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## ROAD SAFETY STRATEGY

In 2008, the State Government released its 12-year road safety strategy, *Towards Zero*. *Towards Zero* set out the ambitious target of 11,000 fewer people killed or seriously injured (KSI) by 2020, which is a 40% reduction from the baseline period of 2005–2007.

**The baseline figure for pedestrian KSI was 210. Using a 40% reduction, a figure of 126 KSI is the Government’s target for 2020.**

Pedestrian safety remains a major priority for the Road Safety Commission and other road safety authorities across Australia.

# DEFINITION

A pedestrian is a person on foot, on or in a toy vehicle, pushing a perambulator (pram) or wheelchair, in a perambulator, or in a motorized or non-motorised wheelchair which is not capable of travelling at a speed greater than 10km/h (BITRE 2015). The definition also applies to people who have alighted from a motor vehicle.

## WHAT IS THE PROBLEM?

Pedestrian safety has, in the past, been relegated in favour of vehicle safety; but the safety of all road users should be treated equally. Pedestrian groups fall into three categories of particular increased risk: children under 17 years, the elderly (60 years and older) and intoxicated pedestrians (Devlin, A et al. n.d.). Pedestrians form the largest, single road user group in Western Australia (WA) because almost everyone is a pedestrian at some point.

The probability that a pedestrian will be killed if hit by a motor vehicle increases dramatically with speed. Motor vehicle fronts have not been designed to provide protection for pedestrians against injury at collision speeds of 30km/h or more.

Pedestrians are classed as vulnerable road users largely due to their lack of protection and limited biomechanical tolerance to violent forces if hit by a vehicle (CMARC. n.d). Pedestrians are exposed to many potentially dangerous situations when in close contact to moving traffic and must use a largely unsympathetic infrastructure system and one which is slowly catching up with the needs of disabled or impaired people.

Pedestrians account for approximately 13% of all road fatalities in Australia and approximately 270,000, or 22% of fatalities worldwide, each year<sup>1</sup>. In WA, 100 pedestrian fatalities were recorded between 2013-2017. Nationally, the pedestrian fatality rate is slowly declining, however, in the five-year period, the fatality rate in WA has risen slightly<sup>2</sup>.

The estimated figure of pedestrian KSI in Western Australia (WA) for 2016 was 185. This is a 12% reduction of the baseline figure (n=210), however **this number still exceeds the government's target for a 40% reduction (n=126) of pedestrians KSI on Western Australia (WA) roads by 59 people<sup>3</sup>.**

Pedestrians are put at risk through several factors:

- Vehicle speed – The speed at which a vehicle travels influences both crash risk and crash outcome
- Lack of pedestrian facilities – Inadequate land use planning and road design fail to provide facilities such as footpaths or pedestrian access at intersections
- Visibility of pedestrians/vehicles – Inadequate or lack of road lighting, vehicle lights, pedestrians wearing dark clothing
- Other – Inadequate enforcement of traffic laws, unsafe driving, driver distraction, driver fatigue, pedestrian distraction, failure of driver to give way to pedestrians, vehicle design (bullbars, high rigid fronts), etc.

<sup>1</sup> Department of Infrastructure and Regional Development – Pedestrians and Road Safety, p2.

<sup>2</sup> Source: Western Australia Police Force Traffic Enforcement and Crash Executive Information System (calculations have not been endorsed by WA Police Force)

<sup>3</sup> Road Safety Commission presentation to Road Safety Council 30/08/2018 – Road Crash and Exposure Trends to 2016 and Progress Towards 2020 Targets

## What happens in a pedestrian crash?

### For adults:

First contact usually occurs between the leg or knee and the vehicle's bumper, followed by the thigh with the bonnet's edge, and the pelvis or thorax with the bonnet's top. The head then hits the bonnet or windscreen.

### For children:

Due to their smaller stature, first contact often is the head or neck level.

Most serious injuries are caused by the direct impact of the pedestrian by the striking vehicle itself rather than the road onto which the pedestrian falls.

The severity of injuries is influenced by:

- Vehicle impact speed
- Type of vehicle
- Stiffness and shape of the vehicle
- Age and height of pedestrian
- Standing position of the pedestrian relative to the front of the car. Source: WHO, n.d.

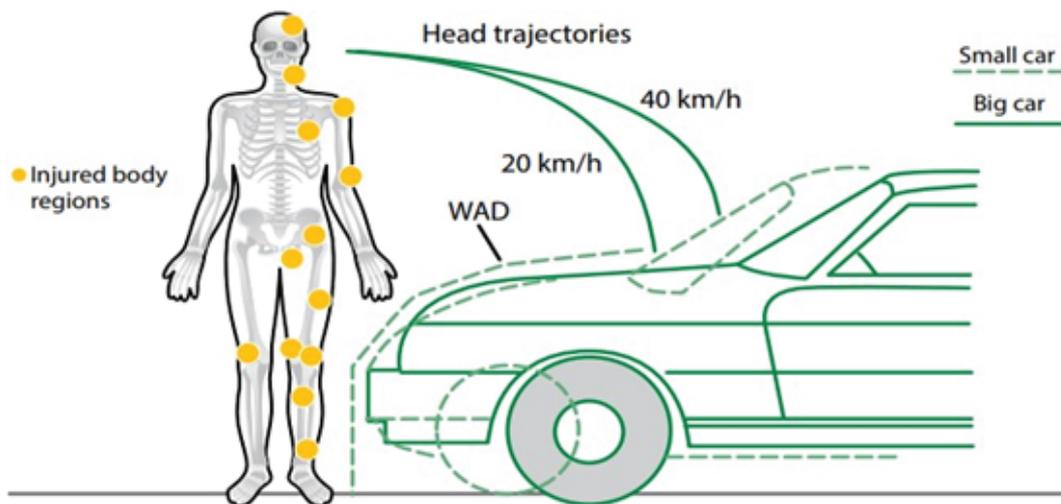


Fig 1: Distribution of injuries on the body of a pedestrian in a frontal car-pedestrian collision

### Children under 17 years

A lack of experience in road use and undeveloped skills combine to make young children high risk pedestrians. It is recommended that adults accompany young children when close to traffic, however, research shows that most child pedestrian crashes occur close to home, on the way to or from school or in streets local to home.

Western Australia Police Force (WA Police Force) reported from 2004–2013, 9.2% of pedestrian fatalities were the 0–16 years age group (n=226) (WA Police Force 2014).

The same report stated that of the seriously injured pedestrians, 20.3% were 0–16 years old (n=1893).

## **Senior pedestrians**

Senior pedestrians fall into the vulnerable road user category due to the deterioration of physical abilities, sensory, perceptual, as well as cognitive abilities.

WA Police Force reported from 2004-2013, 12.9% of pedestrian fatalities were in the 60 and over age group (WA Police Force 2014).

The same report stated that of the seriously injured pedestrians, 12.9% were in the 60 and over age group.

## **Intoxicated pedestrians**

Intoxicated (drink or drug) pedestrians continue to feature in KSI annual statistics. The effects of alcohol on a person include, but are not limited to:

- Trouble concentrating
- Loss of coordination
- Slower brain activity
- Dulled perception, especially vision and hearing
- Stumbling
- Passing out<sup>4</sup>.

Some of the effects of drugs on a person are similar to alcohol, however, increased heart rates, increased energy, hallucinations, paranoia, etc., are other known side effects.

A recent study into pedestrian serious injury crashes of eight people, showed that three people had consumed four or more drinks three hours before the crash and two had taken prescription drugs, which may have affected their motor ability (C-MARC 2017). Approximately one third of all fatally injured adult pedestrians in Australia have a blood alcohol content exceeding 0.08 to 0.10g/100ml (WHO 2013).

## **Remote and Regional WA**

Indigenous people are classed as a vulnerable road user, especially those who live in regional and remote areas of WA. Western Australia constitutes one third of the total land mass of Australia. Population densities vary throughout the state, with most people living in or near to Perth. Regional and remote WA experiences a relatively high number of KSI due to several factors: geographical differences (deserts, forests, coastal regions, etc.), low population density over vast distances, socio-economic and transport issues all contribute to WA's unique and challenging remote areas that impact on road safety:

- Low infrastructure investment due to low traffic volumes when using traditional assessment methods
- Lower quality transport infrastructure and roads due to long road networks and limited resources
- Vast distances to travel to major service centres and cities
- Long distances to travel to receive treatment at trauma centres and rehabilitation centres
- Limited public transport options with existing services relatively expensive and infrequent
- Lack of all-weather access to communities and services

<sup>4</sup>[www.alcohol.org](http://www.alcohol.org)

- Geographical isolation from the rest of Western Australia
- Low population density resulting in diseconomies of scale.

Statistically, there are fewer pedestrian crashes in rural and remote areas, but these crashes are 2.3 times more likely to result in the death of a pedestrian (Mueller, et al. 1988). A study conducted between 2005–2009, investigated 1082 pedestrian serious injury crashes across all regions of WA (metropolitan, regional and remote). Owing to the higher speed restrictions in regional and remote areas, coupled with a lack of basic pedestrian infrastructure outside of established community locations (forcing pedestrians onto roads, lack of lighting, etc.), 24% of crashes occurred in 80km/h speed zones, nearly 14% in the maximum speed zone compared with 6.7% in metropolitan equivalent zones. Aboriginal pedestrians are 5.5 times more at risk than other Australian pedestrians (AIHW, Henley & Harrison, 2010).

### Other pedestrian groups which need consideration

The following pedestrian groups warrant special consideration due to physical impairment or having to negotiate unforgiving pedestrian infrastructure with very young children:

- Pedestrians with prams
- Impaired pedestrians (Vision/Hearing/Cognitive)
- Limited walking ability
- Wheelchair users (Powered/Manual/Gopher).

Often, pathways are not wide enough for wheelchair access or for people to move around comfortably on crutches. Paths or roadways do not have ramp access/entry points and the missing tactile additions to support impaired users. Existing street obstacles, such as post boxes, telegraph poles, bus stops, café tables and chairs, etc., poses many problems for this group of pedestrians.



Fig 2: Street obstacles inhibiting impaired pedestrian groups

Towards Zero, the road safety strategy, incorporates the Safe System, which aims to improve road safety through four cornerstones: Safe Road Use; Safe Roads and Roadsides; Safe Speeds; Safe Vehicles.

The key initiatives under the four Safe System cornerstones are:

- Safe Road Use – integrating behaviour change programs with improved enforcement to make them more powerful and addressing impaired driving (alcohol, drugs, fatigue and distraction), restraint use, graduated licensing and speed choice
- Safe Roads and Roadsides – investing in Safe System infrastructure improvements
- Safe Speeds – enhancing speed enforcement and further reflecting on the appropriateness of WA's speed limits
- Safe Vehicles – promoting the uptake of safer vehicles and key safety features, particularly by government and corporate fleets.

Figure 3 shows the number of projected savings of killed and seriously injured people over the lifetime of the current road safety strategy.

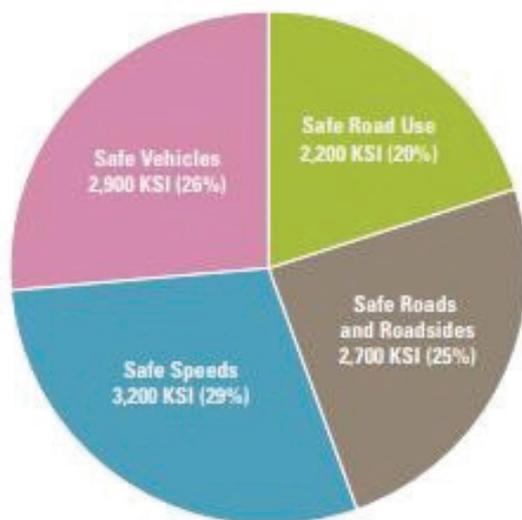


Fig 3: Projected cumulative savings in numbers killed and seriously injured 2008–2020 Towards Zero strategy

## WHAT IS THE SUPPORTING RESEARCH AND EVIDENCE?

It is estimated that for every 1km/h increase in mean speed\*, the number of injury crashes will rise by around 3% (thus an increase of 10km/h would result in a 30% increase in injury crashes) (Nilsson, G 1984). Pedestrians have been shown to have a 90% chance of survival when struck by a car travelling at 30km/h or below, but less than 50% chance of surviving an impact at 45km/h (Peden et al, 2004). Fig 2 shows a pedestrian has almost no chance of surviving an impact as speed approaches 70km/h.

\* Mean speed: The distance an object moves under uniform acceleration is equal to the width of the time interval multiplied by its velocity at the midpoint of the interval (its mean speed) – Encyclopaedia Britannica, Inc.

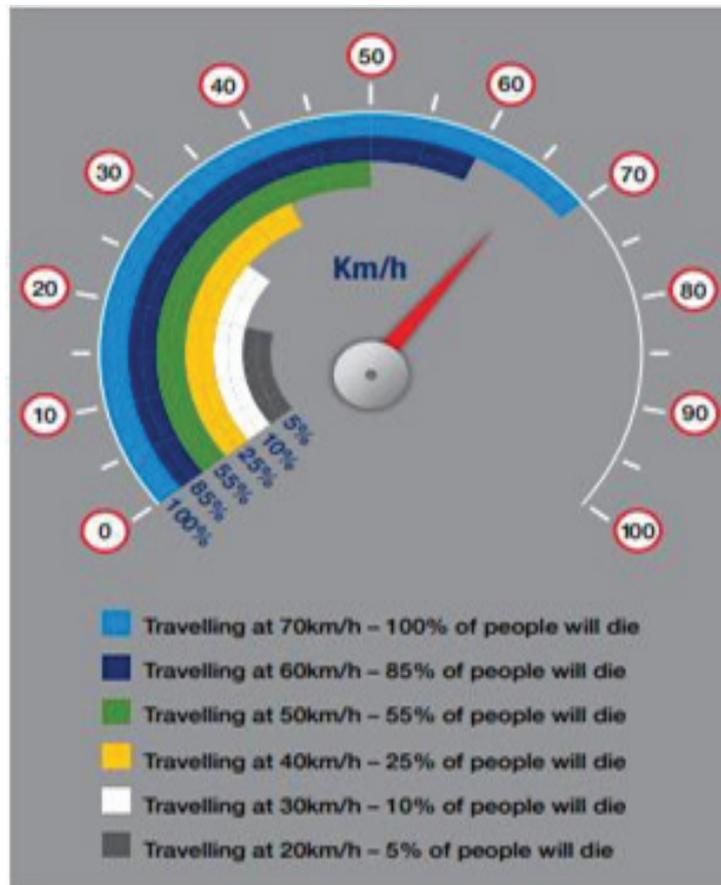


Fig 4: Percentage of pedestrian fatalities when struck by an oncoming vehicle at various speeds

## Children

Evidence shows that children, due to immature and less well-developed cognitive, attentional, perceptual and visual skills, are less competent in traffic than older children and adults (Zeedyk, et al. 2002). Children's smaller stature is a significant issue for them when trying to see over parked cars and other obstacles and can also be hidden from drivers. They have difficulty in judging safe gaps in traffic, choosing safe locations to cross, are easily distracted, fail to comprehend the situation in complex traffic situations, judging distances and speeds and controlling impulsive behaviour and reactions (Barton & Schwebel, 2007).

A great deal of effort has been invested in safe routes for children to go to and from school, however, research indicates that less children are now walking to or from school. In 1999, of all trips made by children aged 5-9 81% of trips were by car and 62% of 10-14 years was also by car (Morris, et al. 2001). This moves children into cars, which causes further congestion and removes the opportunity to teach children fundamental methods of road safety and to develop awareness of traffic (Collins & Kearns, 2005; Timperio et al. 2004).

## Seniors

The increasing complexity of road systems is placing high demands on senior pedestrians. Older people are having to adapt to a high speed/high volume traffic system which largely fails to cope with their special requirements. In 2017, there were 14 pedestrian fatalities of which seven were senior pedestrians (average age 87) (BITRE 2018).

Research of ageing pedestrians has found that consequences of ageing on sensory, perceptual, cognitive and physical abilities and the ability to cope with traffic situations all contribute to difficulties encountered by senior pedestrians (Oxley, et al. 2004). All the above consequences appear very similar to those of young pedestrians.

Poor road design remains a constant contributing feature in senior pedestrian crashes. Road designs are generally designed for vehicles and young, fit and health users. These designs often compromise the elderly by lacking basic features, such as:

- Refuge islands
- Lack of signals to control turning traffic
- Poorly sited signals and signs
- Delineation of travel lanes
- Pedestrian crossing light timings.

Source: Oxley 2004

### **Intoxicated Pedestrians**

An analysis of the Australian Transport Safety Bureau (ATSB) Coronal Database 1999 -2001 identified 304 cases of pedestrian fatalities across Australia in which a BAC of 0.05g/100ml or greater was detected (Cairney & Coutts. n.d.). In 2014, approximately 37% of pedestrian fatalities in WA recorded a BAC of 0.05g/100ml or higher (RSC 2014). Evidence suggest that alcohol may also be a determining factor in fatal crashes in rural and remote WA. In 2006, five out of seven pedestrians killed in rural areas had a BAC of 0.05g/100ml or above with four having a BAC over 0.15g/100ml. In contrast, only four of the 14 pedestrians killed in the metropolitan area had a BAC of 0.05g/100ml or greater (Marchant et al., 2008).

Contributory factors to the high incidence of intoxicated pedestrian crashes in regional and remote areas include:

- Limited transportation options
- Lowered perception of being detected by police
- Greater incidence of high alcohol consumption than metropolitan areas (Parliament of Victoria Road Safety Committee, 2005).

Source: Palamara, P, et al. 2013

A South Australian Government report stated that between 2012-2016 the number of pedestrians involved in crashes that tested positive to a drug or drugs on average was 12% (Department of Planning, Transport and Infrastructure 2017). Cairney and Coutts reported that of the 304 pedestrians killed, 17.9% of the deceased were also found to have one or more drugs in their system. It is, however, difficult to obtain accurate figures for WA drug related pedestrian fatalities/ injuries. A London Assembly Transport Committee report stated that up to 24% of pedestrians killed on London roads had an alcohol or drug impairment (London Assembly 2014).

Many intoxicated pedestrians are injured or killed outside or very near to the premises they have just left. The ATSB Coronal Database showed that 50% of the 304 of deceased pedestrians were outside or opposite the establishment they had just left.

### **Other special users**

A New Zealand study found that children with abnormal vision were four times as likely as other children to have a pedestrian injury, and that children with abnormal hearing were twice as likely to have a pedestrian injury (Roberts, I. & Norton R. 1995). Other impaired pedestrians report feeling anxiety and stress when travelling on roads without adequate crossings or when using personal assistive devices (Mitullah, W. & Makajuma, G. 2009 & Lundaiv, J 2005).

Pedestrian risks become elevated for the following reasons:

#### **Mobility impairments**

- May cross roads more slowly and may be more at risk for falls if sidewalks or road surfaces are uneven

## **Wheelchair users**

- Disadvantaged if kerb cuts are lacking or if accessible routes are lacking, and may find it harder to dodge traffic

## **Sight or hearing impairment**

- May not be able to anticipate and avoid other road users

## **Intellectual/cognitive disabilities**

- May be unable to make good judgements about safety – knowing when it is safe to cross the road – or may behave in unpredictable ways.

Source: Xiang, H.Y., et al. 2005)

Road design must be considerate of pedestrian needs, of all abilities. Much of the existing pedestrian walkway system has been treated to some degree to enable pedestrians to move about more easily. However, much more needs to be done.

Much of the WA road network consists of relatively wide roads and these present problems when pedestrians are trying to cross. Wide roads, with fast flowing, high volume traffic increases hesitancy, anxiety and impulsive actions on behalf of the pedestrian. It is no longer acceptable to treat roads or streets for individual needs, such as improving an aspect solely for one reason. Universal design is required to cater for all types of user. It benefits everyone, not just those with disabilities. For example, ramps incorporated into a building's main entrance and wider doorways not only aids wheelchair users but are also better for people with prams. As the population ages and instances of disability increases, universal design will become even more important.

Road designers need to address issues that induce confusion into pedestrians. Simple issues, such as; increasing visibility of pedestrians at traffic lights, extending the crossing time for pedestrians at crossing junctions, pedestrian refuges, more pedestrian phases at traffic lights, reducing traffic speeds, all contribute to make it safer for the movement of pedestrians.

The town of Freiburg in southern Germany have introduced 30km/h speed restrictions on 90% roads and provided car-free residential areas for 15,000 people. The effect of this strategy is that 24% of trips every day are on foot, 28% by bicycles, 20% by public transport and 28% by car (Whitelegg, J. 2012)

Engineering works to reduce the number of lanes, or narrow the width of a road, appears to improve the safety of pedestrians (Knaap, K.K. & Geise, K. 2001 & Huang, H.F., et al. 2002). Vehicles travel more slowly on single lane roads or when streets are narrow (Gattis, J.L. 2012 & Fitzpatrick, K, et al. 2001). Drivers may drive less aggressively and generally feel less safe and thus drive more cautiously on narrow streets (Mahalel, D., Szternfeld, Z. 1986 & Untermann, R.K. 1990).

Improvements in car design have gone some way to addressing the issues of injury inflicted by a vehicle. A large percentage of crashes occur when the driver of a vehicle doesn't see the pedestrian. In Adelaide, 45% of fatal pedestrian crashes involved the driver taking no evasive action because they did not see the pedestrian or realise a collision was likely (Anderson, R.W.G., et al. 1997).

Vehicle braking systems can now operate either manually or autonomously. Most new cars now have brake assist, which activates when a sensor detects an emergency situation, indicated by unusually fast brake pedal actuation and/or unusually hard pressure on the brake pedal. An evaluation in France concluded that cars fitted with brake assist had a 10% lower involvement in pedestrian fatalities than cars without (Page, Y, et al. 2005).

Autonomous Emergency Braking (AEB) is a newer concept in pedestrian protection. Sensors mounted in the front grill or high up behind the windscreen scan the road and roadside ahead of the vehicle. If the sensors detect a risk of collision with a pedestrian in front of the car, the driver is warned, and/or the brakes applied automatically. Other technological advances in vehicle safety include reversing collision avoidance systems.

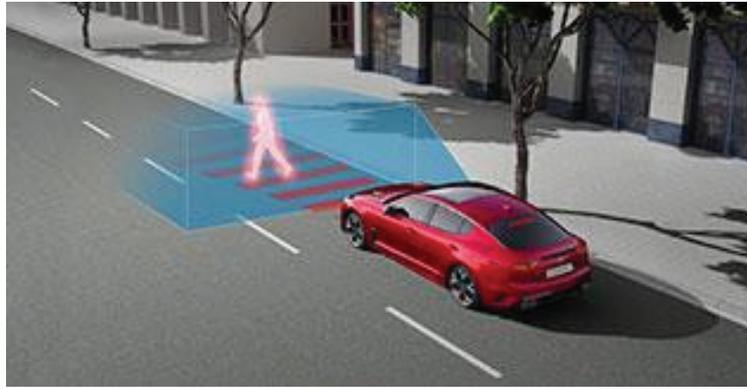


Fig 5: Autonomous Emergency Braking Sensor Detection

Energy absorbing fronts and pedestrian protection systems are becoming increasingly common in new vehicles. Volvo has been particularly strong in this area and now includes, as standard, many safety features:

### Collision warning with full auto brake and pedestrian and cyclist detection

At speeds above 4km/h, sensors detect if there are pedestrians or cyclists ahead of the car. If no reaction is detected by the driver, and a collision is imminent, full auto braking is engaged to head avoid or mitigate the impact. An audible and visual warning are provided for the driver by the system. During daylight, a digital camera can detect a standing or moving pedestrian travelling in the same direction. If a pedestrian suddenly swerves out in front of the car, the collision warning senses a collision is likely to happen and prompts the driver to act by flashing a warning light on the windscreen along with an audible alarm.

### Pedestrian airbag

A world first, helps to reduce the consequences of a frontal collision between a car and pedestrian. Sensors in the bumper register an impact with a pedestrian and release the rear end of the bonnet, together with an airbag that covers the area under the bonnet, 1/3 of the windscreen and the lower part of the windscreen pillars. Together with the energy absorbing front and bonnet design, helps reduce the severity of pedestrian injury in an impact. The airbag is active at speeds from 20-50km/h.



Fig 6: Volvo's Pedestrian Collision Airbag System

The Commission works with the Australasian New Car Assessment Program (ANCAP) in providing and participating in research and promotes the uptake of safer vehicles based on safety research outcomes. ANCAP is a leading independent vehicle safety advocate and provides consumers information on the level of occupant and pedestrian protection provided by different vehicle models. NCAPs have been established in Europe, Latin America, Japan and the Republic of Korea.



Fig 7: ANCAP Crash Test Dummy Family

## WHAT ARE THE COUNTERMEASURES?

### Legislation

#### General

Road Traffic Act 1974

Road Traffic Code 2000

To legislatively address speeding and other dangerous driver behaviours which increase protection for pedestrians, penalties and various amendments to the Act and Code have been implemented:

- September 2014 Road Traffic Code 2000 – Penalties increased for various offences, including speeding
- July 2017 Road Traffic Code 2000 – Penalties increased for speeding where the driver is more than 29km/h but not over 40km/h and over 40km/h above the speed limit
- January 2018 Road Traffic Code 2000 – Introduction of regulations for drivers to slow down to 40km/h when approaching stationary incident response vehicles and move into an adjoining lane if possible – penalty offence
- Due November 2018 – Amendment to the Road Traffic Act 1974 – s.49AB(1) dangerous driving. Reducing the current circumstances of aggravation from driving 45km/h above the speed limit to 30km/h and increase in penalty.

On 1 December 2001, the WA Government introduced the default 50km/h speed limit in WA to improve the safety of pedestrians and cyclists on local area road networks. Evaluation of the 50km/h speed limit, undertaken by the Monash University Accident Research Centre (MUARC), revealed a 51% reduction in pedestrian crashes, with 432 fewer crashes involving pedestrians in 24 months following the introduction of the lower speed limit.

The Commission's road safety research program continues to conduct evidence-based research to improve the safety of pedestrians. Topics for research include; 'Safer Road Crossings for Pedestrians, including Older Pedestrians and

Pedestrians with Disabilities'. The output of this research will then inform evaluations on policy reforms, aimed at improving pedestrian safety.

## **Enforcement**

Enforcement is concerned more with reducing the instances of dangerous driving and reducing the confrontation between pedestrians and speeding vehicles. Measures to combat this behaviour involve legislated penalties and road treatments, such as the installation of red light speed cameras. The camera detects speeding drivers and instances of running through red lights, both of which pose a significant risk to pedestrians.

## **Self-explaining roads**

As cities grow and become more crowded, innovative ideas are required to improve the road infrastructure whilst causing the least amount of disruption to the flow of traffic. Low cost improvements, which remove the onus of the driver having to concentrate on road signs or markings (which are often ineffective) and impart a more conceptual notion of a driver's surroundings, are now becoming more commonplace. Roads specifically designed to look different to other roads and are designed to give the impression of a busy pedestrian area which naturally activates a driver's instinct to slow down, are a solution to address speeding in built up areas; in other words, roads should be "self-explaining", or such that the traffic environment "elicits safe behaviour simply by its design (Jan Theeuwes & Godthelp, 1995)."

Simply installing features such as roadside street art, landscaping the surrounding area, installing furniture to create pinch points, laying different road surfaces, widening pathways and introducing cycle lanes all help to give the impression of a busy, well used area.

These types of roads are not new and have been successfully installed in the United Kingdom, New Zealand and Australia. They are user friendly and the local community is often involved in the design. The City of Stirling is currently working on self-explaining roads in the Innaloo area.

Other design solutions to reduce speed focus on drivers accommodating pedestrians and cyclists using the road infrastructure. Bike Boulevards, part of the Safe Active Streets Program managed by the Department of Transport (DoT), converts quiet local streets, by reducing vehicle speed limits to 30 km/h, into areas where pedestrians and cyclists can share the road space equally and safely with motorists. Bike Boulevards allow mums, dads, children, seniors and others to make short trips to schools, railway stations or shops. Bike Boulevards are developed around the self-explaining road concept whereby street signage is kept to a minimum and encourages courteous interaction between street users (Department of Transport [www.transport.wa.gov.au/activetransport/safe-active-streets-program.asp](http://www.transport.wa.gov.au/activetransport/safe-active-streets-program.asp)).

Under the Safe Active Streets program the following streets have been transitioned into a safe area for cyclists and road users:

- Robertson Road Cycleway, Joondalup
- Bayswater to Morley.
- Shakespeare Street, Mount Hawthorn.

## **Shared paths**

A 2009 survey found that 25% of Western Australians reported using walking or cycle paths, up from 10% in 1999. Respondents also reported that they would walk more if encouraged to do so and if there were good walking paths. In the cases of shared paths, pedestrians have right of way over cyclists.

In 2017, the WA Government committed to \$55m investment to increase the principal shared path (PSP) network adding at least a further 95km of new pathway to the network. A further \$29m has been allocated to local governments to develop bike plans and the delivery of new shared path and bike boulevard infrastructure. As well as dedicated pathway projects, all new major road projects will also consider PSP infrastructure.

PSP extensions or new builds are currently underway or planned for:

- Mitchell Freeway PSP – Glendalough to Hutton Street (expected construction 2018- 19)
- Fremantle Railway PSP – Grant Street to Jarrad Street (expected construction 2018- 19)
- Roe Highway – Chisholm Crescent to Welshpool Road (complete)
- Armadale Road PSP – Tapper Road to Anstey Road (expected completion 2019-20).

The above mentioned works are a selection of planned or ongoing works and form part of the committed funding for the PSP Program 2017-22 program of works being undertaken by the Department of Transport.

### **Countdown timers for pedestrian crossings**

A Main Roads project in 2014 attempted to alleviate the confusion caused at pedestrian crossings created by the flashing red man at intersections. Reports of drivers failing to give way to pedestrians at crossings created the need for more clarity for both pedestrians and drivers. The idea was to remove the flashing red man and replace with a countdown timer to give both parties a clear view of how much time was left for pedestrians to cross the road. To change the crossing lights, a modification of Australian Road Rule 231 had to occur.

The initial trial site was the intersection of William and Murray Street in the Perth central business district. An online survey reported a 95% approval rating for the timers, after the conclusion of a three week trial. Due to the success of the trial, four more sites were chosen in November 2014. A roll out program to address other problem intersections has seen more pedestrian countdown timers installed, during 2015-16 and a comprehensive 2017 program seeing 23 further intersections receiving treatment. As well as the metropolitan area receiving treatments, Bunbury, Geraldton and Kalgoorlie have also seen the introduction of countdown timers.

### **Local government area speed reduction trials**

Main Roads Western Australia, in conjunction with various local governments, have been jointly implementing 40km/h speed limits in areas of high pedestrian activity. Dual purpose engineering treatments to reduce speed and increase pedestrian safety are implemented in places such as shopping precincts.

Perth Central Business District, Northbridge, South Terrace, Fremantle and the City of Vincent have all implemented speed reduction zones.

Other road treatment improvement options include:

- Choosing the appropriate crossing location
- Longer and less confusing walk and clearance phases
- Puffin crossings (where intelligent pedestrian detection is used to automatically extend the pedestrian's crossing time where required)
- Provision of auditory signals
- Raised crosswalks
- Improvements to approaches (tactile paving, ramps, kerb extensions, etc.)

Mainroads WA has rolled out a program of electronic road signs which show the required speed limit around school zones during school open and close time periods. The signs reduce non-conformance of drivers who may be unaware that they are within the time period or day of the week that the school zone takes effect. Overall, the aim is to reduce speeds in order to make it easier and safer for children and help road users stay alert and take extra care through school zones. Cost of the program is \$36m and is environment friendly by providing solar power for the signs.

Tactile paving, ramps, kerb extensions, etc., are all measures that attempt to address the difficulties experienced by impaired pedestrians also. Specific plans to address disability have been produced, in line with six key outcomes specified in the *Disability Services Act 1993*. Disability Access and Inclusion Plans (DAIP) address the six outcomes and more specifically for road safety and pedestrian groups, outcome 2:

*“People with disabilities have the same opportunities as other people to access the buildings and other facilities of a public authority.”*

Some measures to improve the pathway/roadside experience for disabled pedestrians, that are now legislated for include:

- The identification of barriers or hazards which may affect people with disability and undertake universal access repairs, replacements and improvements, such as improving access ways, kerb ramps and placing tactile ground surface indicators
- Audit existing TGSI's to see if they have been placed perpendicular to the direction of travel and identify a safe path of travel. Install TGSI's correctly when areas are upgraded, and new roundabouts and crossings are constructed
- Develop a systematic plan to address priority issues and ongoing upgrades for access related to roads, parks and footpaths<sup>5</sup>.

Examples of local governments implementing good DAIPs where walking accessibility has been considered include those of the cities of Perth, Swan and Bayswater.

DAIPs can be found here:

- Perth
- Bayswater
- Swan

## **Education**

Pedestrian behaviour plays a major part in pedestrian crashes. A nationwide study of coroners reports into pedestrian deaths attributed responsibility for the road crash full to the pedestrian in 76% of cases and partial responsibility in 12% of crashes (WA Office of Road Safety 2007).

Various education schemes are in place, to address both children and adults. Programs, such as Road Safety Around Schools, Safe Routes to School and Walk Safely to School Day are run by RoadWise, in partnership with the Commission.

School Drug Education and Road Aware (SDERA) run the Smart Steps for Parents aims to promote safe road use for parents to use with their children. The program is focused for very young children and is based on an intuitive learning process of safe road behaviours.

<sup>5</sup>Department of Transport, Disability Access and Inclusion Plans (DAIP), Transport Items for Local Government Authorities

The Commission provides information and leaflets for specific groups, such as the Aboriginal Road Safety Stakeholder Pedestrians factsheet. Commission campaigns have featured more specifically with behaviour likely to cause pedestrian crashes, such as Priorities - drink driving, distraction and speeding.

### **Community engagement**

Constable Care is a WA Police Force initiative that uses trained actors and puppet theatre to communicate the message of safety for children. The program is targeted to the 2-12 years age groups and, where possible, uses indigenous performers to deliver remote WA indigenous programs.

## **WHAT IS THE FUTURE FOCUS?**

Aligned with *Towards Zero*, the aim is to remove pedestrians from potential conflict with vehicles and other dangerous situations. The program of works intended to do this is ongoing, with improvements already made to existing networks and future works planned. A program to address regional and remote areas is also planned for. Some future work of the PSP Program includes:

- Mitchell Freeway PSP – Telford Crescent to Civic Place
- Tonkin Highway PSP – Redcliffe Bridge to Stanton Road
- Tonkin Highway PSP – Railway Parade to Redcliffe Bridge.

The Commission will continue to work with vehicle manufacturers through ANCAP to ensure pedestrian safety is paramount to any new technologies built into vehicles. It is intended that these technologies are offered as standard in all cars and promotion of the safety features is seen as a high priority activity. The Vehicle Road Safety Research Group is a consortium of 16 government road authorities that the Commission partners with in evaluating new vehicle technologies, injury risk posed to other users, etc.

Almost half of the cases involving an intoxicated pedestrian occur immediately outside the venue. Physical countermeasures in and around the vicinity of the premises could be something to investigate to attempt to address the problem of intoxicated pedestrians being involved in crashes.

Ongoing monitoring of pedestrian fatalities with regards to road treatments and education campaigns will inform of any future works necessary and help to target any previously unrecognised gaps.

<b>Reference:</b>	F18-158; D18-9168
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## Endorsed

DATE	DETAILS	ENDORSED BY
21/12/2018	Developed	Melissa Watts

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