VICTORIAN RAILWAY CROSSING SAFETY STRATEGY

2018-2027

Contents

Chair's Foreword

The passenger rail network is at the centre of Victoria's liveability and future prosperity. Every day it connects people to critical services and helps them travel to work, school and social engagements.

Our freight rail network supports our economy by connecting Victorian farmers and produce to export markets around the world and delivering imported goods to customers.

The Victorian rail industry, in partnership with the State Government, is committed to making our rail crossings safer for everyone, including passengers, motorists, pedestrians and the operators of passenger and freight services.

Since 2015, the Level Crossing Removal Authority has led an unprecedented program to remove dangerous and congested level crossings. Up to 29 level crossings will be removed by the end of 2018, and all 50 level crossings will be removed by the end of 2022.

Across regional Victoria over four years, the Safer Country Crossings Program is upgrading 50 road and 25 pedestrian crossings to improve safety for motorists, passengers and local communities.

Alongside these upgrade programs there is a need for a strategic approach to managing and improving safety at rail crossings.

The Victorian Railway Crossing Safety Strategy 2018–2027 will guide this important task and has been developed collaboratively by the transport authorities and agencies with a part to play in improving safety at our railway crossings.

Furthermore, the Victorian Railway Crossing Safety Strategy 2018–2027 provides a coordinated direction for numerous crucial railway crossing safety initiatives to be rolled out over the next decade.

With several projects already underway and the guidance this strategy will provide, we are committed to creating a safer rail network for all Victorians.

Jeroen Weimar

Chair, Victorian Railway Crossing Safety Steering Committee

CEO, Public Transport Victoria

Improving railway crossing safety in Victoria

Victorian Railway Crossing Safety Strategy 2018–2027

As of 1 July 2018, there were 1,828 public road crossings of Victoria's rail network.

Improvements at many of these crossings are being delivered through initiatives such as the *Level Crossing Removal Program*, the *Statewide Level Crossing Upgrade Program and Safer Country Crossings* (see pages 6–7).

As such, a strategic approach to managing and improving safety at railway crossings not targeted by existing programs is required.

To this end, the *Victorian Railway Crossing Safety Strategy* will guide the delivery of a holistic approach to safety at level crossings. This approach leverages the benefits that can be derived from a targeted mix of infrastructure upgrades, and research-driven initiatives that address human factors – including the behaviour of level crossing users.

It has been developed by the Victorian Railway Crossing Safety Steering Committee (VRCSSC) and is intended to complement the work being delivered by existing programs and infrastructure investment. The strategy is focused on coordinating the efforts of multiple agencies and authorities and delivering a coordinated approach to improving safety at Victoria's railway crossings in order to save lives and reduce the number of incidents.

What it covers

This strategy covers railway crossings as defined in the Rail Safety National Law (RSNL) Application Act 2013. This means:

a) An area where a road and railway tracks cross at substantially the same level, whether or not there is a level crossing sign on the road at all or any of the entrances to the area; or

b) An area where a road and tramway tracks cross at substantially the same level and that has a level crossing sign on the road at each entrance to the area.

As such, the *Victorian Railway Crossing Safety Strategy* addresses both train and tramway crossings. This provides opportunities for the consistent management of similar risks encountered at both types of crossing.

This strategy does not extend to:

- 'Informal crossings', where people cross rail lines in places which are not public roads, footpaths or private access points (such as driveways or private roads).
- The broader tram network where pedestrian and road traffic intersects with trams in the shared road space. Those safety risks are managed as part of broader rail safety management.

Major railway crossing safety initiatives

Multiple authorities and agencies share responsibility for improving safety at crossings, and are doing so through a range of initiatives.

Level crossing removals in Melbourne

Melbourne's metropolitan rail network has 178 level crossings – more than any other Australian city. Each of these crossings represents a major conflict between rail, road and pedestrian traffic.

The Victorian Government established the Level Crossing Removal Authority in 2015, tasked with removing 50 of Melbourne's most dangerous and congested level crossings over eight years.

At these crossings there have been over 60 collisions between a train and road vehicle or pedestrian between 2005 and 2014, with 20 fatalities. Risk taking behaviour is also evident at these crossings, with approximately 680 near-miss incidents over the last decade, half of which involved pedestrians.

Level crossings in urban Melbourne are also a source of congestion and economic impacts, with boom gates on busy roads disrupting traffic flow. At some crossings, the boom gates are down for more than half of the two-hour period between 7 am and 9 am on weekdays. A key example is Buckley Street in Essendon, where the crossing is closed for 78 minutes during this two-hour period.

The *Level Crossing Removal Program* is well advanced. As of July 2018, 26 crossings have been removed and three more are in construction. By the end of 2018, 35 of the 50 removals are expected to be completed or underway.

Statewide Level Crossing Upgrade Program

The *Statewide Level Crossing Upgrade Program* has delivered a rolling program of rail crossing upgrades across the state.

In 2016–2017, 21 pedestrian crossings in the Melbourne area were upgraded as part of the program, including new automatic gates at seven crossings and upgrades to automatic gates at a further 13. These works were delivered by VicTrack.

In 2017–2018 the program upgraded 14 high risk pedestrian crossings in the Melbourne area. During the 2018-19 financial year, 15 upgrades at 10 pedestrian and road railway crossings are expected to be completed under this program.

Safer Country Crossings Program

The *Safer Country Crossings Program* is a four-year program being delivered by the Victorian Government to improve safety at regional level crossings.

The $50 million program will boost safety at 52 priority roads and level crossings which carry high speed passenger trains or a high number of heavy vehicles. The upgrades will include works to install flashing lights and boom gates.

The program, delivered by V/Line and VicTrack, is also upgrading 25 pedestrian crossings at 13 priority locations. The Safer Country Crossings Program is also well advanced. As of July 2018, 38 road crossings and 23 pedestrian crossings have been upgraded to improve safety.

About the Victorian Railway Crossing Safety Steering Committee

The Victorian Railway Crossing Safety Steering Committee advises, and makes recommendations to the Minister for Public Transport on policy direction, management and standards for railway level crossings in Victoria.

Its membership is composed of the key agencies and authorities responsible for rail safety in Victoria including:

- Australian Rail Track Corporation
- Level Crossing Removal Authority
- Metro Trains Melbourne
- Municipal Association of Victoria
- Public Transport Victoria
- Transport for Victoria
- VicRoads
- VicTrack
- V/Line
- Victoria Police

Building on previous work

The Victorian Railway Crossing Safety Strategy 2018-2027 builds on the results being delivered through previous programs and current crossing safety initiatives and investment, as well as the latest research from within Australia and overseas.

Safety at railway crossings in Victoria has been an area of focus for many years, both in terms of strategic planning and infrastructure projects.

Towards Zero: A Strategy for Improved Level Crossing Safety in Victoria has set the direction for level crossing safety management since 2009.

Managed by the VRCSSC, implementation of the strategy has considerable progress over the last nine years to upgrade railway crossings and warning systems to improve safety.

In 2009 there were 374 active road crossings with boom barrier controls. As at July 2018, this had increased to 622 as a result of the focus on improving safety and concerted investment. Now all metropolitan railway crossings and 28 per cent of non-metro railway crossings have boom barriers.

Other important safety improvements have also been implemented under the 2009 Towards Zero strategy, including:

- The *Speed Limits Project* which reduced the sign-posted speed of vehicles approaching sealed roads crossings to no more than 80 km/h. This project was developed in response to the Kerang Rail Disaster.
- Railway crossing safety awareness campaigns conducted as part of Rail Safety Week. These annual campaigns were specifically targeted at various road user groups. During 2015 and 2016 over a million people were reached through a combination of media events and communications on the metropolitan, regional and light rail networks.

Another significant achievement has been the completion of a four-year study through a joint Australian Research Council Linkage Grant.

The project conducted unprecedented research to gain an in-depth understanding of the factors influencing user behaviour at railway crossings. This included examination of the behaviour of road-based users (such as drivers, cyclists, motorcyclists and heavy vehicle drivers) and pedestrians.

It also developed new railway crossing designs through systems thinking techniques, which examines interacting elements, and evaluated them using driver simulators.

Examples include intelligent "in road" vehicle warnings of approaching trains and using mirrors to improve visibility at crossings. Alterations to the environment around crossings that influences road user speeds – such as altering the pavement surface and using other passive traffic calming devices – were also examined.

These research findings now provide an evidence base to support the direction of potential safety interventions at railway crossings across Victoria.

Safety risks and trends to be addressed

The context in which rail crossings operate is continually changing. The latest observations set out in this chapter have resulted from analysis of reported incidents and other data.

Factors contributing to risk

Various factors can contribute to increased safety risk at railway crossings. These include:

- Non-compliant user behaviour, such as disobeying signals or disregarding warning signs
- The increasing number of passenger rail services
- An increase in the number of heavy road vehicles, as well as increases in their mass and length
- Rapid population growth in newly urbanised areas leading to greater level crossing use.

Safety risks can be removed by separating rail and road traffic. The Victorian Government is committed to removing many of these dangerous and congested level crossings through the Level Crossing Removal Program.

The program has also removed or upgraded pedestrian crossings, improving safety in these precincts.

While this program has been significantly accelerated, railway crossings will remain a part of the Victorian rail network for the foreseeable future.

In order to develop and implement effective safety interventions at high risk crossings, a holistic approach should be followed taking into consideration the specific safety issues.

Key to this approach is to understand the trends in incidents at railway crossings in terms of their type, location and the changes to population and infrastructure that influence them.

Observed trends

Changes to population and residential areas

Victoria's regional population is likely to grow by around 790,000 between 2011 and 2051. This growth and change is expected to be uneven. The regional cities of Geelong, Ballarat and Bendigo are expected to be responsible for around 55 per cent of this growth.

Melbourne's population is expected to grow to almost 8 million residents by 2051. By 2031, nearly half of that growth is expected to occur in new developments in the northern, western and south-eastern growth corridors. Average weekday boardings are forecast to double to 1.5 million by 2031 when compared to 2011, while the number of people travelling into the city in the morning peak is expected to grow by around 90 per cent.

Additionally, from 2011 to 2051, the share of the Victorian population aged 65+ years will increase from 14 per cent to 22 per cent. An ageing population means more people will face mobility issues.

This can be expected to affect the way people interact with physical environments and impact the nature of risks around railway crossings (such as pedestrian mobility and the use of wheelchairs and mobility aids).

Current railway crossing safety trends

Since 2009, there has been an overall reduction in railway crossings collisions and near misses involving vehicles.

As shown in Figure 1 in 2009 there were 220 incidents involving road vehicles while in 2016 there were 195.

This data suggests that the combination of safety measures implemented has been successful.

As shown in Figure 1, while the overall number of vehicle incidents decreased, over the same period there was a steady increase in incidents at pedestrian crossings.

Pedestrian vs road vehicle incidents at level crossings by year

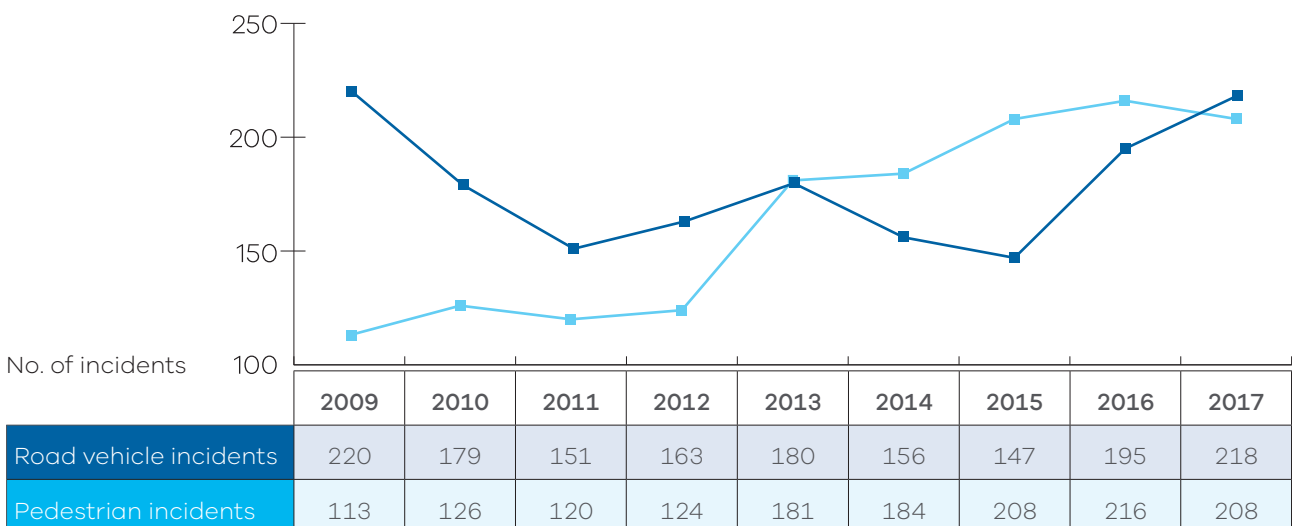| No. of incidents	2009	2010	2011	2012	2013	2014	2015	2016	2017
Road vehicle incidents	220	179	151	163	180	156	147	195	218
Pedestrian incidents	113	126	120	124	181	184	208	216	208

Figure 1 – Pedestrian vs road vehicle incidents at level crossings by year

This rise indicates a need for an increased focus on pedestrian safety measures, as well as a continued focus on preventing incidents involving vehicles.

The *Victorian Railway Crossing Safety Strategy 2018–2027* will build upon the improved safety outcomes achieved to date, and will direct the approach taken to increasing railway crossing safety – for both vehicle users and pedestrians – over the next decade.

Pedestrians incidents are increasing

As noted before, reported pedestrian incidents[1] have significantly increased in Victoria.

In 2009 there were 113 pedestrian incidents; by 2016 this figure had increased to 216.

As shown in Figure 2, over the last three years the increase has been observed in both metropolitan and non-metropolitan areas.

Number of pedestrian incidents by location and year

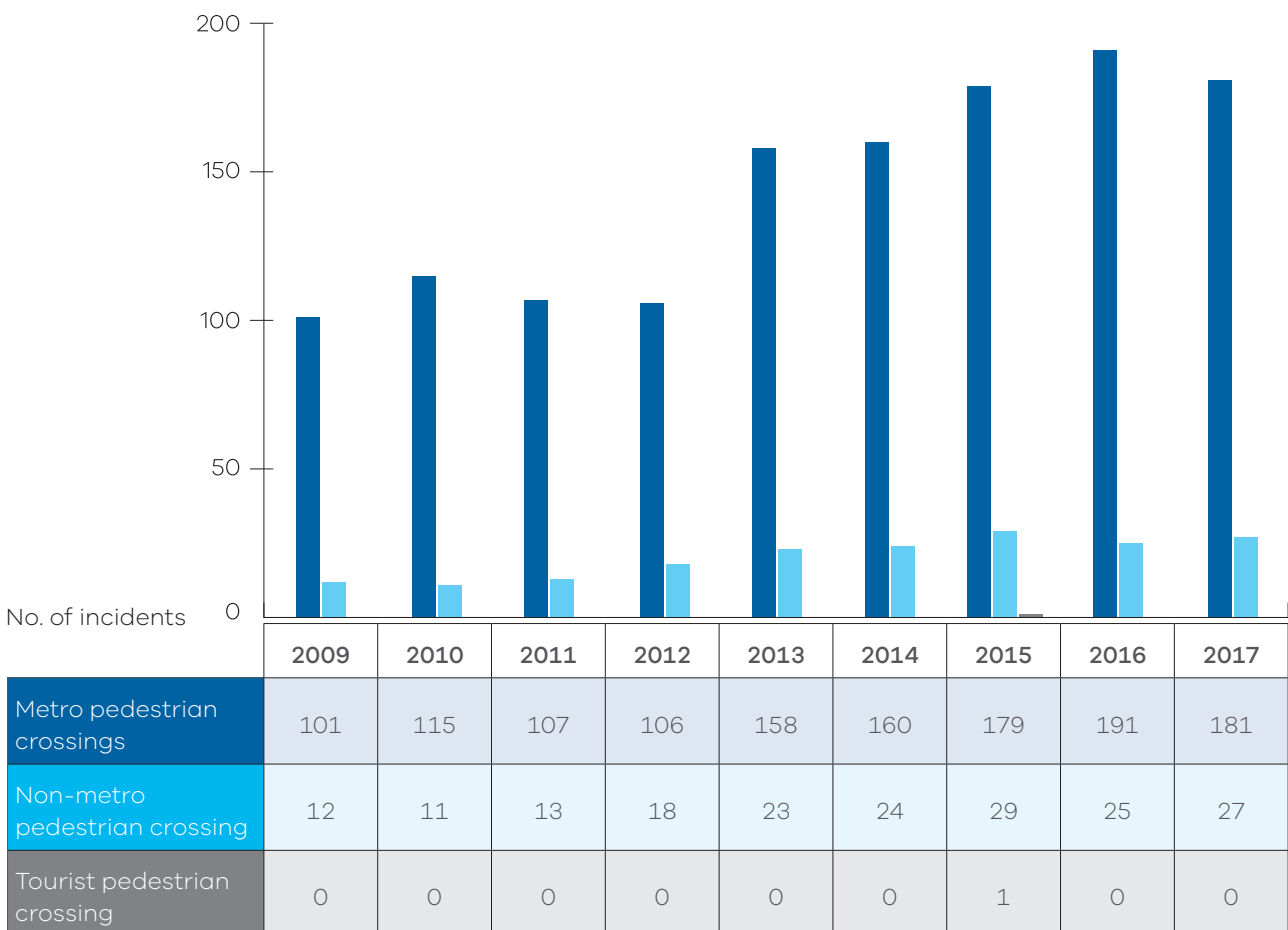| No. of incidents	2009	2010	2011	2012	2013	2014	2015	2016	2017
Metro pedestrian crossings	101	115	107	106	158	160	179	191	181
Non-metro pedestrian crossing	12	11	13	18	23	24	29	25	27
Tourist pedestrian crossing	0	0	0	0	0	0	1	0	0

Figure 2 – Number of pedestrian incidents by location and year

1 Incidents include near-miss and collision occurrences

In the metropolitan area, the average number of pedestrian incidents that occurred between 2009 and 2016 was higher than the number of road incidents. As shown in Figure 3 below, between 2009 and 2016 there was an average of:

- 147 metro pedestrian incidents
- 93 metro road incidents.

In non-metropolitan areas, while the number of pedestrian incidents is increasing, the average number of road incidents is still greater than pedestrian incidents. Between 2009 and 2016 there were:

- 20 non-metro pedestrian incidents
- 64 non-metro road incidents.

Average number of incidents per year by location – 2009 to 2017

- Metro pedestrian level crossing
- Metro road vehicle level crossing
- Non-Metro pedestrian level crossing
- Non-Metro road vehicle level crossing
- Tourist lines pedestrian level crossing
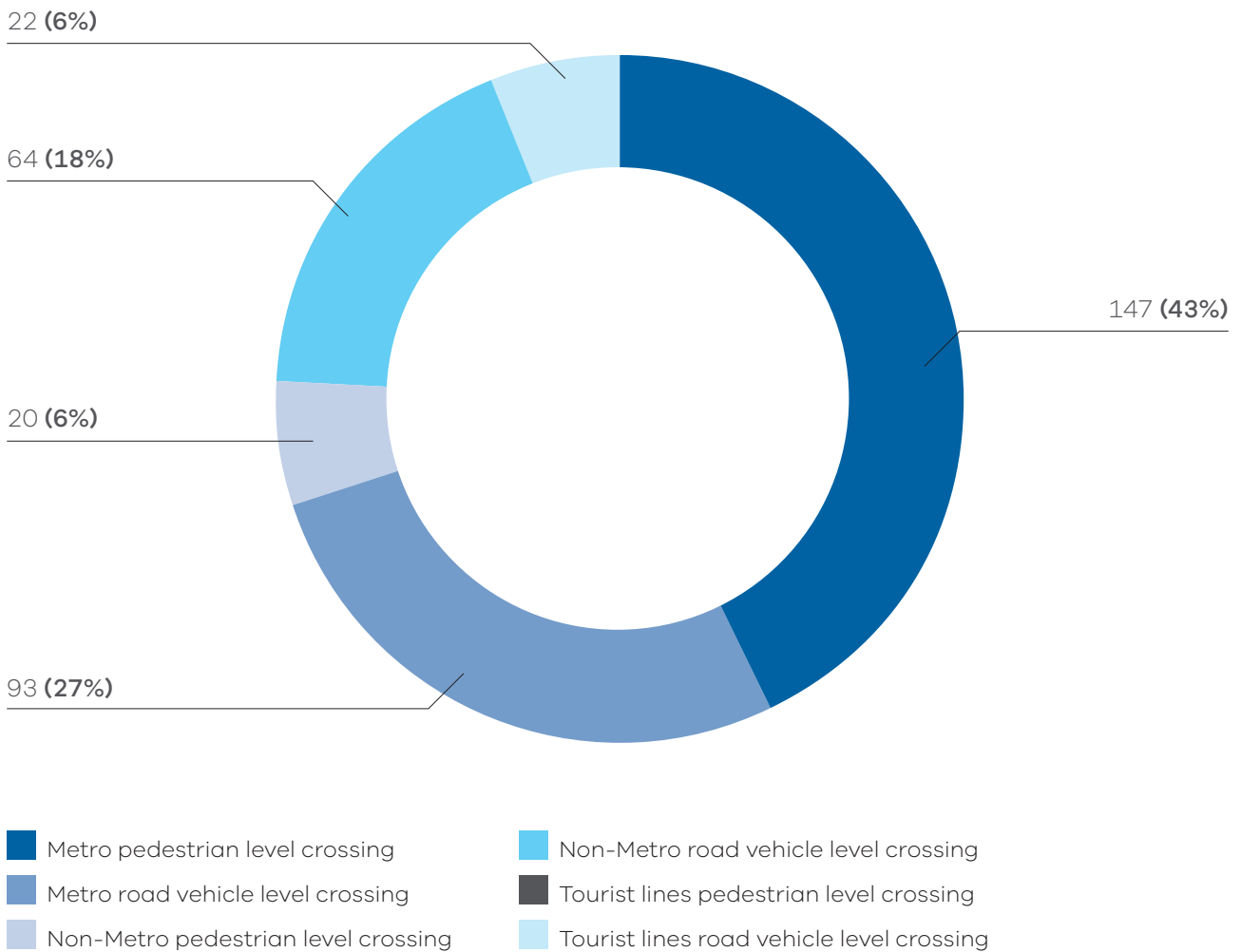- Tourist lines road vehicle level crossing

Figure 3 – Average number of incidents by location – 2009 to 2017

Road incidents still occur at crossings with active controls

Railway crossings with active controls such as boom barriers are over-represented in road incident data.

As shown in Figure 4 below, as of December 2017, 34 per cent of road crossings had boom barriers, but 53 per cent of reported incidents during the same period happened at these active crossings. This data highlights the importance of promoting safe behaviours amongst drivers, as well as removing level crossings.

2017 – Road Incidents and level crossing type (All)

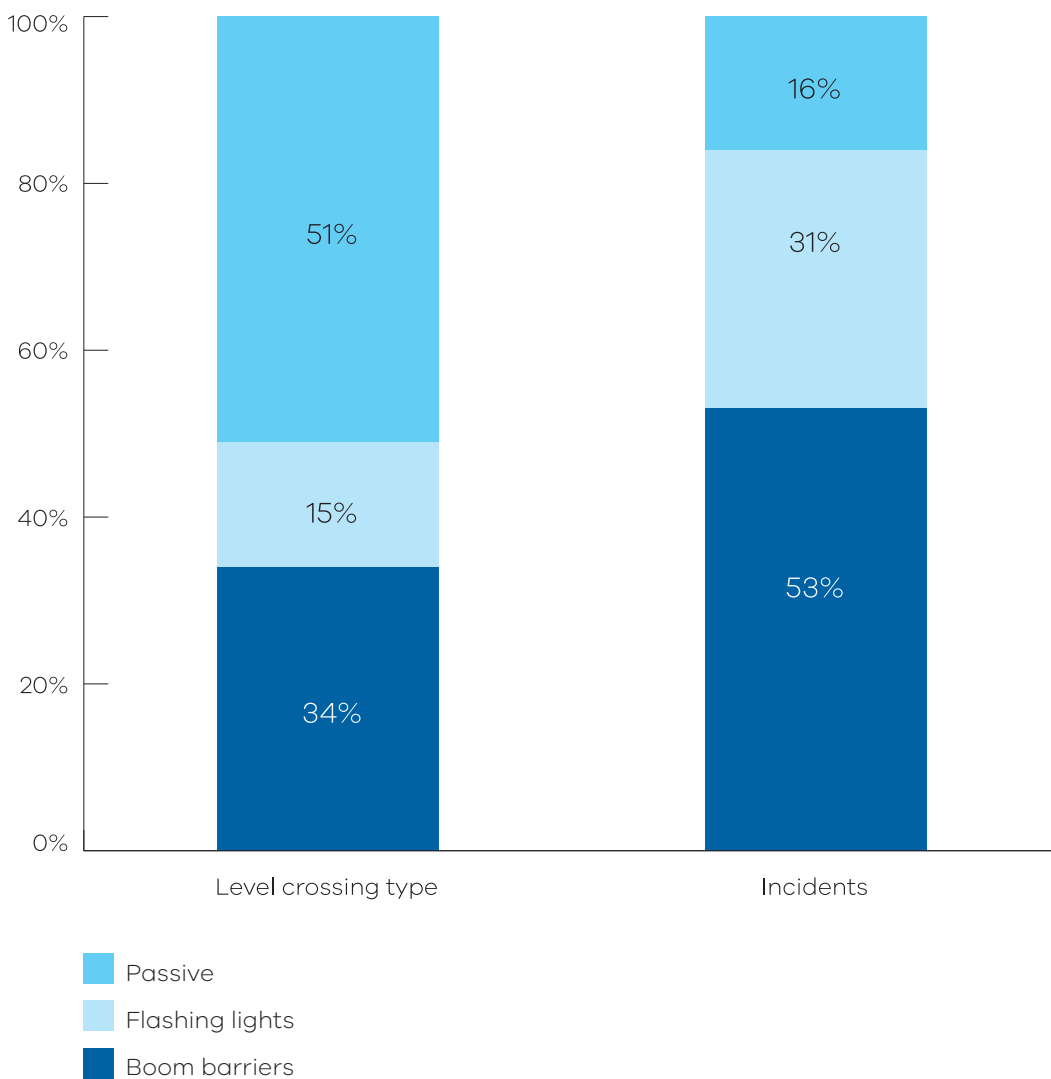Passive

Flashing lights

Boom barriers

Figure 4 – 2017 Road incidents and level crossing numbers by crossing control type

The majority of these incidents, 70 per cent, took place in the metropolitan area where all public railway crossings are active crossings with boom barriers.

It is important to note that active controls are installed at railway crossings with higher levels of road and rail traffic, which influences the likelihood of incidents at these locations.

The problem is not uniform across Victoria

Data shows that there is higher likelihood of railway crossing incidents occurring in the metropolitan area. This aligns with higher volumes of road, rail and pedestrian traffic.

In regional areas, while incidents are less likely or less frequent, the potential consequences of an incident may be more severe. This is linked to higher average road and train speeds in regional areas and a higher proportion of heavy vehicle traffic.

The risk profile for particular local areas can vary depending on the frequency of rail services, average speeds of road and rail traffic, types of rolling stock and types of road vehicles. The type of vehicle is important to consider as there are higher potential consequences involved with heavy vehicles and buses.

Examples of regional variations in incidents include:

- **Passively controlled crossings in regional areas:** In non-metro areas a large number of railway crossings remain passively controlled where road users are not provided with warnings (except for static signage) of approaching trains.
- **Growth areas need specific consideration:** Rapid population growth means that some infrastructure and traffic configurations that previously suited semi-regional locations are no longer suitable for what have quickly become heavily populated locations. Looking ahead, a progressive shift of population is expected to lead to increases in transport demands in peri-urban centres, and on key rail and road corridors.

Behavioural causes need to be understood.

The increase in the number of incidents at pedestrian and road railway crossings with active controls highlights that user behaviour is a key issue to address.

The work undertaken through the four-year Australian Research Council Linkage Grant provides the tools to analyse behaviours in greater detail. Continued work is required to apply and refine these tools to understand the user behaviours across Victoria.

This will result in data systems, research and analysis to improve the understanding of the types and causes of railway crossing incidents.

Railway crossing movements are increasing

Victoria's population is increasing, with rapid growth predicted in the coming decades. Consistent with an increasing population, there has been a steady increase in traffic movements (rail, road and pedestrian) at railway crossings[2].

2 Source: http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0)

A strategic approach to safety

The strategy sets a strategic outcome and five key themes that will guide activity between 2018 and 2027 and is a multi-agency approach to railway crossing safety.

Aim

This strategy is working towards improving safety at Victoria's railway level crossings to save lives and reduce the number of incidents at railway crossings.

Strategic themes

Knowledge will be the enabler necessary to support all aspects of the strategy. Enhancing the collection and use of data will allow greater understanding of the problems and effectiveness of potential solutions. Drawing insights from the data will inform, and be informed by, strategic initiatives.

Technology, education, regulation and environment are the strategic themes that will provide the key areas of focus and direct the development of initiatives to enhance railway crossing safety.

These five key elements are described in Table 1.

Enabler	What this is about
Knowledge	Data, insights, research, analysis • Use of data to understand underlying causes and effectiveness of safety measures • Research and analysis to better understand human factors, drivers of behaviour • Using evidence to prioritise and make risk-based decisions on projects and safety initiatives

Strategic themes	What this is about
Technology	Innovation, new engineering and technology solutions • Research and development • New types of controls/warning infrastructure
Regulation	Change behaviour and increase compliance through enforcement • Regulation, legislation • Policing
Education	Change behaviour through awareness and education • Increase the understanding of risks • Community awareness, targeted stakeholder programs
Environment	Control risk through design of physical environment, place-based planning, operation of assets • Crossing configuration, road treatments, crossing infrastructure, engineering controls • Embedding rail safety outcomes in policy-making

Table 1 – Key elements of the safety strategy framework

A focus on outcomes

Saving lives and reducing incidents at level crossings is the aim of this strategy.

To steer efforts in that direction, the strategy defines the desired outcomes for each key element of the framework. These are the conditions that need to be achieved to enable the overall objective to save lives and reduce incidents.

This will inform strategic initiatives, action planning and evaluation of progress.

As the strategy guides initiatives over the period between 2018 and 2027, it must be responsive to changes in the factors that influence incidents and the resulting safety trends. As such, initiatives to be delivered under the strategy will be delivered in three-year action plans.

Initiatives developed for the first three years of the strategy – 2018–2020 – are included in Appendix A.

The strategy on a page

Aim: Save lives and reduce incidents at railway crossings

			AIM
Knowledge	**Technology**	**Education**	
The causes of incidents and effectiveness of safety measures are well understood. There is a broadly available and consistent evidence base for risk-based prioritisation of responses.	The risk of conflict between level crossing users is reduced by continual improvement in technology. Stakeholders are confident to try new approaches, and can appropriately test new ideas.	The community understands the risks. Behaviour is changed through awareness and education.	
Stakeholder satisfaction with data	Research and development activity	Community awareness Campaign effectiveness	
• Pedestrian counting. • ALCAM field survey. • Level crossing complaints mobile device reporting. • Improved availability of crossings location data. • Forward facing cameras on train. • ALCAM improvements and validation. • Systems approach to safety at level crossings. • Behavioural assessment of level crossing users.	• Traffic signal modification. • In-vehicle audio warnings. • Obstacle detection inter-locked with signals. • In-ground active lights. • C-ITS (Collaborative Intelligent Transport Systems) • Pedestrian crossing gap fillers. • Mirrors at passive crossings trial.	• Evaluation of existing campaign effectiveness. • Development of unifying level crossing safety campaigns. • Implementation of school education program.	

Key measures
- Fatalities
- Incidents

	Regulation	Environment	
	The law is effective in deterring unsafe behaviours around level crossings. Regulation enables stakeholders to work together effectively to manage risks.	The physical environment leads people to safer behaviours around level crossings. Standards and planning for level crossings is well integrated with other transport and urban planning.	Outcome
	Signal violations Policing data	Number of Incidents Risk reduction (ALCAM) Crossing upgrades	Indicators
	• Enforcement cameras. • Enforcement and awareness blitz. • Advocacy.	• State Level Crossing Upgrade Program. • Safer Country Crossings Program (Phase 1 & 2). • Level crossing and pedestrian crossing standards. • Level Crossing removal program.* * Carried out by Level Crossing Removal Authority.	Strategic initiatives 2018–2020

Governance

This strategy sets the direction for improving Victoria's railway crossing safety for the period 2018–2027. Short-term action plans will guide specific activity to implement the strategy and monitor progress toward desired outcomes.

The VRCSSC will monitor progress on the strategy and will prepare an annual review of progress which will be provided to the Minister for Public Transport.

The Victorian Government, through capital programs managed by the VRCSSC, funds upgrades to railway crossings and research as well as education and awareness campaigns which are implemented through four working groups as shown on Figure 5.

VRCSSC – Victorian Railway Level Crossing Safety Steering Committee

Purpose:

Advise and make recommendations to the Minister for Public Transport on policy directions, management and standards for railway level crossings in Victoria.

Membership:

- Public Transport Victoria (PTV) – Chair
- Australian Rail Track Corporation (ARTC)
- Level Crossing Removal Authority (LXRA)
- Metro Trains Melbourne
- Municipal Association of Victoria (MAV)
- Transport for Victoria (TfV)
- V/Line
- VicRoads
- Victoria Police
- VicTrack.

VRCSSC working groups			
RCHFG Railway Crossing Human Factors Group	**RCPD** Railway Crossing Program Delivery Group	**RCTG** Railway Crossing Technical Group	**RCSAG** Railway Crossing Safety Awareness Group
Purpose: Provide advice and guidance to the VRCSSC and working groups on issues related to Human Factors at Level Crossings.	**Purpose:** Manage the delivery of the State Level Crossing upgrade programs.	**Purpose:** Advise and make recommendations to the VRCSSC on research and development initiatives which could enhance the safety of railway crossings in Victoria.	**Purpose:** Development and implementation of communication and awareness initiatives to promote safety around railway level crossings.
Membership: • Metro Trains Melbourne *(Chair)* • PTV • Transport Accident Commission • VicRoads • VicTrack • V/Line	**Membership:** • VicTrack *(Chair)* • ARTC • Metro Trains Melbourne • MAV • PTV • VicRoads – Safety • V/Line	**Membership:** • VicTrack *(Chair)* • ARTC • Metro Trains Melbourne • MAV • PTV • VicRoads • V/Line	**Membership:** • PTV *(Chair)* • ARTC • LXRA • Metro Trains Melbourne • TrackSafe Foundation • Transport Accident Commission • Transport for Victoria • VicPol • VicTrack • V/Line • Yarra Trams

Figure 5 – VRCSSC membership and working groups

It should be noted that maintenance of new railway crossing infrastructure delivered under the strategy becomes the responsibility of the relevant Accredited Rail Transport Operator. Road infrastructure such as advance warning signs and equipment becomes the responsibility of the Road Authority.

As such, it is essential that upgrades and safety solutions implemented are both highly reliable and cost effective over their full life cycle. The coordinated, state-wide approach enabled by this strategy seeks to ensure this outcome.

Factors influencing the response to railway crossing safety

To implement the strategy effectively, the broader context must be taken into account. This includes the authorities and agencies responsible for rail safety, and the development and requirements of the public transport and road networks. It is also important to ensure alignment with other government initiatives and to be aware of rapid advances in technology which may also present new opportunities or risks.

A coordinated effort from many stakeholders

The nature of railway crossings as an interface between different types of transport creates a complex environment.

Because of this complex interface, safety at railway crossings is a shared responsibility. Rail operators, road agencies, government agencies that oversee and regulate, and the people who use railway crossings, all have a part to play.

Consequently, delivering safety solutions requires a continued collaborative effort.

The strategy seeks to support improved safety outcomes by providing a framework to guide and coordinate the effort of the many stakeholders responsible for rail and road safety outcomes.

Public transport network development

Victoria's rail network is undergoing an unprecedented program of upgrades as part of the government's infrastructure program.

These upgrades are delivering more services, new trains and new rail lines.

Significant focus and investment has been placed on removing level crossings around Melbourne, in addition to upgrading regional rail crossings. Improvements to signalling systems on the metropolitan and regional networks are also improving the safety and reliability of crossings.

PTV has developed a suite of network requirements, informed by technical policies and guidance, which ensure the efficient and reliable operation of the public transport networks and meet future customer needs.

The network requirements aim to ensure that future improvements and technologies applied to railway level crossings meet the following guiding principles:

- Safety – improving safety for passengers, employees and the community.
- Reliability – ensuring the asset performs its intended function continuously and dependably under all specified conditions.
- Accessibility and inclusiveness – providing an equitable shared experience over and above the required legislation.

Initiatives developed and delivered under the *Victorian Railway Crossing Safety Strategy* will adhere to these requirements so that safety performance and innovation of railway crossings can respond effectively to the changing operational environment.

Technological change

Rapid technological change will mean that safety risks and possible solutions, may change significantly over the life of a 10-year strategy. The strategy will need to be flexible enough to identify, respond and adapt to emerging risks.

Recent developments in the use of augmented reality and smartphone technology demonstrate that the type of safety risks around railway crossings can change quickly and unexpectedly. Emerging technologies that are likely to change road use, such as driverless technology, will also present opportunities to improve safety around railway crossings.

Connection to other strategies

Level crossings are one part of Victoria's land transport system. As part of an integrated system, this strategy for managing safety at level crossings connects with two other key safety strategies outlined below.

Towards Zero 2016/2020 – Victoria's Road Safety Strategy & Action Plan

Deaths from collisions between trains or trams and motor vehicles are part of the road toll. In both areas, Victoria is targeting zero fatalities for road and level crossing users. The two strategies support the same objective and in some areas will have complementary actions.

National Railway Level Crossing Safety Strategy 2017–2020

This strategy is consistent with the national approach to level crossing safety and will support Victoria's contribution to nationally coordinated activity.

The National Railway Level Crossing Safety Strategy 2017–2020 identifies the following key areas of focus:

1. Safe Systems

2. National coordination

3. National approach to risk assessment

4. Technology and innovation

5. Education and enforcement

6. Data improvement and knowledge management.

The key focus areas of the Victorian strategy (Knowledge, Education, Regulation & Technology) directly align with and complement the National Strategy's key areas of focus, as shown in figure 6. In addition, the VRCSSC supports national coordination through the sharing of good practices and working together to achieve common aims and goals.

National Railway Level Crossing Safety Strategy

| Data improvement and knowledge management. Safe Systems. National approach to risk management. | Education and Enforcement. | Technology and innovation. |

↓

Victorian Railway Crossing Safety Strategy

| Knowledge. | Education. Regulation. | Technology. |

Figure 6 – National Level Crossing Safety Strategy and Victorian Railway Crossing Safety Strategy alignment

Appendix A – Strategic initiatives 2018–2020

Working Group Project Lead

RCHFG	RCPD	RCTG	RCSAG

Project
Pedestrian counting **Description:** Conduct pedestrian counting at selected level crossings. **Benefit sought:** Obtaining more accurate pedestrian volumes to be incorporated into the Australian Level Crossing Assessment Model (ALCAM).
ALCAM field survey **Description:** Conduct field surveys of level crossings. **Benefit sought:** Ensure accurate data within the ALCAM to inform upgrade, closure and removal programs.
Traffic signal modification **Description:** Modifying traffic signals phasing and assess if there is capacity loss and traffic impacts with the proposed changes. **Benefit sought:** Avoid cars queuing over level crossings.
Trial of mirrors at passive crossings **Description:** Test use of mirrors at level crossings as a measure to improve safety at level crossings with passive controls. Mirrors have been trialled at one location. This project seeks to extend the trial to include a site with higher traffic to verify safety outcomes. **Benefit sought:** Improve safety at level crossings with passive controls in which an upgrade to active controls is not possible.
Enforcement cameras **Description:** The proposed system is to capture weaving as well a red light and speeding offenders. **Benefit sought:** Reduce likelihood of crashes at level crossings, improves safety.
Pedestrian crossing gap fillers **Description:** Review and trial flange gap filler products that can be used at pedestrian crossings. **Benefit sought:** Increase safety at pedestrian crossing by reducing risk of slips, trips or falls due to gaps between pedestrian crossings' foot path and railhead.

	Strategic Theme Alignment					Timing		
	Knowledge	Technology	Education	Regulation	Environment	2018	2019	2020
	■	■	■					
	■							
	■	■						
	■	■	■					
	■	■	■	■				
	■	■						

Working Group Project Lead

| RCHFG | RCPD | RCTG | RCSAG |

Project				
Obstacle detection inter-locked with signals **Description:** Detection of obstacles in the level crossing when boom barriers are down, linked to railway signals to stop trains. **Benefit sought:** Reduction in collision of trains and vehicles (vehicles trapped in the level crossing when boom barriers are down).				
In-ground active lights **Description:** Review and trial in-ground active light products that can be used as warning devices at level crossings. **Benefit sought:** Increase drivers' awareness when approaching a level crossing with the aim to increase safe user behaviour and reduce likelihood of incidents.				
Level crossing complaints mobile device reporting **Description:** Explore the opportunity to utilise mobile device apps to collect level crossing issues via public interaction. **Benefit sought:** Increase level crossing safety data repository to include customer reports. This data would be useful in assessing risks at specific locations and for Human Factors analysis.				
Improved availability of crossings location data **Description:** Project aimed at releasing public level crossing location data. **Benefit sought:** Facilitate incorporation of crossing locations into navigation and route planning technologies.				
C – ITS (Collaborative Intelligent Transport Systems) **Description:** C-ITS allow vehicles to communicate with other vehicles and infrastructure fitted with the same system. Drivers can be alerted about risks ahead or traffic signal information. This project seeks to have rail industry representation into C-ITS technology State policy and supporting initiatives. **Benefit sought:** Incorporate/consider level crossing safety into emerging C-ITS technologies.				
Forward facing cameras on train **Description:** Utilise front facing cameras to capture occurrences. **Benefit sought:** Gain further understanding of contributing factors through footage of occurrences.				
ALCAM improvements and validation **Description:** Advocate for a review of the pedestrian model and validation of ALCAM (Australian Level Crossing Assessment Model). **Benefit sought:** Ensure accurate quantification of risk at level crossings within Victoria.				

	Strategic Theme Alignment					Timing		
	Knowledge	Technology	Education	Regulation	Environment	2018	2019	2020
		■		■				
		■			■			
	■							
	■							
		■						
	■	■						
	■							

Working Group Project Lead

| RCHFG | RCPD | RCTG | RCSAG |

Project
Systems approach to safety level crossings **Description:** Apply findings and models from the four year behavioural research programme to level crossing safety projects and initiatives. **Benefit sought:** Test and predict effectiveness of safety interventions considering human behaviour at level crossings.
Behavioural assessments of level crossing users **Description:** Project to observe and analyse level crossing road and pedestrian users' behaviours to improve knowledge of infrastructure and motivating factors that lead to non-compliant behaviour. **Benefit sought:** Understand types of behaviour and other users contributing factors, and use knowledge and data collected on the development or implementation of safety interventions such as awareness campaigns, technical solutions and site selection for upgrades.
State Level Crossing Upgrade Program **Description:** Risk based upgrades or closure of road and pedestrian level crossings across Victoria. **Benefit sought:** Reduce risk of incidents on the Victorian railway network.
Safer Country Crossings Program **Description:** Risk based upgrades or closure of road and pedestrian level crossings across regional Victoria. **Benefit sought:** Reduce risk of collisions at level crossings with passive controls.
Regional Rail Revival Program **Description:** Upgrades to every regional passenger line in Victoria, including risk based upgrades or closure of road and pedestrian level crossings across regional Victoria. **Benefit sought:** Reduce risk of collisions at level crossings.
Enforcement and awareness blitz **Description:** Awareness campaign aligned with targeted enforcement. **Benefit sought:** Increase railway crossing safety awareness amongst target audiences.
Unifying level crossing safety campaigns **Description:** Develop and implement an overarching campaign/message on level crossing safety. **Benefit sought:** One single campaign to be used across Victoria and unite existing mode and event specific activities.

	Strategic Theme Alignment					Timing		
	Knowledge	Technology	Education	Regulation	Environment	2018	2019	2020
	■	■	■	■		▧	▧	▧
	■					▧	▧	
		■			■	▧	▧	▧
		■			■	▧		
		■			■	▧	▧	▧
	■		■	■		▧	▧	▧
	■		■			▧	▧	▧

Working Group Project Lead

RCHFG	RCPD	RCTG	RCSAG

Project	
Schools education program **Description:** Conduct research into existing Victorian education-based programs and develop, then implement, a schools education program. **Benefit sought:** Provide assessment of messaging based on the feedback. Make recommendations for strategies, tools and resources which help students understand how to safely navigate level crossings.	
Advocacy **Description:** Continuous advocacy, awareness raising and influence activities. **Benefit sought:** Support various initiatives across the level crossing safety strategy, including Rail Safety Week to highlight risks at level crossings and encourage safe behaviour.	

	Strategic Theme Alignment					Timing		
	Knowledge	Technology	Education	Regulation	Environment	2018	2019	2020
	■		■					
			■					