The Department of Transport and Main Roads is Queensland’s Rail Safety Regulator. We work with the rail industry to enhance rail safety by:

- conducting regular safety audits of operators
- investigating rail safety incidents
- overseeing compliance with rail safety legislation
- working with rail operators on potential opportunities to improve safety management
- collecting and analysing rail safety incident statistics
- developing rail safety legislation and policies
- providing research support on rail safety issues.

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Our vision

The long-term vision of the *Queensland Level Crossing Safety Strategy 2012-2021* (the Strategy) is zero harm at level crossings across Queensland.

To this end, in 2012-2021, the Strategy aims to:

- eliminate level crossing collisions
- reduce the number of near miss incidents at level crossings
- minimise the impact of any incidents that occur.

Our purpose

In 2012 the Queensland Government released the *Queensland Level Crossing Safety Strategy 2012-2021* (the Strategy) as a commitment to further improving safety outcomes at rail level crossings. This ten year strategy is being implemented at all public level crossings across Queensland, including pedestrian crossings. The Strategy excludes private (occupational) crossings and crossings that are part of the cane rail network as these are considered to be a workplace health and safety matter and are managed under separate arrangements.

The *Queensland Level Crossing Safety Group* (QLCSG) provides leadership and overall direction to achieve the objectives of the Strategy. It brings together government and industry stakeholders who have committed to work collaboratively to address 12 areas of strategic focus across three themes: people, vehicles and infrastructure, and knowledge. The Strategy targets a wide range of initiatives including promoting safe behaviour at level crossings, enhancing the visibility and audibility of trains, exploring new technology, improving level crossing infrastructure, and undertaking research and development.

Regular meetings of the QLCSG provide a forum to foster communication, information sharing and collaboration between these road and rail stakeholders, and to ensure that a focus on level crossing safety remains a key feature of each organisation’s work program. Additionally, it provides the opportunity to discuss, debate and develop strategies regarding prevailing issues in the rail industry such as the development of interface agreements, proposed changes to sighting distances at level crossings in the Australian Standard or changes to rail safety law.

The QLCSG develops an action plan with key deliverables for each financial year and reports to the Minister for Transport and Main Roads on the outcomes.

Our members

Members of the QLCSG are representatives from state and local government and industry organisations responsible for the delivery or maintenance of road and rail level crossing safety in Queensland. Members include:

- Department of Transport and Main Roads (TMR):
  - Land Transport Safety Branch (Chair)
  - Translink
  - Program Delivery and Operations Branch
  - Engineering and Technology Branch
- Queensland Rail
- Aurizon
- Local Government Association of Queensland
- Queensland Police Service
- Australian Rail Track Corporation
- Queensland Trucking Association
- Australian Sugar Milling Council (Observer)
Context

A reliable state transport network is vital for connecting people, places, goods and services. It is in everyone’s interest that road and rail users work together to make Queensland’s network as safe and efficient as possible.

Level crossing collisions usually represent less than one per cent of the national road toll but a high percentage of rail fatalities, and is the biggest risk for rail operators. All level crossing collisions are ultimately avoidable and any collision at a level crossing has the potential to be catastrophic, so a strong safety strategy is vital. Deterring level crossing misuse is an ongoing goal for the government and rail authorities to prevent lives being put at risk, as well as to minimise major delays for passengers and motorists and the high cost to industry and the public through damage and disruption.

The implications of level crossing incidents extend beyond person and property costs. There are also significant socio-economic costs resulting from train passenger delays, road vehicle delays, vehicle unavailability and significant infrastructure replacement and repair costs.

Under the Strategy, level crossing safety is very much a joint responsibility between rail infrastructure owners, such as Queensland Rail and Aurizon, and local and state governments.

Statistics

- At 30 June 2014, there were 8,991 kilometres of rail track in Queensland.
- On this track there were approximately 1,400 public rail level crossings.
- In 2013-2014 there were nine collisions at public level crossings, seven with road vehicles and two with pedestrians.
- In 2013-2014 there were 327 reported near misses at public level crossings, that is, when no collision occurred but where the driver of a moving train takes emergency action to avoid impact with a road vehicle or person.
- There was one fatality and two serious injuries caused by incidents at public level crossings in 2013-2014.
- In 2013-14 there were 146 reported boom strikes.

Performance indicators

The two overall performance indicators for the Strategy are:

- number of collisions and near misses (normalised)
- number of deaths and hospitalisations (normalised).

<table>
<thead>
<tr>
<th></th>
<th>2011-2012</th>
<th>2012-2013</th>
<th>2013-2014</th>
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<tbody>
<tr>
<td></td>
<td>Number</td>
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<td>1</td>
</tr>
<tr>
<td>Total casualties</td>
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<td>0.11</td>
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</tr>
</tbody>
</table>

*Note: Data for collisions and near misses normalised per 1,000,000 train kms travelled
Data for fatalities and serious injuries normalised per 100,000 population*

Table 1: Number and normalised rates of safety occurrences at public level crossings.
Queensland Level Crossing Safety Strategy: Achievements so far

There has been a reduction in risk with approximately 200 fewer public level crossings in Queensland since the Strategy was launched. This has been achieved by closing level crossings where possible, three grade separations being completed, the closure and decommissioning of the Monto-Mungar branch line and by promoting the goal within the Strategy to not introduce any new level crossings onto the network.

Ongoing targeted campaigns to reduce near misses with pedestrians and vehicles at public level crossings have been successful with a continuing downward trend in near miss statistics since the launch of the Strategy. This is in spite of railway operators promoting a culture of increased reporting within their workforces.

Near misses have steadily decreased, and have reduced by approximately 41% between 2011-2012 and 2013-2014.

Fatalities at public level crossings have also decreased since the Strategy started, reducing by 66% between 2011-2012 (three) and 2013-2014 (one).

Three grade separations have been completed:

- A rail overpass was built at Gracemere, allowing the Somerset and Malchi Road level crossings to be closed on the Aurizon network. This significantly improved the safety for the local community. During 2011, 110 near misses occurred at the Somerset and Malchi Road level crossings in Gracemere, accounting for one third of all near miss incidents at level crossings in central Queensland. This project cost a total of $50 million and was jointly funded by TMR, Aurizon and the Rockhampton Regional Council.

- A road overpass at Robinson Road in Geebung was completed at a cost of $176.4 million, jointly funded by TMR and Brisbane City Council. This level crossing had been named as the worst level crossing in Queensland in the last three RACQ Red Spot Surveys (2004, 2007 and 2010), and a pedestrian was killed at the crossing in 2011. Closing the level crossing has improved safety and alleviated congestion and road network delays.

- A road overpass at Telegraph Road Bracken Ridge was completed at a cost of $80.4 million, jointly funded by TMR and Brisbane City Council. This level crossing had been named as the third worst level crossing in Queensland in the last two RACQ Red Spot Surveys (2007 and 2010), and was known for serious traffic congestion and a significant number of boom strikes and near misses. A 60 metre box rope fauna crossing was also installed as part of the project to protect sugar gliders, squirrel gliders and ringtail possums.
from traffic by allowing them safe passage over the top of the road.

A review of the appropriateness of penalties for breaches of Queensland law in relation to level crossings resulted in the introduction of new offences and penalties under the *Transport Operations (Road Use Management—Road Rules) Regulation 2009.*

From 30 November 2012, a four-point demerit loss, an infringement notice fine of $880 and a maximum penalty of $8,800 for two new level crossing road rules were applied. The new rules relate to:

- damaging rail infrastructure at a railway crossing
- causing an obstruction to trains or other drivers at a level crossing.

Queensland Rail launched the Crosses campaign in June 2012, contributing to a 33% drop in the number of near misses at level crossings across their network in 2012-2013. The campaign has continued to be used and near misses have continued to decrease across the Queensland Rail network.

In 2012 high load detectors were installed by Aurizon at two level crossings in Blackwater and Dingo that had had repeated incidences of heavy vehicles and machinery dewirements, causing considerable safety issues, delays and infrastructure replacement costs. Since their installation there have been no further truck and overhead wire collisions at the Ardurad Road level crossing.
2013-2014 Highlights

The collaborative focus on level crossing safety by government and industry under the Strategy has resulted in a wide range of positive safety initiatives and an improvement in the performance indicators in 2013-2014. Highlights included:

- In 2013-14 there were nine collisions at public level crossings in Queensland. Seven were with road vehicles and two were with persons. This is two fewer collisions than the 11 reported in 2012-2013.

- Near misses reported on the network reduced substantially by 27.5% between 2012-2013 and 2013-2014 (from 451 to 327). This is an improvement from the 19% reduction from 2011-2012 to 2012-2013.

- Queensland Rail’s 2013-2014 program of open level crossing improvements funded by the Rail Transport Service Contract continued. TMR provided $2.27 million in 2013-2014 to fund works including maintaining and replacing boom mechanisms and level crossing signage, pedestrian crossing installations and pedestrian crossing upgrades.

- Queensland Rail undertook a trial of modified camera technology at the Cooran level crossing in order to gather footage of an evidentiary standard for a simpler and more effective enforcement regime. If the trial is successful, Queensland Rail plan on rolling the technology out to all regional level crossing camera equipment.

- Queensland Rail recovered over $100 000 in costs resulting from level crossing incidents during 2013-2014 to compensate for replacement infrastructure and to deter future misbehaviour at level crossings.

- During 2013-14 TMR, in conjunction with Queensland Rail, started the Level Crossing Congestion Project to look at ways to reduce worsening road congestion (due to increases in both the number of road users and train frequency) and related driver misbehaviour around level crossings in greater Brisbane, while maintaining safety levels. This project brings road and rail engineers together to share their expertise and create solutions that benefit the transport system holistically.
Year in review: Our performance

Key Area 1 – Coordinate level crossing services

Coordinate level crossing activities state-wide through the Queensland Level Crossing Safety Group.
Contribute to the coordination of level crossing safety activities Australia-wide through membership of national bodies.
Finalise the interface agreements providing for the coordination of risk management at individual level crossings.

Queensland based activities

Regular quarterly meetings of the QLCSG during 2013-2014 provided a forum to foster communication, information sharing and collaboration between road and rail stakeholders, and an opportunity to keep a focus on level crossing safety issues across Queensland. It also provided the opportunity to discuss, debate and strategise about prevailing issues relating to level crossing safety. In 2013-2014 this included finalising interface agreements, proposed changes to sighting distances in the Australian Standard 1742 and changes to rail safety law.

Australia-wide activities

Members of the QLCSG also contributed to Australia-wide level crossing safety activities through membership and/or contributions to the Australian Level Crossing Assessment Model (ALCAM) Group, Rail Industry Safety Standards Board (RISSB), the Australian Railway Association (ARA), TrackSAFE Foundation and the Cooperative Research Centre for Rail Innovation (Rail CRC).

In March 2014, representatives from TMR, Queensland Police Service, ARTC, Aurizon and Queensland Rail attended the inaugural Australasian Railway Level Crossing Safety Forum in Melbourne. More than 90 representatives from 40 different organisations attended the two day workshop, hosted by V/Line and Public Transport Victoria. The aim of the forum was to bring together key stakeholders from the rail and road industries, government, research bodies and Police to share their knowledge on level crossing safety work, especially around education and awareness, infrastructure and technology, data management and enforcement, and how these can influence behaviour.

Participants agreed that a National Railway Level Crossing Safety Committee should be formed with an initial focus on the development of a new National Level Crossing Safety Strategy, drawing on the previous strategy and existing strategies in state jurisdictions. It was also determined that the ideas from workshops held during the forum would be used to develop a work program to support the new national strategy.

Moving forward on level crossing safety issues requires a collaborative road, rail, and all levels of government approach, and it was decided that an annual Railway Level Crossing Safety Forum will be convened to allow adequate sharing across jurisdictions. QLCSG members will continue to participate in these forums.

Interface agreements

The Transport (Rail Safety) Act 2010 requires rail infrastructure managers and road managers to seek to enter into an interface agreement for road and rail crossings.

An interface agreement is a written agreement between road and rail managers for managing risks to the safety of both road and rail traffic at these crossings. It is intended to ensure risks arising from rail
crossings are identified, measures to manage those risks are determined and accountabilities for risk control measures are clearly articulated.

Rather than a one-off process, interface agreements are intended to be ‘living documents’ that will require ongoing monitoring of risks, including regular audits to ensure that agreed control measures continue to be appropriate.

In February 2014, the QLCSG endorsed a letter and fact sheet that went to all local councils who had not yet finalised their interface agreements, to assist them to understand the legislative requirements.

The majority of interface agreements have now been signed off. Some parties are still in negotiations about what should be included in the agreement, although all rail and road managers are considered to be meeting their obligation to ‘seek to enter’ into an agreement at this time. If either party does not believe this to be the case, the Chief Executive Officer of TMR may issue a notice to the party, directing them to comply. If the rail or road manager does not comply with this direction, the Chief Executive Officer may decide the arrangements that are to apply regarding managing the risks identified and direct the parties involved to give effect to those arrangements within a specified time.

**Key Area 2 – Increase public awareness**

- Promote level crossing safety through general and targeted public awareness campaigns that promote overall road safety and rail safety.
- Promote level crossing safety through National Rail Safety Week.

A range of level crossing safety public awareness campaigns were initiated, promoted and sponsored by QLCSG members.

Members participated in the 2013 Rail Safety Week (12-18 August 2013). The theme, ‘Train Yourself’ encouraged people in a positive way to take responsibility to be aware, alert and educated around railway lines, level crossings and train stations. It reinforced the fact that the onus is on the individual to always obey the rules at level crossings and to Stop, Look, Listen and Think.

Members conducted safety-related activities including school visits and competitions, internal safety activities, staff briefings, increased monitoring and enforcement at railway level crossings, as well as awareness raising advertising campaigns.

Queensland Rail continued its successful Crosses public education campaign to draw attention to the dangers and potentially serious consequences of taking risks at level crossings. The crosses campaign urges pedestrians and motorists to act safely near trains and tracks through the tagline: ‘Don’t gamble with your life at level crossings’.

**Images from Queensland Rail’s Crosses campaign**

Don’t gamble with your life at level crossings
Queensland Rail also continued their Railsmart school and community education projects. The Railsmart program aims to positively influence people’s attitude and behaviour on and around trains, tracks and rail property, and encourage community members to take responsibility for their own safety and that of others. Queensland Rail’s Education Unit offers school and community visits across the state where they deliver a proactive message of safety at or near railway lines, as well as free online resources.

Aurizon has been working closely with the Queensland Police Service to target the top ten level crossings on the Central Queensland Coal Network, which have had the highest number of near misses and collisions over the recent year. Aurizon also continued their Driver’s plea campaign.

Key Area 3 – Address risk to specific population groups

- Address risk to young people, seniors and pedestrians through road and rail safety public awareness campaigns.
- Where possible, install lockable gates to prevent pedestrians from forcing gates open when a train is in the vicinity.

Queensland Rail Customer Engagement Officers undertook a series of integrated school and station visits across the City network, specifically targeting schools and stations with high numbers of student incidents. Transit Officers and Senior Network Officers were also deployed to high risk locations over a four week period at the start of the school year to monitor student behaviour and enforce legislation around level crossing safety during the morning and afternoon peak periods.

Other population groups were targeted as part of the public awareness campaigns discussed in Key Area 2.

Queensland Rail engineers have designed a new safety lock being trialled on pedestrian gates at Murarrie, Morayfield, Woodridge and Wynnum Central to prevent people pushing through the unlocked emergency gates. This has been funded under the Transport Service Contract (Rail Infrastructure) between TMR and Queensland Rail.
Key Area 4 – Enforce the law

Enforce the road rules relating to level crossings through traffic policing.

Consider amending state legislation to provide for use of level crossing safety cameras.

Install safety cameras at selected level crossings.

There is a high cost to the rail industry and the community from incidents at level crossings caused by road user behaviour resulting in significant infrastructure replacement and repair costs. Queensland Rail actively pursued motorists for the cost of repairing level crossing equipment during 2013-2014. More than $100,000 was recovered from motorists for property damage during that time.

Queensland Rail and Aurizon continued to have active CCTV cameras installed at high risk level crossings on their networks. During 2013-2014 Queensland Rail undertook a trial of modified camera technology at the Cooran level crossing in order to gather footage of an evidentiary standard for a simpler and more effective enforcement regime. If the trial is successful, Queensland Rail plan on rolling the technology out to all regional level crossing cameras.

The Queensland Police Service has worked actively with rail transport operators during 2013-2014 to target high risk level crossing locations to educate drivers and pedestrians about level crossing safety, and to enforce the law against those who willfully disobey the law.

Aurizon has been working closely with the Queensland Police Service to target the top ten level crossings on the Central Queensland Coal Network, which have had the highest number of near misses and collisions over the recent year.

TMR has submitted a proposal to the Australasian Centre for Rail Innovation (ACRI) to undertake research on introducing camera detected offences at level crossings. While there are studies dealing with the effectiveness of red light cameras and speed cameras used as deterrents to risky behaviour on the road, there is minimal research into the use of camera detected offences at rail level crossings. TMR has proposed the ACRI research should therefore focus on the following questions:

- What evidence-based strategies, including camera detectable offences, have had positive impacts on driver and other road users’ behaviour at rail level crossings?
- How effective is the use of cameras in reducing the incidence of traffic violations at level crossings in Australia and overseas? In particular, does the use of camera detected offences reduce the rate of level crossing incidents?
- What type of camera set up (e.g. mobile units, fixed cameras, etc) would be most effective and appropriate for level crossings in Australia?
- What costs and legislative options are involved in implementing enforcement measures at level crossings through camera detected offences?

This research is proposed to be undertaken in 2014-2015. The QLCSG will consider the outcomes and how to proceed once it has been completed.
Key Area 5 – Equip trains, train crews and road vehicles to reduce risk

Assess the potential to apply new vehicle-to-vehicle warning systems as they become available.

Continue support for the Australian Design Rules as an instrument in enhancing road vehicle crashworthiness.

TMR, in collaboration with Queensland Rail, continued the trial of innovative technologies to evaluate whether they have a positive effect on driver behaviour at level crossings. All three suppliers worked with Queensland Rail and Aurizon to complete the installation of their systems during 2013-2014.

Live trials on the Queensland Rail network started in mid-2013, with two radio break-in systems and a solar-powered lighting system being trialled across five sites around Queensland. These were:

- La Trobe University’s Dedicated Short Range Communication based Intelligent Transport System - a radio break-in technology that allows vehicles, trains and infrastructure to “talk” to one another in real-time and alert vehicle drivers (two trial sites between Charters Towers and Townsville).
- NFA’s radio break-in Pixie system - a radio break-in system where a transmitter sends a signal to a car radio (similar to that used in tunnels), to alert the driver of their proximity to a train (one trial site near Dalby).
- Railnet’s solar powered signs - an innovative solar powered lighting and signage system to warn motorists of approaching trains by activating flashing lights (two trial sites at Lanefield and Thallon).

The Cooperative Centre for Rail Research and Innovation (Rail CRC) is evaluating the trials to determine the types of systems which may be effective in changing road driver behaviour and reducing safety risks at level crossings in Queensland. The evaluation report is expected to be completed by the end of 2014.

QLCSG members continued to support the Australian Design Rules as an instrument in enhancing road vehicle crashworthiness.

Railnet’s trackside and advanced warning signs being trial at Lanefield.
Key Area 6 – Reduce heavy vehicle risk

- Ensure approvals for heavy vehicle use of roads will not increase level crossing risks.
- Enforce multi-combination vehicle compliance with level crossing rules, route use requirements and heavy vehicle performance based standards.

The National Heavy Vehicle Regulator (NHVR) aims to ensure that all relevant state and local government road managers have assessed the infrastructure impacts and provided their consent for the heavy vehicle movement. The law also requires that applicants must first obtain the consent of other third party agencies, such as railways and electricity providers, before the Regulator can issue a permit.

The establishment of the NHVR has initiated a period of change as to how the different road and rail stakeholders interact. During 2013-2014 TMR established a new working group to manage these issues. The Strategy’s action items relating to heavy vehicle compliance at level crossings have been forwarded to the new Heavy Vehicle Working Group to consider. A report back to the QLCSG is expected in the near future.

Key Area 7 – Maintain and improve level crossing infrastructure

- Continue the assessment of risk through application of the Australian Level Crossing Assessment Model (ALCAM).
- Maintain a dedicated ongoing program of public open level crossing improvements funded by the Queensland Government.
- Continue to target additional Australian and Queensland Government programs as an opportunity to fund public open level crossing improvements.

Queensland Rail, Aurizon and ARTC continued to use ALCAM to assess the risks at their level crossings during 2013-2014.

TMR provided $2.27 million under the Rail Transport Service Contract to fund safety improvements at public level crossings and pedestrian crossings on the state supported rail network in 2013-2014. Works included maintaining and replacing boom mechanisms and level crossing signage, pedestrian crossing installations and pedestrian crossing upgrades.

TMR continued to target any government programs that could provide an opportunity for additional funding for public level crossing improvements.

Key Area 8 – Control level crossing environments

- Where appropriate, reduce road speeds in the approach to level crossings.
- Ensure local planning approvals do not increase risk at level crossings.

During 2013-2014 TMR researched the impact of reducing road speeds on the approach to level crossings in order to provide advice to the QLCSG on whether there is evidence to show it would be a low cost program with positive safety outcomes that could be implemented by TMR.
Road speeds on the approach to 10 level crossings were reduced by Roadtek in 2012-13. 14 public level crossings on Aurizon’s Newlands Systems have 80km/hr speed limits despite the highway around them having a 100km/hr speed limit. However given the low number of occurrences at these level crossings, there is no statistical evidence available to show whether the speed reductions have had an impact on safety. TMR has now referred this issue to Australasian Centre for Rail Innovation (ACRI) as a potential research topic so further work can be done in this area with meaningful results.

TMR is a concurrence agency for local government development applications and has continued throughout 2013-2014 to provide input about the impacts to level crossing risk arising from development applications.

Key Area 9 – Eliminate level crossings where appropriate

Subject to agreement from stakeholders, close level crossings where appropriate.

When possible, undertake grade separations in high priority locations.

Seek alternatives to the building of new level crossings.

An ongoing goal of the Strategy is to eliminate level crossings where possible, entirely removing the risks associated with them. This can happen when a rail line is moved or closed, a road is moved or a grade separation is undertaken. Removing a level crossing is done in consultation with relevant stakeholders and the local community.

In 2013-2014, two grade separations were completed at Robinson Road in Geebung and Telegraph Road in Bracken Ridge to increase road system efficiency and improve safety.

A road overpass at Robinson Road in Geebung was completed at a cost of $176.4 million, jointly funded by TMR and Brisbane City Council. This level crossing had been named as the worst level crossing in Queensland in the last three RACQ Red Spot Surveys (2004, 2007 and 2010), and a pedestrian was killed at the crossing in 2011. Closing the level crossing has improved safety and alleviated congestion and road network delays.

A road overpass at Telegraph Road Bracken Ridge was completed at a cost of $80.4 million, jointly funded by TMR and Brisbane City Council. This level crossing had been named as the third worst level crossing in Queensland in the last two RACQ Red Spot Surveys (2007 and 2010), and was known for serious traffic congestion and a significant number of boom strikes and near misses. A 60 metre box rope fauna crossing was also installed as part of the project to protect sugar gliders, squirrel gliders and ringtail possums from traffic by allowing them safe passage over the top of the road.
Key Area 10 – Evaluate safety initiatives and investigate incidents

Evaluate new safety initiatives to establish which initiatives may provide significant safety improvements.

Undertake audits of interface agreements between road managers and rail infrastructure managers.

Investigate or assess level crossing incidents, including near misses and respond to findings of investigations as appropriate.

New safety initiatives
TMR, in partnership with Queensland Rail, undertook a $2.1 million trial of three new and innovative rail level crossing safety technologies to evaluate whether they have a positive effect on driver behaviour at level crossings. The independent evaluation reports are expected in the second half of 2014 (see Key Area 5 for more information).

There were 146 boom strikes reported across Queensland in 2013-2014. In March 2014, Queensland Rail introduced new safety procedures to minimise the disruption to train passengers and road users caused by boom strikes. This change has resulted in a significant reduction in delays.

Audits of interface agreements
The finalisation of interface agreements between road and rail managers is in progress (as discussed in Key Area 1). The Rail Safety Regulator plans to commence audits of interface agreements in the second half of 2014.

Investigation of level crossing incidents
TMR, Queensland Rail and Aurizon all collect and analyse data on level crossing incidents and near misses, and investigate occurrences as appropriate.

TMR has a risk-based audit model targeting areas of safety concern. TMR conducts investigations of serious incidents (including level crossing incidents) and makes safety recommendations to reduce the likelihood of further incidents. The implementation of safety recommendations is monitored by TMR’s Rail Regulation Unit until completion.

During 2013-2014 TMR’s Rail Regulation Unit conducted an investigation into the fatality at the Cannon Hill level crossing. On 3 January 2014, a pedestrian was fatally injured while attempting to cross a railway track while the boom gates were down at Cannon Hill. At 6.47am a female pedestrian was struck by a train. Information suggests that the deceased has gone around the active pedestrian protection in place at the level crossing and has then stepped into the path of an express Cleveland bound train which caused fatal injuries.

The investigation established that the rail transport operators’ systems and procedures did not contribute to the rail safety incident.

Level crossings with a high number of incidents are targeted through enforcement activities, media communications, community education, grade separation or crossing closure and engineering improvements.
Key Area 11 – Collect and analyse data to better understand risk

Maintain a high standard of data collection including near miss reporting.

Continue to explore opportunities for greater use of cameras for collecting data.

Undertake effective statistical analysis and provide reports enabling level crossing safety measures to be better targeted.

TMR and the rail industry in Queensland maintained a high standard of data collection, near miss reporting and statistical analysis throughout 2013-2014.

In Queensland, rail transport operators are required to report notifiable occurrences to TMR’s Rail Regulation Unit. The Rail Regulation Unit uses this data to determine risks within the rail industry and to measure rail safety performance.

Incidents at level crossings are reviewed daily and if appropriate, information is sent to the Queensland Police Service to follow up.

TMR and Queensland Rail are working with the data analysis stream of the new National Level Crossing Safety Committee and the Office of the National Rail Safety Regulator to ensure work towards a nationally consistent data collection system is being pursued.

TMR is also investigating how level crossing incident data may be used in conjunction with Google Earth to inform decisions on where safety initiatives need to be targeted.

Using cameras to collect data
TMR contributed funding and in kind support to the Rail CRC’s research project: Establishing baseline rail level crossing incident occurrence and behaviours using video data. Aurizon and Queensland Rail are also working to identify alternative ways to collect data using cameras at level crossings and from in-cab cameras on locomotives, particularly to ensure that data is of an evidentiary standard.

Data collection and analysis in 2013-2014
In 2013-14 there were 9 collisions at public level crossings in Queensland. Seven were with road vehicles and two were with persons. This is two fewer collisions than the eleven reported in 2012-2013.

Of the level crossing collisions with road vehicles in 2013-14, four occurred at crossings protected by active protection (boom gates or flashing lights), three at crossings with passive protection (stop or give way signs) and two at pedestrian crossings protected by pedestrian gates. In all of the circumstances, the road user disobeyed the road rules and the rail operation did not contribute to the incident.

In 2013-14, there was one fatality and two serious injuries reported as a result of level crossing collisions. This is an increase of one occurrence in both categories, from the zero fatalities and one serious injury in 2012-2013.

Along with the level crossing collisions there have also been numerous near misses with both road vehicles and persons reported. A near miss is defined as any occurrence where the driver of a moving train takes emergency action or has insufficient time to take emergency action to avoid impact with a road vehicle or person at a level crossing and no collision occurred. Emergency action includes continuous audible warning and/or brake application.
In 2013-14 there were 327 near misses reported at public level crossings, a decrease of 124 (27.5%) from the 451 reported in 2012-2013. 225 of the near misses in 2013-2014 were with road vehicles and 113 were with people.

An alarming near miss between a car and a 400 tonne freight train near Grandchester in 2009, one of 709 public level crossing incidents on Queensland Rail’s network that year. In 2013 the number of near miss incidents had decreased to 294 on the Queensland Rail network, showing the extensive safety and awareness campaigns around near misses have had a positive effect.

Other level crossing occurrences include boom strikes, which is when a road vehicle collides with the level crossing equipment at crossings protected by boom gates. In 2013-14 there were 146 reported boom strikes. Queensland Rail recovered over $100 000 in costs resulting from level crossing incidents during 2013-2014 to compensate for replacement infrastructure and to deter future misbehaviour at level crossings.

Key Area 12 – Promote research and development

- Trial and evaluate new technologies, with emphasis on low cost solutions and use of Intelligent Transport Systems to enhance level crossing safety.
- Contribute to projects of the Cooperative Research Centre for Rail Innovation (Rail CRC) and development of the national research agenda.
- Monitor current Australian and overseas research and assess its implications for Queensland.

National research agenda

In 2013-14, TMR, Queensland Rail and Aurizon continued to provide financial and in-kind support to the research projects of the Rail CRC. Rail safety related research projects that have been completed by the Rail CRC in 2013-14 included:

- Understanding pedestrian behaviour at level crossings
- Intelligent transport systems for safer level crossings
- Rail incident investigator training and competency framework
- Safety case for driver-only operations.
The Rail CRC closed its research program on 30 June 2014 and was replaced by another research entity, the Australasian Centre for Rail Innovation (ACRI). Other Rail CRC projects relating to level crossing safety, including Low Cost Level Crossing Technology trials, were carried over to ACRI for completion by December 2014.

During 2013-2014 TMR signed on as an ACRI participant, commencing 1 July 2014 and contributing up to $300 000 per year for targeted research projects that can be applied in a Queensland context. TMR has proposed two level crossing related priority topics for research in 2014-2015:

- Introducing camera detected offences at rail level crossings.
- Reducing road traffic congestion while ensuring safety at level crossings in the metropolitan rail network.

TMR regularly monitored current Australian and overseas research in relation to level crossing safety, and how this information could be applied in Queensland. During 2013-2014 TMR and Queensland Rail (together and also as participants of the Rail CRC) also trialled new technologies for level crossing safety as discussed earlier in the report.

**Level Crossing Congestion Project**

During 2013-14 the TMR’s Safer Rail team, in conjunction with TMR’s Engineering and Technology Branch and Queensland Rail, started a project to look at ways to reduce worsening road congestion (due to increases in both the number of road users and train frequency) and related driver misbehaviour around level crossings, while maintaining safety levels. This project brings road and rail engineers together to share their expertise and create solutions that benefit the Brisbane transport system holistically.

There are 47 public level crossings in the greater Brisbane area that are being reviewed as part of this project. All options and treatments that can improve road congestion will be considered including upgrading technology, changing road geometry and/or signage, signalling upgrades, better integration of traffic and rail signals and addressing human factors issues. It is acknowledged that no single initiative is going to solve congestion problems across all the different types of road and rail interfaces, so it is important to identify short, medium and long term options; and to find a way to try and measure the costs and benefits of implementing different treatments at different crossings.

A literature review was also undertaken which showed that research and innovation relating to level crossings has traditionally focussed only on safety, with road congestion or road infrastructure efficiency being a secondary issue. Consequently there isn’t a body of research available that explicitly identifies and documents initiatives to tackle this issue.

A working group was established to explore various options and treatments to reduce road congestion around level crossings in the greater Brisbane area. By the end of June 2014, the project working group has completed:

- the analysis of all available rail and road data that could be an indicator of congestion near level crossings
- a technical review of international best practice in relation to reducing congestion at active level crossings, and considering how these initiatives could be applied in the Southeast Queensland context.

The 47 level crossings being reviewed in the greater Brisbane area.
This work is being used to build a comprehensive level crossing simulation model which can test different treatments at eight level crossing sites. This simulation model will provide snapshots of level crossings that we have never had before. STRC have advised that integration of the road and rail models to provide multi-modal intelligence across the whole Brisbane network like this is a world first. If the modelling shows measurable benefits to road congestion through identified measures, the project could be expanded to include the other 39 crossings, live trials and to implement solutions.