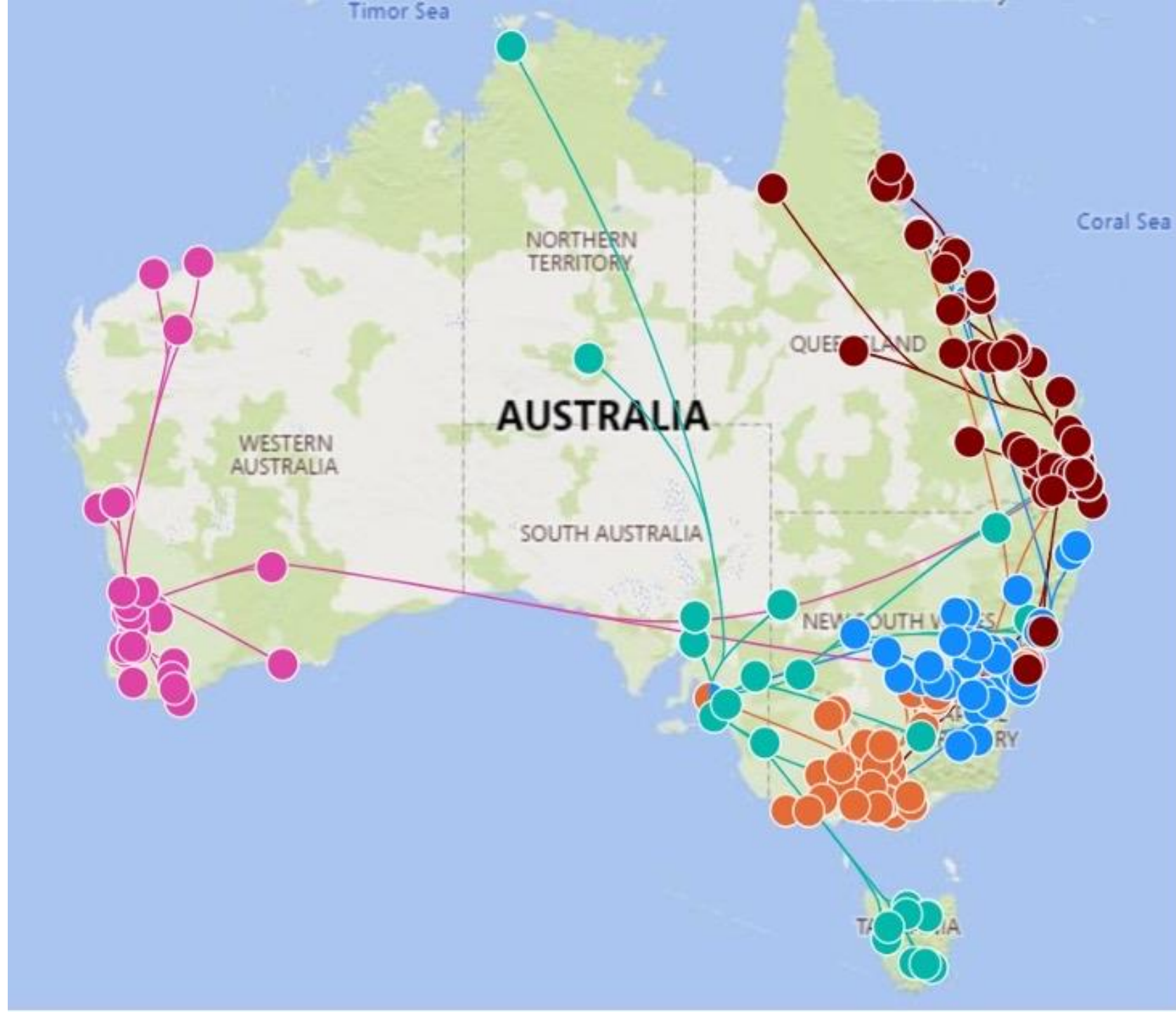
200

Staff

ONRSB
Rail Safety Regulator

ONRSB
Rail Safety Regulator

ONRSR's regulatory footprint



2024-2027 STRATEGIC DIRECTIONS

onrsr Office of the
National Rail
Safety Regulator

VISION

Safe Railways for Australia.

VALUES

Integrity, Respect, Independence,
Diligence, Excellence

PURPOSE

To enhance rail safety for the Australian community through targeted, risk based regulation, and by proactively sharing insights and information arising from our work.

STRATEGIC PRIORITIES



LEVERAGE DATA AND INTELLIGENCE TO ENHANCE OUR APPROACH TO RISK-BASED REGULATION.



ENSURE OUR PEOPLE ARE VALUED, SKILLED AND ENGAGED.



CULTIVATE STRONG AND COLLABORATIVE RELATIONSHIPS WITH KEY STAKEHOLDERS.



POSITION ONRSR AS A FUTURE-FOCUSED AND SUSTAINABLE REGULATOR.



INFLUENCE SAFETY PRACTICES AND BUILD SAFETY KNOWLEDGE AMONG RAIL TRANSPORT OPERATORS.

Focus areas and initiatives: a data-driven culture



REFINE OUR RISK-BASED APPROACH



- REFINE THE ONRSR RISK MODEL AND SUPPORTING DECISION TOOLS (inc. AI)
- DELIVER A REVISED NATIONAL WORK PROGRAM



INFORM DECISIONS



- REVISE THE ANNUAL SAFETY REPORT & WEB

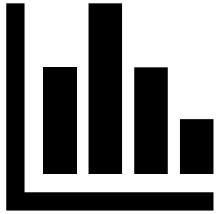


GAIN INSIGHTS

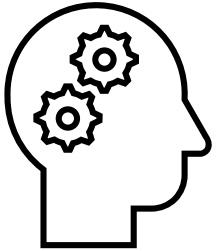


- DEVELOP DATA & ANALYTICS STRATEGY
- ENHANCED INVESTIGATION STRATEGY

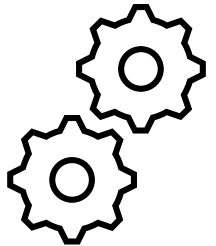
Data @ ONRSR – three core functions



DATA REPORTING AND ANALYTICS



ANALYTICAL INSIGHTS



**NATIONAL LEVEL CROSSING PORTAL
(NLXP) AND DATA ENGINEERING**

Data @ ONRSR – three core functions



DATA REPORTING & ANALYTICS

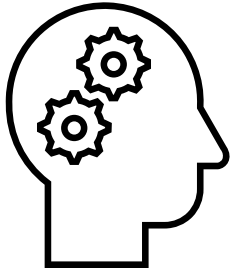
- Providing rail safety data insights to internal and external audiences
- Producing reports and website statistics

The image shows the cover of the Rail Safety Report 2023-2024. It features a large yellow curved shape on the right side. Inside this shape, there are two photographs: the top one shows a modern high-speed train at a platform, and the bottom one shows a freight train with a yellow locomotive and blue cars. The text 'RAIL SAFETY REPORT' is written in large, bold, yellow capital letters, and '2023-2024' is written in smaller yellow capital letters below it.

**RAIL
SAFETY
REPORT**

2023-2024

Data @ ONRSR – three core functions



ANALYTICAL INSIGHTS

- Natural Language Processing (NLP) and Large Language Models (LLMs)
- Geographic Information System (GIS)
- Investigative Studies
- Use of AI and its impact on rail safety



What data do we have?

Inspections

Audit Reports

External Rail Data

Operator Regulatory Strategy

Occurrences

Weather

Investigations

Social Media

Safety Performance Reviews

Demographics

Monthly Returns

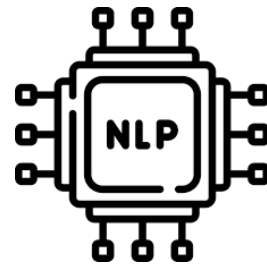
Traditional Media

What can we do with it?



- Classification
- Regression
- Forecasting

Machine Learning



- Text Analysis
- Sentiment Analysis
- Topic Modelling

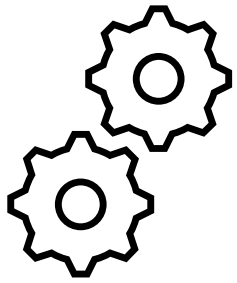
Natural Language Processing



- Summarise a topic/operator
- Chatbot for ONRSR
- Continuous Learning

Large Language Models

Data @ ONRSR – three core functions



NATIONAL LEVEL CROSSING PORTAL (NLXP) AND DATA ENGINEERING

- Upgrading NLXP portal
- Ensuring data integrity and accuracy



2023-2024 RAIL SAFETY REPORT

ONRSR 2023-2024 - AT A GLANCE

NETWORK STATISTICS

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

ACCREDITED OPERATORS*
195

PASSENGER JOURNEYS
867.0M

TRACK KM
50.8K

130.1M
COMMERCIAL PASSENGER TRAIN KM

31.9M
COMMERCIAL TRAM KM

488.6K
TOURIST & HERITAGE PASSENGER TRAIN KM

84.6M
FREIGHT TRAIN KM

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

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

7 RUNAWAYS (FREIGHT TRAIN)
0.08 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

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)

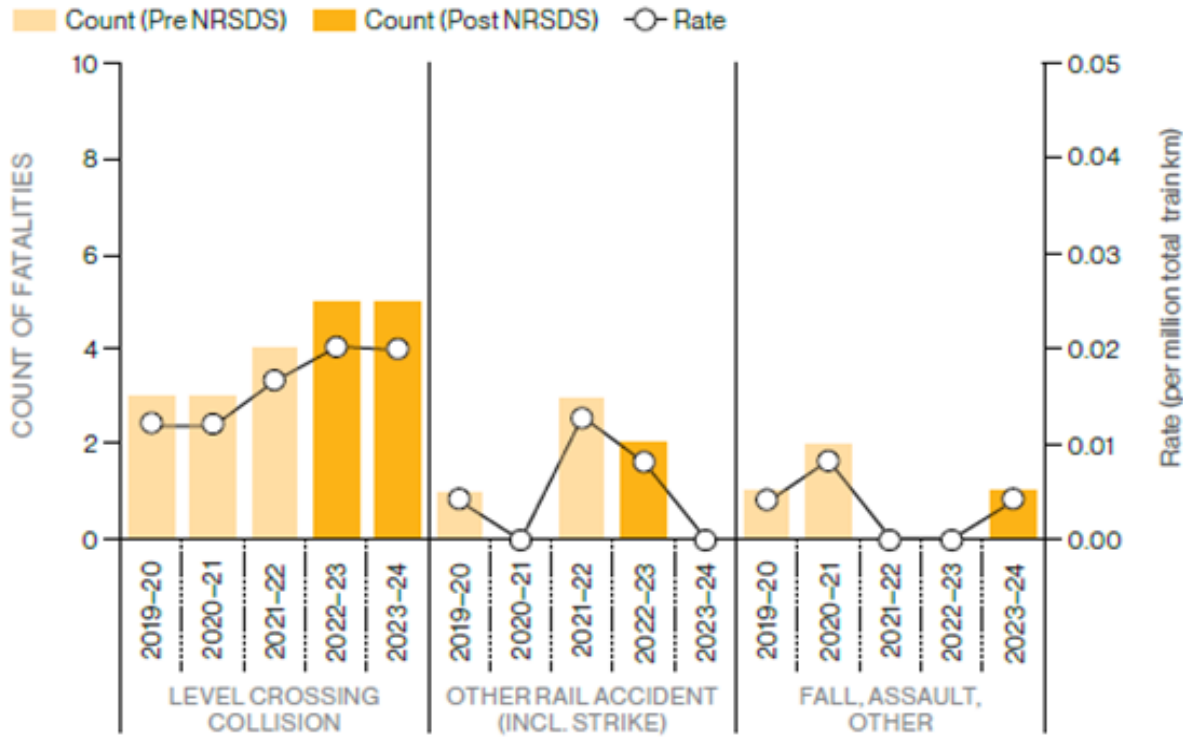
912 LEVEL CROSSING NEAR-HITS WITH PERSON OR VEHICLE (PASSENGER / FREIGHT TRAIN)

12 LEVEL CROSSING EQUIPMENT FAILURES / DEFECTS

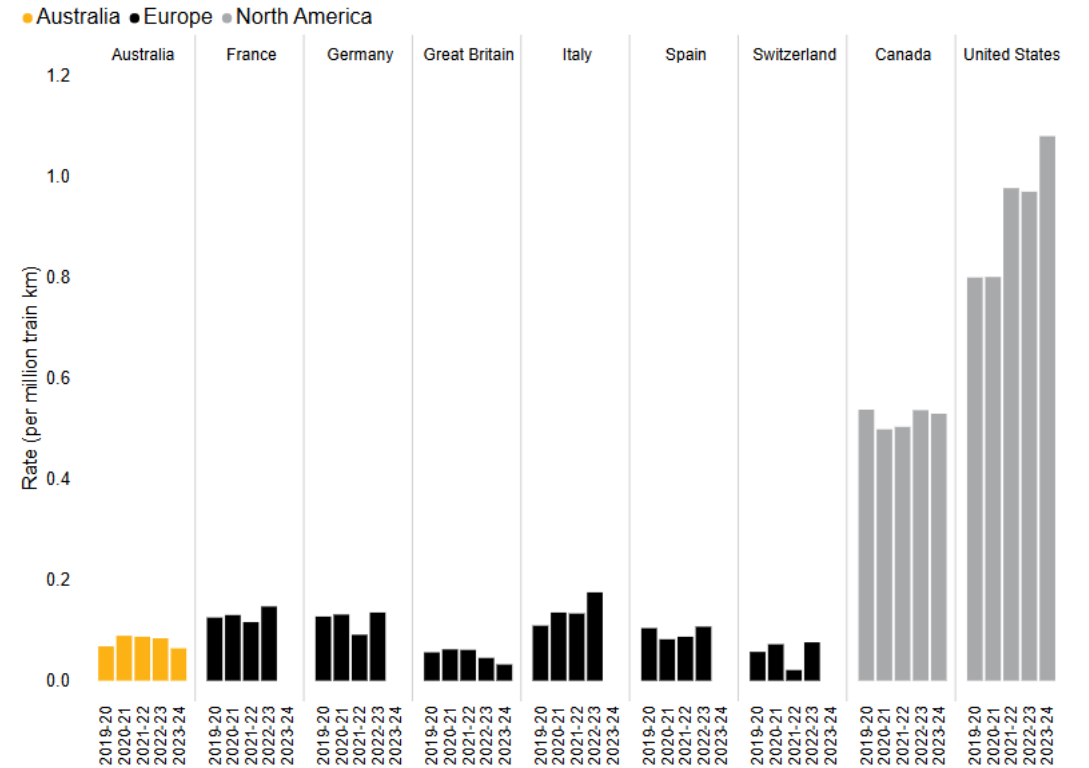
HARM TO PEOPLE



Public Fatalities (all types)



Railway Fatalities Comparison



KEY OCCURRENCES

6331

TOTAL OCCURRENCES

960

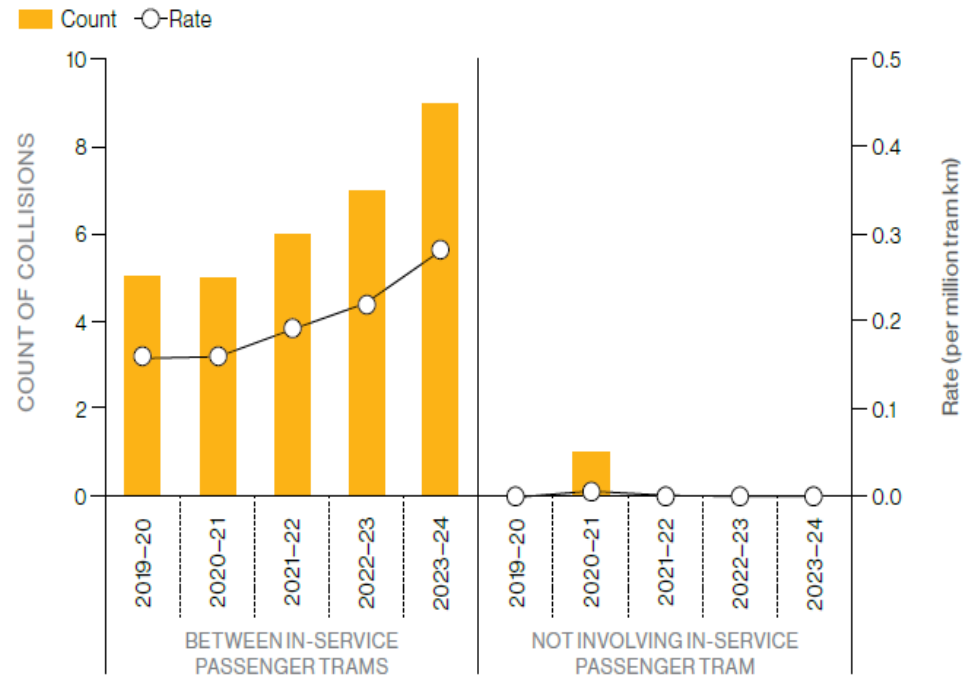
CATEGORY A

5371

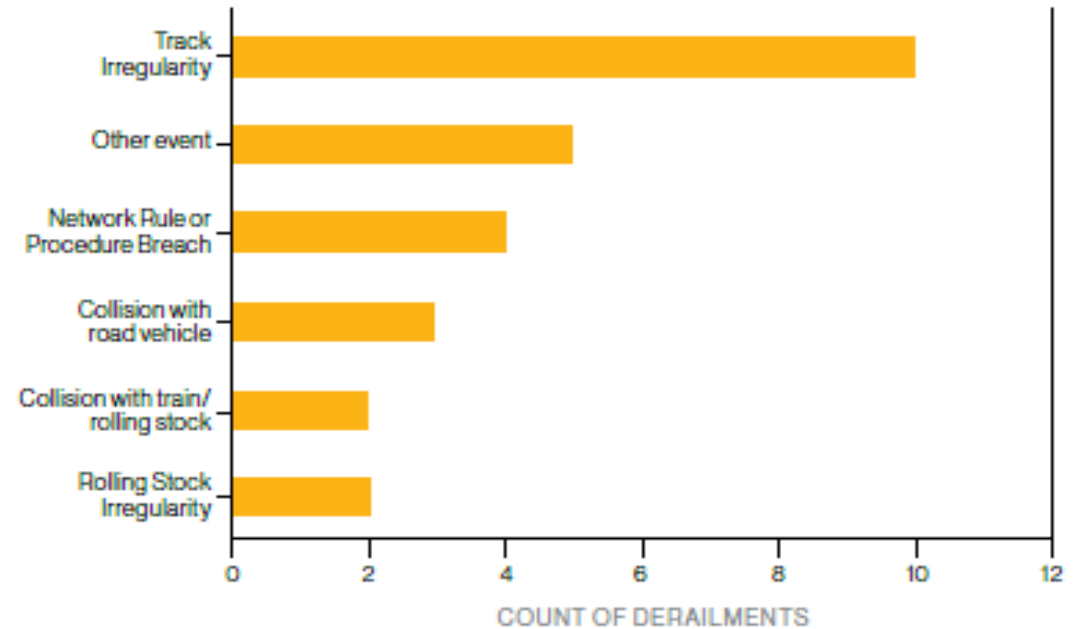
CATEGORY B

- 4 PASSENGER, 19 TRAM & 26 FREIGHT TRAIN DERAILMENTS
- 5 TRAIN COLLISIONS & 9 COLLISIONS BETWEEN TRAMS
- 39 TRAIN & ROAD VEHICLE COLLISIONS AT LEVEL CROSSINGS

Tram Running Line Collisions



Freight Train Derailment (proximal cause)

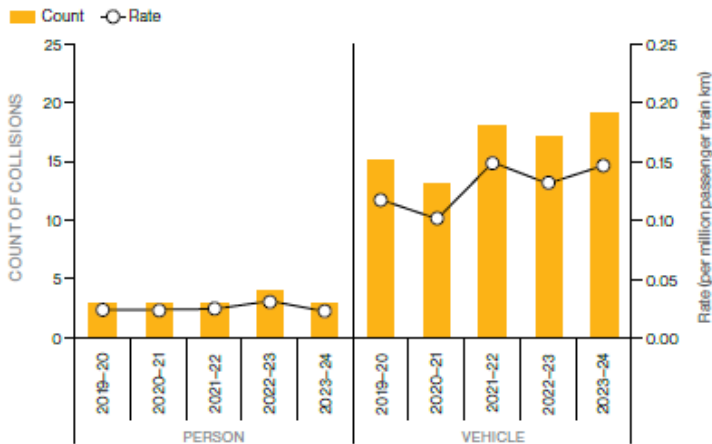


LEVEL CROSSINGS

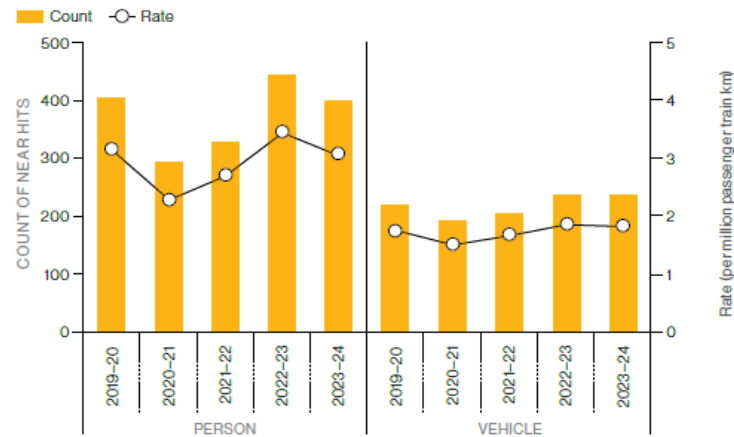
In 2023-24 ...

- Two workers and five members of the public fatally injured
- Four workers and three members of the public seriously injured
- 39 collisions between passenger or freight trains and vehicles

Level Crossing Collision - Passenger Train

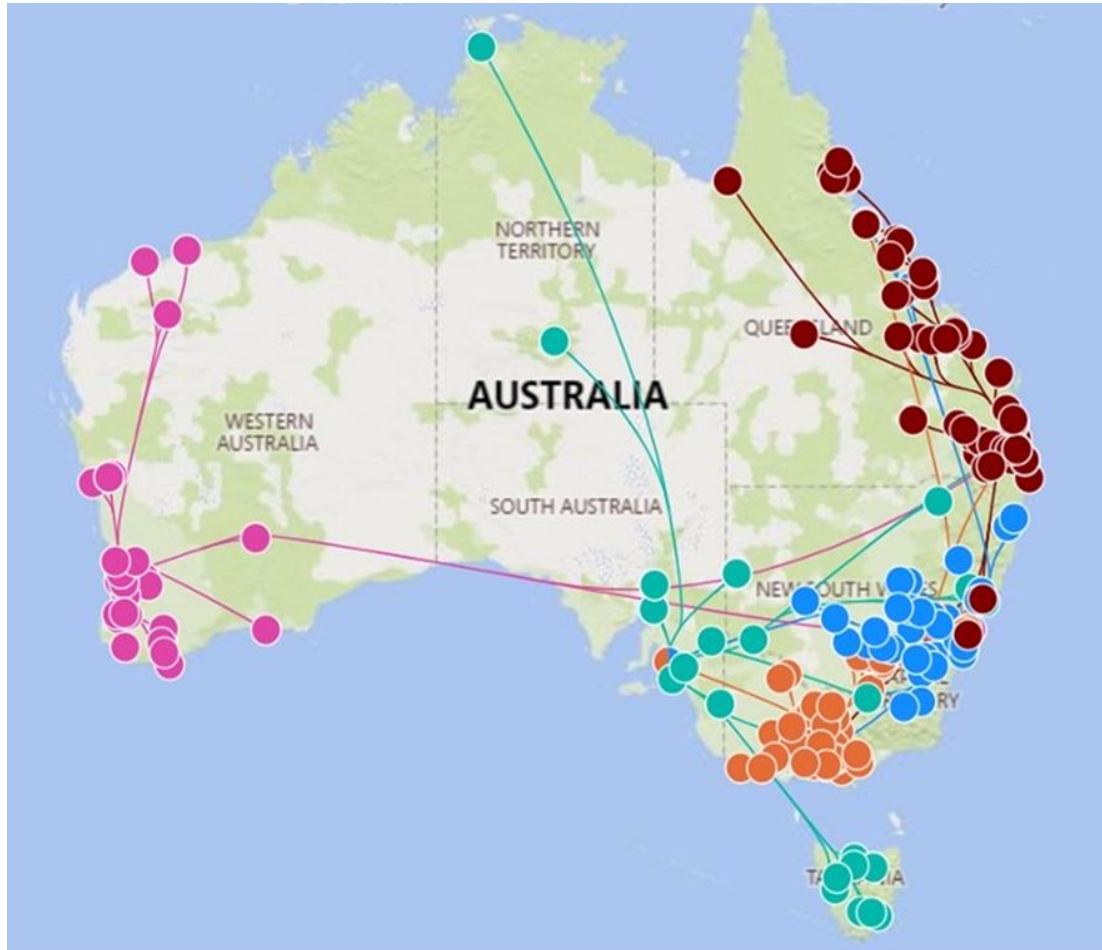


Level Crossing Near Hit – Passenger Train





CASE STUDY – COMPLIANCE ACTIVITIES AND FINDINGS



Insights from our regulatory activities...

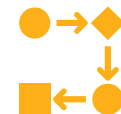
- ❑ From ONRSR's audits & inspections program
- ❑ Across full range of operations across Australia
- ❑ Some common SMS themes across sectors...



Document control & info. management



Risk Management



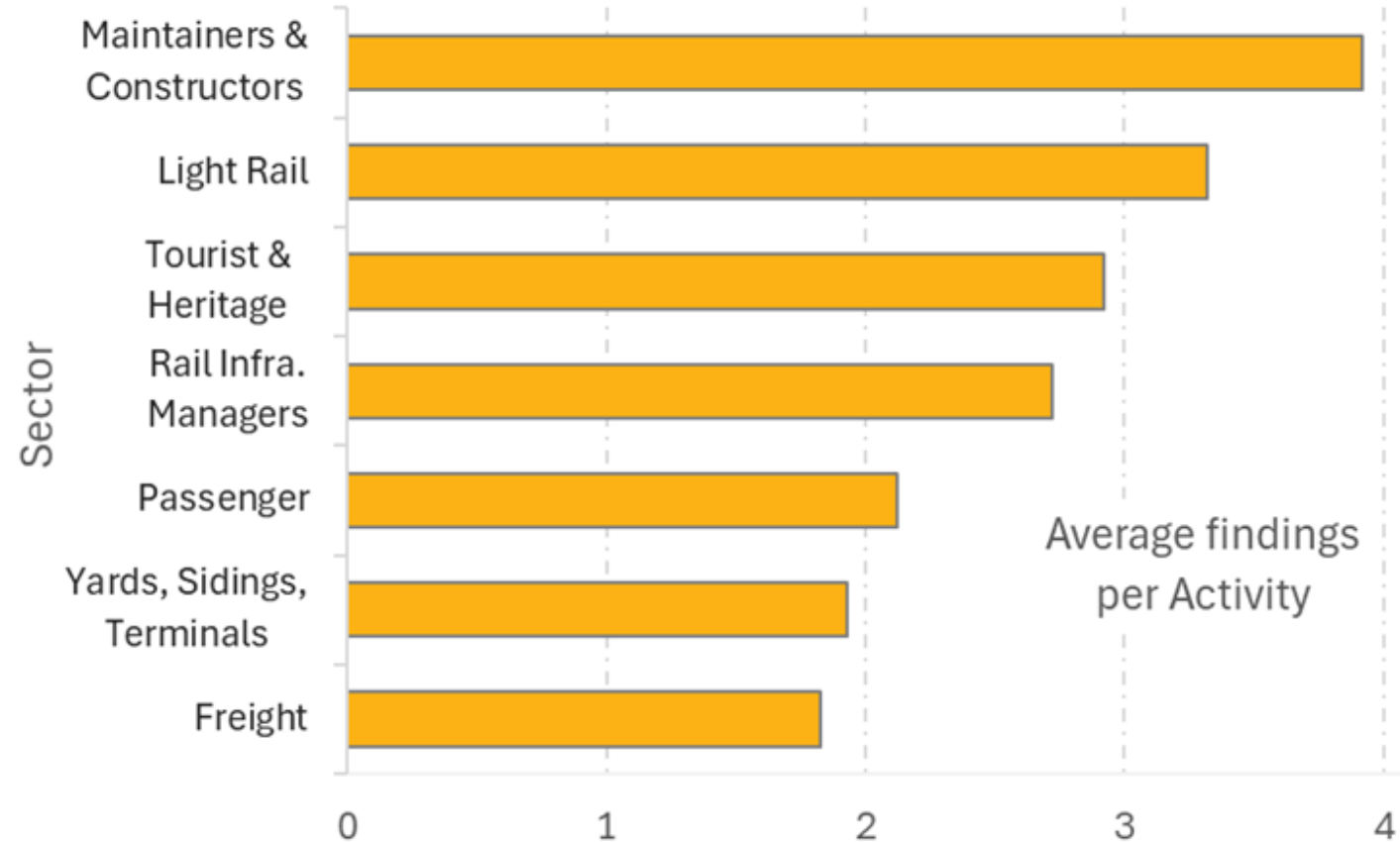
Process Control



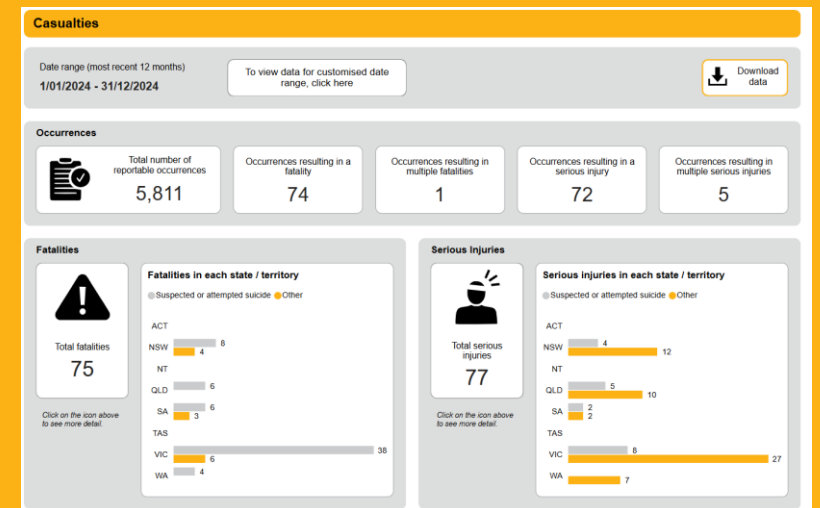
CASE STUDY – COMPLIANCE ACTIVITIES AND FINDINGS

Sector-specific examples...

- ❑ Maintainers & constructors
– high rate of findings
- ❑ Rail Infrastructure Managers
– *Procurement & Contract Management*
- ❑ Yards, Sidings, Terminals
– *RSW competence*



REVAMPED WEBSITE DATA



DEMO

Request for Data

Safety Message: LXs and the Importance of Ongoing Risk Assessment [Read more](#)

ONRSR's Data Analytics team is able to assist with any questions you may have or requests for further data information.

If you require data that isn't found in any of the existing reports published on the [National Rail Safety Data](#) page, you can request data analytical assistance through the Request for Data form below. Once received, a member of the Data Analytics team will be in touch within three (3) business days to discuss the nature and scope of your request.

Information Statement

The Rail Safety National Law and the Rail Safety National Law National Regulations requires rail transport operators to provide a wide range of information to ONRSR including information about safety incidents (via notifiable occurrences) as well as safety concerns that may be of a commercially sensitive nature. This enables ONRSR to be aware of safety issues that warrant regulatory oversight.

ONRSR is subject to strict obligations of confidentiality in relation to the information that it holds.

If you wish to make a request for information held by ONRSR, whether it be safety data or otherwise, please complete and submit the form below to enable your request to be considered.

If you have any questions regarding this Information Statement, please contact ONRSR's General Counsel via email at Corporate.Counsel@onrsr.com.au

National rail safety data

[Key occurrences](#) →

[Industry drug and alcohol testing](#) →

[National priorities data](#) →

[Network statistics](#) →

[Scope and methods](#) →

[Request for Data](#) →

Data Request Form

Name *

DATA REQUEST SYSTEM

www.onrsr.com.au

EXTERNAL STAKEHOLDER DATA WORKING GROUP

HOW CAN WE HELP YOU?

We want to know your data needs!

- Formation of external stakeholder data forum

Aims:

- Understand how can we analyse/distribute our data for your benefit & support you to improve safety
- Showcase new ONRSR data products/initiatives
- Hear about your data journeys
- Collaborate!

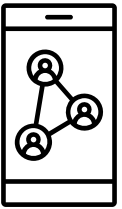
Sign up on our website or via dataanalyticsteam@onrsr.com.au



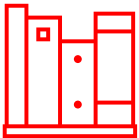
ENGAGE AND INFLUENCE



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