DATA COLLECTION:
This poster reports on a small subset of a large observational database on commuting by bus, car, train and bicycle in Christchurch and Auckland. The full study, its aims, location, dates and study design are detailed in Kingham et al. (2011). This poster focuses on data collected on multiple 2-part bus journeys in Christchurch.

Personal measurements of ultrafine particles (particle number concentration) were made on multiple journeys between the same journey origin and destination between 26th February 2009 and 28th March 2009. Sampling was conducted during traffic peak hours along two routes consecutively. Journeys included time spent at three bus stops, a pedestrianised city centre street (between bus journeys), and an indoor bus terminus.

Particle number concentration was measured at 1 second resolution using a TSI 3007 portable condensation particle counter sampling via a purpose-made diluter to the design reported by Knibbs et al. (2007). Location was logged at 3 second resolution using a Nokia N82 mobile phone with built-in GPS receiver.

Onboard bus
Once normalised by city centre concentrations (see above), concentrations on buses exhibited a bi-modal distribution with 96% of data falling between 1 and 10 times the background. Further analysis is aimed at determining whether make & model of bus, direction of travel, number/duration of stops were significant determinants of onboard concentrations.

Bus stops
Three bus stops were sampled: Redwood, University and City. The highest concentrations by far overall were consistently observed at and around the Redwood bus stop (e.g. blue trace in Figure 1). This bus stop is located on a busy road with regular peak-time congestions.

Pedestrian city centre street
The lowest concentrations overall were consistently observed in pedestrianised city centre streets. The data obtained in this microenvironment each day was used to normalise all data to compensate for changes in city-wide particle levels.