

Diagonal cycle crossing for signalised intersection



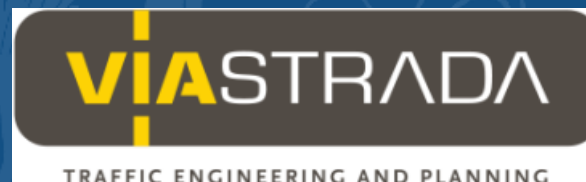
**CYCLISTS PUSH TO
ACTIVATE SIGNAL
CROSS DIAGONALLY
ON SIGNAL**

Axel Wilke – ViaStrada

Matthew Hinton – Maunsell

Daniel Newcombe – Auckland City Council

MAUNSELL | AECOM



Auckland City

Background

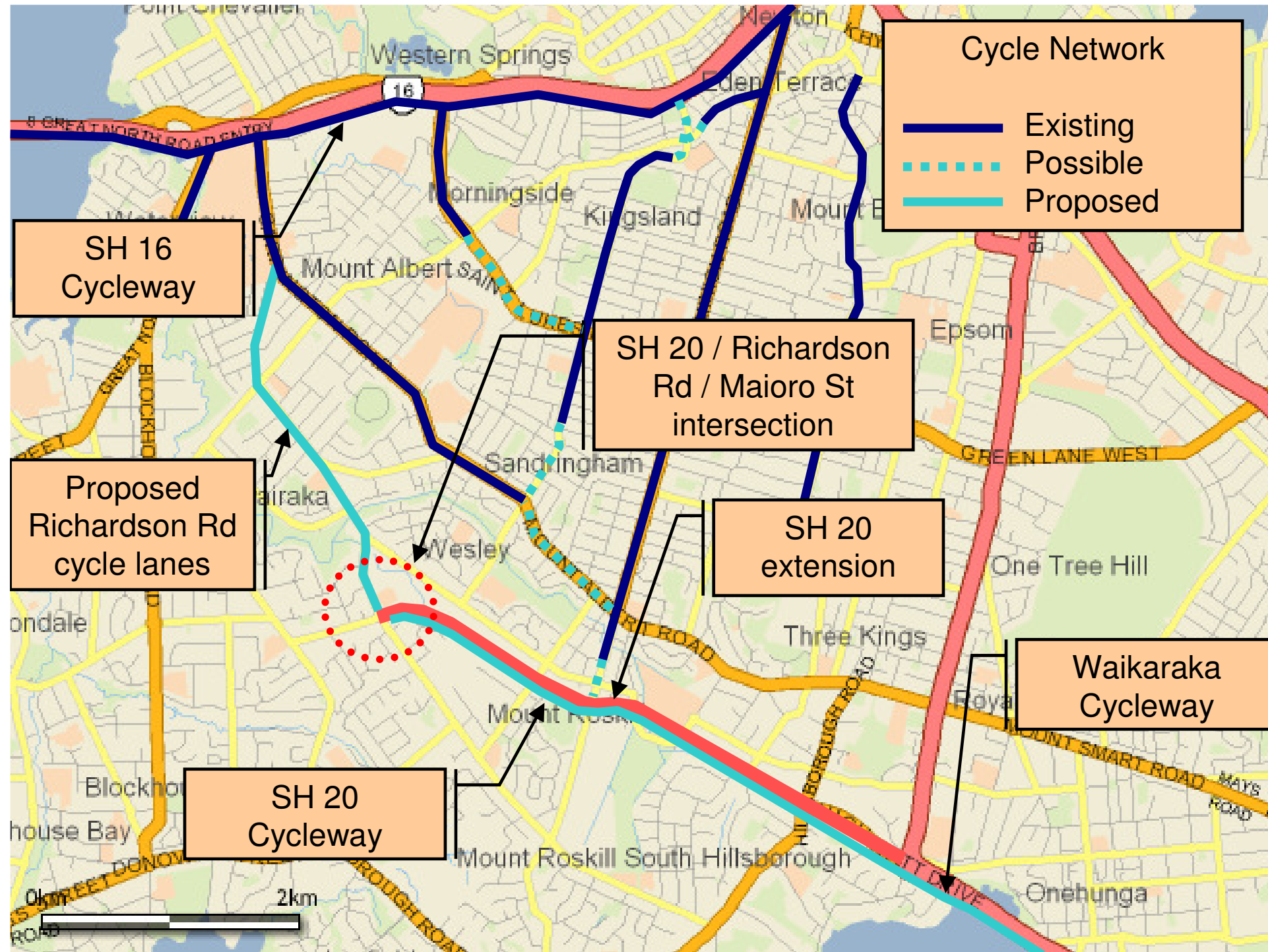
- Paper previously presented at 6th NZ Cycling Conference in Napier
- Paper jointly written by:
 - Axel Wilke (ViaStrada)
 - Matthew Hinton (Maunsell)
 - Daniel Newcombe (Auckland CC)
- Purpose of this presentation is to stimulate discussion and feedback from signal engineers at SNUG workshop

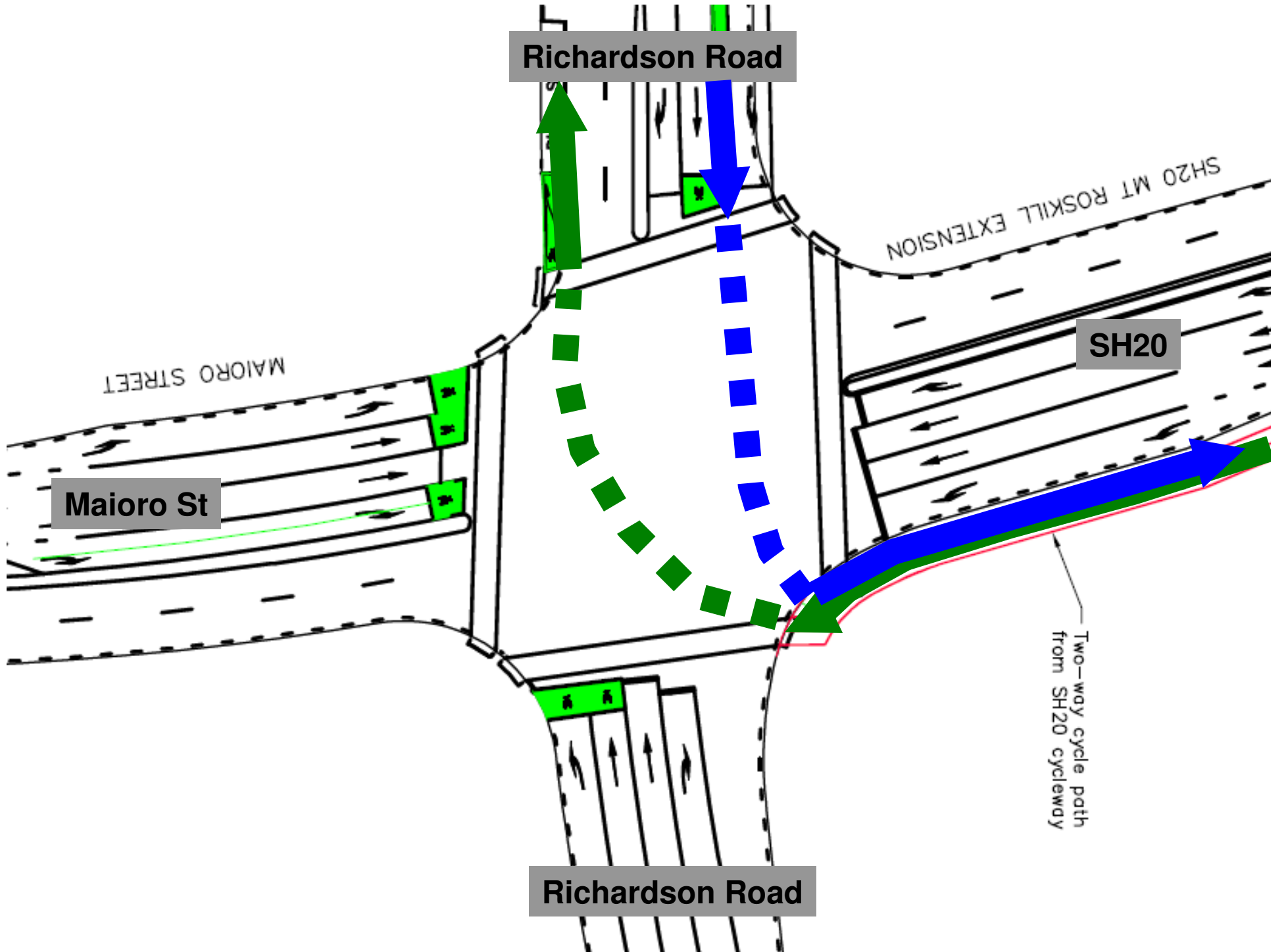
Introduction

- New intersection at end of SH20
- New cycleway also ends here
- Difficult for cyclists to reach other side
- Numerous options looked at
- Auckland City Council engaged Maunsell and ViaStrada to investigate:
 - innovative diagonal crossing solution

Disclaimer

- This is a concept only
- No audits undertaken or approvals given
- For discussion purposes only





Options – rejected

- Finish cycleway somewhere else
 - Indirect, new set of signals, potentially same issues
- Use pedestrian crosswalks as a pedestrian
 - Poor level of service, not likely to be used
- Cycle hook turn
 - Can't overcome safety or efficiency issues
- Grade separation
 - Not considered cost effective; unnecessary
- others?

Options – discussed here

- Parallel cycle crossing adjacent to pedestrian crosswalks
- Diagonal cycle crossing

Parallel Cycle Crossing

- Have cycle crossing parallel to pedestrian crossing
 - Can cycle across, rather than walk
 - Requires two-stage crossing
- Requires full turn protection
 - Cyclists commencing straight ahead movement do not have right of way over turning motorists
 - Compare Axel's 2005 SNUG presentation
 - <http://viastrada.co.nz/pub/cycle-paths-signals>

Richardson Road

Note:
fully controlled RT

SH20 MT ROSKILL EXTENSION

SH20

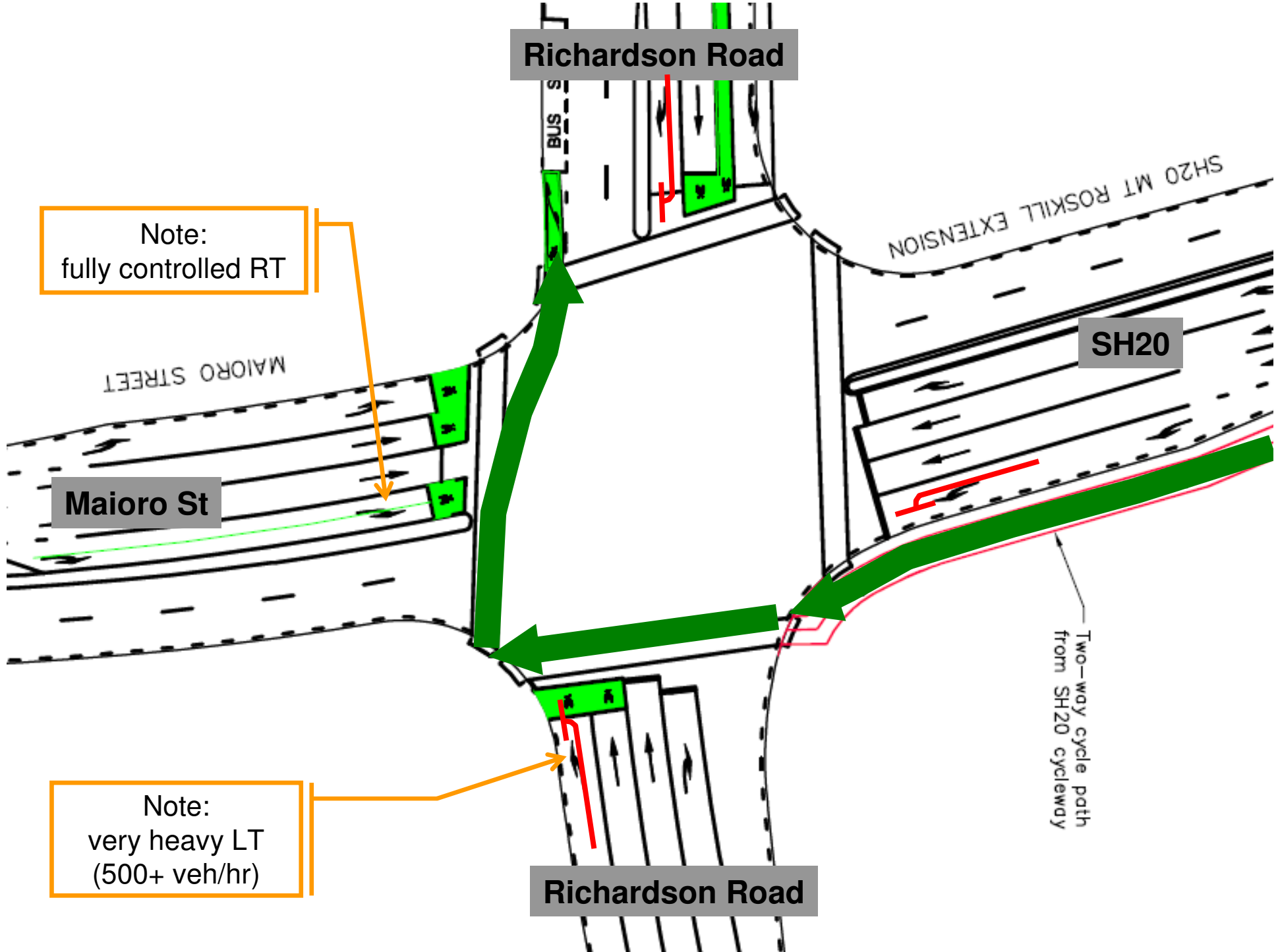
MAIORO STREET

Maioro St

Two-way cycle path
from SH20 cycleway

Note:
very heavy LT
(500+ veh/hr)

Richardson Road



Parallel Cycle Crossing – Assessment

- Not a great LOS for cycling
 - Due to two stage crossing
- Also reduces LOS for drivers
 - Due to turn protection in D phase (side road)
 - Red arrow would need to be on for minimum 13 SEC (6 sec green, 3 sec yellow, plus say 4 sec all red if cycle crossing is one-directional only)
 - LT arrow less of an issue during A phase (SH20), as phase time is longer

Diagonal crossing

- Large intersection with opposed right turns
- 6-7 m gap between swept paths
- Potential for cyclists to cross diagonally during opposed right turns, without change to standard phasing
- Would remove need to have 2-stage movement

Richardson Road

BUS STOP

SH20 MT ROSKILL EXTENSION

SH20

MAIORO STREET

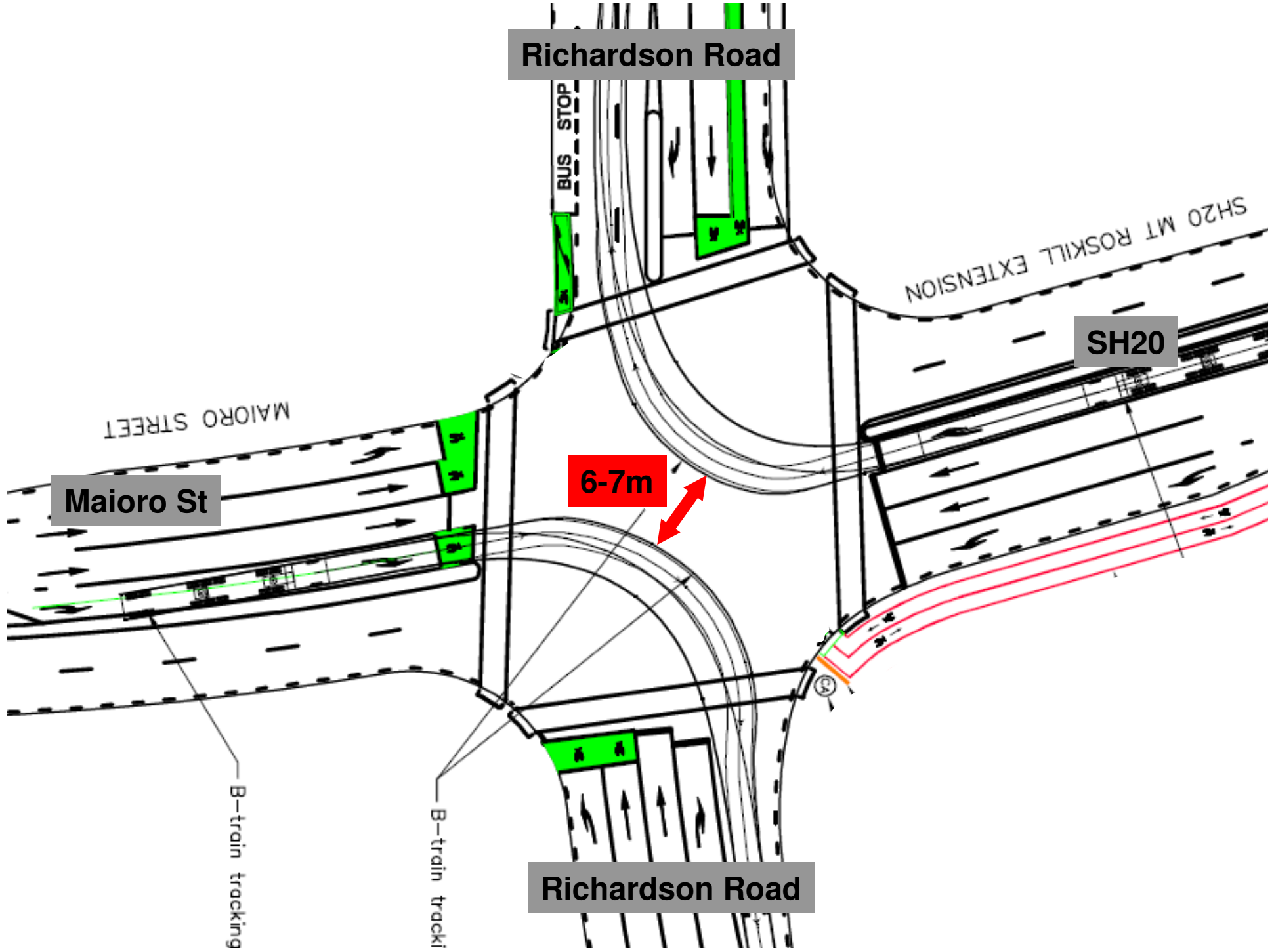
Maioro St

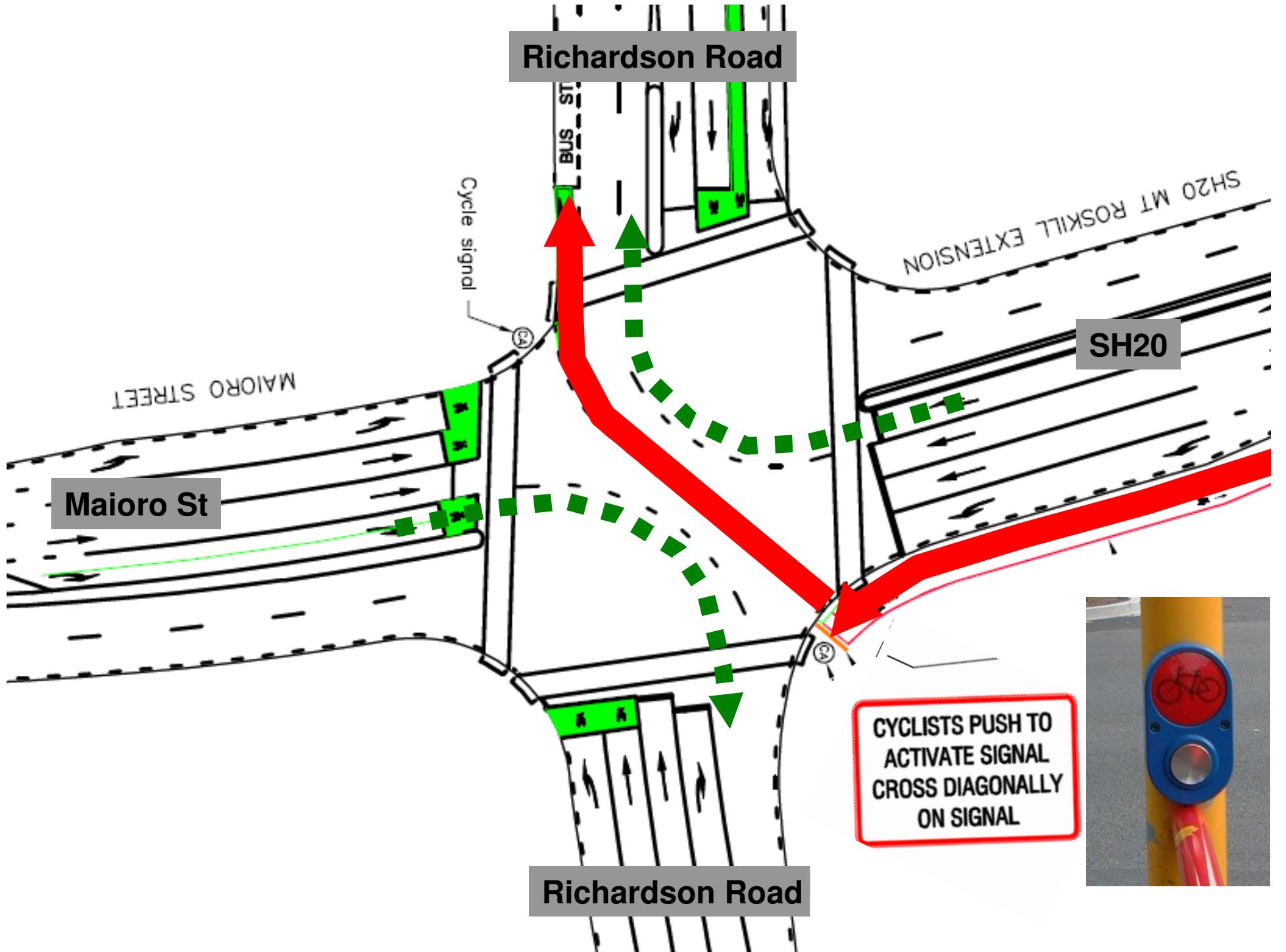
6-7m

B-train tracking

B-train tracki

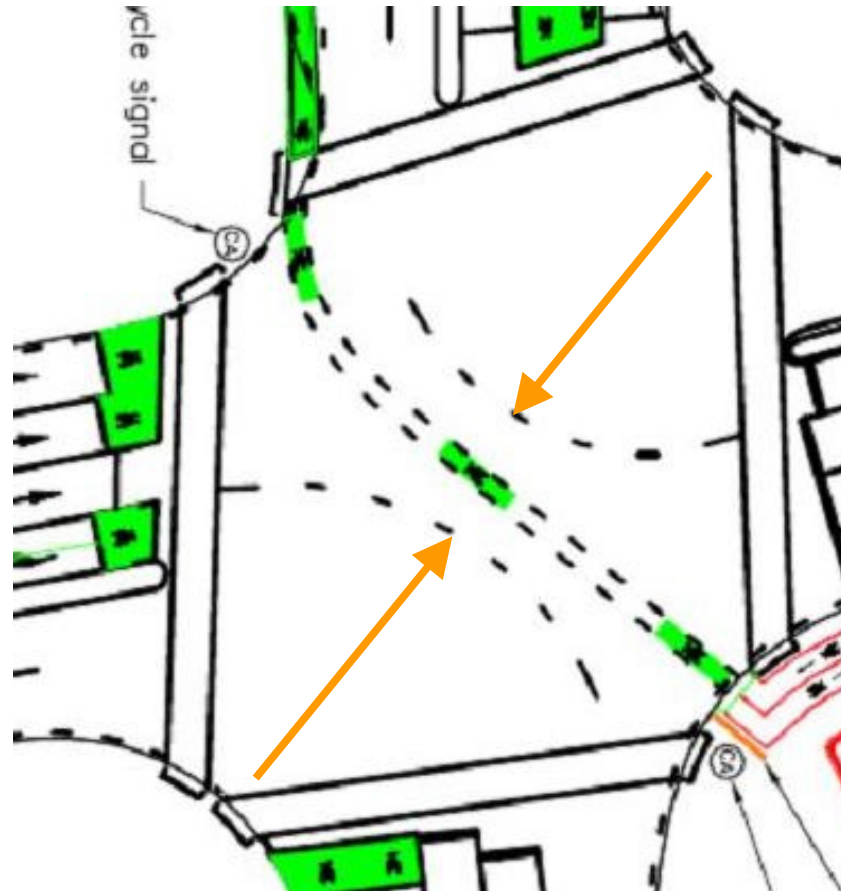
Richardson Road





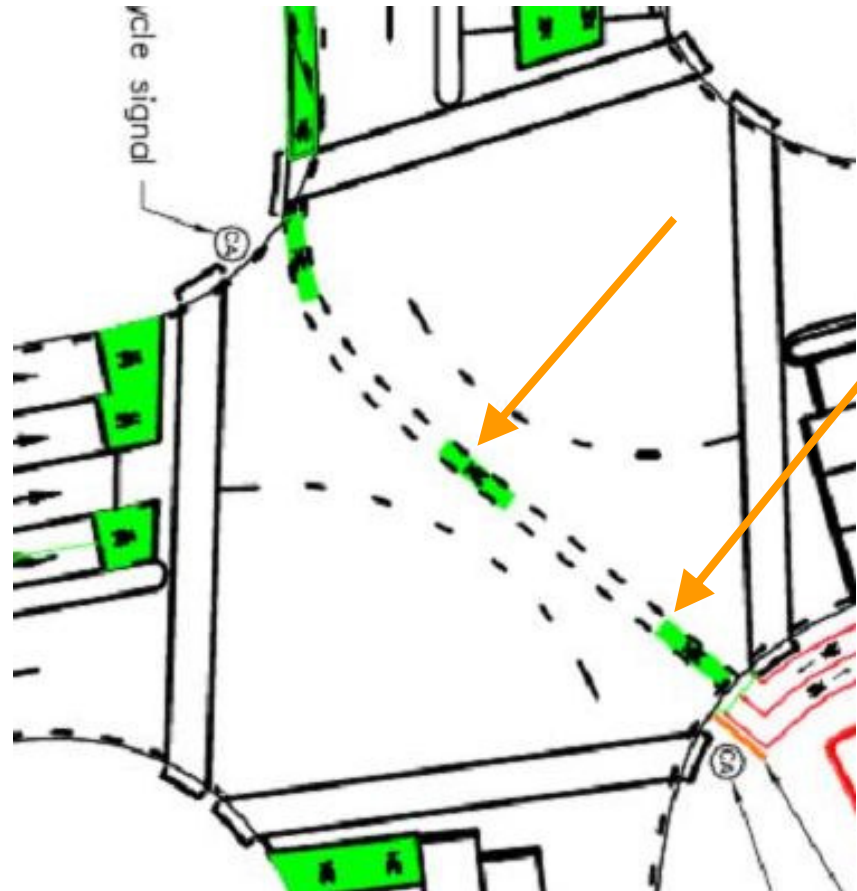
Features for safety

- Continuity lines for right-turning traffic to direct them away from cyclists



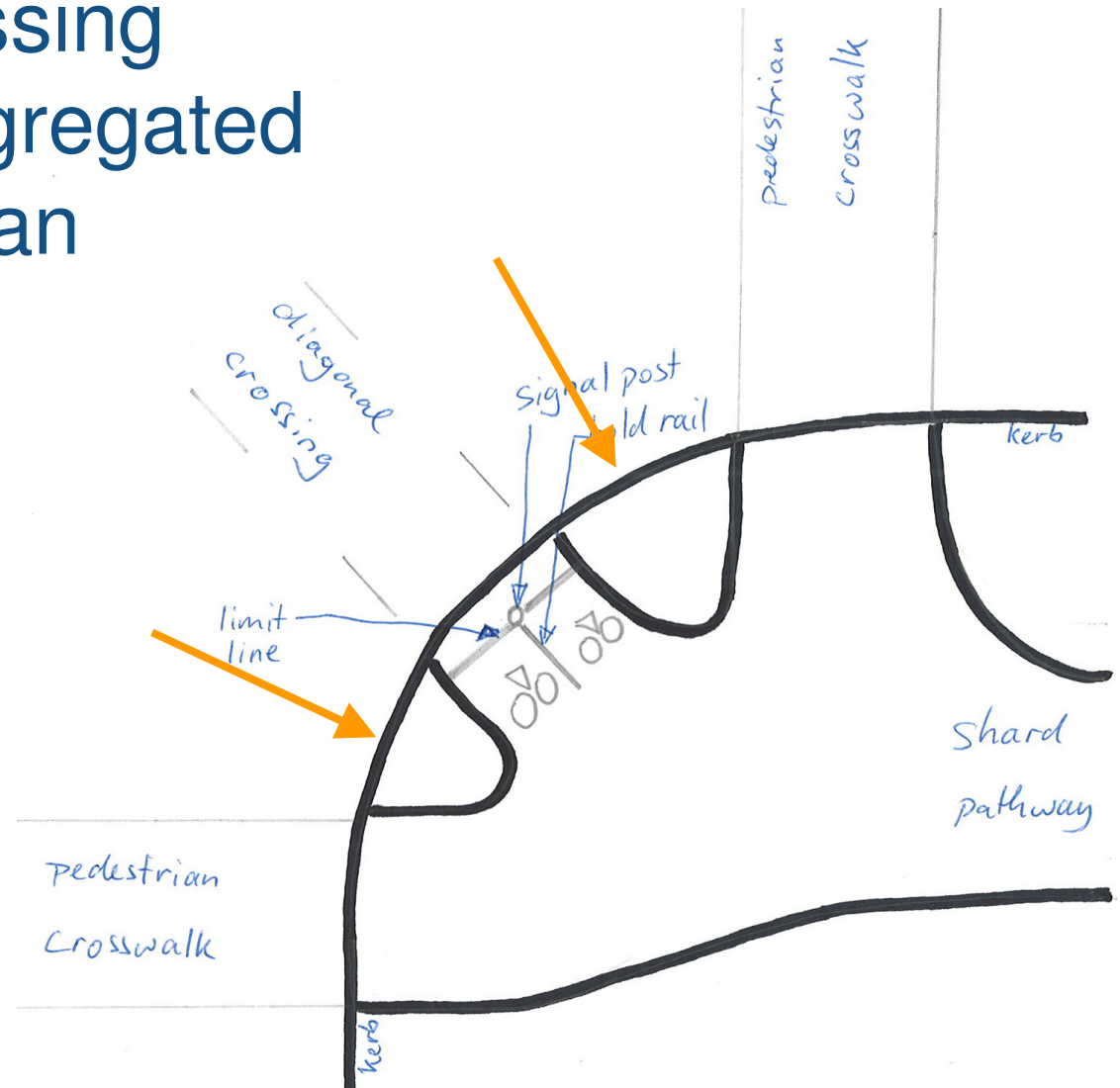
Features for safety cont'd

- Diagonal cycle lane marked with continuity lines, cycle symbol and green surfacing



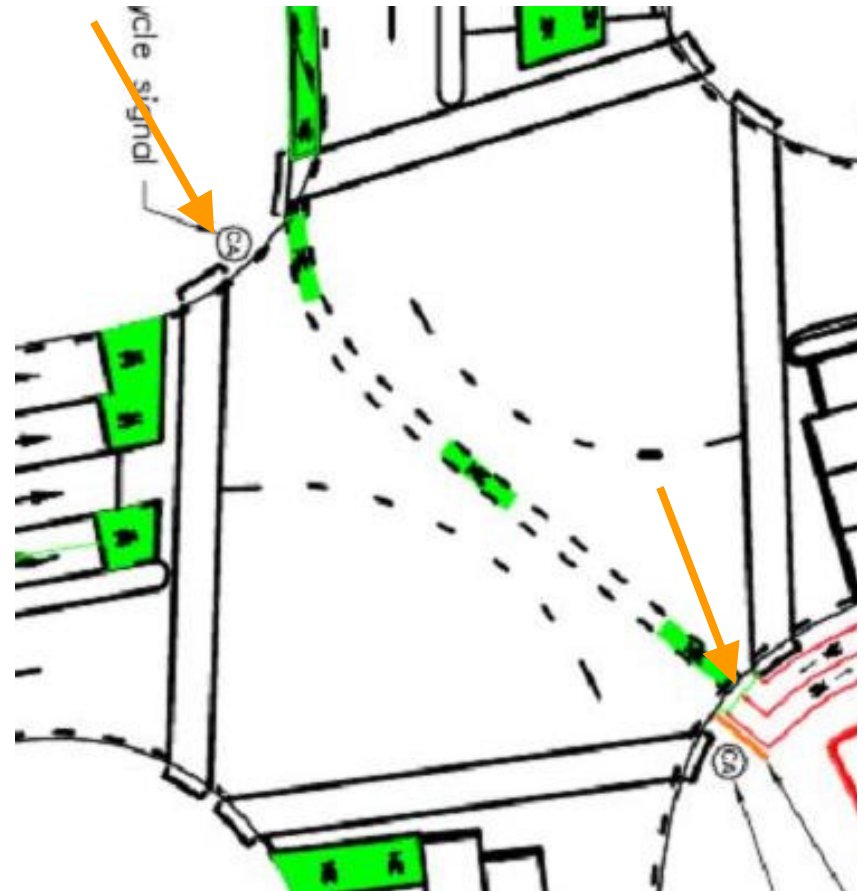
Features for safety cont'd

- Diagonal crossing physically segregated from pedestrian crosswalks



Features for safety cont'd

- Diagonal crossing controlled with its own cycle signals



Features for safety cont'd

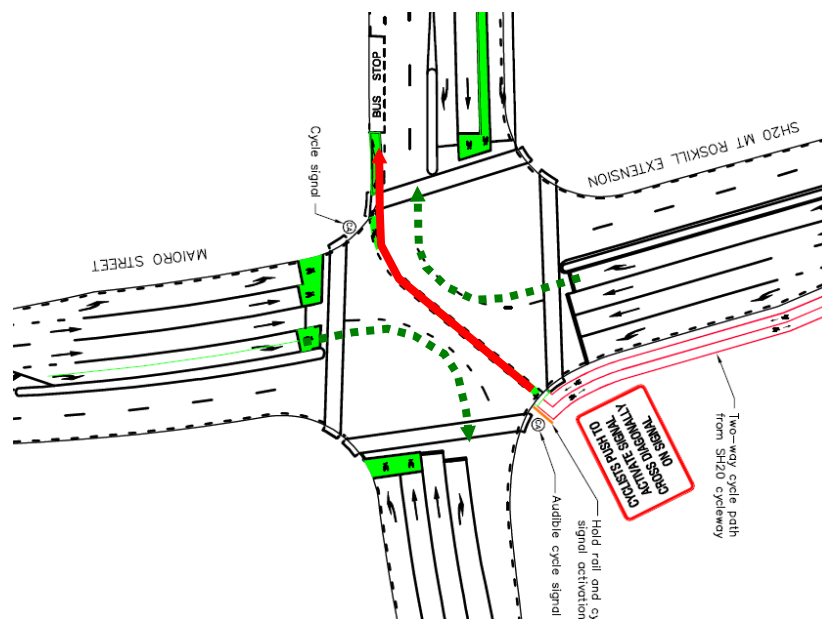
- Information sign advising cyclists how to use facility (and alternative options)



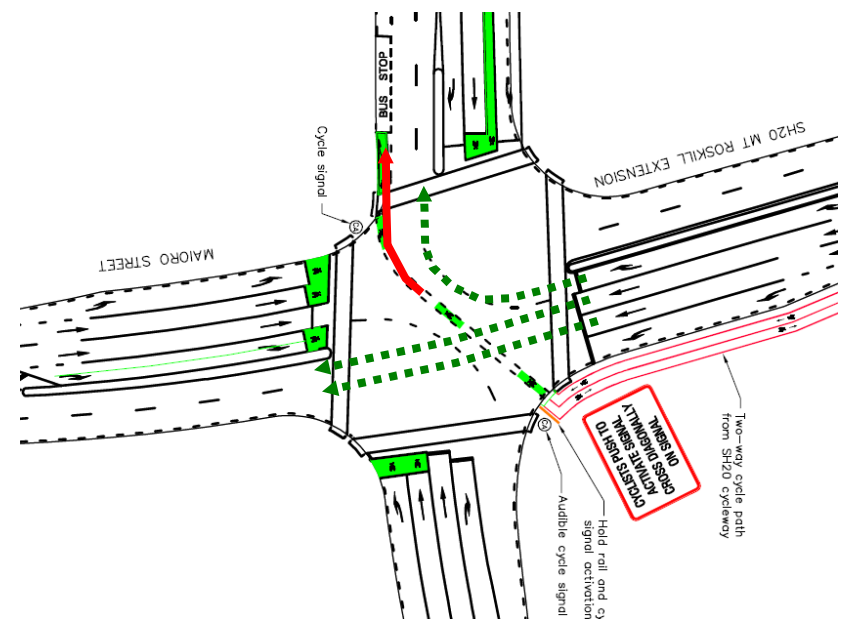
Features for safety cont'd

- Keep signals in RT phase (from SH20 to Richardson Rd) until cyclists have cleared intersection

Diamond phase



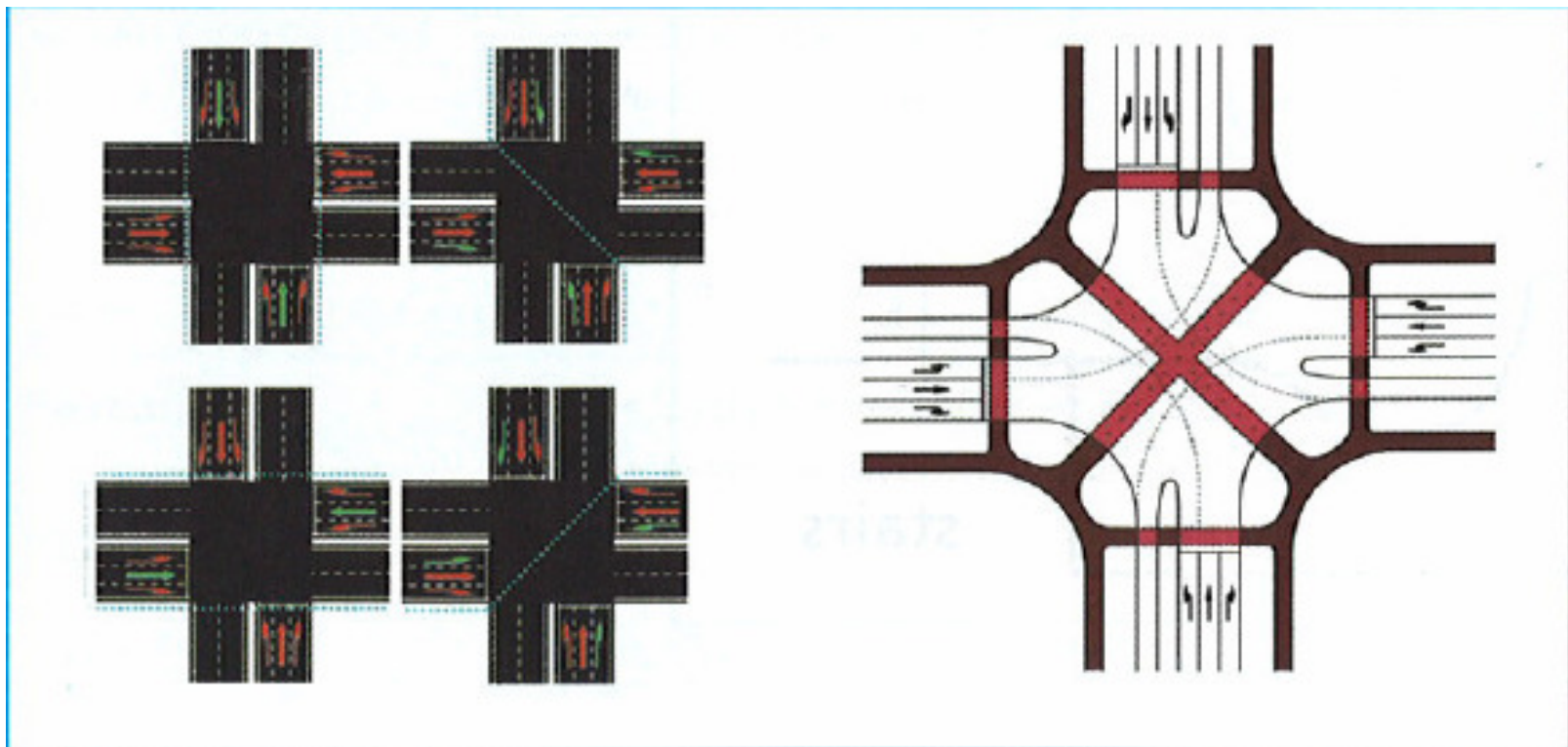
Can introduce westbound movement once cyclists halfway across



Issues

- Described in CROW manual (2007) but not implemented anywhere

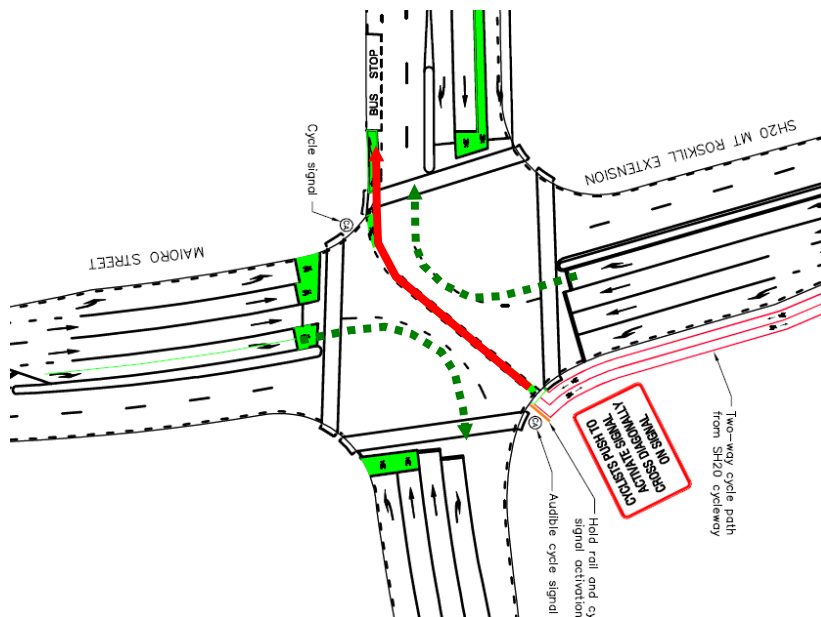
CROW graphic



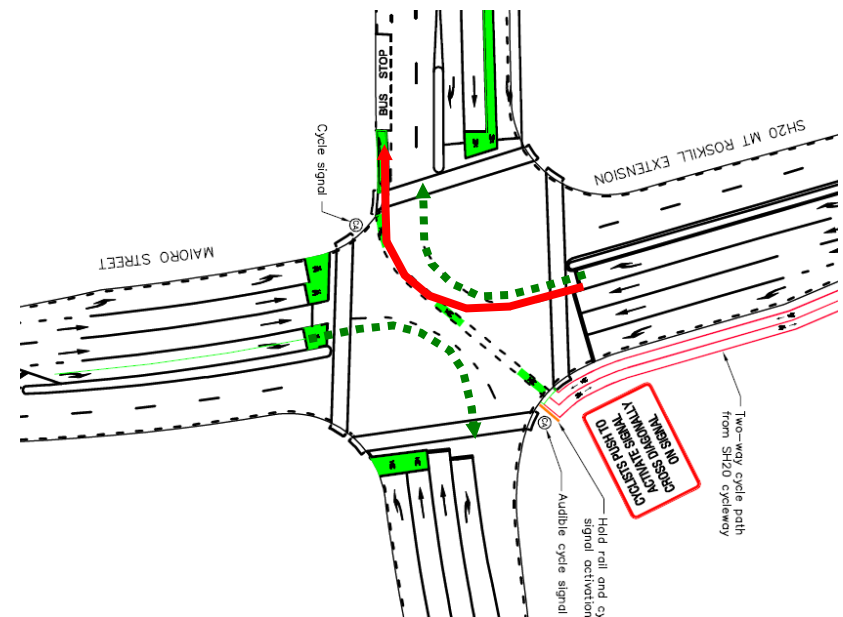
Issues cont'd

- Very unusual situation but similar movement to cyclists making right turn

Diagonal crossing

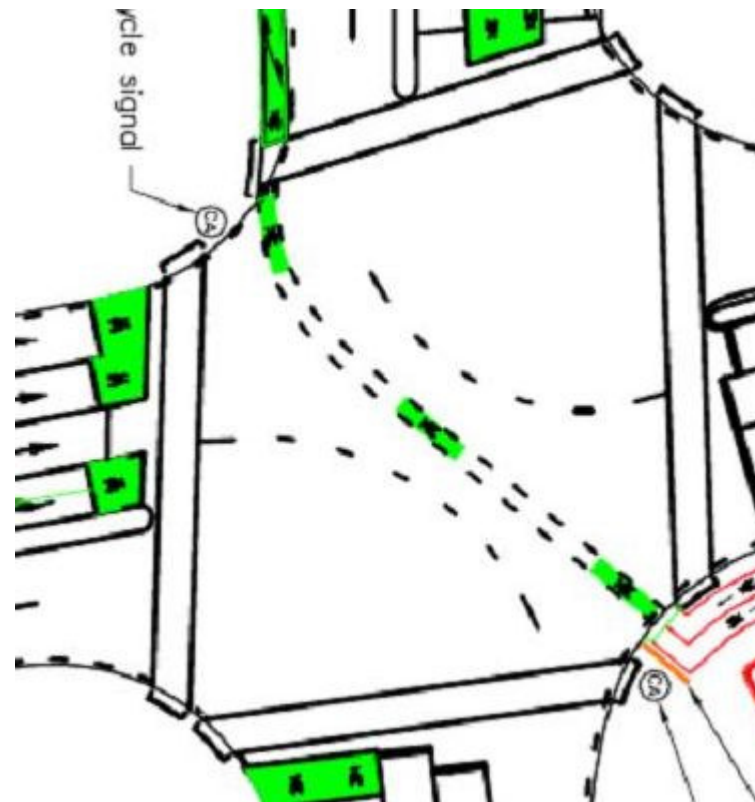


'Normal' right turn manoeuvre



Issues cont'd

- Central area likely to accumulate debris
- May limit future double right turn



Potential benefits – diagonal

- 30% reduction in average cyclist waiting time compared to using ped phases
- Cross in one movement
- Ability to cycle across, and therefore more likely to be used by cyclists
- Only minor changes to intersection layout required
- No disadvantage to motorists

Next steps

- Discussion with LTNZ, Transit NZ and other stakeholders over potential for diagonal cycle crossing
- Further design and safety auditing needed
- Looking for SNUG feedback on the diagonal concept

Questions and Feedback?

