Delivering Interim Cycling Facilities Design Guide: A cross-disciplinary outcome

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2WALKandCYCLE Conference March 2024

EDC
Engineering Design Code

SED
Standard Engineering Details

CY0000

Cycling Infrastructure Index

SED_NO	Title
CY0000	Cycle infrastructure index
CY0001	Cycle way handrail details
CY0002	Cycle stand details
CY0003	Cycle stand details
CY0004	Cycle separator details (400mm Wide)
CY0005	Cycle separator details (600mm Wide)
CY0006	Cycle separator details (800mm Wide)

Transport Design Manual | Standard Engineering Details

Review 1
DATE: February 14, 2020

TDM TECHNICAL STANDARDS
Cycle infrastructure index

Date: Document in Review
SED No. CY0000
Version A

Auckland Cycling Facilities

Off-road Path Outside road reserve

Shared Path

Separated Path

On-carriageway

Shared Zone: Mixed Traffic, Cycle Street

Separated Zone

Cycle lane - Paint

tactical

with buffer space

with separator (interim facility)

Within road reserve

Off-carriageway

Shared Path, Pedestrian Priority Areas, Multi-use Path

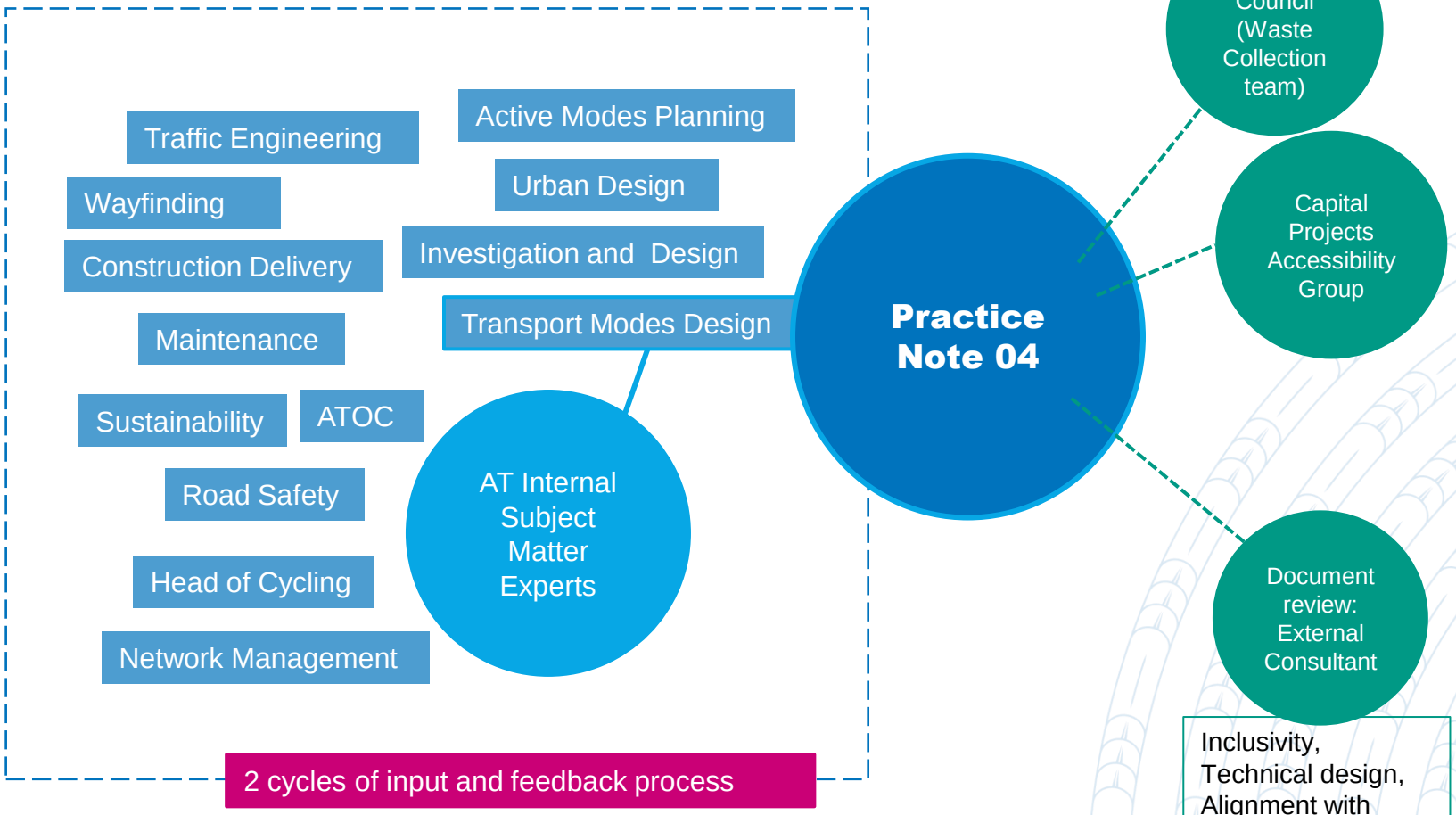
Separated Path: Cycle path

Auckland Cycling Facilities

EDC Classification

- Off-Road Paths
  - along Motorway corridor
  - through Parks
- Approve facility within the Road Reserve
  - Separated Cycleway
    - busy, fast, or heavy traffic
    - low volume and slow traffic
  - Alternatives Cycleway Departure required
    - Two-way facilities, Reduced Cycleway (min.1.3m for one direction and 2.6m for two direction), Contraflow Cycleway, Vertical Kerb.
    - Practice Note 4 – Cycling Infrastructure Interim
  - Mixed Traffic
  - Cycle streets
  - Pedestrian priority areas
  - Interim Facilities
    - Interim design (up to 15years)
    - Temporary design (up to 12 months)
- Other infrastructure Departure required
  - Buffered cycle lanes
  - Cycle lanes
  - Cycle lanes between other traffic lanes
  - Shared paths

Cross-discipline Involvement



AT Internal Stakeholders

External Stakeholders and Consultants

3.7 Interim facilities

FASTER AND RESPONSIVE DELIVERY

For all new roads, full rehabilitations or road improvements where properties are being purchased or road reserve space is available, approved facilities consistent with the Roads and Streets Framework classification are to be provided.

However, there is often a need for AT to respond to changes in the transport network or test layouts for long term projects. These faster and more responsive options are broken down into two types; interim and temporary.

- **Interim Design** – design life of up to 15 years
- **Temporary Design** – design life of up to 12 months

Interim and temporary projects have impacts on the public realm and the delivery of benefits and must be clearly scoped with agreement on long-term network planning. The concept should also be clearly communicated with key stakeholders.

Interim facilities are to be used where network planning and user safety require a facility to be installed economically in an existing road where a business case for the cost of a full approved facility cannot be made until a later improvement or major rehabilitation is programmed.

Temporary designs, including tactical urbanism, can transform a street quickly and cheaply and are perfect to test a layout ahead of a permanent project, or to make use of a space made available through other works.

Cycleways and other cycling infrastructure, whether interim or temporary, need to be considerate of streetscape, land use activity, and pedestrian environment. As such, input at the start of any project is vital from AT Urban Designers and the Auckland Council Design Office (ADO).

3.7.1 Interim facilities Design life up to 15 years

Interim cycleways have the same principles as the approved separated facilities. They are acceptable when the project street will have a significant upgrade or change within 15 years. A departure can be sought for when the main project may be more than 15 years away.

The shorter design life of interim cycle facilities means they should be delivered in lower cost materials that may contribute less to the public realm.

CONCRETE ISLAND SEPARATORS

Concrete separators are currently used in various locations in Auckland and can be a cost-effective way to deliver an interim facility e.g. Quay Street.

The approved widths for interim facilities are shown below.

TABLE 4 INTERIM FACILITY DIMENSIONS

Element	Approved Width (Minimum)
Cycle lane width	2.0m (1.5 m)
Cycle lane width (two way)	3.0 m (2.6 m)
Separator width (without parking)	0.6m (0.4m)
Separator width (next to parking)	0.8m (0.6m)

Widths above assume clearance from channels, high kerbs, planters, or other hazards next to the cycleway. Clearance (a "shy zone") is required from any hazard that may be impacted by a pedal or handlebar:

Clearance distances to be added to cycleway width:

- Kerbs higher than 70 mm: 0.2 m
- Vertical feature 150-500 mm high: 0.3 m
- Vertical feature >500 mm high: 0.5 m
- Clear from channel/catchpit, unless made suitable for cycling

Precast concrete islands of 3 m to 5 m long, at least 70 mm high on the traffic side, and maximum 70 mm on cycleway side, should be used. Drainage gaps (typical 500 mm) will be required at regular intervals to allow existing road drainage to continue to capture surface water.

Other products that may be suitable will require specific approval by the Chief Engineer.

CYCLE LANES

Buffered cycle lanes and paint-separated cycle lanes are considered to be interim facilities. They are not permitted for new streets (including full rehabilitations or reconstructions). However, if it is possible to prove they are safe, in some instances they may be appropriate, e.g.:

- Connector or Local Street typologies where traffic speeds and volumes are already low
- as a short-term measure to provide space for existing cyclists, addressing an identified issue
- as a stepping stone to higher quality facilities when budgets are available
- when proposed by or supported by the local community or advocacy groups

In all of these instances, safety is key and the principles of cycle facilities remain.

Cycle lanes are unlikely to be considered safe for all ages and abilities and as such should not be used as a trial. They are unlikely to attract new riders and may not be considered a success.

Interim Facilities components

Cycle Lane Width
Cycle lane width talks about **user dimension, opportunity of overtaking.**

TABLE 4 INTERIM FACILITY DIMENSIONS

Element	Approved Width (Minimum)
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Separator width (next to parking)	0.8m (0.6m)

Separator Width
Separator width talks about **kerbside activity, on this table for example reference made for parking activity.**

Widths above assume clearance from channels, high kerbs, planters, or other hazards next to the cycleway. Clearance (a "shy zone") is required from any hazard that may be impacted by a pedal or handlebar:

Clearance Width
Clearance width talks about **effective through route width**

Clearance distances to be added to cycleway width:

- Kerbs higher than 70 mm: 0.2 m
- Vertical feature 150-500 mm high: 0.3 m
- Vertical feature >500 mm high: 0.5 m
- Clear from channel/catchpit, unless made suitable for cycling

No further change on Horizontal Clearance

Cycle Lane Width

Minimum width requirement with condition

- **Channel is flush and made suitable for cycling**

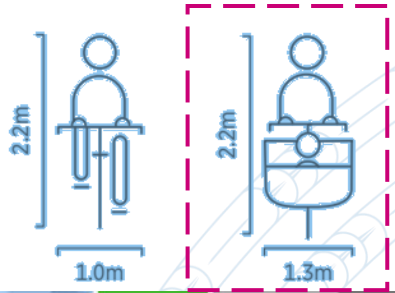
Clearance distances to be added to cycleway width:

- Kerbs higher than 70 mm: 0.2 m
- Vertical feature 150-500 mm high: 0.3 m
- Vertical feature >500 mm high: 0.5 m
- Clear from channel/catchpit, unless made suitable for cycling

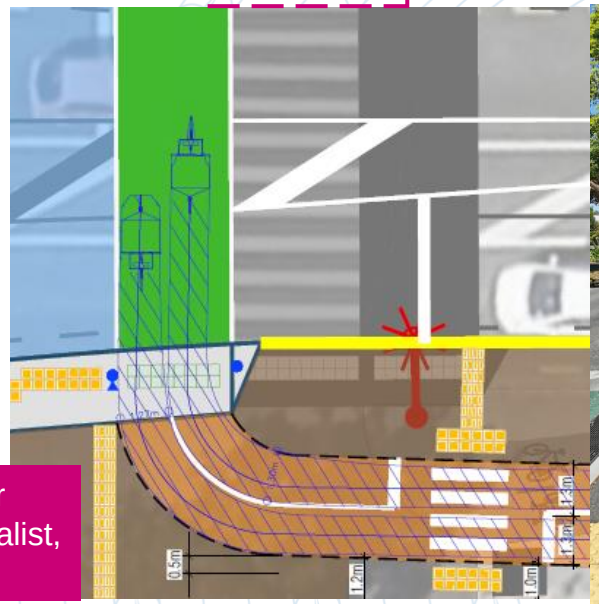
Channel should be made suitable for cycling
(flush channel and with cycle-friendly catchpits).

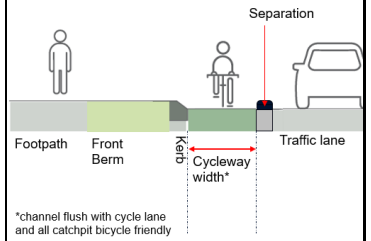
Cross-check with Stormwater and Geometric Design Specialist, and Digital Design team

- **Maintain AT Design User Dimensions**



Non-standard bike envelope as minimum user width requirement.



Minimum for constrained environment - with maximum length.	1.6m	2.6m	• Applicable only on a constrained environment for short distance (maximum 100m length). In locations such as: bridge, signal-controlled crossing, or intersection. • For existing bridges, conditions need to be checked during the design investigation. Bridges usually have a higher kerb which requires designer to consider horizontal clearance in the design. • For bus stops, kerb separation at full height to the traffic lane and delineation between the path and bus customer platform is required. PN04 section 7.1 Bus Stop Design. • Surface level across channel and seal is flush so as not to pose a hazard. • This compromised solution doesn't allow for comfortable overtaking nor side-by-side riding. Safety must be justified when selecting this width.	 PN04-3 Diagram 2: Cycleway Width in a constrained environment	

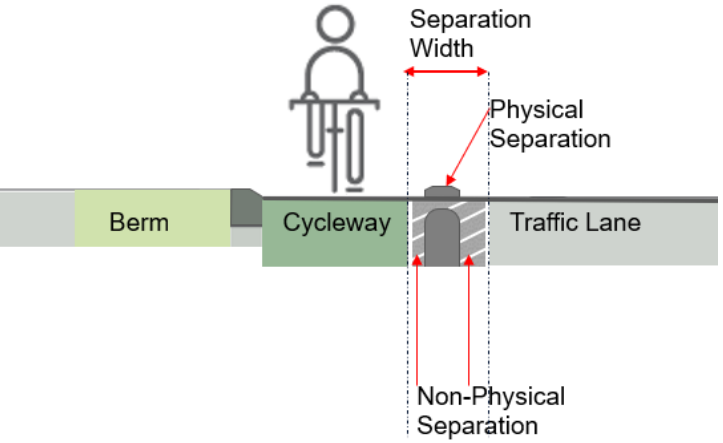
Cross-check with Traffic Ops team

Separation Width

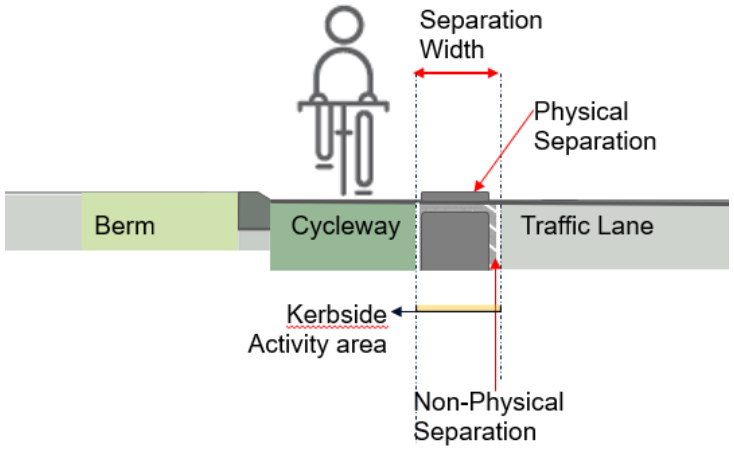
Cycleway and the carriageway

- Separation between the cycleway and the carriageway provides several functions.
- It is the safety margin between faster moving traffic and people on bikes and other kerbside elements.
- Separation width determines what it can be used for.

cycleway and the live traffic



cycleway and kerbside activity

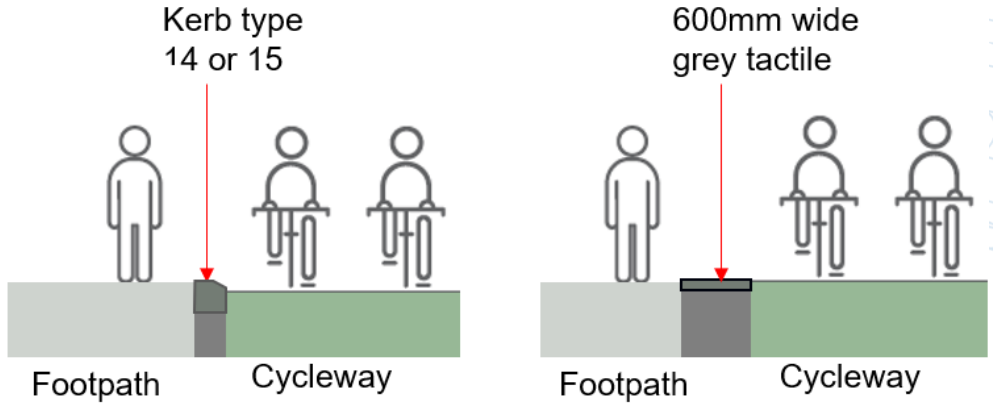


Expanded kerbside activities separation width

Cycleway and footpath (berm space)

- Separation on footpath (delineation) will encourage cycleway and footpath users to stay in their respective spaces.

cycleway and footpath space



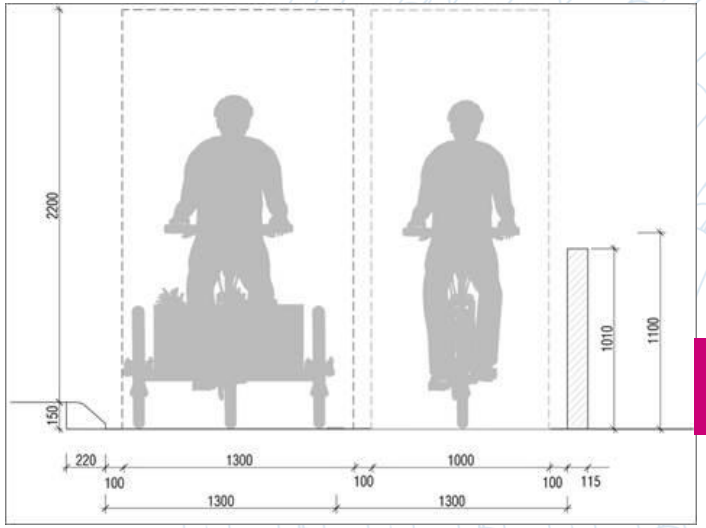
Separation width: Cycleway and Kerbside Activity

Kerb side bus platform* *Further bus stop information covered in section 7.1	1.2m (minimum) + delineation width (various between 300mm to 600mm)
Vehicle crossing ramp	0.9m (minimum)
Traffic pole, push button, signposts, wayfinding	0.85m (minimum)
Rubbish bin between separators (depends on rubbish bin. Refer to Auckland Council information)* *Further waste collection information covered in section 7.3	0.8m – 0.6m
Loading activity* *Further loading zone information covered in section 7.6	0.8m (minimum)
Kerb side parking (car door opening)	0.6m (minimum)
Note: Designer to consider separation width between the road markings (non-physical separations) and separators (physical separation) on the traffic lane side.	

Section 7.6 Loading Zone

Supporting Image

Supporting Diagram



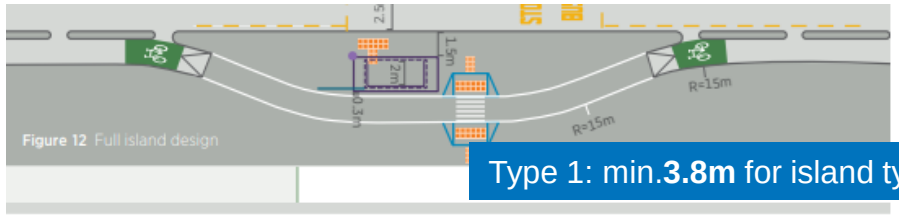
2.6m two-way

- The width (when standard bike side by side with standard bike or non-standard bike) should be sufficient to prevent the handlebar risk.

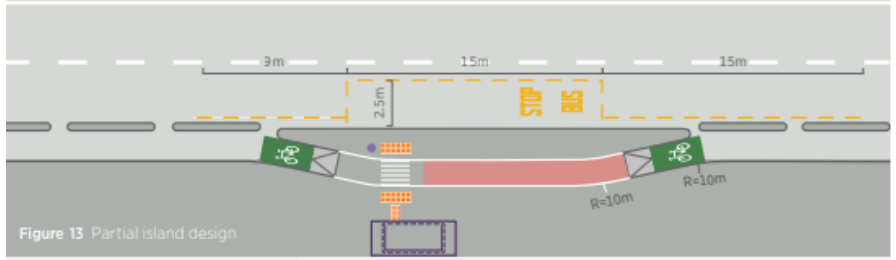
Cross-check during design and construction phase

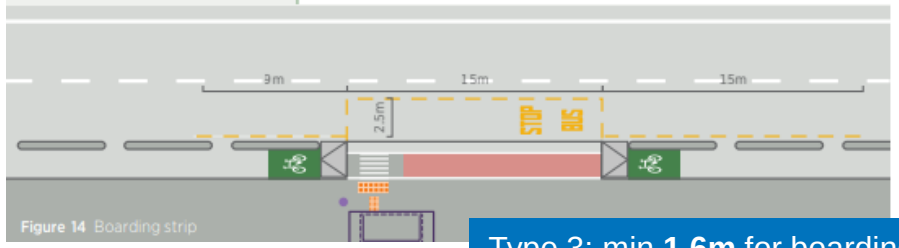
- **Bus Stop activity**

AT TDM – EDC Public Transport Bus: Bus Stop Design Typology



Type 1: min.**3.8m** for island type



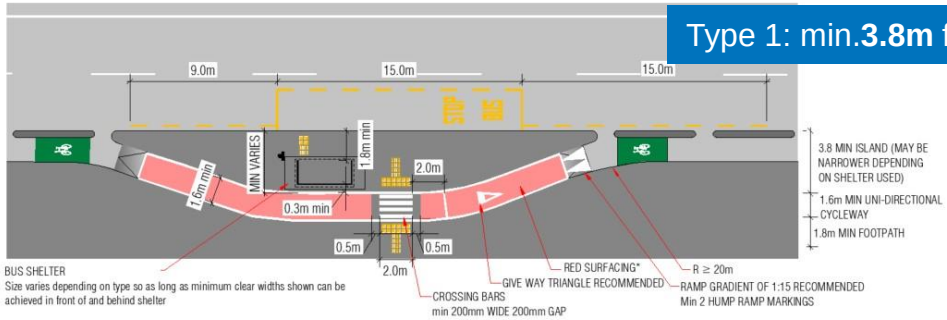


Type 3: min.**1.6m** for boarding strip

Cross-check with Public Transport Design Specialist

NZTA Multi-modal: Bus Stop and Separated Cycleway Interface

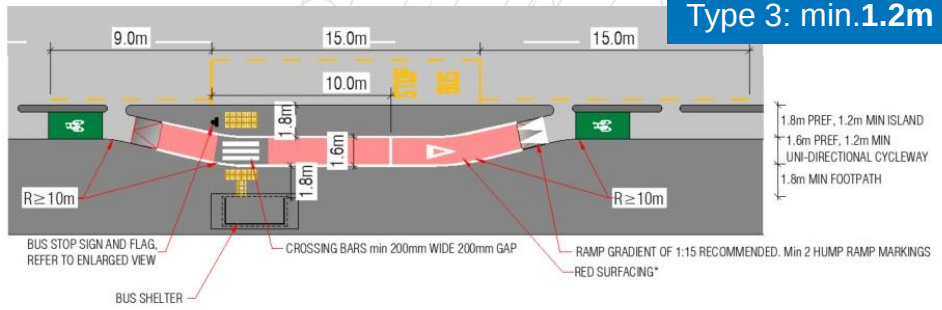
Type 1: min.**3.8m** for boarding strip



*Note: Red pavement markings across the full length of bypass is optional but recommended.
At a minimum red marking should be painted 2.0m on both sides of the pedestrian crossing and should not be painted under the pedestrian crossing bars.

FULL WIDTH ISLAND DESIGN (PREFERRED CHOICE)
To be used where buses are more frequent and have high boarding and alighting patronage
e.g. town centres and busier bus stops

Type 3: min.**1.2m** for boarding strip



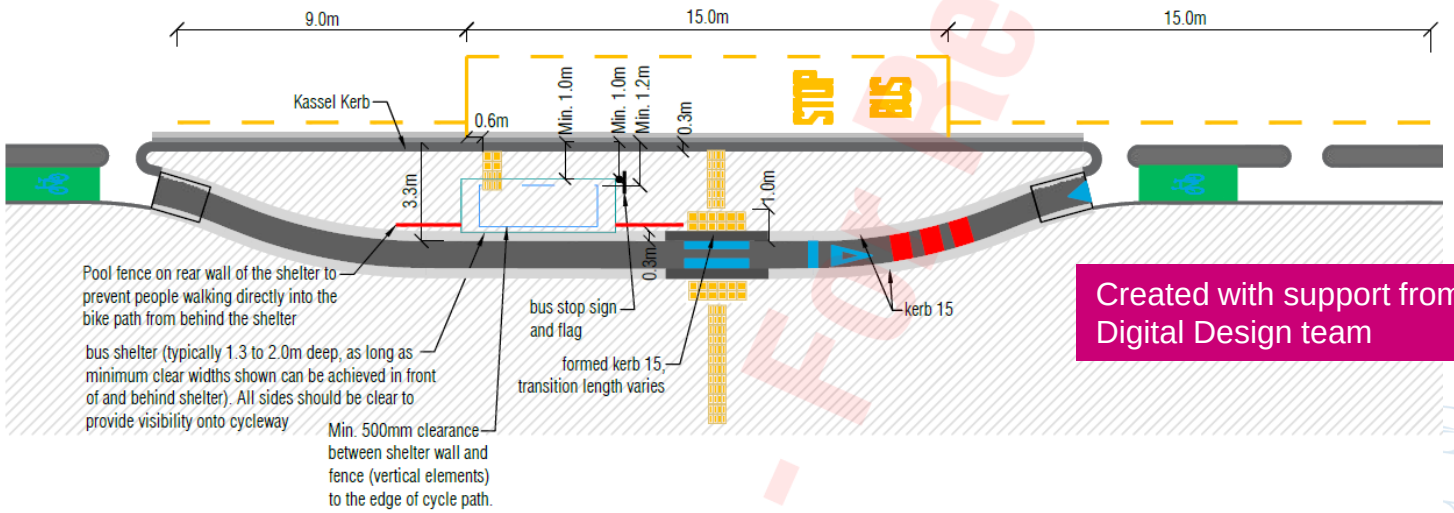
NARROW WIDTH ISLAND DESIGN
To be used where full island width cannot be accommodated.
Sightlines between the waiting area and approaching bus must not be restricted.

- Delineation – accessibility aspect, providing edging treatment.
  - Kerb 15 (level difference)
  - 600mm grey warning tactile

TYPICAL SECTION FOR DELINEATION

Input from CPAG

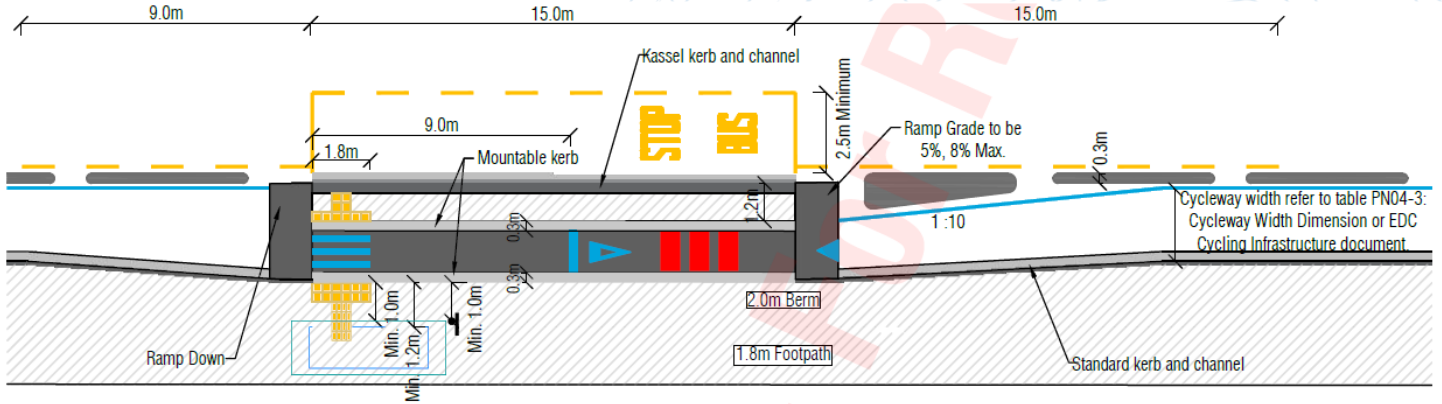
- Zebra markings – consistency marking across region.
- Change red surfacing to red strips bar – reduce paint marking requirement, sustainability and maintenance aspect. Alignment with User Behaviour Marking Guide, strip bar on approach.
- Internal drawing mark up to test minimum width. Drawing can be used on concept level to testing the Bus Stop typology.
- Updating latest AT Metro bus stop component – alignment with AT Metro.



ONE-WAY CYCLEWAY AT BUS STOP (OPTION 1 - FULL ISLAND DESIGN) WITH KERB 15 DELINEATION

Created with support from Digital Design team

Type 1: min.**3.0m** for boarding strip (exclude separation)



ONE WAY CYCLEWAY (OPTION 3 - BOARDING STRIP) WITH MOUNTABLE KERB DELINEATION

Type 3: min.**1.2m** for boarding strip (exclude separation)

Latest iteration

Introduction

Design Components

Alignment within AT internal subject matter expert.

Table of Contents

Conflict point 1: Intersection

Conflict point 2: Kerbside Activity

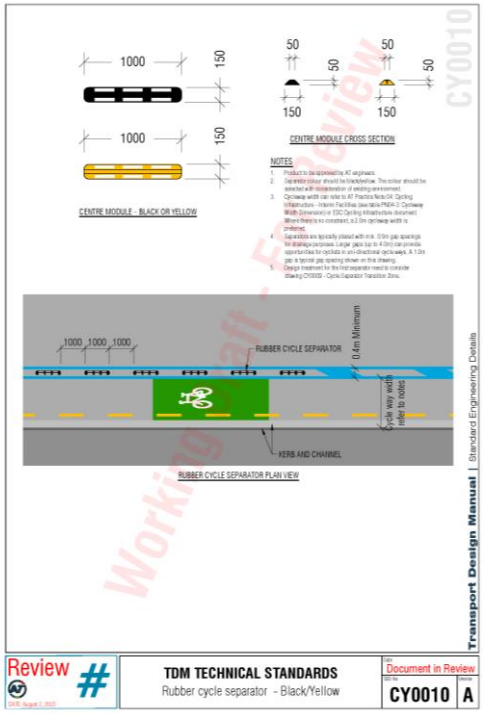
5.1.4. Type of Separation

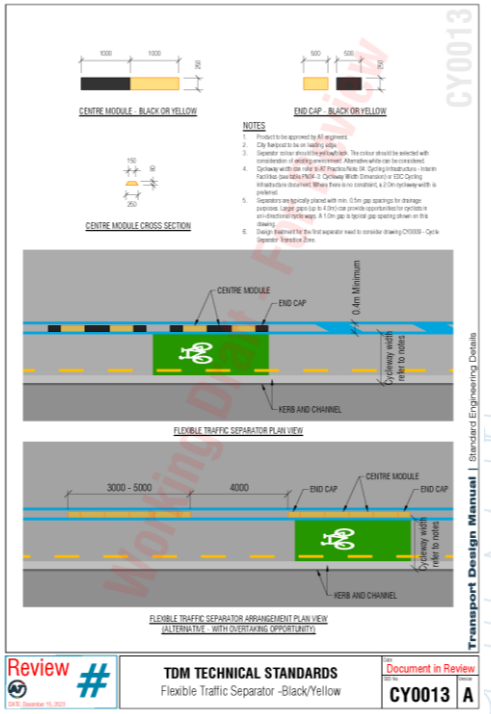
	Rubber/ Plastic Kerb Separator	Rubber Raised Separators (Flexible Traffic Separator)	Rubber Mountable Separators	Rubber Raised Separators (Modular Traffic Islands)	Precast Concrete Separators	"Copenhagen Type" Mountable / Concrete Kerb Separators
						
Design Period	0-1 years	0-5 year	5-10 years	5-10 years	Up to 15 years	Up to 15 years
Note	*(see note 4)*	*(see note 4)*	Use for Driveway Treatments		*(see note 5 and 6)*	By Departure from Standards process only. Departure required on the basis that there is no separation width to carriageway. *(see note 7, 8, and 9).*
Length	1-2m	1m module can be formed to 3-5m	*(Depending on the driveway length)*	2-5m	2-5m	-
Width	150 – 160mm	200 – 250mm	400 – 900mm	500mm	300 – 800 mm	150 – 300mm
Height	50 mm	50 – 100mm	50 – 75mm	130 mm	120mm 150mm	65 mm
Vertical Elements	Narrow separator width might require vertical elements (flexi post) on top of the separators as a combination.		-	On the first separator after intersection or long gap		-
Colour	Black and/or yellow	- Black and/or yellow - White or Grey can be an option if considered safe.	Black and yellow	Grey or red islands with white edge paint. RRPMs.	All concrete separator edges (or minimum leading edges) to be pre-painted with reflectorized white paint.	Concrete colour.
Drawing Number SED	CY0010, CY0011	CY0012, CY0013, CY0014	CY0015	CY0016	CY0004, CY0005, CY0006, CY0007	NA
Environment	Requires consideration of SW devices for micro plastics				Preferred material	

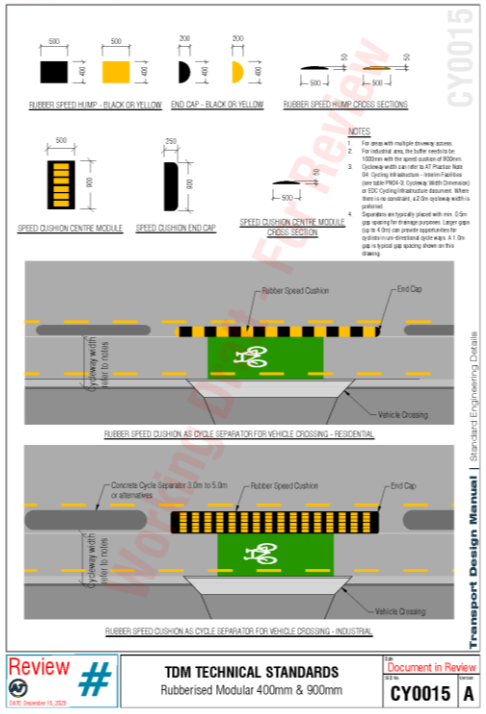
Cross-check with Sustainability Team

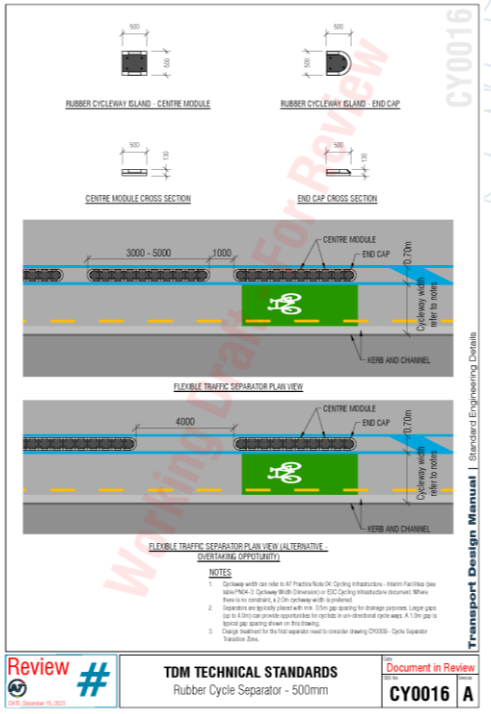
Alternative material, such as recycled glass may be used with the approval of Auckland Transport Chief Engineer and Chief Scientist.

Plastic and Rubber needs adequate stormwater to prevent microplastics from entering and polluting the ecosystem.









snip of 5.2 General Design

Raised Platform

Channels need to be avoided through raised platform. Project scopes sometimes not accounted for changing kerbs or catchpit position which can be seen as a great interim compromise. However, 20-30% grade change through the channel can be hazard for faster moving wheeled users, especially less able ones. Stormwater assessment should be checked when considering raised entry treatments and drainage catch pit locations should be noted at concept design investigation.

Aco Kerb

Cycle-friendly catchpit

Figure 19: Example of catch pits at raised safety platform
(Source: Auckland Transport)

5.2.5 Road Pavement

Cycleway on carriageway

Project teams should check at the outset for alignment opportunities with planned renewals or other planned works such as stormwater separation. If the existing road surface is inacceptable condition, it will not usually be resurfaced as part of the cycle facility installation. This includes chipseal roads, where the existing surface will be accepted as part of cycleway delivery. Asphalt surfacing is preferred where resurfacing is required. Asphalt should be flush or slightly above (generally <5mm) channel lip level to ensure positive water flow plus construction tolerance. This aligns with NZTA M10:2020 cl 10.1. See EDC Cycling Infrastructure Section 8.4. guideline asphalt surfacing for all new cycling infrastructure.

Cycleway on berm space

To enhance the separation between the footpath and cycleway, the cycleway should normally be darker in tone than the footpath. The cycleway material (darker colour) should have a 30% luminance contrast to the footpath material (lighter colour). Using the approved surface types for the footpath (concrete) and cycleway (asphalt) will assure this colour difference. The use of other materials for the surface requires a Departure from Standards.

- Cycle path – Asphalt: 40mm DG10 asphaltic Concrete with 200mm granular basecourse as per FP0003 Heavy Duty Asphalt Footpath
- Cycle path – Concrete: 150mm thickness with 20 Mpa concrete from a registered manufacture as per FP0001 Heavy Duty Concrete Footpath and using 8% Black Oxide. If heavy vehicles need to use part of the concrete cycle path, a 30 Mpa concrete can be considered through Departure from Standards process. It needs a Departure on the basis that 30MPa concrete has higher carbon content.
- Where mountable kerb is used along the cycleway, designer must consider Heavy Duty specifications.

Cross-document reference

snip of 6.1 Signalised Intersections

6.2.4 Jug handle on signalised intersection

Where cyclists need to access a crossing facility to make a turn, usually of around 90 degrees, this arrangement is known as a `jug handle' turn. A jug handle can be installed to allow a right turning cyclist on T-intersection to wait out of the path of the straight-ahead cyclists. Jug handle signal will give a green phase at the same time as the pedestrian crossing, a separate push button is needed for cyclist. Design treatment such as darker surface material and kerb edging (jug handle can maintain the same level with road or have a slight transition ramp to manage the level difference between berm and road) should be provided. Jug handle space take up front berm space as a dedicated waiting space for cyclist, which creates delineation between pedestrian and people on bikes.

Figure 24: Jug handles provide waiting space for cyclist turning right on T-Intersection of Tamaki Dr and Ngapipi Rd
(Source: Auckland Transport)

Alternatively, if cycleway arrangements have wide separator width (minimum is 1.3m), a waiting space can be formed on the gap between the separator for the right turning cycle signal.

Figure 25: Separator gap waiting space for cyclist turning right on T-Intersection of Karangahape Rd and Howe St
(Source: Auckland Transport)

Recap

The Practice Notes is substantial addition to the existing Auckland Transport Cycling Infrastructure Engineering Design Code.

73 pages

+

Auckland Transport

Practice Note 04

Cycling Infrastructure - Interim Facilities

DRAFT

Supplement of Engineering Design Code – Cycling Infrastructure
03 Approved facilities within the road reserve
3.7 Interim Facilities
Edition 1, March 2024

Practice Note 04: Cycling Infrastructure – Interim Facilities
March 2024
Pg 1 of 56

55 pages

+

CY0000

Cycling Infrastructure Index

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Transport Design Manual | Standard Engineering Details

Review 1
DATE: December 15, 2023

TDM TECHNICAL STANDARDS
Cycle infrastructure index

Date: Document in Review

27 drawings

Recap

Cross-disciplinary outcome

1. **The intention is always to try create a balanced outcome within modes, other road activities/elements.**
2. **Developed on the basis of experience, lesson learned, and looking at good practice through a wide-spread internal consultation with AT subject matter expert.**
3. **The priority has been on:**

- **Cycle lane width**
- **Separation width**
- **Separation type**
- **Other supporting information from other subject matter expert**

4. **A final review by management is expected, with publication anticipated by mid-year or sooner.**
5. **This will be a dynamic document which can be updated online to reflect any required improvement.**

Thank you!

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