



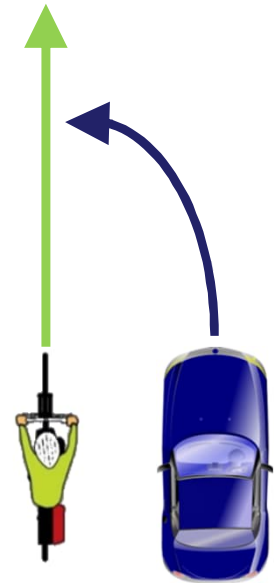
Filtering through protected cycleways

New Plymouth Transport Choices

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Setting the scene

- Separated cycleways at signalised intersections
 - left turning motorists vs through cyclists
- Typical treatment = full protection
 - Is this *really* the most safe and efficient way?
 - Are there other options?
- Let's talk...

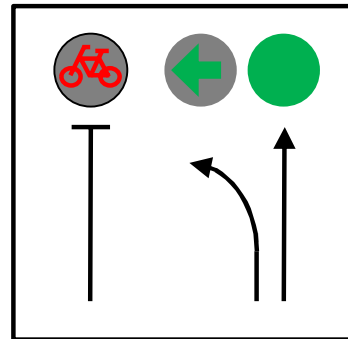
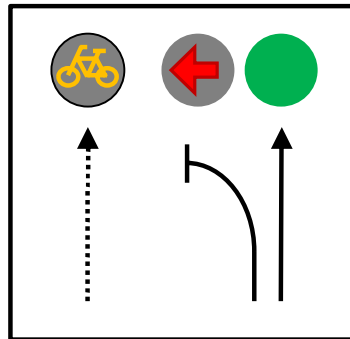
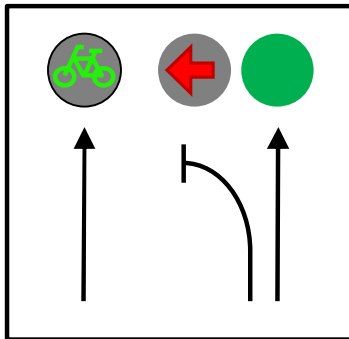


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Here's a few slides that Megan and I presented to you at the 2018 meeting.

Lot more sep cways... nice physical separation on midblock... cross signalised ints

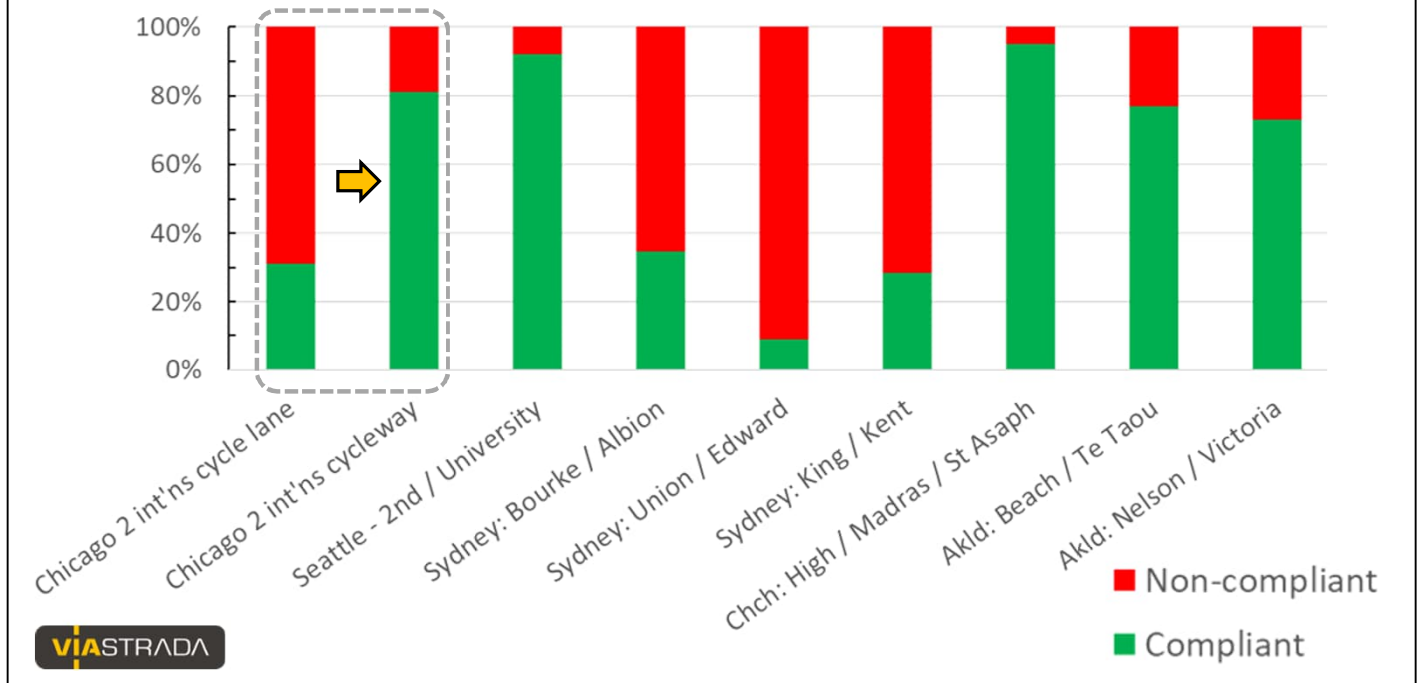
Fully protected cycleway at intersection



When cycle mvmt operates, run non-conflicting parallel traffic, but hold back traffic that would cross the cycle mvmt.

Let's look at how it's working...

Cycle compliance studies – full protection



Overview of compliance studies for sites with full protection. 1st Chicago involved cycle lane, 2nd same location after converted to 2-way cycleway. All others involve separated cycleways. Last 3 from directional cycle signals trial, but only considering through cyclists when operation provided for through cycling during part of phase for general traffic going in the same direction (i.e. doesn't include before data at Beach Rd when the through movement was only operated with the diagonal).

Huge range of compliance rates – why are they so different?

Factors in cyclist compliance at full protection

- Opportunity to infringe
 - Depends on cycle signal state on arrival



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Could be factors like:

Can only run a red light if they arrive on red light. Most studies consider all cyclists, not just those who arrived during a red light and were faced with a decision – stats on prev. slide would look worse if only considering opp to infringe.

Factors in cyclist compliance at full protection

- Opportunity to infringe
 - Depends on cycle signal state on arrival
 - Timing of cycle movement within phase is important
 - Relates to coordination along corridor



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Important when during phase cyclists are given green, in relation to when they turn up.

If corridor progression is set up well for driving, it may not work well for cycling.

Separated cycleway along SH1 pair in Dunedin – cycle mvmt at start of phase, realised cyclists their green, thinking of re-introducing cycle mvmt at end of phase.

Seattle uses adaptive signal timing with loop detection – if a cyclist is present at the start of the phase, they get the green light first. If not, turning traffic goes first, and perhaps by the time cyclists have arrived at the intersection, their signal will be green.

Factors in cyclist compliance at full protection

- Opportunity to infringe
 - Depends on cycle signal state on arrival
 - Timing of cycle movement within phase is important
 - Relates to coordination along corridor
- Risk of conflict



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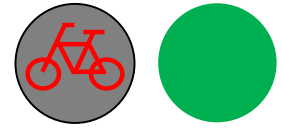
Risk of conflict – less likely to RLR if there's real danger, e.g. from turning vehicles or cross traffic. Depends on **volumes** and **how green time is distributed**.

Photo: no cars in LT lane, cyclists could proceed safely.

Some of the studies quoted involved 2-way cycleways, cyclists coming from opposite the LT can't see lights for conflicting traffic, so can't assess the risk – more likely to hold back.

Factors in cyclist compliance at full protection

- Opportunity to infringe
 - Depends on cycle signal state on arrival
 - Timing of cycle movement within phase is important
 - Relates to coordination along corridor
- Risk of conflict
- Comparison with parallel through traffic



$$\text{Cyclist compliance} \sim \frac{\text{cyclist green time}}{\text{parallel traffic green time}}$$

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Alrutz et al (1996)

Cyclists comparing their signals with those of the adjacent traffic

German research over 25 years ago - cyclist level of satisfaction, and therefore compliance, related to the ratio of their green time to the green time of parallel traffic. Also found poor compliance leads to more crashes.

Seattle made decision to give least possible green time to turning movement and max to cycle phase – 92-93% compliance; Sydney gave min time and had bad coordination: 9-35% compliance.

LOS

- Exclusive phases for people cycling / drivers turning reduces LOS for both groups
- If left turn & through lane is shared, through traffic is also impacted
 - And if through traffic overtakes left turners held on red arrow in RT lane, there may be safety implications for drivers

Filter turning in NZ?

- Legal implications
 - Still a few grey areas (as presented at SNUG 2014)
 - **Ambiguous definition of “roadway” (Road User Rule)**
 - Limited definition of cycle aspect (Traffic Control Devices Rule)
 - Accessible Streets Package will address those issues
 - When will that happen?
- Concerns
 - Already have a problem with filter turning through pedestrians – why extend this to cyclists?

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Defn of roadway possibly a problem – separated cycleways not considered roadway, so not legally clear if turning motorists must give way, even if there's a green cycle signal. Needs to be updated by MoT, NZTA is pushing, SNUG endorsement would help.

Drivers are more likely to take notice of a new device like FYA, so it could be a way of teaching them the correct behaviour.

Trials in USA started with applications for filter turns across ped mvmts, now just starting to use across separated cways. We need to trial them too.

NYC conflict study suggests a good level of understanding of and, more importantly, compliance with FYA.

If legal implications weren't an issue...

- Other jurisdictions that allow filter turning do so for turning volumes of up to 150 veh/hr
 - This number can be traced back to the CROW manual
 - That's a busy turn and whether it's the right number should be studied / observed
- In New Zealand, we do allow filter turning when it's a cycle lane
 - What is the real difference between paint and concrete as separators when it comes to filter turning?



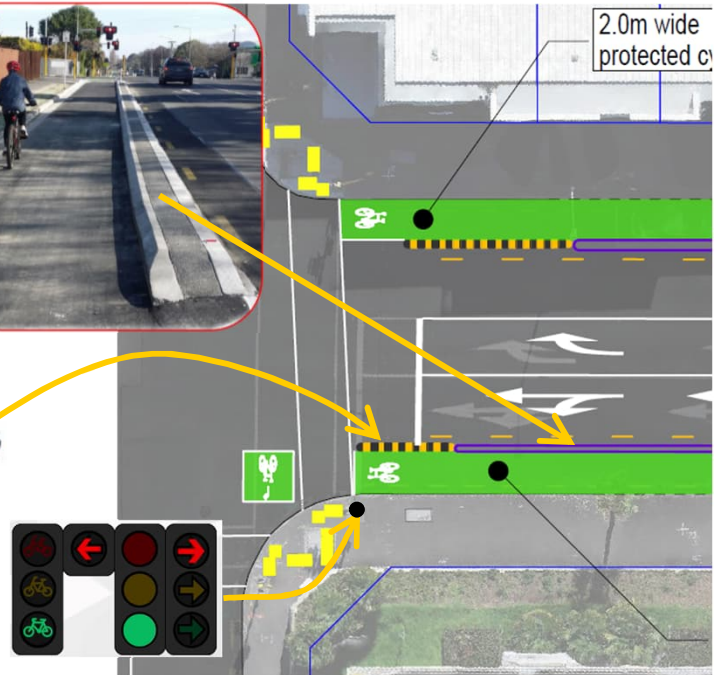
Filter turning through separated cycleways

- Technically not legal
- Know of just 2 NZ examples where filter turning happens
 - Clyde / Ilam (Christchurch)
 - Abel Smith / Victoria (Wellington)



New Plymouth proposal: layout

- Cycleway with physical separators (concrete)
- 5 m before limit line use commercial speed hump in lieu of separator
 - Cycleway now forms part of the roadway

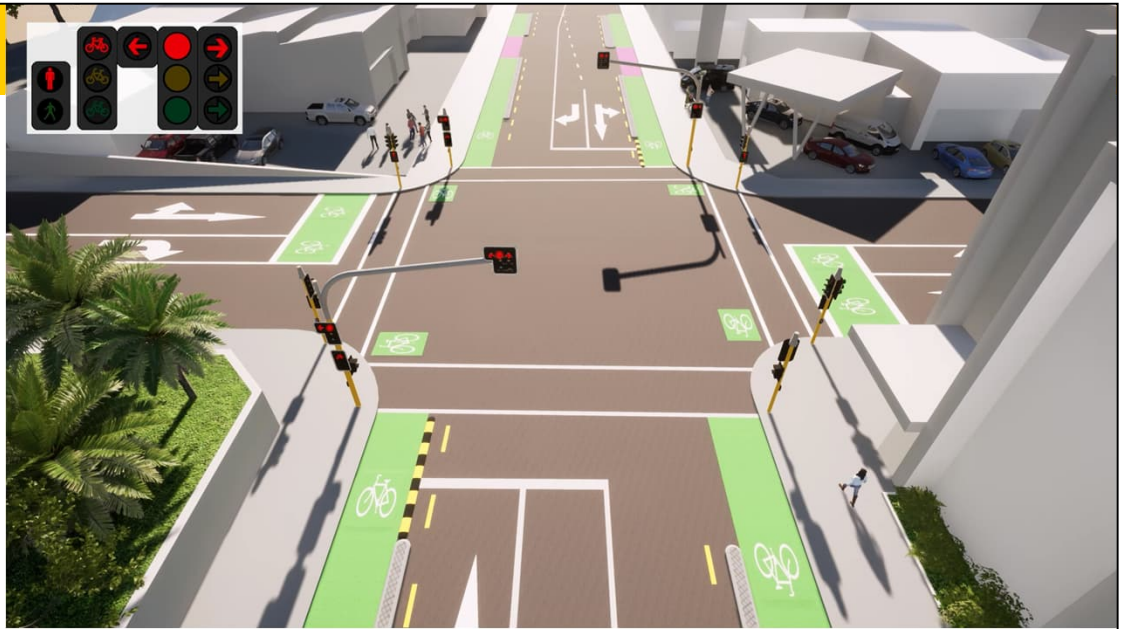


New Plymouth proposal: operation

1. Don't allow filter RT
2. LH red arrow protection and green cycle signal
3. Then show yellow cycle signal
4. Drop the LT red arrow and blank the cycle displays



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** Play separate video here



Expected outcome

- Expected to function like filter turning through a (painted) cycle lane
 - Operationally more efficient for people cycling and driving
- Expected to have much better compliance with traffic lights
- Expected to have improved safety outcomes
 - Because of the relationship between non-compliance and crashes

Next steps

- Elected members to decide upon the projects next month
- If approved, construction between Dec 2023 and June 2024
- Can report back at a subsequent SNUG workshop

Thank you!

Questions and discussions



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