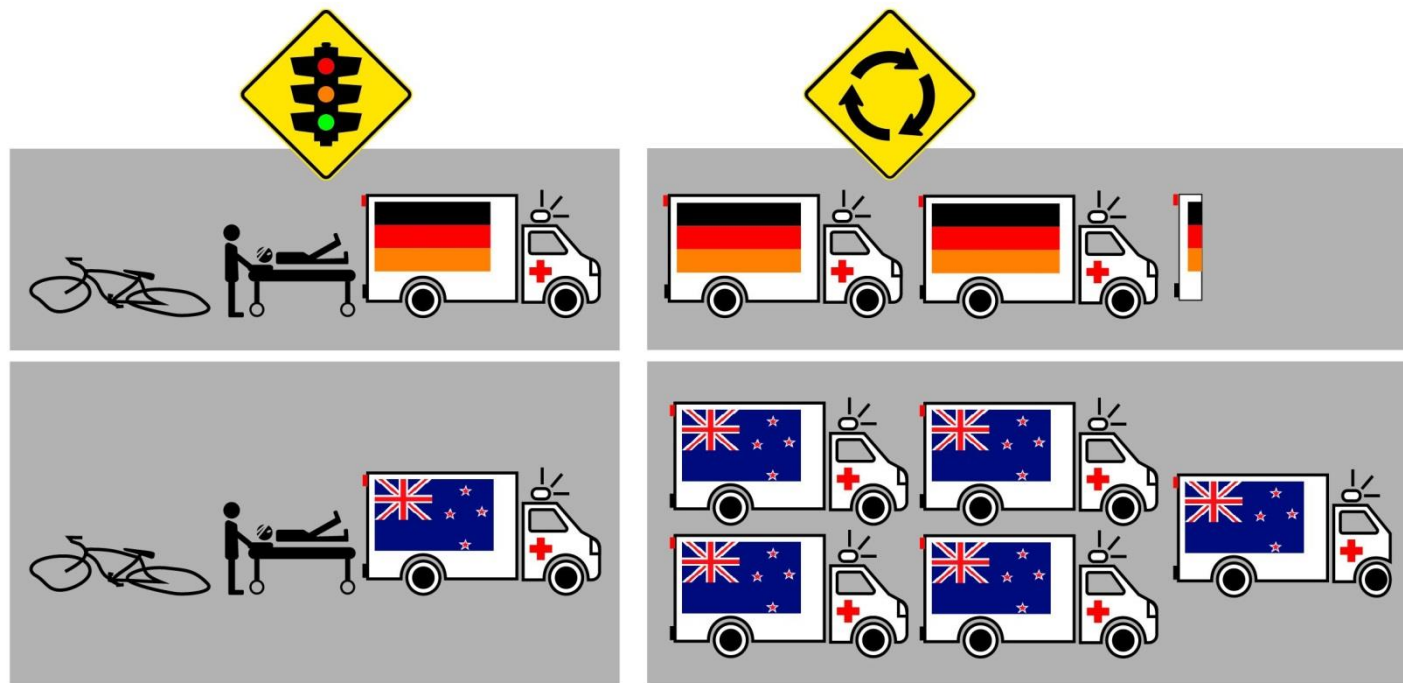

Around about time to make cycle-friendly roundabouts?



The problem: urban roundabouts vs signals

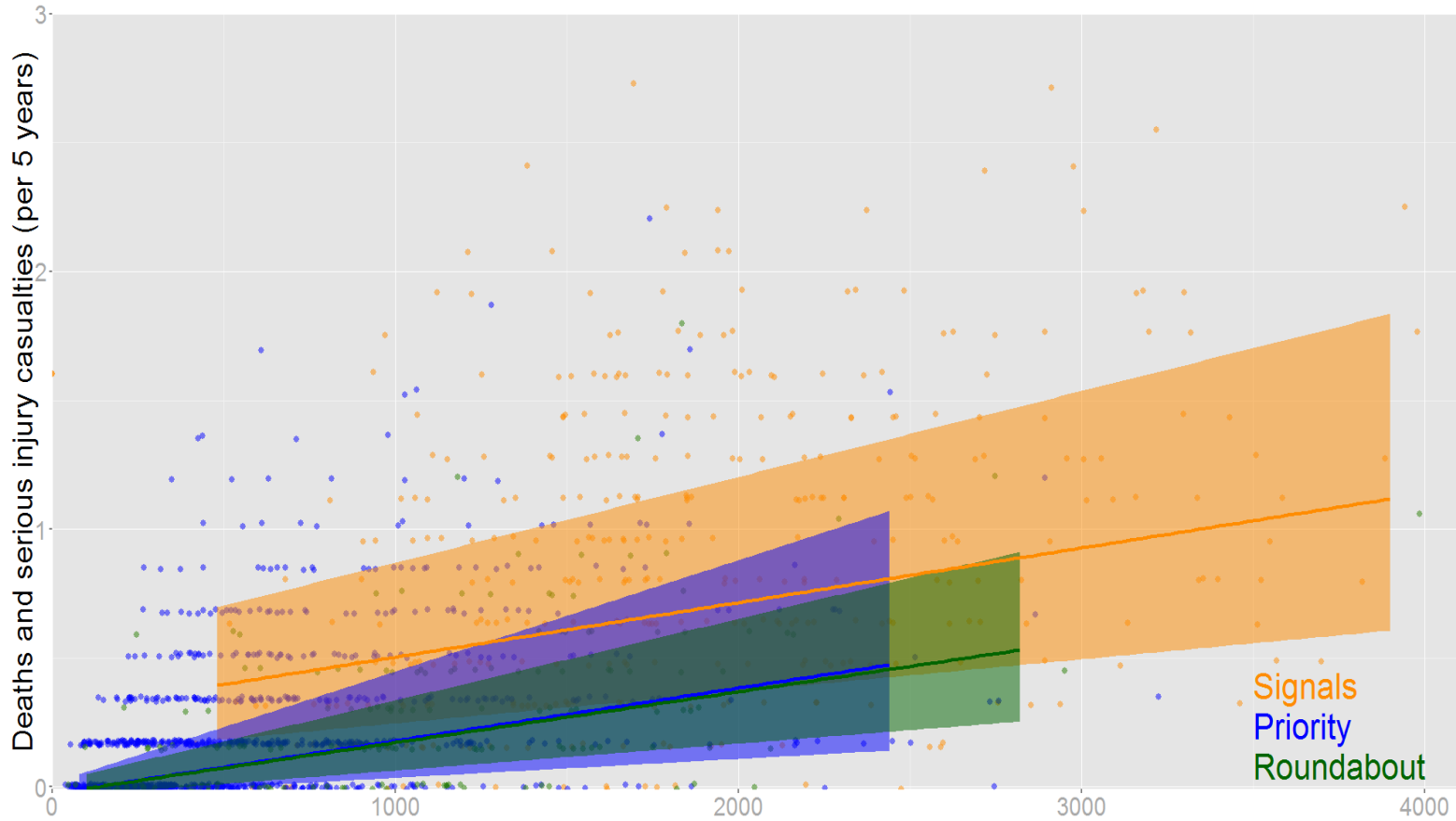
Proportion of cyclist injuries: roundabouts vs signals, Germany vs NZ.



NZ cyclists are 41% of **serious casualties** at urban roundabouts cf 11% for signals.
NZ cyclists are 28.7% of all **casualties** at urban roundabouts cf 6.6% at signals

Roundabout overall safety compared

Urban crossroads - risk of death and serious injury by traffic volume



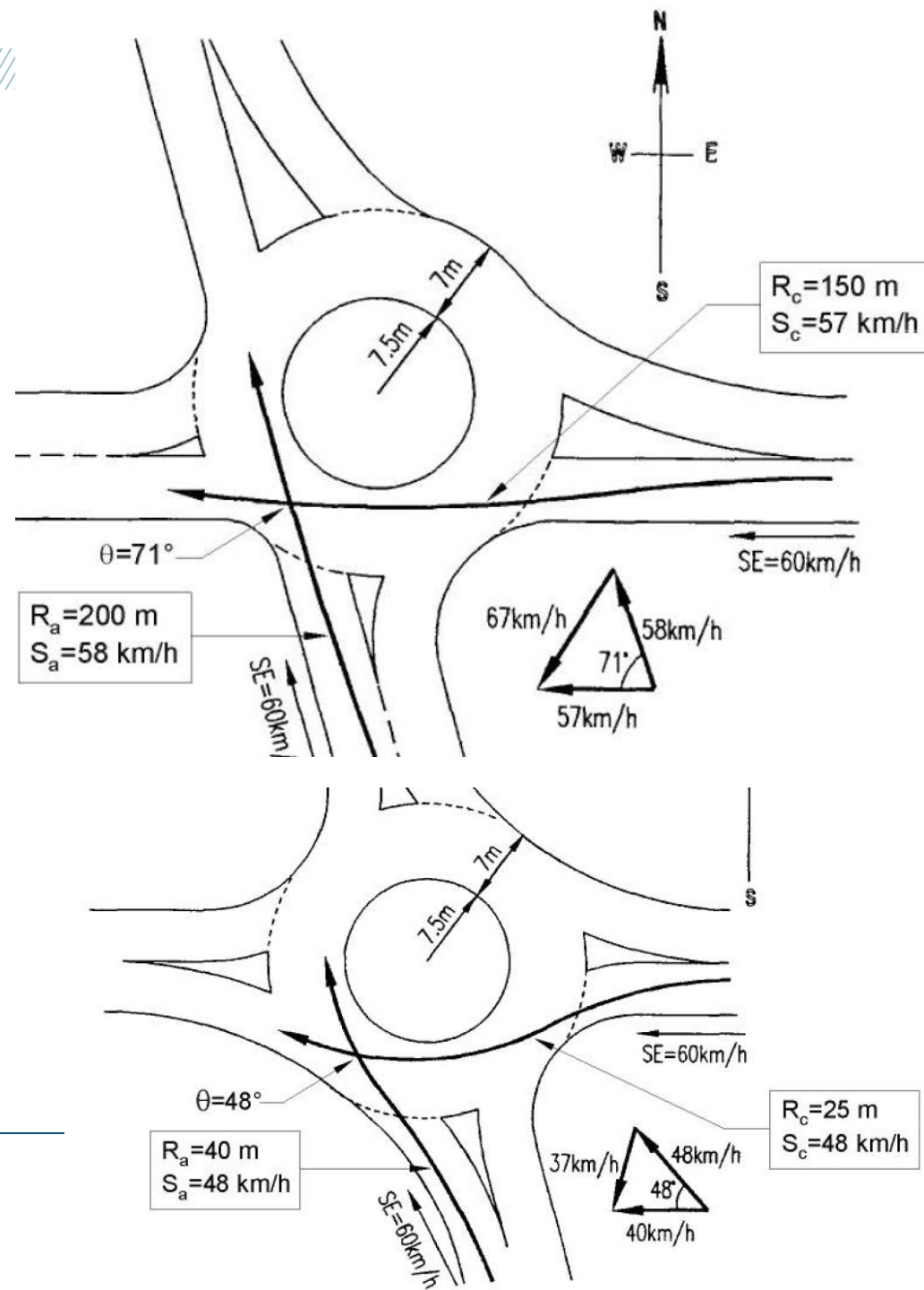
The Issue

Nearly all NZ roundabouts are based on UK and Austroads guidance, i.e. from countries with little cycling.

Designs in Austroads guides meet safe system thresholds for cars, so collisions rarely involve serious injury to car occupants.

Diagram from GRD pt 4B showing vector diagram of impact between two cars.

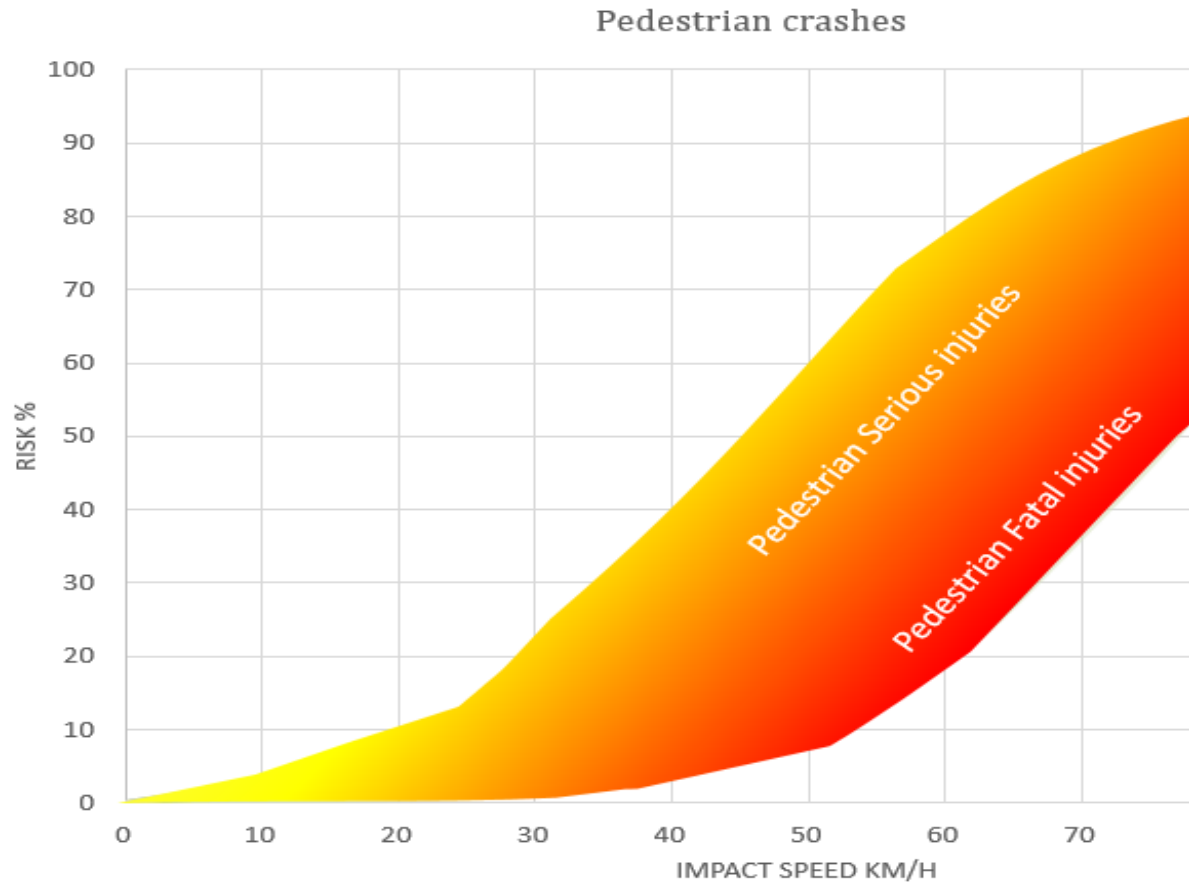
Designs aim for speeds below 50 km/h. Impact speed of 37 km/h is shown as best practice.



The Issue

However the safe speed threshold for pedestrians and cyclists is 20 km/h. They are much more at risk of serious injury than people in cars.

So urban roundabout designs should aim for 20 km/h relative impact speeds.





The Issue

Putting all this information together.

It is usual to note the much higher proportion of cyclist casualties at roundabouts compared to signals.

But we know that roundabouts are much safer to start with.

In a cycling friendly roundabout we reduce the risk to all users and reduce the risk margin between car occupants and cyclists.

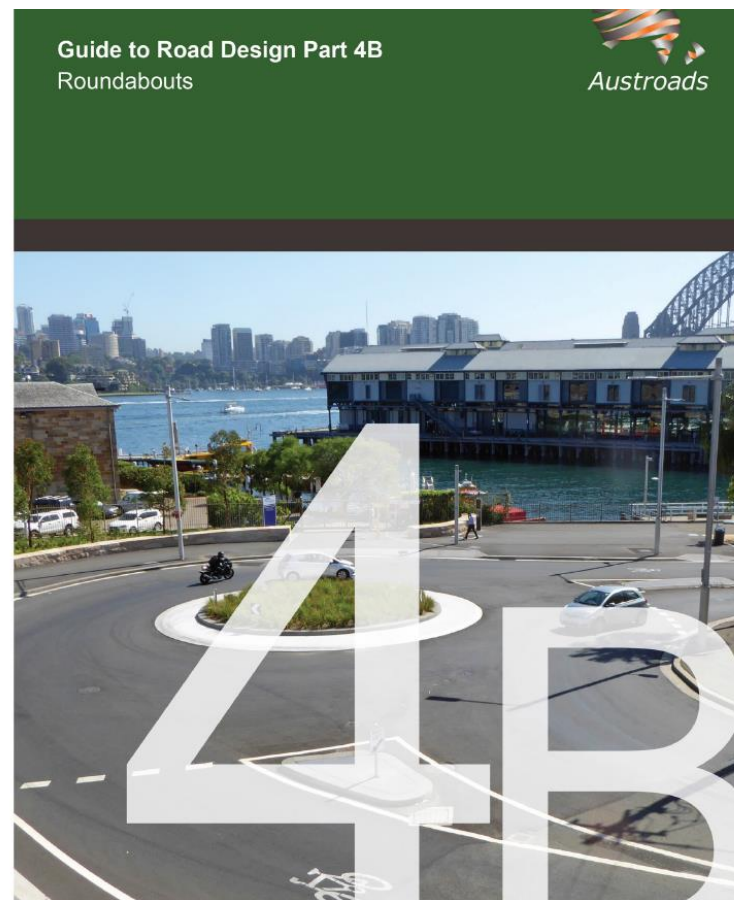
The Design Issue

Austrroads GRD pt 4B roundabouts acknowledges the cycling and pedestrians issues and recommends slow speed single lane roundabouts for urban areas.

However it does not say how to design for these low speeds.

Recent Austrroads research confirms the need for better guidance.

The cycling friendly roundabouts pages in the NZTA Cycle Network Guidance fills this gap.





3 principles of safe urban roundabouts are:



Speed



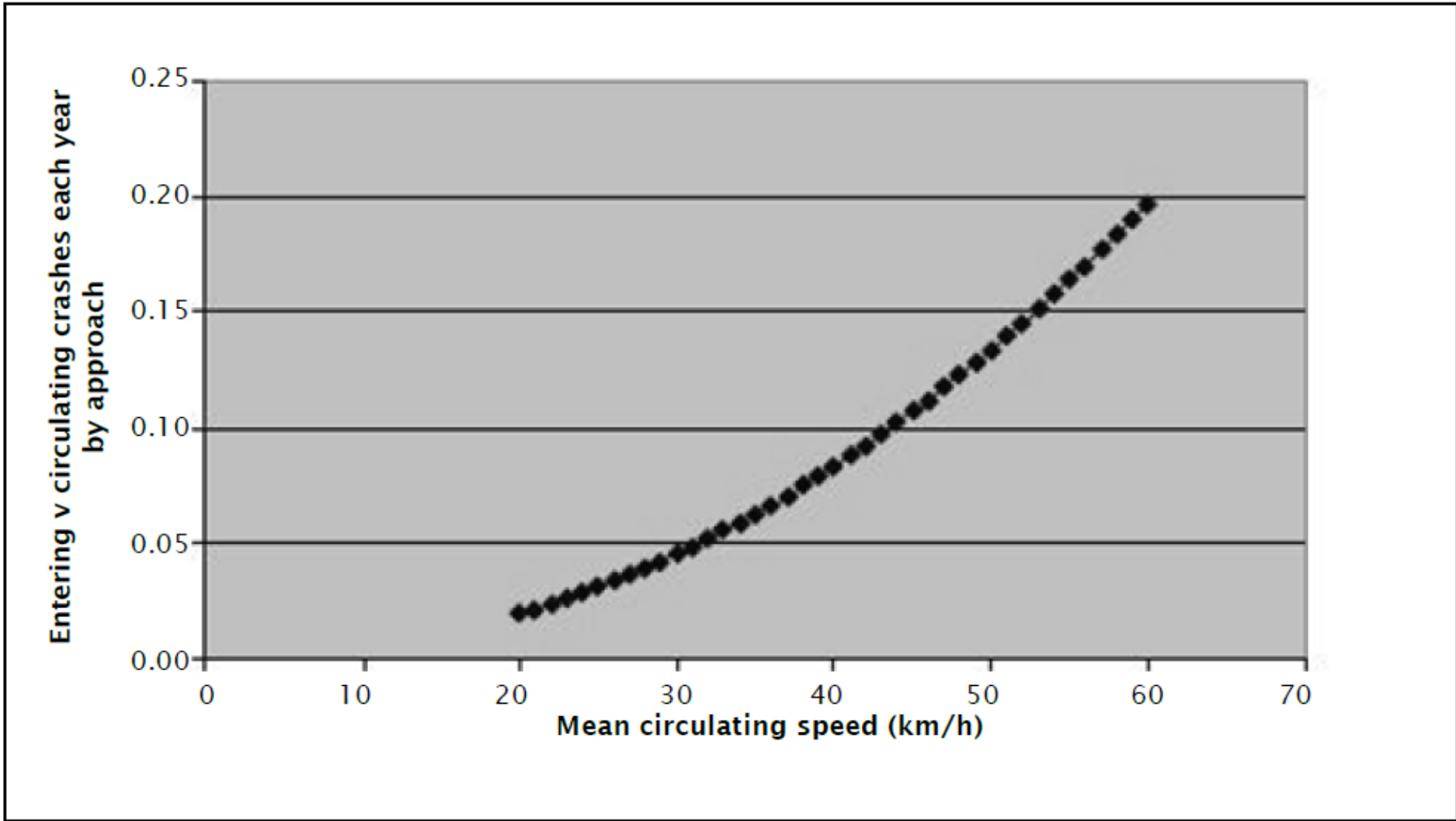
Speed



Speed



Figure 4.5 The relationship between mean circulating speeds and entering v circulating crashes at roundabouts (Turner and Roozenburg 2007)





Design to reduce speed through roundabouts

Horizontal

Drivers slow for entry curve and to circulate around roundabout.

Vertical

Drivers slowed on roundabout approach by a speed platform or similar which also can be used as a pedestrian crossing point.

Visibility

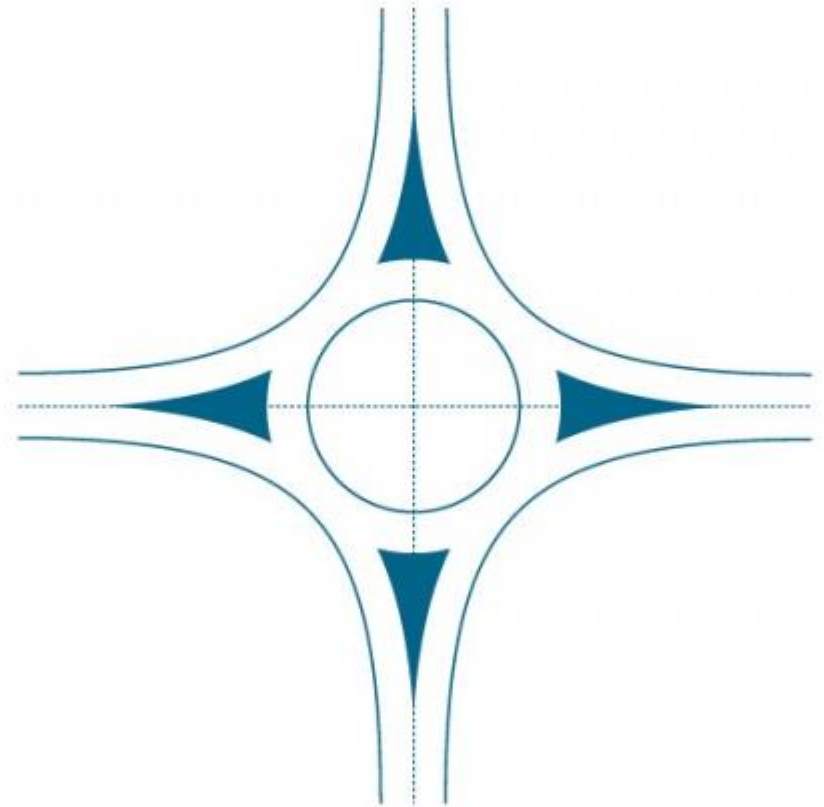
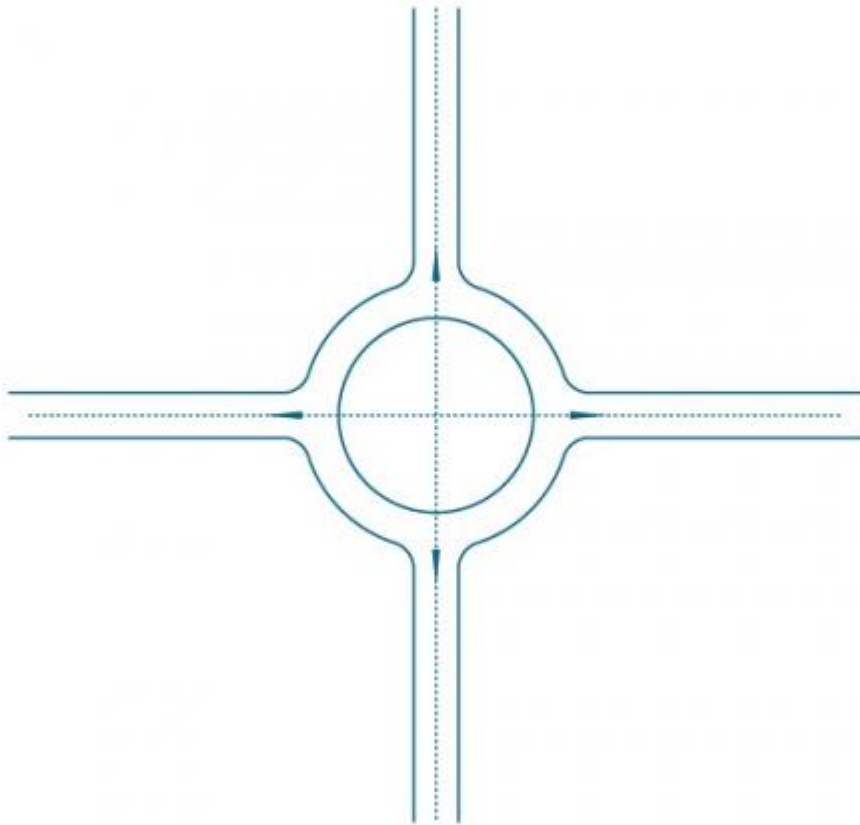
Drivers slow because they can't safely enter because they can't see the traffic they have to yield to.

Roundabout design layout concepts

Radial Design

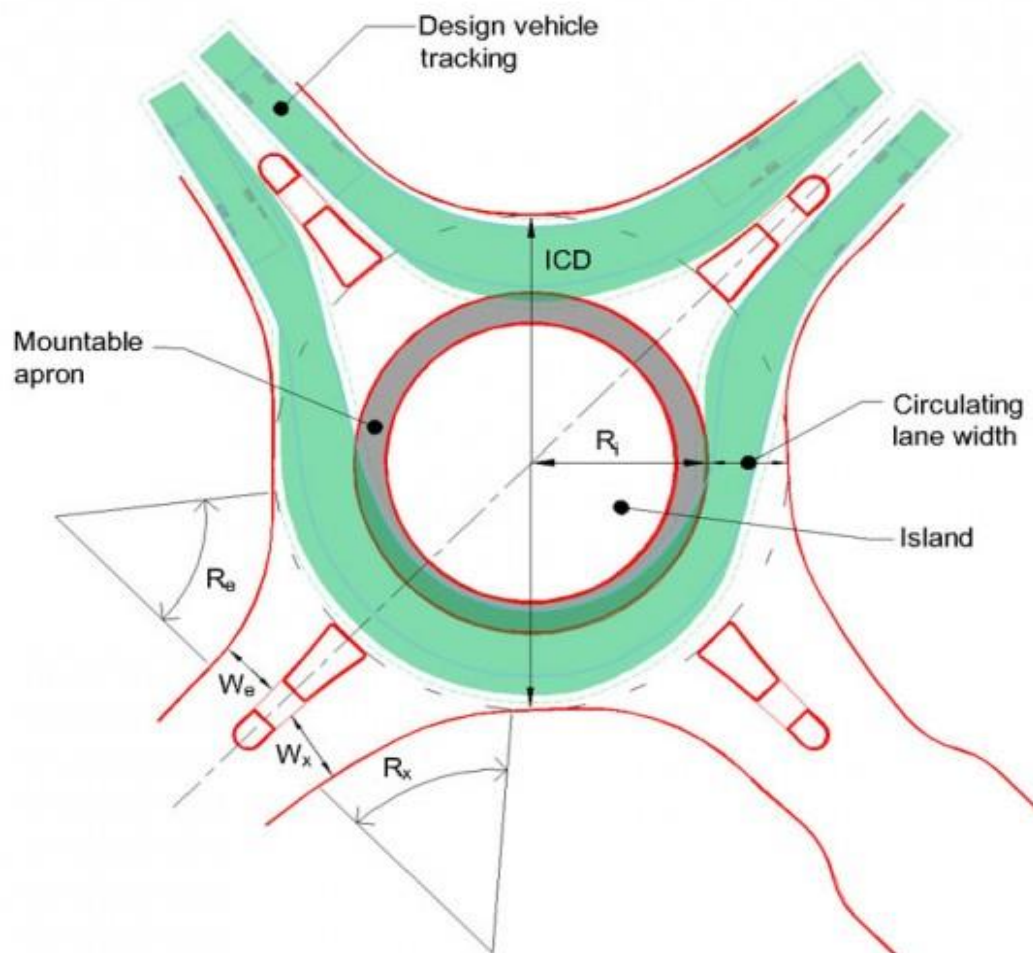
compared to

Tangential design



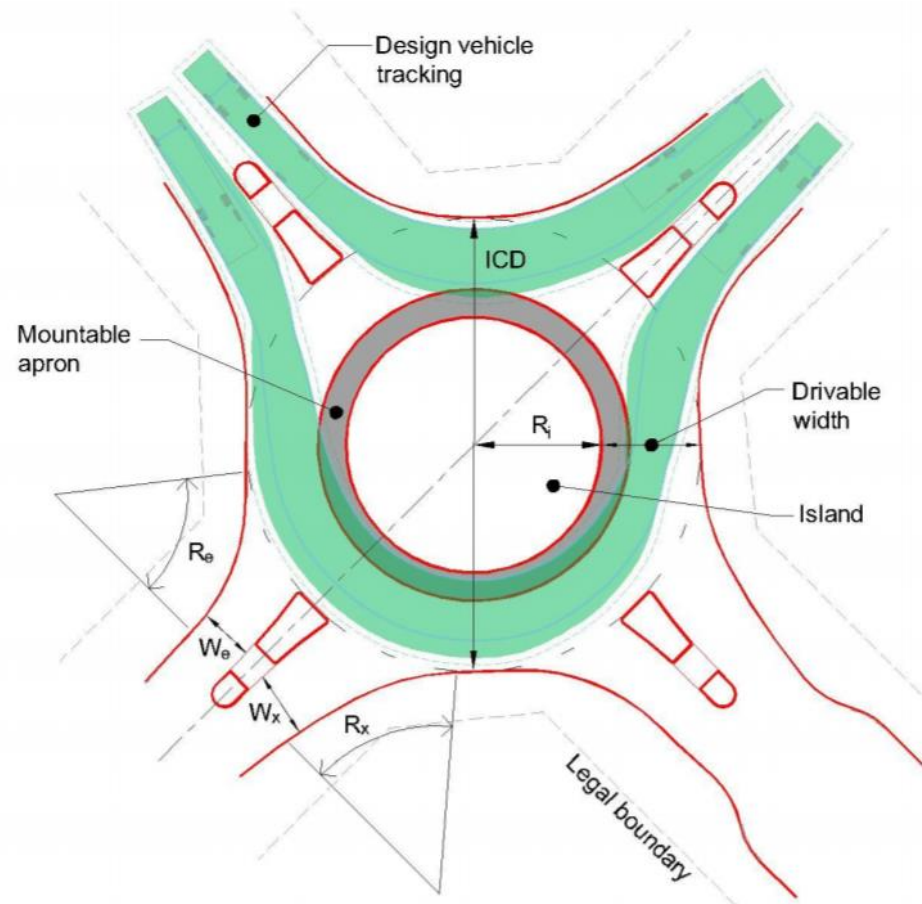
The compact roundabout – horizontal design

Speed control by layout only.



European single-lane

- Inscribed diameter (ICD) 30 - 35 m
- Central Island diameter 20 – 24 m
- Circulating lane width 4 - 6 m
- Entry kerb radius, R_e : 8 - 15 m
- Exit kerb radius, R_x : 12-16 m
- Entry lane width, W_e : 3.2 - 3.7m
- Exit lane width, W_x : 3.5 - 4.5 m
- Cycle lanes stop 20m prior
- Up to 8,000 vehicles per day 2 way.
- Above that provide path alternative as well.



CNG: Cycling Friendly Roundabouts,

<https://viastrada.nz/node/2140>

European Compact Roundabout



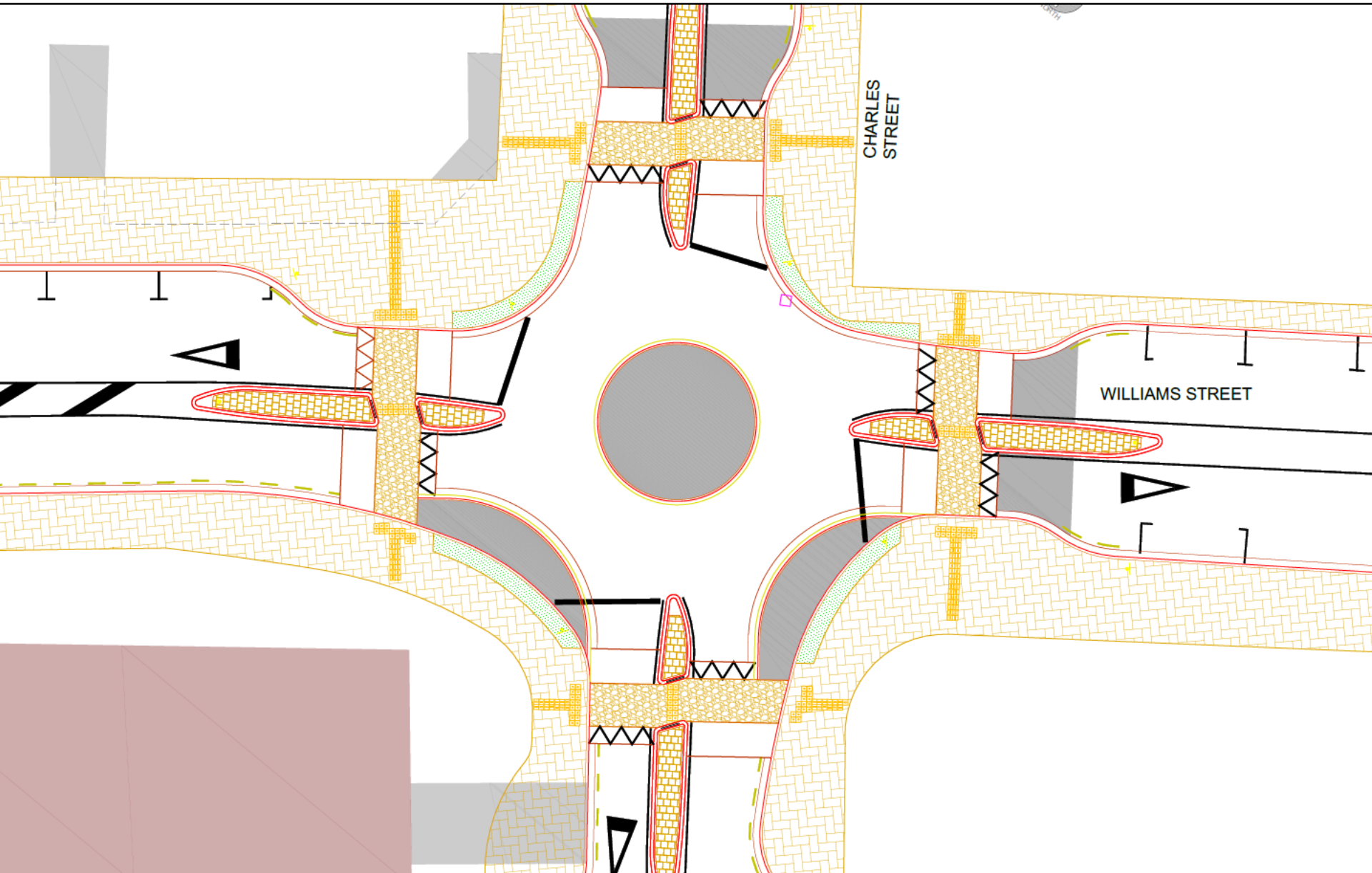
*Enschede,
Netherlands*

Small Roundabouts – Platforms



Small Roundabouts: Pedestrian platforms

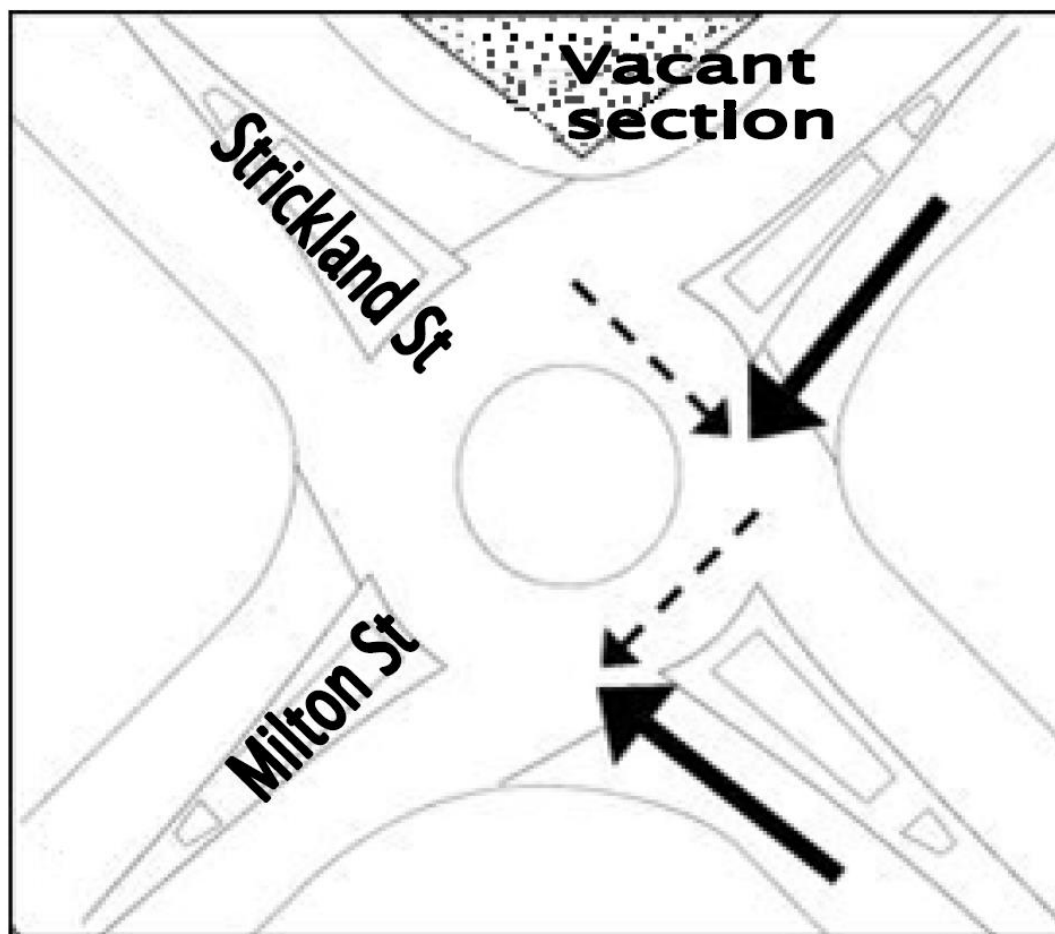




Aprons or encroachment areas



Visibility: Equal and poor is safer



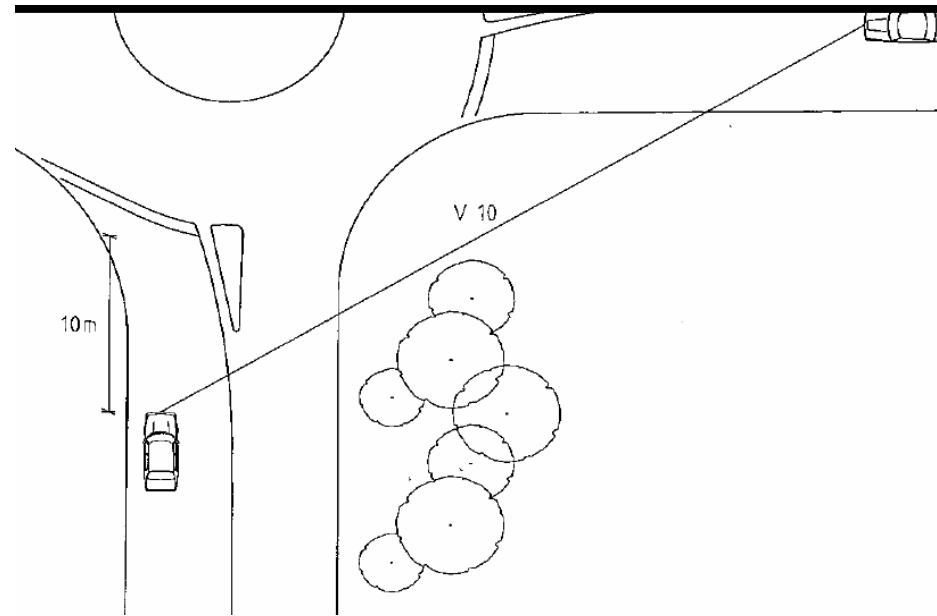
Restricted Visibility

Contrary to received wisdom, the earlier on the approach a driver can see conflicting traffic, the less safe for everyone, especially cyclists.

Crash prediction models consistently show less visibility = safer.

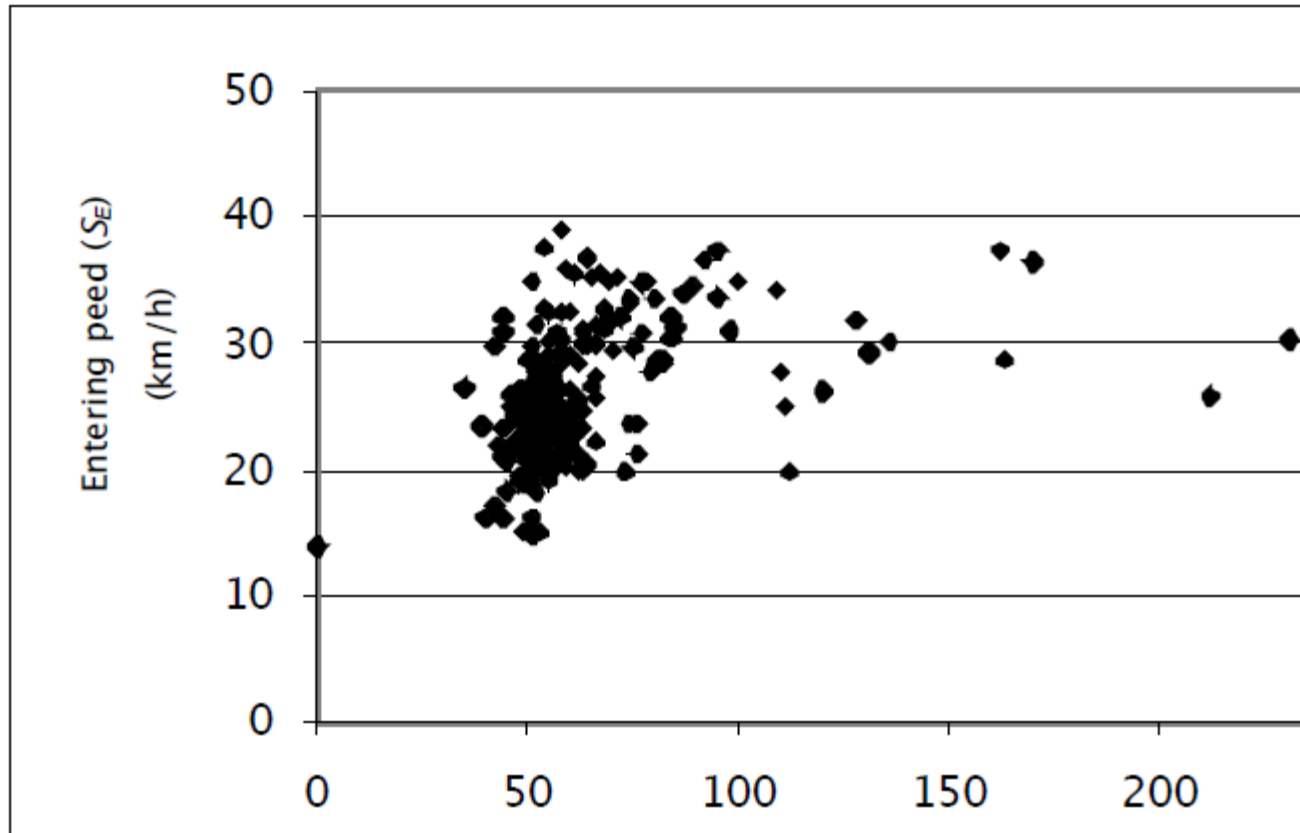
See NZTA Research Report 386, Roundabout Crash Prediction Models, 2009 Shane Turner, Aaron Roozenburg,

Detailed argument in Campbell et al; Improved multi-lane Roundabout Designs for Urban Areas: NZTA Research Report 476: 2012, Duncan Campbell, Ivan Jurisich & Roger Dunn



Visibility from 40 m prior and speed

Figure 4.5 Relationship between sight distance (V_{40}) and entering speed (S_E)

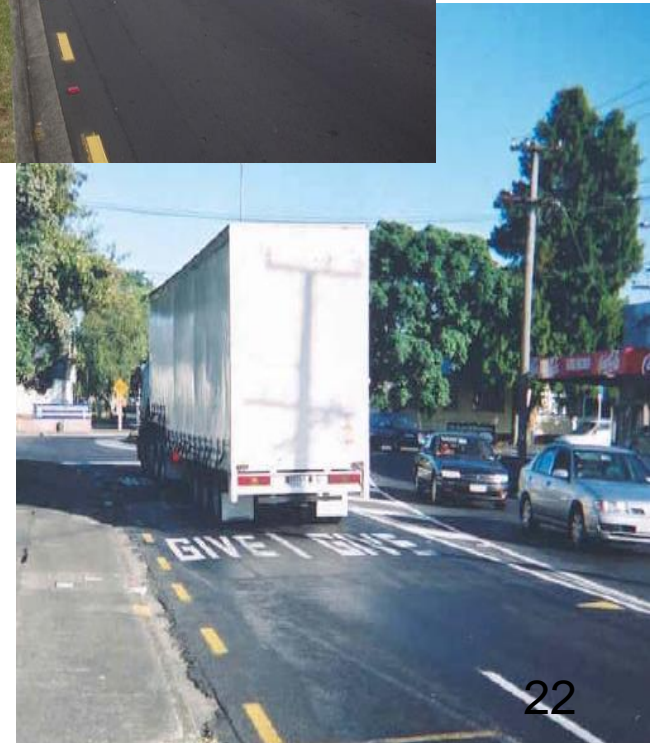


C-Roundabout

- Narrow (2.7 m) approach lanes aid cyclists in taking the lane
- HCVs straddle both lanes
- Circulatory markings and sight boards
- 30 km/h advisory speed
- Proposed (not yet authorised) approach sign:



Campbell *et al.*
(2005)
Campbell *et al.*
(2012)



Google:
***“Cycling Network Guidance
NZTA roundabouts”***

It’s around about time

**Making roundabouts cycling friendly
makes them safer for everyone.**

Thank You

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