



Australian Government
Australian Transport Safety Bureau

ATSB

Level crossing collisions involving heavy vehicles ATSB Safety Study Update

Presented by

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About the ATSB

Rail Safety Study

RS-2021-001

- Review of level crossing collisions involving trains and **heavy road vehicles** in Australia
- Commenced August 2021
- Full details available on ATSB website (search for RS-2021-001)

Rail Safety Study

RS-2021-001

What is a Safety Study?

- Analyses safety information gathered over an extended timeframe, considering multiple events
- Seeks to provide insight into current and future trends to influence positive safety action

Rail Safety Study

RS-2021-001

Why this Safety Study?

- Several of the most significant level crossing accidents have involved heavy vehicles, and road vehicles are getting larger and heavier:
 - Kerang, Victoria (June 2007, 11 fatalities / 15 injured)
 - Rungoo, Queensland (November 2008, 2 fatalities / 10 injured)
 - Larpent, Victoria (July 2016, 20 injured)

Rail Safety Study

RS-2021-001

Why this Safety Study?

- Higher potential for severe consequence
 - Rail passenger and crew
 - Road driver and passengers
 - Infrastructure and vehicle damage
- Enables use of TSI powers to collect additional information
- Larger data set can be considered

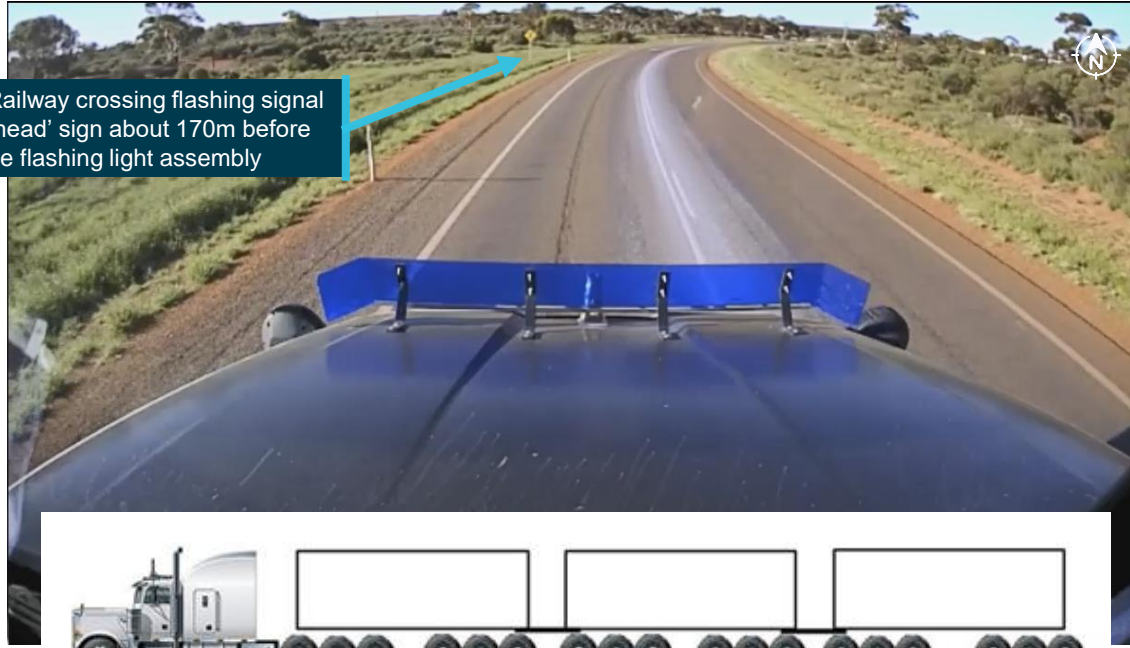
Case in Point

RO-2021-003



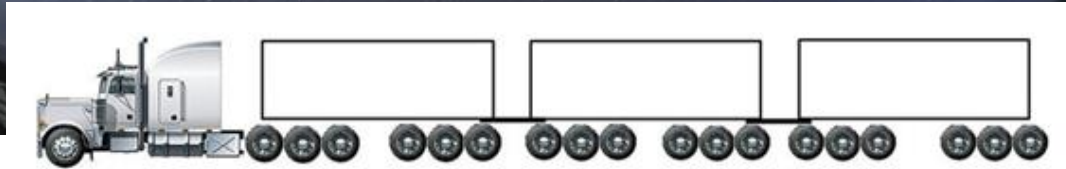
Case in Point

RO-2021-003



'Railway crossing flashing signal ahead' sign about 170m before the flashing light assembly

- 148-tonne A-Triple road train
- Driver distracted
- Did not identify flashing lights (indicating inbound train)



Case in Point

RO-2021-003



- Geometry of road meant driver would need to look ahead and across to see lights at crossing
- Report notes level crossing is consistent with Australian Standard

- RO-2014-024 – Collision between truck and passenger train 8042 at Woodvale, Victoria, on 19 December 2014
- RO-2015-016 – Level crossing collision between freight train 8834N and road-train truck, Tullamore Rd, Narromine, NSW, on 23 September 2015
- RO-2016-009 – Level crossing collision between truck and passenger train 8753, Phalps Road, Larpent, Victoria, on 13 July 2016
- RO-2017-005 – Level crossing collision between freight train 8426N and road-train truck, Cobb Highway, Ivanhoe, NSW, on 11 July 2017
- RO-2017-011 – Level crossing collision between freight train 8279 and truck, at level crossing 5318 near Yalboroo, Qld on 29 August 2017
- RO-2020-004 – Level crossing collision between freight train 5KQ7 and a road coach at Norlane, Victoria on 2 April 2020
- **RO-2021-003 – Level crossing collision between freight train 2C74 and road-train truck, Yarri Road, Parkeston, WA, on 22 February 2021**
- RO-2022-007. Collision between passenger train and truck at North Goornong, Victoria, on 13 July 2022

Preliminary Data

Preliminary Data

RS-2021-001

47 accidents from July 2014

- Road vehicles involved:
 - 44 trucks
 - 3 passenger coaches
- Rail vehicles involved:
 - 15 passenger trains (8 urban, 5 non-urban, 2 heritage)
 - 31 freight trains
 - 1 other

Preliminary Data

RS-2021-001

47 accidents from July 2014

- Crossing types:
 - 23 active crossings
 - 11 lights and boom gates
 - 12 lights only
 - 23 passive crossings
 - 19 stop signs
 - 5 give way



Preliminary Data

RS-2021-001

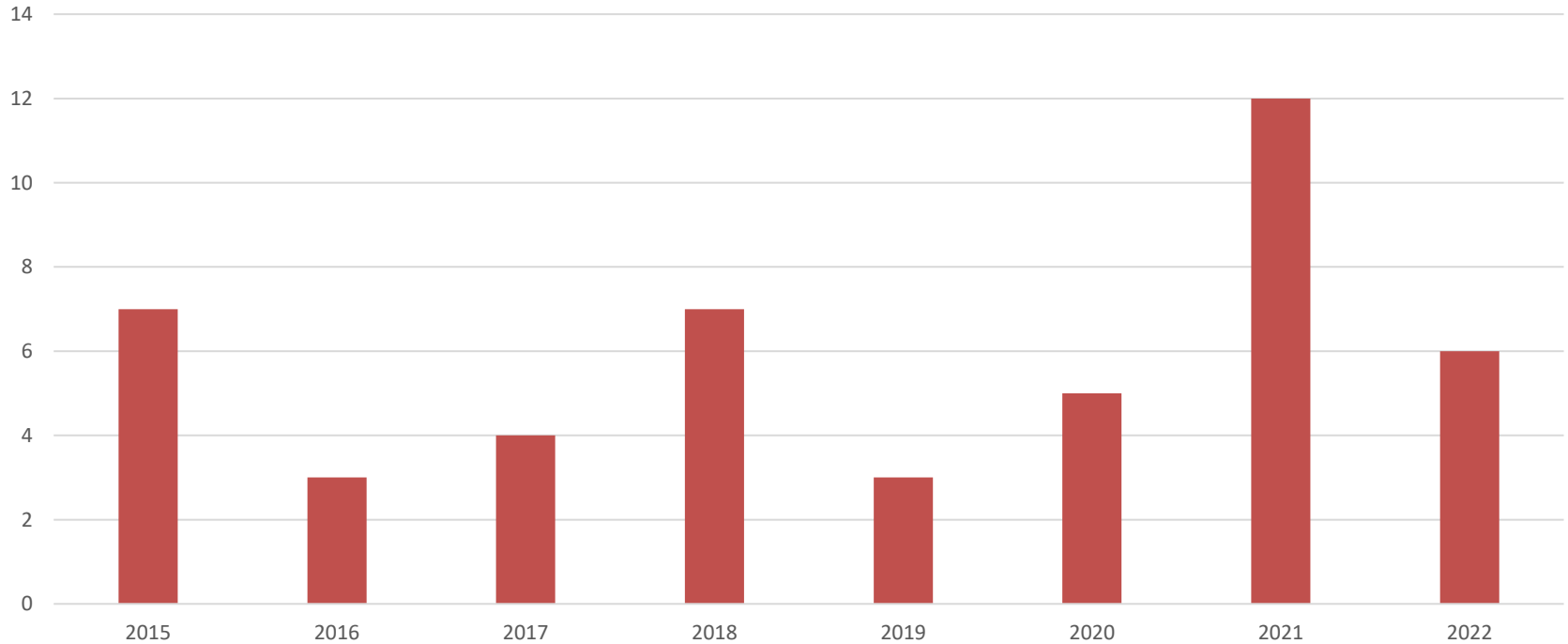
- For each occurrence, ATSB has sought information from:
 - Rail operator
 - Infrastructure manager
 - Level crossing sighting surveys
 - Police reports
 - Other records
- Some limitations to data availability

Preliminary Data

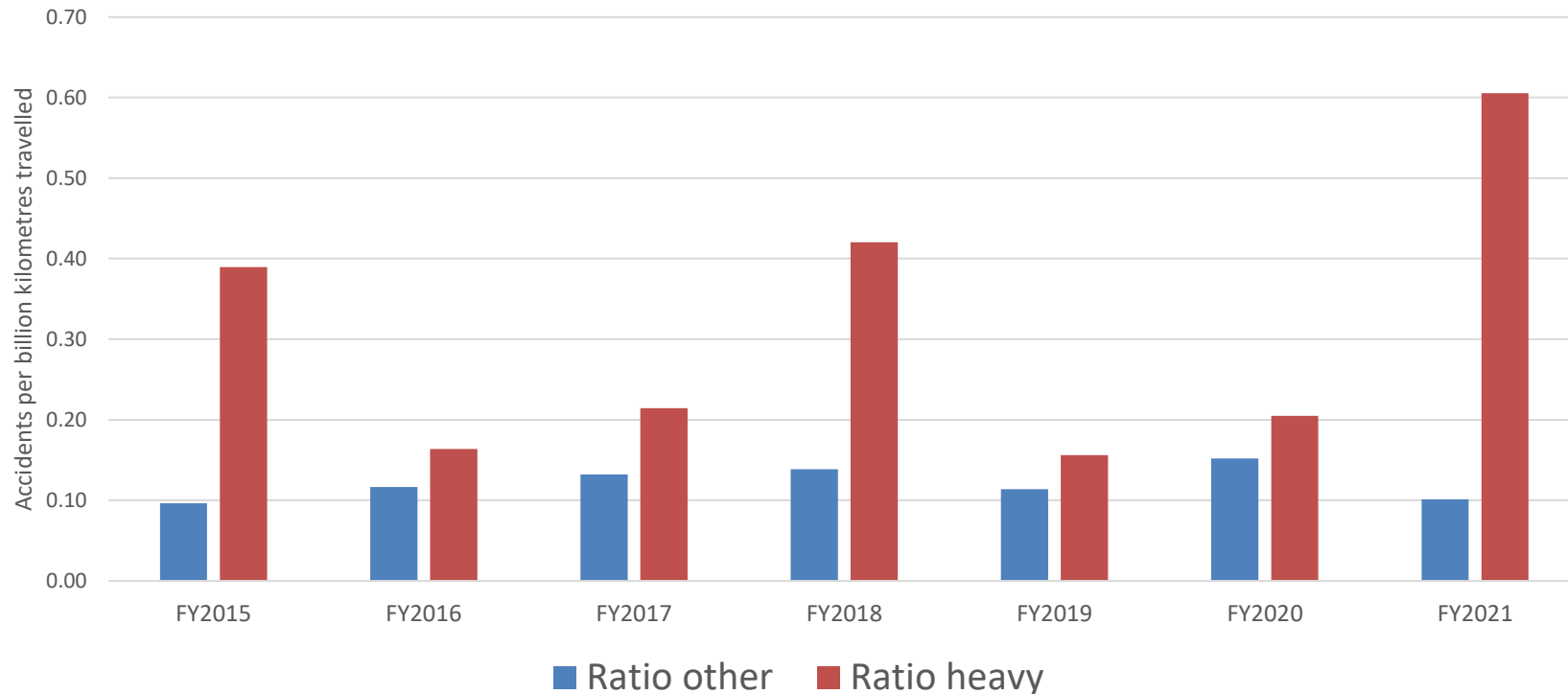
RS-2021-001

- Seeking to identify common characteristics, circumstances, and safety factors
- Considering:
 - Accident sequence
 - Types of protection
 - Environmental factors
 - Collision geometry and speeds
 - Types of vehicles and operators
 - Traffic levels
 - Conspicuity of rail vehicles

Level crossing collisions involving heavy vehicles (financial year)

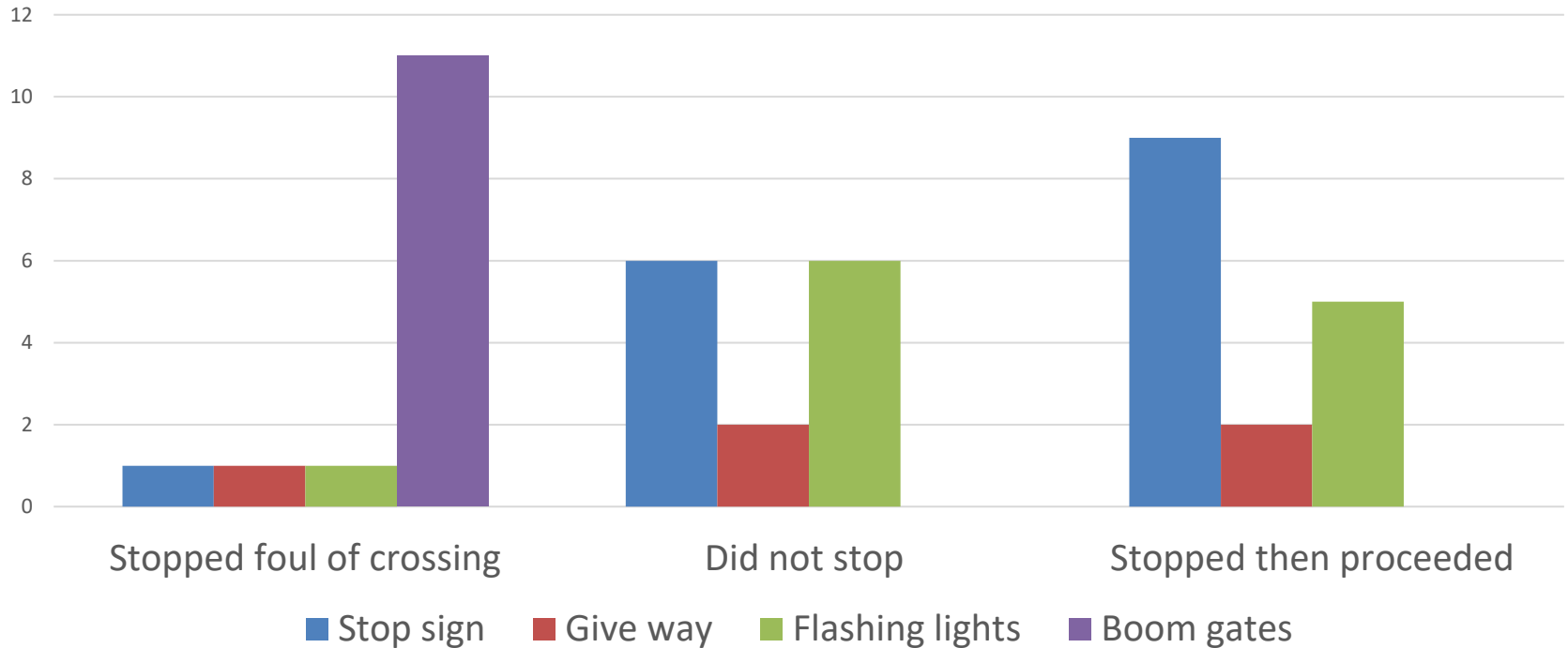


Level crossing collisions per billion kilometres travelled¹ Heavy vehicles vs. Other vehicles

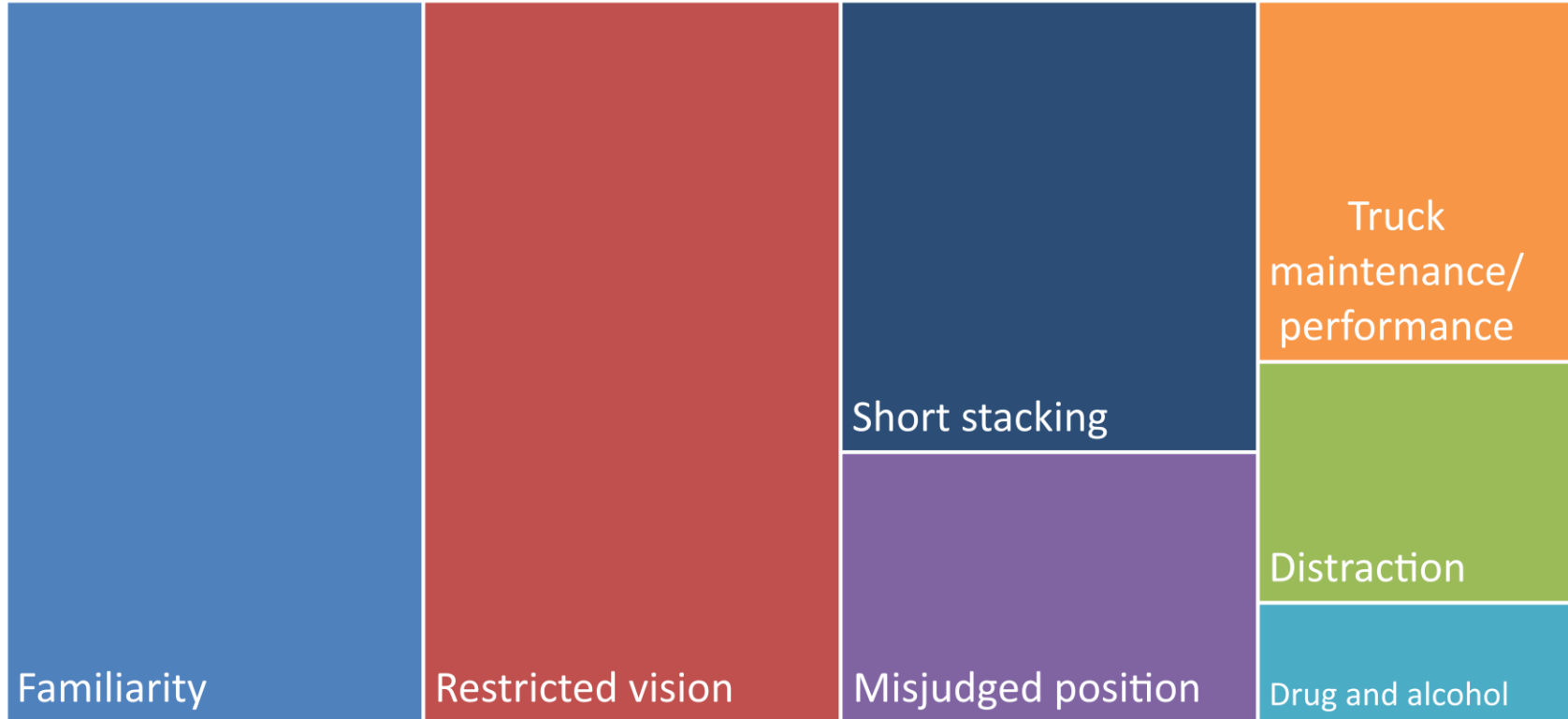


Note [1]: Distance travelled per year sourced from BITRE Australian Infrastructure and Transport Statistics Yearbook 2021, table 6.3

Level crossing heavy vehicle accident forms by crossing type, 2014-2022

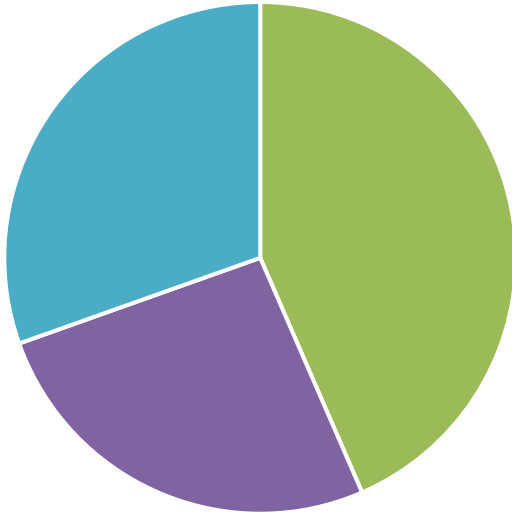


Identified causal factors: level crossing accidents

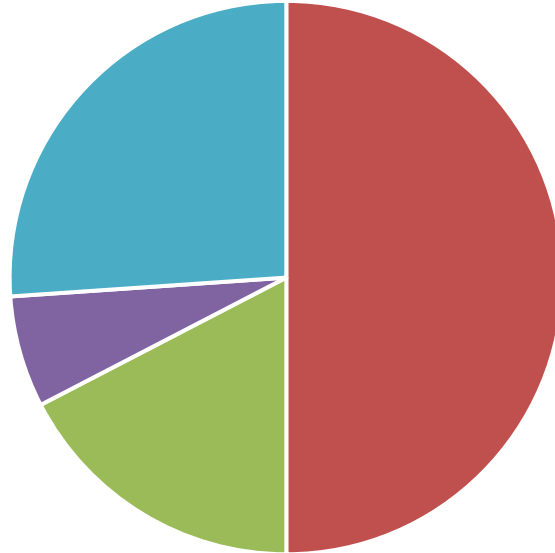


Consequence data

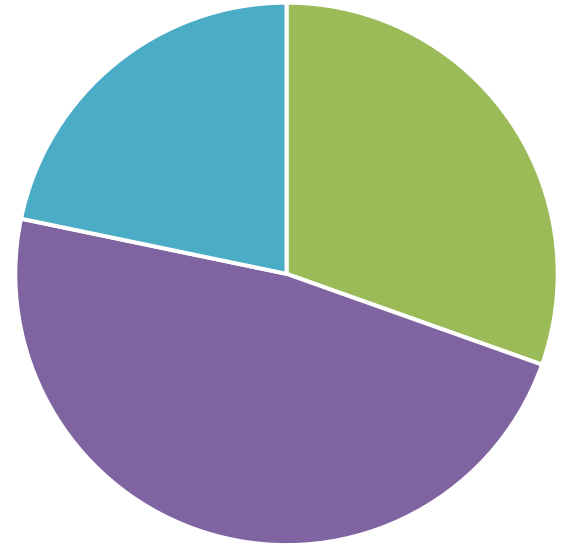
Rail vehicle damage



Infrastructure damage



Road vehicle damage

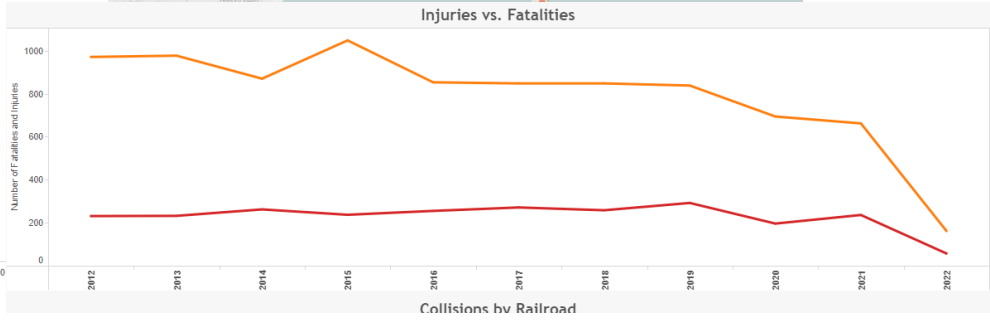
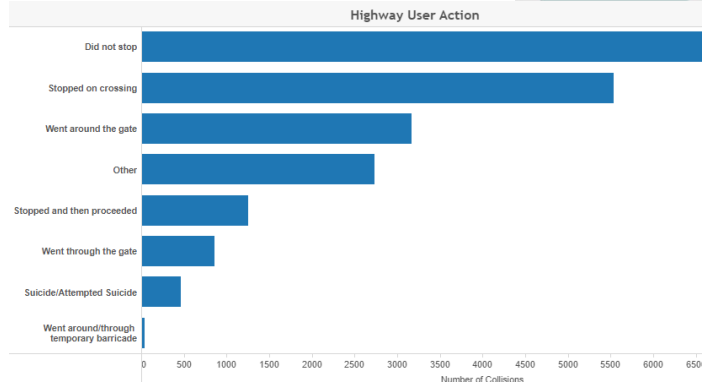
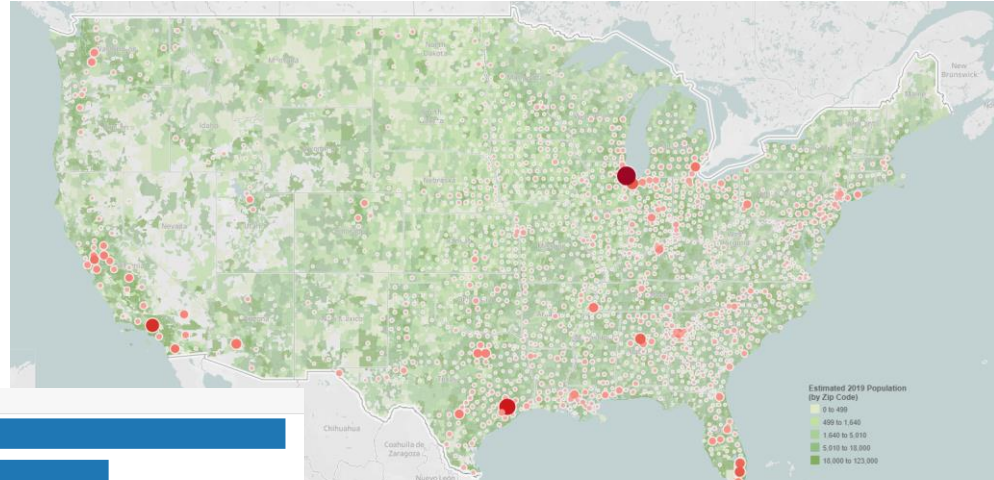
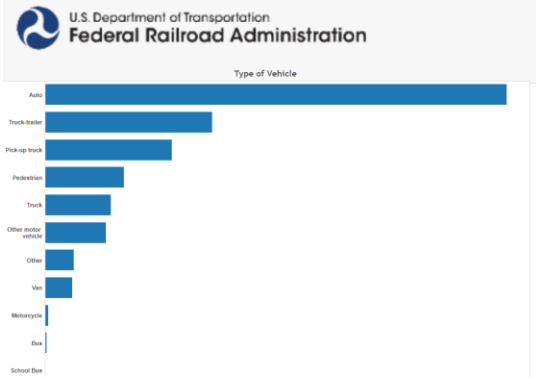


■ None ■ Minor ■ Substantial ■ Unknown

Additional sources

- Other sources for the dynamics of heavy vehicle collisions at level crossings
- US Federal Railway Authority database
 - 21,048 collisions, 4,879 involving heavy road vehicles
 - More collisions, richer data on collision variables
 - Preliminary assessment: *Heavy vehicle collisions result in more damage to track and rollingstock, more injuries to rail occupants, more likely to derail*

Additional sources



Collisions by Railroad

Next steps...

- Finalising Australian data set
 - Where necessary seeking additional information (not contained in investigation reports)
- Analysis of key characteristics, common themes, indications limitations with level crossing protection systems
- Analysis of international (US) data

More information

www.atsb.gov.au

- information about the ATSB, investigation process, brochures
- rail investigation reports, active investigations

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