Junction Design and the Cycle Design Manual

Presented by
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TII Standards Road Show May 1st and 2nd 2024

Introduction

Frequent reasons Designs require resubmission/or are refused

Roundabouts

Retrofit safety issues

T-junction

Need to go further

Transition

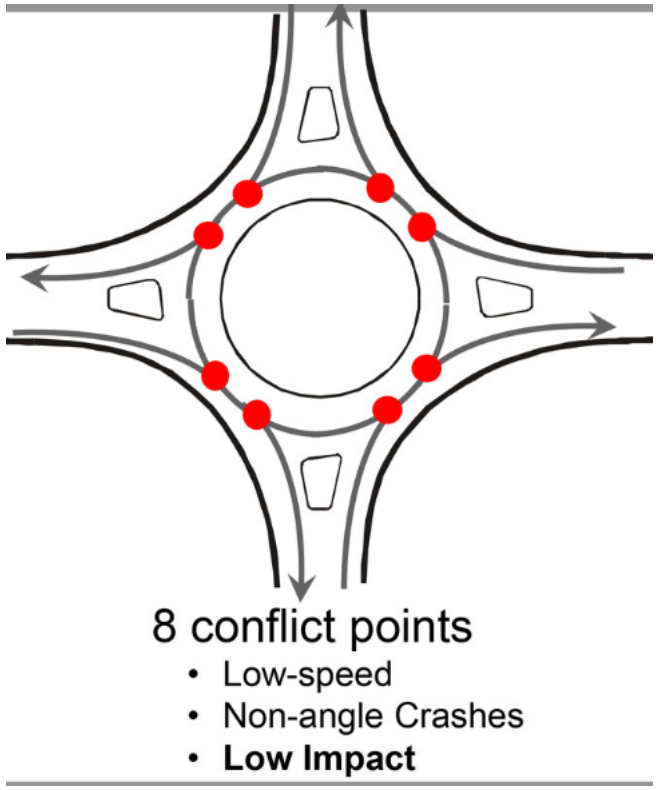
Safety risks

Signalised Junction

- Designing for cyclists

Roundabouts – Active Travel retrofit

- Existing roundabout – e.g. 8 conflict points
- Cycling Design Manual – Options
- Some problems observed by TII
- Operating within Safe Limits?
- TII Statement of Strategy



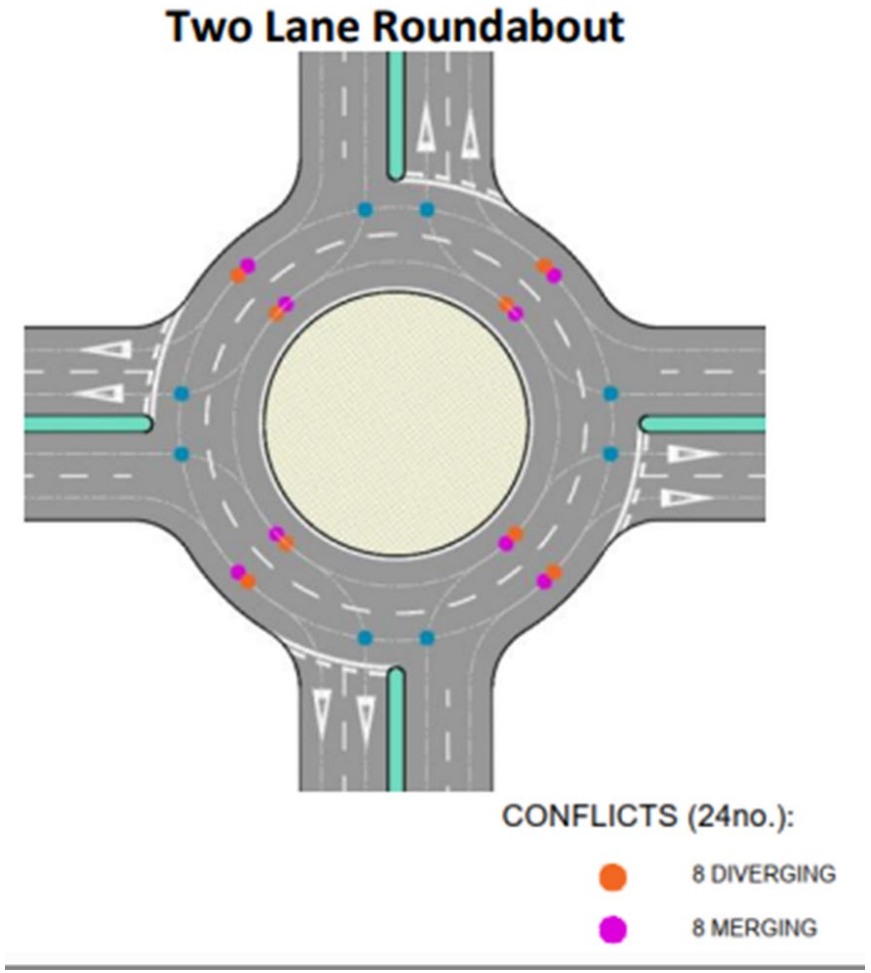
NTA
Údarás Náisiúnta Iompair
National Transport Authority

An Roinn Iompair
Department of Transport

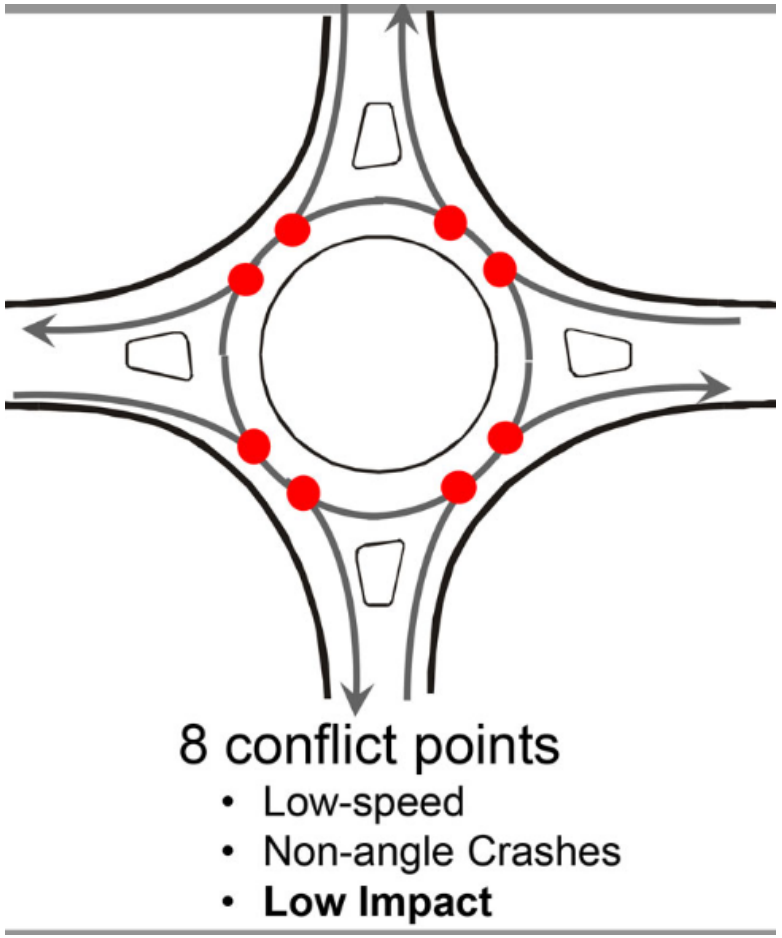
Cycle Design Manual

September 2023

- Single Lane entry/exit when walking and cycling routes cross/interact with roundabout?

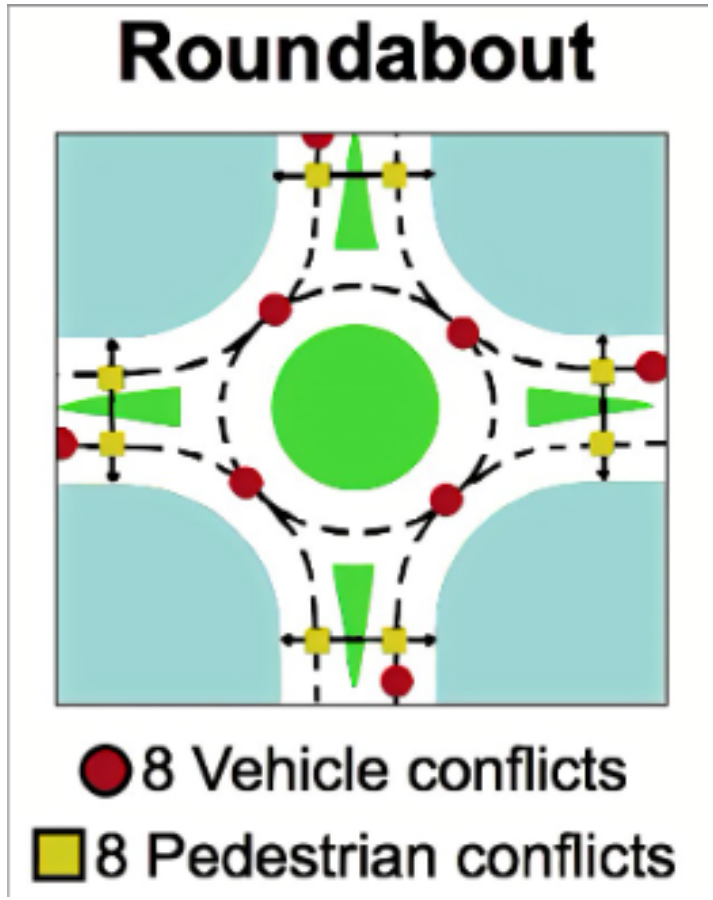


40,000 AADF



< 25,000 AADF

Roundabout: When uncontrolled pedestrian crossing added to each arm?



Adding cycle lanes/routes?

Roundabouts with double entry/exist lanes

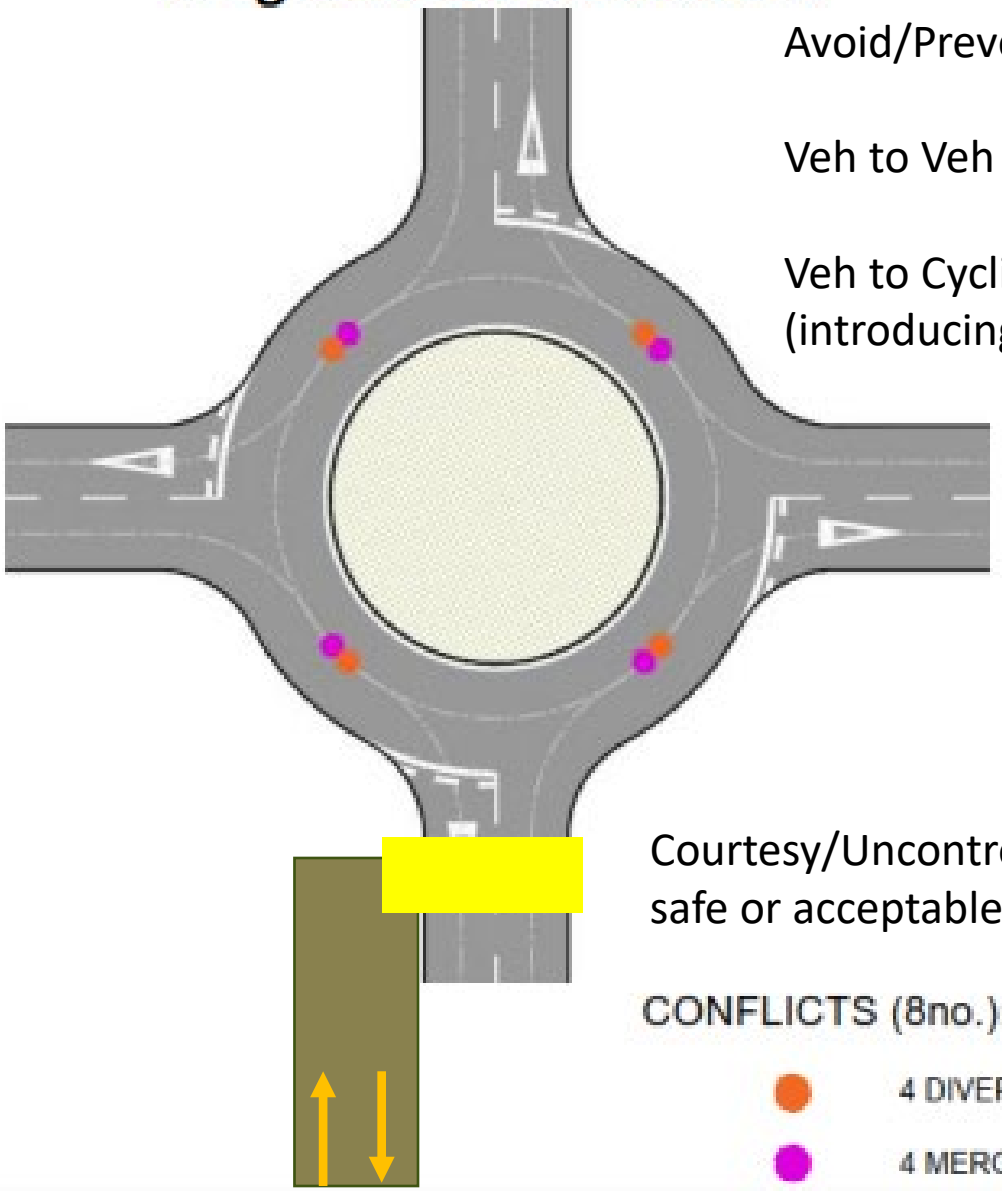
24 vehicle

16 Pedestrian (with uncontrolled crossings) Cyclists ++++ (depends on Design)

Roundabout: When a two-way or shared segregated facility added to an urban street?

- Facility terminated at a pedestrian crossing
- Roundabout is not treated
- How do cyclists navigate their route?
- Is it all shared space?
- How many conflict points added to the roundabout?
- Will it operate within Safe Limits?
- What collision type will follow?

Single Lane Roundabout



Avoid/Prevent new conflict points

Veh to Veh 8 (24)

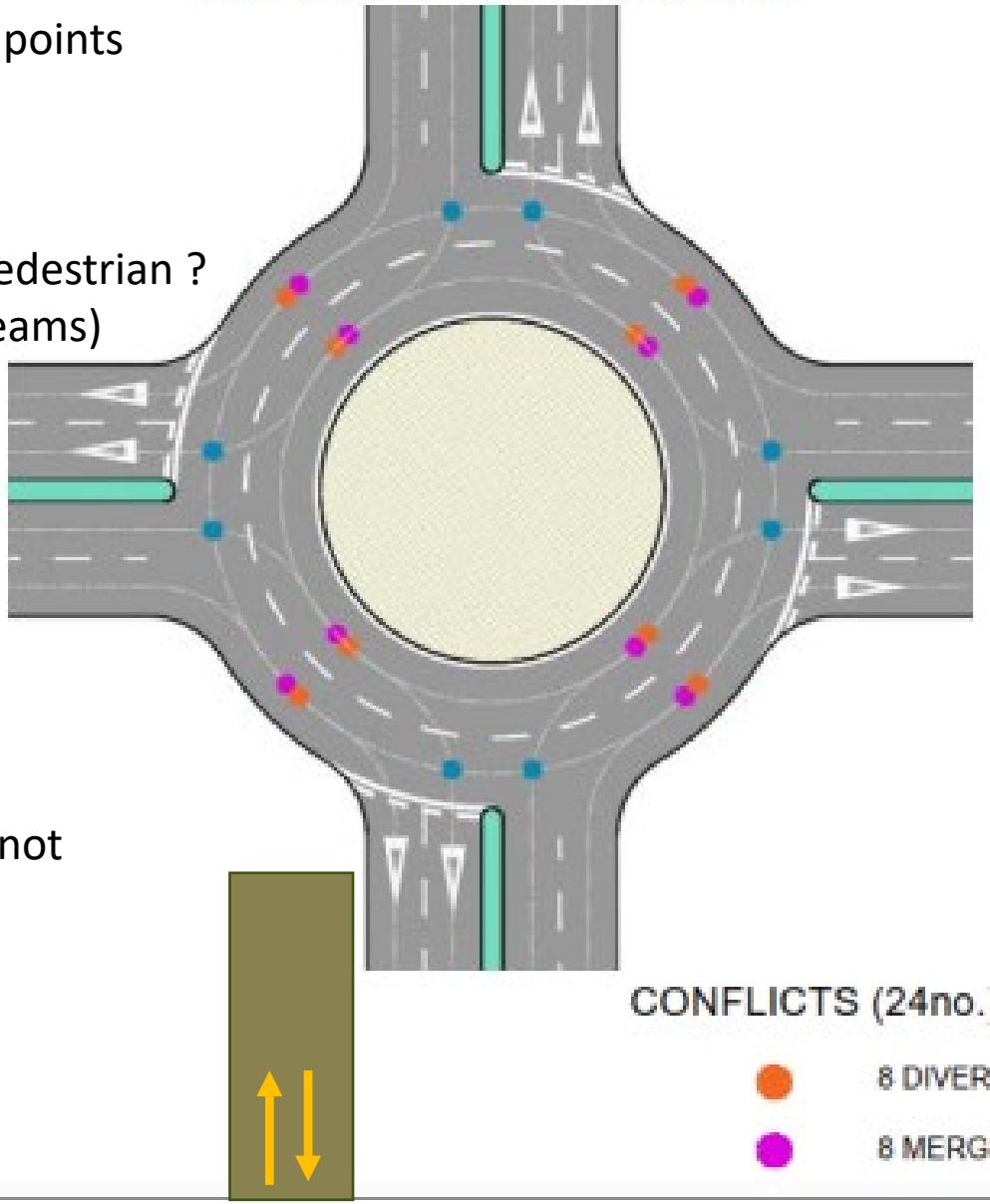
Veh to Cyclist & Cyclist to pedestrian ?
(introducing new traffic streams)

Courtesy/Uncontrolled crossing is not safe or acceptable on NRN

CONFLICTS (8no.):

- 4 DIVERGING
- 4 MERGING

Two Lane Roundabout

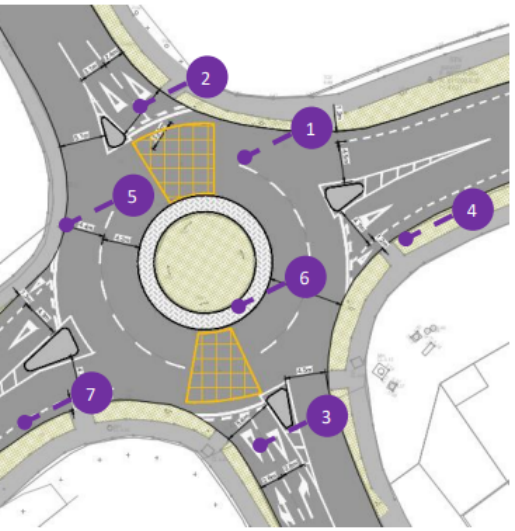


CONFLICTS (24no.):

- 8 DIVERGING
- 8 MERGING

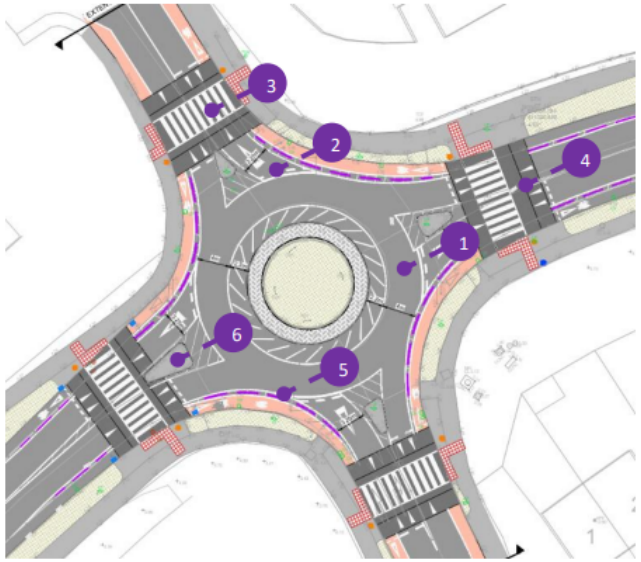
See CDM and Roundabout Retrofit Guidelines.

Existing Roundabout Arrangement



isting arrangement:
wo lane circulatory lanes
pproach lanes
ane entries
rolled pedestrian crossings
footpath width
overrun area
y cycle lanes (road marking) on major arms,
mixed with other traffic at the roundabout
ke not possible/requirement to work within road
ries

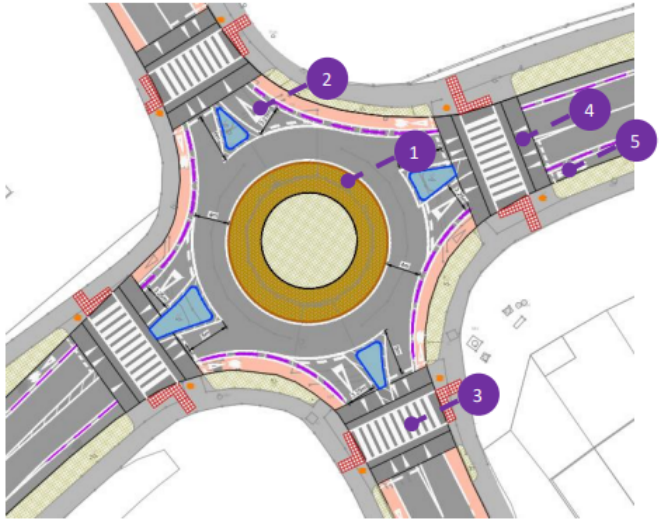
Level 1
Rapid build interim measures



Summary of interventions:

1. Narrowing of circulatory lane (ribbed road markings to minimise drainage impacts at overrun area).
2. Approach lane widths reduced, Multi lane entries removed
3. Zebra Crossing with raised table, set back 5.0m from circulatory carriageway
4. Raised tables to reduce vehicular speeds
5. Segregated cycle Lanes (kerb with gaps to minimise drainage impacts)
6. Existing traffic islands retained to minimise works to existing street lighting

Level 2
Rapid build permanent measures



Summary of interventions:

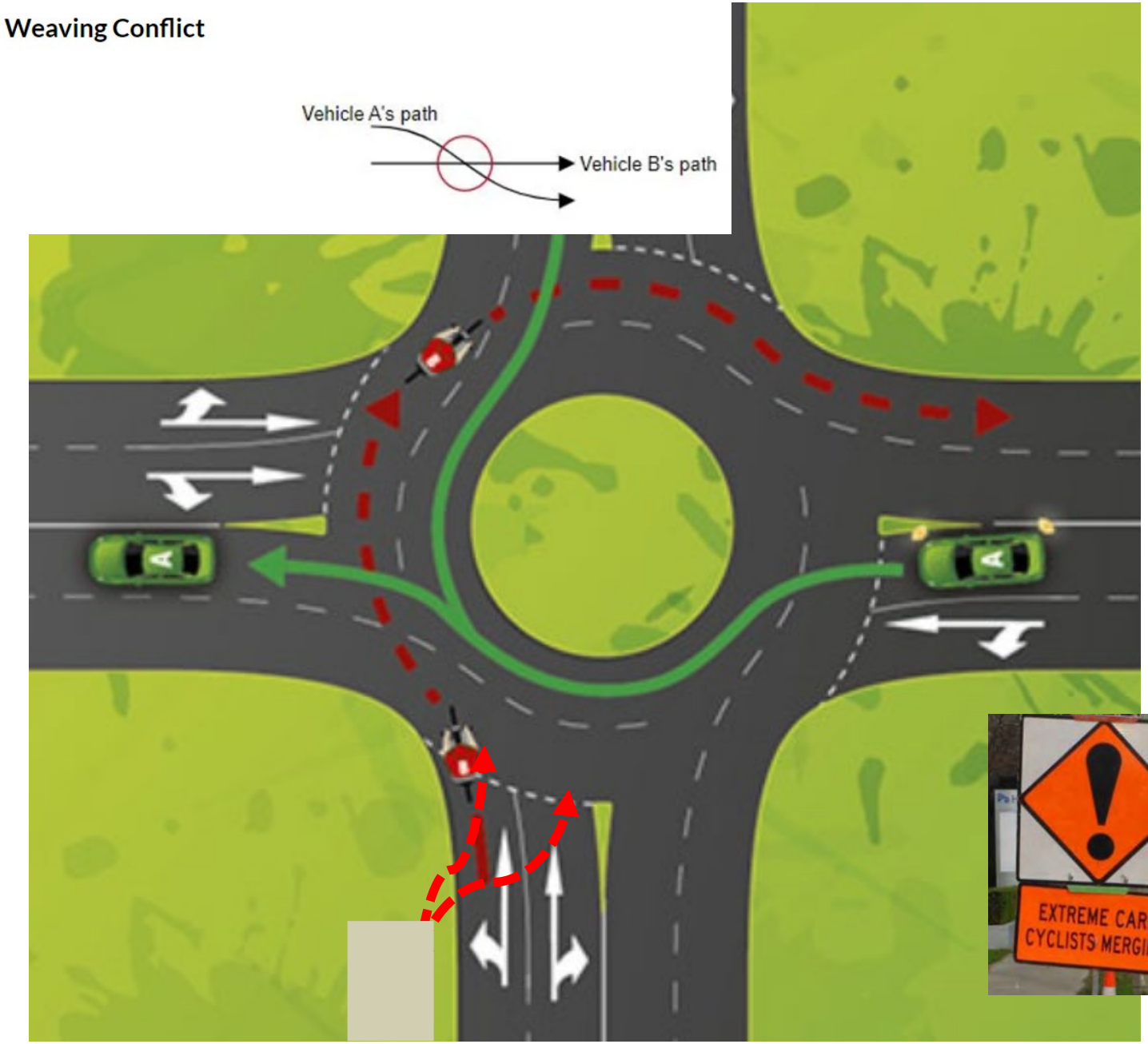
1. Narrowing of circulatory lane (concrete overrun area).
2. Approach lane widths reduced, Multi lane entries removed
3. Zebra Crossing with raised table, set back 5.0m
4. Raised tables to reduce vehicular speeds
5. Segregated cycle lanes (kerb with gaps to minimise drainage impacts)

Level 3
Full redesign

Summary of interventions:

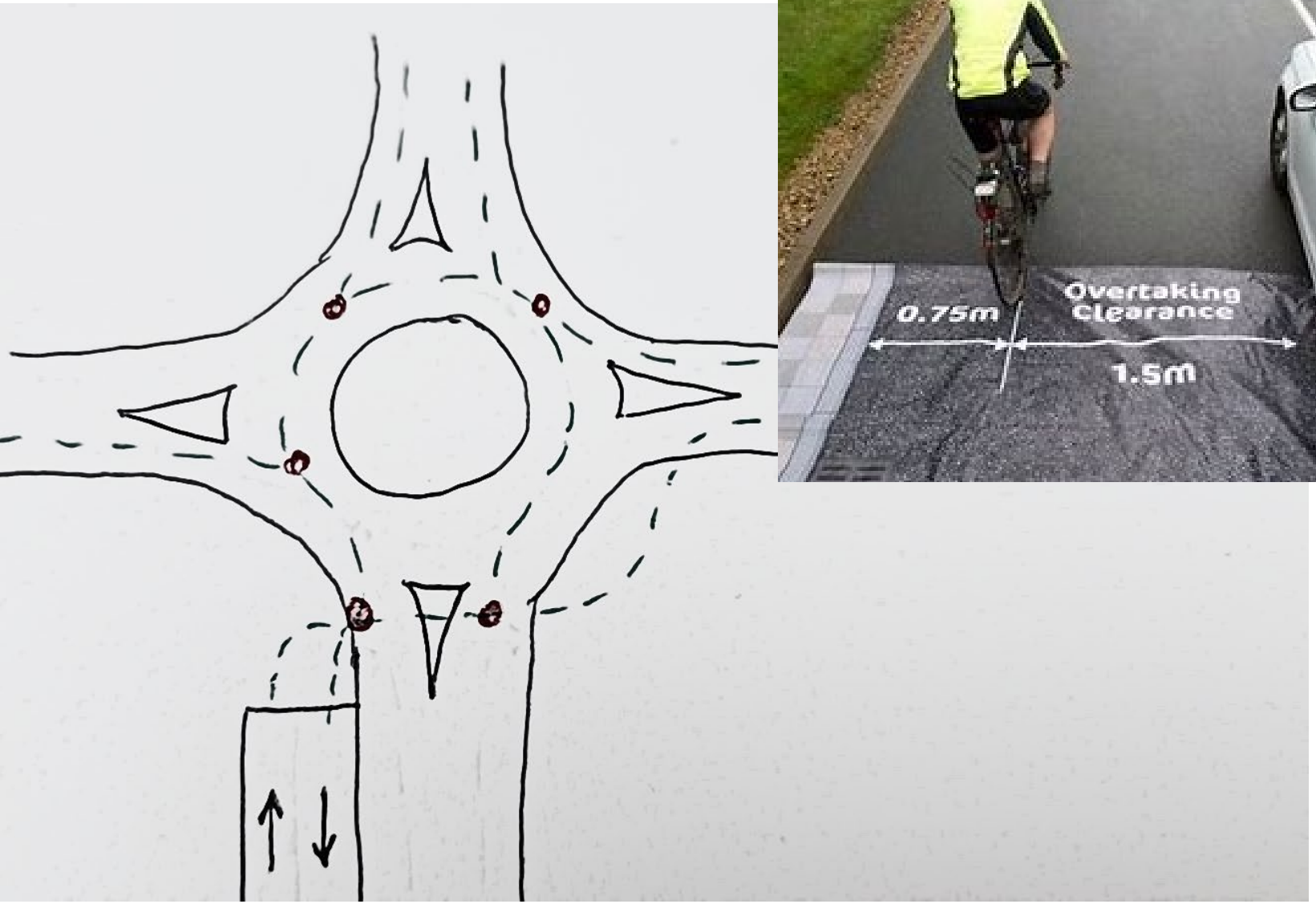
1. Narrowing of circulatory lane (concrete overrun area)
2. Approach lane widths reduced, Multi lane entries removed
3. Raised controlled pedestrian zebra crossing followed by parallel cycle zebra crossing on major arms (Zebra Crossing with raised table)
4. Segregated cycle tracks
5. SUDS / public realm greening opportunities.

Weaving Conflict



Ending at a Roundabout

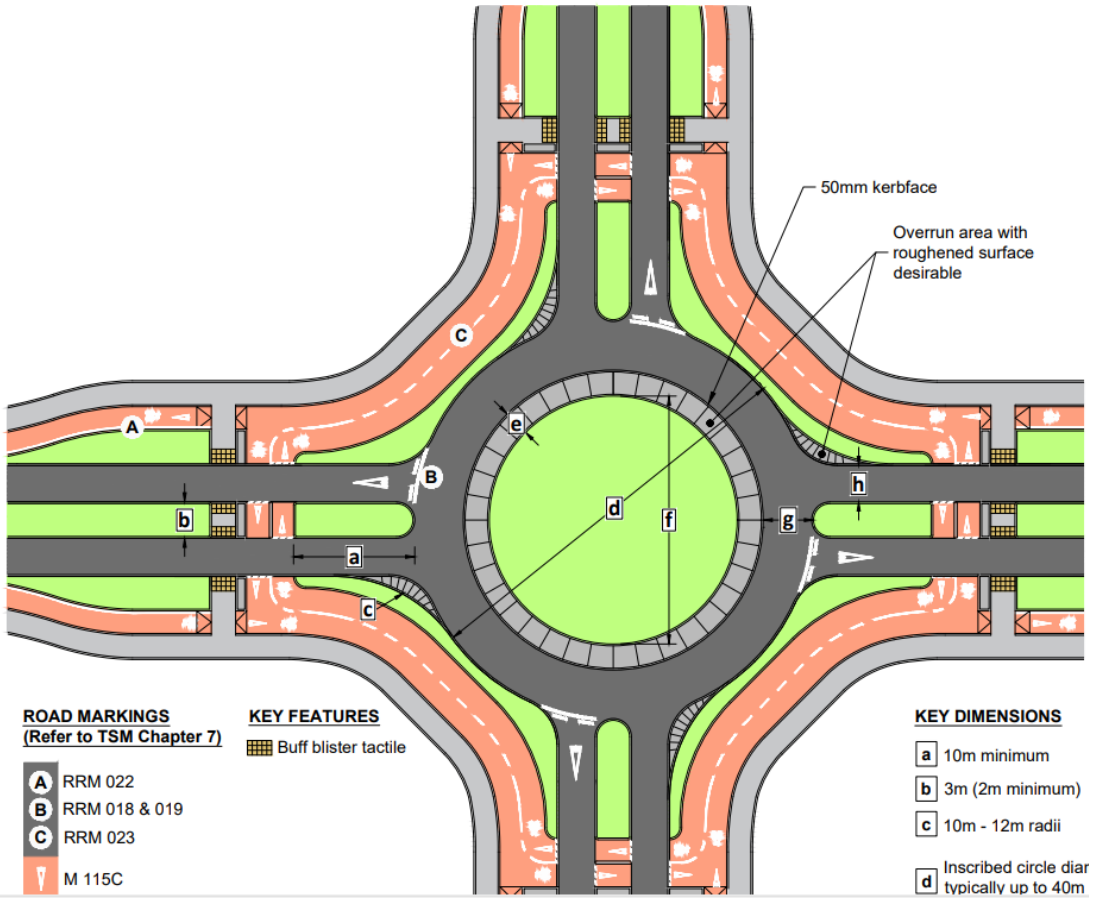
- Drivers approach roundabout - action expected is get in correct lane.
- Cyclist merge from the left (By Design).
- Cyclists at high risk of vehicle conflict.
- How do cyclists cross to/from ?
- Does the cycle route end here? What was planned?



0.75m
Overtaking
Clearance
1.5m

High Speed/Rural

TL702 Protected Roundabout without Cycle Priority



Low Speed/Urban

TL701 Protected Roundabout with Cycle Priority

Cyclist perspective view approaching roudabout

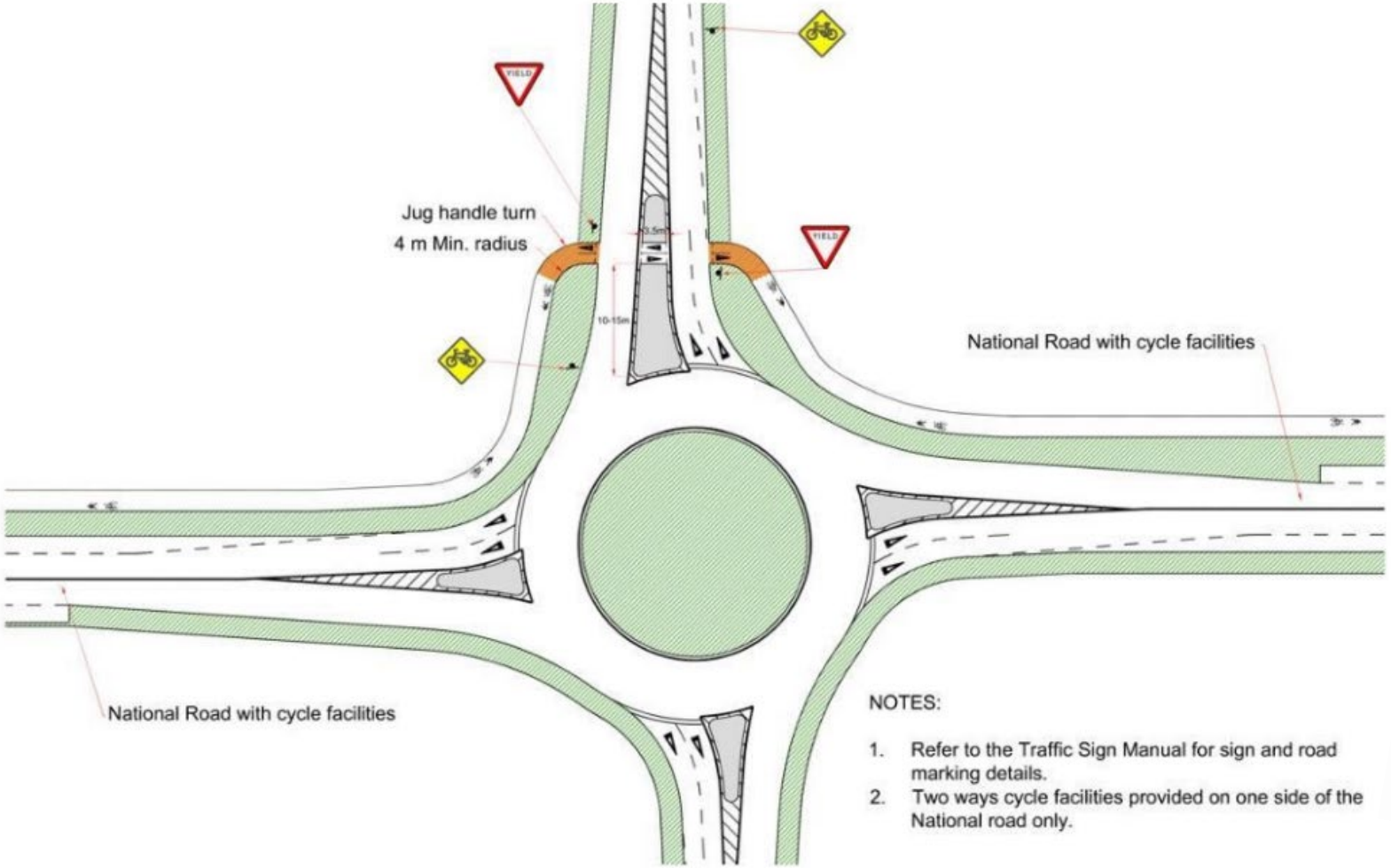
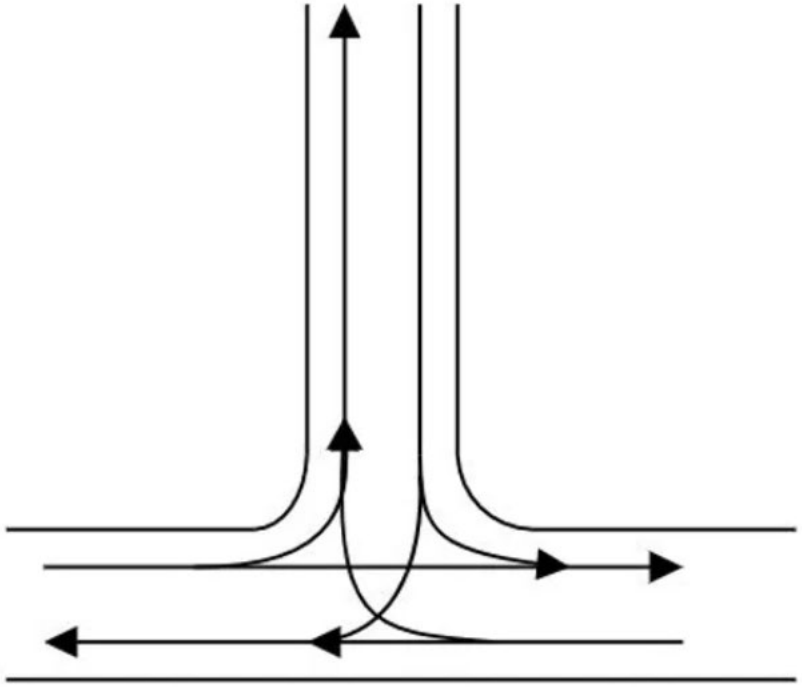
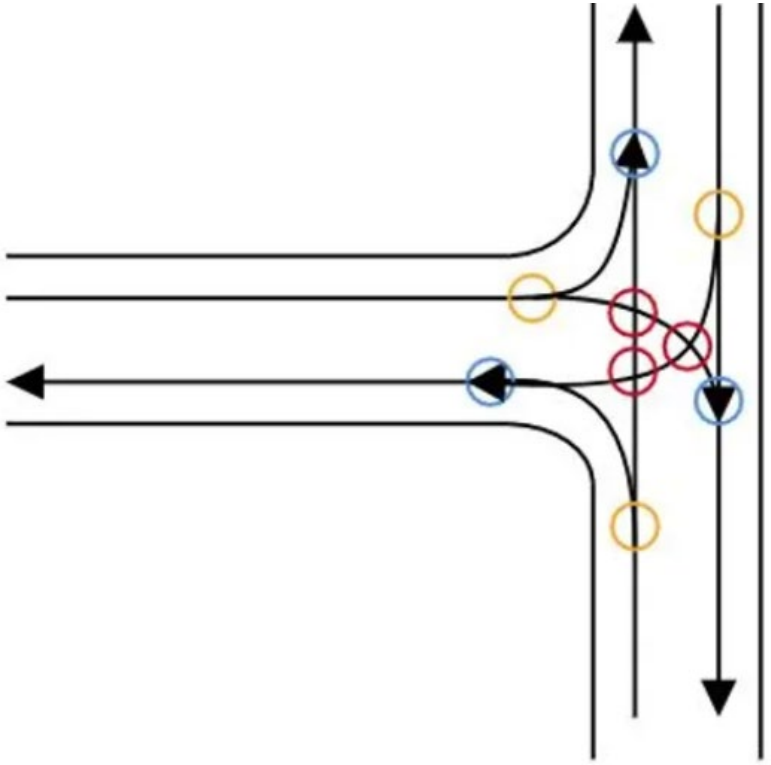


Figure 7.5 Roundabout Junction

T-Junction – Adding and Active travel route

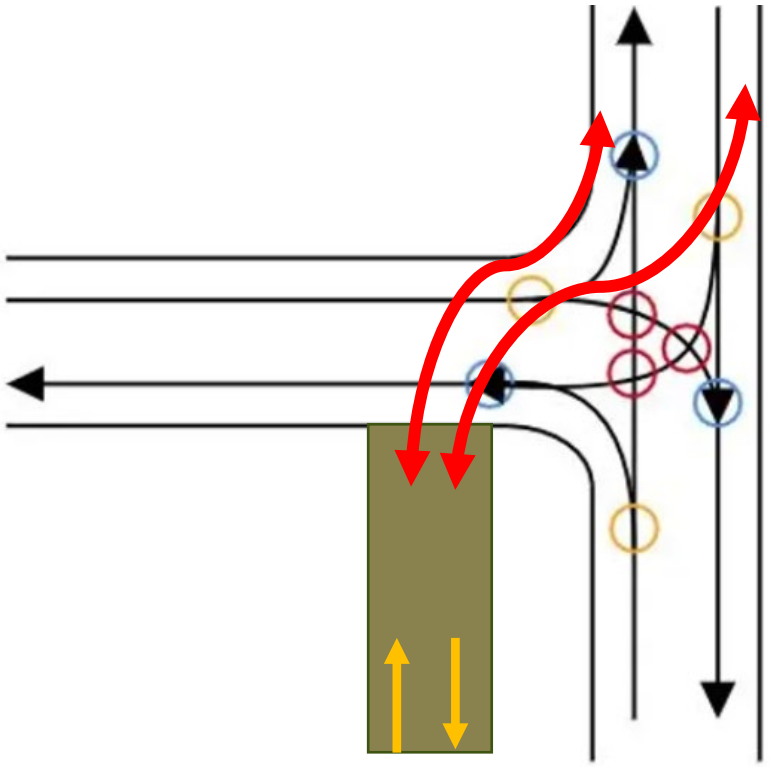




?

END A CYCLE FACILITY OR SHARED FACILITY HERE?

T-Junction



THIS CREATES CONFLICTS ON APPROACH TO THE STOP LINE

THIS CREATES A PERMANENT CROSSING DEMAND TO/FROM THE FACILITY AT A CONFLICT POINT ON A NETWORK

USER INTER VISIBILITY??

CYCLIST LOOKING OVER SHOULDER ??

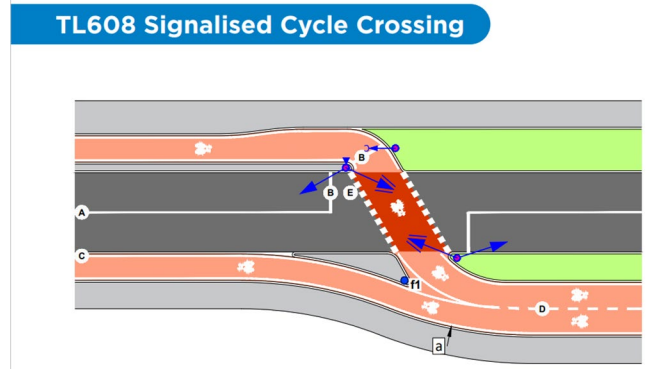
T-Junction (not a safe transition or terminal) URBAN

Part A (Crossing the minor road)

Part B (Crossing the Major Road and transition)

- Cyclists leaving an off-carriageway facility to re-join the carriageway at risk of conflict with motor traffic due to merge manoeuvre.
- The merge should be designed so that cyclists do not need to give way to general traffic and are physically protected until safely established on their new alignment.
- Collision - Reduce

the risk of cyclists being struck by motor traffic from behind.



T-Junction (not a safe transition or terminal) RURAL

Part A (Crossing the minor road)

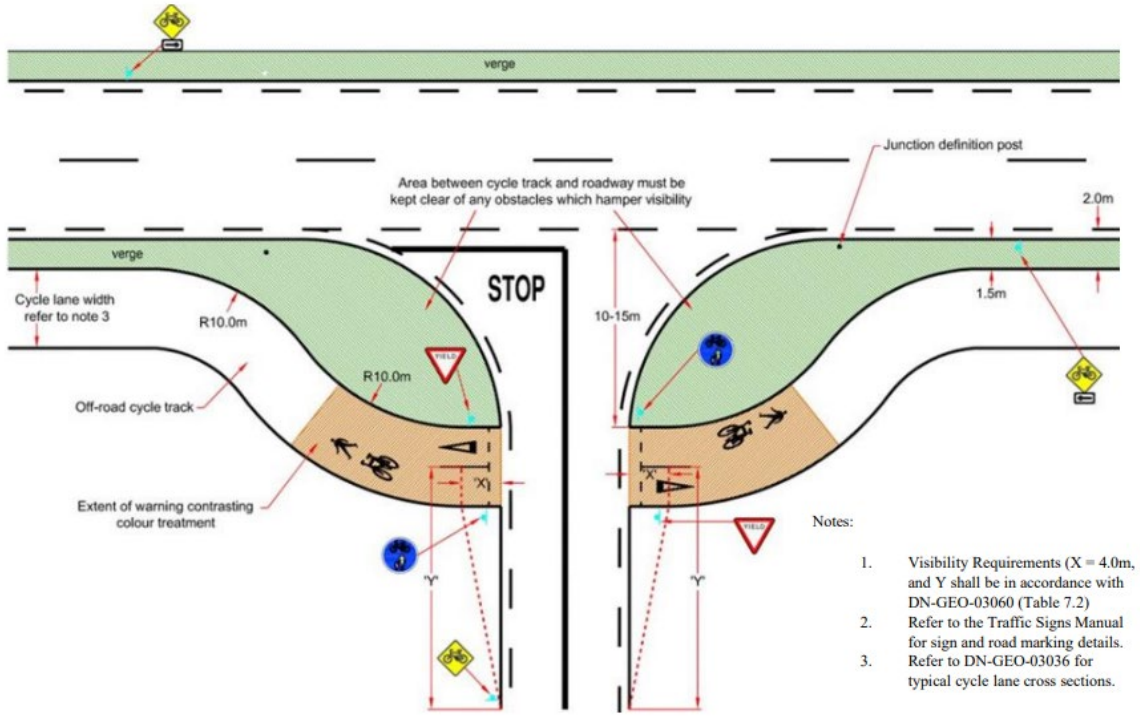
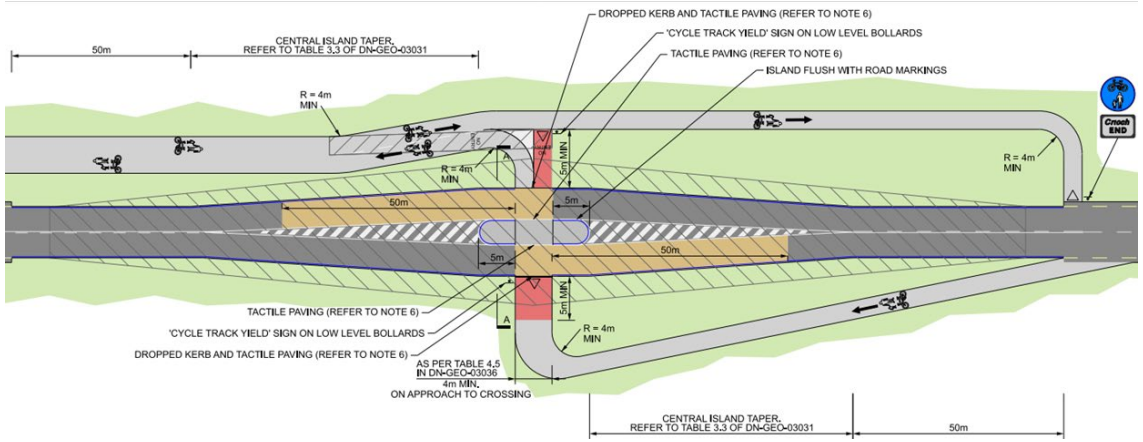


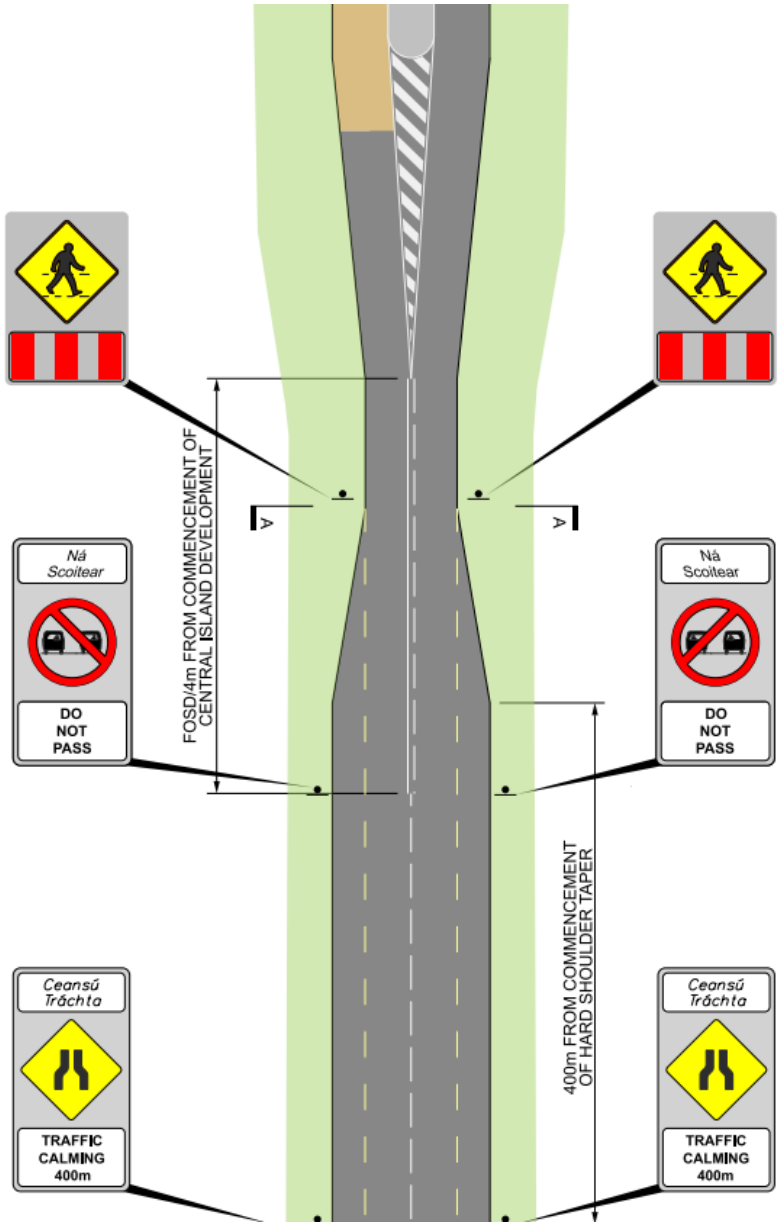
Figure 7.2 Bend Out Crossing (minor road AADT <4,000)

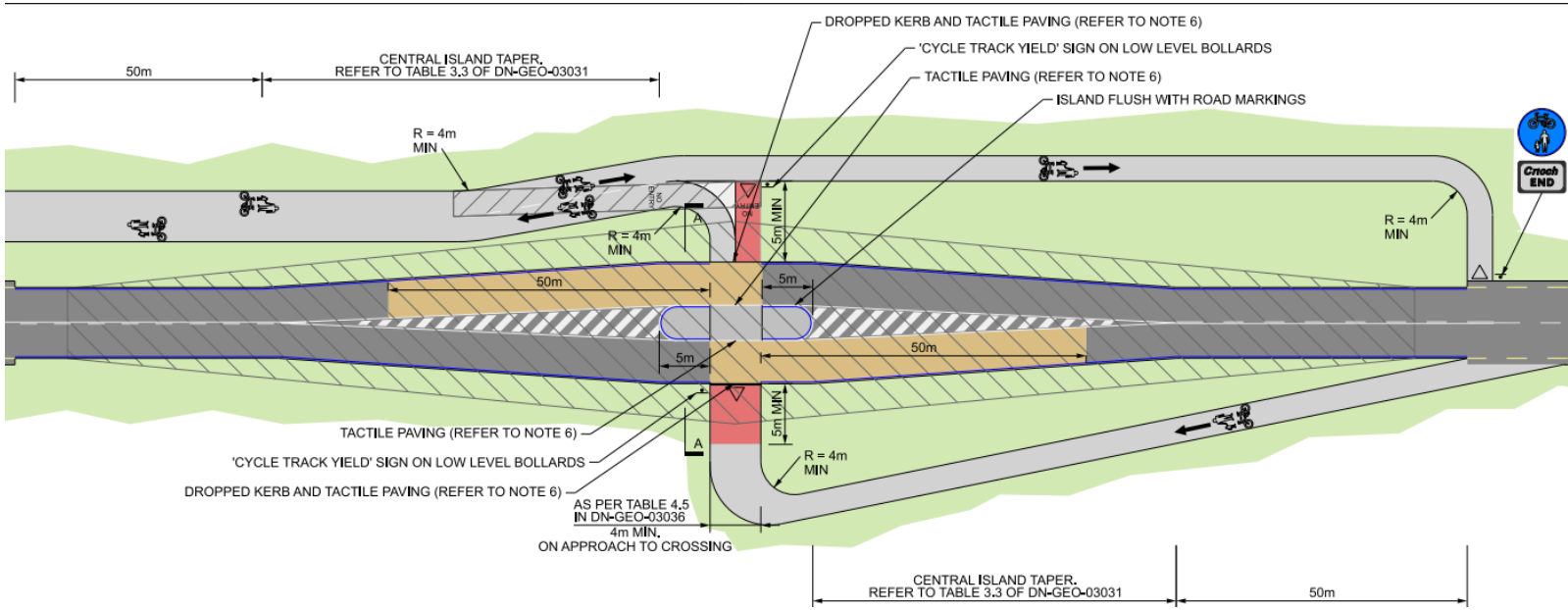
Part B (Crossing the Major Road and transition)



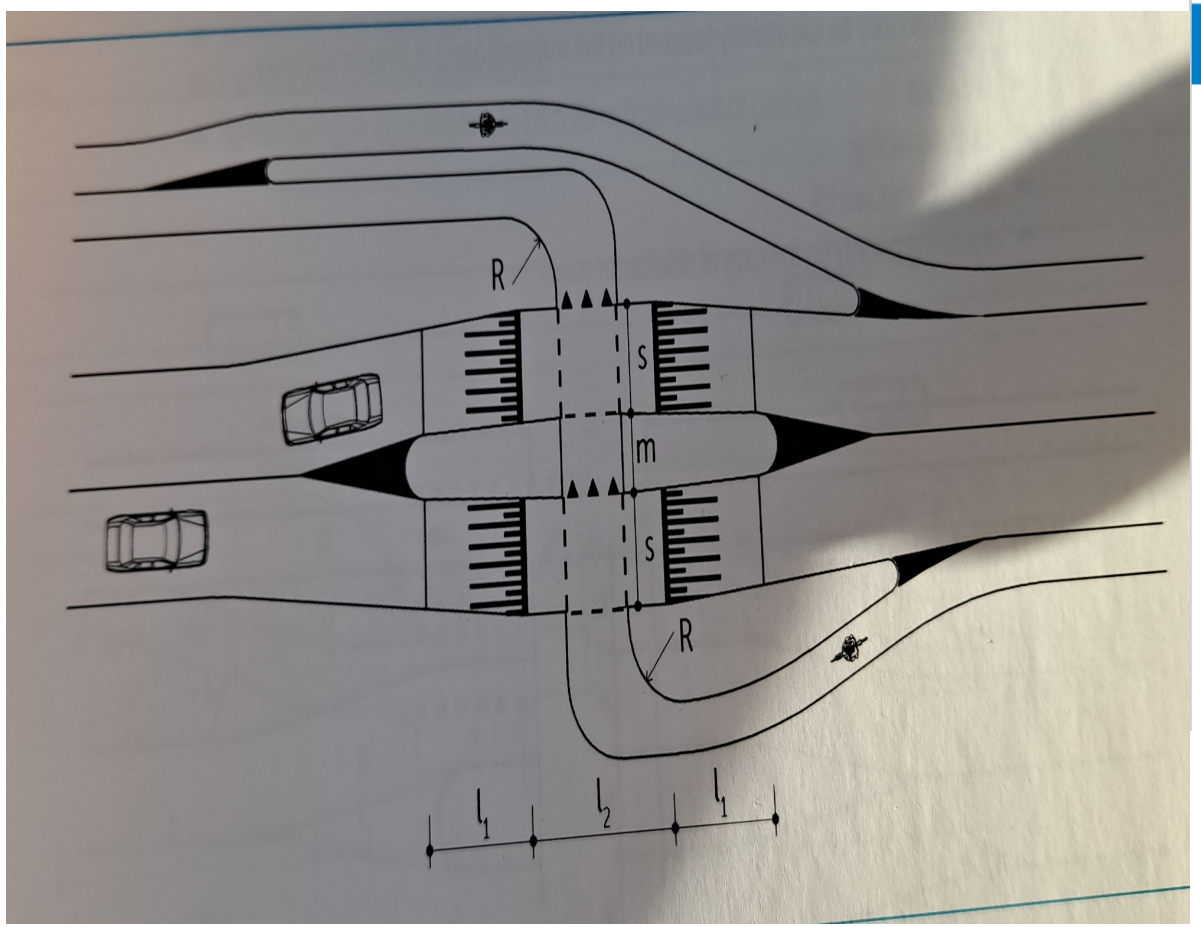
https://www.tiipublications.ie/advanced-search/results/index.xml

Dual Carriageway Urban 2 Lane			
CC-SCD-00016 - Road Type and Cross-Section - Dual Carriageway Urban 3 Lane	RCD/000/16	Oct 2013	Published
CC-SCD-00051 - Active Travel At-Grade Crossing of National Roads, with Development of Central Island		May 2023	Published
CC-SCD-00052 - Signage Details for Active Travel At-Grade Crossing of National Road		May 2023	Published
CC-SCD-00053 - Termination of Active Travel Facility and Transition to Road with Hard Shoulder		May 2023	Published
CC-SCD-00054 - Termination of Active Travel Facility and Transition to Road with Hard Strip		May 2023	Published

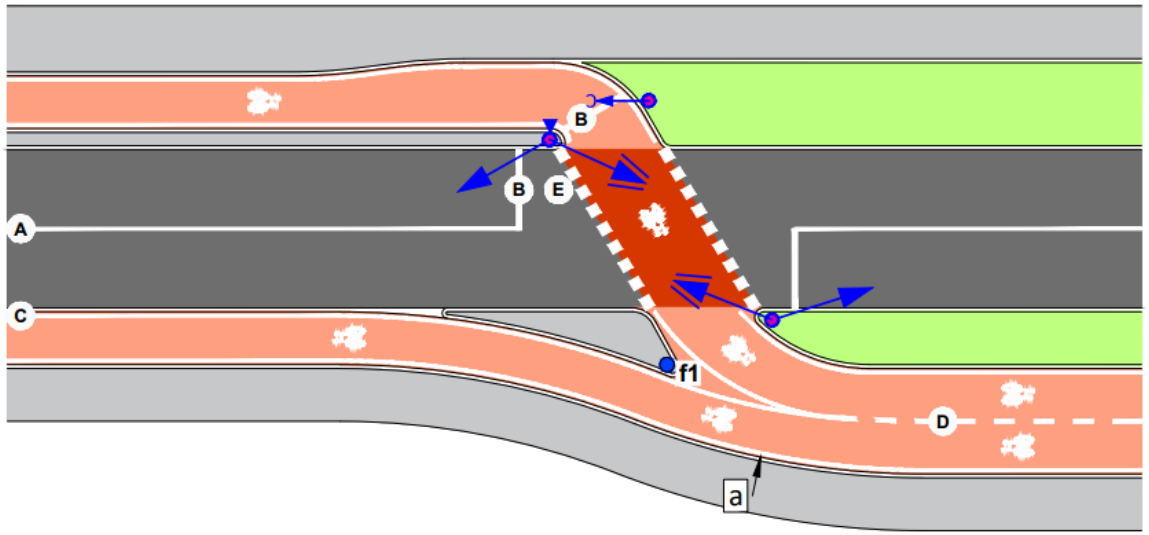

Ná Scoitear
DO NOT PASS
Ná Scoitear
DO NOT PASS
FOSD/4m FROM COMMENCEMENT OF CENTRAL ISLAND DEVELOPMENT
A
A
400m FROM COMMENCEMENT OF HARD SHOULDER TAPER
Ceansú Tráchta
TRAFFIC CALMING 400m
Ceansú Tráchta
TRAFFIC CALMING 400m


DROPPED KERB AND TACTILE PAVING (REFER TO NOTE 6)
'CYCLE TRACK YIELD' SIGN ON LOW LEVEL BOLLARDS
TACTILE PAVING (REFER TO NOTE 6)
ISLAND FLUSH WITH ROAD MARKINGS
50m
CENTRAL ISLAND TAPER. REFER TO TABLE 3.3 OF DN-GEO-03031
R = 4m MIN
R = 4m MIN
R = 4m MIN
5m MIN
5m
50m
5m
50m
5m MIN
A
A
A
Cnoch END
TACTILE PAVING (REFER TO NOTE 6)
'CYCLE TRACK YIELD' SIGN ON LOW LEVEL BOLLARDS
DROPPED KERB AND TACTILE PAVING (REFER TO NOTE 6)
AS PER TABLE 4.5 IN DN-GEO-03036 4m MIN. ON APPROACH TO CROSSING
CENTRAL ISLAND TAPER. REFER TO TABLE 3.3 OF DN-GEO-03031
50m

On/Off Cycle routes – crossings design MUST be provided



TL608 Signalised Cycle Crossing



Cross at right angles

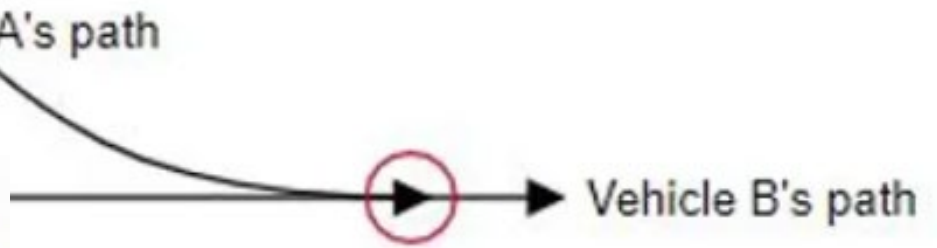
Transitions

- Merge conflicts are potentially fatal/serious - vehicle to cyclists (e.g. HGV)side or cyclist being struck from behind.

- Is it to/from one-way or two-way?

- Is a crossing required?

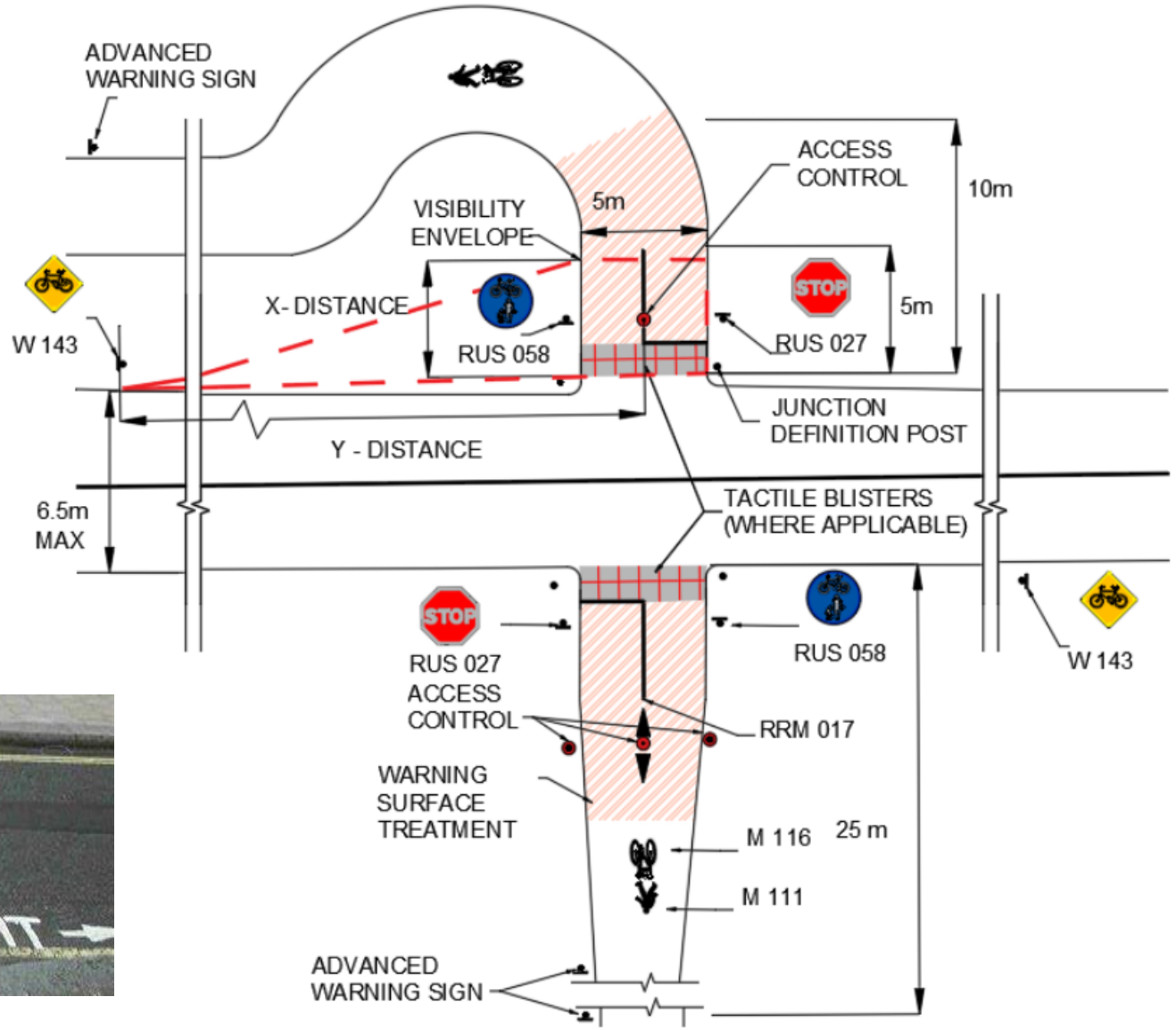
- Can cyclist see behind them????



Merge Conflict

Jug Handles

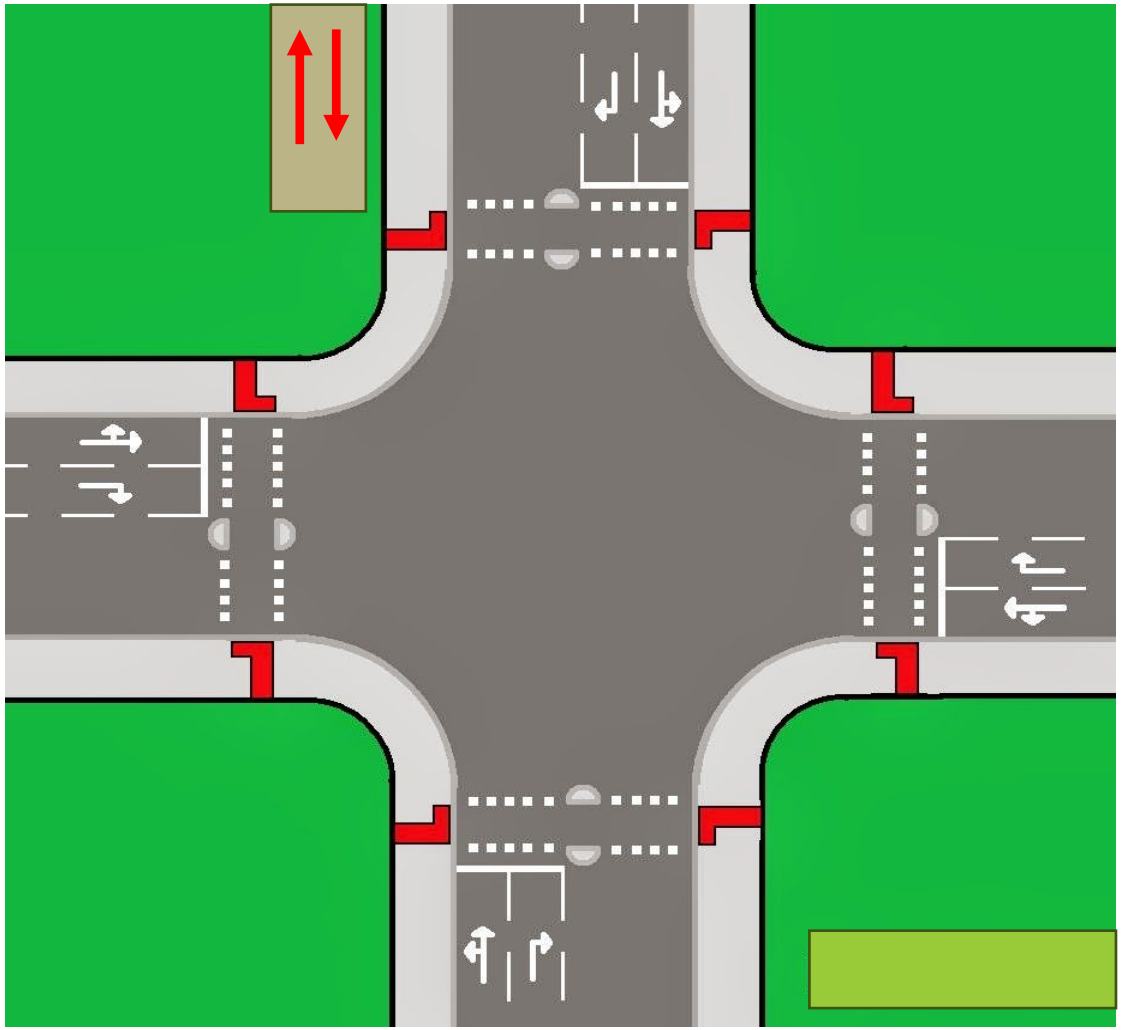
Objective of the 'jug handle' junction is to ensure that cyclists approach the road perpendicularly to maximise the cycleway user's visibility of road traffic.



Ending a cycle lane

- This Design has created a permanent need to cross a road at this location to/From the facility.
- A crossing facility should be provided.

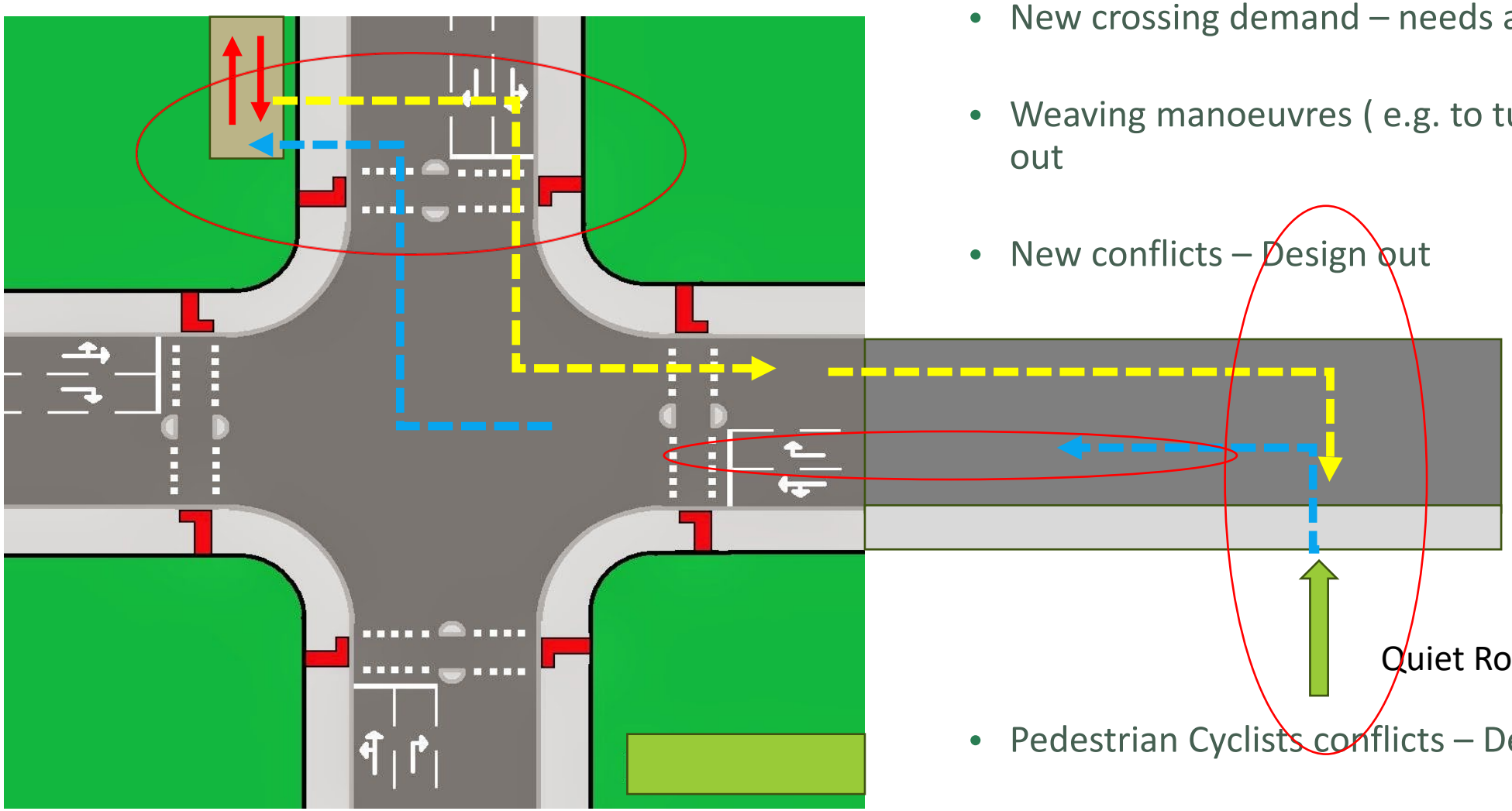
Signalised Junction



- New Signal Controlled Cross Road
- Private Development with new recreational facilities
- All arms have pedestrian crossings
- Development has 2-way segregated cycle track. Widths as per CDM.
- A quiet route for cyclists was found through residential roads to avoid busy main road

(High AADT)

Signalised Junction



- New crossing demand – needs a crossing Design
- Weaving manoeuvres (e.g. to turn right) – Design out
- New conflicts – Design out
- Pedestrian Cyclists conflicts – Design out

CDM – Many SAFE options!

Cycle Design Manual

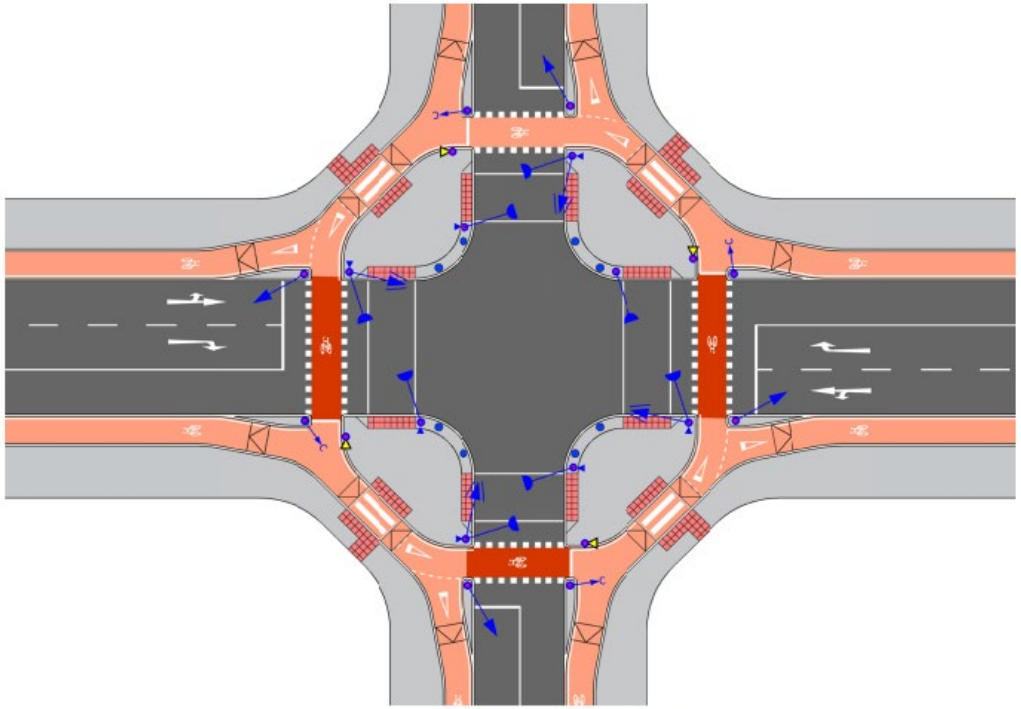
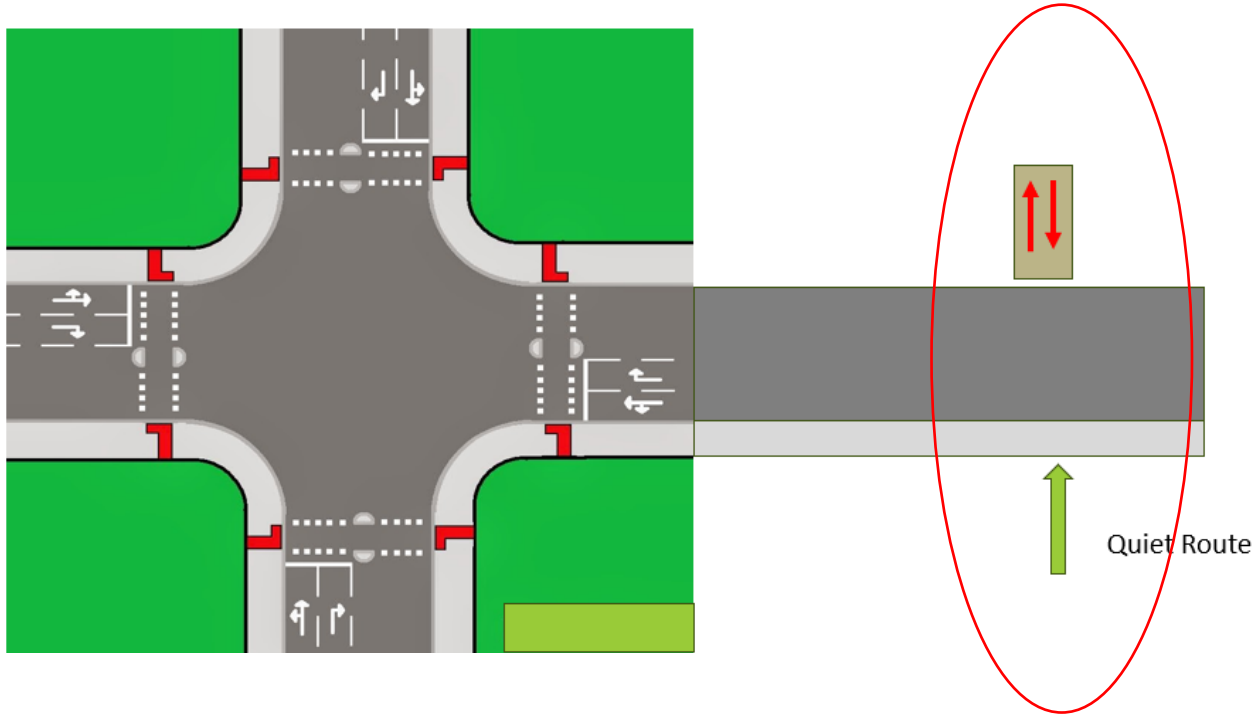


Figure 4.86: Typical layout of a protected junction with zebra crossings of the cycle track and inner pedestrian crossings (draw up 'clean' version without dims/labels).



- CDM
- TII
- CROW(other)

Can a child cyclists use it Independently?

Designed to operate within Safe Limits?

Prevent / Mitigate Conflicts?
(did you add some????)

Avoid ambiguous layouts / A crossing should be Obvious to all users!

Thankyou