

Transport  
for NSW

# Level Crossing Strategy Council Yearly Report 2021-22

December 2022

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Front cover: LX ID 600 Olympic Highway, Cootamundra, 2022.

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# Glossary

<b>Active Control</b>	Lights, bells, boom gates regulate motorists Lights, bells, booms and locking swing gates regulate pedestrians
<b>ACRI</b>	Australasian Centre for Rail Innovation
<b>ALCAM</b>	Australian Level Crossing Assessment Model
<b>ARTC</b>	Australian Rail Track Corporation
<b>CRN</b>	Country Regional Network (the part of the NSW rail network owned by Transport for NSW excluding any part under an ARTC lease or licence)
<b>CRSMS</b>	The Centres for Road Safety and Maritime Safety (part of the Safety, Environment and Regulation division of Transport for NSW)
<b>IPWEA</b>	Institute of Public Works Engineering Australasia
<b>ITSOC</b>	Infrastructure and Transport Senior Officials' Committee
<b>JHR</b>	John Holland Rail
<b>LCCWG</b>	Level Crossing Communication Working Group
<b>LCIP</b>	Level Crossing Improvement Program
<b>LCSC</b>	Level Crossing Strategy Council
<b>LCWG</b>	Level Crossing Working Group
<b>LGNSW</b>	Local Government NSW
<b>NSW TrainLink</b>	The NSW Government agency [constituted as NSW Trains] that provides passenger train and coach services for regional NSW and outer-metropolitan Sydney
<b>NLCSC</b>	National Level Crossing Safety Committee
<b>NLXP</b>	National Level Crossing Portal
<b>ONRSR</b>	The Office of the National Rail Safety Regulator
<b>Passive Control</b>	STOP or GIVE way signs regulate motorists Signs warn pedestrians Pedestrian maze control and signage regulate pedestrians
<b>RSNL</b>	The Rail Safety National Law (NSW)
<b>ROM</b>	Regional and Outer Metropolitan (a division of Transport for NSW)

<b>RIM</b>	Rail Infrastructure Manager, a term defined in the RSNL that refers to, among other things, the person or organisation that has effective control and management of the rail infrastructure of a railway
<b>RISSB</b>	Rail Industry Safety Standards Board
<b>Sydney Trains</b>	The NSW Government agency that provides passenger train services for the Sydney suburban area and is the RIM for the Greater Sydney metropolitan rail network
<b>TfNSW</b>	Transport for NSW
<b>UGLRL</b>	UGL Regional Linx



## Year in Review: 2021-22

In 2021-22 Rail Infrastructure Managers (RIMs) and Road Managers invested \$13.43 million on safer level crossing initiatives in NSW of which \$3.21 million was allocated through the NSW Level Crossing Improvement Program (LCIP).

Transport for NSW (TfNSW) manages the LCIP, which provides funding to accelerate improvements to priority level crossings across NSW, raise awareness of level crossing safety issues and promote new technology to improve level crossing safety. LCIP funding is additional to the funds RIMs and Road Managers spend on maintaining and upgrading level crossings on their networks.

COVID-19 continued to impact LCIP engineering projects in 2021-22. In the first half of the year, border controls and lockdowns impacted the availability of materials, equipment and contractors nationally. Social distancing meant on-site construction practices needed to be compliant with NSW Health requirements. In the second half of the year, staffing shortages due to illness, supply chain problems, and inflation had a negative impact on delivery time frames and costs of some of the LCIP engineering projects. Additionally, changing the NSW Country Regional Network (CRN) service provider from John Holland Rail (JHR) to UGL Regional Linx (UGLRL) mid-way through the financial year resulted in delays in delivery of the CRN LCIP 2021-22 projects.

The following 4 major upgrades were commissioned in the 2021-22 financial year. This includes some delayed projects from the previous financial year:

- LX ID 1143 Wirrinya Road, Wirrinya
- LX ID 696 Maxwell Street, Wellington
- LX ID 515 Bulunbulun Road, Breeza
- LX ID 466 Merriwa Road, Willow Tree

In addition to infrastructure works, the LCIP also funded further level crossing safety initiatives during the year including:

- The level crossing safety education campaign 'Don't rush to the other side'
- Level crossing awareness and enforcement campaigns in regional NSW
- Australian Level Crossing Assessment Model (ALCAM) data verification projects
- Road speed limits reduction at active level crossings.

The TfNSW Transport Infrastructure Plan provides the LCIP \$7.3 million in funding a year to 2031-32, which enables the planning and completion of future priority level crossing upgrades. In June 2017 the LCIP converted to a three-year rolling program to provide RIMs and local governments with improved long-term planning and consultation capacity in design and delivery for both LCIP and agency-funded level crossing upgrade projects. This also gives communities greater certainty in managing disruption while works are underway.

This report provides a consolidated overview of level crossing improvements delivered by RIMs and Road Managers in 2021-22 (including LCIP funded projects).

Appendix A provides a summary of all projects funded under the LCIP in 2021-22.

Appendix B sets out the expenditure on level crossing upgrades in NSW funded through the LCIP and by RIMs and Road Managers from 2015-16 to 2021-22.



## Agency Level Crossing Updates

### Australian Rail Track Corporation

2021-22 was the most difficult year for project delivery that ARTC has encountered. There were two sources of the delays:

Firstly, the COVID-19 pandemic impacted construction works significantly due to a lack of access to site. Despite rail construction being a permitted activity under the NSW Emergency Response, several significant issues emerged including the implementation of stringent testing measures and restricting the numbers of personnel on site in signalling locations at any given time.

These measures increased safety but dramatically reduced construction productivity. Additionally, all the level crossing construction was in small rural communities and there was significant community concern about bringing workers into these communities, thereby increasing the risk of infection. ARTC received representations from local councils seeking to defer all but emergency works impacting sites at Breeza and Willow Tree, adding six months to the construction duration for each level crossing.



Figure 1: Floodwater at the ARTC constructed Bulunbulun Road, Breeza level crossing

Secondly, extreme weather events had a significant impact on construction in 2021-22, in particular flooding during November 2021 and February 2022. The flooding caused significant damage on the ARTC network, and all personnel were diverted from their normal duties and mobilised for flood repairs on the North Coast of NSW. In some cases, construction work that had been completed was washed away, requiring extensive rework.

### **Country Regional Network (JHR and UGLRL)**

The 2021-22 financial year has proved to be a challenging year for delivery of LCIP projects on the CRN. The main issue that impacted LCIP delivery was a change in CRN service provision. TfNSW's 10-year engagement with previous CRN service provider JHR ended on 29 January 2022. A new 10-year engagement with CRN Service Provider UGLRL commenced on 30 January 2022. The change of service provider mid-way through the financial year meant that in the months approaching the end of the contract, JHR experienced a significant depletion in staffing levels. There was also a need to reprioritise JHR projects to address the damage to infrastructure due to several natural disaster incidents – particularly the flooding events of 2021-22. This resulted in a number of projects being taken over by the new CRN service provider, UGLRL, to be completed in 2022-23.

# Level Crossings in New South Wales

Under the Rail Safety National Law (NSW), RIMs and Road Managers have an obligation to manage risks at level crossings. Safety regulatory oversight is provided by the Office of the National Rail Safety Regulator (ONRSR) for railway operations and rail infrastructure and the road/rail interface. The NSW Police Force enforces the Road Rules 2014 (NSW).

## Level Crossing Strategy Council

The Level Crossing Strategy Council (LCSC) is a NSW interagency forum that coordinates level crossing safety initiatives by RIMs, Road Managers and other key stakeholders. The LCSC is chaired by TfNSW and comprises executive representation from:

- TfNSW (Centres for Road Safety and Maritime Safety, Regional and Outer Metropolitan, Country Rail Contracts, Customer Strategy and Technology)
- ARTC
- UGLRL
- Local Government NSW
- NSW Police Force
- NSW TrainLink
- Sydney Trains

The Office of the National Rail Safety Regulator (ONRSR) also attends LCSC meetings to provide a national perspective in discussions on rail safety related issues and to offer independent comment/advice on level crossing safety strategy and policy. ONRSR does not have an endorsement or approval function in LCSC deliberations.

The LCSC is supported by the Level Crossing Working Group (LCWG) and the Level Crossing Communication Working Group (LCCWG), which comprise of officer-level representatives from member agencies. TfNSW provides secretariat support and assistance to the LCSC, LCWG and LCCWG, coordinates the implementation of the LCIP, and manages the application of the Australian Level Crossing Assessment Model (ALCAM) in NSW.

## Level Crossing Strategy Council Strategic Plan 2021-30

The Level Crossing Strategy Council Strategic Plan 2021-30 was developed by the Centres for Road Safety and Maritime Safety (CRSMS) and endorsed by the LCSC on 23 February 2021. The Strategic Plan guides the LCSC to continue to develop policy, review incident and safety trends, monitor new technologies, and oversee the development and delivery of the annual capital works program, and education and awareness campaigns.

Under the Strategic Plan, rail and road stakeholders will commit to working collaboratively to address 12 areas of strategic focus across three key themes for safer level crossings in NSW: safe people; vehicles, speeds and infrastructure; and harnessing knowledge for safety.

The Strategic Plan is available on the [TfNSW website](#).

## Level Crossing Improvement Program

The LCIP was established in 2000 to fund a range of level crossing safety initiatives in NSW. Funding under the LCIP is supplementary to the existing capital and maintenance programs of RIMs and Road Managers to improve and maintain safety at the level crossings on their networks.

Key elements of the LCIP include: accelerate engineering upgrades and safety improvements at priority level crossings; education campaigns and police enforcement campaigns in regional NSW; and data collection to ensure accurate information is available on the status of NSW public level crossings.

The projects funded under LCIP each year are developed by the CRSMS, with the assistance of the LCWG and endorsed by the LCSC. The LCWG monitors program delivery and promotes collaboration and consultation between delivery agencies. In April 2017, the LCSC endorsed an approach to establish the LCIP as a three-year program to commence from the 2017-18 financial year. The three-year LCIP program 2020-21 to 2022-23 was approved by the LCSC on 28 April 2020.

A methodology is in place to determine the level crossings eligible for funding under the LCIP and the priorities for improvements. This methodology, commonly known as the LCIP Infrastructure Works Eligibility Criteria, ensures available funding is applied effectively to level crossing safety improvements. The methodology continues to apply to the development of the LCIP through to 2022-23.

In the first instance, the methodology distributes the LCIP funding across the following three categories:

- upgrading level crossings controlled by flashing lights to boom gates and flashing lights
- upgrading level crossings controlled by passive signage (e.g. give way or stop sign) to boom gates and flashing lights
- minor works at passively controlled level crossings.

A prioritisation process is then used to identify the crossings to be upgraded within the first two categories. This process first uses an ALCAM ranking to generate a shortlist of sites. The shortlist is then refined through consultations with relevant stakeholders to nominate sites required for major upgrades. Consultations involve a review of level crossing incident data for NSW, and consideration of local knowledge from RIMs, Road Managers and other relevant stakeholders.

## National Level Crossing Safety Committee

The National Level Crossing Safety Committee (NLCSC) is an initiative of the Australasian rail industry. It operates as an inter-agency forum to coordinate national efforts for safer level crossings and reports to the Infrastructure and Transport Senior Officials Committee (ITSOC). Its focus is on maximising knowledge-sharing and best practice, and on strategic opportunities such as greater national consistency in data collection/use and technology trials and take up.

The strategic objectives of the NLCSC are to:

- reduce the likelihood of crashes and near misses at railway crossings
- improve coordination between Road Managers, RIMs, governments and other member organisations through maximising knowledge-sharing, skills and practice
- develop and recommend initiatives to align and coordinate safety mitigation strategies developed by member organisations where it is agreed a national perspective provides safety benefits.

The former Chair of the NLCSC, Chief Executive of the Department of Planning, Transport and Infrastructure South Australia, resigned in early 2022, and the position was unfilled by the close of 2021-22. NLCSC includes representatives from Australasian jurisdictions, government and

private rail operators, RIMs, rail industry associations, regulators, and the Australia New Zealand Policing Advisory Agency. Its secretariat support function is provided by the TrackSAFE Foundation. The NLCSC met in August and November of 2021 and February of 2022.

## Level Crossing Closures

The only means to completely eliminating risk at a level crossing is to close the crossing. The closure of public and private level crossings is pursued, where appropriate, by LCSC member RIMs and Road Managers.

Thorough inspection and detailed assessment of crossings, including alternative means of access (such as grade separations), are considered before closure. Consultation with the relevant local council, adjacent landowners, the community, Regional and Outer Metropolitan Division (ROM), emergency services and other rail and road users is also conducted prior to recommending closure. The Transport Administration Act 1988 (section 99B) provides that level crossings can only be closed with the approval of the Minister for Transport and Roads or the Minister for Regional Transport and Roads. The TfNSW Level Crossing Closures Policy provides additional information related to level crossing closures.

Since 2003, a total of 195 level crossings have been gazetted for closure, most of which were on private property. As shown in Table 1 below, nine level crossings were gazetted for closure in 2021-22.

Table 1: Level crossings gazetted for closure in 2021-22

Location	Rail KM	Line Section	Status
Edgeroi	599.700	Main North West	Private
Edgeroi	601.400	Main North West	Private
Bellata	605.450	Main North West	Private
Bellata	622.150	Main North West	Public
Milguy	705.300	North Star	Private
Crooble	711.710	North Star	Private
Crooble	717.630	North Star	Private
Croppa Creek	728.980	North Star	Private
Murrurundi	353.794	Main North	Private

## Level Crossing Incident Data

Of the 1,347 public road level crossings in NSW, 440 have active traffic controls; 152 have flashing lights and bells, 290 have flashing lights, bells and boom gates and two have manually operated booms/gates. The majority of other crossings are passively controlled by 'give-way' or 'stop' signs.

There were eight collisions between a train and a road vehicle in NSW in 2021-22, five at crossings with passive control equipment and three at crossings with active control equipment. Seven collisions involved light passenger vehicles and one involved a heavy vehicle. These

collisions have resulted in two serious injuries and one minor injury. There were no collisions between a train and a pedestrian in NSW during 2021-22.

Figure 2 through to Figure 5 shows the number of collisions and fatalities at level crossings from 1989-90 to 2021-22.

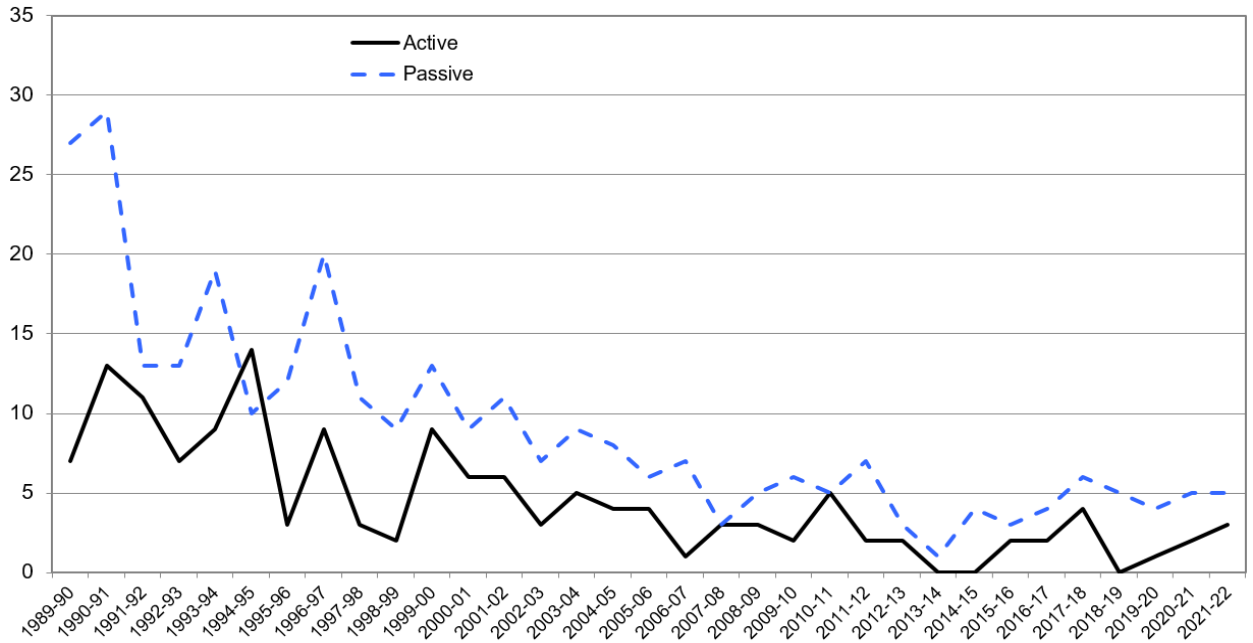


Figure 2: Train colliding with road vehicle at level crossing in NSW 1989-90 to 2021-22

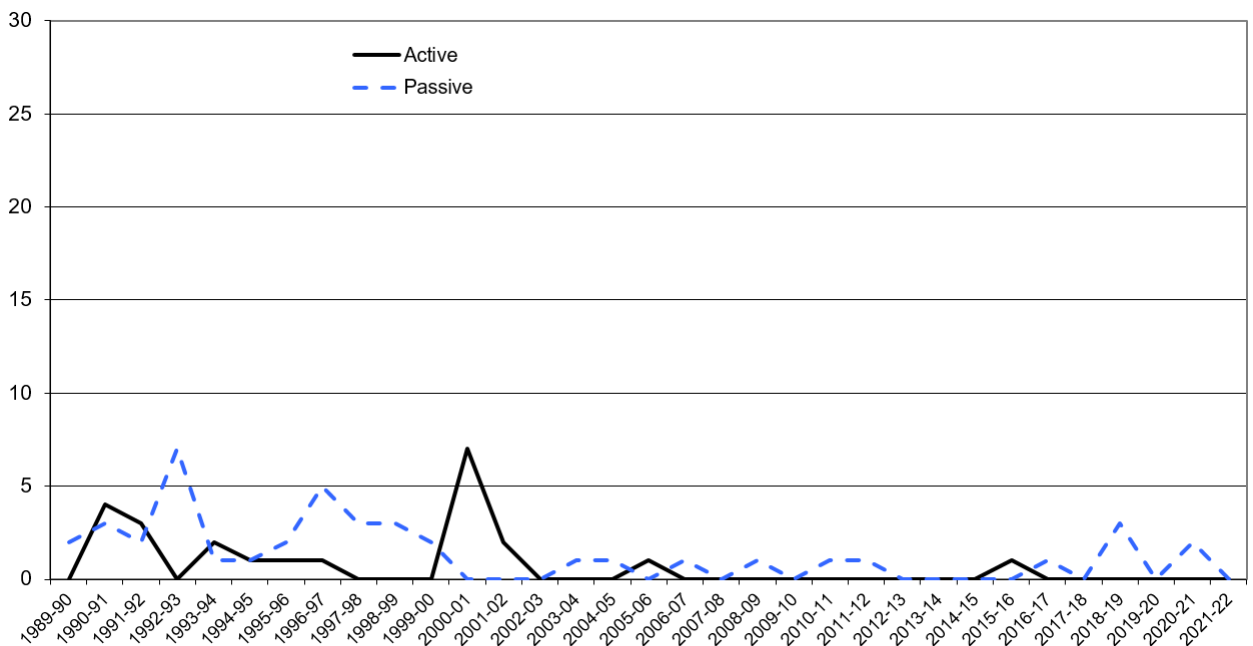


Figure 3: Fatalities: train colliding with road vehicles at level crossings in NSW -1989-90 to 2021-22

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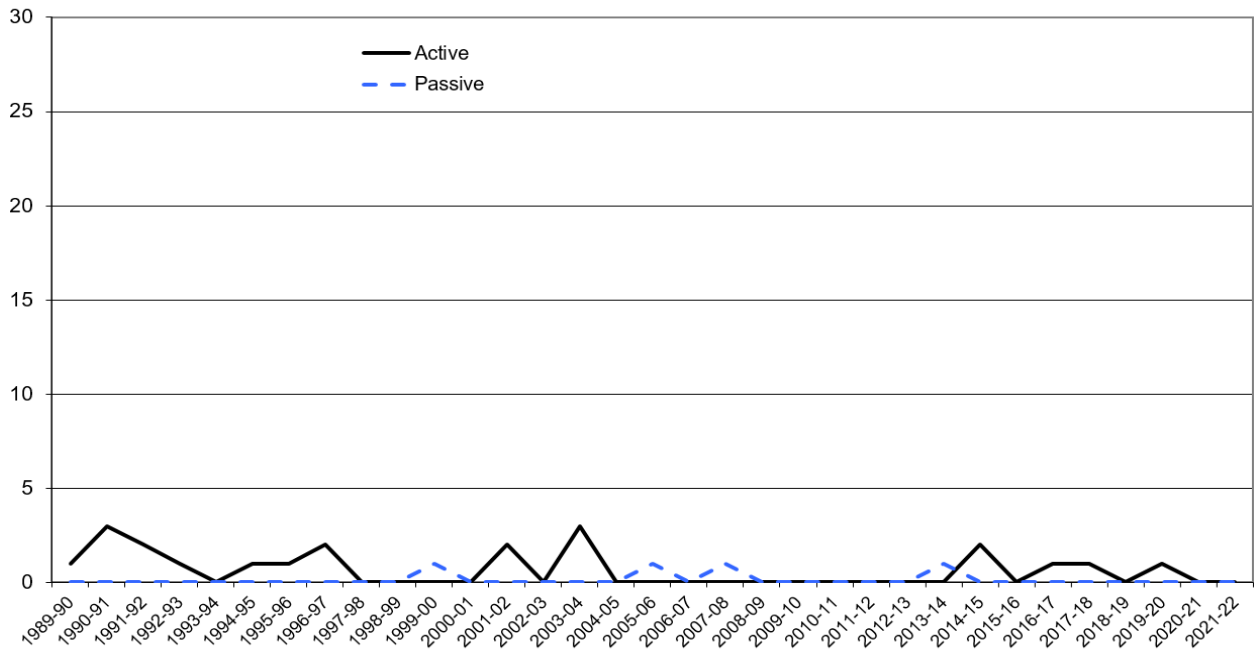


Figure 4: Train colliding with pedestrian at level crossings in NSW -1989-90 to 2021-22

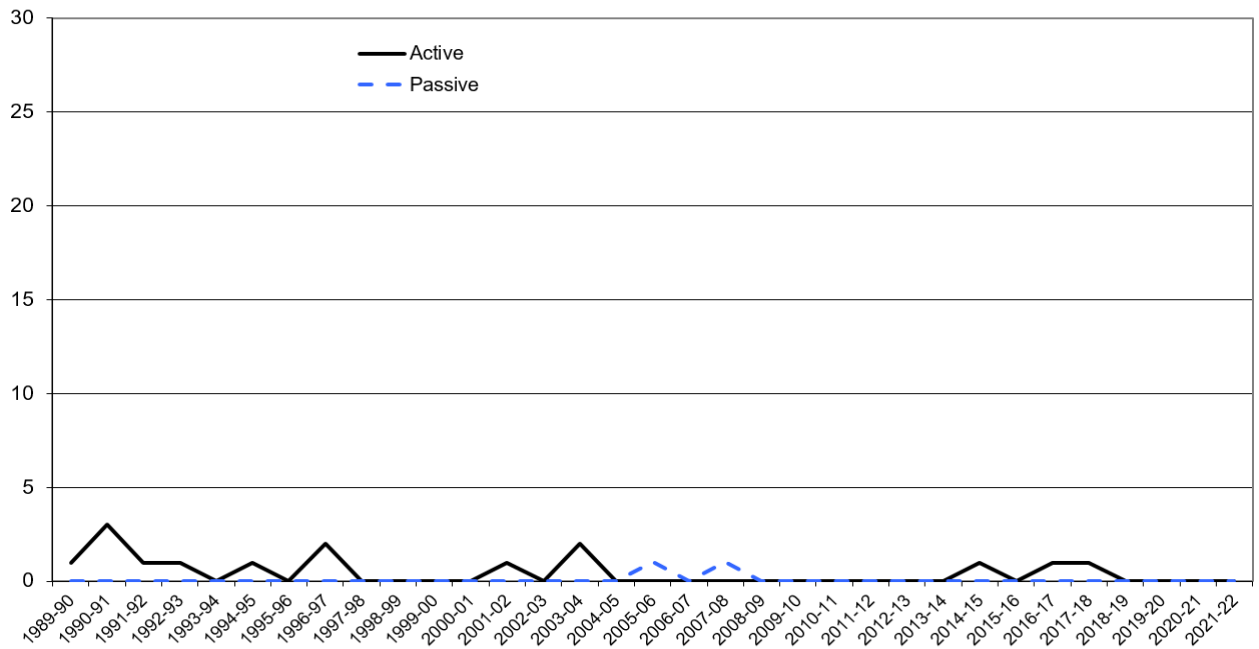


Figure 5: Fatalities: train colliding with pedestrian at level crossings in NSW -1989-90 to 2021-22

# Level Crossing Improvement Program 2021-22: Infrastructure Works

## Major Works Completed

### Summary of Major Works Completed

During 2021-22 there were four major construction projects commissioned across the NSW rail network under the LCIP. The commissioned projects are shown in Table 2 and described in detail below.

Table 2: Summary of major works completed under the LCIP in 2021-22

Location	Electorate	Network
LX ID 1143 Wurrinya Road, Wurrinya	Orange	ARTC
LX ID 696 Maxwell Street, Wellington	Dubbo	CRN
LX ID 515 Bulunbulun Road, Breeza	Tamworth	ARTC
LX ID 466 Merriwa Road, Willow Tree	Upper Hunter	ARTC

### LX ID 1143 Wurrinya Road, Wurrinya (ARTC)

This passive level crossing was upgraded from stop signs to new high intensity LED flashing lights, bells and retro-reflective boom gates. The upgrade also included new road and rail signage. The upgrade was commissioned in September 2021 at a total cost of \$1.27 million, including a LCIP contribution of \$990,000.



Figure 6: Wurrinya Road, before



Figure 7: Wurrinya Road, after



### LX ID 696 Maxwell Street, Wellington (CRN)

This active level crossing was upgraded from flashing lights to new high intensity LED flashing lights, bells and retro-reflective boom gates. The upgrade also included new road and rail signage. The upgrade was commissioned in December 2021 at a total cost of \$1.773 million, including a LCIP contribution of \$688,000.



Figure 8: Maxwell Street before



Figure 9: Maxwell Street after

### LX ID 515 Bulunbulun Road, Breeza (ARTC)

This passive level crossing was upgraded from stop signs to new high intensity LED flashing lights, bells and retro-reflective boom gates. The upgrade also included new road and rail signage. The upgrade was commissioned in February 2022 at a total cost of \$1.36 million, including a LCIP contribution of \$688,000.



Figure 10: Bulunbulun Road before



Figure 11: Bulunbulun Road after

**LX ID 466: Merriwa Road, Willow Tree (ARTC)**

This active level crossing was upgraded from flashing lights to new high intensity LED flashing lights, bells and retro-reflective boom gates. The upgrade also included new road and rail signage. The upgrade was commissioned in April 2022 at a total cost of \$1.1 million, including a LCIP contribution of \$688,000.



Figure 12: Merriwa Road before



Figure 13: Merriwa Road after

**Level Crossing Asset Renewal**

Level crossing asset renewal was funded under the LCIP in 2021-22 to the value of \$484,624 as expressed in the table below.

Table 3: LCIP asset renewal in 2021-22

Location	Electorate	Network	Cost \$
LX ID 409 Irrigation Way, Wumbulgal	Murray	CRN	228,836
LX ID 393 Irrigation Way Yanco	Murray	CRN	255,788
<b>Total \$ Asset Renewal</b>			<b>484,624</b>

**LX ID 409 Irrigation Way, Wumbulgal (CRN)**

Life expired existing level crossing flashing signals assemblies were replaced at Irrigation Way, Wumbulgal. This replacement of level crossing infrastructure included the installation of new aluminium cast cable termination bases to improve structure frangibility to further improve safety, along with the replacement of cables and conduits. The total project cost was \$228,836, and was funded by LCIP.



Figure 14: Irrigation Way, Wumbulgal before



Figure 15: Irrigation Way, Wumbulgal before

### LX ID 393 Irrigation Way, Yanco (CRN)

Life expired existing level crossing flashing signals assemblies were replaced at Irrigation Way, Yanco. This replacement of level crossing infrastructure included the installation of new aluminium cast cable termination bases to improve structure frangibility to further improve safety, along with the replacement of cables and conduits. The total project cost was \$255,788, and was funded by LCIP.



Figure 16: Irrigation Way, Yanco before



Figure 17: Irrigation Way, Yanco after

## Development Work

Development work for upgrades in future years is a key element of the LCIP. Although there were less major upgrades than expected in 2021-22, development work went ahead at 8 sites to a total value of \$193,712.

Table 4: LCIP development work in 2021-22

Location	Electorate	Network	Cost \$
LX ID 370 Goldfields Way, Old Junee	Cootamundra	CRN	23,761
LX ID 686 Overshot Road, Euchareena	Dubbo	CRN	30,295
LX ID 705 Beni Street, Wongarbron	Dubbo	CRN	23,761
LX ID 980 Akuna Road, Parkes	Orange	CRN	10,000
LX ID 951 Convent Lane, Borenore	Orange	CRN	30,295
LX ID 1015 Kiacatoo Road, Condobolin	Barwon	ARTC	25,200
LX ID 1138 Mid Western Highway, Caragabal	Cootamundra	ARTC	25,200
LX ID 1315 Sheep Wash Road, Calwalla	Goulburn	ARTC	25,200
<b>Total \$ Development Work</b>			<b>193,712</b>

# Education and Awareness

## Level Crossing Safety Education Campaigns

### **‘Don’t rush to the other side’**

The ‘*Don’t rush to the other side*’ level crossing safety education campaign provides a timely reminder to drivers that level crossings should not be approached with complacency. The campaign continued throughout 2021-22 and focussed on light vehicle drivers who live within 10 kilometres of a level crossing in regional NSW. The paid advertising campaign was fully integrated and ran across television, outdoor billboards, radio, digital, social media, and cinema.



Figure 18: ‘Don’t rush to the other side’ campaign branding

Level crossings social media content featured two train drivers from NSW TrainLink being interviewed about their personal experiences. There was also a series of short form social informative content, to support an “always on” approach, which highlights the risks at level crossings and the need for drivers to always obey the signs and signals. All social content was distributed across TfNSW and key stakeholder channels to further engage and encourage mindfulness when next approaching a level crossing.

Additionally, industry communication aimed at Heavy Vehicle drivers was distributed during this time. With more delivery trucks on the road than ever, it has never been more important to remind truck drivers to take care and not rush to the other side.

There were three periods of paid advertising in 2021-22:

- November 2021, to coincide with harvest season – when more trains are operating and more vehicles are on the road
- February 2022 and May/June 2022: both during the traditional peaks in level crossing collisions.

### **Campaign Outcomes**

Campaign tracking research carried out during 2021-22 activity by an independent research agency showed the campaign continues to perform well for light vehicle drivers over time.

Results for key measures and advertising diagnostics are well above norms and results are either stable or continue to increase over time. The summary of the results is set out in Table 5 below:

Table 5: 'Don't rush to the other side' campaign effectiveness - advertising diagnostics and outcomes

	Results achieved over time	Baseline	Norms (TfNSW Safety Video average)
<b>Recognition</b>	17/18 – 58% 18/19 – 60% 19/20 – 59% <b>20/21 – 67%</b> <b>21/22 – 67%</b>	42%	
<b>Main message takeout* (always look and obey the road signs and signals when approaching a level crossing")</b>	14/15 – 72% 15/16 – 78% 16/17 – 87% 17/18 – 75% 18/19 – 80% 19/20 – 80% <b>20/21 – 81%</b> <b>21-22 – 71%</b>	77%	66%
<b>Believability (Found the message of the ad to be believable)</b>	14/15 – 81% 15/16 – 69% 16/17 – 75% 17/18 – 73% 18/19 – 80% 19/20 – 74% <b>20/21 – 75%</b> <b>21/22 – 72%</b>	71%	68%
<b>Personal Relevance</b> <b>'Ad's message is appropriate and has meaning to me personally'</b> <b>NOTE: *Statement changed from 'The ads message is appropriate and has meaning to me personally' to 'The ad is for people like me' in Jan' 22</b>	17/18 – 38% 18/19 – 41% 19/20 – 49% <b>20/21 – 47%</b> <b>21/22 – 37%</b>	48%	48%
<b>Social Relevance 14/19</b> <b>'After seeing this ad, I would tell my family and friends to be careful and always obey the signs and signals at level crossings</b> <b>Social Advocacy 20/22</b> <b>Social Advocacy is measured by "After seeing this ad I would tell my family and friends to be careful and always obey the signs and signals at level crossings".</b>	14/15 – 46% 15/16 – 43% 16/17 – 48% 17/18 – 43% 18/19 – 54%  <b>20/21 – 49%</b> <b>21/22 – 42%</b>	81%	55%

Throughout the lifetime of the campaign there has been an ongoing positive effect demonstrated on both past behaviour and future intentions on the actions needed when approaching a level crossing.

91 per cent of regional drivers say they will never ignore the signs or signals at a level crossing in the next 12 months. This maintains with the average of 90 per cent over the last six years of the campaign.

The campaign will continue to raise awareness of the safety risks at level crossings and educate drivers on the actions needed when approaching a level crossing. This will continue to be done in partnership with other level crossing safety campaigns and programs in NSW.

### Regional Field Days

To raise the profile of level crossings and generate discussion, TfNSW usually participates in three public engagement exhibitions featuring the ‘Don’t rush to the other side’ campaign message and a car that had been involved in a level crossing crash. Unfortunately, due to COVID-19 restrictions, the AgQuip Field Days at Gunnedah, Henty Machinery Field Days at Henty and Australian National Field Days at Borenore events were all cancelled in 2021.

## Level Crossings Awareness and Enforcement Campaigns

The level crossing awareness and enforcement campaign includes public awareness (print, electronic and social media, letterbox drops and the use of Variable Message Signs) supported by the tasking and deployment of additional Police resources to enforce level crossing road rules. Police presence around level crossings throughout the campaign is highly visible, using well marked police vehicles.

NSW Police enforces the *Road Rules 2014 (NSW)* including level crossing offences. The impact of level crossing awareness and enforcement campaigns in delivering increased road policing around level crossings is reflected in the increase in legal actions for level crossing offences (driving) since the first campaign in February 2011.

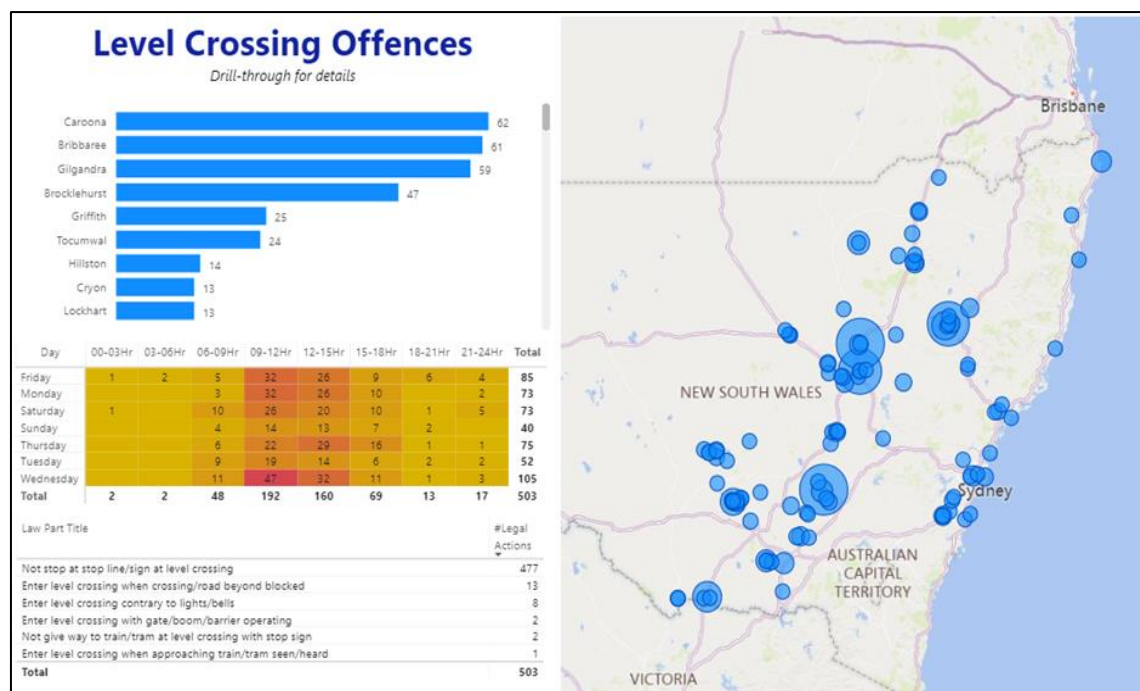


Figure 19: Level crossing offences for the period 1 July 2021 to 30 June 2022 in NSW

Each year, the LCIP works closely with NSW Police, funding four level crossing awareness and enforcement campaigns. In 2021-22 the number of campaigns was reduced to two, however, due to COVID-19 restrictions and the resulting redeployment of NSW Police resources. Throughout these campaigns, NSW Police Force enforced compliance with level crossing controls in a targeted approach with a significant amount of level crossing breaches being detected.

TfNSW ran localised radio campaigns and letterbox drops to inform residents of upcoming local police enforcement operations at level crossings, and to remind them of the penalties for disobeying the road rules. To complement this, the NSW Police Traffic Highway Patrol Command were interviewed by local radio stations in key areas to discuss the risks associated with level crossings. TfNSW provide this media support for each campaign which coincides with NSW Police media release and social media messaging.

### **Campaign One: Sydney Metropolitan Area – Fairfield and Yennora**

Campaign one for 2021-22 was held in Fairfield and Yennora and was the first enforcement campaign conducted in the metropolitan area, presenting new challenges. Operations were also hampered by inclement weather.



Figure 20: Level crossing awareness and enforcement campaign underway at Yennora

The road policing component (enforcement window) took place from 28 March to 8 April 2022 and involved resources from Cumberland and Liverpool City Highway Patrol Sectors. Six South West Region Highway Patrol Officers were deployed for specific tasked periods over the ten-day enforcement window. Police enforcement took place in the near vicinity of the level crossings to compliment VMS messaging. Six days of enforcement were conducted during the ten-day enforcement window.

Campaign one results:

- 8 x infringements issued for level crossing offences
- 25 x other traffic infringements issued
- 2 x charges laid for *Driving Whilst Disqualified* and *Driving Whilst Cancelled*
- 72 x driver interactions involving roadside breath testing and drug testing.

## Campaign Two: Southwest Slopes and Central West

Campaign two for 2021-22 focussed on level crossings in Caragabal, Quandialla, Milvale and Weedallion. The road policing component (enforcement window) took place from 20 June to 30 June 2022 and involved resources from Hume and Macquarie Highway Patrol Sectors. Six days of enforcement were conducted during the ten-day enforcement window. NSW Police force engaged with local media including a number of radio interviews which were conducted between Inspector Kelly Wixx and Rocky FM for the Southwest Slopes region.



Figure 21: NSW Police Inspector Kelly Wixx announces Campaign Two

Prior to the campaign, a joint media release involving NSW Police and Minister for Regional Transport and Roads, Sam Farraway, was released. Campaign 2 produced the highest amount of level crossing infringements issued during an enforcement period for several years.

Campaign two results:

- 48 x infringements issued for level crossing offences
- 25 x other traffic infringements
- 10 x *Exceed Speed* infringements
- 3 x *Fail to Wear Seatbelts* infringements
- 8 x other infringements
- 76 x roadside tests conducted.



Figure 22: NSW Police patrolling near Caragabal Road level crossing, Quandialla



# ALCAM Development and Data Collection

The Australian Level Crossing Assessment Model (ALCAM) is used to assess potential risks at level crossings and to assist in the prioritisation of safety improvements at level crossings according to their comparative safety risks. ALCAM is currently applied across Australia and in New Zealand. It is overseen by the National ALCAM Committee and managed and supported by the Rail Industry Safety Standards Board (RISSB).

## National ALCAM Committee

The National ALCAM Committee comprises representatives of all Australian states, the Northern Territory, and New Zealand. The committee's role is to manage the development of ALCAM and to ensure consistency in its application. TfNSW represents NSW on the committee.

The National ALCAM Committee has taken a risk-based approach to ensure the viability and longevity of ALCAM and has carried out the following works in 2021-22:

### ALCAM Road Model Validation and Enhancement Project

This project verified the Exposure Factor, Infrastructure Factor and Consequence Factor in the ALCAM Road Model against Australian and New Zealand level crossing crash data for the period 2013 to 2020 and updated the parameters and formulae used in the model. The project also made recommendations on the following proposed enhancements to the model:

- Improving performance of the model for tourist and heritage lines
- Extending the consequence component of the model to include consequences to pedestrian bystanders
- Incorporating the 'four quadrant booms' control into the model.

### ALCAM Training Strategy & RISSB Training Proposal

In regard to training, the National ALCAM Committee and RISSB have made several developments including:

- The training strategy for ALCAM survey & rating
- ALCAM operator and ALCAM practitioner training
- A training proposal for delivering ALCAM survey & rating training.

It is anticipated that the ALCAM Survey & Rating training be rolled out in both Australia and New Zealand in 2023.

### LXM System Rebuild

The purpose of this project is to redevelop the ALCAM Level Crossing Management (LXM) system to incorporate contemporary human factors and cyber security principles and improve the accessibility and useability of the web-based interface with a view to future proofing the LXM system.

The project has already commenced and is expected to be completed by the end of 2023.

## NSW ALCAM Data Verification

ALCAM plays a critical role in planning and developing the LCIP, and is used as the principal means of ranking public road level crossings for major upgrades funded under the LCIP. It is therefore important that the level crossing data in ALCAM is the most accurate and up-to-date information available.

In 2021-22, TfNSW undertook the second stage of the NSW ALCAM Data Verification project to address the findings of the first stage of the project, which have clear data sources that are able to be identified by desktop inspection (not requiring field survey or inspection). The first stage of the project was completed in 2020 and it verified the accuracy of some key NSW ALCAM data and identified a number of areas for improvement.

During 2021-22, TfNSW also engaged the Property & Commercial Services section of Sydney Trains to verify the ownership of access roads and licensing arrangement for some NSW level crossings recorded in ALCAM.

# New Technology and Research

## Cooperative Intelligent Transport Initiative (TfNSW)

The Cooperative Intelligent Transport Initiative (CITI) infrastructure test bed was established in 2014 by the Centre for Road Safety in TfNSW. 'Connected' vehicles use Cooperative Intelligent Transport Systems (C-ITS), to talk to each other and roadside infrastructure, such as signalised intersections.

The CITI team is continuing to work on adding the Princes Highway Unanderra level crossing (one of the busiest crossings in NSW with respect to train movements and vehicular traffic) into the CITI testbed. COVID-19 restrictions along with major flood emergencies have significantly delayed the project.

Drivers of vehicles fitted with C-ITS technology will receive in-cab audio-visual alerts to indicate that the crossings are activating or are activated. This small-scale trial will include up to 20 buses fitted with an in-vehicle display unit and test the use of both dedicated short-range communications (DSRC) applications as well as cloud-based communications. It is expected that the pilot site will be established by the end of 2022.

TfNSW is also working on the development of proof-of-concept application using the Internet of Things (IoT), Global Navigation Satellite Systems and Cellular Low Power Wide Area Networks (Cellular LPWANs) that could locate a train and activate a warning sign on the road network for drivers approaching a passive level crossing. The active warning sign would be located outside of the rail corridor and act as a prompt for drivers to stop at the passive crossing.

## Self-Contained Cost-Effective Level Crossing Solution Project (ARTC)

This project arose from background research into lower cost level crossing activation solutions over several years, and earlier trials of a range of technologies. The concept is to trial Grade Crossing Predictor (GCP) technology, utilising mostly equipment that had already been type approved for other applications. The scope includes a software interface to the 4Site alarm monitoring system currently used by ARTC, and safety assurance according to EN 50126, 50128 and 50129 standards.



Figure 23: Solar powered location case interna (sentinel power rack on left. GCP on right.)



Figure 24: Boom gates in operation during the Self-Contained Cost-Effective Level Crossing Solution Project trial, Stage 1.

As the level crossing control and level crossing monitoring software is embedded in the system, future instances of the configuration will reduce the effort for signalling design work which will provide some cost savings. The system is also configured to run on either mains power or a solar/battery power source for remote sites. The project is broken into 2 stages:

### **Stage 1: Factory Trial**

This stage includes the development of interface design between Siemens and 4Tel, detailed design for the trial of the level crossing solution, installation, testing and commissioning of a level crossing with boom gates, flashing lights and bells supplied by mains and solar supply – all within a factory setting.

### **Stage 2: Site Trial on a Selected ARTC Level Crossing**

Following the successful submission of all deliverables and satisfactory outcome of Stage 1, ARTC may proceed to a site installation on an ARTC selected level crossing for a field trial.

## **Innovative Level Crossing Safety Trial (ARTC)**

ARTC undertook a pilot program in 2021-22 with road camera technology developer Acusensus to monitor how motorists respond to stop signs at level crossings. The trial was conducted in regional NSW at level crossings at Culcairn, Red Bend and Scone using specialised equipment to detect the number of motorists who failed to heed stop signs when approaching level crossings.

The results revealed that more than half of motorists who used the Culcairn crossing ignored the stop sign, with similar non-compliance levels recorded at the Red Bend and Scone crossings. Data from the trial will be used to progress ongoing efforts with government agencies and other key stakeholders to help increase awareness and address safety risks.

# Agency safer level crossings initiatives

## ARTC Initiatives

### Infrastructure Upgrades: LX ID 458 Gateleys Road, Wingen

Gateleys Road, Wingen was a passive level crossing which was upgraded to an active level crossing, which included lights, bells and boom gates. The upgrade was commissioned in April 2022 at a cost of \$1.4 million.



Figure 25: Gateleys Road before



Figure 26: Gateleys Road after

### ARTC Civil and Signal Upgrade Works

Table 6: 2021-22 ARTC Level crossing civil and signal upgrade works

Corridor / Funding Stream	Sites	Cost \$
Broken Hill Corridor - Level Crossing Upgrade - Civil	13	\$912,482
Main South Corridor - Level Crossing Upgrade - Civil	3	\$673,579
Main South Corridor - Level Crossing Upgrade - Signals	5	\$263,304
Hunter Valley - Level Crossing Upgrade - Civil	50	\$1,618,086
Hunter Valley - Level Crossing Upgrade - Signal	1	\$123,348
<b>Totals</b>	<b>72</b>	<b>\$3,590,799</b>

### ARTC Community Participation

ARTC's commitment to level crossing safety continued throughout the year despite the challenges of COVID-19, which saw key community events cancelled, including the AgQuip Field Days, Henty Machinery Field Days and Maitland Steamfest. ARTC also took the time to rebuild their school education presentations and kits for their regional teams to present to local primary school students.

ARTC worked with TfNSW during grains season to boost the Harvest 2021 campaign, geotargeting additional areas promoting the offer to send farmers free safety signs to use for their private crossings.

ARTC's social media channels ran passive and active level crossing animations, and they proudly supported awareness programs such as Rail Safety Week and Rail R U OK Day, in addition to hyper-local campaigns across the Hunter, with in-store posters and letter box drops.

ARTC's Level Crossing Safety Strategy was bolstered with approval to run geo-targeted regional campaigns, beginning in March 2022, which has reached more than 40,000 people and created more than 240,000 impressions. In 2022-23 ARTC intends to reach more than one million people across the state and generate five million impressions nationally.

## Sydney Trains Initiatives

In a challenging year for project delivery due to the COVID-19 pandemic and industrial actions, Sydney Trains undertook a program of level crossing improvements across the network during 2021-22 with key infrastructure improvement initiatives. Improvements included the final completion of signalling arrangement modifications in conjunction with line speed changes to reduce the level crossing gates closure time to improve traffic flow at Pine Road Fairfield level crossing. The objective is to reduce the number of incidents at this location improving the efficiency of boom gate closure time while maintaining safety.

Table 7, below, summarises Sydney Trains' level crossing initiatives for 2021-22.

Table 7: Sydney Trains level crossing improvements in 2021-22

Location	Project Scope	Cost \$
LX ID 945 Pine Road Fairfield	Finalisation of project to reduce the level crossing gates closure time to improve traffic flow at the level crossings. The objective is to reduce user frustration and the number of incidents.	\$148K
LX ID 437 St James Road Adamstown	Construction of Stage 1A – removal of redundant relays. Working with Council to firm up construction date for Stage 1B. project to continue in 2022-23	\$264K
LX ID 434 Rawson Road Woy Woy	Collaboration with TfNSW and council to request a revised concept design that would be staged to allow installation of traffic lights at a later date without significant re-work required. Project to continue in 2022-23	\$61K
Various	Completion of works at some sites for audible alarms and other signalling modifications to improve safety and compliance to relevant standards. Project to continue in 2022-23	\$336K
<b>Total</b>		<b>\$809K</b>

## NSW TrainLink Initiatives

NSW TrainLink (NSWTL) is a member of the Level Crossing Strategy Council and its working groups and provides a unique perspective as a Rolling Stock Operator (RSO). NSWTL works

constructively with RIMs to address risks and increase safety at level crossings in NSW. In 2021-22 NSWTL participated in a range of initiatives to support safer level crossings including:

- Input and collaboration into the lift upgrade at Blackheath Station. Work is underway for an accessibility upgrade at Blackheath Station with site set-up and construction activities started in early May 2022. Completion of this project (anticipated for May 2023) will remove the need for customers to utilise the level crossing
- Regular engagement by NSWTL Senior Management with local communities, including:
  - West region - attendance at the Royal Bathurst Show and Mudgee Small Farm Field days
  - South region – letter box drops to residents at Marulan and Penrose
- Regular attendance with the school programs, targeting schools near level crossings with high trespass rates
- Weekly meeting with RIMs, addressing rail corridor issues as raised by NSWTL train crew or other staff
- Regular engagement with local police on areas of concern or ‘hot spots’
- Engagement with TfNSW to deliver train drivers' videos for media consumption to address safety at level crossings
- NSWTL uptake to the ONRSR National Level Crossing Portal as launched in Rail Safety Week 2021.



Figures 27a and 27b: NSWTL staff engaging with patrons at Mudgee Small Farm Field Days

## CRN (JHR and UGLRL) Initiatives

Level crossing safety on the CRN has continued to be improved with over \$4M spent on improvements in 2021-22. This includes asset renewal works at Irrigation Way Widgelli and level crossing civil road and rail surface upgrades.

### LX ID 411 Irrigation Way, Widgelli

The existing RX-5 Railway Crossing Flashing Signals Assemblies at Widgelli were more than 40 years old. The old designs are not guaranteed to fall should a vehicle collide with them which may cause serious injury or death. These were replaced with new aluminium cast cable termination bases further from the road edge. The cable and conduits were also replaced to align with current standards. The upgrade was commissioned in December 2021 at a total cost of \$358,000.

### CRN Civil Road and Rail Surface Upgrades

Table 8: CRN level crossing civil road and rail surface upgrades in 2021-22

Location	Project Scope	Cost \$
Twigg Road, Yenda	Civil Construction Upgrade	\$818,074
Yuranigh Road, Molong	Civil Construction Upgrade	\$805,176
Moore Street, Beckom	Civil Construction Upgrade	\$1,110,723
Robert Street, West Tamworth	Civil Construction Upgrade	\$972,798
Junee Road, Temora	Civil Construction Upgrade	\$355,734
<b>Total</b>		<b>\$4,062,505</b>

### Level Crossing Safety with Minecraft: “Level Up” Rail Safety Pilot



Figure 28: TfNSW Level Up Rail Safety Pilot

In 2021-22, TfNSW developed a safety education resource for school students, using an interactive Minecraft world and accompanying teacher resource. The resource explored level crossing safety and allowed students to explore the technical systems involved as well as personal responsibility for their own safety.

The project team (led by TfNSW’s Tayla Hallett and Madhavi Shankarling) initiated and worked on the pilot for a period of 18 months. The project team also included representatives from the Centres for Road Safety and Maritime Safety and Sydney Trains education programs. Consultation was conducted with Safety SME’s, Level Crossing Technical SME’s, NSW TrainLink Drivers, the Department of Education Road Safety Coordinators and Industry Partners including Microsoft. Two consultants, recommended by TfNSW industry partner Microsoft (Eduelfie & Innovative Educational Ideas) were contracted to develop a Minecraft World, accompanying teacher resource and to oversee the pilot of the resource in schools.



On 26 July 2021, a four-week pilot in NSW schools commenced (1 week delayed due to COVID-19). The pilot was extended due to COVID-19 lockdowns and was completed at the end of term 2

2022. The pilot had 23 schools participate and received overwhelmingly positive qualitative feedback from teachers and students.

Teachers felt they could really engage students on safety in the Minecraft world and improve their understanding of real-world issues. The structured nature of the program gave teachers the confidence to use Minecraft as a teaching resource.



Figure 29: Level crossings in the Minecraft world

The pilot validated and demonstrated how TfNSW can use interactive gaming technology to reach its youngest customers, improve their understanding of safety issues in their communities, and make journeys safer in regional settings. Students enjoyed the challenges, research components, group work and the immediate feedback in the level crossing simulator. The NSW Department of Education has seen the resource's potential and is keen to have the project expanded and rolled out further in the future. TfNSW has provided an additional \$150,000 for the project. The project was the winner of the Excellence in Digital Innovation Category at the 2022 "I'm Transport Awards".

### Guiding the challenge in-world

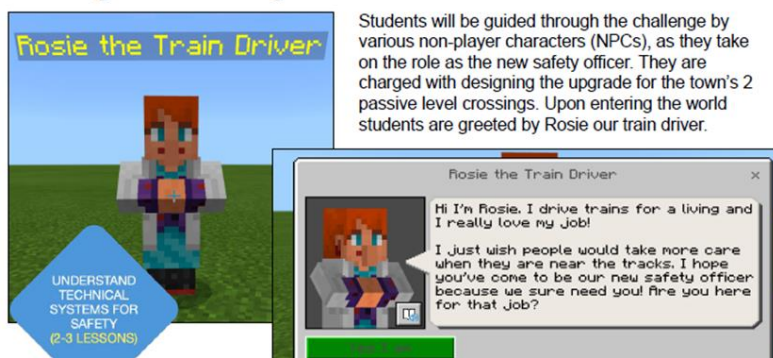


Figure 30: "Rosie the Train Driver" helps guide students through level crossing challenges

## Level Crossing Speed Zone Reduction Program

The Level Crossing Speed Zone Reduction Program is a joint initiative between LCIP and TfNSW Regional and Outer Metropolitan (ROM) in response to the [Speed Limit on Approach to Active Level Crossing Policy](#). The Program is being implemented to reduce speed limits at active level crossings, as well as the approaches to them, setting the speed limit to a maximum of 80 km/h.

This policy is helping to reduce the risk of crashes at level crossings between road vehicles and trains by reducing road speeds on high-speed approaches to actively controlled level crossings. Reducing the road speeds to a maximum of 80km/h allows motorists more time to react and decreases the likelihood of vehicles not being able to stop at level crossings.



Figure 31: Golden Highway, Beni speed reduction from 100km/h to 80km/h

ROM commenced the speed change implementation in November 2020 as part of a three-year program. The program is planned for completion in 2022-23. The new speed zones will be signposted in accordance with speed zoning guidelines and with supplementary railway crossing signage where possible.

2021-22 proved to be a very challenging year, in terms of being able to deliver the program as planned. COVID restrictions and staff and contractor illness as a result of COVID, together with the impact of natural disasters, saw the planned number of sites where a speed reduction was to be implemented in 2021-22 reduced.



Figure 32: Jaspers Brush Road, Jaspers Brush speed reduction from 100km/h to 50km/h

The budget allocated to this program was \$1.09M over three years 2020-21 – 2022-23. Costs were to be split equally between LCIP and the ROM Speed Management program, however additional funding became available under LCIP which has to date covered most costs. The total expenditure to date over the two years is \$1,271,094. LCIP has covered \$1,043,469 of these costs while the ROM Speed Management program has covered the remaining \$227,625.

As of 30 June 2022, 57 of the 106 identified sites (53.7%) have had their speed limits reduced including:

- 7 of 27 sites completed in the ROM North region
- 28 of 28 sites completed in the ROM South region
- 22 of 51 sites completed in the ROM West region

Estimated cost to complete the program in 2022-23 and install the final 49 reduced zones is an additional \$570,000. It is expected that all sites requiring speed reductions under this program will be delivered within program parameters and prior to 30 June 2023.

## Inland Rail Update

The [Inland Rail](#) (IR) project is being delivered by the Australian Government through ARTC to provide an enhanced link between Queensland and Southern Australia to enable freight travelling to Brisbane to bypass the Sydney network. Connecting Melbourne and Brisbane via regional Victoria, New South Wales and Queensland, this 1,700km fast freight network will better link producers to markets and create new opportunities for businesses, industries and regional communities. Approximately 1,000km of the route is in NSW.

Current IR planning includes 54 new public road level crossings across the greenfield sections of Inland Rail in NSW. While Inland Rail will be introducing level crossings along greenfield sections of the project, the overarching objective across the project is to minimise the number of level crossings through a combination of design, closures and property solutions.



Figure 33: Development work on the Inland Rail project

On the brownfield upgrade sections, the project is proactively and successfully pursuing the closure of existing public and private crossings with no proposals to introduce new level crossings. On the first brownfield upgrade project which has been commissioned, Parkes to Narromine (P2N), agreement was reached with landowners to close 14 private level crossings

which represents over 40% of all the private level crossings on the P2N project and 1 public road level crossing.

Works commenced on the second brownfield upgrade project, Narrabri to North Star (N2NS) which is 188km long in 2021, with the second stage of the project due to be commissioned in Q4, 2022. Following consultation ARTC will be closing 12 private and 1 public level crossings, 8 have been formally gazetted closed with 5 more to be gazetted in 2022-23. This is a significant safety outcome for the project, the interstate rail network, and local communities.

As part of the N2NS project, all public level crossings will be upgraded to comply with current standards and 13 passive level crossings will be upgraded to flashing lights and boom gates.

Environmental approvals are progressing for all the greenfield section of IR across NSW. These include: Illabo to Stockinbingal – 37km; Narromine to Narrabri– 300km; and North Star to Border– 30km.

## Roads and Transport Directive (LGNSW)

The [Roads and Transport Directorate](#) is a joint initiative between the [Institute of Public Works Engineering Australasia](#) NSW & ACT Division (IPWEA) and [Local Government NSW](#) (LGNSW) to support NSW councils to deliver an improved local road and transport network. The Directorate is funded by all 128 NSW councils.

Member councils are collectively responsible for the management of over 165,000 kilometres of roads valued at more than \$70 billion representing the single largest community asset in NSW. NSW councils also represent the single biggest stakeholder group in regard to level crossings in NSW, being responsible for the road network adjoining the majority of public level crossings in NSW.

The Directorate is committed to representing the interests of NSW councils in regard to level crossing safety, in particular by advocating for additional funding to improve the safety of level crossings on local roads. The Directorate is also committed to representing the interests of the Level Crossing Strategy Council to NSW councils, particularly in addressing outstanding, or outdated, interface agreements with councils.

## Interface Agreements

### Context

Rail infrastructure managers (RIMs) and Road Managers are obliged to enter into interface agreements for level crossings on public and private roads under Part 3, Division 6 of the Rail Safety National Law (RSNL).

The purpose of the interface coordination provisions of the RSNL is to ensure that all RIMs and Road Managers identify risks to safety arising from level crossings, determine measures to manage those risks so far as is reasonably practicable, and seek to enter into interface agreements to manage the risks. The provisions are intended to ensure that risks arising from level crossings are identified and that accountabilities for risk control measures are clearly articulated.

Interface agreements have been a long-standing requirement since the introduction of the Model Law in 2006 and continued through the RNSL. The Office of the National Rail Safety Regulator (ONRSR) maintains a register of required interface agreements that it is aware of, and routinely follows up with accredited RIMs to monitor the status of such agreements.

## Progress

ONRSR regularly engages with RIMs to monitor progress on outstanding interface agreements and also engages with councils as required. During 2021-22, RIMs advised that a further six interface agreements were executed in NSW, one agreement was identified as no longer being required and one new agreement was also identified. As of 30 June 2022, 140 interface agreements have been signed and 28 remain outstanding.

Note that these numbers exclude interface agreements relating to the Country Regional Network, approximately 45 of which are in the process of being re-signed, following the transition of RIM responsibility from John Holland Rail to UGL Regional Linx.

Table 9: Outstanding interface agreements in NSW as of 30 June 2022

Summary of interface agreement implementation	
Agreements required in NSW	168
Agreements outstanding in NSW	28 (17%)

## Funding for Level Crossings in NSW

Table 10 provides a summary of the total expenditure on level crossing safety improvements in NSW since 2003-04 through to 2021-22.

Table 10: Funding for level crossing safety improvements in NSW from 2003-04 to 2021-22

Year	Program Agency	Expenditure \$ million	Total \$ million	Year	Program Agency	Expenditure \$ million	Total \$ million
2003-04	CRIA	2.00	5.00	2004-05	LCIP	5.00	5.00
	LCIP	3.00					
2005-06	RailCorp	1.30	7.30	2006-07	RailCorp	2.40	11.33
	LCIP	6.0			ARTC	1.65	
2007-08	RailCorp	2.65	18.49		CRIA	0.28	
	ARTC	6.90			LCIP	7.00	
	CRIA	1.94		2008-09	RailCorp	2.81	18.03
	LCIP	7.00			ARTC <sup>1</sup>	2.47	
2009-10	RailCorp	3.27	59.77		CRIA	4.53	
	ARTC <sup>1</sup>	42.77			RTA	2.94	
	CRIA	3.87		LCIP	5.28		
	RTA	3.30		2010-11	RailCorp	3.60	15.94
	LCIP	6.57			ARTC	1.65	
2011-12	RailCorp	3.20	42.69		CRIA	3.37	
	ARTC	29.21			LCIP <sup>2</sup>	7.33	
	CRIA	2.88			2012-13	RailCorp	
	LCIP <sup>3</sup>	7.40		ARTC		12.90	
2013-14	Sydney Trains	1.80	20.85	CRN		1.04	
	ARTC	8.17		RMS		1.30	
	CRN	2.82		LCIP <sup>4</sup>	7.51		
	RMS	0.46		2014-15	Sydney	2.78	19.62
	LCIP <sup>3</sup>	7.60			ARTC	5.36	
2015-16	Sydney Trains	1.96	16.70		CRN	1.16	
	ARTC	3.88			RMS	3.05	
	CRN	3.79			LCIP <sup>3</sup>	7.27	
	LCIP	7.07		2016-17	Sydney	2.94	29.21
2017-18	Sydney Trains	0.11	13.16		ARTC	3.03	
	ARTC	2.00			CRN	12.70	
	CRN	4.71			RMS	3.26	
	LCIP	6.34		LCIP	7.28		
2019-20	Sydney Trains	1.62	30.31	2018-19	Sydney	1.55	21.57
	ARTC	5.52			ARTC	3.87	
	CRN	15.59			CRN	8.10	
	LCIP	7.58			RMS	0.48	
2021-22	Sydney Trains	0.81	13.43	LCIP	7.57		
	ARTC	4.99		2020-21	Sydney	3.67	21.58
	CRN	4.42			ARTC	3.33	
	LCIP	3.21			CRN	7.10	
			LCIP		7.48		

<sup>1</sup> One-off funding for the Boom Gates for Rail Crossings Program was provided as part of the Commonwealth Government's Nation Building Program.

<sup>2</sup> Includes \$2 million funding provided from the former RTA.

<sup>3</sup> Includes \$2.5 million provided by RailCorp and \$4.8 million provided by RMS

<sup>4</sup> Includes \$2.5 million provided by RailCorp and \$5.0 million provided by RMS

## Appendix A: Total LCIP 2021-22 work completed

Table 11: Total LCIP 2021-22 work completed

<b>Construction Projects</b>		
<b>Location</b>	<b>Electorate</b>	<b>Value \$</b>
LX ID 515 Bulunbulun Road Breeza	Tamworth	513,000
LX ID 980 Akuna Road Parkes	Orange	10,000
LX ID 686 Overshot Road Euchareena	Dubbo	30,295
LX ID 951 Convent Lane Borenore	Orange	30,295
LX ID 1015 Kiacatoo Road Condobolin	Barwon	25,200
LX ID 466 Merriwa Road Willow Tree	Upper Hunter	575,000
LX ID 1315 Sheep Wash Road Calwalla	Goulburn	25,200
LX ID 370 Goldfields Way Old Junee	Cootamundra	23,761
LX ID 705 Beni Street Wongarbron	Dubbo	23,761
LX ID 1138 Mid Western Highway Caragabal	Cootamundra	25,200
LX ID 393 Irrigation Way Yanco	Murray	255,788
LX ID 409 Irrigation Way Wumbulgal	Murray	228,836
	<b>Sub Total</b>	<b>\$1,766,336</b>
<b>Other safer level crossings initiatives</b>		
<b>Location</b>		<b>Value \$</b>
Minor works – road speed limits reduction at active level crossings		454,329
Level Crossing Education and Enforcement Campaigns		735,722
ALCAM Contribution & Data Verification Projects		248,713
	<b>Sub Total</b>	<b>\$1,438,764</b>
	<b>Total</b>	<b>\$3,205,100</b>

## Appendix B: Expenditure on level crossing upgrades in NSW funded through the LCIP and by RIMs and Road Manager 2015-16 to 2021-22

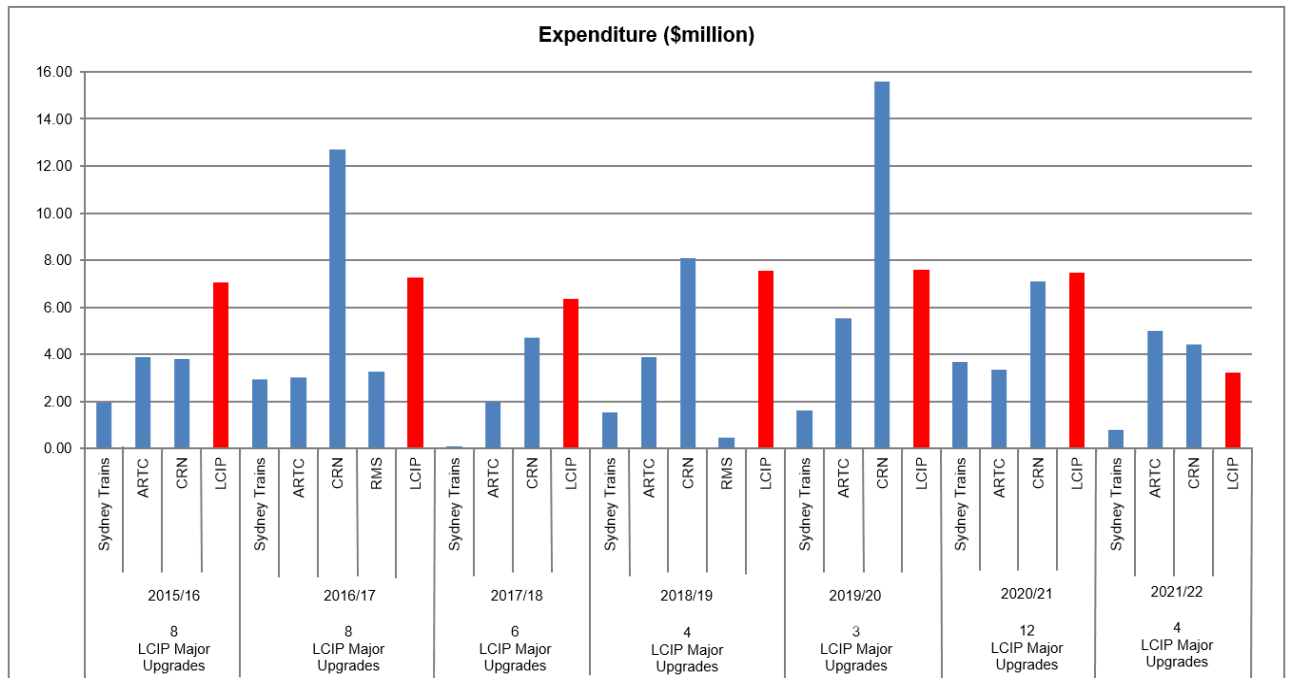
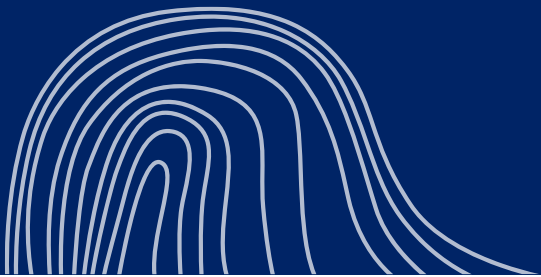


Figure 34: Expenditure on level crossing upgrades in NSW funded through the LCIP and by RIMs and Road Manager 2015-16 to 2021-22





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