

Presentation to the SNUG Workshop
Whangarei, Friday 21 November 2008

Staged Pedestrian Crosswalks at Signalised Cross Intersections

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TRAFFIC ENGINEERING AND PLANNING

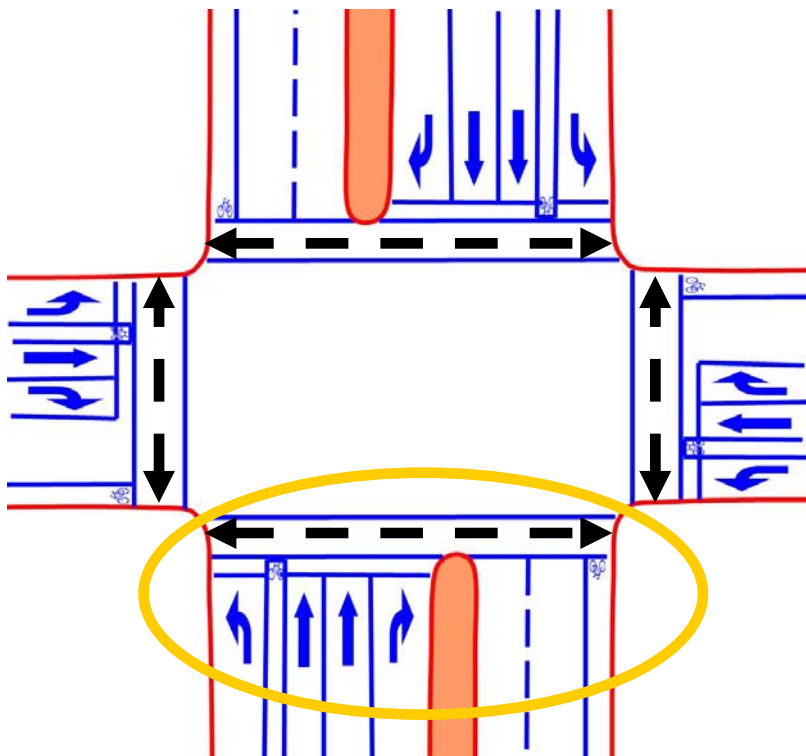
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Presentation outline

- Introduction
- Components of staged pedestrian crossings
- Modelling
- Case study
- Phasing example
- Conclusions

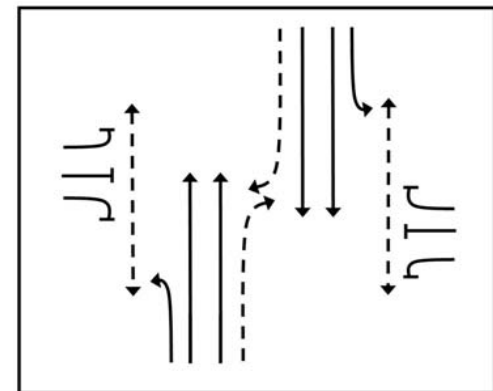
Introduction

- A typical pedestrian crosswalk operation in NZ:

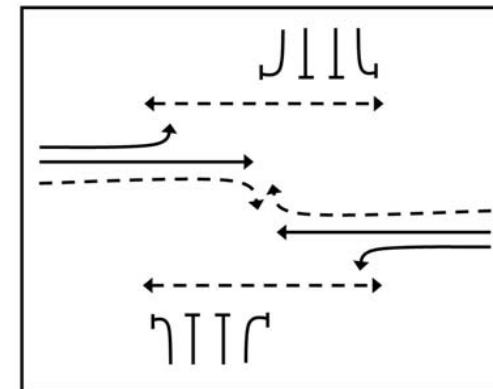


- Multi lane road

A Phase

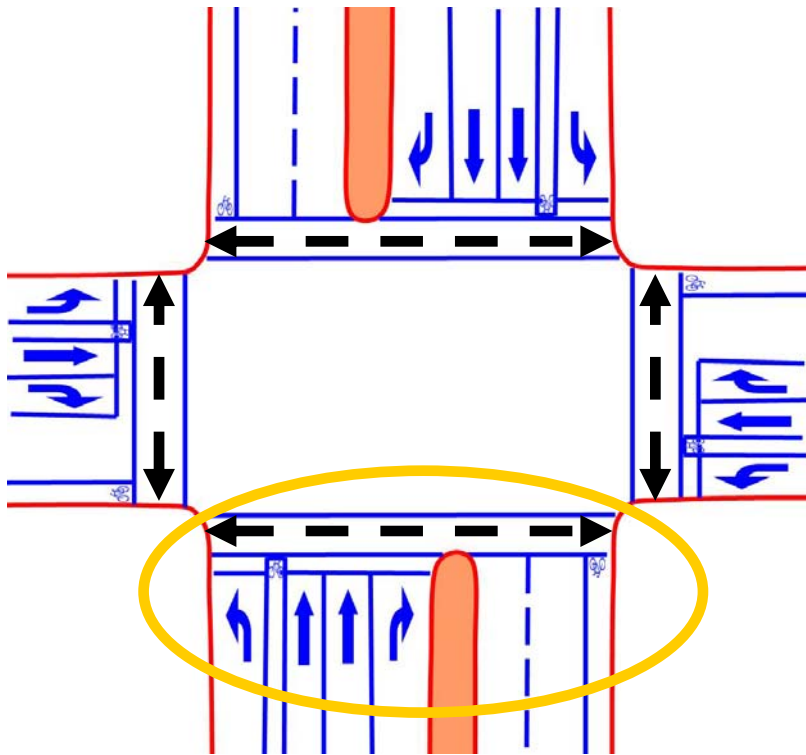


B Phase

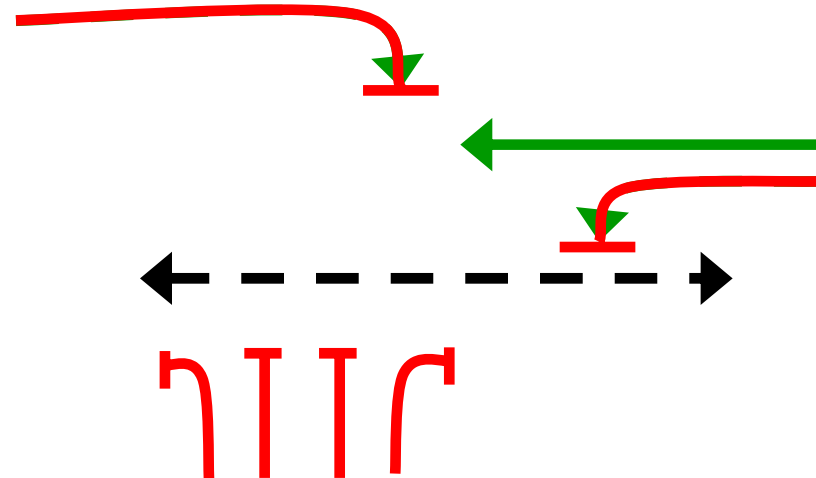


Introduction

- A typical pedestrian crosswalk operation in NZ:

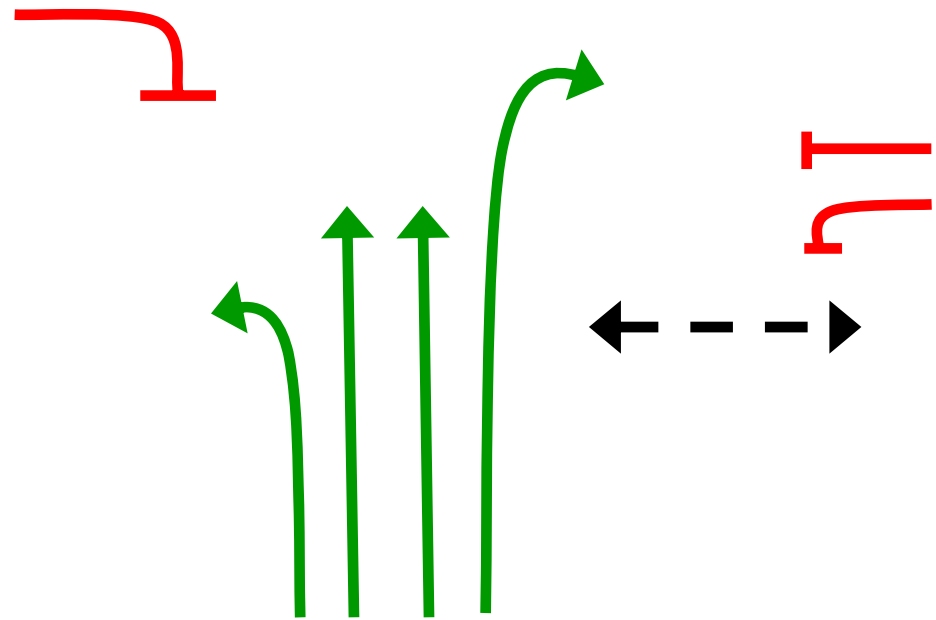
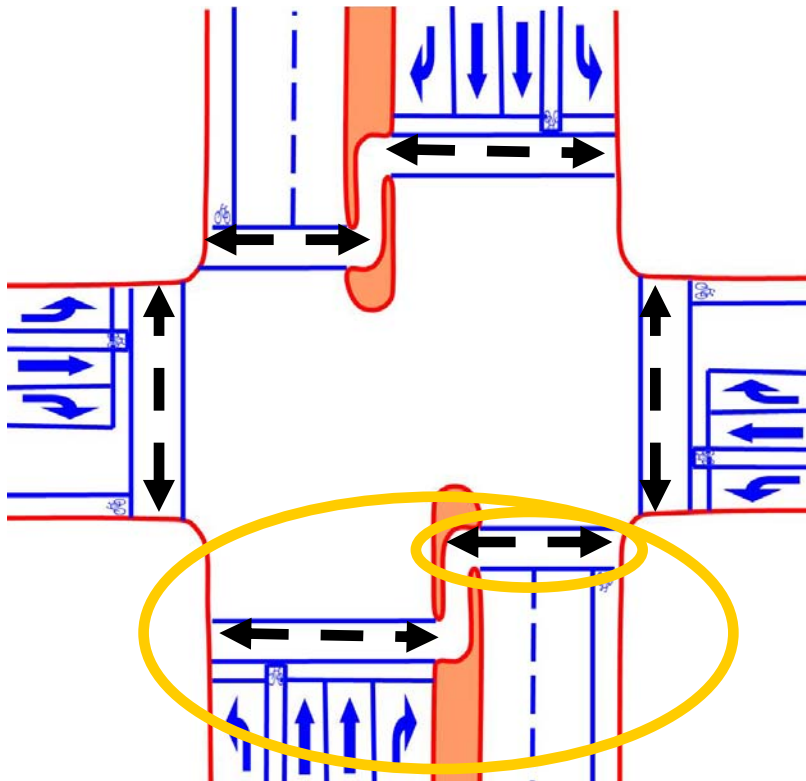


- Allowing filter turning vehicles significantly decreases pedestrian safety
- Pedestrian protection decreases efficiency



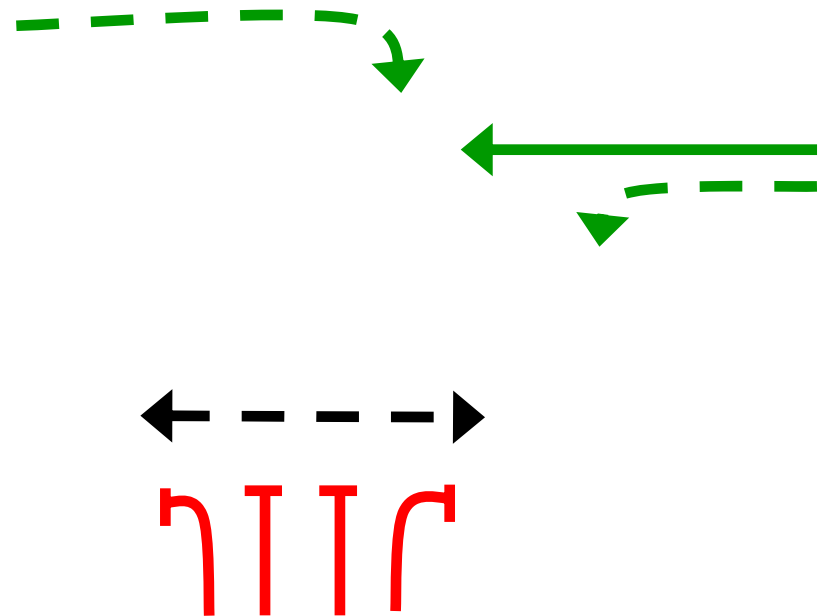
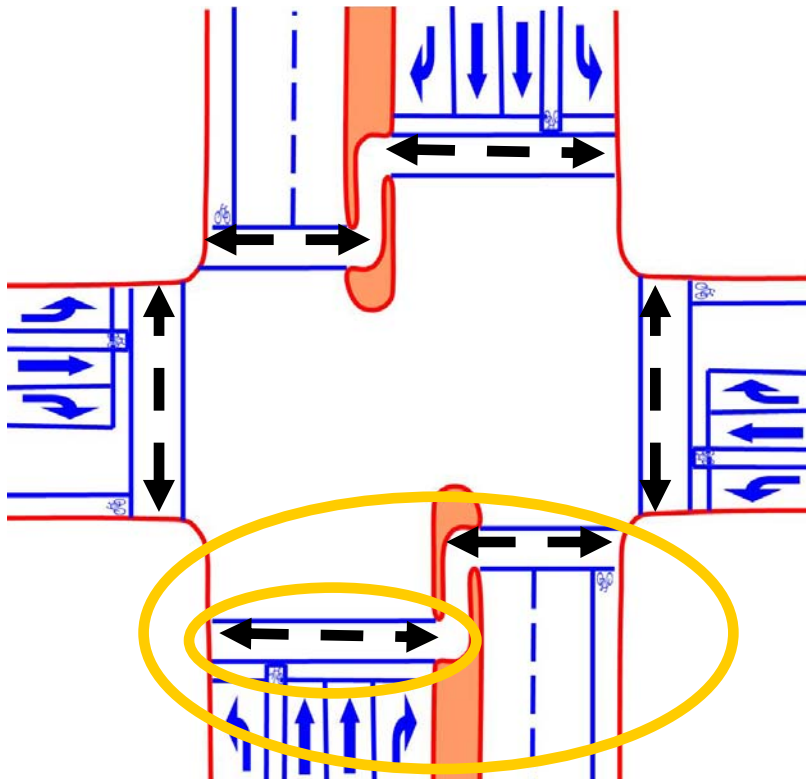
SPC Concept

- Why not try a staged pedestrian crossing (SPC)?



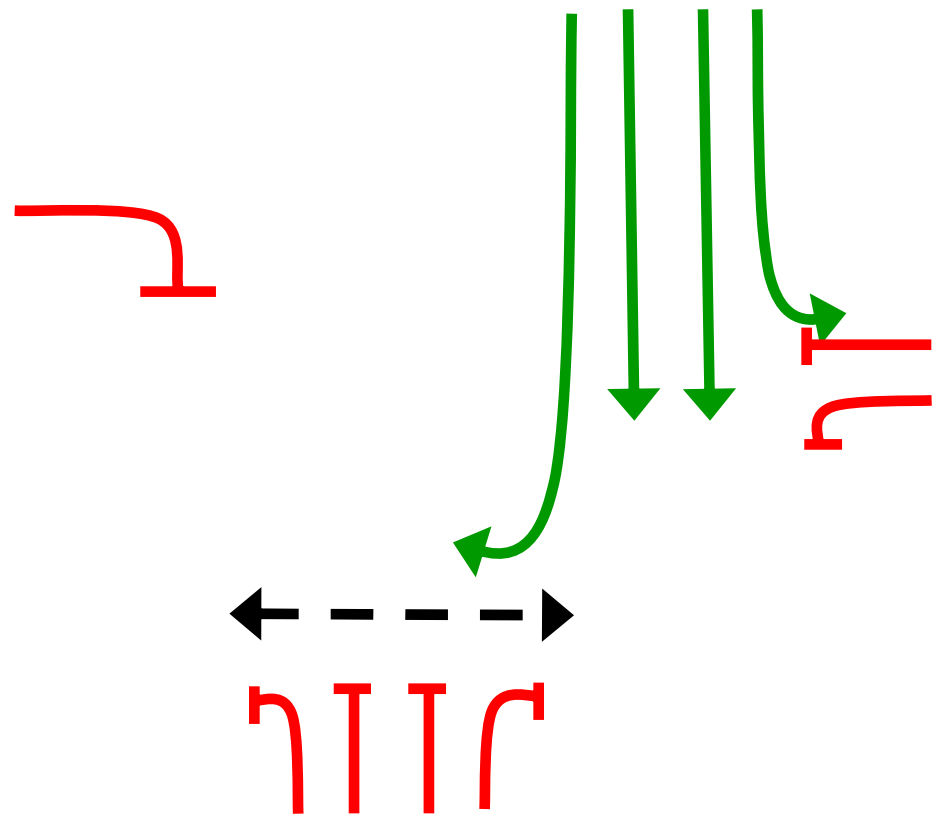
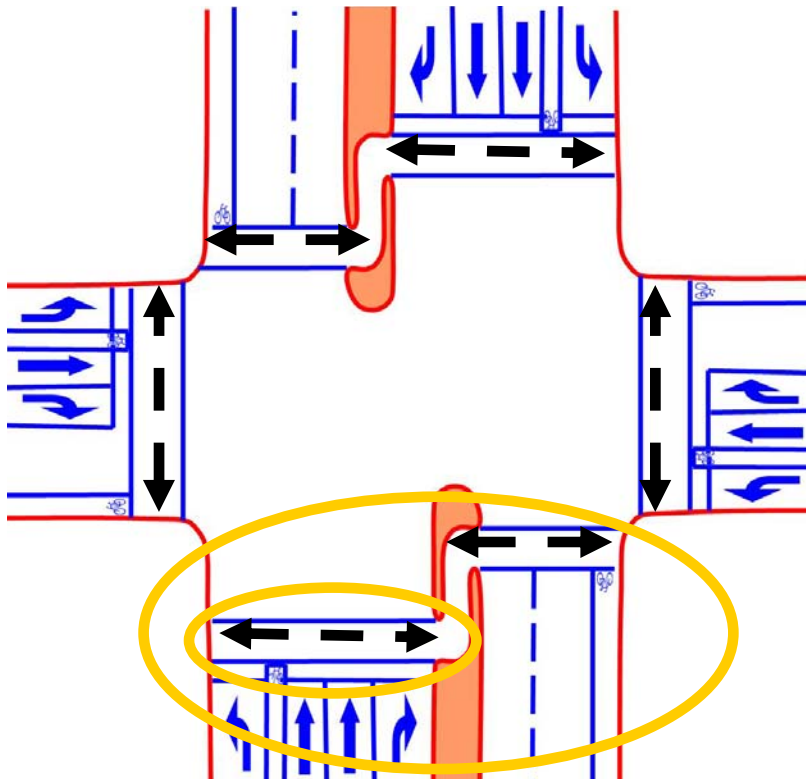
SPC Concept

- Why not try a staged pedestrian crossing?



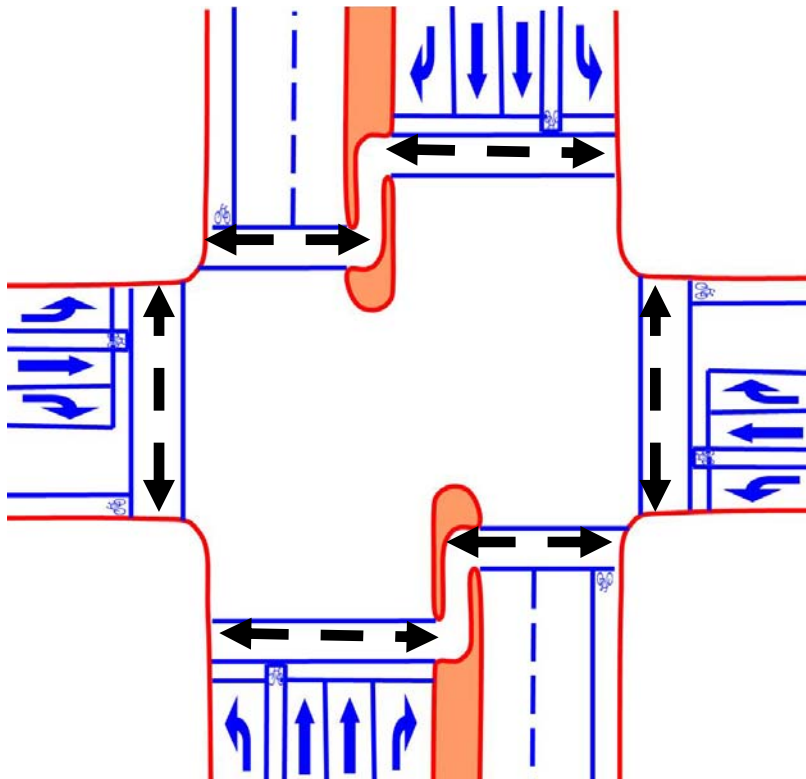
SPC Concept

- Why not try a staged pedestrian crossing?



SPC Concept

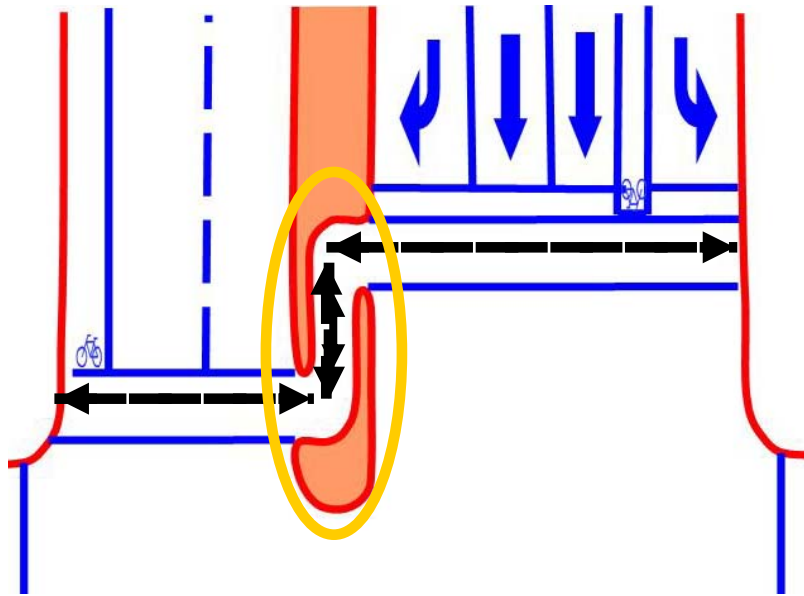
- Why not try a staged pedestrian crossing?



- Separates crossing tasks
- Allows for full (or increased) protection without (necessarily) decreasing motor vehicle efficiency
- Increases pedestrian walking distances (but may decrease waiting time)

Components of SPCs

- Refuge island



- Staggered
- Stagger ≥ 3 m
- Lefthand stagger preferred
 - ensures peds walk towards opposing traffic

Components of SPCs

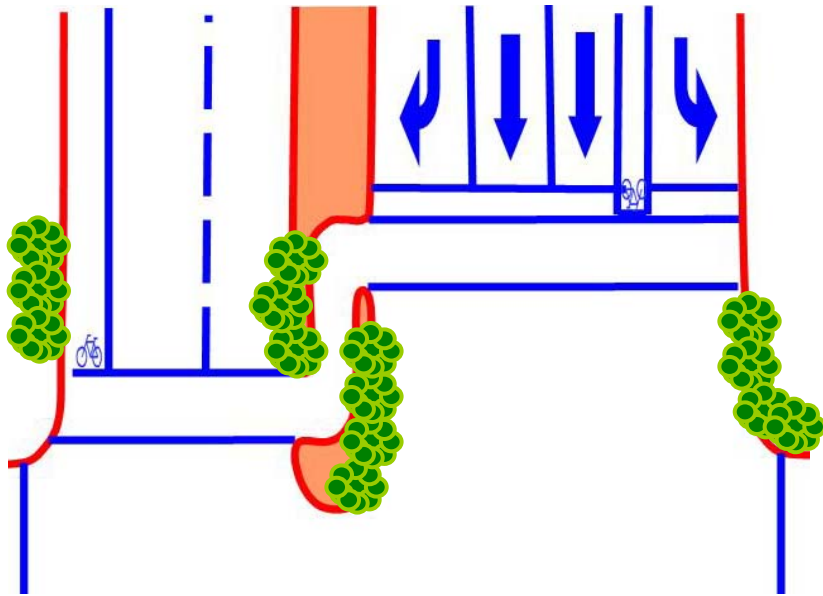
- Traffic signal phasing



- Operates as two separate crosswalks
- Different phasing possibilities
 - Depending on location of pedestrian demand
 - Depending on turning movement demand

Components of SPCs

- Assisting infrastructure



- Signal aspects
- Signage
- Low cover landscaping
- Ped call buttons in median

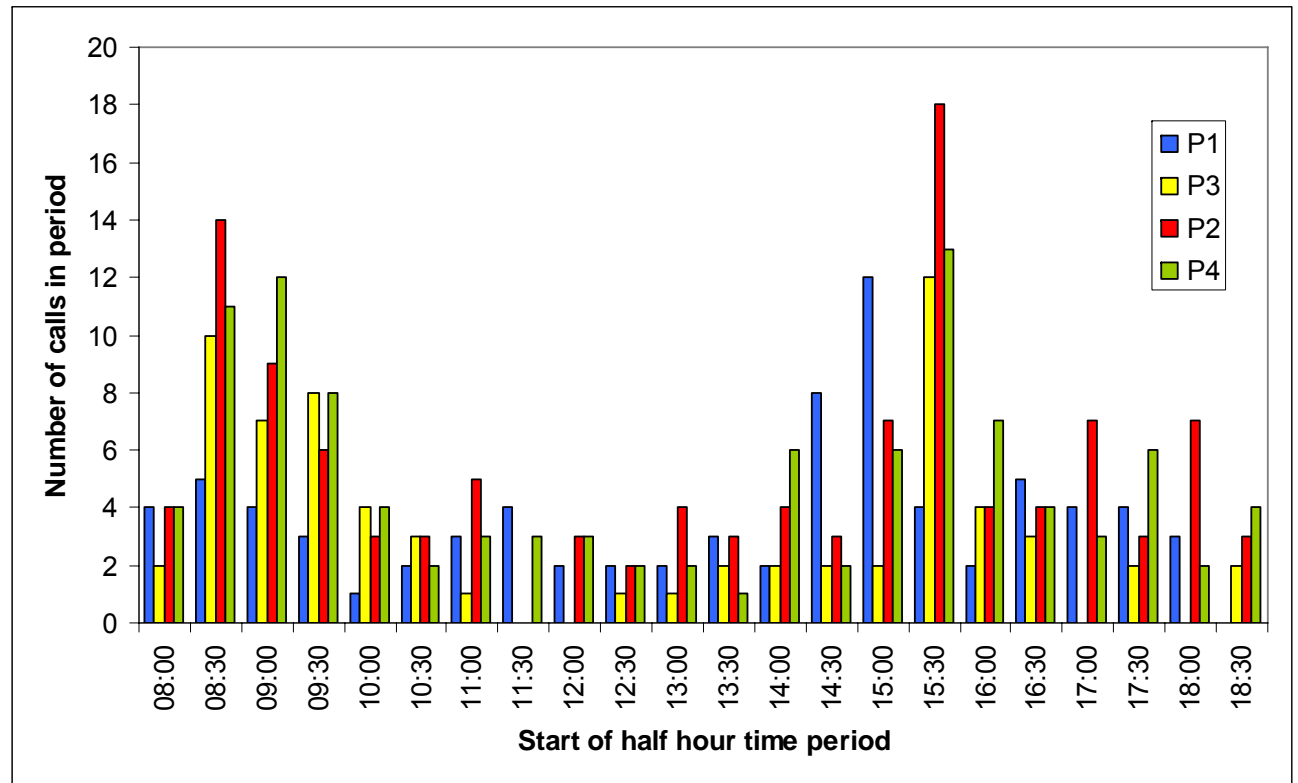


Modelling

- Two ways of modelling pedestrian effects in SIDRA
 - Use pedestrian volume data, or
 - Define late start to conflicting vehicle movement
- Second method is recommended
 - In control of what SIDRA does
- This requires demand and delay data

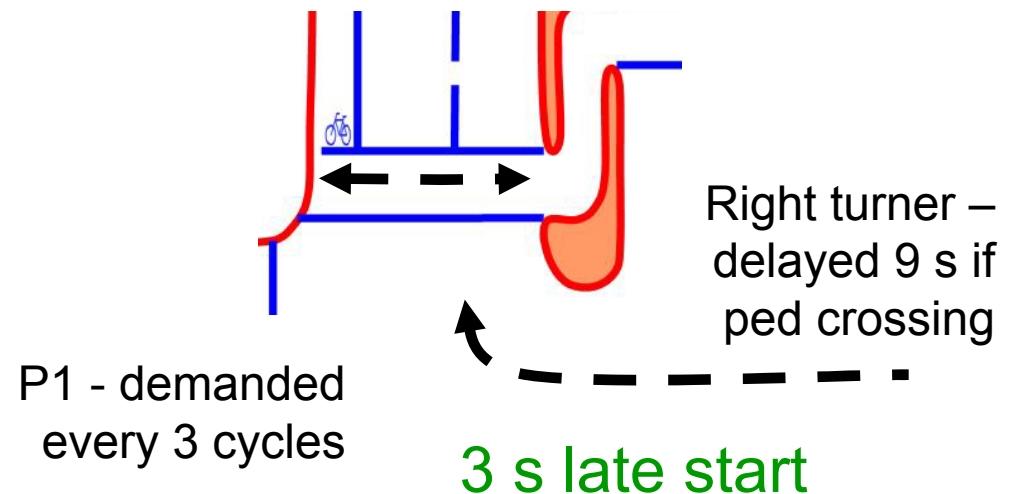
Modelling

- SCATS data
IDM
(intersection
diagnostic
monitor)



Modelling

- SCATS data (intersection diagnostic monitor)
- Average demand rates
- Late starts when demanded
- Average late starts



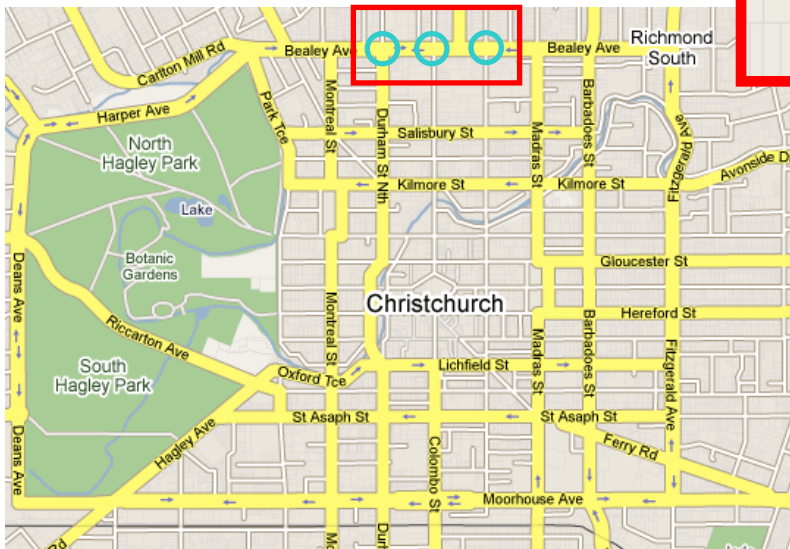
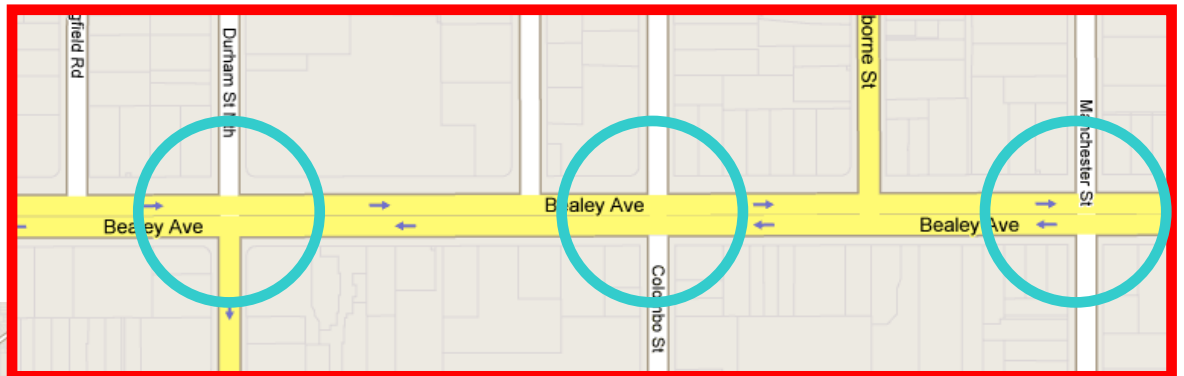
Case study

- Bealey Avenue, Christchurch

- Manchester Street

- Colombo Street

- Durham Street



Case study

- Applying the modelling method:

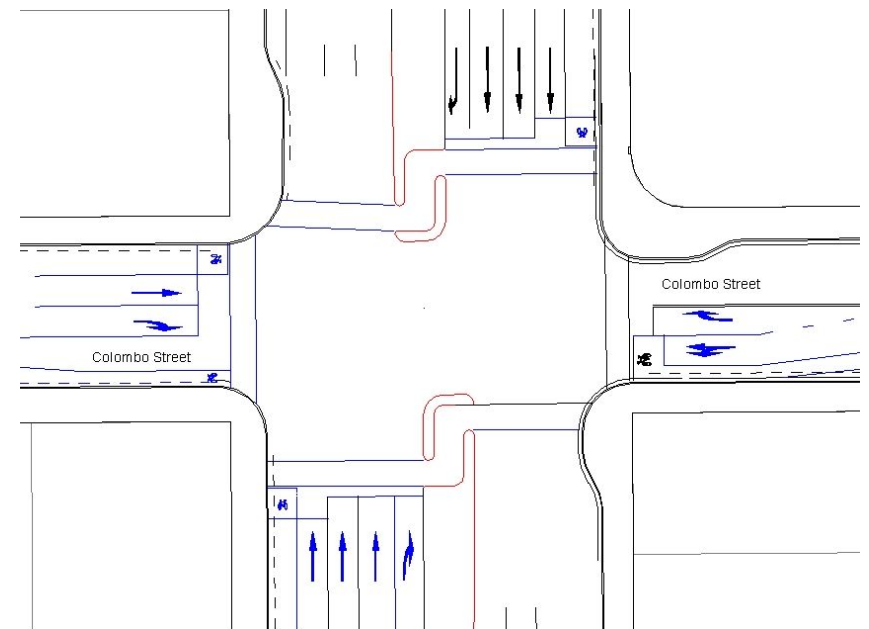
Side road	Level of Service		Average delay (s/person)		Spare capacity	
	Base	SPC	Base	SPC	Base	SPC
Manchester	D	C	39.0	34.9	-14%	-10%
Colombo	D	D	49.1	45.7	-19%	-18%
Durham am	D	D	51.4	50.4	-10%	-10%
Durham pm	D	C	35.7	33.4	8%	10%

Observations & Question

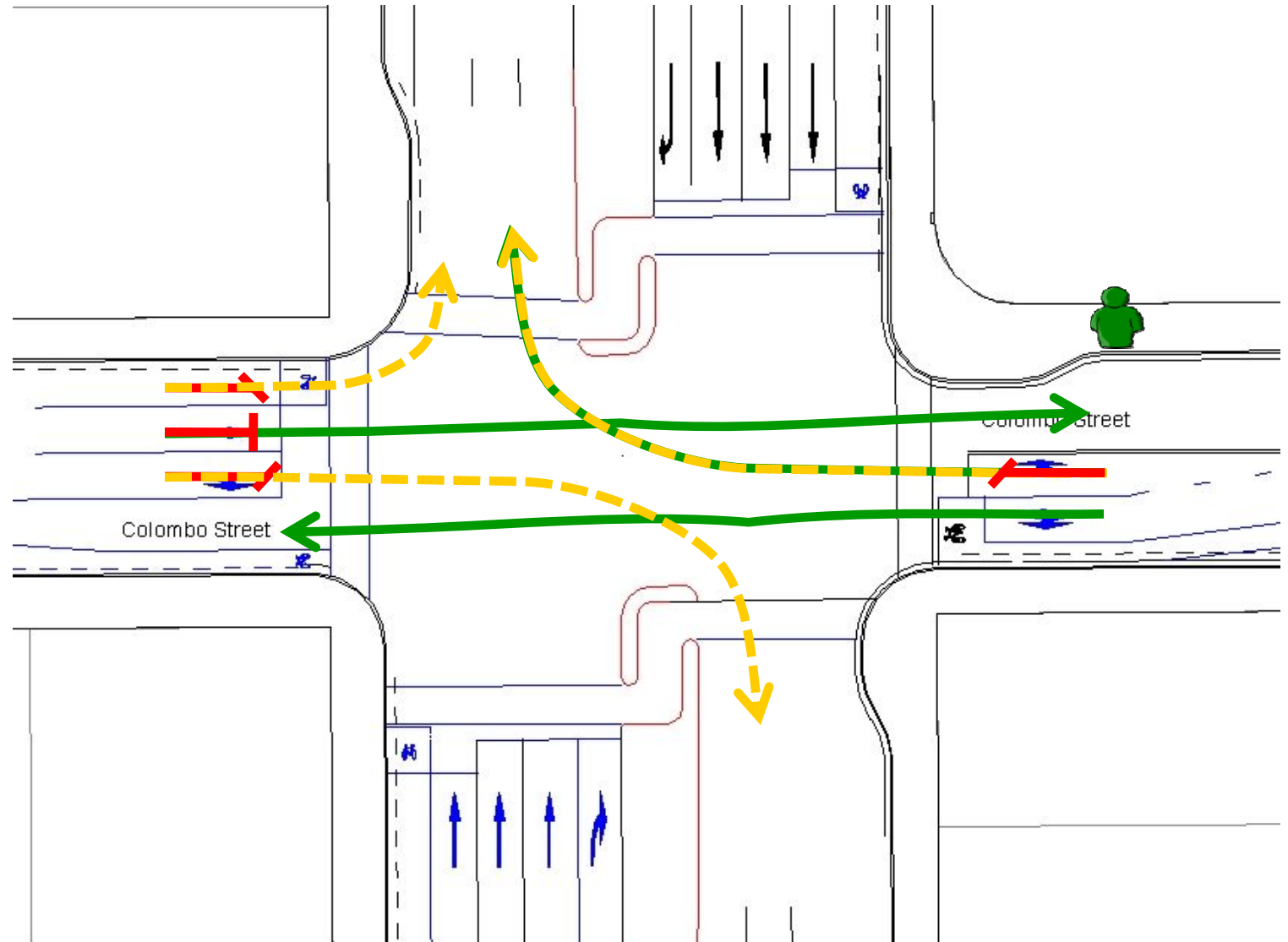
- Often don't have wide enough median
- Large intersections get high cycle time from length of ped phases
- Would ...
 - Dropping a lane
 - Introduction of wider median and SPC
 - Shorter cycle time
- ... result in better intersection operation?

Phasing Design

- Convert simple 2 phase operation to more complex arrangement
- Heavy RTs on Colombo Street (tidal)
- Pedestrian demand is tidal
 - am demand into town



Morning peak phasing

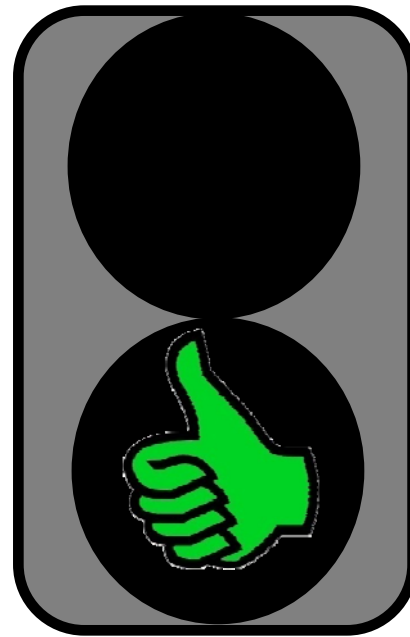


Conclusions

- British experience suggests staged pedestrian crossings will improve safety and quality of pedestrian provision at intersections
- Initial modelling suggests that intersection efficiency can be improved through proper introduction of staged pedestrian crossings
- Great solution for multi lane roads
- Further investigations required
- Let's try it!

Thank you

Questions and discussion



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Discussion

- Are staged pedestrian crossings unsafe because they require pedestrians to wait in the centre of the road?
 - Phasing should be designed to minimise this occurrence
 - Refuge should be designed to offer actual and perceived safety
 - What about the current situation?

Discussion

- Is pedestrian split approach operation unsafe?
 - Phasing must be carefully designed
 - Signal hardware and refuge layout must emphasise the two separate crossings

Discussion

- Is efficiency the “be all and end all”?
 - NZ Transport Strategy 2008 objectives:
 - Environmental sustainability
 - Economic development
 - Safety and personal security
 - Access and mobility
 - Public health
 - Staged pedestrian crossings satisfy all 5 objectives

Discussion

- Will user-unfamiliarity make SPCs unsafe?
 - Current intersections are vastly inconsistent
 - Current intersections not always self-explanatory
 - Improvement requires change