

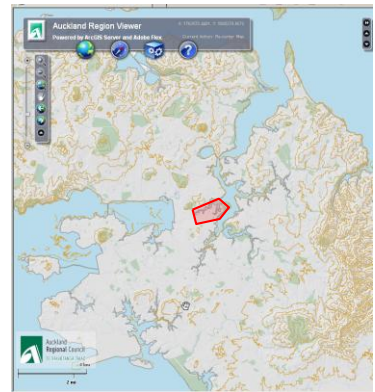
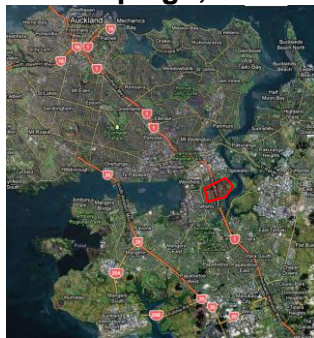


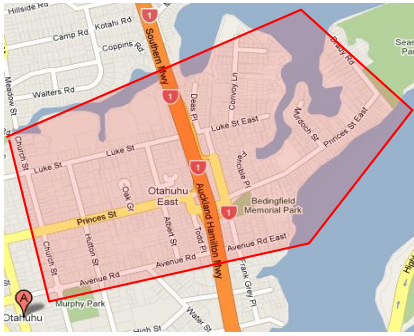
# Street-to-street variations in PM, PNC and BC in a motorway-dominated urban neighbourhood

Ian Longley<sup>1</sup>, Woodroe Pattinson<sup>2</sup>, Simon Kingham<sup>2</sup>, Lou Reddish<sup>1</sup>, Gustavo Olivares<sup>1</sup>, Guy Coulson<sup>1</sup>  
<sup>1</sup>National Institute of Water & Atmospheric Research, Auckland, New Zealand  
<sup>2</sup>University of Canterbury, Christchurch, New Zealand



# “ROADSIDE” observational campaign, 2010



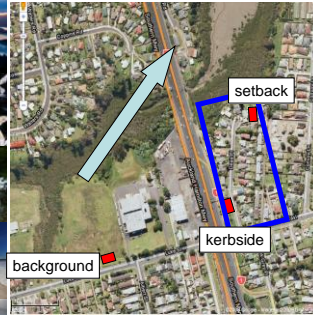


### Data collection

- PM<sub>10</sub>, CO, NO, NO<sub>2</sub>, meteorology at 3 fixed sites for 3 months
- BC & particle size distribution at kerbside site
- NO<sub>2</sub> diffusion tube network
- Traffic data (SCATS, SH1)
- Bike- and car-based 'mapping' surveys (CO, CO<sub>2</sub>, BC, PNC, PM<sub>1/2.5/10</sub>)



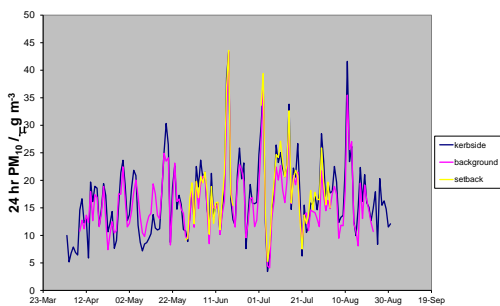
### ROADSIDE study design and dispersion model validation



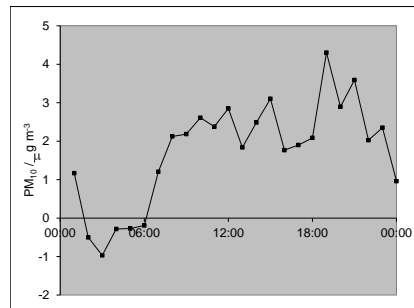
- Within the blue box emission ~0
- Sinks ~0
- Only relevant process is dilution (dispersion)
- In prevailing (SW) wind:
 
$$\text{dispersion\_ratio} = \frac{\text{kerbside} - \text{background}}{\text{setback} - \text{background}}$$
- Triple-site design allows dispersion errors to be isolated from emission errors



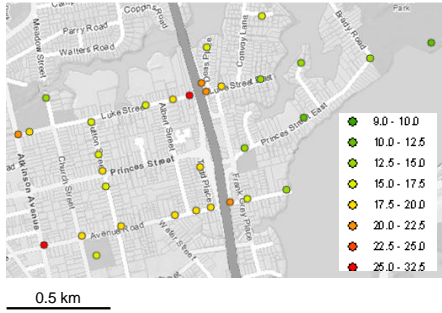
### 24 hr PM<sub>10</sub>



### Diurnal mean kerbside – background PM<sub>10</sub>



### NO2 diffusion tube network



### bike/car survey route



### NIWA's Mobile Air Quality System

- PNC (CPC)
- BC (AE22)
- CO2 (Vaisala)
- 6 evening runs in winter 2010

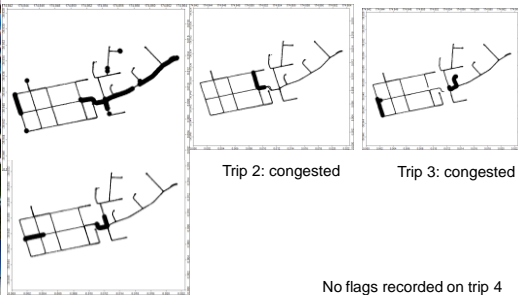


### 17th June 2010

- 4 circuits
- Start 17:30, end 23:00
- Calm conditions, weak NE wind
- domestic woodsmoke



### 17th June flags

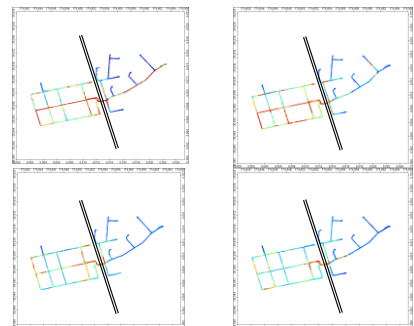


Trip 1  
above: congested  
Below: HGV

No flags recorded on trip 4

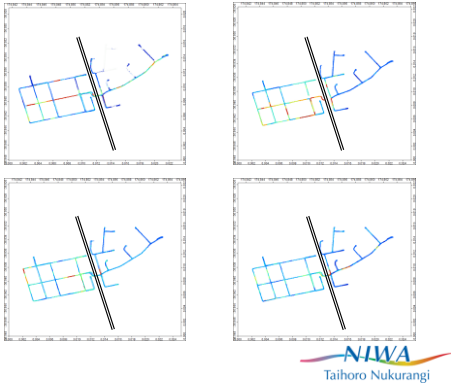


### 17th June PNC

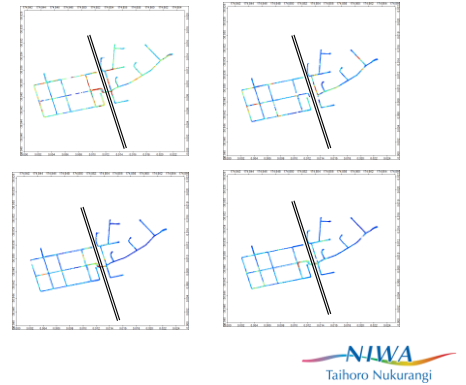




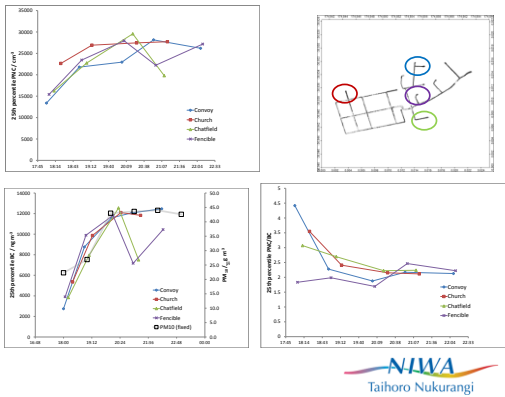
### 17th June BC



### 17th June PNC/BC



### Background trends



### Forthcoming analysis

- De-trending and normalisation
- Combination of all day/night data
- GAQIS-based street-by-street analysis
- Use CO2 data for source profiling
- Generalised mapping



### Thanks for your attention

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