
Memorandum

To:	Claire Pascoe, Renee Corlett	Of:	Wellington City Council
From:	Lukas Adam	Date:	5 October 2022
Copies:	Bridget Doran		
Project:	NZ3257		
Subject:	Riddiford Street bus stop bypasses - accessibility audit		

1 Introduction and context

Wellington City Council (WCC) has asked MRCagney (NZ) Limited to carry out an accessibility audit of recent changes to two bus stops on either side of Riddiford Street outside Wellington Regional Hospital, which include cycleway bypasses. The bus stop changes are part of the Newtown to City cycleway, which has been built as part of WCC's Bike Network Plan that plans to build over 166 kilometres of cycling infrastructure over the next ten years. The purpose of the programme is to develop a network of cycle routes that are safe and easy for people to use no matter their age or ability. As the first step in that programme, transitional cycleways are intended to improve safety and accessibility for people on bicycles along key routes in a quick build, interim fashion.

The fast-paced nature of the cycle network implementation is intended to allow improvements to be implemented quickly, with on-site refinements rather than lengthy design iterations. As part of the design process, this technical note specifically focuses on auditing the bus stop bypasses through an accessibility lens to consider the mobility and ability of every citizen and visitor, whether they travel by foot (including with a mobility aid), bicycle or public transport.

1.1 The auditing framework

This audit was carried out by staff at MRCagney using the guidance of the Safe, Obvious and Step-free framework (SOS)¹. A visit to the site was made on 17 June 2022. The designs were also reviewed by a specialist advisor from the Disabled Persons Assembly.

The SOS framework was designed to inform streets that are universally accessible for all humans with various capabilities. The first principle, 'safe', makes sure pedestrians are both free from harm and feel safe in a given environment. Various aspects are looked at under this principle, such as whether appropriate separation and space is given to different road users, an area is free of hazards or has good lighting.

Secondly, whether routes and wayfinding are obvious and accessible to everyone is assessed. Assessed aspects under this principle include clear, consistent information is provided and that there is clear separation between different transport modes. Under the 'obvious' principle for assessment, the audit considers whether priority crossings such as zebra crossings or traffic signals are emphasised as the most obvious road crossings.

Thirdly, the 'step-free' principle checks that step-free route choices are available for anyone who needs them. This last aspect is to ensure routes can be navigated by everyone, including those using wheelchairs or other

¹ ([Principles of Safe, Obvious and Step-free \(SOS\) | Waka Kotahi NZ Transport Agency \(nzta.govt.nz\)](https://www.nzta.govt.nz/principles-of-safe-obvious-and-step-free-sos/))

devices with small wheels, such as scooters or prams. Step-free routes must be free of obstacles, not too steep, and smooth (that is, sealed or paved without defects that could create trip hazards).

1.2 Definition & Purpose

The purpose of this accessibility audit is to review the bus stop cycleway bypass designs for the two Riddiford Street bus stops. Our recommendations promote access for all, with a focus on pedestrians, bus passengers, and cyclists. Accessibility opportunities are listed according to which principle they relate to (safe, obvious, and/or step-free) and whether they present a major or a minor opportunity to improve the proposed design, as summarised in Table 1.

Access principle(s)	Safe / Obvious / Step-free
Risk	Suggested Action
Major	Major concern that should be addressed and requires changes to avoid serious access constraints.
Minor	Minor concern that should be addressed where practical to improve access, or to mitigate an issue that will only occur rarely.
Comment	General comments regarding access issues which should be taken into consideration during reviews of the implemented changes and any future detailed design to make the changes permanent.

Table 1: Accessibility Audit Concern Categories

1.3 Bus Stops

The recently implemented bus stop changes feature:

- A kerb-level platform made from recycled plastic built out from the kerb to allow passenger access to in-lane bus stops.
- Cycleway ramps up to kerb level to slow cyclists on approach to potential conflict points.
- Integrated tactile ground surface indicator units ('tactiles') to communicate the layout clearly, including to people with vision impairments.
- A 'footpath ramp' over the drainage channel to allow stormwater to continue to flow.
- Non-slip surface which exceeds the slip resistance standards used for footpaths.

The designs are shown in **Figure 1** and site photos are included in Figure 2. Note that we have not confirmed dimensions on-site. We have assumed that dimensions shown on drawings are the same as what has been constructed.

Figure 3 sets out the terminology used in this document regarding bus stop bypass elements.

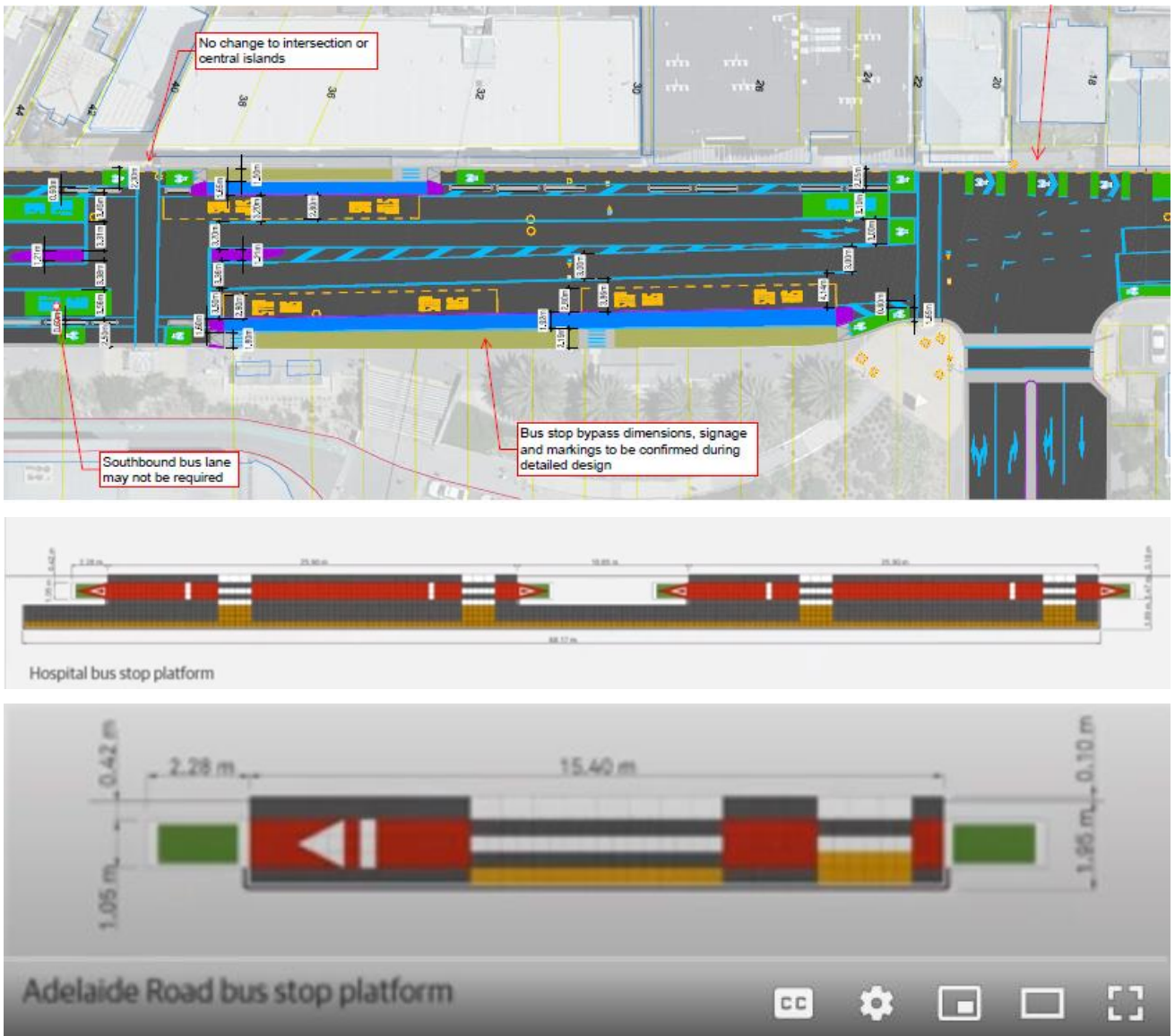


Figure 1: Bus stop bypass design - 30% concept design (October 2021)



Figure 2: Riddiford Street bus stop bypass (southbound left, northbound right)

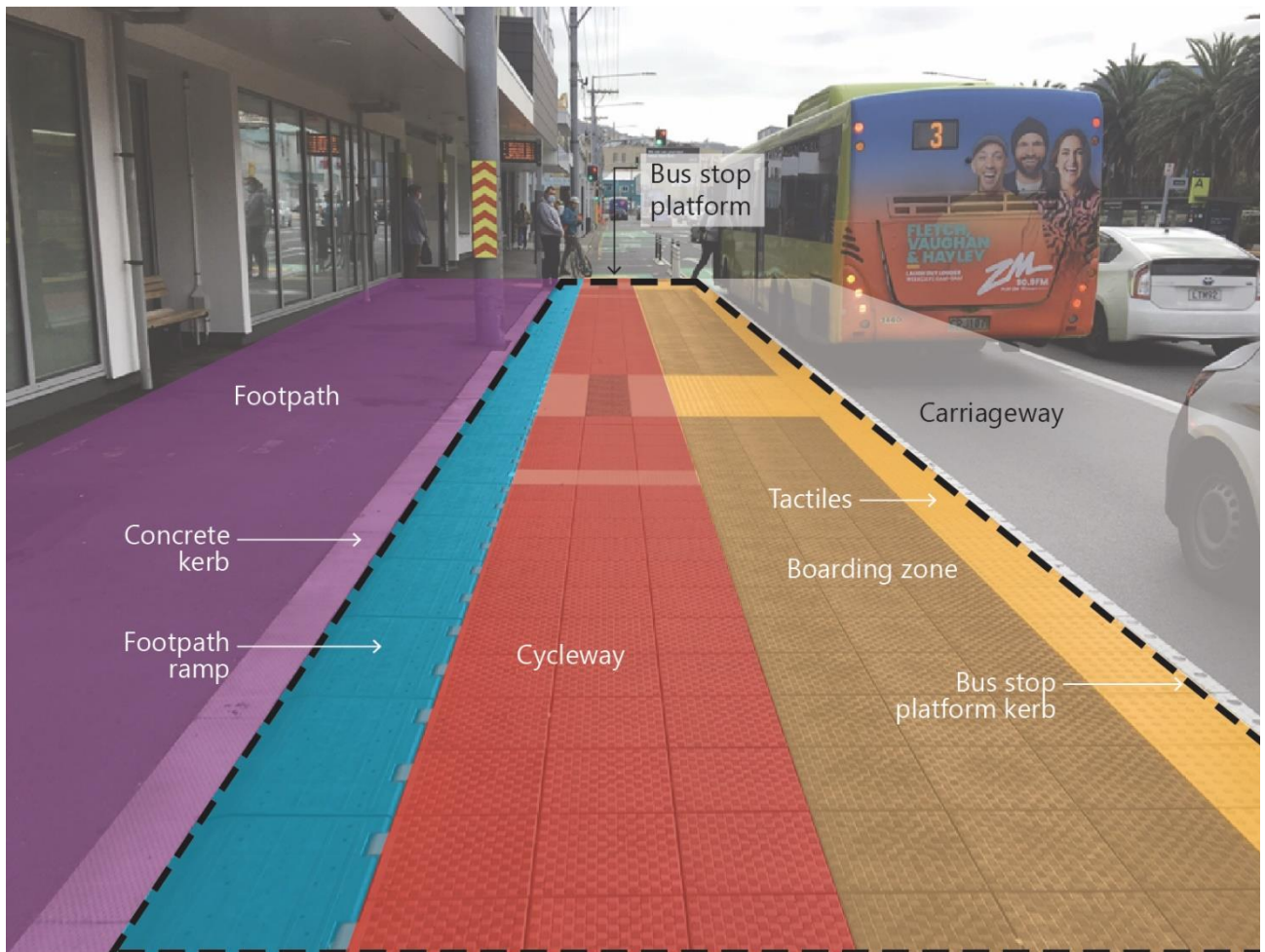


Figure 3: Bus stop bypass terminology

2 Design Commentary

The following show specific locations identified that require further investigation, design, or review to promote access for everyone at the bus stops.

2.1 Tactiles and bus stop platform geometry

Tactiles along the length of the bus stop platform kerb highlight the change in level down to the carriageway (a function which is also performed by the kerb itself), as shown in Figure 4. When approaching from the footpath side, there is no tactile warning of the potential hazard presented conflict with cyclists using the bus stop bypass cycleway aside from the footpath ramp between the concrete kerb and bus stop platform. A row of tactiles should, therefore, be added along the length of the bus stop platform between the concrete kerb and cycleway, particularly at the zebra crossings. The existing tactiles along the bus stop platform kerbside should be retained.

It should be noted, however, that design changes to accommodate additional tactiles should consider the use of the boarding zone. Narrowing the boarding zone will compromise its use for bus access ramps and, for example, for passengers to harness a guide dog or put a child into a pram.



Figure 4: Northbound bus stop platform

Tactiles and bus stop platform geometry	
Access principle(s):	Safe
Overall Rating	Minor
Designer response	Am cautious of putting tactiles on the ramp over the gutter as this would make it harder for people in wheel chairs and people with prams to access the bus stop platform. Preference would be tactiles along the kerbline instead because this would create less of a lip for wheel chairs. Stick on tactiles could potentially be used to test tactiles along the kerbline
Client decision	Investigate additional stick on tactiles along the kerb to test improved accessibility.
Action taken	Investigate additional tactiles along the kerb.

2.2 Crossing points aligning to rear bus doors

Crossing points are only provided aligning to the front doors of buses. Adding zebra crossings and tactiles to align with rear bus doors could be considered to make crossing the cycleway safer and more legible for all bus users and to guide people with vision impairments. Zebra markings along the length of stopped buses could also be considered to underline pedestrian priority in crossing the cycleway and queuing to board at various points along the bus stop platform.

Crossing points aligning to rear bus doors	
Access principle(s):	Safe
Overall Rating	Minor
Designer response	<p>Purpose of tactiles on the footpath is to guide passengers to the head of the bus stop which is where passengers board. Placing tactiles at the rear door would confuse blind/low vision people and could result in people trying to board from the rear door.</p> <p>Regarding a zebra crossing for the rear door the current layout complies with the guidance for bus stop bypasses which has one crossing per stop which is at the head of the stop</p>
Client decision	The bus size also varies so the back door location is inconsistent therefore the placement of the zebra crossing is in line with national guidance.
Action taken	No action required.

2.3 Cycleway and ramp widths

The cycleways narrow from 2300-2500mm to 1050mm (three red bus stop platform units) at the bus stop, as shown in Figure 2. Two types of ramp between the carriageway and kerb levels are used: a steel plate approximately 1400mm wide and plastic ramps are approximately 1200mm wide. It was observed that the taper of the horizontal change in direction required to access the first ramp in the southbound direction is

relatively steep, which in addition to the crossfall of the carriageway could cause some cyclists to lose their balance.

The narrower path will have the effect of encouraging lower speeds by people on cycles and discouraging side-by-side riding or overtaking through the bus stops, which is desirable given the potential for conflict with pedestrians/bus passengers. The width of the cycleways on the bus stop platforms and the kerb ramps are, however, too narrow to provide for a range of different cycles. Cycles such as mobility and cargo tricycles and bicycle trailers are up to 1200mm wide, meaning that the cycleway should be 1500mm wide to allow some margin for error on either side. These cycles should be accommodated to ensure ease of use for all cyclists and retain accessibility for diverse types of cycle to the entire length of the new facilities. Leaving the protected cycleways to travel around the bus stop platforms on either side could be hazardous.

It is recommended that all ramps are widened to a minimum of 1500mm. If feasible, the following changes should also be made:

- a) The cycleways on the bus stop platforms should also be widened by one unit width to 1400mm. This will be more easily achieved at the southbound bus stops, which are one unit wider in total.
- b) Changes should be made to the layout of the approach to the first ramp on the southbound bus stop to make the deviation to align to the ramp less pronounced.

Cycleway and ramp widths	
Access principle(s):	Safe
Overall Rating	Minor
Designer response	<p>Temporary plastic ramps have already been replaced with steel plate so comment a has already been addressed.</p> <p>For comment b the approach turn complies with the guidance of 10m radii. Straightening the approach angle further would require civil works which is outside of scope of transitional cycleways programme. Would be cautious of realigning the ramp because then cyclists would need to turn on the bus stop platform which provides less friction than the road surface</p>
Client decision	Agree with designer. We will aim to ensure the ramps on the bus platforms are 1500mm where feasible. Note road width constraints may result in a less than desired outcome in some instances.
Action taken	Use 1500mm ramps where possible. Investigate replacing ramps if on-going issues

2.4 Inconsistent markings

Inconsistent markings are used to communicate the need for cyclists to give way to bus passengers at the bus stop platform zebra crossings, as shown in Figure 5. The two 'up' ramps in the southbound direction feature the same green colour as the cycleways and white give way triangles on a red background, while this is missing from the equivalent plastic ramp in the northbound direction. Furthermore, the zebra markings on the northbound bus stop platform do not extend to the concrete kerb as they do in the southbound direction. All zebra markings could also be one unit wider to improve legibility. The short length and width of the zebra markings makes them difficult to recognise readily.

These inconsistencies reduce the clarity of the design and could lead to confusion and collisions. It is recommended that for the northbound bus stop platform: a) the triangle markings are added to the ramp, and b) the zebra markings are extended to the concrete kerb. For both sides of the street, it is recommended that

the zebra crossings are widened by two units to enhance the legibility of where pedestrians should cross the cycleway to board a waiting bus.



Figure 5: Different markings at the two bus stops (southbound left, northbound right)

Inconsistent markings	
Access principle(s):	Safe, Obvious
Overall Rating	Minor
Designer response	Comment a is already addressed by change in ramps. Comment b agree that for consistency the white tiles should be used to the kerb. Comment c the width of the zebra in the bus stop designs is 6 tiles or 2.3m wide and a bus front door is 2m wide so the existing width is sufficient
Client decision	Changes to ramp markings made. Agree with designer
Action taken	No additional action required.

2.5 Unnecessary down and up between southbound stops

The total length of the bus stop platform on the southbound side is approximately 60m. Over this distance, cyclists are required to ramp up to kerb level twice and back down to carriageway level twice. The grade of the ramps is suitable to slow cyclists down, but the bump and shock experienced in riding up and down the ramps is a nuisance to all cyclists and could cause some people severe discomfort. Handcyclists in particular do not have the option of lifting off the saddle to avoid shocks to their spines when going over such features.

It is acknowledged that the ideal sinusoidal profile for such a ramp is unlikely to be achieved using tactical materials. Filling in the gap between the two southbound bus stops to maintain a level path of cyclists would lessen the impact. This will also have the benefit of removing the need for the barriers/rails along the carriageway of the cycleway, which add unnecessary visual complexity and compromise legibility. The tactile difference of riding on the bus stop platform units and other design features should be enough to maintain safe speeds through the bus stops.

If additional speed reduction features prove necessary, tactile rumble strips could be used in the positions of the limit lines before the zebra crossings. Textural difference of the cycleway could also be used to strengthen the 'traffic calming' effect.

Unnecessary down and up between southbound stops	
Access principle(s):	Safe
Overall Rating	Minor
Designer response	Middle section of the bus stop bypass at road level saved on material costs which was felt to be acceptable for a temporary cycleway
Client decision	Agree with designer. This is specific to this bus stop the other bus stops will be single only. This also ensures slower cyclist speeds.
Action taken	No action required.

2.6 Slip resistance and surface textures

The slip resistance of the footpath ramp units (shown in Figure 6) was observed to be lower than the main bus stop platform units. It is recommended that these are tested for slip resistance and a treatment to increase grip applied if a deficiency is identified.

The texture of the cycleway units is the same as that of the boarding zone. It is recommended that a different texture is used for the cycleway so that it feels different from adjacent surfaces.



Figure 6: Footpath ramp lacking slip resistance (black units)

Slip resistance and surface textures	
Access principle(s):	Safe, Obvious
Overall Rating	Minor
Designer response	To consider applying slip resistant tape or similar product
Client decision	Agree with designer
Action taken	Look to add slip resistant tape along this section.

2.7 Shelter and bus stop sign

Providing a shelter and bus stop signpost on the boarding island is recommended. This will benefit all bus users, but in particular people with vision impairments and limited mobility. It can be difficult to see a bus coming and move quickly enough to signal the driver when waiting under the existing bus stop shelters or building canopies with the buses now passing further from the concrete kerb. This can be the case especially if the footpath and cycleway are crowded with people.

A bus stop sign where the bus's front doors align to helps people to position themselves for boarding and makes it easier to avoid missing buses.

Shelter and bus stop sign	
Access principle(s):	Obvious
Overall Rating	Minor
Designer response	We are using the existing bus stop sign, RTI sign board and static timetable provided at both stops. There is not enough space for a bus stop shelter in city bound direction and building canopy provides shelter from the rain
Client decision	This is out of scope of this project to add additional shelter agree with designer.
Action taken	No action required.

2.8 Audio announcements

It is recommended that audio announcements are included at the stop and on the bus letting people know the stop is next to a cycleway and that passengers need to cross to get to the bus/to the footpath, which should be done using the marked crossings.

It is also recommended that audio announcements are used to let blind and low-vision passengers know where different buses are when they are queued at the stop. It may be possible for this real-time information to be integrated into the public transport app.

Audio announcements	
Access principle(s):	Safe, Obvious
Overall Rating	Minor
Designer response	Is outside of scope for the Transitional Cycleways Programme and as would need to be implemented by Metlink who runs the buses
Client decision	Agree with designer, GWRC are investigating.
Action taken	No action required.