Slide 1:

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Improving Pedestrian LOS at Signals

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TRAFFIC ENGINEERING AND PLANNING

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Slide 2:

Background

- Study of central Christchurch by Danish architect Jan Gehl
  - *Public Space Public Life* (2009)
  - High level look at how to further develop the central city
- CCC (Christchurch City Council) adopted implementation actions
  - *A City for People Action Plan* (2010)

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PROJECT central city

A City for People
Action Plan
Christchurch 2010

Slide 3:
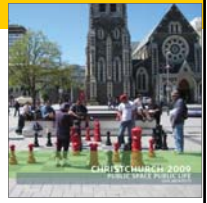
Background (cont'd)

- Objective of action plan is to lay foundation "for future growth and prosperity" (Bob Parker)
- Action item – improve pedestrian level of service (LOS)

Pedestrian Friendly City

ACTION		
#	Public Space Public Life Recommendations	A City for People Action Plan Recommendations
		Review LTCCP levels of service to provide better recognition of pedestrians
4	Increase pedestrian priority at intersections including reduced waiting times	Review traffic light (SCATS) operations with the objective of providing higher pedestrian priority including extended 'green person' crossing times

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Slide 4:

Study area

- Study area adopted from Gehl report
- 32 signalised intersections with
- 110 signalised pedestrian crossings

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Methodology

Stage 1: conference paper
- Develop a pedestrian LOS process
- Measure LOS for the signalised pedestrian crossings in the study area
- Prepare a toolkit of measures to improve LOS
- Develop an implementation strategy

Stage 2: work undertaken since submitting paper
- Develop preferred option for each crossing
- Undertake network modelling
- Evaluate improvement

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Defining level of service

- No recognised system available for measuring pedestrian LOS at signals
- Method developed for this study:
  1. Crossing distance: kerb to kerb distance
  2. Delay time: average length of time before walk phase begins
  3. Green time ratio: ratio of delay to green walk time
  4. Exposure to risk: conflicting turning volumes

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Measuring level of service

- Review signal plans
- Site visits
  - ped counts, observations, hardware
- Data from the signals team
  - turning volumes, operational data
- Apply engineering judgement
  - exposure to risk
- LOS score for each crossing
  - spreadsheet analysis

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LOS rating

- Spreadsheet analysis assigns points
  - Range 0 to 100 points
- Points ranges get translated to LOS rating

LOS	Range	
A	100	83
B	82.9	66
C	65.9	49
D	48.9	32
E	31.9	16
F	15.9	0

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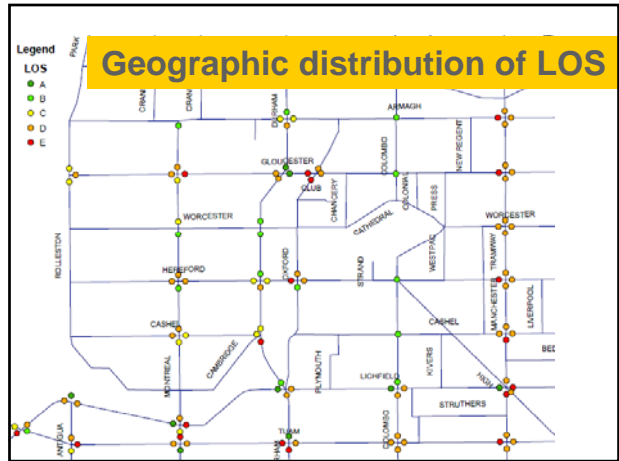## Numerical distribution of LOS

- Based on engineering judgement (we assigned scores and distributed points ranges)
  - No LOS F
  - Half of the crossings LOS D
  - Rest evenly distributed
  - Average score 48.9 points
- Wellington and Auckland perform less well
  - Based on Beca research

LOS	Number of crossings
A	9
B	15
C	15
D	53
E	18
F	0

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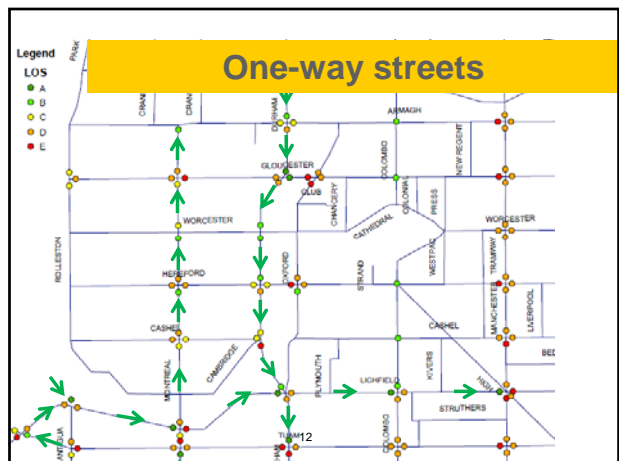## Geographic distribution of LOS

Observations on distribution

- Many LOS A crossings are on one-way approaches
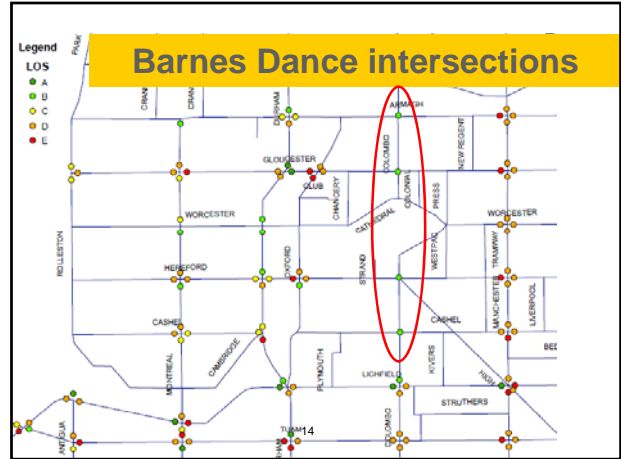

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One-way streets

Slide 13

Observations on distribution

- Many LOS A crossings are on one-way approaches
- Barnes Dance (pedestrian scramble phase) intersections have LOS B

Slide 14

Barnes Dance intersections

Legend
LOS
- A
- B
- C
- D
- E

Slide 15

Observations on distribution

- Many LOS A crossings are on one-way approaches
- Barnes Dance (pedestrian scramble phase) intersections have LOS A
- Two-way cross intersections often have a low LOS
  - Not a reflection of an inherent problem, rather a reflection how they are currently operated

Slide 16

Two-way cross intersections

Legend
LOS
- A
- B
- C
- D
- E

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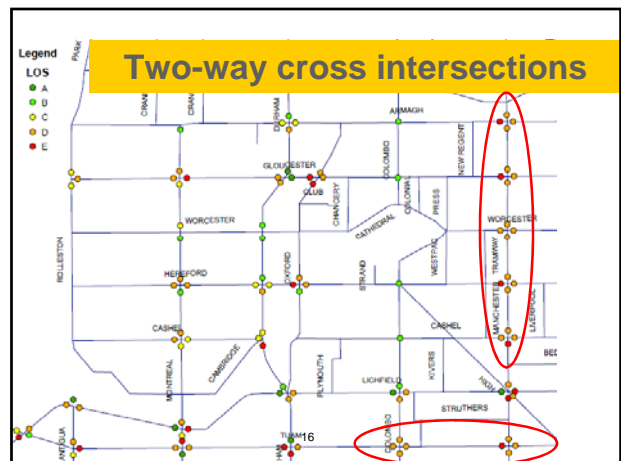
Toolkit of measures to improve LOS

- Reduce the waiting time for pedestrians (through cycle time reductions)
- Lengthen the pedestrian phase (reduce perceived conflict created by the "flashing red man", plus reduced delay)
- Give pedestrians an advance start ahead of vehicles (several different methods available)
- Increase geographic distribution and time schedule for automatic call of pedestrian signals
- More Barnes Dances
… and other measures

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The most effective tool

- Cycle time reduction most effective
  - More effective than increasing walk time
  - Requires departure from current operating philosophy
  - Need to balance pedestrian benefits with impacts on driver delays / capacity
  - Often benefits motorists, too

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Stage 2 – Implementation phase

- Not part of the written paper
- Hence will report results only
- Methodology
  - Study undertaken for each crossing
  - Considered most applicable tool(s) from Stage 1
  - Detailed proposals worked out
  - Network effects modelled in Paramics
- Final draft submitted to client

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Stage 2 – Results

- The cycle time in the CBD would be reduced in the interpeak
- Some intersections and one corridor taken out of co-ordinated system
- Proposal would raise average LOS

	Existing	Proposed
Score	48.9	59.0
Rating	D	C

- Overall network performance for motorists remains fairly unchanged

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Stage 2 – LOS comparison

- Average score 59 points – LOS C
- Significant pedestrian improvement without lowering vehicle performance

LOS	Number of crossings	
	Existing	Proposal
A	9	16
B	15	19
C	15	40
D	53	28
E	18	7
F	0	0

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Stage 2 – Implementation

Armagh @ Durham (Feb 11)

Worcester @ Manchester (Sep 10)

- Implementation date uncertain

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Colombo @ Kilmore (Feb 11)

Discussion & thank you

- Questions please

- Thank you for listening
- Contact phone numbers:
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  - Susan McLaughlin   (03) 941 8569

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Video Clip

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