

## 2022 LEVEL CROSSING SAFETY FORUM | WORKING GROUP OUTCOMES

Tuesday 9<sup>th</sup> August 2022

### TOPIC: Technology and Innovation

(Facilitator: Georgia Nicholls)

The group came up with a total of six (6) recommendations for the NLCSC. Each are described below, including various notes from the group conversation on each.

#### 1. Back to basic design and management

- a. Consider the need for crossing at all, and prioritise removal
- b. Maintenance
- c. Compliance – check the fundamental design, do assessment
- d. Simplification of standards
- e. Alignment to road design.

It was agreed that technology presents major opportunities for advancement in level crossing safety but felt probably the greatest gains in immediate safety could be achieved through a proactive program of audit and upgrade to ensure 'the basics' of appropriate crossing design were in place across the network. This includes ensuring the design of each complies with all applicable design standards (elevation, road trajectory/geometry etc.), that necessary sight lines are achieved, and any barriers or vegetation removed, that any major dips or rises where road and rail meet are smoothed etc.

It was also felt that this process could be facilitated by a comprehensive review of applicable standards to simplify and enhance national consistency, as well as consideration of what opportunities there are to increase alignment of crossing design, signage, lighting etc. with road signage conventions to simplify for road users (explained further below).

The proactive program of audit and upgrade should also begin with a determination of whether any given crossing is required to reduce the overall number and thereby concentrate investment, education and monitoring on a smaller number of better maintained crossings. Removals of signage on areas of track not in use may also help avoid functional blindness of drivers, especially locals, when navigating crossings on live track. It was noted that UGL manage more thousands of kms of track which is not in use across country NSW, than the amount that is in use.

Heritage Rail NSW have had some success in achieving significant removals in regional areas in collaboration with the community, council and roads authority which could be learned from.

Technology interventions should be reserved for deployment in circumstances where good crossing design is inadequate.

#### 2. Model level crossing design

There was a sense that level crossing design is currently informed by traditions and practices from many years past and crossings would likely look quite different if designed for the first time now. The 'back to basics' approach to enhancing safety could be facilitated by

collaboration of experts on a new and updated 'model level crossing design' which includes the ideal features to enhance safety for road users using widely available and low-cost options. For example, the model design should include:

- Sealing passive approaches – helps with truck crossing when having come to a stop at LX, creates attention, similar to road application
- Consideration of rumble strips, reflective materials on the road or other low-cost interventions
- Crossing clearance signage which indicates the available dwell space in meters on the other side of a crossing on approach – avoid stacking where there is an intersection or other change in road conditions which limits dwell space for heavy vehicles. It was noted that WA miners are currently trialling short stack signage at crossings
- Consistent line marking
- Consistency with road signage conventions – the group questioned why level crossings have signage and lighting which depart from convention on the roads in all other applications, potentially contributing to uncertainty or lack of knowledge about how to respond by road users.

### **3. Type approval reforms**

The group felt that innovation and uptake of emerging technology was only likely to occur sensibly if there were drastic reforms to type approval processes. Namely, that type-approval of new and emerging technology for use in rail should:

- Be clearly defined in a publicly transparent and consistent way by RIMs which includes detailed roles and responsibilities to ensure clarity of governance and expectations for all parties;
- Be subject to minimum service level commitments to ensure timely processing; and
- Be subject to a clear and well-define mutual recognition process to achieve national approval of products once type-approved by any one authority.

The group feel Rio Tinto has a very good approach to type approval which should be considered.

### **4. Inclusion of level crossing safety information in drivers licence tests**

The group did not have a good understanding of what information on level crossing safety is included for prospective road users during theory, practical or virtual driver training and education or license testing. It recommended that this be audited by jurisdictions to determine opportunities for improvement. It was also recommended that special consideration be given to what content could be included specifically in driver training and testing for those seeking a license to operate heavy vehicles, both when initially being sought and upon renewals.

Finally, consideration could be given to sharing curriculum content on level crossing safety identified with the above to providers of occupational driver training and testing, such as businesses who routinely provide defensive driver or driver refresher training for certain workforce groups.

## 5. Illumination

The group felt there warranted some further investigation into options for the illumination of crossings for safety. The group acknowledged the existing work to try enhanced lighting on locomotives and wagons currently underway by Pacific National and Aurizon but thought further information could be sought on lighting options at the crossing itself, which could make use of solar with battery power access and could be set up to operate dynamically when track vehicles are approaching, crossing, or clearing a given crossing. This would minimise disruption to homes, businesses or wildlife close to the corridor and more effectively draw the road user's attention.

## 6. Level crossing in mapping

It was felt there were great opportunities to better support road users to identify, predict, be attentive to and even avoid level crossings if they were better represented in mapping technology commonly used by domestic drivers and heavy vehicle users. The NLCSC should consider working with Apple, Google and other major providers of mapping software used by car manufacturers as standard in Australia to identify and alter drivers to level crossings, both when journey planning and throughout the journey.

Ultimately, it was felt that a risk-based approach to intervention would likely never result in substantial investment to address safety at regional, passive level crossing safety, but that community sentiment, impact on the community of low frequency but high impact tragic events at crossings, and the proliferation of crossings with the delivery of vast distances of new track in the regions of Australia all underpinned the need for greater focus on their safety.

The group also discussed how road user behaviour could likely be vastly improved through development and deployment of automated enforcement at passive crossings. It may even be worth considering installing 'fake' or 'dummy' cameras at crossings to draw drivers' attention. It was noted that Rio trialled 'fake' cameras on two crossings about 20 years ago, and the result was observed much higher compliance with crossing safety.

This could be supported by more active promotion of rail level crossings, and talking about enforcement, using tactics similar to the 'every police car is a mobile booze bus' approach. This could be reinforced by release of 'near miss' or 'near hit' vision captured from trains, and publication of statistics on how many infringements had been issued at crossings.

### **TOPIC: Technology and Innovation**

(Facilitator: Paul Murray, ACRI)

The group consisted of predominately technical SME representatives from ONRSR, TfNSW, Sydney Trains, ARTC and then smaller SME organisations such as Rail Safety Systems, SigTech, JMADR and ACRI. A strong signalling tech/management contingent with a lot of hands-on experience as mentioned in the wrap up on Tuesday's session. The top 3-4 recommendations included;

1. Widespread deployment of level crossing monitoring (to build objective evidence base of effectiveness in road user behaviour improvement of controls in different environments;

- before/after upgrade; various sensor options, IoT, non SIL rated etc) to provide evidence base for which control is relevant to crossing design/environment etc.
2. Addition of Yellow/Amber Flashing light to RX5 assembly (particularly high interest from some of the Sydney Trains signalling team). Would recommend this is expanded to test vs traffic lights and similar concepts also. Needs effectiveness study alongside.
  3. Active advanced warning/information signage including assess effectiveness of various options; some examples discussed included warning of second train coming at busy stations; Constant LED flashing warning vs only when train/road user approaching (SMART stop sign, Active variable messaging boards etc); road user wait time information etc.
  4. Technology sustainability – via centralising key data/information (including NLXP; ALCAM; National LX Intervention Register; Updates to include obsolescence key info for tech, interoperability; Reminder/checklist/audit of low hanging fruit and automatic updates to maintenance planning regimes from tech solutions; lessons learnt sharing from type approvals, etc etc) to a single source of truth.

Although not one of the recommendations, the group did extensively discuss the topic of a unified industry wide approach to new technology/kit approval.

#### **TOPIC: Technology and Innovation**

(Facilitator: Jesse Baker, RISBB)

The group discussed the importance of keeping on top of what work is being done/and by whom in this space. The importance of engagement with both rail and road users, in particular R&D in the heavy vehicle space. Mapping technology and broadcast systems could also be useful – like it is with alerting drivers to speed cameras. Variable speeds zones and going from 100kms to stop is a safety concern - look at how speed can be reduced such as through radar triggered signage. The group also discussed the opportunity to use AI to monitor behaviour of road/LX usage.

The group came up with 3 recommendations for the NLCSC, as described below;

1. Enablers of technology – further examination of what feeds into ALCAM, and how technology can improve this (e.g Google, Drones), including feedback and engagement from road groups. Robust data is essential.
2. To create a community of best practice through ‘Knowledgeshares’ – Joining up organisations/government – both domestically and internationally to share info on what is going on, to ensure stakeholders are informed and opportunities maximised, in a timely manner.
3. Unlock a national market for supply chains to bring their product to the Australian rail market and look at ways to reduce barriers in their way for adoption/implementation, i.e. can approval processes be simplified.

## **TOPIC: Education & Enforcement**

### **(Facilitator: Graeme Jackson, RISBB)**

The group discussed driver risk perception and queried if this changes with age/experience.

It would be useful to understand more of the demographics of road users to help target interventions. The group discussed the opportunity for local safe driving champions to communicate to local communities, especially in regional centres. And the importance of engagement with farming groups. In summary, the key areas for further exploration the group would like to see includes;

1. A review of ALCAM - assessments not current – and not acted on.
2. An opportunity to inform and educate with road management and RIMS – are we doing all we should?
  - Interface agreements
  - Info sharing/capacity building required in this area.
3. The idea of retesting vehicle drivers (road rules changed etc/currency/rules vary state to state). Testing could be improved in L+P tests on Level Crossing awareness/safety.
4. The need for consistency in messaging in communities across the country, and local voices.
5. Explore the opportunity to improve advertising of enforcement – i.e. signage at/near crossings as a reminder to road users of fines.

## **TOPIC: Education & Enforcement**

### **(Facilitator: Hope Steele, TrackSAFE Foundation)**

The group discussed the need for engagement with heavy vehicle groups on education and awareness. Given there are so many small-medium heavy vehicles operators, perhaps looking at larger operators in the first instance to prioritise LX safety with their drivers – i.e Linfox – those driving for supermarkets. In summary

1. The need to develop a national education campaign. Commitment from top down/Commonwealth Gov driven, targeting
  - Heavy vehicle
  - Pedestrians
  - General road users.
2. Increased Local Government involvement/engagement, e.g., RSW – build on this (National theme but local opportunities for messaging that speaks to local issues).
3. Increased Enforcement to coincide with campaigns - need resources allocated to support campaigns + federal govt. involvement.
  - The need for greater uniformity of road rules across jurisdictions.
  - Is there a way of positively reward good behaviour? I.e., Discount on registrations?

## **TOPIC: Data and Knowledge Management**

(Facilitator: Julie Bullas, ONRSR)

The group discussed how the data we already have is being used/acted on and how this could be improved as well as what additional data is required.

Occurrence data – particularly relating to near hits. Feedback was that this is well under reported by train drivers and other rail safety workers and improving the feedback loop including more information could assist in more accurate data being collected.

Recommend actions from the group discussion include;

1. Conflict value – this should be a national measure – will help determine the protection type including when a-grade separation is required. Will be a national approach.
2. NLX portal – explore additional users. Expand to local gov. managers, state and federal government departments (more than those on the committee), NHVR, ATSB. What value can be added and what new data? Such as;
  - Road usage data
  - Interface agreements (to also have them attached and able to be shared)
  - Police/accident data
  - Human factors
  - Coroners' findings and recommendations
3. Greater data sharing. Permission from State Govts and Operators – a challenge that must be overcome.
4. ALCAM – how to make it current, rich and usable data for broader audiences. RGB report findings/recommendations to be actioned

Other topics discussed were:

- How to obtain data/information on land developments
- How to reduce the number of private level crossings – should this data be in ALCAM and consistent nationally?
- Human Factors – Research to continue on everyday behaviour of people – then data to be contained in NLXP

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