

Pedestrian and Cycle Crossings

At midblock locations
(Intersections webinar to follow)



Introductions - Presenters

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James Wratt (Waka Kotahi; Q&A facilitator)



House-keeping

How will this webinar operate?

- You will see a Presentation on screen
 - Various presenters will speak to it
 - Your own microphones/cameras are **off**
- At any time you can type in a question in the Q&A panel about what you see/hear
 - We may address them after each session or at the end
- If you have any technical problems, please type in the chat panel and we will address

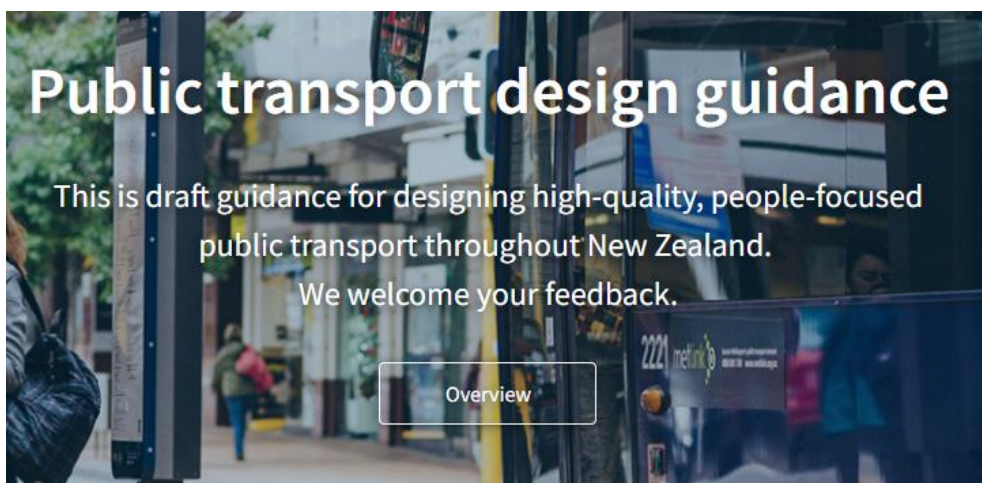
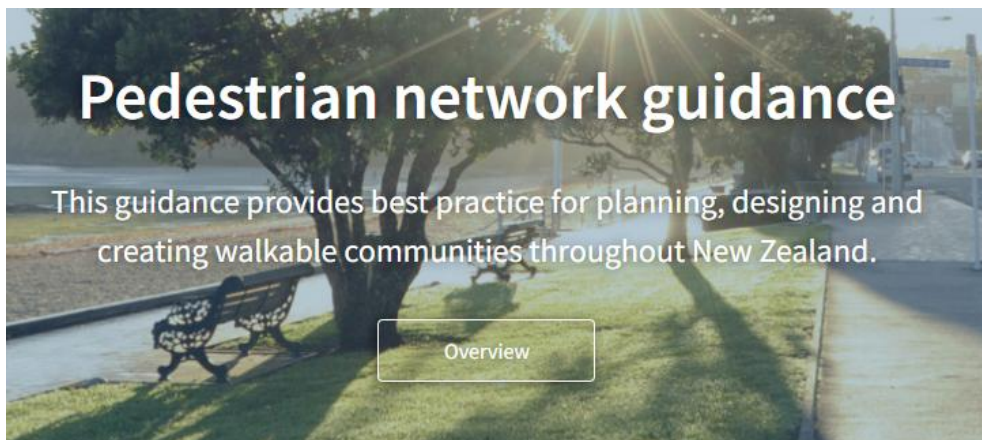
Agenda

- ❖ Introduction
- ❖ Principles
- ❖ Crossing selection process
- ❖ Non-priority crossing aids
- ❖ Priority crossings
- ❖ Wrap up
- ❖ Q&A (15mins)

Introduction

Waka Kotahi Multi-modal guidance

PNG, CNG, PTDG, AUSPDG...



The Training Webinars

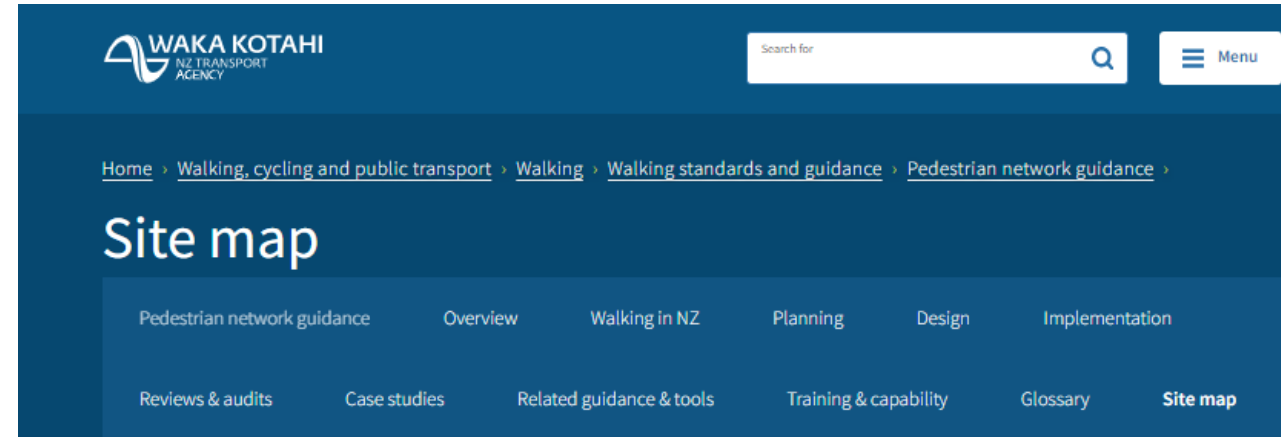
- A survey was sent out after the Introduction webinar, this included seeking feedback on learning methods and topics
- Over 60% of respondents preferred the webinar style learning for this current environment – beyond 2022 people supported a mix of formats
- Here is the preference people had for topics
- We are delivering the first two because we had the material ready - we will then focus on the higher preference and integrate some as appropriate

What do you think are the highest priorities for further industry training for multimodal street design?

Planning for walking & cycling	99
Safety for cycling	89
Design: multi-modal intersections	85
Safety for walking	78
Design: road space allocation	76
Understanding inclusive access for walking and cycling	69
Public transport planning	65
Case studies and industry best practice examples	63
Navigating politics for better multimodal street design	59
Design: pedestrian/cycle road crossings	58
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Design: public transport optimisation and priority	41
Design: neighbourhood greenway streets	38
Design: bus stop design (including integration of cycling facilities)	38
Consultation and engagement	38
Rural provision for walking and cycling	36
Monitoring: counting pedestrians & cyclists	35
Design: walk/cycle railway crossings	24
Other	7

Common questions: Finding the guidance

- Bookmark the PNG, CNG etc.
 - <https://nzta.govt.nz/png>
 - <https://nzta.govt.nz/cng>
- You can use the site maps like a table of contents



Pedestrian network guidance

- Overview
An overview of the Pedestrian Network Guidance.
- Walking in NZ
Understand the context, relevant legislation, the benefits of walking, walking trends in New Zealand and safety.
 - Context and definitions
 - Pedestrians and the law
 - Benefits of walking
 - Equity
 - Environment
 - Efficiency
 - Health and wellbeing
 - Community
 - Economy
 - Supports public transport
 - Walking activity and trends in New Zealand
 - A Safe System for walking
 - Falls - slips, trips and stumbles
- Planning
Understand who's walking and their needs, walkability, planning methods you can apply and funding options.

Etc, etc

Site Maps

PNG

CNG

Designing a cycling facility

The guidance for each type of provision includes a description, legal considerations, design aspects, information on any relevant trials and selected case studies that may be useful to designers.

✓ Between intersections >

✓ Intersections >

✓ Crossings >

- [Pedestrian and cycle rail crossings \[PDF, 8.5 MB\]](#)
- [Unsignalised crossings](#)
- [Signalised crossings](#)
- [Grade-separated crossings](#)

◦ Crossings

- [Introduction](#)
 - [Safe System and safety benefits](#)
 - [General legal considerations](#)
- [Crossing selection](#)
 - [Types of crossing facility](#)
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 - [Location and spacing of crossings](#)
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 - [Design requirements for pedestrians](#)
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 - [Kerb crossings](#)
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 - [Pedestrian / median refuges](#)
 - [Pedestrian platforms](#)
 - [Courtesy crossings](#)
- [Priority crossings](#)
 - [Zebra crossings](#)
 - [Raised zebra crossings](#)
 - [Signalised crossings](#)
- [School crossings](#)
- [Grade separation](#)
- [Rail crossings](#)

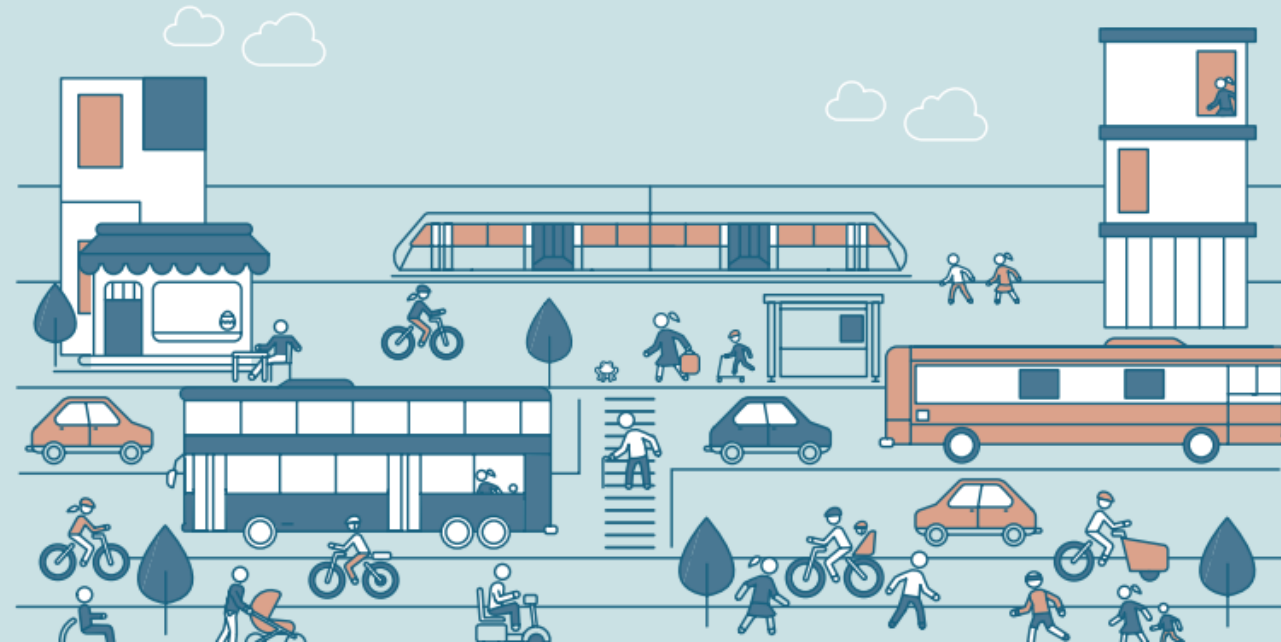
Common questions:

What about RCA guides?

- Refer to Waka Kotahi guides and local guides (if they exist) for RCA streets
- Check the date of publication for local guides
 - There may be more up-to-date guidance available in the Waka Kotahi guides (as they are being updated on a regular basis)



Urban Street and Road Design Guide



Principles for pedestrian crossings

What is a crossing?

Walkability

Safe, obvious and step free

Safe System

Design principles

What is a crossing?

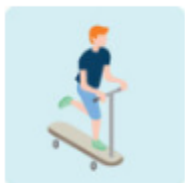
- [PNG>Design>Crossings>Types of crossings](#)
- Pedestrians generally need to cross roads on every walking trip and may also need to cross railways, waterways and other natural features
- We will cover Types of road and rail crossings today in this table
- The alternative to a defined crossing facility is a shared space where pedestrians share the space with other road users

Table: Types of crossings for pedestrians

Category of treatment	Objective	Possible treatment
Non-priority crossings / aids	Assists pedestrians to cross by shortening the crossing distance, simplifying the crossing task, increasing visibility, reducing vehicle speeds or encouraging courtesy between drivers and pedestrians. On their own, these aids do not give pedestrians priority over vehicles.	Kerb crossings Kerb extensions Pedestrian/median refuges Pedestrian platforms Courtesy crossings
Priority crossings	Gives pedestrians priority, or allots pedestrian-only periods for use of an on-road section, alternating with periods for vehicles.	Zebra crossings Raised zebra crossings Signalised crossings School crossings
Grade separation	Eliminates conflict by putting pedestrians and vehicles in physically distinct areas.	Underpasses and overpasses
Rail crossings	Manages pedestrian crossings of rail lines.	Rail crossings

Walkability

- [PNG>Planning>Walkability](#)
- Walkability describes the extent to which the built environment is walking-friendly
- Crossings are a key part of walkable networks



If Mum and Dad think that it's safe enough, I can go to the park by myself or to the dairy, but if there are busy streets and no safe places to cross the road we usually take the car.

[Tom](#)

Personas

Walkability

[Pedestrian network guidance](#)

[Overview](#)

[Walking in NZ](#)

[Planning](#)

[Design](#)

[Implementation](#)

[Reviews & audits](#)

[Case studies](#)

[Related guidance & tools](#)

[Training & capability](#)

[Glossary](#)

[Site map](#)

This is draft guidance, and we [welcome your feedback](#)

Walkability describes the extent to which the built environment is walking-friendly. Urban form contributes to walkability and a walkable place will have a range of characteristics that are important for pedestrians. Methods are available to measure and assess walkability.

Walkable places →

Walkability describes the extent to which the built environment is walking-friendly. It is a useful way to assess the characteristics of an area or a route, and considers accessibility in terms of proximity to destinations.

Urban form →

Urban form relates to how communities are designed and structured, the type of development that is allowed and where, and how the different areas are connected. Urban form affects the need to travel and the attractiveness (or otherwise) of walking as a practical form of transport.

Pedestrian network characteristics



A walkable place or community has several important qualities as described by seven pedestrian network principles.

[Safe](#)

[Inclusive](#)

[Comfortable](#)

[Direct](#)

[Legible](#)

[Connected](#)

[Attractive](#)

Measuring walkability →

Measuring the walkability of an area or route means understanding the ease by which pedestrians can move around. There are many different methods to measuring walkability using desktop analysis, on-site assessment or through pedestrians' experiences.

SOS Principles

- [PNG>Planning>Pedestrian Planning Principles](#)
- Principles of Safe, Obvious and Step-free (SOS) incorporate human variation, so that planners and designers can incorporate universal access
- It is important that safe, obvious, step-free routes are provided as a priority on the most important pedestrian routes in towns and cities

Pedestrian planning principles

[Pedestrian network guidance](#)

[Overview](#)

[Walking in NZ](#)

[Planning](#)

[Design](#)

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Humans are diverse. Planning for pedestrians means designing for all of human capabilities and states. Measuring pedestrian activity is crucial and many methods are available. Engagement particularly with the disability sector is important, guidance is available to help with this.

[Pedestrian characteristics →](#)

Humans are diverse. Designing streets and places for pedestrians means designing for all of human capabilities and states. Considerations include the space needed for different devices and for people moving at different speeds.

[Principles of Safe, Obvious and Step-free \(SOS\) →](#)

By following these principles, planners and designers can create accessible, inclusive streets and places.



If something doesn't feel familiar or if I am not sure which way to go, I can panic and freeze, and I can't talk to people when that happens. So I stick to the most obvious walking routes.

[Josh](#)

Safe System Principles

- [PNG>Design>Crossings>Introduction](#)
- Places where pedestrians cross should align with Safe System principles. In general, safe system aligned measures for pedestrians either:
 - Separate pedestrians from motor vehicles, or
 - Ensure impact speeds are at or below 30km/h

Introduction

[Pedestrian network guidance](#)

[Overview](#)

[Walking in NZ](#)

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[Related guidance & tools](#)

[Training & capability](#)

[GL](#)

Pedestrians generally need to cross roads on every walking trip and may also need to cross railways, waterways and other natural features. Crashes involving pedestrians occur most commonly where they are crossing roads and difficulties crossing roads can be a barrier to undertaking a walking trip.

[A Safe System for walking](#)

Providing safe and appropriate crossings are therefore key elements in providing a connected network for pedestrians. Crossings for pedestrians can be located mid-block (focus of this section) or at an intersection.

[PNG: Walkability](#)

[PNG: Intersections](#)

[Safe System and safety benefits →](#)

Places where pedestrians cross should align with Safe System principles. Installing a crossing can have safety benefits.

[General legal considerations →](#)

There are legal requirements to consider for pedestrians crossing roads.

Safe System Principles

- Primary Safe System interventions:
- Pedestrian facilities that are Safe System aligned



- Supporting Safe System interventions:
- Those that are not fully aligned with Safe System principles but can support or make incremental improvements to safety and/or mobility for pedestrians



Design Principles - Crossings

- [PNG>Design>Crossings](#)



The longer there is to cross, the less likely I will enjoy that part of my walk. I have to keep looking over my shoulder to check no more traffic is coming, it is very stressful.

Aisha

Crossings

[Pedestrian network guidance](#)

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Pedestrians generally need to cross roads on every walking trip and may also need to cross railways, waterways and other natural features. Safe and appropriate crossings are therefore key elements in providing a connected network for pedestrians.

Introduction →

Designing safe and appropriate crossings requires an understanding of Safe System principles and the legal obligations of pedestrians and vehicles.

[Safe System and safety benefits](#)

[General legal considerations](#)

Crossing selection →

Choosing an appropriate crossing type and supporting aids for the context is critical to ensuring a safe and appropriate crossing facility.

[Types of crossing facility](#)

[Crossing selection process](#)

[Location and spacing of crossings](#)

Crossing design principles →

A range of design principles contribute to creating a safe and appropriate pedestrian crossing facility.

[Design requirements for pedestrians](#)

[Kerb ramp design](#)

[Design requirements for other road users](#)

[Sight distances](#)

[Landscaping at crossings](#)

[Street lighting at crossings](#)

[Use of colour on crossings](#)

[Monitoring and maintenance](#)

Non-priority crossing aids →

This section describes different crossing aids that assist pedestrians to cross but do not provide legal priority over traffic.

[Kerb crossings](#)

[Kerb extensions](#)

[Pedestrian / median refuges](#)

[Pedestrian platforms](#)

[Courtesy crossings](#)

Facilities for blind and vision impaired pedestrians

Resources

- [PNG>Design>Pedestrian design principles](#)
- [RTS14: Guidelines for facilities for blind and vision impaired pedestrians](#)
- [Tactile indicator installation note](#)
- [Webinar](#)



Crossing selection

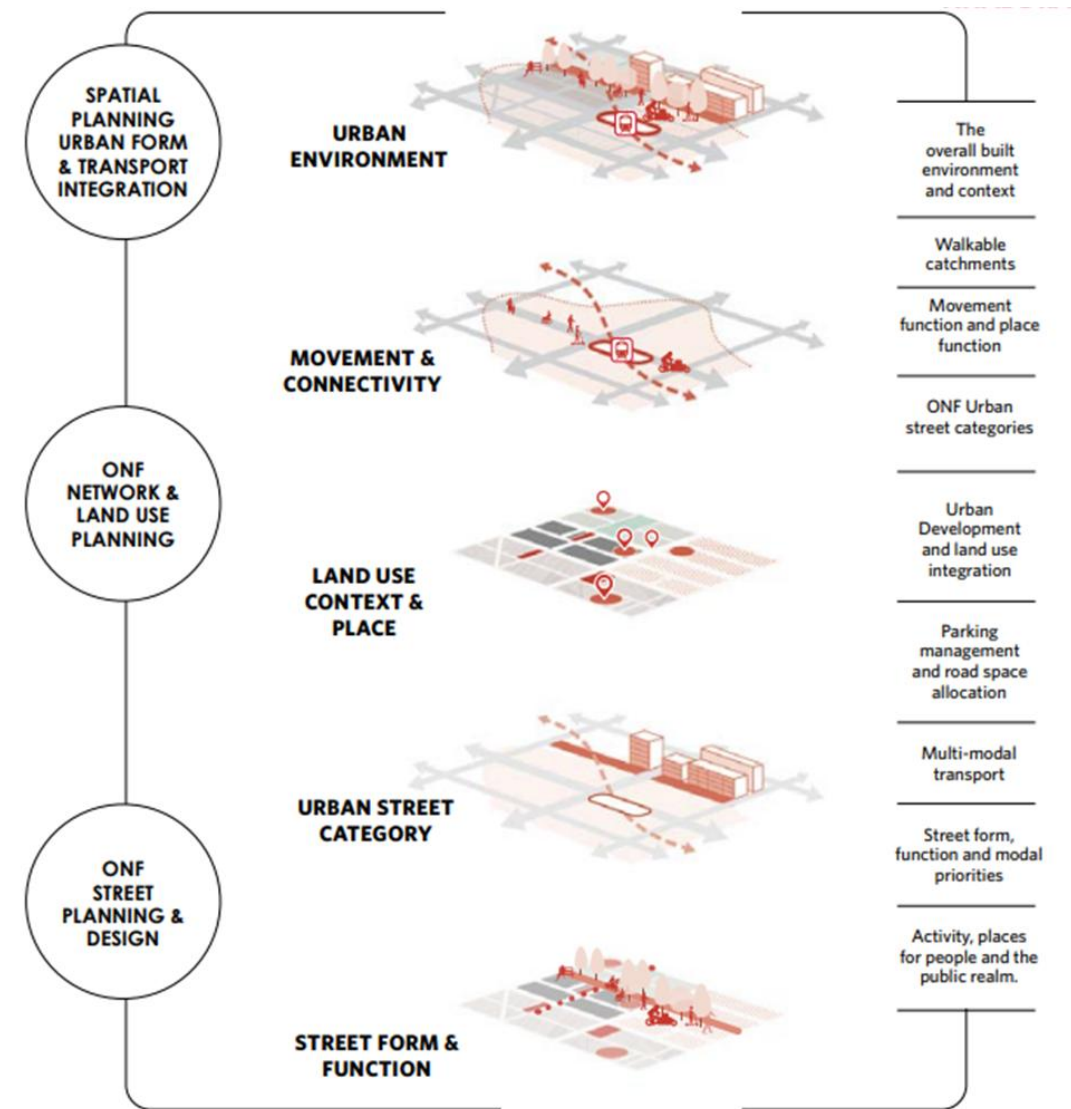
Context

Crossing type selection

Location and spacing

Context

- When looking at pedestrian crossings you might be considering a network, street or specific location
- It is important to match the scale with the context analysis that you undertake
- The data you gather is also about the scale, but noting that even at a specific location you need to gather data along the street as crossings may be occurring where you didn't expect them



[Aotearoa Urban Street Planning & Design Guide. He Whenua, He Tangata](#)

Context

- [PNG>Design>Crossings>Crossing selection process](#)
- The table lists some key questions and aspects to consider as inputs to the decision-making process
- [PNG>Planning>Pedestrian Planning Principles>Measuring pedestrian activity](#)
- Data collection could include pedestrian observations and counts

Table: Street environment considerations

Question	Considerations
What is the street function?	What is the current or desired movement and place function of the street and to what extent should pedestrians be prioritised? The One Network Framework classification may assist. One Network Framework
What are the traffic volumes and composition?	Traffic volume affects the delays experienced by pedestrians. Facilities that give priority to pedestrians result in delays to other road users. Should the traffic volumes be reduced? Should the traffic composition be modified or restricted? The composition of traffic includes how many heavy vehicles, buses and cyclists use the road which influences facility choice and design.
What are the vehicle operating speeds?	Vehicle operating speeds over 30km/h increase the severity of injury or likelihood of death in crashes involving pedestrians. Higher speeds make it more difficult for pedestrians to judge safe gaps and require longer sight distances. Should traffic calming and speed management be used along the route/area?
Who is expected to use the crossing?	Who wants to cross? How many people want to cross? Who is the most vulnerable person likely to cross here? Is there suppressed demand to cross here? Are there crossing safety issues for existing or future pedestrians?
What is the road layout?	How many traffic lanes are there in each direction? Can road space be reallocated to reduce the number of lanes?
What are the surrounding land uses / place value?	What is the surrounding land use and how might it affect the types, times, and volumes of pedestrian? What would pedestrians expect in this area?
What is the best location of the crossing to match pedestrian desire lines?	Where do pedestrians cross now and where do they want to go or come from? Do they cross in one place or are they spread out along a link, or at an intersection. What other crossing opportunities are nearby and what type are they?

Crossing type selection

- [PNG>Design>Crossings](#)
- Selecting a crossing type can be complex
- The Austroads Pedestrian Facility Selection Tool can be used to identify feasible pedestrian crossing treatments but there are a lot of inputs needed
- A new PNG flowchart and context table has been developed to help you in the NZ context with less inputs

Introduction →

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Priority crossings →

This section describes the crossing types that provide legal priority over traffic.

[Zebra crossings](#)

[Raised zebra crossings](#)

[Signalised crossings](#)

Grade separation →

This section describes underpasses and overpasses that separate pedestrians from other road users through a grade change.

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School crossings →

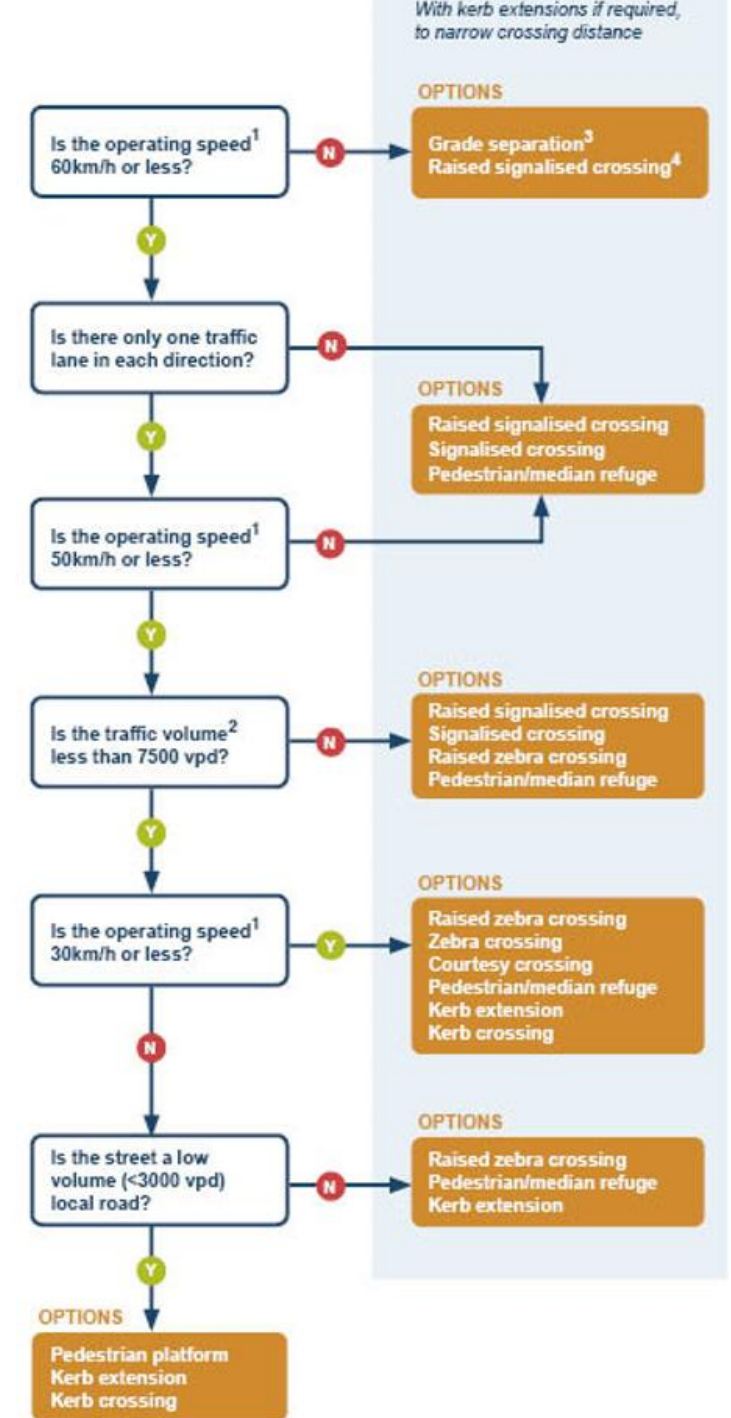
School crossings assist children crossing roads on their journey to or from school. Different types of crossing assistance are available for different contexts.

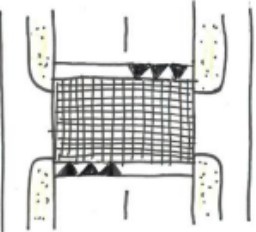
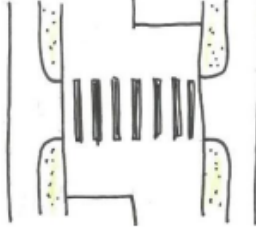
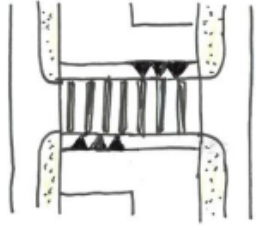
Rail crossings →

Rail crossings help pedestrians to cross railway corridors, either at-grade using a level crossing, or under or over the railway.

Crossing type selection

- [PNG>Design>Crossings>Crossing selection process](#)
- A flow chart for mid-block crossings based on operating speed, number of lanes and traffic volumes
- Then refer to the context table that looks deeper into these aspects as part of refining options:
 - Pedestrian demand
 - Land use and ONF street types
 - Safe system primary or secondary intervention
 - Implications to consider

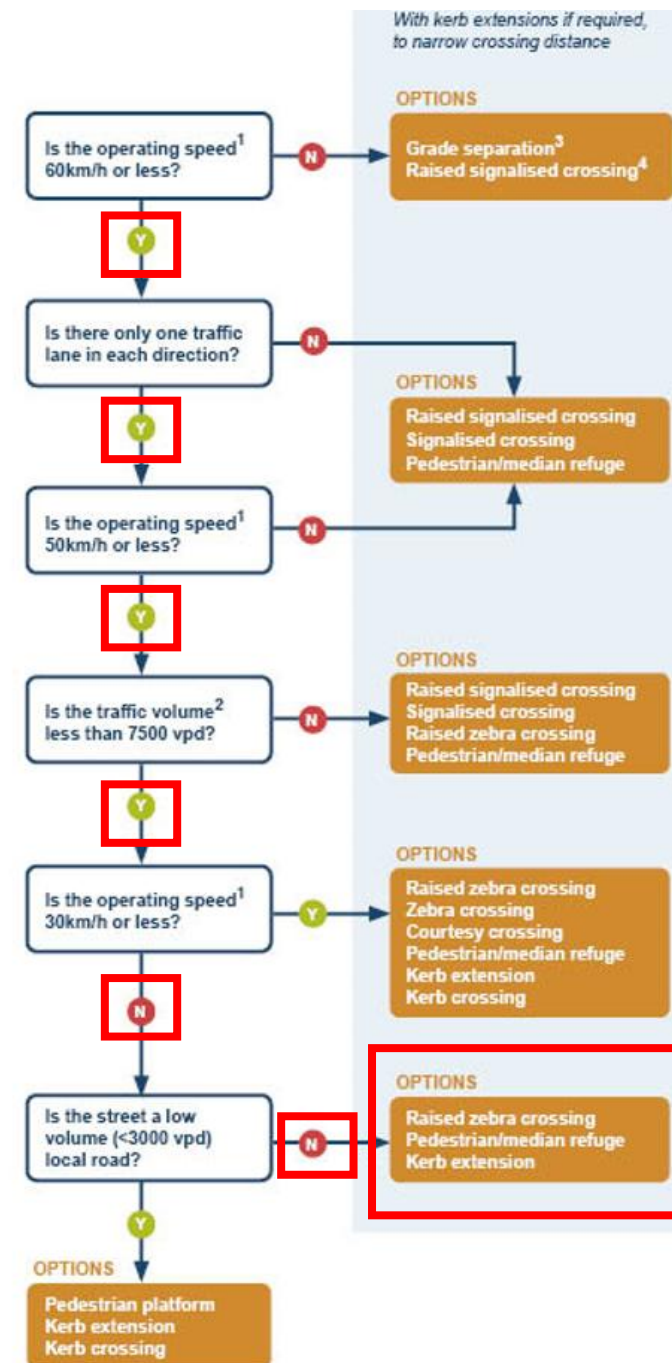


OPTION	BENEFITS	IMPLICATIONS	RECOMMENDED PARAMETERS
Courtesy crossing 	- Intended to facilitate eye contact between pedestrians and drivers resulting in a mutually negotiated position of who goes first - Can improve pedestrian safety and level of service while causing minimal delay to other traffic - Can result in courteous behaviour where drivers yield to pedestrians - Can eliminate grade changes from the pedestrian route and therefore the need for kerb ramps.	- Are not obvious who has right of way so can create uncertainty and can be less suitable for some pedestrian user groups - Can result in unsafe use if pedestrians assume they have right of way - Can create discomfort for vehicle occupants travelling over platforms if not well designed (particularly buses) - May increase noise as vehicles brake, slow, pass over them and then accelerate (particularly heavy vehicles).	- Likely to be a Primary Safe System treatment as operating speeds are below 30km/h[1]. - Not obvious who has right of way so their use is discouraged except where pedestrian volumes are very high and vehicle speeds are low and where alternative priority crossings are located nearby as this provides route choice. - Operating speed 30km/h or less - May be suitable on Activity Streets, Main Streets and Civic Spaces where pedestrian volumes are significant (high) - Traffic volume less than 7500vpd - Only appropriate for crossing distances 7m or less (can combine with kerb extensions to achieve) as only used in slow speeds where cyclists share with traffic. - Should be on a raised platform unless in very slow speed environments - Can be combined with kerb extensions - Crossing should be a colour that contrasts with both the adjacent road and footpaths
Priority crossings			
Zebra crossing 	- Gives pedestrians priority resulting in minimal delays for pedestrians - Are obvious as a place for pedestrians to cross.	extensions and median refuge, zebra crossings do not improve pedestrian safety or may even decrease it - High pedestrian flows can dominate and cause traffic delays - Can increase rear end crashes between vehicles, however these tend to be low severity.	Primary Safe System treatment if operating speeds are below 30km/h. Supporting treatment if operating speeds above 30km/h[1]. - Posted speed of 50km/h or less (>50km/h posted speed requires approval from NZTA) - Operating speed of 30km/h or less (lower approach speeds result in higher yielding by drivers) - Maximum of one traffic lane in each direction to avoid traffic in adjacent lanes blocking visibility of people crossing or waiting to cross - Suitable for medium to high pedestrian demand so drivers are expecting pedestrians - Can be combined with kerb extensions and/or a refuge
Raised zebra crossing 	- Gives pedestrians priority resulting in minimal delays for pedestrians - Are obvious as a place for pedestrians to cross - Reduces or helps to reinforce slower vehicle speeds and increases drivers' give way rates - Can eliminate grade changes from the pedestrian route and therefore the need for kerb ramps.	- High pedestrian flows can dominate and cause traffic delays - Can create discomfort for vehicle occupants travelling over platforms if not well designed (particularly bus passengers) - May increase noise as vehicles brake, slow, pass over them and then accelerate (particularly heavy vehicles).	- Primary Safe System treatment if operating speeds are below 30km/h. Supporting treatment if operating speeds are above 30km/h[1]. - Posted speed of 50km/h or less (>50km/h posted speed requires approval from NZTA) - Operating speeds 50km/h or less (design platform to reduce speeds). Lower approach speeds result in higher yielding by drivers - Maximum of one traffic lane in each direction - Suitable for medium to high pedestrian demand* so drivers are expecting pedestrians - Can be combined with kerb extensions and/or a refuge - May be a standard safety intervention if key criteria are met which can lead to a streamlined investment pathway. Refer to the Standard safety intervention toolkit

Crossing context table

Example – Opawa Road

Location:	Opawa Road, Chch	Road type	Assumed ONF: Activity Street
Posted speed limit	50km/hour	Traffic volume	7,100vpd
Est. operating speed	Approx.50km/hour	Ped usage	High volumes at school peaks, moderate through the day due to access to shops on both sides
 Currently a flush zebra and not always well observed by approaching drivers, any solution really needs to be part of a scheme to reduce speed on the approaches		Options	Discussion
		1. Zebra on platform (with kerb extensions)	Appropriate and would help to reduce approach speeds that are currently higher than desired
		2. Refuge	Not enough priority due to ped demand and also limited space to do this well
		3. Kerb extension	Not sufficient on their own for the demand

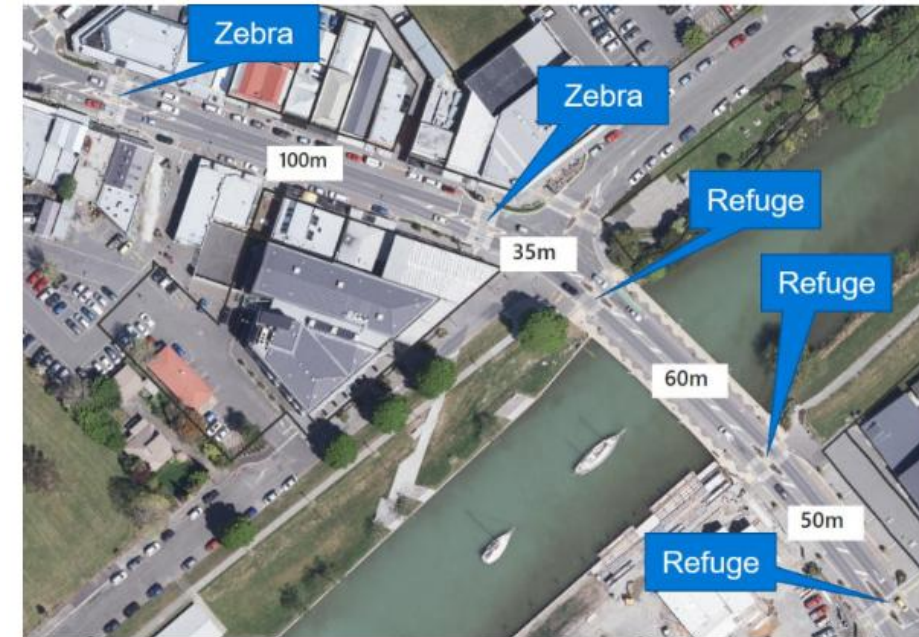


Example – Opawa Road



Location and spacing

- [PNG>Design>Crossings](#)
- The spacing and frequency of crossings along a street depends on the street type, land use and built environment, and pedestrian desire lines
- Research suggests that at grade crossings should be provided every 80 to 100m in urban environments
- Bus stops - it is preferable for crossings to be located so that pedestrians will cross behind the bus stop in both directions. This is a safer location for pedestrians and more operationally efficient for the buses in the mid-block



Hot off the press!!

[PTDG>Bus stops>Walking access](#)

Poll

Selection of crossing type

Non-priority crossings

Kerb crossings

Kerb extensions

Pedestrian refuge islands

Pedestrian platforms

Courtesy crossings

Non-priority crossing aids

- [PNG>Design>Crossings](#)



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Rail crossings →

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Grade separation →

This section describes underpasses and overpasses that separate pedestrians from other road users through a grade change.

Kerb crossings

- **Benefits**

- Guides pedestrians to a safer place to cross.
- Provides a smooth transition between the footpath and roadway that can be used by all pedestrians.

- **Implications**

- Does not give pedestrians priority so can be unsuitable for some pedestrians.
- Does not assist pedestrians to cross if street is wide.

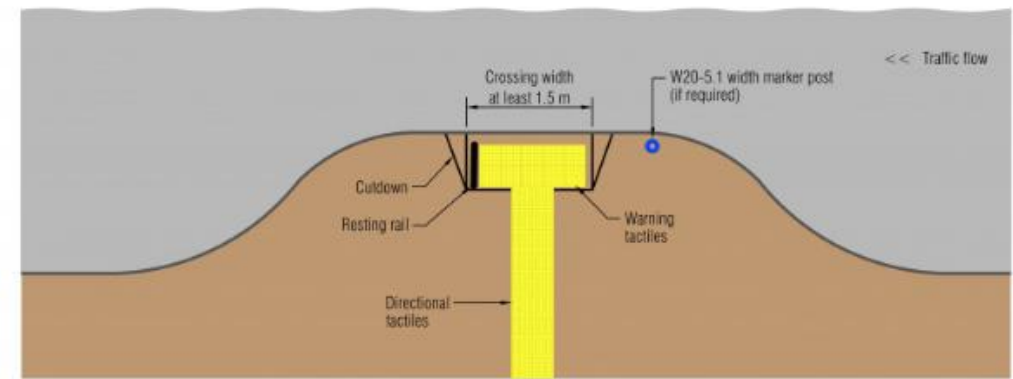


Kerb crossing, Sumner, Christchurch. (Photo: Ben Jassin)

[**PNG: Kerb crossings**](#)

Did you know? – *In forming or reforming any road or part thereof (not being a road in a rural area), the council shall ensure that reasonable and adequate provision is made for the kerb and channel of any footpath or part thereof to be formed or reformed so as to permit safe and easy passage from kerb to kerb of any mechanical conveyance normally and lawfully used by a disabled person (Local Government Act, s331(2))*

Kerb extensions



Example of a mid-block kerb extension. (TCD Manual Part 5 Figure 7-1)

- **Benefits**

- Reduces crossing distance and therefore crossing time.
- Pedestrians more visible to oncoming drivers and can view approaching traffic better.
- Creates space for pedestrians to wait without blocking others walking past.
- Physically prevents drivers from parking and blocking the crossing point.
- Can help to slow vehicle speeds by narrowing the road.

- **Implications**

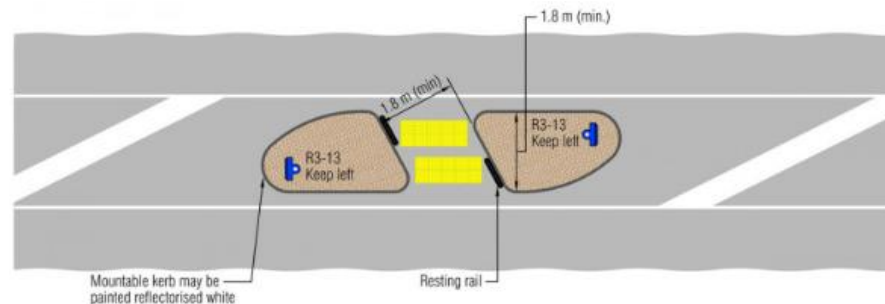
- Does not give pedestrians priority so can be less suitable for some pedestrian user groups.
- Can cause issues for cyclists particularly on narrower roads.
- Can create an obstruction that may be struck by cyclists and vehicles
- Where the kerb alignment is being altered they can create drainage issues and places where rubbish can accumulate ('stick on' extensions could overcome this if designed well).

[PNG: Kerb extensions](#)

Pedestrian refuge

- **Benefits**

- Reduces crossing distance for pedestrians.
- Simplifies the crossing task as pedestrians only need to find gap in one stream of traffic at a time.
- Can considerably reduce delays to pedestrians.
- Can help to slow vehicle speeds by narrowing the traffic lanes.



Typical pedestrian refuge design. (Source: [TCD Manual Part 5](#))

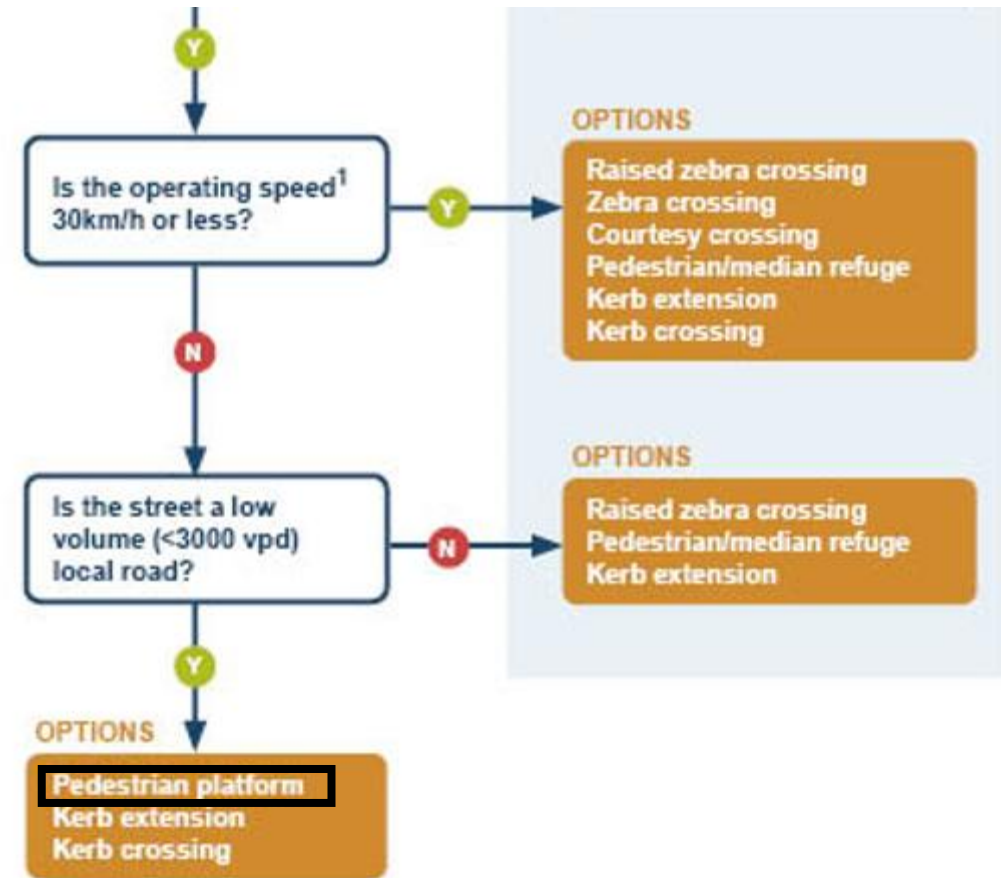
- **Implications**

- Does not give pedestrians priority so can be less suitable for some pedestrian user groups.
- Can cause issues if on-road cyclists are expected to travel adjacent to vehicle traffic, wider traffic lanes would be required (at least 4.2m wide). Alternative provision for cyclists such as cycle bypasses could be used or narrow the lanes so cyclists share with traffic.
- Can create an obstruction that may be struck by vehicles.
- Can restrict vehicle access to adjacent driveways.

PNG: Pedestrian refuge

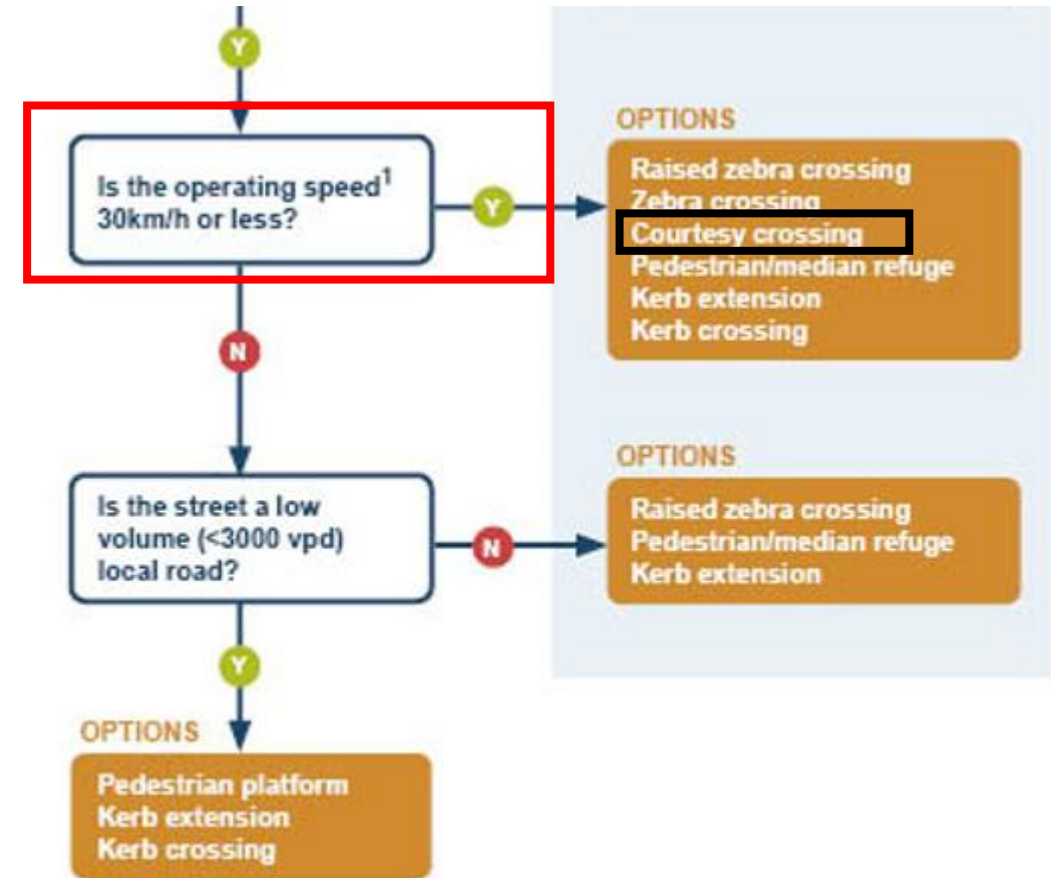
Pedestrian platforms

- Raised platforms are crossing aids for pedestrians raised above the carriageway level, on their own they provide a focus for pedestrians to cross, however pedestrians must still give way to vehicles
- They can be a raised safety platform (RSP) to reduce vehicle speeds when used with zebras and signalised crossings – more on that soon



Courtesy crossings

- Vehicle operating speeds very low, at most 30km/h, ideally 20km/h or less. The lower the speed the more effective the crossing as vehicles are going slower so are more likely to be courteous to pedestrians wishing to cross.
- They are intended to facilitate eye contact between pedestrians and drivers
- However, this can create uncertainty between road users as to who has the right of way, which can be very uncomfortable (or unacceptable) for some pedestrians
- In many cases a zebra crossing is most likely more appropriate



I don't really like to eyeball a driver so I prefer zebra crossings and traffic signals. Usually I can work out my own way to go that has the crossings I like but sometimes it means a much longer walk which is hard if I'm trying to get somewhere in a hurry.

Josh

PNG: Courtesy crossings

Courtesy crossings vs pedestrian platforms

Courtesy crossing	Pedestrian platform
Courtesy crossings are intended to facilitate eye contact between pedestrians and drivers resulting in a mutually negotiated position over who goes first.	On their own pedestrian platforms provide a focus for pedestrians to cross, however pedestrians must still give way to vehicles.
Traffic volume less than 7500vpd (could be higher if a median refuge is provided and an alternative crossing provided nearby)	Traffic volumes less than 3000vpd
Vehicle operating speeds very low, at most 30km/h, ideally 20km/h or less. The lower the speed the more effective the crossing as vehicles are going to slower so are more likely to be courteous to pedestrians wishing to cross.	Vehicle operating speeds less than 50km/h (the platform should be designed to slow vehicle speeds to 30km/h)
Likely to be found on Activity Streets, Main Streets and Civic Spaces where pedestrian volumes are high	Likely to be found on Local Streets and Activity Streets where the pedestrian volumes are low

Etc etc...

Priority crossings

Zebra crossings (raised and flush)

Dual zebra crossings

Mid-block signalised crossings (pedestrian and combined ped/bicycle)

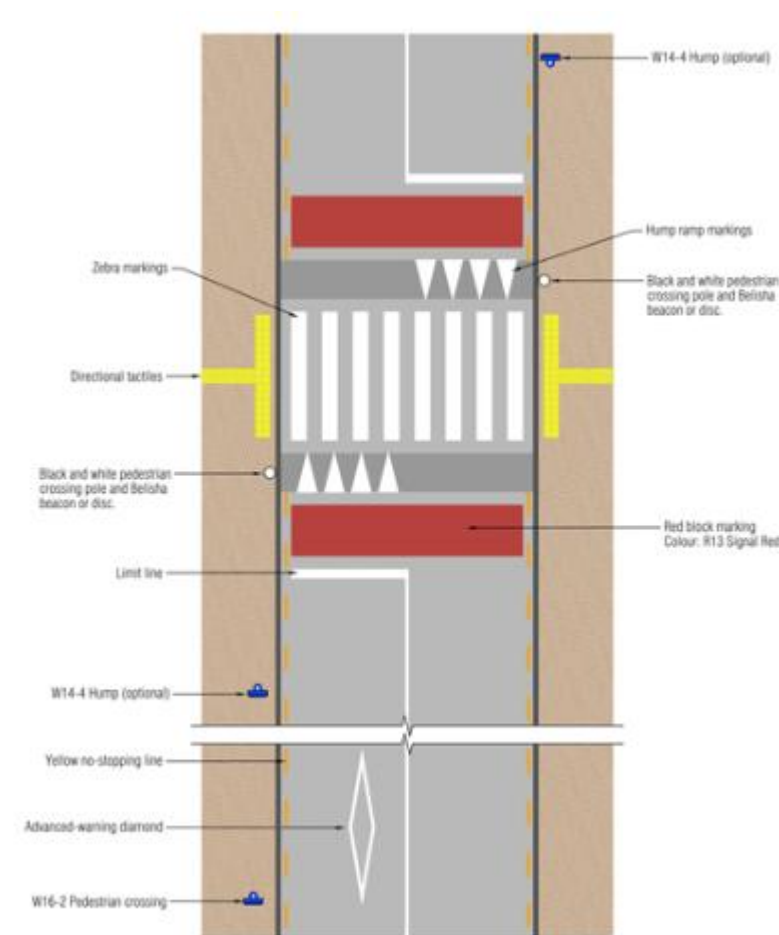
Zebra crossings – Raised

- **Benefits**

- Gives pedestrians priority resulting in minimal delays for pedestrians.
- Are obvious as a place for pedestrians to cross.
- Reduces or helps to reinforce slower vehicle speeds and increases drivers' give way rates.
- Can eliminate grade changes from the pedestrian route and therefore the need for kerb ramps.

- **Implications:**

- High pedestrian flows can dominate and cause traffic delays.
- Can create discomfort for vehicle occupants travelling over platforms if not well designed (particularly bus passengers).
- May increase noise as vehicles brake, slow, pass over them and then accelerate (particularly heavy vehicles).

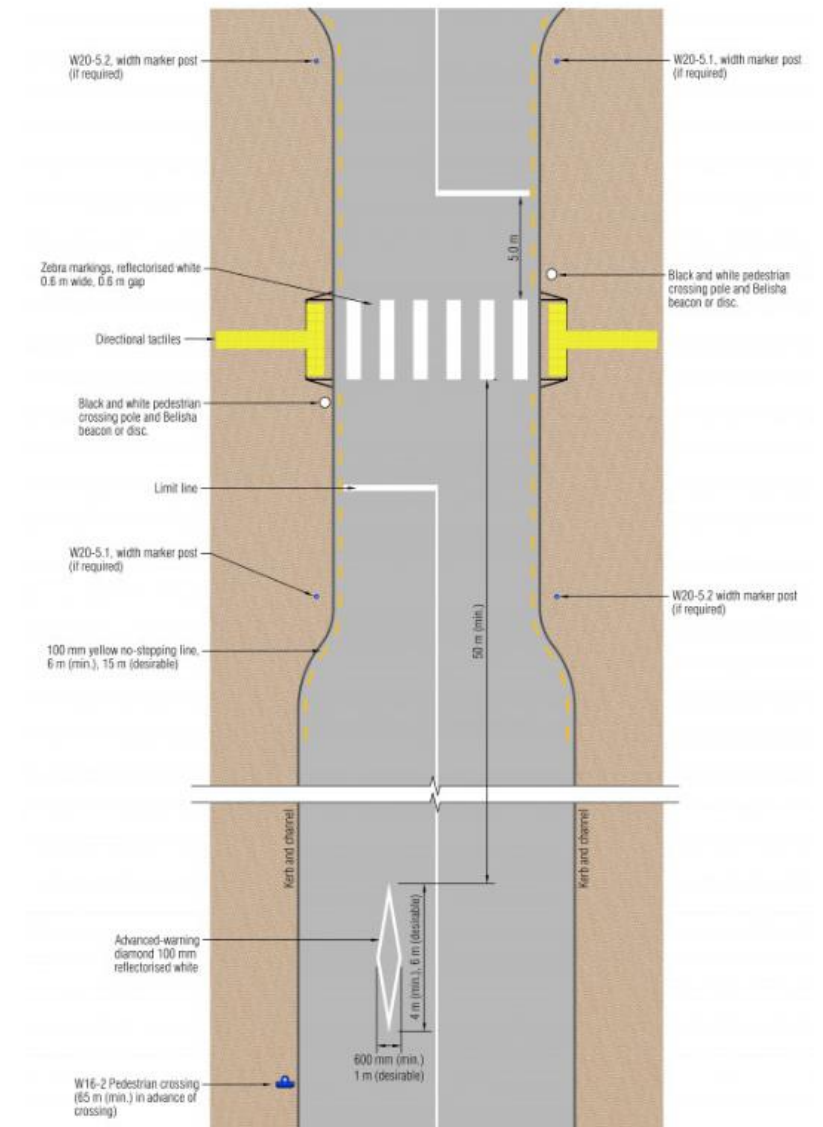


PNG: Raised Zebra crossings

Note: Coloured surfacing principles

Zebra crossings – Flush

- **Best practice - Only appropriate if operating speeds are low 30km/hour or less**
- **Benefits**
 - Gives pedestrians priority resulting in minimal delays for pedestrians.
 - Are obvious as a place for pedestrians to cross.
- **Issues**
 - Unless on a platform, or without other measures like kerb extensions and median refuge, zebra crossings do not improve pedestrian safety or may even decrease it.
 - High pedestrian flows can dominate and cause traffic delays.
 - Can increase rear end crashes between vehicles, however these tend to be low severity.



Typical layout for pedestrian crossing (zebra) with kerb extensions. (Source: [TCD Manual Part 5 Figure 7-10](#))

Dual crossings

Zebra crossing and adjacent cycle crossing

Zebra crossing priority rules do not apply to cycles...

- Give-way controls with supplementary plate 'TO CYCLISTS AND PEDESTRIANS'
- Use of tactile pavers and coloured surfacing



More information at [CNG: Unsignalised Crossings](#)

Raised dual crossings

- Vertical elements are the most effective technique in reducing speeds
 - Could be at crossing or on approaches
- Recommended to achieve target vehicle speeds < 30 km/h
 - Ideally < 20 km/h
- Cycle speeds reduced by horizontal deflection being created on approaches



Time for another Poll...

Implementation of Dual Crossings around NZ

Mid-block signalised crossings

Benefits and Issues

- **Benefits**

- Clearly show drivers/people where to stop
- Can balance delays to pedestrians and vehicles
- Allows pedestrians to cross multiple vehicle lanes safely
 - ➔ less community severance
- Very safe for pedestrians when used properly

- **Issues**

- Delay pedestrians when traffic is given more green time
 - ➔ People may cross against the red signal
- Slower pedestrians (elderly, impaired) may find it difficult to cross within the allotted time
- More \$ to install/maintain than other at-grade crossings
- Can be disruptive to traffic if frequently called



Cashel Mall, Christchurch

*Pedestrian-only signals with
countdown timer displays*

[PNG: Signalised crossings](#)

Types of mid-block signalised crossings



Standard pedestrian-only signals



Two-stage pedestrian crossings



Pedestrian-only signals with countdown timer displays

[PNG: Signalised crossings](#)

Types of mid-block signalised crossings cont'd



Wilsons Rd, St Martins, Chch

**Nearside pedestrian signals
(similar to PUFFIN)**



Manchester St, Central Chch

**Combined pedestrian and
cycle (dual) crossings**



Victoria Square, Central Chch

**Combined pedestrian and
cycle crossings with **trialled**
ped/cycle combined display**

[CNG: Signalised crossings](#)

Mid-block signalised crossings

Tips and tricks (good practice) for ped/cycle crossings

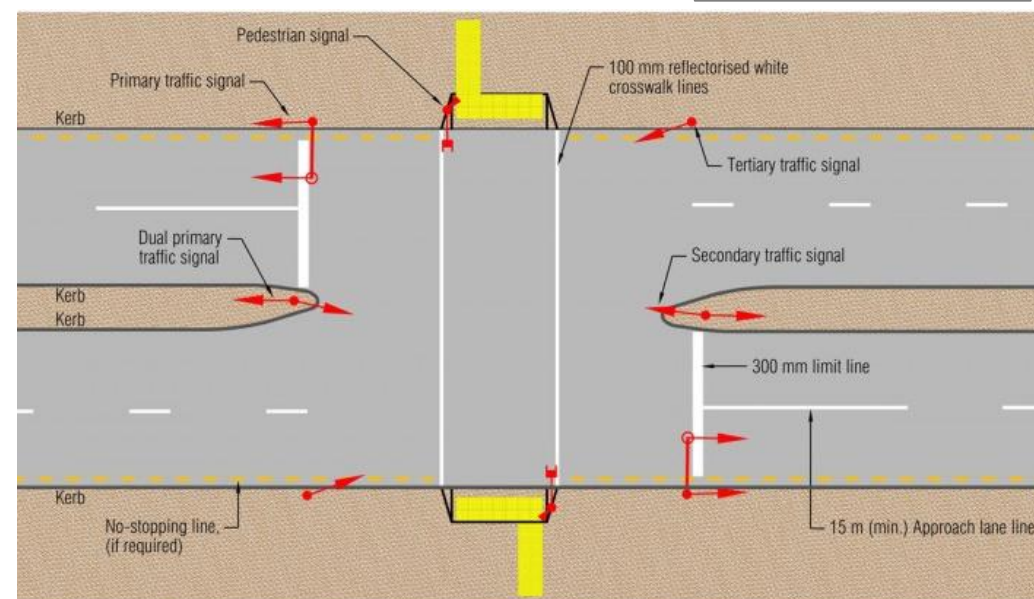
- **Raised safety platforms** make for a safe system!
- Provide enough **storage** for current/future users
- Don't treat cyclists like pedestrians at intersections
e.g. expecting sharp 90° turns, fitting in small waiting spaces
- Crossing path lines:
 - Use **separate** crossing lines when there are **separate** signals and/or separate ped'n/cycle facilities on either side
 - Use **shared** crossing lines with shared ped/cycle signals (*NB: still under trial*) and/or shared approach paths
- **Push-button** detection still better than other options
 - Use **advance detectors** too for cycle path approaches?
 - **Automatic call phase** during busy periods of the day?



Mid-block signalised crossings

Further details

- Recommended parameters - [PNG: Signalised crossings](#)
- Types of crossing - [PNG: Crossing selection process](#)
- Legal considerations
 - [Land Transport Rule: Traffic Control Devices 2004](#)
 - [Land Transport \(Road User\) Rule 2004](#)
- Design considerations and design elements – look to PNG page



Other crossing types

School crossings

Rail crossings

Grade separated crossings

School crossings



Children among our most vulnerable pedestrians

- Crossings needed both at school gate, and further afield
- Flows are generally *tidal* (to/from school) and are in *bursts* (before/after school)
- Variety of crossing types
 - Kea, Zebra, Signalised
 - STOP sign arms have legal status

[PNG: School crossings](#)



Parkvale School, Hastings

Kea crossing



Kaiti School, Gisborne

School patrolled zebra crossing

Rail crossings



Three main types:

- 1) Grade separated →
 - Underpass, overbridge
- 2) Path level crossing adjacent to vehicle level crossing
- 3) Path level crossings separate from vehicle crossings →

KiwiRail prefers grade-separated crossings, and aims to minimise the need for at-grade crossings

[PNG: Rail crossings](#)



Rail crossings

Available treatment options

- There are a wide variety of treatments available →
- Depends a lot on
 - Ped'n/cycle volumes
 - Train frequencies
 - Site geometry factors

[Design guidance for pedestrian and cycle rail crossings \(KiwiRail website\)](#)

GRADE SEPARATION

AUTOMATIC BARRIERS

AUDIBLE/VISUAL WARNING

PHYSICAL CALMING

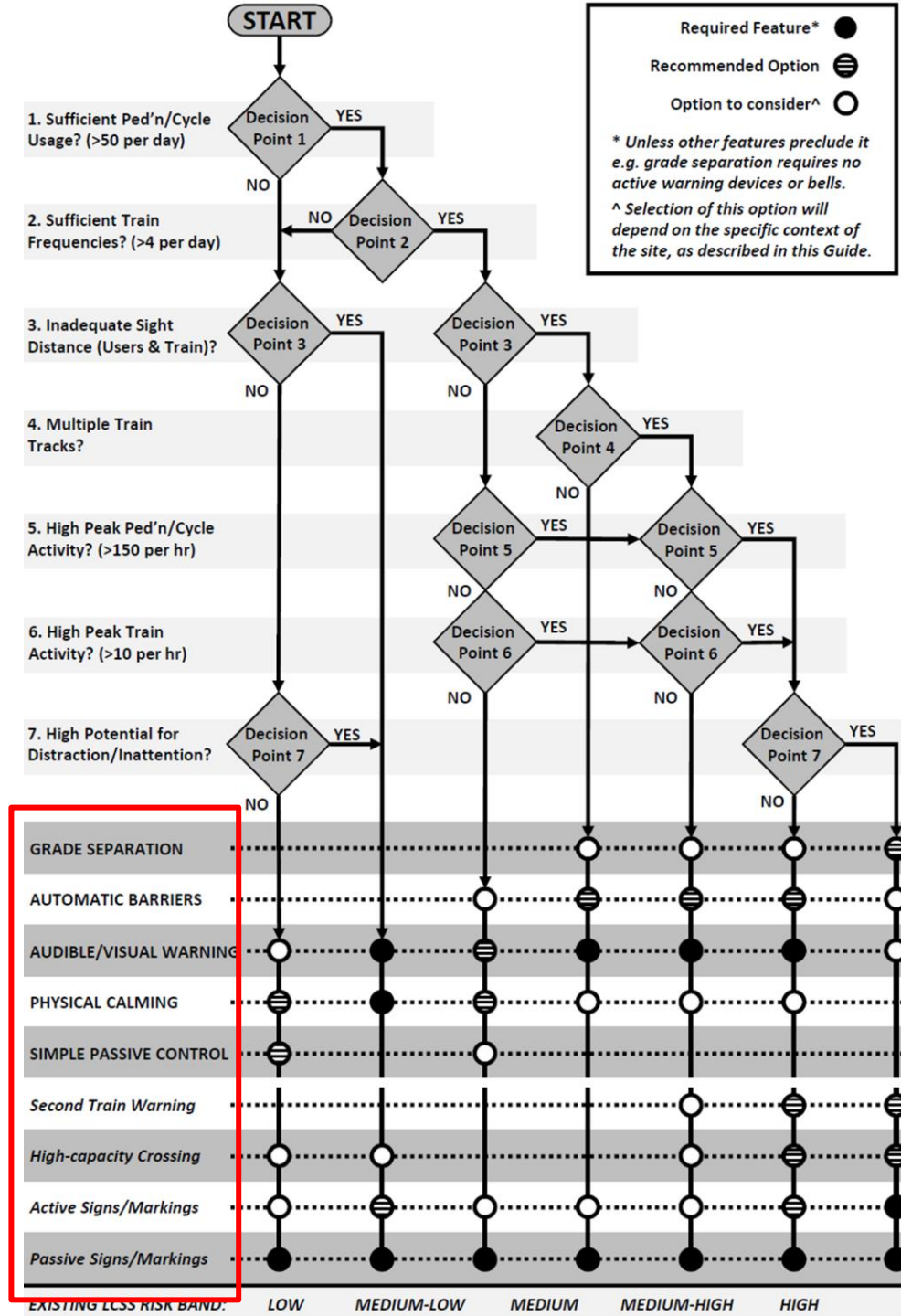
SIMPLE PASSIVE CONTROL

Second Train Warning

High-capacity Crossing

Active Signs/Markings

Passive Signs/Markings



Rail crossings – passive control



Aim to seek awareness (by users) of crossings and trains

- For passive control, **chicanes** are preferred over **mazes** at rail crossings



Chicane (2 barriers)



Maze (3 tight fences)

[Design guidance for pedestrian and cycle rail crossings \(KiwiRail website\)](#)

Grade separated crossings

Underpasses and overbridges

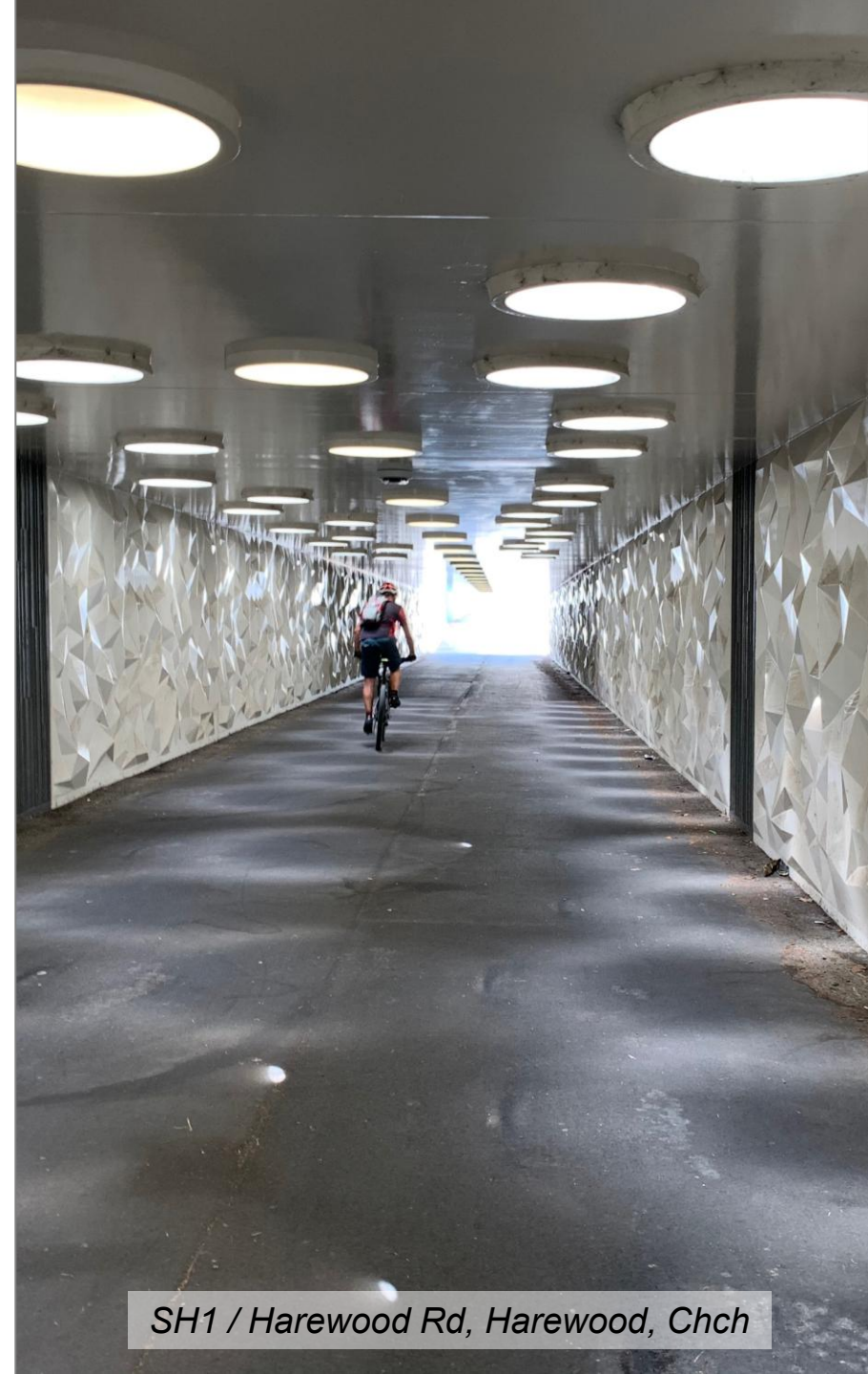
- **Benefits**

- Allows path users to cross unhindered by vehicles
- Reduce walking travel time (*maybe?*) & vehicle delays

- **Issues**

- May increase risk if path users continue to cross at-grade – *review desire lines*
- Consider CPTED personal safety
 - Mitigate with width of tunnel, lighting design
- Gradients/steps can create difficulties
- **Costly** option...

[PNG: Grade separation](#)



SH1 / Harewood Rd, Harewood, Chch

Wrap up

- Today we have looked at the principles to consider, how to select a crossing type and described all the crossing types
- The guidance also includes reviews and audits that might apply to the crossing planning and design
- Stay tuned for our next webinar on Pedestrian Planning and Design!



Q & A

Please put your questions in the Q&A box (not Chat)

Thank You!

nzta.govt.nz/PNG – Pedestrians

nzta.govt.nz/CNG – Cycling

nzta.govt.nz/PTDG – Public Transport

nzta.govt.nz/urban-street-guide – Street Guide