Glossary, References and Appendices

This part contains all terms (glossary) and references indicated within all parts of the Practice Note.

This part also includes all Appendices (forms, checklists) referenced within all other parts of the Practice Note.

This part includes the following components:

Glossary

Where terms have additional italicised terms underneath them (such as control measure) – these are variants of the term that may be used in some cases and can be assumed to have the same meaning.

Term	Definition
AADT	Annual Average Daily Traffic *The total volume of traffic passing a roadside observation point over the period of a calendar year, divided by the number of days in that year (365 or 366 days). Measured in vehicles per day (VPD).* [72]
Activity	*A planned event or operation done within the road reserve or affecting the normal use of the road reserve. An activity can be:* - *vertical and horizontal construction projects* - *vertical and horizontal maintenance activities* - *inspections and data collection – survey, asset investigation, traffic counting* - *on-road events and races – cycling, triathlon, running, motorsport* - *adjacent events – horse races, concerts, air shows* - *emergency services operations – FENZ, police, tow truck, civil defence* - *planed legal enforcement – police, MPI, Covid cordons* - *• agricultural and forestry - stock crossing, stock droving and logging activities* [77]
ADA (1990)	The Americans with Disabilities Act of 1990 (U.S)
AGTTM	Austroads Guide to Temporary Traffic Management (Australia) [5]
ALARP	As Low As Reasonably Practicable *A risk management principle that calls for the reduction of risk to the lowest level that is feasible, given existing technical, financial, and temporal constraints. It represents a balance between the effort and cost of further risk mitigation against the degree of safety achieved.* [6] *This means you must do everything reasonably practicable to eliminate or minimise health and safety risks arising from your work.* [83]
Audible Message Device (AMD)	*A specialised form of traffic control equipment designed to disseminate pre-recorded or live voice messages to inform, guide, or warn road users. These devices are intended for temporary use in or near work zones, special events, or other scenarios where typical visual traffic control devices may not be fully effective for all road users, including the visually impaired.* [19]
Barrier	Refer to Temporary Road Safety Barrier System (TRSBS)

Term	Definition
Bicycle	Refer to Cycle
Bow-Tie method[13] *[of risk assessment]*	*The Bow-Tie Risk Assessment method is a visual tool used to analyse and communicate how major incidents can occur and what measures are in place to prevent or mitigate such incidents.* *The method is depicted by a bow-tie diagram, which outlines the causes of an event on the left-hand side, the event itself in the middle, and the potential consequences on the right-hand side. Preventive measures (barriers) are identified to stop the event from occurring, and mitigative measures are identified to lessen the impact if the event does occur.*
CAS	Crash Analysis System *New Zealand's centralised crash analysis database administered by Waka Kotahi (NZ Transport Agency) [76]*
CBD	Central Business District
Client	Refer to Contracting PCBU
Closure [area]	*The physical area from which the road users are to be excluded. This includes, but is not limited to, shoulder closures, lane closures, and road closures.*[86]
CNG	Cycling Network Guidance[79] *Published by Waka Kotahi (NZ Transport Agency)*
Competent Person	*Someone who has the appropriate skills, training, knowledge, and experience to perform the task or role.* [86]
Contracting PCBU	*The initiator of a contract for work or services.* [86]
Contractor	*A PCBU has been awarded a contract by the contracting PCBU (for example, an RCA or utility/service provider) or a PCBU that has been awarded a contract to work near or on a private road.* [86]
Consult, Cooperate, and Coordinate *Overlapping Duties The 3C's*	*Sometimes referred to as 'the 3 C's' – this phrasing is directly from the Health and Safety at Work Act 2015 (Section 34) and requires that where PCBUs have the same duty, "each PCBU with the duty must, so far as is reasonably practicable, consult, co-operate with, and co-ordinate activities with all other PCBUs who have a duty in relation to the same matter".* *These overlapping duties emerge when multiple businesses share health and safety responsibilities within a shared workspace or a contracting chain. Through consultation, cooperation, and coordination, businesses can delineate clear roles, responsibilities, and effective communication channels, thereby averting potential gaps in risk management.*

Term	Definition
Control measure *Risk controls* *Control*	*A way of eliminating or minimising risks to health and safety.*[86]
CoPTTM	The Code of Practice for Temporary Traffic Management (New Zealand)
Cycle	*A vehicle having at least two wheels designed primarily to be propelled by the muscular energy of the rider and includes a power-assisted cycle.* [72] *Not permitted to use the footpath.*
Cycle Lane	*A longitudinal strip within a roadway reserved by a marking or sign designed for the passage of cycles.* [72]
Cycle Path	*Part of the road that is physically separated from the roadway that is intended for the use of cyclists, but which may be used also by pedestrians and includes a cycle track formed under section 332 of the Local Government Act 1974.* [72]
Delineation	*A treatment that enhances the selection of the appropriate path and speed or position to allow a movement to be carried out safely and efficiently. It could include line marking, raised pavement markers, traffic cones, post-mounted reflectors, chevron signs, etc.* [72]
Disabled Person *Person with Disability*	*Someone who experiences impairments in mobility, vision, hearing, or cognitive function, limiting their ability to navigate and interact safely within the road environment.* [48] *Alternative definition: Any person who suffers from physical or mental disablement to such a degree that they are seriously limited in the extent to which they can engage in the activities, pursuits and processes of everyday life.* [72]
DSI	Death and Serious Injury [Crashes] *Crashes are vehicular accidents resulting in either fatality or serious injuries that necessitate immediate and specialised medical treatment and may lead to long-term physical, cognitive, or psychological impairment.* [61]
EED	Engineering Exception Decision *A mechanism utilised within the Code of Practice for TTM (CoPTTM) framework.* *"A written decision made following consideration of all factors, including the safety of all concerned, to vary a code of practice(s), standard(s) or guideline(s), to suit a particular situation."*[73]
Emergency	*An uncontrolled event that has caused, or is risking to cause, loss of life, injury or serious property damage. It can include declarations of civil defence emergencies, traffic crashes or other significant incidents. It does not include delays unless these are the result of one of the above situations.* [72]

Term	Definition
Event	Refer to Special Event
Exclusion Zone	*An area where activity, workers, materials, plant or public is prohibited to preserve the separation between hazards and road users or different road user groups.* *This area is usually marked in yellow on a Traffic Management Diagram.*
Failure Modes Effects Analysis (FMEA)	*A systematic approach for evaluating the potential failure modes in a system. It identifies and assesses potential failure modes, their causes, and their effects on the system's functionality. The methodology is beneficial for preemptively identifying and addressing how a device or process might fail, thereby facilitating risk mitigation.* [59]
FENZ	Fire and Emergency New Zealand
Footpath	*A path or way principally designed for and used by pedestrians and includes a footbridge.* *Users of mobility and wheeled recreational devices are permitted (unless specifically prohibited by the road controlling authority) to use a footpath.* [72]
Fundamental Temporary Traffic Management (TTM) Controls	Refer to TTM Methods *Around the site, through the site, past the site, in the gaps in this order. These controls are the temporary traffic management (TTM) description substitutes for the Health and Safety at Work Act 2015 hierarchy of controls.* [77]
Good Practice	*A method or technique that has consistently shown superior results compared to others and can serve as a benchmark. It is replicable, adaptable to different contexts, and emerges from comparative evaluations. It can yield desired outcomes consistently and evolve through iterative solutions in response to changing contexts.*
GPG	Good Practice Guide
Hazard	*A potential source of harm. It could include an object, situation, or behaviour.* [86]
H&S	Health and Safety
HSWA (2015)	Health and Safety at Work Act 2015
ISO	International Standards Organisation
Level Crossing *Rail Crossing* *Railway Crossing*	*means any place where—* *(i) a railway line crosses a road on the same level; or* *(ii) the public is permitted to cross a railway line on the same level; and* *includes a bridge used for both rail vehicles and road traffic on the same level; but does not include a railway line on a road that is intended solely for the use of light rail vehicle.* [51]

Term	Definition
LGA (1974, 2002)	Local Government Act (1974, 2022) *The Local Government Act 2002 supersedes the 1974 Act. However, numerous provisions of the 1974 Act remain in place and were not retracted, including provisions that have implications for local authorities' oversight of Temporary Traffic Management. Both Acts (1974 and 2022) are referenced within this text together – or, where appropriate, where the specific provision is from one of the versions of the Act that is specifically referenced.*
Live Lane	*A traffic lane available for use by road users.* [86]
Low Powered Vehicle (LPV)	*A Low Powered Vehicle (LPV) is a category of electrically assisted personal mobility devices designed for individual use. These devices typically feature a footboard or platform, two or three wheels, a long steering handle, and an electric auxiliary propulsion motor. LPVs encompass a variety of wheeled recreational devices, including but not limited to electric scooters, electric bicycles (e-bikes), electric skateboards, self-balancing devices, and similar electrically powered individual transportation modes.* *To legally qualify as an LPV, these devices should meet specific criteria, including:* • *Wheel Size: The wheels on an LPV must not exceed 355mm in diameter.* • *Motor Power: LPVs are equipped with an electric motor that assists in propulsion. The maximum power output of this motor must not exceed 300W.* [72]
Lowest Total Risk	*A principle aimed at minimising the overall risk across all involved parties rather than just transferring risk from one group to another.* *This concept acknowledges that a solution for reducing risk to one group might inadvertently escalate the risk for another group. The objective is to identify solutions that bring down the total risk for everyone involved rather than merely shifting the risk around.*[77] *The term Lowest Total Risk originated from the NZ Guide to TTM. However, the principle is similar to 'Global at Least Equivalent' (GALE), used in aviation safety.*
LTMA (2003)	Land Transport Management Act 2003
Manual Traffic Control (MTC) *Manual Traffic Controller*	*Traffic is controlled using stop/go paddles by hand.* *A Manual traffic controller is the person who operates the stop/go paddle.*
Marking	*A line, symbol, pattern, message, numeral, pavement marker or other device set in the roadway or applied or attached to the road surface.* [72]

Term	Definition
Method of Conflict	*A potential interaction between a risk subject, such as a vulnerable road user, and a hazard source causing harm within a given environment.* *This concept is an operational tool for designers and field staff, facilitating an easier understanding of how risk materialises in real-world scenarios.*
Mobile TTM Operation	*Mobile operations are those activities or operations not contained within a fixed site where vehicles are progressively travelling in the same direction as, but at a speed less than or in a manner different from, normal traffic. Mobile operations may involve stopping for short periods.* [73]
Mobility Device	*A vehicle that:* - *is designed and constructed (not merely adapted) for use by persons who require mobility assistance due to physical or neurological impairment and* - *is powered solely by a motor that has a maximum power output not exceeding 1500 W; or* *A vehicle that the Director of Land Transport has decided under section 168A(1) of the Land Transport Act 1998 to be a mobility device.* [72] *Is permitted to use a footpath.*
NZGTTM	The New Zealand Guide to Temporary Traffic Management
NZQA	New Zealand Qualifications Authority
NZTA	Refer to Waka Kotahi (NZ Transport Agency) *The formal name Waka Kotahi (NZ Transport Agency) is used primarily in recent documentation – the acronym NZTA is present in documentation dates prior to 2022. Further older documentation may refer to Transit New Zealand.*
Operating Speed	*Operating speed is the speed at which users are observed to travel over a given stretch of road under favourable conditions and in the absence of speed limits or other traffic control devices. It reflects the speed most users perceive as safe and comfortable for that particular road segment. In plain language, it is the speed that most drivers naturally choose to drive at when nothing is telling them to go slower or faster, and the road conditions are good* [8]*.*
OHS	Occupational Health and Safety
Overlapping Duties	*When a PCBU shares duties with other PCBUs. When two or more PCBUs are working together at the same location or through a contracting chain, they must work together to fulfil their duties of care and manage risks. Where those duties overlap, the PCBUs must consult, cooperate, and coordinate with each other to meet their health and safety responsibilities to workers and others.* [86]

Term	Definition
Pavement Marking	Refer to Marking
PDCA	Plan-Do-Check-Act [cycle][12] *The PDCA cycle is a four-step method for continuously improving processes and products. It stands for Plan, Do, Check, and Act:* 1. ***Plan**: Identify an issue and plan how to tackle it. Create a plan outlining the changes needed.* 2. ***Do**: Implement the changes according to your plan.* 3. ***Check**: Analyse the results to see if the changes positively impacted or solved the issue.* 4. ***Act**: If the changes were successful, apply them on a broader scale. If not, go back to the planning stage and devise a new plan.* *It is like a loop because once you have acted, you go back to planning the next improvement, and the cycle repeats. This way, there is a continuous effort towards improving processes and outcomes.*
Pedestrian	*A person on foot on a road and includes a person in or on any contrivance equipped with wheels or revolving runners that is not a vehicle and permitted to use a footpath.* *In New Zealand law, a pedestrian does not include a person on a mobility or wheeled recreational device. However, both of these classes of users may use a footpath.* [72]
Pedestrian Channelising Device (PCD)	*Primarily a term used in the United States and Canada for corraling pedestrians using physical devices that direct their movement.*
Person Conducting a Business or Undertaking (PCBU)	*In most cases, a PCBU will be a business entity, such as a company. However, an individual carrying out business as a sole trader or self-employed person is also a PCBU. A PCBU does not include workers or officers of a PCBU, volunteer associations with no employees, or home occupiers that employ or engage a tradesperson to carry out residential work.* [86]
PNG	Pedestrian Network Guidance[79] *Published by Waka Kotahi (NZ Transport Agency)*
Power Assisted Cycle	*A cycle to which is attached one or more auxiliary propulsion motors that have a combined maximum power output not exceeding 300 W*[72]*. Such a device is still considered a cycle.*
Primary Duty of Care	*A PCBUs legal obligation to ensure, so far as is reasonably practicable, the health and safety of workers and that other persons are not put at risk by its work. This is called the 'primary duty of care'.* [86]

Term	Definition
Principal	Refer to Contracting PCBU
Rail Crossing *Railway Crossing*	Refer to Level Crossing

Reasonably Practicable	*What is, or was, reasonably able to be done to ensure health and safety, taking into account and weighing up relevant matters, including:*
	- *The likelihood of the risk concerned occurring or workers being exposed to the hazard*
	- *The degree of harm that might result*
	- *What the person concerned knows, or ought reasonably to know, about:*
	  ○ *the hazard or risk*
	  ○ *ways of eliminating or minimising the risk*
	- *The availability and suitability of ways to eliminate or minimise the risk*
	- *After assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.* [86]
	For more information, see WorkSafe New Zealand's fact sheet.

Risk	*The effect of uncertainty on objectives.* [27] *Risk can become a difficult concept to understand and practically work with. It can have multiple meanings and interpretations. This results in confusion and ineffective treatment of risk in physical settings.* *For this reason, this practice note has adopted the term methods of conflict as a way for designers and field staff to understand what risk looks like in practical environments more easily. 'Conflict' refers to the exposure of a risk subject to a hazard that can cause harm.*
Road Controlling Authority (RCA)	*As defined in the Land Transport Management Act 2003 – "in relation to a road, means the Minister, Department of State, Crown entity, State enterprise, or territorial authority that controls the road. In relation to a road within Auckland that is controlled by Auckland Transport, means Auckland Transport".* [30] *Referred to in some New Zealand legislation as a public road controlling authority*
Road *Road Reserve* *Roadway*	*The area of land between the legal boundaries, usually fence line to fence line and including any safety run-off areas, which is dedicated to allow the passage of road users. The road reserve also includes an air space of six metres directly above the road surface.*[72] *Roadway or carriageway refers to the sealed area between kerbs (or the edges of the seal if no kerbs are present.*

Term	Definition
Road Marking	Refer to Marking
Safety Zone ***Safety Zones***	Refer to Exclusion Zone
Shared Path	*A path intended to be used by pedestrians, cyclists, mobility devices and wheeled recreational devices.* [72]
Shoulder	*The portion of the formed road beyond the traffic lanes that is contiguous and flush with the pavement's surface and, on a sealed road, includes any unsealed part of the road and any sealed part of the road outside an edge line on the road.* [72]
Side Friction	*The retarding effect on the free flow of traffic caused by interference of any sort at either edge of a carriageway or traffic lane, other than at an intersection. Concerning road works, it is a form of positive traffic management that uses delineation devices placed close to a live lane to give road users the impression that they are travelling in a more restrictive width than they are.* [72]
Special Event	*An event requiring Temporary Traffic Management is a planned, non-construction activity that significantly impacts the normal flow of traffic or the safety of road users. This encompasses public gatherings, sporting events, concerts, and filming, necessitating special traffic arrangements to manage increased or altered vehicular and pedestrian movement.* [73]
Subcontractor	*A PCBU hired by a contractor to carry out temporary, paid work under contract.* [86]
STMS	Site Traffic Management Supervisor *A qualified person who has specific responsibility for documentation and management of temporary traffic management (TTM). The STMS is the system installer, the person that installs a system designed by a designer.* [77]
Tactile Pavers	Refer to Tactile Ground Surface Indicators (TGSI)
Taper	*A straight or smoothly curved row of delineation devices used to shift traffic laterally, for example, from a lane to the shoulder.* [77]
TCD	Traffic Control Device *A device used on a road for the purpose of traffic control; and includes a sign, signal or notice; or traffic calming device; or marking or road surface treatment.*[32]
TCP	Traffic Control Person *Primarily a term used in the United States and Canada. Equivalent to a Traffic Controller, TTM Worker, or Traffic Management Operative (TMO) in New Zealand.*
TA (or TLA)	Territorial Authority *Sometimes referred to as a Territorial Land Authority* *A city council or district council under the Local Government Act 2002* [36]

Term	Definition
TAO	Transport Authority Organisation *This term is not referred to in legislation; however, it is defined in the New Zealand Guide to Temporary Traffic Management (NZGTTM) as a "Road Controlling Authority (RCA), Rail Access Authority (RAA), Public Transport Authority (PTA) or other authority"* [77]
Temporary Traffic Management Industry Steering Group (TTM ISG)	*New Zealand's Temporary Traffic Management Industry Steering Group (NZ TTM ISG) was formed in April 2023 to connect and represent the TTM industry to provide guidance and enable aligned decision-making to ultimately meet the requirements of the Health and Safety at Work Act (2015).* *The group comprises representatives across various TTM industry stakeholders like Tier 1 Contractors, CCNZ, ACE NZ, Waka Kotahi, RCAs, and others.*
Temporary Traffic Management (TTM) Method *TTM Methodology [for vulnerable road user treatment]*	*Groupings and arrangements of TTM control measures create a complete fit-for-purpose TTM environment that manages risk to road users and workers as low as reasonably practicable.* *Refer to the section Selecting a Temporary Traffic Management Method.* *The New Zealand Guide to TTM (NZGTTM) uses the term "Fundamental TTM Controls"* [77]*; however, this term has not been adopted in this guidance so as not to confuse the use of the term controls (refer to control measures).* *TTM Configurations*
Temporary Road Safety Barrier System (TRSBS)	*An engineered assembly of components designed and installed to redirect, absorb, or contain kinetic energy from errant vehicles to minimise injury to vehicle occupants and other road users during a specific time-limited period or activity.*
TGSI	Tactile Ground Surface Indicators *Sometimes referred to colloquially as tactile pavers.* *Design standards can be found in AS/NZS 1428.4:2002*
TMA	Truck Mounted Attenuator *A safety device fitted to the rear of a vehicle that collapses when impacted by another vehicle.* [72]
TMD	Traffic Management Diagram *The TMD is a traffic management diagram within the traffic management plan (TMP). A TMP may have more than one TMD included as part of it.* [77]

Term	Definition
TMP	Traffic Management Plan *A document describing the design, implementation, maintenance, and removal of temporary traffic management (TTM) while the associated activity is being carried out within the road reserve or adjacent to it and affecting the road reserve.* [86] *This term has a range of alternative forms across international territories, such as transportation management plan, traffic control plan, and traffic guidance scheme.*
TPAR	Temporary Pedestrian Access Routes *Primarily a term used in the United States*
TSL	Temporary Speed Limit *A speed limit that is in force for a period of less than 12 months and is set under the Land Transport Rule: Setting of Speed Limits 2022 by the Road Controlling Authority (RCA).* [77]
TTM	Temporary Traffic Management *Temporary measures applied to preserve the safety of road workers and users while an activity impacting the normal operation of the road reserve is undertaken.* *Alternate terminology is used in other territories, such as Temporary Traffic Control or Work Zone Traffic Control.*
TTM Zone	*The section of road defined at each end by advance warning and end of works signs, or between vehicles in a mobile operation, including the vehicles themselves.* [77]
Unicycle	*A vehicle with one wheel that is designed to be propelled by the muscular energy of the rider. With only one wheel, a unicycle is, by definition, not a cycle (which has two or more wheels). Therefore, a unicycle must be considered a wheeled recreational device.* [72]
VKT	Vehicle Kilometres Travelled
VPD	Vehicles Per Day *The total volume of traffic passing a roadside observation point over 24 hours.*
VRU	Vulnerable Road User(s) *Defined in the context of this practice note as - "Road users not using registered motor vehicles or motorcycles".*
VTU	Vulnerable Transport User(s) *May also be referred to as Vulnerable Non-Motorised Transport Users.* *See Vulnerable Road User(s) (VRU)*

Term	Definition
Waka Kotahi (NZ Transport Agency)	*New Zealand's transport regulator, a New Zealand Crown entity tasked with promoting safe and functional transport by land, including the responsibility for driver and vehicle licensing and administering the New Zealand state highway network.*
Wheeled Recreational Device	*A vehicle that is a wheeled conveyance (other than a cycle that has a wheel diameter exceeding 355 mm) and that is propelled by human power or gravity. Includes a conveyance to which are attached one or more auxiliary propulsion motors that have a combined maximum power output not exceeding 300 W.* [72] *Is permitted to use a footpath.*
Working Space	*The physical area within which the activity in the road reserve is being undertaken, not including the exclusion zones or TTM areas.*
Worksite *Worksite Area*	Refer to TTM Zone *This term is historically utilised to describe the full extent of the area between 'advanced warning' and 'works end' signs – and is now referred to as the TTM Zone.*
Work Zone	Refer to TTM Zone *This term is used in many international territories to describe the TTM Zone.*

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Appendices

Appendix A: Procurement Assessment for Contracting PCBUs on VRU Safety

The following assessment tool can be utilized by Contracting PCBUs to evaluate and enhance VRU safety in TTM during procurement. It is adaptable and can be recreated or modified electronically to integrate within existing procurement systems or approaches.

Risk Identification and Understanding	
Is there evidence of the safety of Vulnerable Road Users being foundational to the risk management approach taken to TTM by the Contractor?	
What further information could be provided to deliver clearer evidence of risk understanding and mitigation strategies for vulnerable road users? *For example, the contractor's risk assessment including specific elements involving pedestrians, cyclists, and people with disabilities.*	

Track Record	
Is there evidence of the contractor's competency and experience in ensuring VRU safety in previous projects?	
What further information could be provided to establish a contractor's capability in managing VRU safety? *For example, specific case studies of safety initiatives or methodologies from previous work.*	

Legal and Regulatory Compliance	
Is there evidence of compliance with all legal and regulatory requirements related to VRU safety?	
What further information could be provided to demonstrate a clear link between the proposed methodology and legal and regulatory compliance related to VRUs in TTM environments? *For example, specific VRU-focussed legislative provisions and how they will be complied with.*	

Inclusivity and Accessibility	
Is there evidence of inclusivity and accessibility considerations in the procurement process for all VRUs, including those with disabilities?	
What further information could be provided to demonstrate an understanding of the diverse needs of VRUs in the specific contract area and how they will be met? *For example, evidence of research into the VRUs present and using the road corridor in the contract area*	

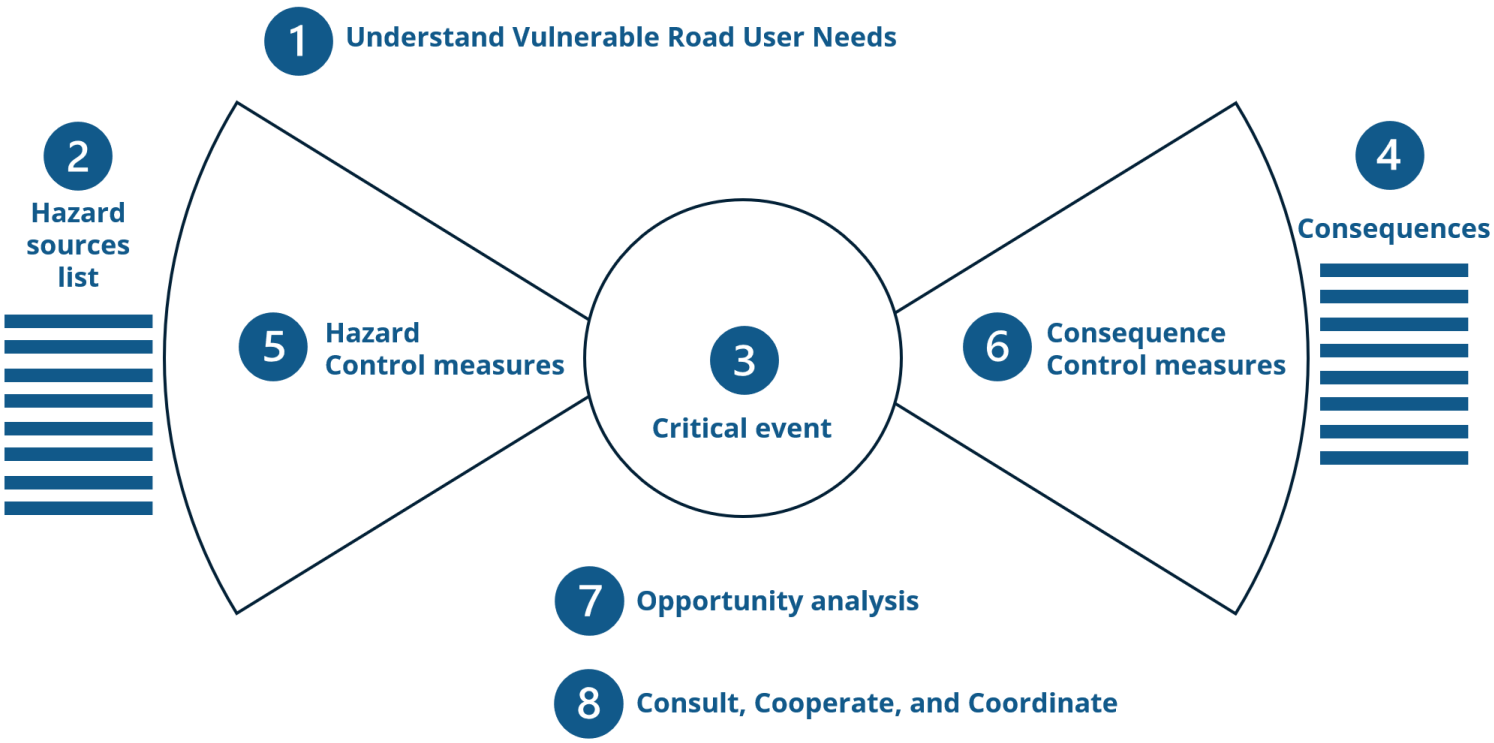
Appendix B: RCA Vulnerable Road User Safety Assessment (VRUSA)

This tool is to aid Road Controlling Authorities (or other parties who wish to use it) in evaluating the level of safety for Vulnerable Road Users in TTM environments and providing practical contributions on how to enhance the level of safety.

This is an enhancement-focused tool, not a compliance-focused one, reflecting the role of the RCA to consult, cooperate, and coordinate with fellow PCBUs**. This tool will generate potential enhancements to risk management for VRUs in TTM to share with other PCBUs.**

This tool is founded on the bow-tie model (for risk assessment), a practical tool used across many industries to explore the origins of a potential incident and its potential consequences[13]. **Follow the steps in order and record the results as you go.**

This tool is adaptable to other use cases outside vulnerable road user safety.



1	**Understand Vulnerable Road Users Needs** • Identification of VRU types (pedestrians, cyclists, people with disabilities, etc.) • Understanding their specific needs and challenges in the given environment through engagement with local community groups, surveys, traffic studies, and observation.
2	**Hazard Source Identification (left edge of the bowtie)** • List and describe all potential hazards that could adversely affect VRUs. • For assistance, a list of potential hazard sources can be found on **Page D5 (in Part D).**

3	**Critical Event (centre knot of the bowtie)** • Define the crucial event as a VRU-involved incident (e.g., collision or near-miss) that the assessment aims to prevent. • This event acts as the focal point around which the assessment revolves. • Note that this explores one critical event. The safety assessment can either be used multiple times with a different critical event each time) – or assess multiple critical events simultaneously and link hazards and those events together more systematically.
4	**Consequence Analysis (right edge of the bowtie)** • For each hazard, outline the potential consequences should the hazard lead to a VRU-involved incident. • Assess the severity (e.g., minor injury, major injury, fatality) of the consequence to generate an understanding of the significance of the risk. • Document the findings in a manner that allows for easy visualisation and understanding of the potential consequences.
5	**Hazard Control Measures (left wing of the bowtie)** • Existing Controls: Detail the current control measures in place to prevent or mitigate the identified hazards, such as signs, fencing, temporary crossings, etc. • Additional Controls: Identify and describe additional control measures that could be employed to reduce the risks further. • Evaluate the feasibility and effectiveness of implementing additional control measures.
6	**Consequence Control Measures (right wing of the bowtie)** • Existing Controls: Detail the current control measures in place to prevent or mitigate the identified consequences. • Additional Controls: Identify and describe additional control measures that could be employed to reduce the risks further. • Evaluate the feasibility and effectiveness of implementing additional control measures.
7	**Opportunity Analysis** • Explore available but unutilised mechanisms/methods to better manage the identified hazards or consequences for VRUs (the main 'additional controls' findings from steps 5 and 6). • Evaluate why these opportunities may not have been utilised, what barriers exist to their implementation, and what steps can be taken to overcome them and implement the opportunities. Consult with other PCBUs if required for information. • Document the findings as recommendations.
8	**Consult, cooperate, coordinate** • Disseminate the assessment findings and recommendations to other PCBUs, obtaining their input and understanding their perspectives on the feasibility and effectiveness of proposed safety measures. • Formulate a joint action plan with other PCBUs to implement prioritised recommendations.

Appendix C: Contractor/Subcontractor review for TTM

The Contractor Risk Review Tool is designed to **align TTM with the work activity.**

This tool is a straightforward way to **check that TTM plans fit well with on-site work.**

It helps ensure that everything about TTM is **right for the specific job**. Use the questions in the tool to write notes to the TTM designer on what needs to be adjusted or what you need to know more about (to confirm everything will work correctly and safely).

Step	Ask
1	**Verify Plant and Material Accommodation** • Is the allocated space for plant and materials clearly marked within the TTM plan? • Are the designated zones sufficient for the quantity and size of materials and equipment? • Are there provisions for additional space if the project scope changes?
2	**Assess Activity Vehicle Flow (in, through, out)** • Can the TTM layout support the frequency and size of vehicles without causing congestion? • Are entry and exit points for construction vehicles safe and accessible and without conflict with other road users? • Is there a contingency plan for different types, times or vehicle entry/exit needs?
3	**Confirm Operational Timing Compatibility** • Are the TTM arrangements designed to accommodate the busiest and most complex work activity planned? • Does the TMP clearly show how the TTM will change as the activity risks change over time?
4	**Check Alignment with Activity Phases** • Does the TTM plan adapt to different activity phases? • Are there clear triggers for when TTM arrangements change as per activity transitions? • Is there a communication strategy to inform stakeholders of phase-related TTM changes?
5	**Evaluate Space for Activity Maneuvering** • Is there enough maneuvering space allocated for the safe operation of plant or machines? • Are VRU pathways and activity maneuvering areas separated? • How will the space for maneuvering be managed in case of unexpected obstructions?
6	**Review Provision for Materials Storage** • Are storage areas for materials placed to minimise manual handling risks? • Do the storage locations comply with the TTM pathways and do not block sightlines? • Is there a process for updating the TTM plan as material storage needs evolve?
7	**Inspect Vehicle and Plant Interaction with VRUs** • Are there dedicated crossing points for VRUs that are monitored during vehicle movements? • Is there physical separation and signage to warn VRUs and operators of interaction points? • Are vehicle and plant operating zones clearly defined and separate from VRU areas?

A PLANNING PROCESS TO HELP PROTECT OUR MOST VULNERABLE ROAD USERS

This isn't just useful for planning TTM for vulnerable people, you can use this process for planning all TTM.

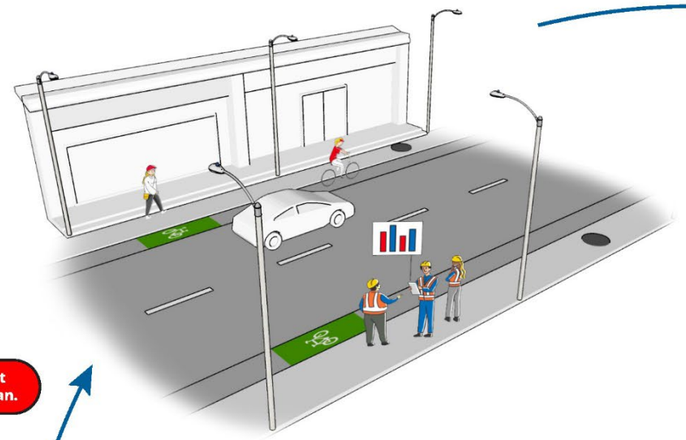
Civil CONTRACTORS New Zealand

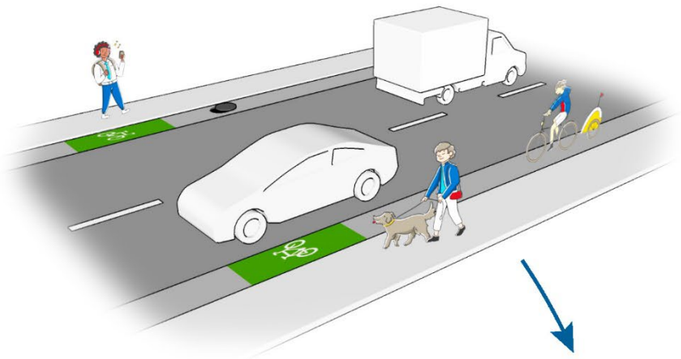
STEP 1

START HERE

UNDERSTAND THE SITUATION

- Gather information about the work being done, and the environment it will be done in.
- The more information the better. Do this with other people involved so you get the best possible information.
- Get really clear on all the people that are moving through the space you will be working in.
- Pay specific attention to disabled people, or people that would struggle more than normal with TTM environments.





STEP 2

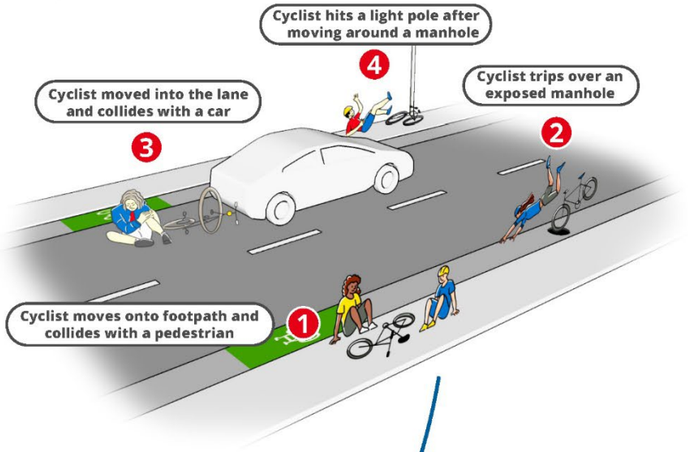
IDENTIFY THE HAZARDS

- Find all the ways that people can be harmed.
- This can be done by listing all the ways that people or objects can come together causing people to get hurt.
- For example pedestrian vs. vehicle entering a property, or mobility scooter vs. work vehicle entering the worksite.
- We call these ***'methods of conflict'*** and they are a useful way to get clear on all the hazards.

STEP 3

ASSESS THE RISKS

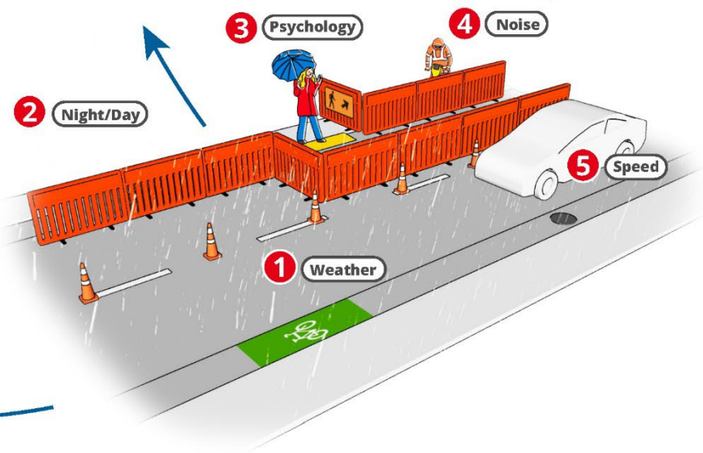
- Now look at how all these ***'methods of conflict'*** might actually come true. How would a pedestrian get exposed to and collide with a pedestrian? Where are they both in relation to each other?
- This allows you to find all the risks that need to be removed or minimised.
- It can help to play out a number of different scenarios of things that could happen (do as many as you can!) – this is a good way to make sure all the different possibilities are covered by your plan.
- Be careful, people might have many risks, and they might show up lots of different ways. Try to list as many risks as you can.



STEP 4

ASSESS THE 'RISK MODERATORS'

- What are all the things that could make the risks you've found worse, or better?
- Things like weather, darkness, or even just the compliance of the road users themselves – all these things might make your risks different.
- For example, if it rains – what will the surfaces that cyclists are using be like? Will they change their path because water pools somewhere?
- List all the risk moderators that could impact your environment – and explore them thoroughly. Ask 'what if?'.

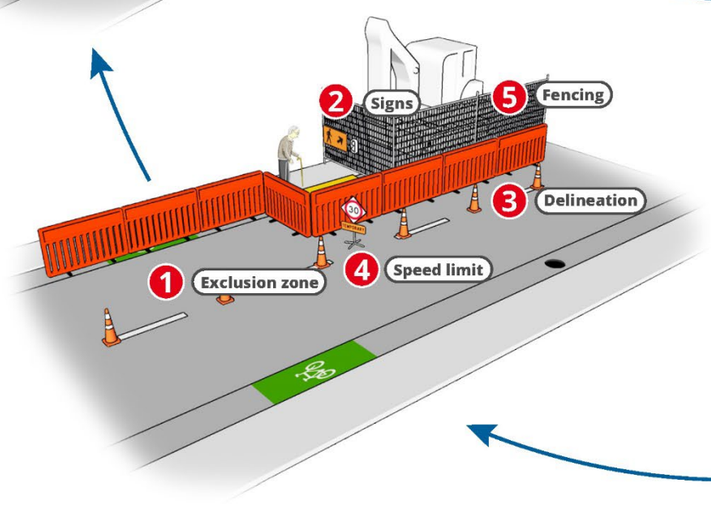


STEP 5

APPLY CONTROL MEASURES

- Controls are all the things we use to reduce risk.
- First see if there are any risks you can completely remove – if you remove the hazard (source of harm), or exposure to it – you can eliminate the risk. Do that first as many ways as you can.
- If you cant, then you can minimise it by controlling exposure (engineer or isolate the risk) like using fencing, or using non-slip surfaces, or using a exclusion zone.
- You have to use the best possible control you can – so be sure to select the best option, and only use a less effective one if the best one is not ***[1] reasonably practicable .***
- You'll have a bunch of controls you've chosen (the list of options is very long!) so take time to make sure you've chosen the best option – AND – make sure they all work together too (for example make sure your fencing allows for how you're managing site access to happen safely).
- Put all these controls into your plan. Your risk solution is now taking shape.

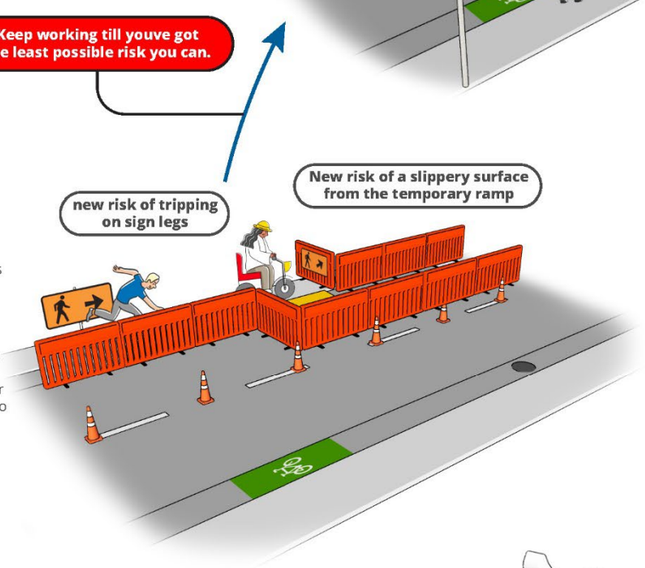
[2] For more information on what 'reasonably practicable' means, refer to that section.



STEP 6

CHECK WHAT NEW RISKS YOU'VE GOT

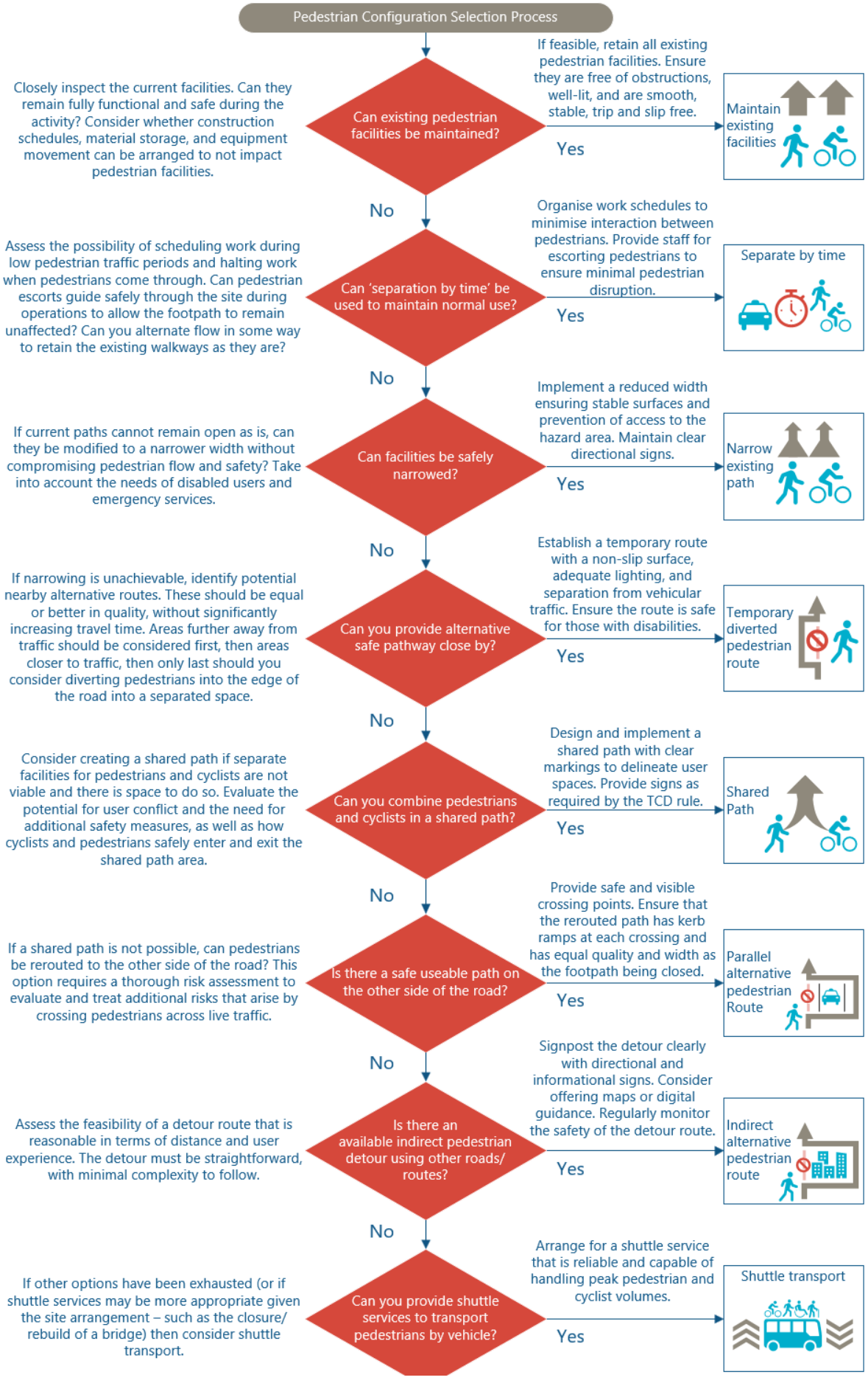
- In a lot of cases – using controls introduces new risks – like putting a fence down means you have an obstacles that people can hit, or they might trip over the feet of the fence.
- Go back to steps 2 and 3 of this process and add these new risks in.
- Go through the process again until you've found the best combination of controls that has the lowest total risk.
- That means, select controls that reduce the risks onsite, and don't have any controls that either have no purpose, or increase risk more than what you had to start with.
- Repeat this process (steps 2, 3, 4, 5, 6) over and over until you've got the best solution you can.

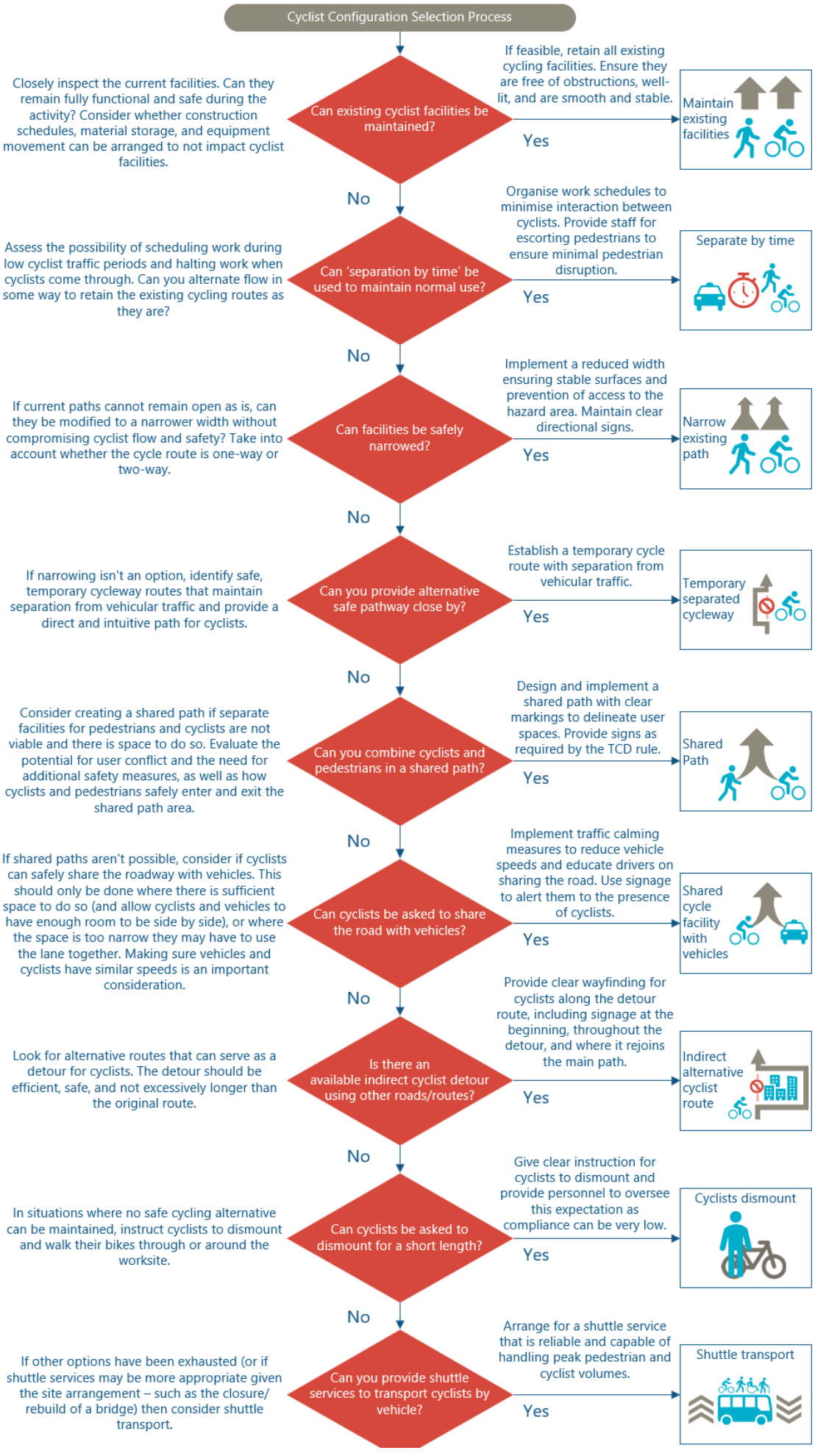


KEEP FOLLOWING THIS CIRCLE OF STEPS UNTIL YOU'VE FOUND THE BEST POSSIBLE COMBINATION OF CONTROLS TO MANAGE RISKS TO THE LOWEST POSSIBLE LEVEL YOU CAN.

ACROSS ALL STEPS – MAKE SURE YOU INCLUDE AS MANY PEOPLE AS YOU CAN THAT CAN HELP YOU DO A GOOD JOB. THE BEST TTM SOLUTIONS COME WHEN ALL THE PEOPLE THAT HAVE A PART TO PLAY ARE INVOLVED ALONG THE WAY.

Appendix E: VRU TTM Configuration selection tools



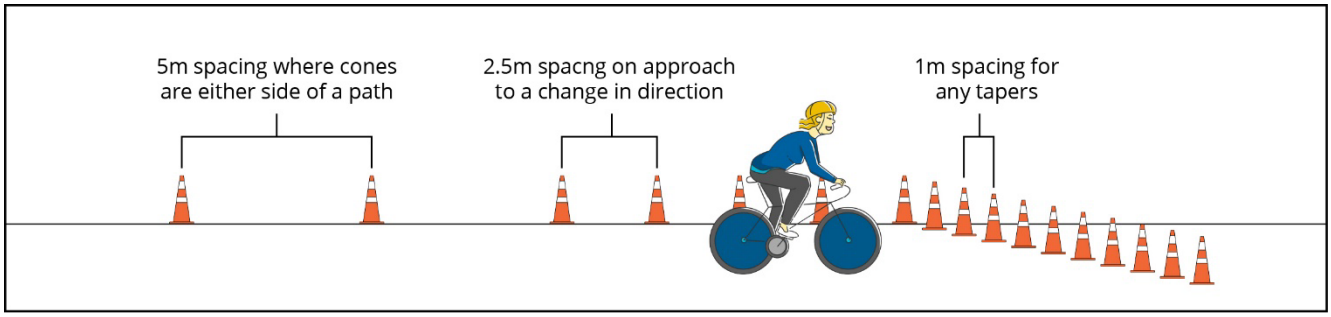

Cyclist Configuration Selection Process
Closely inspect the current facilities. Can they remain fully functional and safe during the activity? Consider whether construction schedules, material storage, and equipment movement can be arranged to not impact cyclist facilities.
Can existing cyclist facilities be maintained?
If feasible, retain all existing cycling facilities. Ensure they are free of obstructions, well-lit, and are smooth and stable.
Yes
Maintain existing facilities
No
Assess the possibility of scheduling work during low cyclist traffic periods and halting work when cyclists come through. Can you alternate flow in some way to retain the existing cycling routes as they are?
Can 'separation by time' be used to maintain normal use?
Organise work schedules to minimise interaction between cyclists. Provide staff for escorting pedestrians to ensure minimal pedestrian disruption.
Yes
Separate by time
No
If current paths cannot remain open as is, can they be modified to a narrower width without compromising cyclist flow and safety? Take into account whether the cycle route is one-way or two-way.
Can facilities be safely narrowed?
Implement a reduced width ensuring stable surfaces and prevention of access to the hazard area. Maintain clear directional signs.
Yes
Narrow existing path
No
If narrowing isn't an option, identify safe, temporary cycleway routes that maintain separation from vehicular traffic and provide a direct and intuitive path for cyclists.
Can you provide alternative safe pathway close by?
Establish a temporary cycle route with separation from vehicular traffic.
Yes
Temporary separated cycleway
No
Consider creating a shared path if separate facilities for pedestrians and cyclists are not viable and there is space to do so. Evaluate the potential for user conflict and the need for additional safety measures, as well as how cyclists and pedestrians safely enter and exit the shared path area.
Can you combine cyclists and pedestrians in a shared path?
Design and implement a shared path with clear markings to delineate user spaces. Provide signs as required by the TCD rule.
Yes
Shared Path
No
If shared paths aren't possible, consider if cyclists can safely share the roadway with vehicles. This should only be done where there is sufficient space to do so (and allow cyclists and vehicles to have enough room to be side by side), or where the space is too narrow they may have to use the lane together. Making sure vehicles and cyclists have similar speeds is an important consideration.
Can cyclists be asked to share the road with vehicles?
Implement traffic calming measures to reduce vehicle speeds and educate drivers on sharing the road. Use signage to alert them to the presence of cyclists.
Yes
Shared cycle facility with vehicles
No
Look for alternative routes that can serve as a detour for cyclists. The detour should be efficient, safe, and not excessively longer than the original route.
Is there an available indirect cyclist detour using other roads/routes?
Provide clear wayfinding for cyclists along the detour route, including signage at the beginning, throughout the detour, and where it rejoins the main path.
Yes
Indirect alternative cyclist route
No
In situations where no safe cycling alternative can be maintained, instruct cyclists to dismount and walk their bikes through or around the worksite.
Can cyclists be asked to dismount for a short length?
Give clear instruction for cyclists to dismount and provide personnel to oversee this expectation as compliance can be very low.
Yes
Cyclists dismount
No
If other options have been exhausted (or if shuttle services may be more appropriate given the site arrangement – such as the closure/ rebuild of a bridge) then consider shuttle transport.
Can you provide shuttle services to transport cyclists by vehicle?
Arrange for a shuttle service that is reliable and capable of handling peak pedestrian and cyclist volumes.
Yes
Shuttle transport

Appendix F: VRU Facilities: Distances, Dimensions and Geometric Guidance

The following dimensional, distance and geometric guidance is provided in alphabetical order:

Cone Spacing

Cone spacing can be used as an effective way to shape movement from vulnerable road users, especially cyclists.

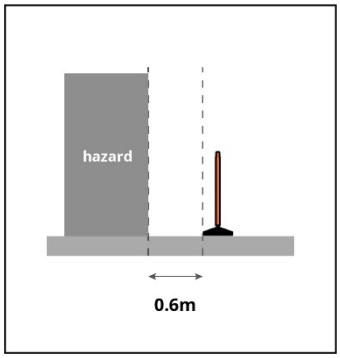


Cones spaced beside the path of travel (but not preventing access to any hazards) can be spaced at 5m centres. When approaching changes in alignment, 2.5 spacing can be used (this also helps slow cyclists down). For all tapers for cyclists, 1m spacing should be used.

Exclusion Zones

When cyclists or pedestrians are placed close to a hazard – utilise an exclusion zone (0.6m) to give room for error[11].

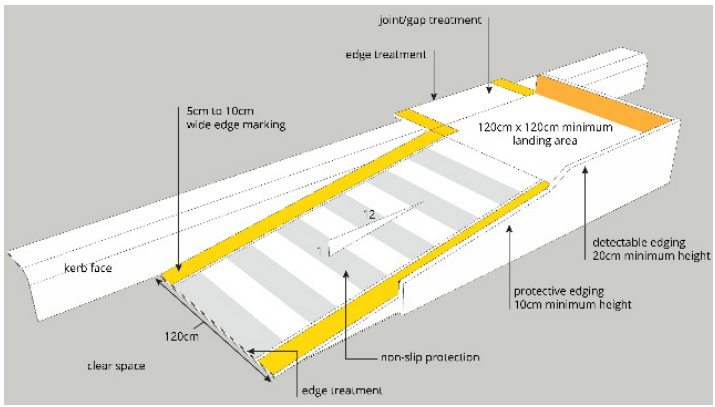
Fencing should not be placed directly next to a hazard, as if struck, fencing will deflect.

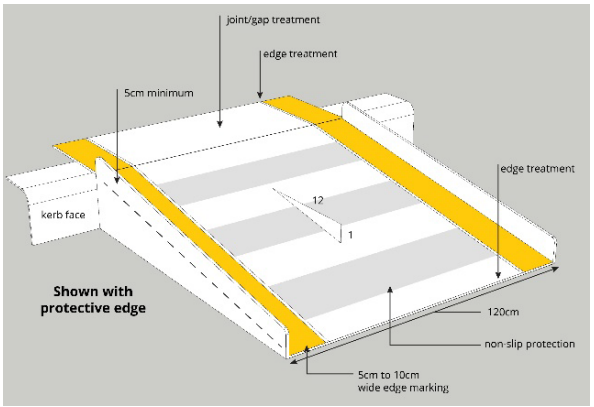


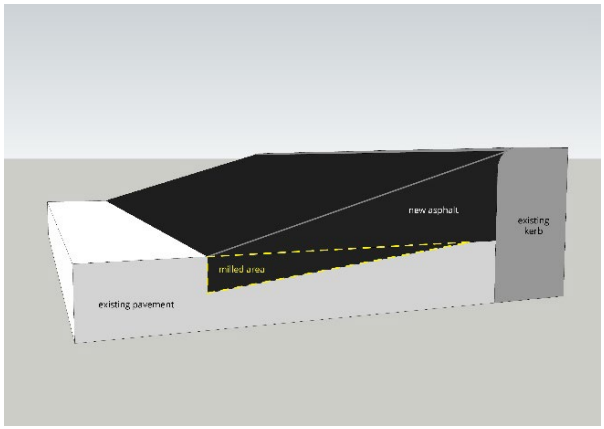
Kerb Ramps

When using kerb ramps – ensure they are wide enough and not too steep to cause challenges for people with mobility issues or those in wheelchairs.

Ramps should have a grade of 1:12. A grade of 1:8 could be used where it is monitored and has very non-slip surfacing[41].

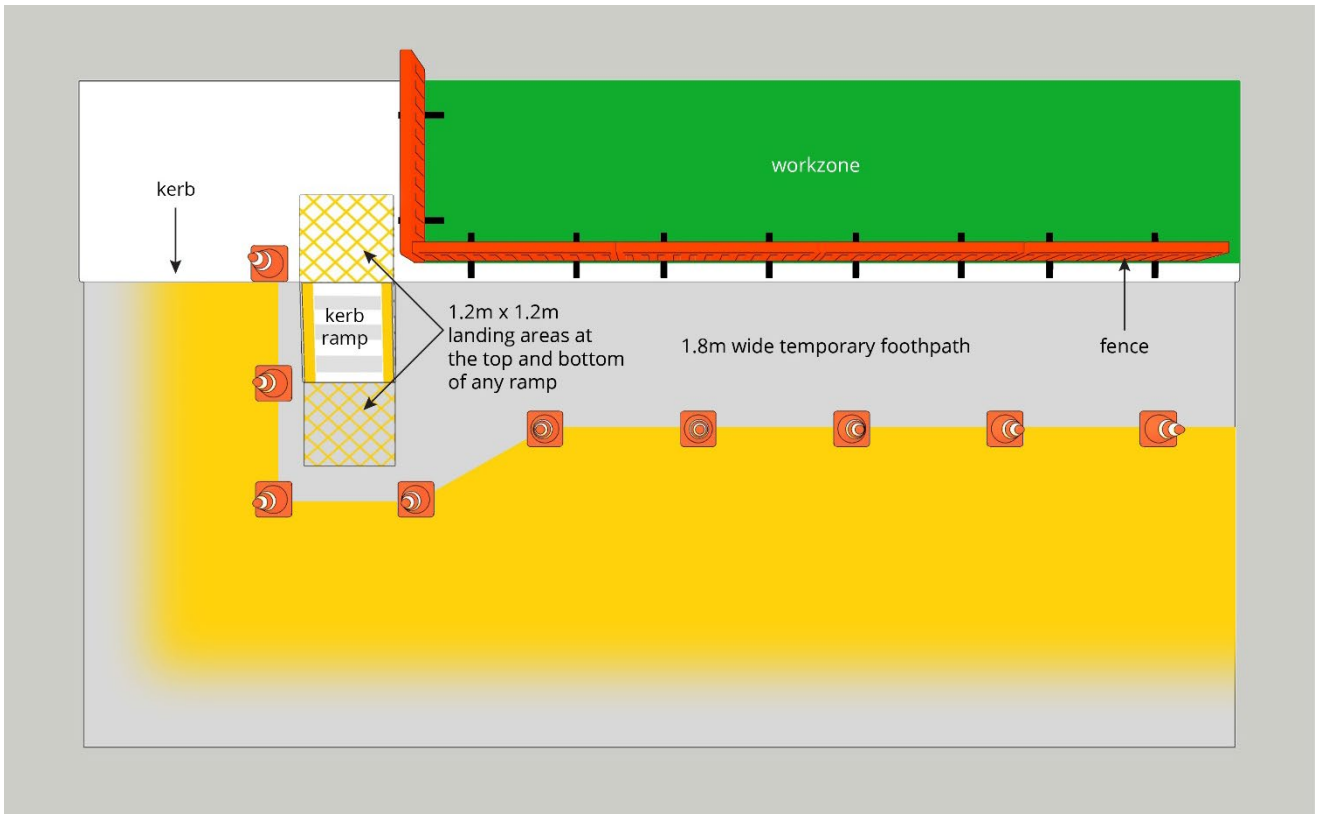






Where an asphalt ramp is used, this should be keyed to avoid edge degradation over time[81].

Regardless of the materials used, all kerb ramps should be no less than 1.2m wide[41].



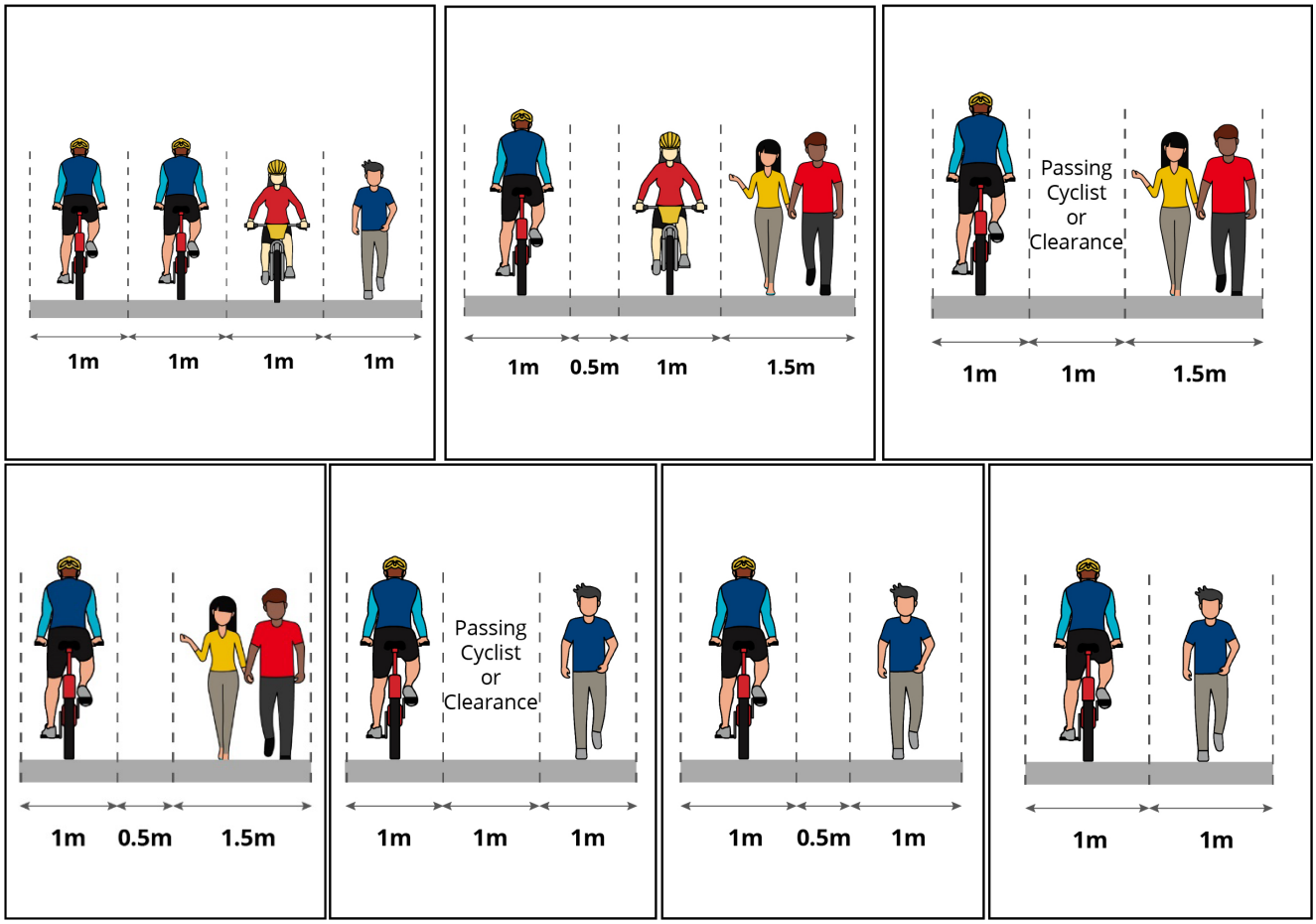
Where kerb ramps are adjacent to narrow spaces – a turning/landing area at the top and bottom of the ramp area is required to allow safe maneuvering by those in wheelchairs or on mobility scooters. **The area at each end of the ramp should be 1200mm x 1200mm.**

Shared Path

When providing a shared path in a TTM environment, maintain the permanent facility dimensions.

If that is not possible, utilise the below dimensional guidance[4].

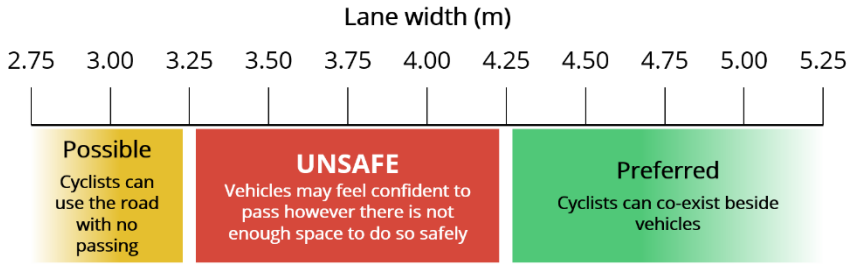
To choose an appropriate width for your TMP, evaluate the volume and type off traffic using the shared path currently and its existing width, and select an appropriate width from the provided options above.



Shared Traffic Lane

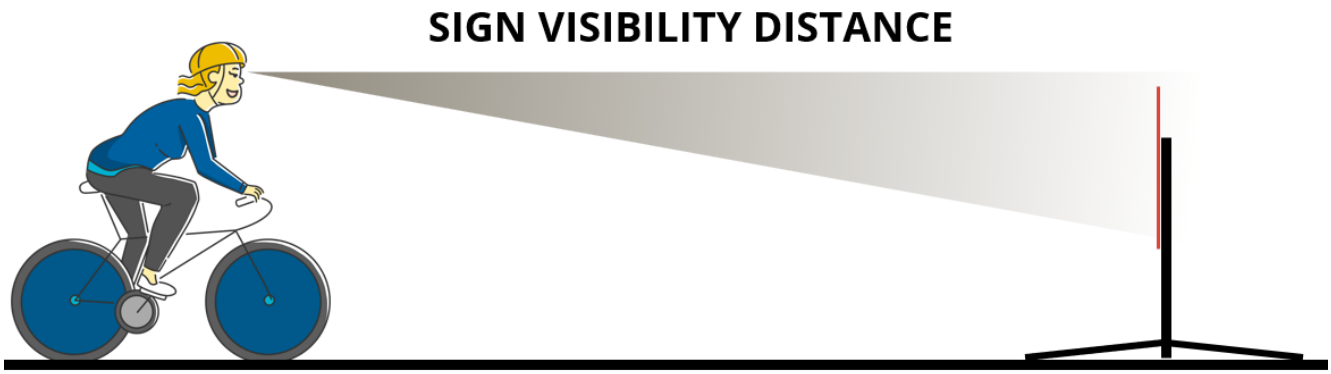
When traffic and cyclists are asked to share the road, sufficient lane width is required to ensure this can happen safely (where they travel side by side).

If the available lane width is **below 4.25m**, cyclists are not advised to travel side by side with vehicles. In this case, the lane width should be reduced further (using side friction) to have cyclists and vehicles use the lane together (not side by side)[63].



Sign Visibility Distance – For Cyclists

The distance that signs should be visible for approaching cyclists should be based on their approach speed.



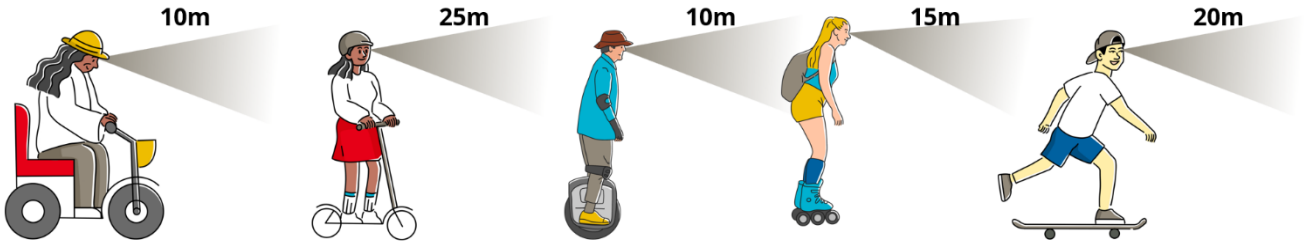
This distance would primarily apply to cyclists as generally the fastest moving road users relevant to this practice note.

Operating Speed	30	40	50	60	70
Sign Visibility Distance	**20m**	**25m**	**32m**	**50m**	**60m**

Stopping Sight Distance (SSD) – for Vulnerable Road Users

All road users need a certain amount of clear visibility of their route to ensure safe decision-making – particularly as they approach intersections or blind spots.

Users of the footpath travel at different speeds, and depending on the different users present in the environment, the distances below can be used as guidance to ensure that sufficient clear visibility is available ahead for these users at all times.



A pedestrian requires at least 2m of clear forward visibility at all times. This would be particularly relevant in covered walkways or sharp turns adjacent to fencing.

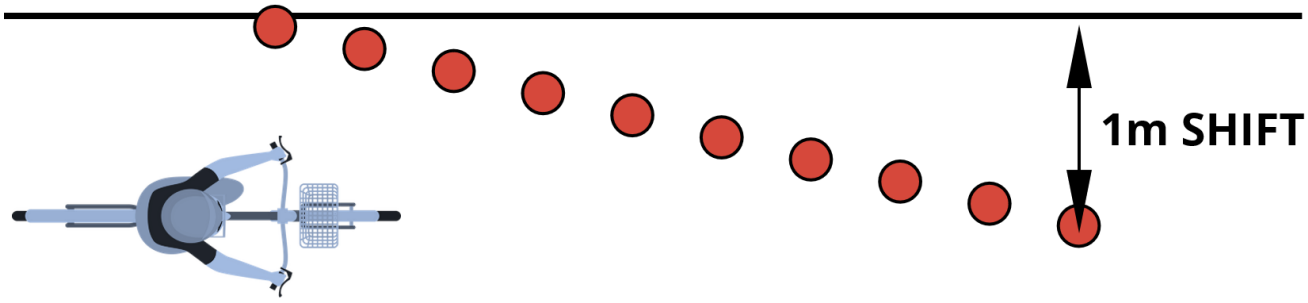
Taper for Cyclists

At times, cyclists need to be shifted from their path. Like vehicles, they need space to do so – therefore, tapers are also necessary for cyclists.

The length of a cyclist's taper depends on how far they are being shifted laterally. The taper rate for cyclists should not be steeper than 1:6. When merging with vehicles, the rate should be 1:8.

WHEN MERGING CYCLISTS WITH VEHICLES: FOR EVERY 8m TRAVELLED

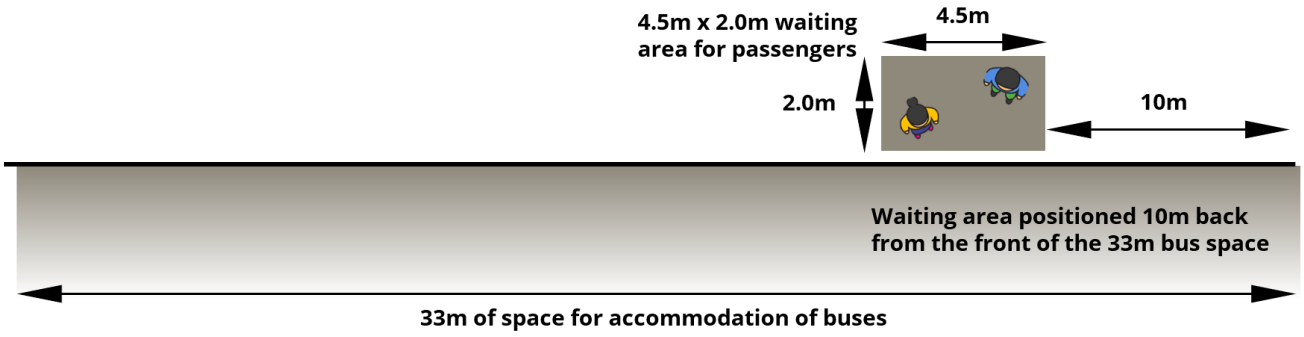
ALL OTHER SITUATIONS: FOR EVERY 6m TRAVELLED



Temporary Bus Stop Dimensions

When relocated temporarily, bus stops still need enough space for passengers to wait safely and not get in the way of other footpath users.

The following dimensions should be used when arranging a temporary bus stop location[69].



Bus drivers and passengers need appropriate signs to inform them of the relocation[75].

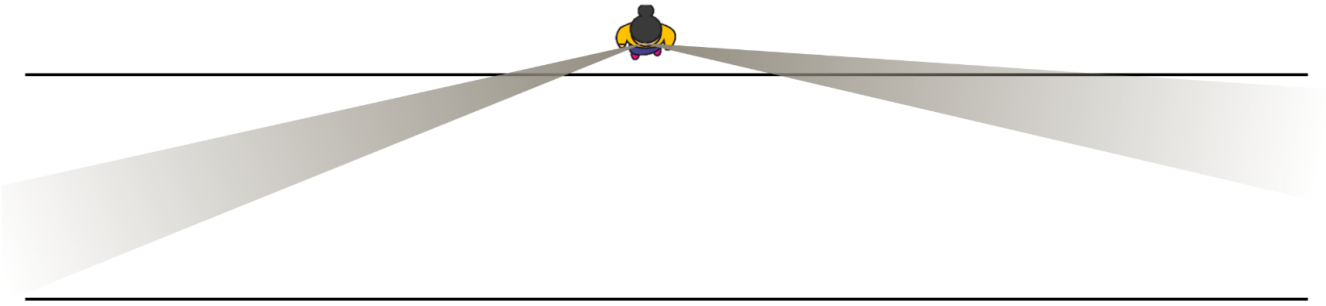
Further extensive guidance regarding temporary bus stop relocations in TTM environments has been published by Waka Kotahi.

Temporary Crossings

Temporary crossings might be implemented where transferring pedestrians across the road is necessary.

Temporary crossings must cater to all users, including those with mobility aids. A crossing width of 1.8 metres allows for unobstructed passage for pedestrians and those in wheelchairs.

A critical consideration of temporary crossings is visibility. Stopping sight distance ensures clear approach visibility (and the ability to stop) for approaching vehicles. The required SSD values (in all approach directions) are provided below.



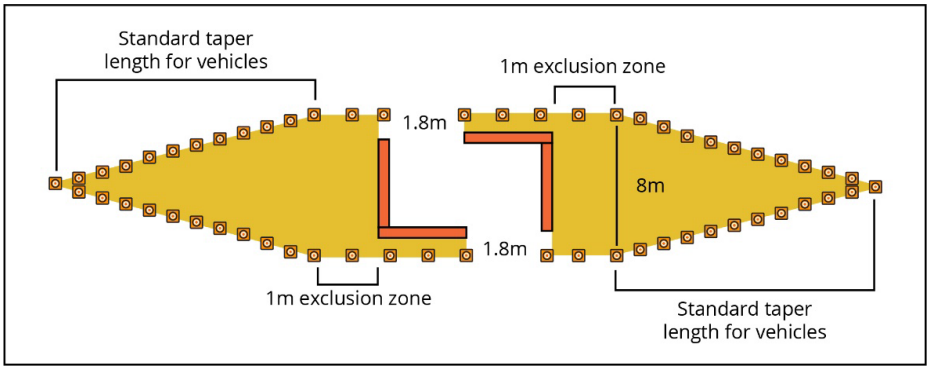
Operating Speed[6]	30	40	50	60	70	80	90	100	110
Stopping Sight Distance (SSD)	**40m**	**55m**	**75m**	**95m**	**115m**	**140m**	**165m**	**195m**	**240m**

These values are based on wet roads and a reaction time of 2.5 seconds[8].

The maximum length for a crossing without a refuge should be 10 metres. If a crossing spans wider than this, a pedestrian refuge is preferred to provide a safe waiting space for crossing the remaining distance.

Temporary Pedestrian Refuge

Utilising temporary crossings on wide (>10m) roads is not advised. Other temporary pedestrian solutions should be explored first.



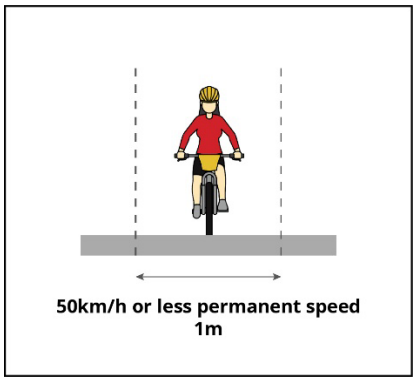
If a crossing over a wider road is necessary (other safer options have been explored and deemed not reasonably practicable), then a pedestrian refuge is advised to allow pedestrians to do the crossing in two stages. The following detail provides a dimensional arrangement for a pedestrian refuge in these instances.

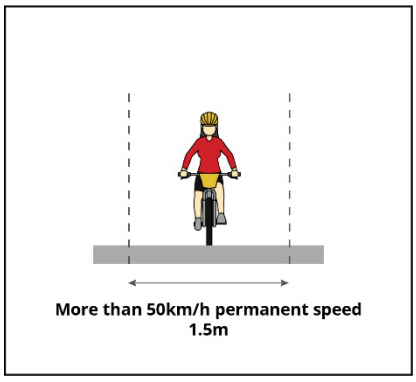
[6] Where possible, attempts should be made to reduce operating speeds to no more than 70km/h near active modes

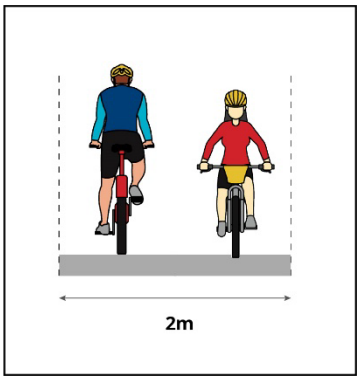
Temporary Cycleways

When providing a temporary cycleway in a TTM environment, maintain the permanent facility dimensions.

If that is not possible, utilise the below dimensional guidance.







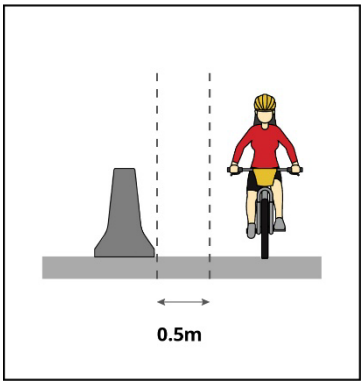
A temporary cycleway in a 50km/h (or less) permanent speed area should be 1m. This increases to 1.5m over 50km/h and 2m when it is a two-way cyclway[73].

To choose an appropriate width for your TMP, evaluate the current arrangement of cyclists, the road's permanent speed, and their existing width, and select an appropriate configuration from the options above.

Lateral Clearance

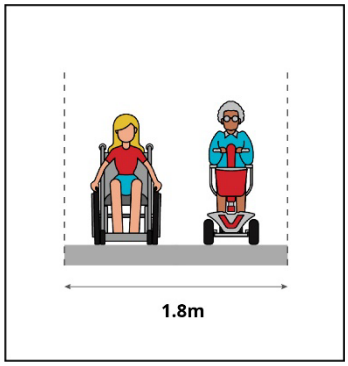
Of important consideration for cyclists is their clearance from obstacles or barriers close to the edge of their travelled path.

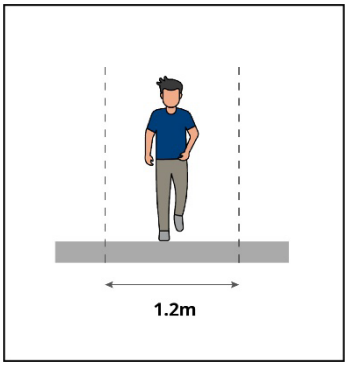
0.5m offset should be provided beside cyclist paths so they can fully use their space[11].



Temporary Footpaths

When providing a temporary footpath in a TTM environment, maintain the permanent facility dimensions. If that is not possible, utilise the below dimensional guidance.





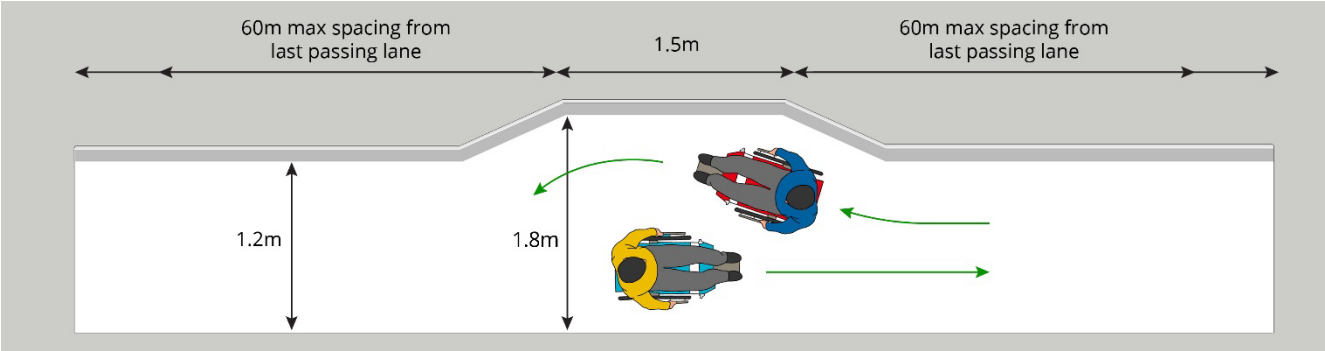
The preferred width is **1.8m for all temporary pedestrian facilities.**

In some cases, this may not be possible, and this **can be reduced to 1.2m** but should only be done for the shortest length possible.

If the length of the reduced-width footpath is greater than 60m – then passing bays should be incorporated.

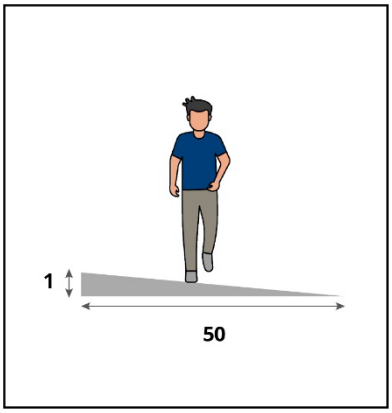
Passing Bays

Passing bays are incorporated when a longer than 60m stretch of footpath of less than 1.8m is used.



The passing bay should be no less than 1.5m long and widen to 1.8m to allow two wheelchairs or mobility scooters to pass safely. They should be spaced no further than every 60m.

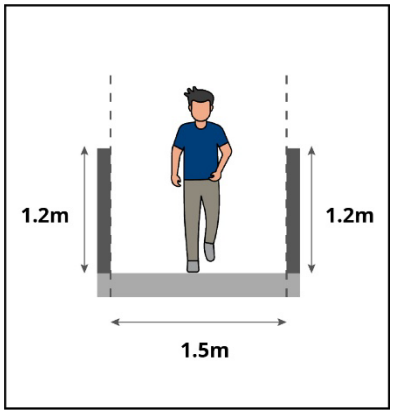
Footpath Gradient



The gradient (lateral crossfall) of the temporary footpath should be adequate to ensure water runoff but not so steep as to cause difficulty for pedestrians, particularly those with mobility impairments.

The lateral gradient of the temporary footpath should be no steeper than 1:50 (2.00%)[57].

Temporary Walkway Bridges



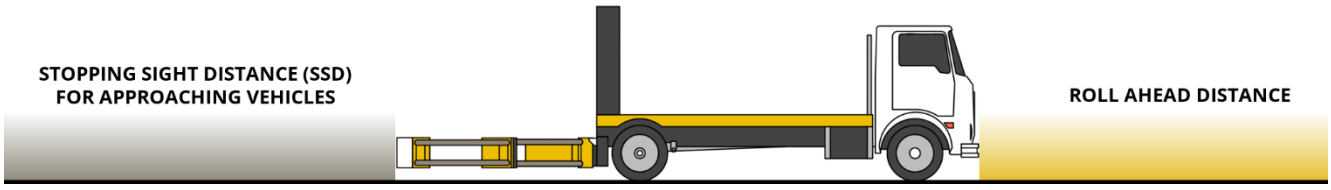
Temporary walkway bridges are sometimes used across hazards to allow continued footpath access.

Temporary walkway bridges should be **no less than 1.5m wide[46]**; however, they may need to be wider depending on the volume of expected use.

Handrails are required on both sides across temporary walkway bridges **to a height of 1.2m[46].**

Vehicle fitted with a Truck Mounted Attenuator

When using a vehicle fitted with a truck-mounted attenuator as a control measure, two important distances are required to be accounted for: stopping sight distance (behind the vehicle) and roll-ahead distance (in front of the vehicle).



Stopping Sight Distance (SSD)

This relates to approaching vehicles – ensuring they have enough room to see, react, and stop without hitting the TMA.

Operating Speed[7]	30	40	50	60	70	80	90	100	110
Stopping Sight Distance (SSD)	**40m**	**55m**	**75m**	**95m**	**115m**	**140m**	**165m**	**195m**	**240m**

These values are based on wet roads and a reaction time of 2.5 seconds[8].

Roll ahead distance

This relates to how far the vehicle may shunt forward when struck from behind. If the vehicle is used as a protective device, this roll-ahead distance becomes an exclusion zone (if something is placed in this roll-ahead zone, then the vehicle is not serving its purpose of protection).

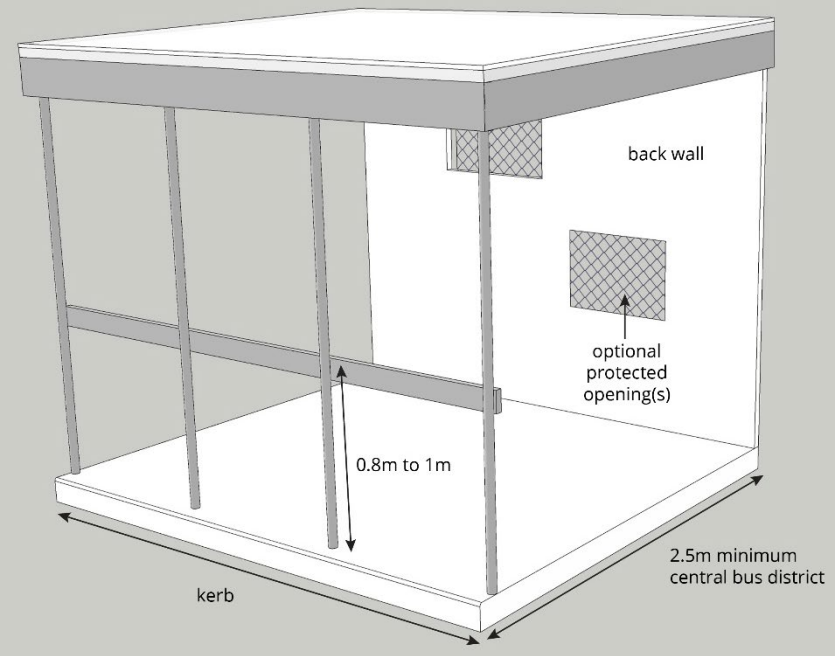
The roll-ahead distance is affected by the size of the vehicle and the size and speed of the vehicle that might strike it.

Operating Speed of impacting vehicle	30	40	50	60	70	80	90	100	110
Roll Ahead Distance (SSD)	**3m**	**5m**	**8m**	**12m**	**16m**	**21m**	**27m**	**33m**	**40m**

These values are based on vehicle weights of 4500kg (GVM) (both the truck being hit and the vehicle striking the truck) and the parking brake being on[65]. The weights of these vehicles heavily influence these distances. The original calculation should be referred to if using vehicle weights different from the above.

[7] Where possible, attempts should be made to reduce operating speeds to no more than 70km/h near active modes

Walkway Covering



Covered walkways are common where there are risks of falling objects, and the walkway remains open.

For city centres, provide a **minimum clear width of 2.5m** for covered walkways to allow for busy foot traffic. In other areas, a width of 1.8 metres is sufficient.

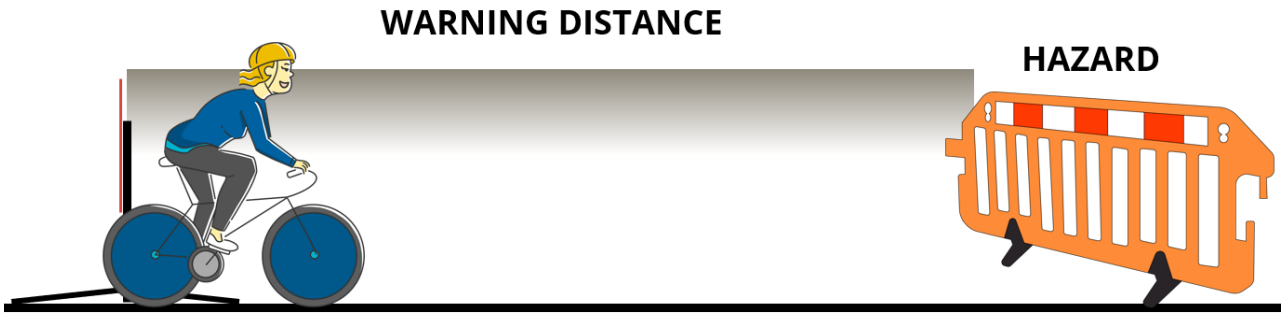
Ensure covered walkways have a **minimum height clearance of 2.5 metres**. This prevents obstructions for taller individuals and allows clearance for any temporary signs or lights.

If the walkway covering is open on one side, install handrails for safety. These should stand between **0.85m and 1.0m from the walkway surface** to accommodate various users.

Fit all covered walkways with **adequate lighting** to ensure visibility at all times. This is crucial for safety day and night, especially in construction areas.

Warning Distance – For Cyclists

Due to the speed at which cyclists travel, a suitable distance is needed from when they are warned of a hazard to when they happen upon it.



The following distances should be used between warning signs and hazards for cyclists.

Operating Speed	30	40	50	60	70
Warning Distance	**15m**	**20m**	**25m**	**30m**	**35m**

For simplicity, the distances are rounded to be half the operating speed in each case.

Appendix G: TTM Design peer/risk review tool

This tool provides a structured approach for conducting a risk review on a traffic management plan – specifically around the needs of vulnerable road users.

This risk review is focused on **finding opportunities to manage risk better** – not as a tool to determine if something is 'safe enough'. This tool should be used to enhance TMPs by **identifying opportunities to improve their safety.**

This tool encourages **'staged reviews'** within the traffic management planning process. Progressively identify and resolve potential issues by evaluating risks at 50%, 85%, and 100% design completion milestones.

1	**Step 1:Establish the stage of the TMP design to define the review's purpose** 50% review purpose: Focus on integrating traffic management with the overall construction methodology, ensuring no opportunities to eliminate risks have been missed. Verify that the emerging TTM configuration is the highest in the preferred list possible. 85% review purpose: Confirm that comprehensive risk assessment and mitigation strategies are documented. Review the proposed traffic management controls to ensure they do not inadvertently introduce new risks elsewhere. 100% review purpose: Evaluate the complete risk landscape to validate that the chosen controls in the TMP are indeed the best available options in strict adherence to the hierarchy of controls. Ensure any new risks introduced by controls have been effectively managed.
2	**Step 2: Understand the context of the Traffic Management Plan** Objective: Get all the details about the traffic management plan and why certain safety measures were chosen. Action: Take note of things like how busy the roads are, any previous accidents, how many cars and people are around, and where bikes and walkers go. Make sure you know why each safety step was picked and how they all work together. This ensures you know the ins and outs of the traffic situation to help evaluate the plan later.
3	**Step 3: Evaluate the TTM Configuration against the preferred list in this guidance** Objective: Evaluate whether the chosen methodology for vulnerable road users aligns with the order of preferences. Action: Review the TTM plan to confirm that the configuration follows the sequence of preferred configurations (i.e. keeping existing facilities first, followed by separation by time, etc.) Begin by defining the proposed method(s), then assess whether the chosen configurations are the best available given the conditions. Output of this step: Identify opportunities to use a more preferred configuration to manage the safety of VRUs.

4	**Step 4: Visualising Conflict Points on the Traffic Management Plan** **Objective:** Identify and mark potential conflict points for VRUs on the TMP. **Action:** Review the TMP layout and physically mark with red X's all possible conflict areas where VRUs might encounter hazards such as moving vehicles, construction activity, obstacles, driveways, plant, materials, or any other hazard. Be comprehensive. **Output of this step:** An annotated copy of the TMP with clearly marked conflict points. This visual tool will highlight areas requiring safety measures and will be instrumental in checking strategies that are used to mitigate identified risks.
5	**Step 5: Clarify Existing Control Measures for VRU Safety** **Objective:** Document and assess existing control measures aimed at mitigating VRU conflicts. **Action:** Work through one-by-one all current controls on the TMP designed to prevent the marked conflicts. Interrogate each control measure's function and how it operates to safeguard VRUs. **Output of this step:** A detailed evaluation of the utilised control measures forming a comprehensive picture of the TMP's safety mechanisms for VRUs.
6	**Step 6: Assess Control Measures Against the Hierarchy of Controls** **Objective:** Do current control measures represent the best possible option under the hierarchy of controls. **Action:** Critically review the utilised control measures against the hierarchy prescribed in legislation to determine if some more effective options or combinations have not been considered. **Output of this step:** A catalogue of areas where control measures can be improved or optimised, with suggestions for enhancements to use controls that are at a higher level in the hierarchy.
7	**Step 7: Investigate Potential Control Measure Failures** **Objective:** Anticipate how and why existing control measures might fail to prevent conflicts. **Action:** For each control measure, identify potential failure points and scenarios where they may not effectively prevent conflicts. **Output of this step:** A risk analysis highlighting weak spots in the current control strategies and recommendations for additional safeguards or redundancy measures.
8	**Step 8: Assess Risks Under Varying Conditions** **Objective:** Analyse how variable conditions could amplify risks to VRUs. **Action:** Simulate scenarios where changes in weather, light, traffic volumes, VRU volumes, events, or site conditions could affect the effectiveness of control measures (or create new risks). Evaluate the resilience of the TMP under these varying conditions. **Output of this step:** An assessment that outlines the TMP's vulnerabilities to changes in conditions and provides a basis for dynamic risk management.
9	**Step 9: Compile Review Findings and Recommendations** **Objective:** Summarise the opportunities for improvement identified throughout the review process. **Action:** Document all findings from the review stages, highlighting where TTM methods can be elevated in the preference list, where controls can be selected from higher up the hierarchy, how potential failures can be more explicitly prevented, and how variability in risk factors can be better accommodated. **Output of this step:** A review report, or annotated TMP, providing actionable recommendations for elevating the TMP's approach to managing VRU risks.

Appendix H: A Pedestrian on-site risk tool for TTM field staff

If your site is safe for those with disabilities, it is safe for everybody

An **elderly** person in a **wheelchair** who is **visually impaired** is approaching your site (this is one example of a possible user. Try other people, too)

Your Name:	**Site ID / TMP ID:**
Date:	**Site Location:**

*Go through the site **yourself**, and use every **pedestrian route** possible. Answer these questions:*

Is it safe?	Is it obvious?	Is it smooth and stable?
Are there places this person would **come close to moving plant, machinery, or traffic?**	If you were in a wheelchair and could not see well, would you know where to go in the current setup?	Are the **surfaces smooth** and **free** of **potholes, gravel**, or **soft ground** that could make it unsafe for wheelchairs?
If yes, could they get **harmed in those places?** **How would it happen** if they did?	Can a wheelchair user easily **move** through the site **without** making **complex** or **unsafe decisions**? If you were them, where would you ***choose*** **to go?**	Are there **trip hazards (any edge thicker than a pencil width)** from equipment, hoses, pipes, signs, or pavement level differences (permanent or temporary) that could be dangerous?
Are there **objects close to their path** that they could hit or be struck by?	Are the signs easy to see and understand? Are there other things in place to help people follow the signs?	Are there **edges or drops** that a wheelchair could easily get caught on or fall off and get hurt?

*Based on your site review - on a **scale of 1 – 10** – how **safe** will this site be for this person?*

1 2 3 4 5 6 7 8 9 10

Most unsafe site ever — Safest site ever

Now, give at least 3 things you can do to improve your chosen number. **What would make it a 10?**	
1.	**Completed:**
2.	**Completed:**
3.	**Completed:**

Appendix I: **A Cyclist on-site risk tool for TTM field staff**

If your site is safe for those with disabilities, it is safe for everybody

A **child** on a **bicycle** who has **headphones on** is approaching your site.

Your Name:	Site ID / TMP ID:
Date:	Site Location:

*Go through the site **yourself** and use every **route users could use on wheels (cyclists, electric scooters, etc.)**. Answer these questions:*

Is it safe?	Is it obvious?	Is it smooth and stable?
Are there places this person would **come close to moving plant, machinery, or traffic?**	If you were a child cycling, would the current setup indicate where you should go?	Are the **surfaces smooth** and **free** of **potholes, gravel**, or **soft ground** that could make it unsafe for a child on a bicycle?
If yes, could they get **harmed in those places?** **How would it happen** if they did?	Can a child on a bicycle easily **move** through the site **without** making **complex** or **unsafe decisions**? If you were them, where would you ***choose*** **to go?**	Are there **trip hazards (any edge thicker than a pencil width)** from equipment, hoses, pipes, signs, or pavement level differences (permanent or temporary) that could be dangerous?
Are there **objects close to their path** that they could hit or be struck by?	Are the signs easy to see and understand? Are there other things in place to help people follow the signs?	Are there any **narrow passages** or **bottlenecks** that could make it difficult for cyclists to maintain stability?

*Based on your site review - on a **scale of 1 – 10** – how **safe** will this site be for this person?*

1 2 3 4 5 6 7 8 9 10

Most unsafe site ever — Safest site ever

Now, give at least 3 things you can do to improve your chosen number. **What would make it a 10?**	
1.	**Completed:**
2.	**Completed:**
3.	**Completed:**

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