

# Pedestrian crossings

A best practice guideline for local governments

April 2022



## Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the lands, waters and seas and their rich contribution to society.

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## Versions

Version	Amendment notes

# 1. Definitions

<INSTRUCTION: Do not include words or terms that have a commonly understood meaning - delete message.>

Term	Definition

# 2. Related policy and supporting information

- Future Transport 2056 (refer also Appendix 1).
- NSW Movement and Place Framework (refer also Appendix 2).
- Practitioner’s Guide to Movement and Place.
- Technical framework (refer Appendix 3).
- Complementary treatments to improve pedestrian safety and amenity (refer Appendix 4).
- Summary of pedestrian facilities (refer Appendix 5).

## 3. Introduction

Pedestrian crossings, often referred to as zebra crossings, provide an opportunity for people to cross a road safely and on demand.

Pedestrian crossings are one of a suite of treatments that can be used on the road network. Used appropriately, they can improve safety, amenity, priority and legibility for pedestrians. They can also be used in a variety of ways to achieve council's movement and place vision for an area or length of road.

Transport for NSW utilises a warrant system to determine if a pedestrian crossing is warranted at a specific location on roads operated by the NSW Government (NSW Supplement to 1742.10). This warrant system is not mandatory for use on non-arterial roads operated by local government.

### 3.1 Purpose

The purpose of this document is to provide guidance for local governments who choose to develop their own pedestrian crossing policy. Locally developed policies should aim to address the specific characteristics within individual local government areas and will help councils to achieve their place-making visions. This guideline is not mandatory.

This guideline assumes that all relevant information gathering, technical assessments, exploration of options and analyses have been done and a pedestrian crossing has been determined to be the most suitable treatment for a location.

### 3.2 Legislation

Pedestrian crossings are regulatory traffic management devices. NSW Road Rule 81 defines what a pedestrian crossing is and requires that drivers must drive at a speed that will allow them to give way to people on a pedestrian crossing, including stopping if required.

NSW Road Rule 82 stipulates that a driver must not pass or overtake another driver, driving in the same direction, who has stopped to give way to a person on a pedestrian crossing. Taking a Safe System approach, NSW practice is not to install pedestrian crossings with more than one lane of traffic moving in each direction across the crossing and to install 20 metre long double barrier lines on each approach to the pedestrian crossing.

NSW Road Rule 234 states that a person must not cross a road within 20 metres of a pedestrian crossing other than at another crossing. It also requires that people do not stay on the pedestrian crossing for longer than necessary to cross the road.

NSW Road Rule 172 defines the statutory NO STOPPING areas as 20 metres before a pedestrian crossing and 10 metres after a pedestrian crossing when the pedestrian crossing is not at an intersection. The NSW Road Rules allow for the statutory NO STOPPING areas to be altered if another rule applies, for example the application of parking when kerb extensions have been installed.

#### 3.2.1 Pedestrian crossings and patterned pavements

Pedestrian crossings are first and foremost a pedestrian safety device. NSW Road Rule 81 defines a pedestrian crossing as a place with white stripes on the road surface that run lengthwise, of approximately equal length and parallel to one another for the width of the crossing. A key attribute of a pedestrian crossing is that it is universally recognisable and understood as a pedestrian safety and traffic management device.

For these reasons, pedestrian crossings may not be installed in conjunction with patterned pavements or street art. A monochrome background road surface may be installed as an alternative to asphalt, for example a terracotta pavement finish (Figure 1).



**Figure 1: Pedestrian crossing with terracotta coloured pavement, Campbell Street, Liverpool.**

## 4. Strategic alignment

The information included in this guideline aligns with key NSW Government strategies such as Future Transport 2056 and the NSW Movement and Place Framework.

The NSW Movement and Place Framework offers new ways of planning, operating and managing public spaces, including roads and road related areas. There is significant emphasis in this guideline on how to apply movement and place approaches and principles when considering suitable pedestrian treatments, and specifically pedestrian crossings.

See Appendices 1 and 2 for more information on Future Transport 2056 and NSW Movement and Place Framework, respectively.

## 5. General requirements for pedestrian crossings

### 5.1 Recommended requirements for all crossings

The expectation is that pedestrian crossings meet the minimum criteria set out in AS 1742.10, i.e.:

- Non-arterial road
- 50 km/h or less
- No more than one lane of moving traffic on each approach
- Adequate sight distances (refer to Austroads Guide to Road Design Part 4A)
- Adequate kerb ramps
- Adequate lighting (refer to AS 1158.4).



## Identifying movement and place characteristics

Legally, a person is not permitted to cross the road within 20 metres on either side of a regulatory crossing. Therefore, pedestrian and vehicle movements need to be understood to ensure the installation of a pedestrian crossing does not reduce pedestrian safety and/or amenity at a particular location.

While minimum vehicle volumes are not required to justify the installation of a pedestrian crossing on a non-arterial road, vehicle type and volumes, 85th percentile speeds, flow dynamics and frequency/duration of suitable gaps, crash data, etc, should still be measured to inform decision-making about whether a pedestrian crossing is the most suitable treatment at a location to solve a problem and contribute to the location's desired movement and place outcomes.

Refer to the Practitioners Guide to Movement and Place for more detailed information on understanding the movement and place characteristics of a road or street and its surroundings

## Pedestrian demand calculation

Local governments are entitled to use TfNSW's warrants outlined in the Supplement to AS1742.10 if they want to. However, the high PV value required by the TfNSW warrants may be difficult to achieve on local or sub-arterial roads.

As an alternate to the TfNSW warrants, councils may use the following pedestrian demand calculation:

- In each of two separate one hour periods in a typical day, the pedestrian flow per hour (P) crossing the road is, or is expected to be, equal to or greater than 20.
- Children and elderly or mobility impaired pedestrians count as two pedestrians.

## Road safety audits

If there is any doubt or contention over safety aspects of a proposed pedestrian crossing, a road safety audit is recommended. The audit will provide an independent assessment of issues and help to determine whether the proposal poses an unacceptable road safety risk.

## Local Traffic Committee

Pedestrian crossings are regulatory devices therefore they are subject to Local Traffic Committee processes.

TfNSW supports a flexible, context-sensitive approach by local governments. However, councils need to demonstrate they have undertaken appropriate consultation and technical and design assessments, can provide supporting data, and have addressed all foreseeable risks prior to seeking consideration at Traffic Committee.

## 5.2 Pedestrian desire lines

Installing the crossing on the pedestrian desire line is one of the most important considerations when deciding the location of a pedestrian crossing. Utilising the pedestrian desire line means the crossing will seamlessly fit into people's trips, meeting their needs and achieving compliant crossing behaviour.

If a discrete desire line cannot be identified, look at existing and future trip generators, eg schools, shops, parks, bus stops, which will help to determine an appropriate location for the crossing. If, by using the pedestrian desire line, the pedestrian crossing does not meet essential safety criteria, i.e. sight distances, consider whether complementary treatments may be used to mitigate the risks and retain the desire line. Consider also, the broader network and whether a precinct-wide approach needs to be taken to make the area more pedestrian friendly if that is the desired function of the street.

## 5.3 Sight distances

Sight distances represent the distance/s at which road users must be able to see each other or a pavement marking, sign, etc, in order to react appropriately, including stopping, to avoid a crash. Adequate sight distances

are essential safety criteria for pedestrian crossings. They are related to vehicle approach speeds and are the reason for statutory NO STOPPING zones on approach/departure to pedestrian crossings (refer Austroads Guide to Road Design Part 4A).

Kerb extensions or blisters and raised crossing thresholds may also improve sight distances at a crossing (refer to Appendix 4 for complementary treatments).

## 5.4 Vertical and horizontal curves

Where pedestrian crossings are proposed on or near vertical or horizontal curves, sight distances still apply but you may also need to take into account the risk of vehicle rear-end crashes and include suitable mitigating treatments.

## 5.5 Lighting

Adequate lighting at pedestrian crossings is particularly important because clear visibility is essential to ensure drivers are able to give way to people on the crossing (refer AS 1158.4).

Daytime shadowing may also affect visibility and should be taken into account when considering risk factors.

## 5.6 Pedestrian crossings at intersections

Careful consideration needs to be given to the installation of pedestrian crossings at intersections. Pedestrian crossings should not be used just to reinforce NSW Road Rules 72 or 73 (which require drivers turning into a side street or slip lane to give way to people who are crossing the side street or slip lane at or near the intersection).

Over use of pedestrian crossings may lead to diminished safety because drivers ignore or no longer see them. Alternate treatments should be investigated, however pedestrian crossings may be installed at intersections where there is a genuine need.

## 5.7 Legible walking routes

In addition to safety and prioritisation purposes, pedestrian crossings may be installed to improve the legibility of key walking routes that are likely to attract a diverse demographic, for example to a swimming pool, library, theatre or sports ground. In such cases, directional signs and wayfinding elements should also be installed to improve the customer's experience (Figure 2). Refer to AS1742.10 and AGTMP10 for more information on wayfinding.



**Figure 2: Pedestrian way finding, The Three Sisters, Katoomba.**

## 6. Guidelines for developing local government pedestrian crossing policies

**Council officers involved in the planning and implementation of pedestrian crossings should be aware of how the Movement and Place street environments are being applied in their area of operations.**

**Following are guidelines that demonstrate how understanding the broad vision for a road or street can help to inform decision making around whether a pedestrian crossing may be a suitable option or not.**

### Main Roads

#### Broad vision:

- Prioritise through movements of people and goods
- Prioritise motor vehicle movements compared to active transport modes
- Speed limit >50 km/h
- Minimise land use that encourages people to dwell
- Limit access in a way that discourages local people from using the Main Road as local access road
- Provide active transport infrastructure that buffers pedestrians and bicycle riders from motor vehicle movements wherever possible

#### With respect to pedestrian crossings:

- Use the warrants per the Supplement to AS 1742.10
- Pedestrian (zebra) crossings will only be permitted by exception.
- Signalised or grade separated crossings are more suitable options

### Main Streets

#### Broad vision:

- Prioritise to/from and within movements
- Balance priority equally between active transport and other modes
- Speed limit ≤50 km/h
- Mixed land use that attracts and encourages people to dwell

#### With respect to pedestrian crossings:

- Use the pedestrian demand calculation recommended in this guideline
- Locate as close as possible to major attractors or where you might expect high proportions of vulnerable pedestrians, eg near schools, medical centres, government services
- Suggested spacing between crossing points: 40 – 100 m
- Preferentially use raised pedestrian crossings to manage speed and pedestrian prioritisation
- Use refuges to provide pedestrian staging areas
- Do not use pedestrian crossings purely to reinforce NSW Road Rules 72 and 73
- Consider complementary treatments, as required, that may help to manage speed and prioritisation

Local Streets	Civic Spaces
<p><u>Broad vision:</u></p> <ul style="list-style-type: none"> <li>• Prioritise to/from and within movements</li> <li>• Prioritise pedestrian and bicycle movements and access to public transport</li> <li>• Speed limit <math>\leq 50</math> km/h, preferably 30-40 km/h</li> <li>• Localised mixed land use but mainly residential</li> <li>• Street design that encourage people to use their local streets recreationally</li> </ul> <p><u>With respect to pedestrian crossings:</u></p> <ul style="list-style-type: none"> <li>• Use the pedestrian demand calculation recommended in this guideline</li> <li>• Use pedestrian crossings sparingly, generally only on key walking routes or close to significant attractors – road environment should be designed and managed to make it easy for pedestrians to move freely</li> <li>• Suggested spacing between crossing points: 100 – 200 m</li> <li>• Consider both raised or at grade pedestrian crossings</li> <li>• Utilise pedestrian crossings to enforce road rules (e.g. rules 72 and 73) as an exception only if other treatments are unsuitable</li> <li>• Consider local area traffic management schemes and alternate treatments where possible, eg road narrowing, pedestrian refuges</li> <li>• Possible hierarchy of treatments for intersections, eg: <ul style="list-style-type: none"> <li>- no treatment</li> <li>- stop line</li> <li>- refuge</li> <li>- continuous footpath treatment</li> <li>- pedestrian crossing</li> </ul> </li> </ul>	<p><u>Broad vision:</u></p> <ul style="list-style-type: none"> <li>• Prioritise to/from and within movements</li> <li>• Prioritise pedestrian movements and dwelling activities</li> <li>• Speed limit <math>\leq 40</math> km/h, preferably 10-20 km/h</li> <li>• Local landmarks that attract and encourage people to dwell in large numbers, including for civic, recreational and entertainment events</li> </ul> <p><u>With respect to pedestrian crossings:</u></p> <ul style="list-style-type: none"> <li>• Use the pedestrian demand calculation recommended in this guideline</li> <li>• Locate as close as possible to major attractors</li> <li>• Suggested spacing between crossing points: 40 – 60 m. Crossing spacing less than 40 m should be reconsidered as a shared zone (where pedestrian crossings are not required because the entire zone provides pedestrian priority)</li> <li>• Consider both raised or at grade pedestrian crossings</li> <li>• Utilise pedestrian crossings to enforce road rules (e.g. 72 or 73) as an exception only if other treatments are unsuitable</li> <li>• Consider complementary treatments that may help to manage speed and prioritisation</li> </ul>

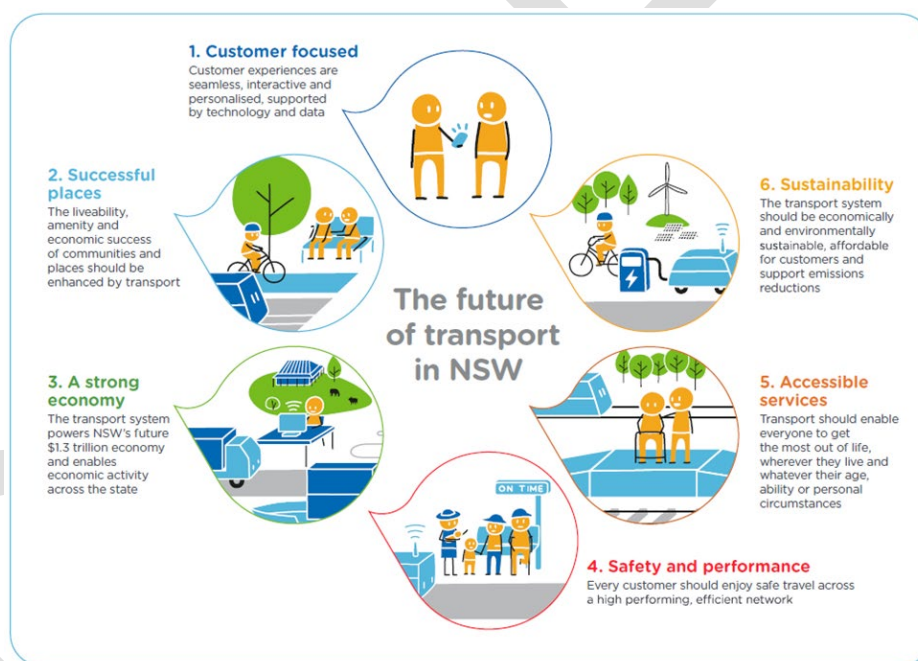
## Appendix 1: Strategic alignment with Future Transport Strategy 2056

The NSW Future Transport Strategy 2056 states:

“ In an age of uncertainty, setting a vision and guiding principles allows us to be flexible and adapt to change as we create the future transport network.

Our population is forecasted to increase to around 12 million people by 2056; freight volumes are estimated to double in the Greater Sydney area and increase by 25 per cent in regional and outer metropolitan NSW; and the passenger network is preparing for over 28 million trips a day. This means planning for the future has never been more important. While recent events, such as COVID-19, impacted demand and mobility patterns, particularly for public transport trips, long-term expectations still forecast a significant increase in demand for transport.

Future Transport 2056 outlines six state-wide principles to guide planning and investment. These are aimed at harnessing rapid change and developing new technologies and innovation to support a modern, innovative and resilient transport network.



NSW Future Transport Strategy, November 2020. Downloaded from <https://future.transport.nsw.gov.au/future-transport-strategy>, accessed on 26 April 2022.

This guideline will help local governments to apply the six principles in relation to pedestrian crossings as follows.

**Customer focused:** appropriately placed pedestrian crossings are focused on the needs of pedestrian customers, particularly children, the elderly and mobility impaired pedestrians, balanced with other community needs for example, free-range pedestrian movement, the movement of goods and services, and parking.

**Successful places:** places are successful when people are able to interact and move about comfortably. Appropriate pedestrian facilities, including pedestrian crossings, can facilitate pedestrian movements and help to prioritise active transport modes, particularly around Civic Spaces.



**A strong economy:** Research shows that active transport choices contribute significantly to the economy, for example reduced transportation costs for households, reduced wear and tear on roads, people-friendly places boost tourism, and people on foot or on bicycle tend to spend more money in local areas.

**Safety and performance:** appropriately placed pedestrian crossings improve the safety and amenity of pedestrian trips. There may also be indirect local safety and performance benefits because areas that are designed for pedestrian safety tend to have lower speeds limits and more controlled motor vehicle movements. The passive surveillance attributes of active transport can also enhance general community safety.

**Accessible services:** Environments that are designed with pedestrians in mind tend to be both more diverse and inclusive, providing a wide range of services, commercial and retail businesses, and social, cultural and entertainment activities within walkable distances of local centres.

**Sustainability:** Walking is our natural and most sustainable mode of transport. Networks that encourage walking and bicycle riding will contribute significantly to sustainable community outcomes such as reduced vehicle emissions, reduced reliance on private motor vehicles, individual and community health benefits, and resilience as we face the challenges presented by climate change, global economic uncertainty and health crises.

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## Appendix 2: Strategic alignment with the Movement and Place Framework

The NSW Movement and Place Framework states:

“ Movement and Place is a multi-disciplinary, place-based approach to the planning, design, delivery and operation of transport networks. It recognises and seeks to optimise the network of public spaces formed by roads and streets and the spaces they adjoin and impact.^

Our roads and streets are key public spaces for our communities – places where people spend time and socialise – enabling activities that add vitality to neighbourhoods. Aligning movement and place in the design of roads and streets can give users of all ages and abilities better, safer and healthier travel options while creating appealing places where people want to live.^

Regardless of their name ('road', 'street' or 'highway') or hierarchy ('State', 'regional' or 'local'), the movement functions and place qualities of roads and streets combine to create different types of street environments.\*

Each type of street environment has typical characteristics. However, this does not equate with a set of rules, assumptions or planning outcomes. The complex nature of our transport networks and our customers' needs means that every road and street is different, and should be considered individually within its own context.\*



^ <https://www.movementandplace.nsw.gov.au/about/about-movement-and-place>, accessed 26 April 2022.

\* <https://www.movementandplace.nsw.gov.au/place-and-network/classifying-street-environments>, accessed 26 April 2022.

The NSW Movement and Place Framework describes each of the street environments as follows (<https://www.movementandplace.nsw.gov.au/place-and-network/classifying-street-environments>, accessed 26 April 2022).

**Main Roads:** These roads and routes are central to the efficient movement of people and goods. They include motorways, primary freight corridors, major public transport routes, the principal bicycle network and key urban pedestrian corridors. Their place activity levels are less intense. However, these roads and routes can have significant meaning to local people.

To support these roads and routes we need to prioritise their strategic movement functions. We can limit negative impacts to place qualities or community severance through their planning, design and operation.

**Main Streets:** These streets are some of the most vibrant places in our cities and towns. They have both significant movement functions and place qualities. Balancing the functions of these streets is a common challenge.

To support main streets we need to improve place qualities while providing access for walking and cycling and safe, low-speed environments, while also allowing for the efficient movement of people and freight. Trade-offs and compromises may be required.

**Local Streets** These are the majority of the streets in our communities. They often have important local place qualities. Activity levels are less intense than for civic spaces, but these streets can have significant meaning to local people. Town and village main streets are usually 'local streets'.

To support these streets we need to provide access for walking, cycling and private vehicles; safe, low-speed environments; easy access to public transport; and access for local deliveries while limiting through-traffic.

**Civic Spaces:** These streets are at the heart of our communities and have a significant meaning, activity function or built environment. They are often in our major centres, tourist and leisure destinations and community hubs. They are places for people, with a priority on place.

We need to support the place quality of these street environments by giving priority to pedestrians; providing safe, low-speed environments; managing freight and deliveries; providing easy access to cycle routes and public transport; and limiting through-traffic.

## Implementing Movement and Place within the road classification system

Under the road classification system, state roads are owned and operated by Transport for NSW. Regional and local roads are owned and operated by local governments, although TfNSW may have a significant interest in the operation of a local or regional road if it adversely impacts the operation of an adjoining state road.

Taking a movement and place approach will help local governments to establish the desired character and function of a road rather than accepting a default perception of character and function based on the road's classification.

The character and function of local roads will be primarily designed by local governments. State roads and, to a lesser extent, regional roads will be co-designed and developed by council and TfNSW to ensure the vision for an area or length of road is implemented successfully, especially where state and regional roads have Main Street, Civic Space or even Local Street significance.

## Integrating Movement and Place with Safe System

Safe System is the philosophy that underpins the design and delivery of all road projects in NSW. The intent of Safe System is to provide a forgiving environment and road system that, when crashes do occur they do not result in death or serious injury.

Place making aspects of Movement and Place are designed to encourage vulnerable road user activity. It is imperative that movement and place activities integrate with Safe System approaches.

In 2020, Austroads produced a report which will help to transform roads for the safe use of pedestrians and bicycle riders: *Integrating Safe System with Movement and Place for Vulnerable Road Users*, AP-R611-20, Austroads 2020.

## Six steps for implementing pedestrian crossings

A pedestrian crossing is not an outcome in itself; rather it is a tool to help fix a safety or movement problem, or to help prioritise movements to achieve your movement and place vision for an area or length of road. All road and related treatments need to help fulfil your movement and place vision for the localised area or length of road.

Step	Example
<b>1</b> Establish the project scope, vision, objectives and evaluation criteria	Develop strategies and plans that identify the four movement and place categories within a local government area – existing and planned. For example, council may specifically identify Main Roads, Main Streets and Civic Spaces and categorise all the rest as Local Streets. Its strategy may also stipulate which road users will be prioritised in each category, and to what extent, with examples of what that might look like.  With respect to pedestrian crossings, the assumption is that the area or length of road in question has already been identified as a Local Street, Main Street or Civic Space
<b>2</b> Understand place	Understanding place includes what it looks like now and what might need to change to achieve council's vision for the location. For example, council's vision for an existing strip shopping area may be to create a Main Street environment by activating shop frontages at street level, inviting people to dwell via public seating and outdoor dining and making it easier for pedestrians to move to and fro across the precinct.
<b>3</b> Understand movement	As with place, understanding movement includes what it looks like now and what needs to change to achieve your vision for the location.  Using the Main Street example above, council may determine that pedestrians need to be able to move more freely and on demand. Vehicle movements may still be necessary but, to achieve the vision, their movements must not dominate the area.
<b>4</b> Overlay and discuss conflicts, issues and opportunities	Keeping the vision clearly in mind, review current and desirable movement and place characteristics to identify gaps between the existing state and what needs to change to achieve the vision.
<b>5</b> Develop options	Develop a set of options that will help to achieve the vision.  All proposed options should align with the overall vision for the location and will address real or perceived conflicts, road safety issues, legibility, priority, etc.  Check that the final proposed treatment or design matches the desired function of the street. If it doesn't, review options and alternatives again, including wider network treatments, to ensure the desired street function and operating environment is achieved.

Step	Example
6 Choose the preferred option	<p>Choose option/s based on best outcomes, physical constraints, financial constraints, etc.</p> <p>For the purposes of this example, this is where you would make the decision that a pedestrian crossing is a suitable treatment because it aligns with the vision for the location as well as solves safety, movement or prioritisation issues and is viable physically and financially.</p> <p>Once you have determined that a pedestrian crossing is the most suitable solution, there is a technical framework which informs the location, design and layout of the crossing, and complementary treatments that you may consider to mitigate risks or to enhance pedestrian outcomes and place-making aspirations.</p>

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## Appendix 3: Technical framework

### Australian standards

#### **AS 1742.10 Manual of uniform traffic management devices: Pedestrian control and protection**

The installation of a pedestrian crossing is an implicit social contract between pedestrians, drivers and road authorities / governments.

A pedestrian crossing indicates to pedestrians a safe place to cross the road and tells them they have legal right of way. Drivers are required to approach the crossing looking for pedestrians and at a speed at which they can stop if required. Road authorities / governments must ensure they install pedestrian crossings in a way that meets the expectations of pedestrians and drivers; an essential part of this is ensuring pedestrians and drivers are able to see each other.

The situational, line marking, signage and lighting requirements set out in AS 1742.10 are designed to meet the expectations of pedestrians and drivers and, taking a Safe System approach, provide an environment in which pedestrians and drivers are best able to see each other and negotiate access to the space occupied by the pedestrian crossing, including on dark, rainy nights when pedestrians are wearing dark clothing.

The key situational criteria for pedestrian crossings as set out in AS1742.10 are:

- Non-arterial road
- 50 km/h or less
- No more than one lane of moving traffic on each approach
- Adequate sight distances (refer to Austroads Guide to Road Design Part 4A)
- Adequate kerb ramps
- Adequate lighting.

#### **AS 1158.4 Lighting for roads and public spaces: Lighting for pedestrian crossings**

AS 1158.4 provides the minimum lighting requirement for pedestrian crossings.

### NSW Supplements to the Australian Standards

The NSW Supplements to the Australian Standards have been written expressly for use by Transport for NSW on state roads. Local governments are not required to adhere to the Supplements.

**Supplement to AS 1742.10 Manual of Uniform Traffic Devices: Pedestrian Protection and Control** – The pedestrian crossing warrants described in the Supplement to AS1742.10 are not required for pedestrian crossings on roads that meet the situational criteria set out in AS 1742.10, i.e. non-arterial road, speed limit less than or equal to 50 km/h and only one moving traffic lane in each direction.

A pedestrian demand is required to justify the installation of a pedestrian crossing. The pedestrian demand may already exist or may be anticipated, e.g. because of land use changes, development, or place-making activities where reprioritisation of pedestrian and vehicle movements is desirable.

The Supplements may also include enhanced practices that are not mandatory for local governments but are strongly recommended, for example in relation to pedestrian crossings: using double barrier lines on approach and installing kerb ramps that extend the full length of the crossing.

## Austrroads Guides

The Austrroads Guides are national guidelines established by state road authorities (or equivalent) in Australia and New Zealand and are skewed towards state road application. However, there are several guides that are applicable to the design and management of Main Streets, Local Roads and Civic Spaces and include guidelines relevant to pedestrian crossings:

**Guide to Traffic Management Part 6 Intersections, Interchanges and Crossing Management** – describes the appropriate use of, and design of, the various intersection types and the techniques that need to be applied if efficient and safe intersections are to be provided to the road user. All categories of road use – including cars, trucks, public transport, motorcycles, cyclists and pedestrians, including people who have disability or mobility difficulty, are addressed.

Pedestrian crossing information in Part 6 is primarily applicable to Main Roads but some concepts can be adapted for intersections and crossings on Local Roads, Main Streets and Civic Spaces.

**Guide to Traffic Management Part 7 Activity Centre Transport Management** – outlines the planning and management of centres typified by high levels of internal activity and interaction, especially by people on foot. It addresses the need to obtain a balance between providing for vehicular access and providing for pedestrian, cyclist and public transport needs without compromising the functionality of a site. It outlines operational and physical measures to provide for movement to and within such centres, either as part of their planning or in their day-to-day management.

Pedestrian crossing information in Part 7 is primarily applicable to Civic Spaces and Main Streets.

**Guide to Traffic Management Part 8 Local Street Management** – outlines the principles and practice of influencing driver behaviour on local and residential streets – both directly by physical changes to the environment, and indirectly by influencing driver perceptions of what is appropriate behaviour. It will show you ways to reduce traffic volumes and speeds in local streets, to increase amenity, incorporate localised place-making, and to improve safety and access for residents, especially pedestrians and cyclists.

Pedestrian crossing information in Part 8 is primarily applicable to Local Streets but some concepts or treatments may be adapted for Civic Spaces or Main Street design and management.

**Guide to Traffic Management Part 10 Transport Control: Types of Devices** – outlines the tools that are required for traffic management and traffic control within a network. It covers the various control devices used to regulate and guide traffic, including signs, traffic signals, pavement markings, delineators, and traffic islands. It provides advice on the functions, suitability and correct use of devices to create a more efficient and safer road traffic environment for all users in permanent or temporary situations.

Pedestrian crossing information in Part 10 is primarily applicable to Local Streets, Main Streets and Civic Spaces.

**Guide to Road Design Part 4 Intersections and Crossings – General** – outlines information that is common to the geometric design of all at-grade intersections. It contains information on the types of intersections, the road design considerations for intersections and the design process for the development of an intersection layout. Guidance is also provided for pedestrian, cyclist, and rail crossings.

**Guide to Road Design Part 4A Unsignalised and Signalised Intersections** – provides equations for sight distances.

**Pedestrian Facility Selection Tool** – designed to help practitioners select the most appropriate type of pedestrian crossing based on walkability, safety and economic outcomes. The tool may not deliver a definitive answer; instead it informs decision-making with a range of suitable options to which the practitioner can then apply local context to determine the preferred option.

## NSW Supplements to the Austroads Guides

The Supplements to the Austroads Guides have been written expressly for use by Transport for NSW on state roads. Local governments are not required to adhere to the Supplements but, where appropriate, adoption of enhanced practice is encouraged.

Per the Austroads guides listed above, the relevant Austroads supplements are:

- Supplement to Austroads Guide to Traffic Management Part 6.
- Supplement to Austroads Guide to Traffic Management Part 7.
- Supplement to Austroads Guide to Traffic Management Part 8
- Supplement to Austroads Guide to Traffic Management Part 10
- Supplement to Austroads Guide to Road Design Part 4.
- Supplement to Austroads Guide to Road Design Part 4A.

## TfNSW technical directions

The following technical directions provide some technical guidance related to pedestrian crossings as well as illustrating some alternate treatments that may be considered when exploring treatment options for a specific location.

- TTD 2020/03 Shared Environment Intersection Treatment
- TTD 2014/005 Statutory 10 m No Stopping at Unsignalised Intersections Review Checklist
- TDT 2013/05 Continuous Footpath Treatments
- TDT 2011/01a Pedestrian Refuges
- TDT 2002/12c Stopping and Parking Restrictions at Intersections and Crossings

# Appendix 4: Complementary treatments to improve pedestrian safety and amenity

## Multiple pedestrian crossings

In high pedestrian activity areas, for example in Civic Spaces and Main Street environments, e.g. shopping precincts, schools, hospitals and other high place valued locations, multiple pedestrian crossings may be desirable. The recommended minimum distance between crossings is around 40 metres. If you determine that crossings can be justified at less than 40 metres apart, you should consider whether a shared zone or other pedestrian prioritisation / vehicle restriction treatment would be more appropriate at that location.



**Figure 3: Multiple pedestrian crossings, Central Road, Unanderra (photo credit: NearMap 2022)**

## Pedestrian crossing with kerb blisters or kerb extensions



**Figure 4: Kerb blisters, Jacksons Road, North Narrabeen.**

Kerb blisters are structures used to locally narrow the carriageway. The advantage of kerb blisters over kerb extensions is that they generally have minimal impact on drainage therefore may present a simpler option for some councils to implement.



**Figure 5: Kerb extensions, Katoomba Street, Katoomba.**

Kerb extensions are a local widening of the footpath generally used to assist pedestrians to cross the road by narrowing the width of the carriageway. Because kerb extensions are contiguous with the adjacent footpath they must be designed and constructed taking into account local drainage issues.

Kerb blisters and kerb extensions narrow the crossing distance for pedestrians and improve visibility between pedestrians and drivers.



Kerb blisters and kerb extensions alone may not result in vehicle speed reduction. However, if the kerb blisters or kerb extensions significantly narrow the traffic lanes, some speed reduction may be achieved at the crossing point.

Depending on the width of the kerb blisters or kerb extensions, and therefore the effect on sight distances, the statutory no stopping distances may be reduced by permitting parking closer to the crossing.

Kerb blisters and extensions may be landscaped to improve the aesthetics of the street environment. Care must be taken to ensure foliage does not obscure pedestrians.

## Pedestrian crossing with refuge

A refuge in the middle of a pedestrian crossing may be desirable in locations where there are high numbers of more vulnerable pedestrians such as young children or elderly pedestrians, or where there are high volumes of traffic. The refuge can simplify the cognitive load for the pedestrian because they only have to concentrate on one direction of vehicular travel at a time.

Refuges alone may not result in vehicle speed reduction. Some speed reduction may be achieved if the refuge creates a significant narrowing of traffic lanes. Kerb extensions along with the refuge may also help to achieve reduced vehicle speeds.



**Figure 6: Pedestrian crossing with refuge, Jacksons Road, North Narrabeen. Refuges are often supplemented with kerb blisters or extensions.**

## Raised pedestrian crossings

Where speed or visibility, including visibility of children and/or elderly or mobility impaired pedestrians, may pose a safety risk, the pedestrian crossing may be raised. Refer to AS1742.10 for more detail on raised (wombat) pedestrian crossings. Raised crossings are preferred to speed humps as they directly control the speed of the vehicle at the crossing point and may help to reduce the number of vertical displacements required on a length of road.

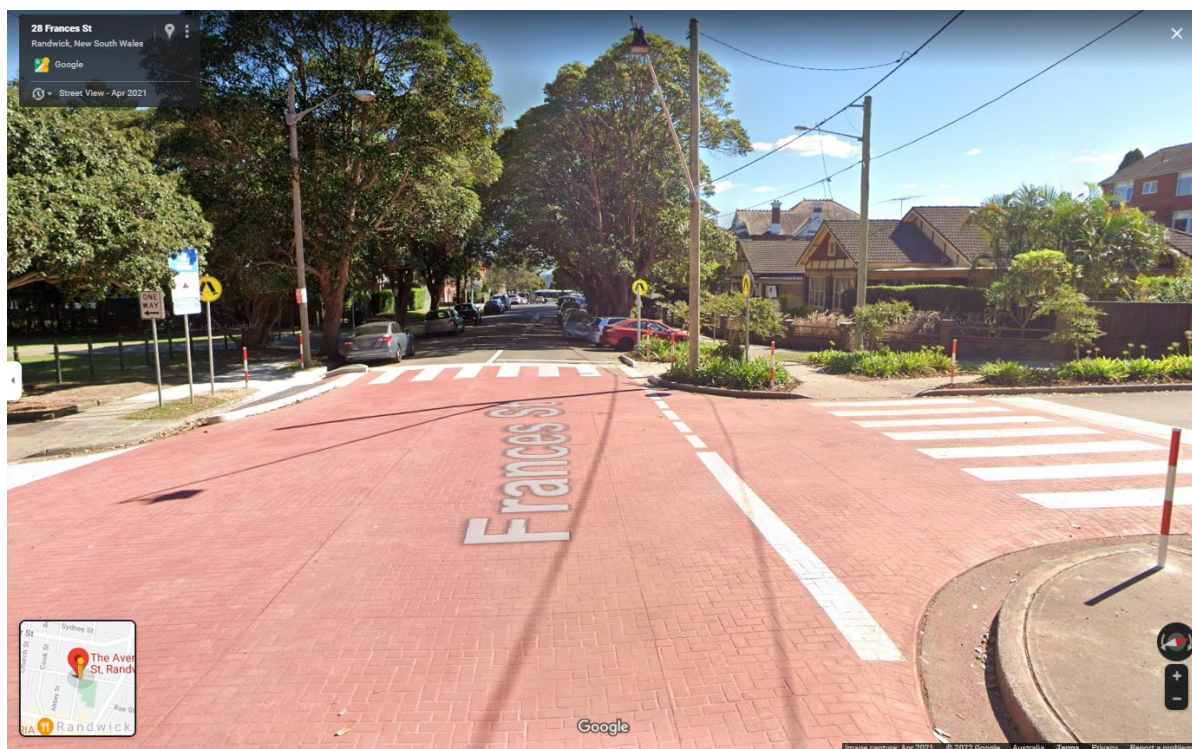




**Figure 7: Raised pedestrian crossing, Parramatta Station, Parramatta. A kerb extension has been installed on one side of the crossing to narrow the width of the crossing and to provide pick-up/drop-off bays close to the station entrance.**

### Raised safety platforms at intersections

The purpose of raised safety platforms is to reduce crash risk and severity at intersections. Where there is sufficient pedestrian activity, pedestrian crossings can be installed on the raised safety platform, preferably across each leg of the intersection if local traffic movements permit.



**Figure 8: The Avenue and Frances Street, Randwick. Pedestrian crossings were only installed on two legs of this intersection because the drop-off/pick-up queues at the local school were extensive and impacting on state road movements nearby.**

### Pedestrian crossings at shared paths

In NSW, bicycle riders are not legally allowed to ride across a pedestrian crossing. Bicycle riders will generally not dismount despite the law. In recognition of this, it is preferable to provide suitable facilities rather than taking an enforcement mentality. Therefore, to enable bicycle riders to cross without dismounting, space can be allocated beside the pedestrian crossing.



















**Figure 9: Pedestrian crossing with bicycle space allocated beside it, Chippendale Way, Chippendale.**

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## Appendix 5: Summary of complementary pedestrian crossing treatments










	<b>Complementary treatments</b>						
<b>Pedestrian crossing</b>		<b>Kerb extensions</b>	<b>Refuge</b>	<b>Speed humps</b>	<b>Raised crossing</b>	<b>Raised safety platform</b>	<b>Shared path</b>
Basic regulatory device	<b>Main purpose</b>	Shortens crossing width  Improves sight distances	Staging space for pedestrians	Traffic calming	Traffic calming and pedestrian safety	Traffic calming through intersection	Allocates space for bicycles which may/may not be regulatory
Provides on-demand priority for pedestrians wanting to cross the road	<b>Pedestrian</b>	Shortens crossing width	Simplifies crossing decisions for pedestrians	Nil	Improves visibility and amenity	Improves visibility and amenity	Nil
Must approach, looking for pedestrians and be prepared to stop / give way	<b>Driver/vehicle</b>	Retain some parking	Lateral deflection	Vertical displacement  Drivers slow to go over hump/s	Vertical displacement Drivers slow at crossing	Vertical displacement  Driver slows through intersection	Drivers tend to give way to bicycles as well as pedestrians










	<b>Complementary treatments</b>						
No impact on vehicle speed unless a pedestrian is present	<b>Vehicle speed on crossing</b>	No or minimal impact	No or minimal impact	Probable reduction	Reduction	Reduction	Depends on what other complementary treatments are installed
Nil	<b>Buses</b>	Minimum 3m lane widths may need to be retained	Minimum 3m lane widths may need to be retained	Can cause discomfort to bus passengers.  Too many speed humps on a bus route may affect bus journey times.	Can cause discomfort to bus passengers.  Too many speed raised crossings on a bus route may affect bus journey times.	May cause discomfort to bus passengers.	Depends on what other complementary treatments are installed
Nil	<b>Drainage</b>	Can be constructed with no or minimal drainage impact	Nil	Minimal	Potential issues	Potential issues	Depends on what other complementary treatments are installed



## Appendix 6: Summary of pedestrian facilities

									
	<b>No treatment</b>	<b>Refuge</b>	<b>Kerb extensions</b>	<b>Continuous footpath</b>	<b>Shared environment</b>	<b>Pedestrian crossing</b>	<b>Signals</b>	<b>Overpass/underpass</b>	<b>Shared zone</b>
<b>Regulatory</b>	<p>- Pedestrians wait for gaps in traffic.</p> <p>At intersections, turning vehicles must give way to pedestrians</p>	<p>No</p> <p>Refuges simplify the crossing task for pedestrians by providing a staging area and allowing them to concentrate on one direction at a time.</p>	<p>No</p> <p>Kerb extensions narrow the carriageway reducing pedestrians' exposure to vehicles.</p> <p>Often installed in conjunction with refuges.</p>	<p>Yes</p> <p>Footpath is a road related area. Vehicles entering a road related area must give way to pedestrians in the area.</p>	<p>Yes when marked with GIVE WAY or STOP lines.</p> <p>Right of way for pedestrians.</p> <p>Four-way intersection for bicycles and vehicles.</p>	<p>Yes</p> <p>Drivers must give way to pedestrians on the crossing.</p> <p>Pedestrians must not cross within 20 m either side of the crossing</p>	<p>Yes</p> <p>Designed to provide time separated pedestrian and vehicle movements.</p> <p>Warrants apply for the use of signals in NSW.</p>	<p>No</p> <p>Used on main roads where vehicle volumes and/or speeds are incompatible with at-grade pedestrian movements.</p>	<p>Yes</p> <p>Generally speed restricted to 10km/h. Pedestrians have priority; drivers must give way to any pedestrian in the area.</p>

									
	<b>No treatment</b>	<b>Refuge</b>	<b>Kerb extensions</b>	<b>Continuous footpath</b>	<b>Shared environment</b>	<b>Pedestrian crossing</b>	<b>Signals</b>	<b>Overpass/underpass</b>	<b>Shared zone</b>
<b>Comment</b>	Baseline scenario.  Represents the bulk of the network at intersections and mid-block	Suitable at locations where there are sizeable gaps in traffic but more vulnerable or mobility impaired pedestrians may need a sense of security	Suitable for pedestrian desire lines that do not warrant a formal crossing.	Suitable for locations where you want to prioritise pedestrian ownership of the space and cars are visitors	Designed for separated path crossings.  A level of ambiguity causes drivers to pause and think.	Provides a visible, legal, on-demand crossing point for pedestrians.	Generally used on heavily trafficked roads where there is strong competition between road users and conflict risk is high.	Generally used where there is a strong desire line across a heavily trafficked road and at-grade crossings are not an option.	Suitable for locations where you want to prioritise pedestrian ownership of the space and/or there is no effective footpath.

									
	<b>No treatment</b>	<b>Refuge</b>	<b>Kerb extensions</b>	<b>Continuous footpath</b>	<b>Shared environment</b>	<b>Pedestrian crossing</b>	<b>Signals</b>	<b>Overpass/underpass</b>	<b>Shared zone</b>
<b>Safety risks</b>	Issues can arise when roads become more heavily trafficked and/or heavily parked. Long straight sections of road encourage speeding and may need to be calmed.	Risk to pedestrians is reduced compared to baseline.	Risk to pedestrians is reduced compared to baseline.	Risk to pedestrians is reduced compared to baseline.  Vehicles will slow to traverse the footpath. There need to be gaps in traffic and low speed limits to mitigate vehicle-vehicle crash risks.	Main risk is between bicycle riders and other vehicles entering the space. They need to negotiate priority.  Low risk to pedestrians.	Risk that drivers do not give way to pedestrians.  Can be misleadingly associated with high crash risk due to high pedestrian usage/exposure at crossings.	Risk that drivers do not stop or they encroach into the crossing.  Risk from filtering traffic if permitted to turn through the crossings.	Virtually no risk from vehicles.  Personal safety risks to pedestrians.	Low speed limit, pedestrian prioritisation and constrained traffic environment designed to reduce all road safety risks.

Important text

6.1.1 Level 3 heading

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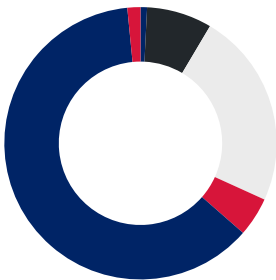
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Sample graph colours

Chart title

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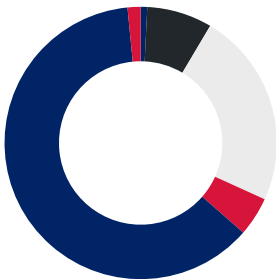
Expenses (\$millions)

- Operating expenses: 1262
- Major rail project expenses: 1528
- Depreciation and amortisation: 605
- Grants and subsidies: 12952
- Other expenses: 1521

Total: 17,953

Chart title

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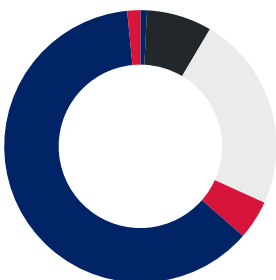
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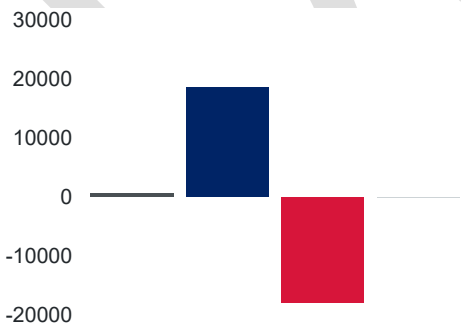
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Expenses (\$millions)

- Operating expenses: 1262
- Major rail project expenses: 1528
- Depreciation and amortisation: 605
- Grants and subsidies: 12952
- Other expenses: 1521

Total: 17,953



FY2018-19 (\$millions)

- Net Result: 619
- Revenue: 18,603
- Expenses: -17,953
- Other comprehensive income: 0.5



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