

PROTECTING VULNERABLE ROAD USERS IN TEMPORARY TRAFFIC MANAGEMENT (TTM) ENVIRONMENTS

Practice Note

v1.0 | December 2023



CIVIL CONTRACTORS
NEW ZEALAND

Sponsored by:

Downer
Relationships creating success

**McCONNELL
DOWELL**
CREATIVE CONSTRUCTION™

Protecting Vulnerable Road Users in Temporary Traffic Management environments

Practice Note

The production and publication of this practice note was sponsored by Downer New Zealand Limited and McConnell Dowell Constructors Limited as part of respective Enforceable Undertakings agreed with WorkSafe New Zealand under [Section 123 of the Health and Safety at Work Act 2015](#).

The Enforceable Undertakings^[84; 85] that led to this Practice Note arose from a tragic event involving the loss of a cyclist's life in October 2019 at a construction site in Christchurch, New Zealand. This practice note seeks to contribute to the prevention of such incidents in the future.

This practice note is intended to fit within the TTM Library outlined within [Waka Kotahi's New Zealand Guide to Temporary Traffic Management \(NZGTTM\)](#) (version 1.0) as an *operational practice note*^[77]

Version 1.0

First published December 2023 by Civil Contractors New Zealand
PO Box 12 013, Wellington 6144, New Zealand

This Practice Note is available from Civil Contractors New Zealand

www.civilcontractors.co.nz

Document Information

Document details

Document Title: Protecting Vulnerable Road Users in Temporary Traffic Management Environments: Practice Note		
Original Publication Date: 15 th of December 2023	Sponsoring Organisations: Downer New Zealand Limited McConnell Dowell Constructors Limited	Originating Publisher: Civil Contractors New Zealand (CCNZ)
To be read and applied in conjunction with: WorkSafe New Zealand's <i>Keeping healthy and safe while working on the road or roadside</i> Good Practice Guide ^[86] Waka Kotahi (NZ Transport Agency) 's New Zealand Guide to Temporary Traffic Management (NZGTTM) ^[77]		
Distribution Statement: No restrictions	Document Owner: WorkSafe New Zealand	Number of Pages: 195
<p>This document is intended to provide guidance on the treatment of vulnerable road users in Temporary Traffic Management in New Zealand and is based on research and practices as understood at the time of publication.</p> <p>While the content may be cited and referred to, it should not be misused or misrepresented for purposes other than those for which it is intended.</p> <p>The document remains the intellectual property of WorkSafe New Zealand, and any changes to its content should be approved by the appropriate parties.</p>		

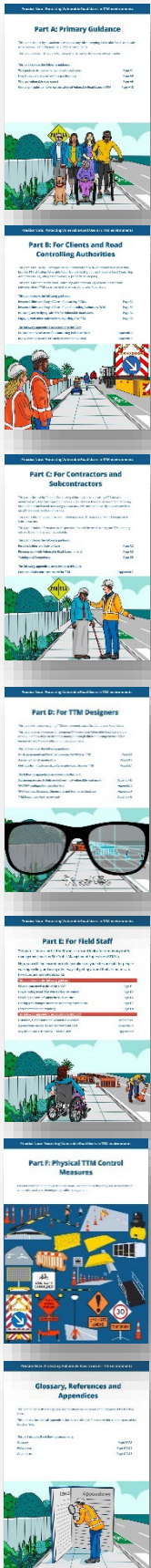


Revision table

Version Date	Author(s) Reviewer(s)	Details of Revision
Version 1.0 15 Dec 2023	Dave Tilton, Parallaxx <i>Dr Glen Koorey, ViaStrada</i> <i>Dr Bridget Doran, MRCagney</i> <i>Dr Dan Sullivan, Solutions in Transport</i> <i>(Part D review only)</i>	Initial publication



Practice Note Structure



Part A: Primary Guidance (for all audiences)

This is for all audiences who have a role in keeping vulnerable road users safe in temporary traffic management environments.

Pages
A1 - A3

Part B: For Clients and Road Controlling Authorities

For use by Clients or Road Controlling Authorities (RCAs) responsible for commissioning work or managing road networks with TTM involved.

Pages
B1 - B5

Part C: For Contractors and Subcontractors

For PCBUs undertaking activities that impact Vulnerable Road Users in the road environment, including TTM Subcontractors.

Pages
C1 - C6

Part D: For TTM Designers

For those designing TTM environments that affect Vulnerable Road Users.

Pages
D1 - D62

Part E: For Field Staff

This is for use by field staff who implement and maintain temporary traffic management, such as site traffic management supervisors (STMSs).

Pages
E1 - E9

Part F: Physical TTM Control Measures

Detailed information on physical control measures for use to enhance the safety and accessibility of people in TTM environments

Pages
F1 - F27

Glossary, References, and Appendices

Includes a complete glossary of terms and all references used within this Practice Note. Also holds appendices (forms, checklists) that are provided as part of this guidance.

Pages
GRA1 - GRA40



How to use the parts of this Practice Note

<p>If you represent a Contracting PCBU (a principal/client)</p>		<p>Read and use</p> <p>Part B</p>	<p>The following may also be helpful:</p> <ul style="list-style-type: none"> - Glossary, references & appendices section: <ul style="list-style-type: none"> o Glossary o Appendix A (Procurement assessment)
<p>If you represent a Road Controlling Authority (RCA)</p>			<p>The following may also be helpful:</p> <ul style="list-style-type: none"> - Glossary, references & appendices section: <ul style="list-style-type: none"> o Glossary o Appendix B (VRU Safety Assessment)
<p>If you represent a Contractor or Subcontractor (you engage with TTM as part of your work)</p>	<p>Read and use</p>	<p>Read and use</p> <p>Part C</p>	<p>The following may also be helpful:</p> <ul style="list-style-type: none"> - Part F (control measures) - Glossary, references & appendices section: <ul style="list-style-type: none"> o Glossary o Appendix C (Contractor/Subcontractor review for TTM)
<p>If you represent a TTM specialist contractor (or division)</p>	<p>Part A (applicable for all roles and organisations)</p>	<p>Read and use</p> <p>Parts C & F</p>	<p>The following may also be helpful:</p> <ul style="list-style-type: none"> - Glossary, references & appendices section: <ul style="list-style-type: none"> o Glossary o Appendix D (planning process) o Appendix E (configuration selection) o Appendix F (dimensional guidance) o Appendix G (peer/risk review)
<p>If you are a TTM Designer (sometimes referred to as a TTM Planner)</p>		<p>Read and use</p> <p>Parts D & F</p>	<p>The following may also be helpful:</p> <ul style="list-style-type: none"> - Glossary, references & appendices section: <ul style="list-style-type: none"> o Glossary & References o Appendix D (planning process) o Appendix E (configuration selection) o Appendix F (dimensional guidance) o Appendix G (peer/risk review)
<p>If you are a Site Traffic Management Supervisor (STMS) or other field worker.</p>		<p>Read and use</p> <p>Part E</p>	<p>The following may also be helpful:</p> <ul style="list-style-type: none"> - Part F (control measures) - Glossary, references & appendices section: <ul style="list-style-type: none"> o Glossary o Appendix F (dimensional guidance) o Appendix H (pedestrian on-site risk tool) o Appendix I (cyclist on-site risk tool)



Keeping up with Good Practice

Any good practice system relies on being up-to-date – and capturing improvements as frequently as possible.

The **Plan-Do-Check-Act cycle** is a well-known continuous improvement process that applies to this document. A process of checking and acting to continue improving this practice note will be necessary for the safety of people in TTM environments in New Zealand.

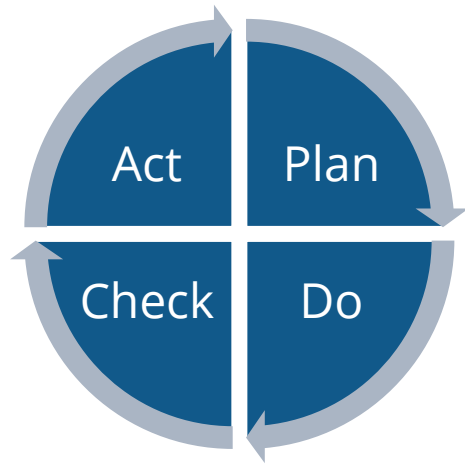


Figure 1 - Plan-Do-Check-Act Cycle^[12]

With a few exceptions, most international TTM guidance gets refreshed approximately every eight years^[66] – this is far too long to stay current.

To remain current, this practice note will be updated as often as possible when new good practice emerges. This will happen in three ways:

1. Engagement with the **NZ Temporary Traffic Management Industry Steering Group (NZ TTM ISG)** to promote discussion of technological and regulatory updates.
2. Biennial formal reviews, regular scanning to update the practice note with the latest research findings, and revisions post-significant incidents for continuous learning and improvement.
3. A broad open feedback mechanism from diverse sectors.

What can you do to help with good practice?



Keep a record of your good practices. When something works and keeps working, record it.



Feed back what works up the chain. If you are an **STMS**, tell your organisation when something is working well and might be good practice.



Email CCNZ (info@civilcontractors.co.nz) or the TTM ISG (info@ttm-isg.org) with any learnings. The more you share what you learn, the more people can be safe.



Part A: Primary Guidance

This part is for use by all audiences who have any role in keeping Vulnerable Road Users safe in Temporary Traffic Management (TTM) environments.

This part includes instructions for using all other parts, definitions, and principles.

This part includes the following guidance:

Why guidance is needed for vulnerable road users	Page A1
How to read and implement this practice note	Page A3
Who are vulnerable road users?	Page A6
Overall principles to maximise the safety of Vulnerable Road Users in TTM	Page A18



Part A: Primary Guidance

Why guidance is needed for Vulnerable Road Users in TTM

Between 2001 and 2021...^[76]

9,988

Vulnerable Road Users killed or seriously injured on New Zealand's roads, including...

3671

Cyclists

6080

Pedestrians

235

Others

1052

People killed or seriously injured in Temporary Traffic Management sites

Vulnerable Road Users killed or seriously injured in Temporary Traffic Management sites

104

15%

of all deaths and serious injuries on New Zealand Roads are **Vulnerable Road Users**

There is

1

Vulnerable Road User death or serious injury on a TTM site **every month** in New Zealand

Vulnerable Road User deaths and serious injuries in TTM sites are

3.4x

higher than they were in 2010

Those killed or seriously injured in our worksites are our people
These are your mothers, fathers, sisters, brothers, and children

1 in 4

New Zealanders
have a disability^[62]

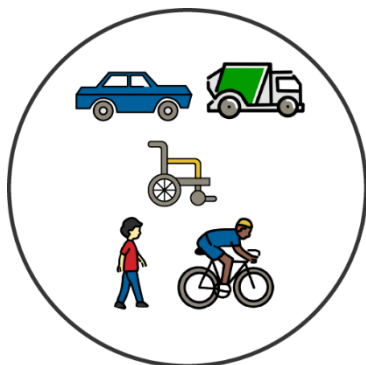


One thing you will notice about this guidance is a significant **focus on disabled people**.

This is deliberate.

These people are among the most vulnerable on the road and can have the highest needs. **If you make it safe for disabled people, you make it safe for everybody.**

Vulnerable Road Users are the most at-risk group, yet they generally receive the **least attention** in temporary traffic management planning^[57; 64]



We have a history of focussing our temporary traffic management effort on cars and treating people walking and cycling last^[38; 57].

This practice note challenges you to do the opposite. **Design for the vulnerable road users first.**

Everyone in temporary traffic management needs to understand **why we must protect vulnerable road users**.

Without the why, solutions and control measures are superficial and less effective^[37].



People who work in the road environment (including TTM) also walk and cycle, just like their families. **Making TTM sites safer for everyone** helps them, too^[63].

How to read and implement this practice note

What is a practice note, and what is good practice?

A Practice Note is a **how-to guide** for doing your job better – in this case, **keeping vulnerable road users safe in temporary traffic management environments**.

It gives **advice** based on what experts and research say **works**^[9].

It is not a bunch of theories but **practical tips** and **steps to make things safe**^[33].





Everything in a practice note should be based on **evidence**. Things that are **tried and tested**.

What is good practice?

In TTM, we often hear about "best practices," but the aim here is "good practice."

The difference is that "best" can make it sound like there is only one perfect way to do something, which is not always true^[15].

"Good practice" is about finding smart, effective ways to get the job done backed by real evidence.

Conditions of good practice		
Good practice means a method or technique aligned with a specific objective that is:		
	Condition	Explanation
	Validated by solid evidence ^[15; 33]	This means that good practice is not just a neat idea someone has; it is a method that has been tested and proven to work effectively.
	Consistently yields better results compared to other approaches ^[58]	This means that good practice is not just about doing something well once, but it is a way of doing things that usually turns out better than other ways you could do it.
	Designed to be iterative, adapting and improving over time ^[18]	Good practice is not set in stone; it evolves and changes to get better results as we learn more.
	It is reliably used and can adjusted to fit different settings ^[58]	This means that good practice is what most reasonable people or organisations do when they want to do things well. It is a trusted method that can work well even if you change a few things.

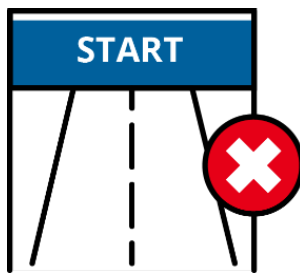


What does this practice note cover, what it does not, and some details about how it is written



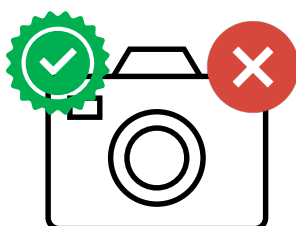
Examples are given as much as possible to help understand the guidance^[21]. These examples are not meant to be templates or recipes for direct copying.

Lists are used in some places – these lists are not to be treated as complete, and they may list some but not all possible examples.



This practice note is primarily aimed at the construction sector, not special events or filming operations. While the guidance may be applicable in those contexts, the language and examples are tailored for construction activities. Such events guidance would be developed separately.

This practice note is not intended for emergencies that require highly dynamic and immediate traffic management. While some principles may be applicable, the focus is on planned construction works.



This practice note uses photos in many places to provide examples (including from other countries). Where these photos are negative (examples that should not be copied or replicated), these are marked with a red “x”. Where they show a positive example, they are marked with a green tick.

The Language of this Practice Note

The language of disability

In this practice note, the social model of disability is adopted, which views disability as a result of societal barriers rather than an individual's issue^[54]. The term 'disabled people' is used to emphasise the impact of inaccessible transport. This language choice aligns with the principles outlined by the [Ministry of Social Development](#)^[39] at the time of writing, highlighting the importance of inclusive communication. Our approach aims to promote understanding and inclusivity in discussing disability-related topics.

Other important language

Vulnerable Road Users. In this practice note, we use the term vulnerable road users as it is widely recognised within the TTM industry and aligns with existing other guidance. While there is a valid call to evolve beyond this term for inclusivity, this guidance aims to provide practical information digestible by its audience, maintaining familiar language. It acknowledges that future iterations may explore alternative terminology, but for now, it builds on established industry terminology to communicate its insights effectively.



Motor Vehicles and Traffic.

In this practice note, we use the term 'motor vehicles' to refer to powered vehicles like cars and trucks, distinguishing them from non-motorized "vehicles" like bicycles.

Also, by minimising the use of 'traffic,' we shift the focus to the individuals operating these motor vehicles, emphasising the human factor in decision-making and actions. This approach highlights that safety and responsibility ultimately lie with people, not just vehicles, aligning with our goal of promoting safer and more responsible road use.

'Must', 'Should', and 'Could'

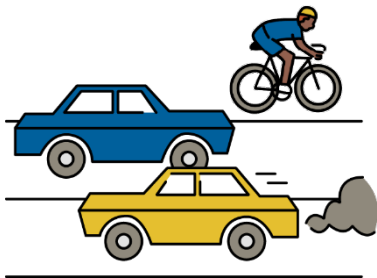
The following table is used at the start of each section to highlight what different parties MUST and SHOULD do concerning vulnerable road users in TTM environments.

	<p>A legal requirement that has to be complied with.</p> <p>These directives are legally obligatory due to their critical role in ensuring safety.</p>
	<p>A recommended practice or approach.</p> <p>These are preferred methods for enhancing safety, but alternative approaches may also be valid if they achieve the same safety outcomes. Words such as shall and could may also be used for the same purpose.</p>



Who are Vulnerable Road Users?

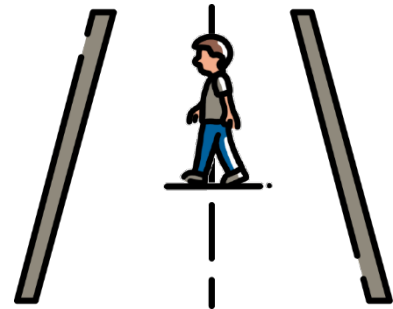
People who are at heightened risk in Temporary Traffic Management (TTM) settings



People outside of motor vehicles **behave differently from those driving motor vehicles.**

They travel at different speeds, in a manner different to traffic, and manoeuvre differently.

Vulnerable road users can **move in various directions** without being confined to designated lanes, leading to unpredictable paths within the road corridor.



Vulnerable road users have **limited protective measures compared to users of registered motor vehicles.**

They are not in an enclosed motor vehicle cab, most do not have horns or indicators, and most cannot react quickly to avoid collision.

Who is vulnerable but not covered by this practice note?



Motorcyclists are not covered by this practice note because, despite their vulnerability, they operate registered motor vehicles that travel in designated lanes at speeds similar to other motor vehicles, requiring different TTM measures.

This practice note **does not cover workers** because the safety measures designed to protect them in TTM settings are distinct from those aimed at the general public.



Types of Vulnerable Road Users

Here is a list of the different types of vulnerable road users. We have divided them into two main categories: **those on foot** and **those on wheels**. Each category lists sub-groups alphabetically to help you understand who we are talking about.

PEOPLE ON FOOT



Pedestrians



Child Stroller Pushers



Pushing/Pulling Other Wheeled Devices



Runners

Pedestrians encompass a broad spectrum of individuals, from children to older adults, each with unique needs and abilities.



Diversity among pedestrians includes factors like age, physical capabilities, and mobility aids, such as walkers or strollers.

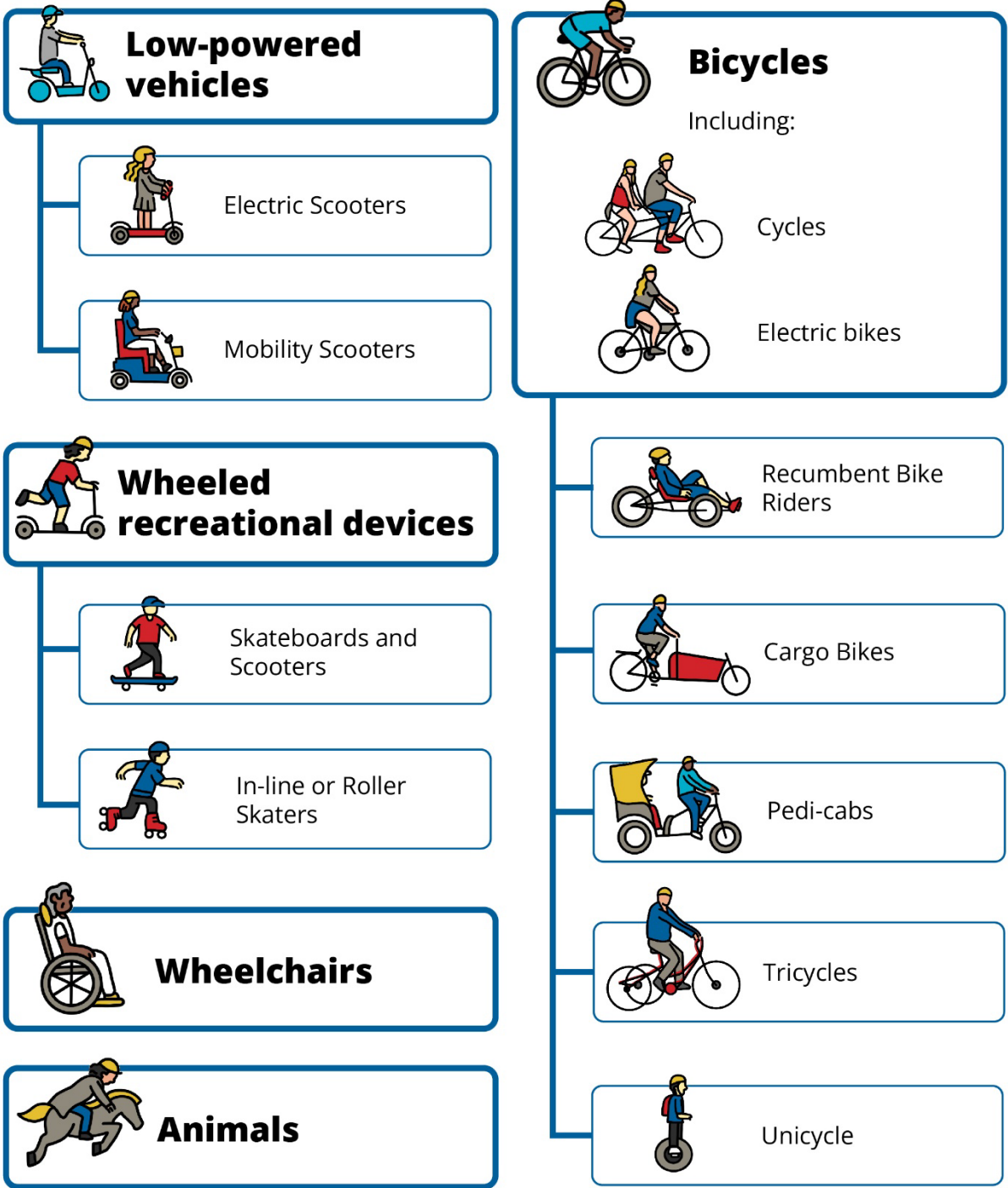
Recognising this diversity is essential in TTM design to ensure safe and accessible pathways for all pedestrians.



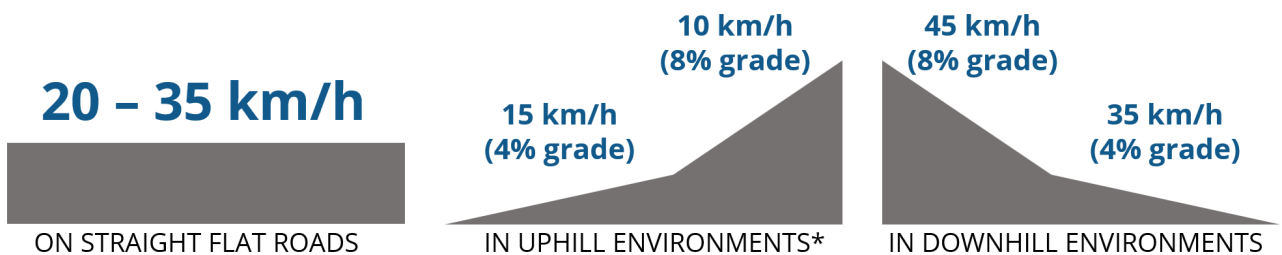
To create inclusive and safe environments, TTM measures must consider factors like crossing times for children or accommodating people who have low vision.



PEOPLE ON WHEELS



Did you know cyclists average travel speeds are approximately^[71]:



*Note: in uphill environments, e-bikes can travel up to 10-15 km/h faster than these approximations

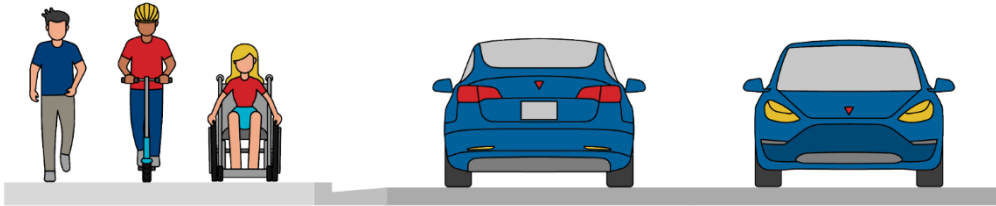


Where Vulnerable Road Users travel

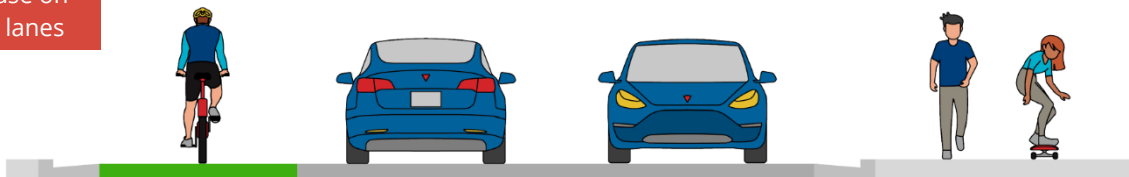
Here, we look at where different types of vulnerable road users are **legally allowed to travel**. Whether there are footpaths, cycle lanes, or shared paths, knowing where these users should and should not go is essential for designing for their safety.

However, it is essential to note that people often choose the **path of least resistance**, even if it is not strictly legal. Research indicates that cyclists and pedestrians may use different parts of the road if they believe it is safer or more convenient^[40; 57; 87].

Pedestrians, low-powered devices, and mobility devices may use footpaths

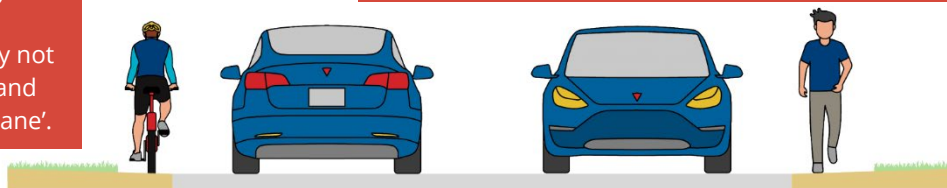


Only people riding bikes may use on-road cycle lanes



Wheeled recreational devices may also use footpaths

Cyclists must ride as far to the left as practical (whether there is a cycle lane or not). In some cases this may not be practical or safe, and cyclists may 'take the lane'.



Pedestrians must use the footpath if there is one, and if not, they must remain as close to the edge of the roadway as practical

Pedestrians, cyclists, wheeled recreational devices, mobility devices, or low powered devices may all use a shared path



Low powered devices may use the roadway but must remain as far to the left as practical



Disabled People

People are disabled by environments that are not accessible for them. The environment is disabling when some people can use it safely and comfortably, but others cannot. Poor planning can worsen these limitations in the TTM context, discouraging disabled people from using the road network^[14]. **Walking and cycling are often the only options for transport disabled people have.** In TTM, we must understand people's challenges on our sites.

Disabilities are not necessarily permanent; the environments we create can make it harder for people with temporary medical conditions, for example.

Physical Abilities

Some people face mobility challenges navigating inaccessible road environments. Examples include rough surfaces, steps, or long detours^[49]. Examples include people using wheelchairs or those using mobility aids like crutches.

Someones physical ability can result in:



Difficulty in moving through narrowed or very angled routes



Difficulty with uneven surfaces and changes in levels or slopes



Inability to cross safely or cover long detours

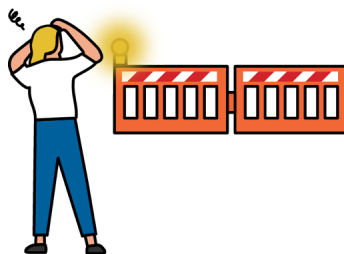
Cognition

These affect a person's mental processes, such as memory, attention, reasoning, problem-solving, communication, or learning^[43]. Examples include dementia, which can cause confusion and disorientation in unfamiliar environments, or autism spectrum disorder, which can make it difficult to cope with sensory overload and changes in routine.

Awareness of normal human variation in cognitive abilities means knowing that:



Some signs can be confusing for some people



Flashing lights or noises that could make some people anxious or uncomfortable



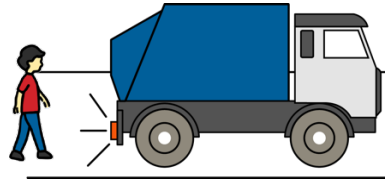
Some people need more time than others to react to sudden movements

Senses

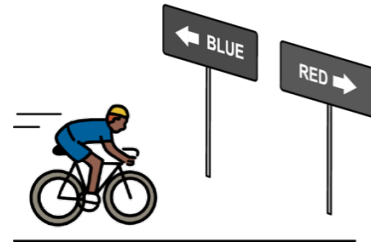
Environments that do not adequately accommodate human sensory variation can introduce danger. Safe environments cater to everyone, including people who have little or no vision, who have colour blindness, who have little hearing or who are Deaf.^[1]



People with canes may struggle with visual directional signs not accompanied by tactile cues at the right height for their cane.



Those with hearing impairments may not respond to auditory cues like nearby traffic or a truck's reversing beeper.



Individuals with colour vision deficiencies might not recognise the significance of coloured safety markings.

Intersectionality

Intersectionality refers to the overlapping of physical, cognitive, and sensory disabilities, along with other variables like age or language, that can compound challenges for vulnerable road users in TTM settings^[14] (see **Error! Reference source not found.**).

For example, an older person who has trouble seeing (visual impairment) and who has trouble walking and keeping their balance has multiple disabilities intersecting - which makes their experience of TTM even more challenging.

TTM provisions should ensure environments are safe for everybody.



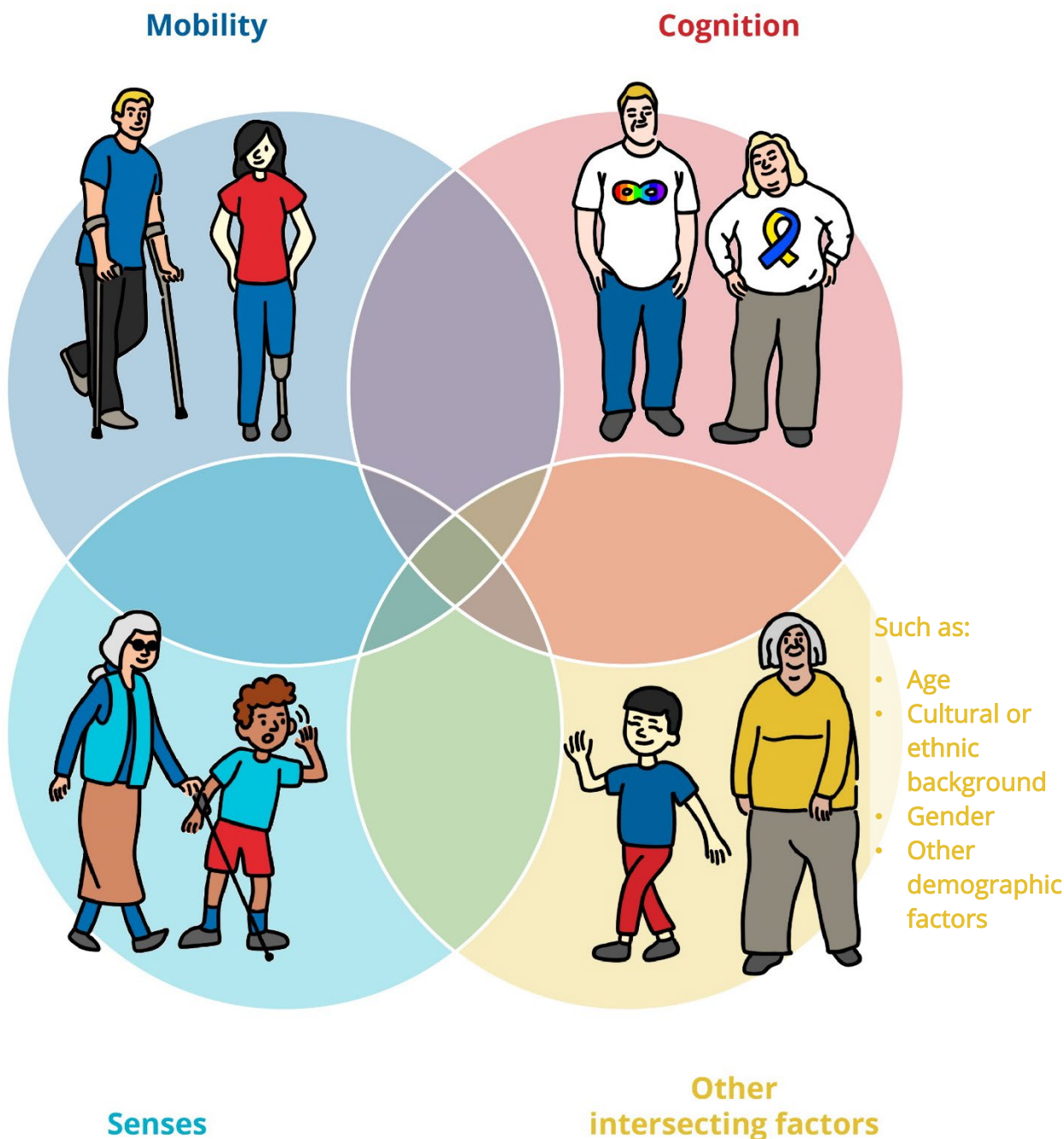


Figure 2 - The intersectionality of human characteristics

Why focus on Disabilities?

The people who need the most care and attention in TTM environments to be safe are disabled people.

The great news is that if they are safe, everyone else will be too.

Disabled people are challenged by even simple TTM shortfalls, like a missing fence panel or a sign that is sticking out slightly too far.

If you make it safe for those disabled people, you make it safe for everybody.



Psychological factors

Understanding the psychology of vulnerable road users is crucial for effective TTM.

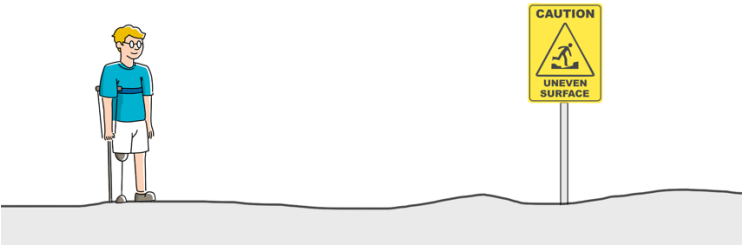
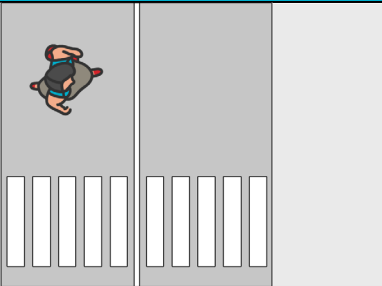
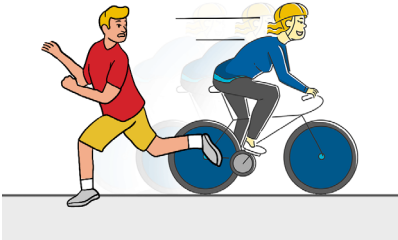
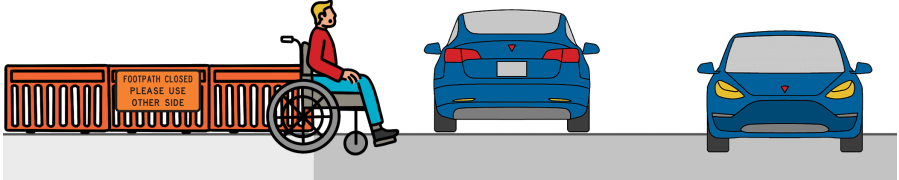
How **people think and feel** directly influences their actions on the road, which can either enhance or compromise safety measures.

Psychological factors include preferred routes, confidence levels, and how easily they get distracted. These factors **introduce unpredictability** that TTM sites must account for.

While engineering solutions like fencing aim to minimise the need for decision-making, the reality is that **human behaviour is a variable that cannot be entirely controlled**.

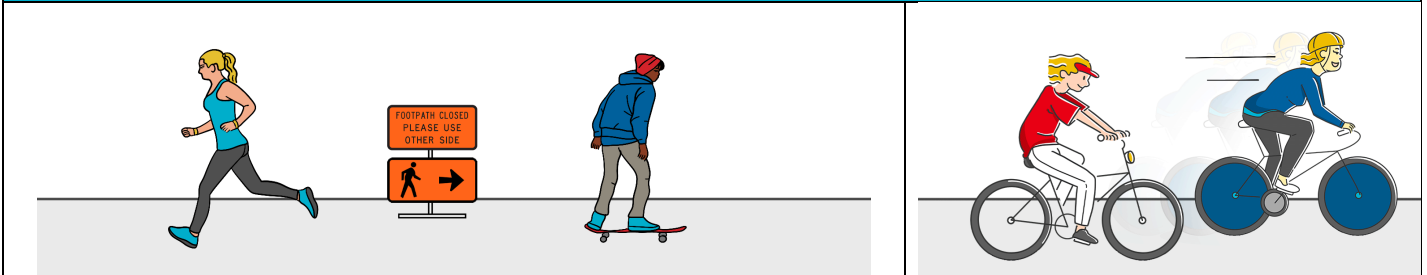
Therefore, TTM measures should be designed to direct and resonate with road users' psychology, **encouraging safer and more predictable behaviours**.

The following examples of psychological factors are just some considerations to account for in how vulnerable road users behave around TTM.

Vulnerable road users like to follow familiar and comfortable routes. This is sometimes referred to as 'the path of least resistance and most comfort' ^[40; 57]	
	
<p>If you present an unrealistic path for people to follow, with lots of bumps, it is unlikely to get used. This means your control measure is not working, and you need to do something different as your current approach creates more risk.</p>	<p>Pedestrian crossings far from usual crossing points may be ignored, leading to risky behaviours.</p>
Highly mobile and confident people are likely to take shortcuts, while less mobile individuals find detours challenging ^[28; 41]	
	
<p>A cyclist may ride on the footpath to bypass a worksite, posing a risk to pedestrians.</p>	<p>A person using a wheelchair may avoid a detour altogether if it appears too complicated or has an unsuitable surface and decides to cross the road in an unsafe area instead.</p>



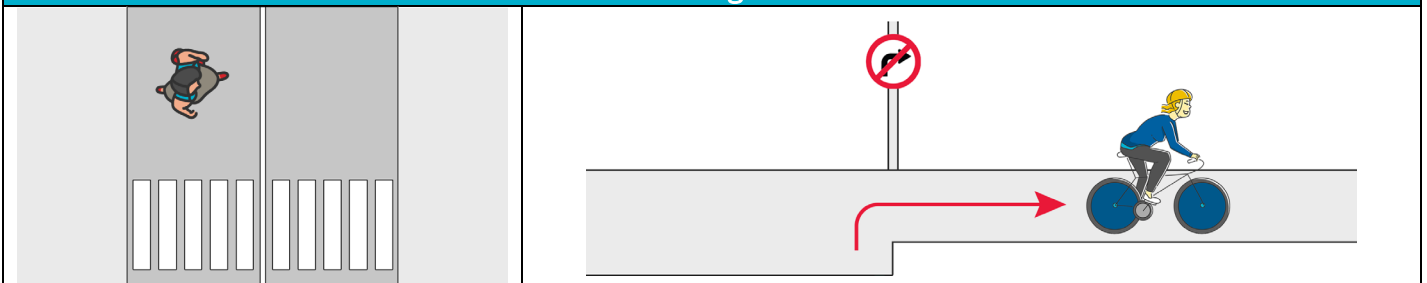
Different people have different perceptions of risk^[28]



Because so many of our control measures in TTM rely on people *choosing* to follow them – we can expect a wide range of behaviours. The more you can get a consistent, predictable response from vulnerable road users (by giving them a clear and obvious path to follow – the safer their choices will be.

Cyclists will have different speeds depending on how confident they are. Just because some are going slow does not mean all will be.

People outside motor vehicles make trade-offs for their safety and comfort when environments are not well designed.^[50; 56]

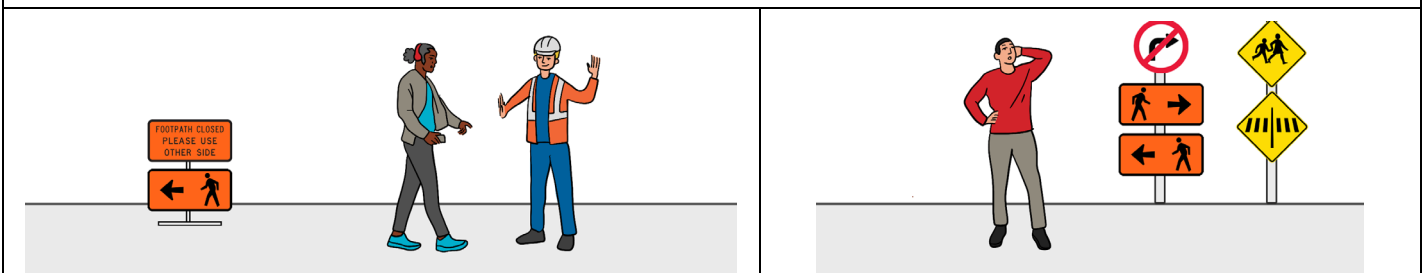


Individuals confident in their ability to judge traffic speed and distance may jaywalk¹ instead of using designated crossings.

Confident cyclists may continue riding through stop signs or stop paddles or ignore restricted movements if the route is faster and they think it is safe to take the risk.

Lots of pedestrian-related collisions are due to distraction and unawareness^[34]

What does this mean for TTM?



People listening to music or using cell phones will likely miss audio cues or instructions from signs. Having multiple control measures helps ensure distracted people have multiple ways to get important information about what to do.

The more complex you make the environment, the more likely people will make mistakes. Keep it simple and repeat the exact instructions over and over.

¹ Jaywalking refers to crossing the road outside of designated crossings or against traffic signals. This is not illegal in New Zealand, unless it is within 20m of a designated crossing or set of traffic signals^[23].

Case Studies

Case studies are **real-world examples** that help you practically apply this guidance. Like this one, you will find case studies in light blue boxes throughout this document.

They show you **lessons learned by others**—both what to do and what to avoid.

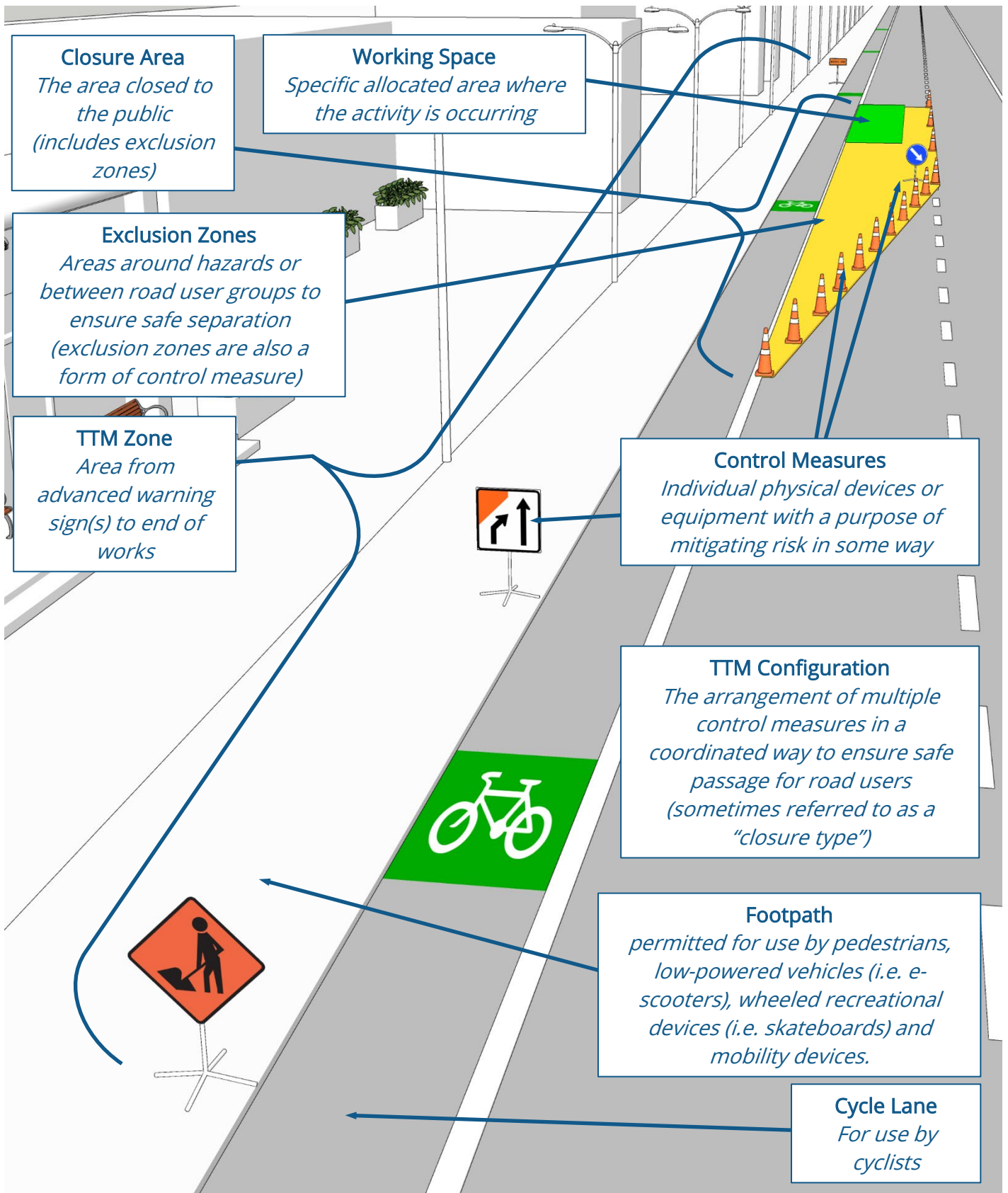
Whether it is a **warning example** with significant consequences or a **success story** worth replicating - these **case studies offer valuable insights** for your TTM situations involving vulnerable road users.

List of Case Studies

Case Study A: Case Study A: Distinguishing between hazards, risk event	Page D16
Case Study B: VRU safety and freight vehicles	Page D20
Case Study C: Engineering, Isolation, and Administrative controls	Page D26
Case Study D: Cyclist Detour Compliance in Sweden	Page D44
Case Study E: Damaged footpath led to elderly man's death	Page D59



Key Terms



Glossary

A complete glossary of terms, including **acronyms** and **definitions**, can be found on Page GRA1 in this practice note's **Glossary, References and Appendices** section.



References

An important aspect of anything to do with *good practice* (like this practice note) is that it is **evidence-based**.

That means the guidelines and information are based on real-world examples and trusted studies.

When we have used information from other places, you will see a number right next to it, like what is shown below:

A Canadian study found that:

- 40% of fatally injured pedestrians had been drinking alcohol.
- 60% of pedestrian deaths occurred in darkness.
- 34% of fatally injured cyclists were struck by a vehicle in darkness^[52].

If you want to know more about where that information comes from, you can find that number in the **references section** at the end of this practice note.

This way, you know our advice is solid and reliable, and you can also go and find more details if you want to.

Appendices

Appendices are included at the end of this practice note to give you easy access to forms or checklists that you might use more than once.

List of appendices

Appendix A: Procurement Assessment for Contracting PCBUs on VRU Safety	Page GRA19
Appendix B: RCA Vulnerable Road User Safety Assessment	Page GRA20
Appendix C: Contractor/Subcontractor review for TTM	Page GRA22
Appendix D: A planning process to help protect our most vulnerable road users	Page GRA23
Appendix E: VRU TTM Configuration selection tool	Page GRA24
Appendix F: VRU Facilities: Distances, Dimensions and Geometric Guidance	Page GRA26
Appendix G: TTM Design peer/risk review	Page GRA37
Appendix H: A Pedestrian on-site risk tool for TTM field staff	Page GRA39
Appendix I: A Cyclist on-site risk tool for TTM field staff	Page GRA40



Overall principles to maximise the safety of Vulnerable Road Users in TTM

Having some easy-to-understand principles for managing vulnerable road users in TTM means we can hold each other accountable simply.

You will find these principles used across this practice note at every level.

These principles should become foundational to how we manage the safety of vulnerable people in TTM environments.

We should all be able to remember them by heart.

Safe

- Environments must have the lowest total risk for all parties.
- Measures should be in place to minimise collision risks and other forms of physical harm.
- The design must incorporate a comprehensive risk management strategy, addressing risks from the environment, the activity, and the introduced control measures.

S.O.S

Obvious

- TTM configurations should be clear and easily understood.
- Signage and markings should be legible and straightforward to navigate, reducing unsafe decision making from users.
- TTM configurations should be easily moved through by even the most disabled of users.

Smooth and Stable

- Environments should be accessible for people with disabilities and free of hazards that can harm our most vulnerable people.
- Pathways should be unobstructed, prioritising the shortest and most straightforward routes.
- Practical and realistic ways of enabling movement should be offered, including ramps and smooth surfaces to facilitate ease of access.

These principles are very similar to the permanent design principles for pedestrians published by Waka Kotahi in 2023^{[78]2} – they have also been adapted to be relevant for cyclists. This means we should all be following the same approach to keeping vulnerable road users safe on our roads – regardless of whether it is permanent or temporary.

² 'Step-free' (from the Waka Kotahi Pedestrian Network Guidance) has been replaced by 'Smooth and Stable'.



Safe

The **Safe** principle ensures everyone stays out of harm's way in TTM setups, especially vulnerable road users like people walking and cycling.

First, have a solid plan to tackle risks - a **comprehensive risk assessment and management plan**.

This means looking at **risks from the environment**, the **activity**, and the risks that come with the **control measures** you put in place.

Keep an eye on things to ensure your plans work as they should.



Image Credit i: Parallaxx



Image Credit ii: New York DOT^[45]

Next, always seek the **lowest total risk^[77]**.

Sometimes, a solution to one problem might cause another. For instance, moving **pedestrians** away from a dangerous worksite is good, but maybe not if it means they have to cross a busy road instead.

Every safety measure should be checked to ensure it **does not lead to other risks**.

Lastly, when designing your TTM setup, think about **safety first**.

So often, when TTM gets planned and delivered, priorities like cost, traffic disruption, or convenience get pushed to the top. **Safety must be the priority**. It is the primary reason we have TTM.



Obvious

The **Obvious** principle emphasises making Temporary Traffic Management (TTM) setups easy to understand at a glance for all road users, regardless of their abilities.

Firstly, TTM setups should be **clear and easily understood**.

The layout should be straightforward so everyone knows where to go without confusion.



Image Credit iii: Betty Mitrova



Image Credit iv: Parallaxx

Next, focus on **signage and markings**. They should be **legible and straightforward** to navigate, reducing the chance of unsafe decisions that could lead to accidents.

They should remain clear even in bad weather or low light.

Lastly, ensure **accessibility for all users**, including disabled people.

TTM setups should allow easy movement for everyone, regardless of their physical capabilities. This means keeping pathways wide, flat, and free of obstacles and providing ramps where necessary.

The goal is to ensure that no one feels excluded or at risk due to the TTM setup.

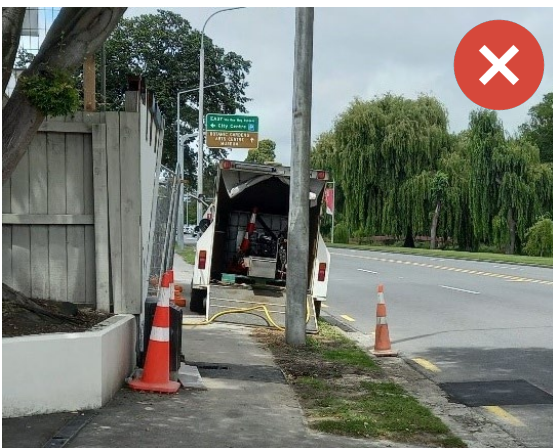


Image Credit v: Jeanette Ward



Image Credit vi: Parallaxx

Smooth and Stable

The Smooth and Stable principle advocates for creating step-free environments that will not cause harm if used by vulnerable road users.

Firstly, it is essential to ensure that environments are accessible and free of hazards. This means removing any obstacles that could cause harm or impede movement.

It is about keeping the ground clear and ensuring it is stable and easy to move on, whether on foot or on wheels.



Image Credit vii: Parallax



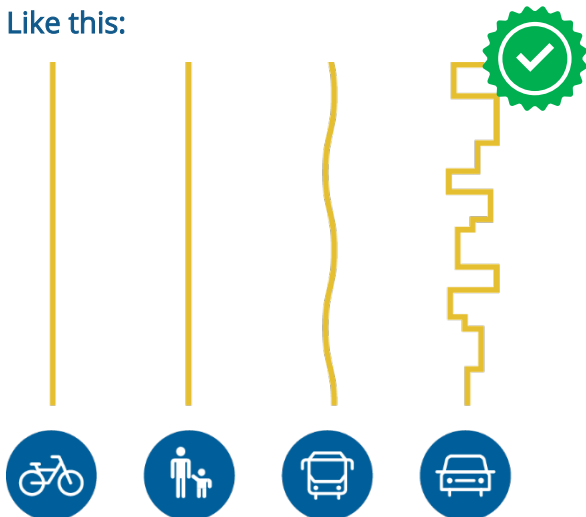
Image Credit viii: Traffic Management and Control

Secondly, focus on **direct routes**.

It is essential to prioritise the **shortest and most straightforward routes** for VRUs.

One way to do this is by making the shortest and straightest path for these vulnerable users, as shown in Figure 3.

Like this:



Not like this:

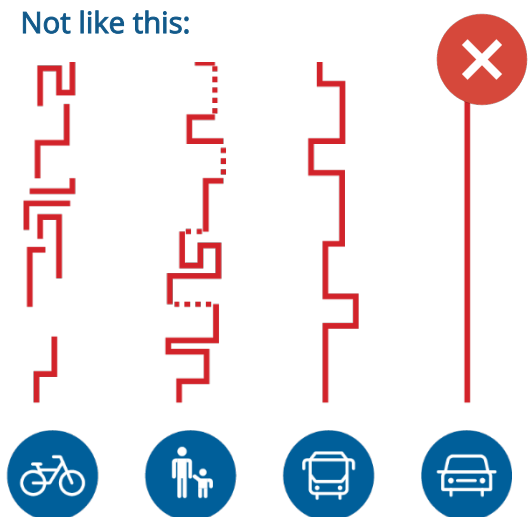


Figure 3 - Applying the principle of 'safe' to vulnerable road users in TTM^[53]


Longer paths can tire them out and lead to them breaking the rules, making things riskier. So, when deciding on routes and spaces, **consider vulnerable road users before motor vehicles**.





www.civilcontractors.co.nz

Civil Contractors New Zealand
PO Box 12 013, Wellington 6144
New Zealand

 0800 692 376

 info@civilcontractors.co.nz

 [civilcontractorsnewzealand](https://www.facebook.com/civilcontractorsnewzealand)

 [civilcontractorsnz](https://www.linkedin.com/company/civilcontractorsnz)