



## **WE HAVE MOVED TO NEW PREMISES IN PETONE, AFTER 57 YEARS AT GRACEFIELD.**

The Opus Research team has relocated over the past few weeks and many of the team are shown in this photo in our new reception area. Some of our laboratories have been completed and the remainder will be finished in the next few weeks so that our client and contract commitments are not compromised. In the next In-Touch we will profile the new lab facilities.

This new facility is 10 minutes' commute from the Wellington CBD by car or train and is located in a prominent and very attractive position across the road from Wellington Harbour (see page 7). It also accommodates Opus' training business which includes a range of NZQA-accredited courses for the water and environmental sectors. The large rooms used for training are also available to clients and other stakeholders for workshops and meetings.

Alongside the excitement (and large challenge!) of moving to our new premises, our team continued to undertake a wide range of research and consultancy projects – and 2013 was a record business year for Opus Research. In this issue of In-Touch you will find stories

on two recent research projects we have undertaken for ACC on industrial health and safety management. There are also stories on how to make public transport journeys more pleasant, and a major study we recently completed on what would make the new central city in Christchurch more liveable. We also introduce several new staff.

I look forward to welcoming as many of you as possible to the Petone facility. We want it to be a place where clients, partners and Opus staff interact in a highly productive and enjoyable manner.

### **Peter Benfell**

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## OUR PROUD HISTORY AT GRACEFIELD

**OPUS' CENTRAL LABORATORIES WAS ESTABLISHED IN 1957 TO BOLSTER NZ'S POST-WWII ENGINEERING DESIGN AND MODELLING NEEDS FOR HYDROELECTRIC PROJECTS AT WAIKATO, WAITAKI AND CLUTHA. DEMAND FOR POWER RAPIDLY OVERTOOK GENERATING CAPACITY AFTER THE WAR, CREATING A SHORTAGE RESULTING IN BLACKOUTS AND POWER CUTS.**

Assistant Engineer-in-Chief at the Ministry of Works, John Gilkison visited the US in the late 1940s and discovered that NZ's expertise in design and preparation of high-quality concrete was sorely lacking. Cement was in short supply and firms were building cheaper – and much less controllable – vertical kilns that raised serious questions of performance and durability, and an urgent need for assessment and monitoring.

Experimental engineering research was also needed to support the development of the state highway system, and for new motorways, airport upgrades, large government

building projects, and river control works.

Shed 13 became the laboratories' first home. This 'temporary' building had been erected during the war to store US military supplies. The original staff of five included an engineer-in-charge, a draftsman, a joiner/model making technician, a carpenter and an electrician.

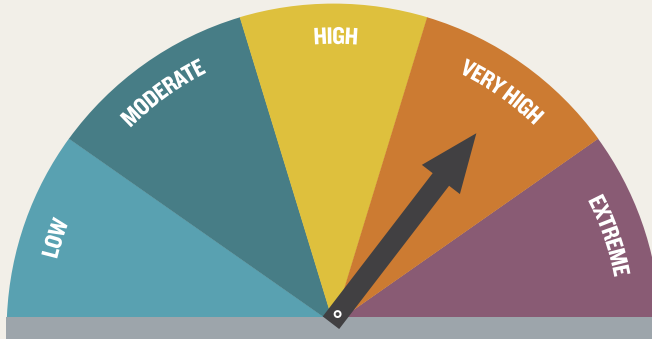
School leavers completing NZCE qualifications were recruited as junior laboratory technicians. Local NZCE classes were initially taught by Central Laboratories' staff until suitable teachers could be recruited.

Hydraulics, soils and concrete labs were operational by mid-1958, and a structures lab followed in 1961. A computational analysis group was developed in 1959, when Treasury installed the Government's first computer and allocated a shift a day for technical research. An instrumentation group began in the 1960s. Central Laboratories expanded into Sheds 10, 11 and 12 during the 1970s, and the wind tunnel was added following the Wahine storm.

Purchased by Opus in 1996 as part of the privatisation of Works Consultancy and rebranded 'Opus Research' in 2013, the facility's latest move to Petone continues the tradition of expansion and evolution that has been a hallmark since its inception.



## “PLEASANT PASSENGER LIKELIHOOD TODAY”



“How would your fellow passengers rate your public transport performance?”



## SMILE, YOU'RE ON PUBLIC TRANSPORT!

Opus' behavioural sciences research manager Jared Thomas has been looking into factors that make public transport journeys more – or less – pleasant for passengers. Findings from the study indicate that kindness from other passengers plays a significant role in how pleasant your journey is.

For cities that are increasingly reliant on public transport networks as populations increase, crowding is the biggest threat to the uptake of public transport as the commuting option of choice. Where social environments are crowded, people tend to minimise their social interactions to avoid mental overload. This breakdown in social niceties can lead to flow-on negative behaviours such as queue-jumping and pushiness, which in turn reduce passenger flow and impact on travel times.

Research partners Opus Research and Black Box Consultants have been working with the Singapore Kindness Movement and the Singapore Land Transport Authority to turn these experiences around.

The Singapore-based study found that commuter behaviours such as passengers taking up more space than they need or having uncomfortably loud conversations, have a greater influence on the pleasantness of the trip than physical comfort measures (such as vehicle temperature or seat comfort) or design measures (such as designated “in” and “out” only doors).

One social solution being looked at is to leverage off people's natural desire to be liked (including by other passengers) to raise self-awareness and to improve patrons' empathy towards others. People already dwell

more on negative – rather than positive – commuter behaviours. The irony is that when a bus or train breaks down or is running late, other passengers are often your greatest resource. Passengers working collectively and not selfishly actually improve the efficiency of the system overall.

The crowded Singapore experience offers a snapshot into the importance of positive passengers interactions. We have the opportunity to act now with interventions to encourage empathy between passengers. We need to meet the social as well as physical needs of public transport patrons to deliver better public transport solutions as our cities continue to grow.

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*A builder using the backpack during construction at our new facility in Petone.*

## **VIDEO EXPOSURE MONITORING STUDY**

**“THE OLD ADAGE THAT A PICTURE PAINTS A THOUSAND WORDS IS VERY TRUE, GREATLY REDUCING THE NEED TO TRY AND TRANSLATE WHAT IS QUITE TECHNICAL DATA INTO INFORMATION THAT WORKERS AND THEIR MANAGERS CAN UNDERSTAND AND MAKE EFFECTIVE USE OF. THIS IN ITSELF WILL BE HIGHLY ENGAGING WITH THE WORKER INVOLVED AS ISSUES AND POTENTIAL SOLUTIONS ARE IDENTIFIED RIGHT THERE ON THE WORKSITE AND TRIALLED.”**

**- MIKE WARD, HEALTH AND SAFETY ADVISOR**

In New Zealand, new cases of work-related disease are currently reported at a rate of 17,000 incidents per year. This prompted the Ministry of Business, Innovation and Employment (MBIE) to develop the National Action Agenda 2010-2013, which aims to promote research into health and safety, particularly in the areas of construction, manufacturing, agriculture, forestry, and fishing. The action plan advocates for “improved awareness and understanding of occupational health issues facing workers” and the collection of better data on exposure and health effects.

ACC Research commissioned Opus Research to develop equipment that integrates live-time video streaming with dust and noise exposure measures. Workers in a range of construction roles wore a custom designed backpack incorporating both a dust and a sound exposure monitor. Using a wireless network, data was transmitted from these monitors to specially designed software operated

by an observer using a tablet. The software graphs the incoming data and integrates this with video feeds of either the observed worker’s environment, or from their own point of view.

The equipment was pilot tested by Opus Research staff at a range of sites, including during the construction of our own new premises in Petone. Of particular interest were the sudden spikes in exposure, such as when a nailgun produces a sound peak. There was also interest in less expected or hidden spikes, such as a dropped board that unsettles dust on the floor of the work area. Health and Safety practitioners shown the equipment believed it to be user friendly, and saw huge potential benefits for training staff to reduce their exposure risks. ACC Research and Opus are currently looking to apply the technology to our work in agricultural health and safety, particularly relating to quad bikes.

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## QUAD BIKE SAFETY RESEARCH

Quad bikes have become a staple in New Zealand's agricultural sector for their ability to transport passengers and equipment across steep and rough terrain. As this popularity has increased, however, so too has the level of debate around quad bike safety, particularly in relation to rollover risk. Quad bike injuries on farms alone cost ACC approximately \$4 million per year. A recent review undertaken by Opus Research reports that for the years 2007-2011, a total of ten fatalities were identified by the Coroner as being caused by injuries sustained in rollover accidents.

ACC Research commissioned Opus Research to investigate use patterns and risks for quad bike riders, as

well as the potential for crush or rollover protection to prevent serious harm. Opus researchers undertook a preliminary literature review, and worked with Greater Wellington Regional Council and Landcorp Farming Ltd to examine accident reporting for event trends. Interviews were also conducted to evaluate the effect of rollover protection.

The interviews showed that only around 1 in 3 accidents and near misses are reported. In addition, common factors in reported accidents suggest that the majority of rollover incidents are rolls to the side, rather than the front or back. Rollover protection is a relatively new introduction in the fleets studied,

which meant there was insufficient data available to fully determine its effectiveness. However a new finding from previous research suggests that changes in quad bike design may have affected their centre of gravity.

To further examine the risk of rollover exposure, Opus undertook a third study which involved instrumenting bikes in use to measure their speed, roll and pitch, and to determine methods for identifying near miss events. Further work is planned in this area for 2014, with additional instrumentation development aimed at alerting riders when they exceed safe riding limits.

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# CANTABRIANS IDENTIFY ELEMENTS OF CENTRAL CITY LIVING SUCCESS

More than 650 Christchurch residents and many staff from Opus' Christchurch office have participated in a survey to investigate the elements needed to support successful central city living. Conducted last September using computer-aided personal interviews, the results are informing the city's rebuilding phase following the 2010/2011 Canterbury earthquakes.

A team of Opus staff played a key role in the project by rolling out the survey at sports centres, churches, community groups and workplaces. The results have been shared with Christchurch City Council, the Christchurch Earthquake Recovery Authority (CERA) – who supported the initiative as co-funders, and Opus staff involved in the residential sector.

The survey took people through a process of presenting the central city environment at a given stage in the rebuild. Participants were then

asked to prioritise selected services and facilities they would need in the central city, to identify their most important neighbourhood qualities, and to decide how they would spend money on dwelling features such as bedrooms, outdoor space, parking, and so on, within a self-defined budget.

Results showed that ready access to everyday, core services and facilities (such as local grocery suppliers, cafes and open spaces) was highly rated. Many demonstrated their willingness to adapt to new lifestyles, for example by choosing private courtyards over traditional gardens, or by spending less on bedrooms and parking space. Opus researchers also noticed a change in the places where everyday activities would take place, with more locally-based (i.e. inner-urban) preferences, and fewer wider city preferences. These changes were accompanied by a move to walking as

the likely future transport mode for travel to activities rather than driving. As a result, inner city residents will provide a complementary local market for central city businesses, with less car traffic.

Opus researchers believe that early 'pioneers' who move in while Christchurch is still being rebuilt can play a vital role in the recovery of the whole city. However our results also show a need for some sort of advantage for these early adopters, such as not having to drive everywhere in a city where transport is difficult and increasingly expensive, being able to purchase a better property earlier to help cope with the challenging environment, and getting a head start on the property market.

**Vivienne Ivory**

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*A view of Wellington from our new home at Petone.*

## NEW TO THE TEAM



### JEAN BEETHAM

Jean has joined Opus Research as an urban studies researcher. She has recently undertaken a Masters' thesis at Victoria University on urban transport and in particular, on road space reallocation. She was also working as a part-time Research Assistant at the NZ Centre for Sustainable Cities.

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### COURTNEY JONES

Courtney has joined us as a behavioural sciences researcher. Courtney has recently completed a BSc in Mathematics and Statistics at Victoria University. She loves statistics and is keen to see her skills applied to real-world problems.

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### NGAIRE TITOV-SMITH

Ngaire has recently started as our Office Manager. She has considerable experience in Office Management and has come from a similar role with the law firm, Minter Ellison Rudd Watts. Ngaire is also Peter Benfell's Personal Assistant.

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