

INFRASTRUCTURE UPDATE



An Occasional Newsletter from the National Infrastructure Unit

Issue #8 December 2013

Welcome to the latest *Infrastructure Update*, the occasional newsletter from the National Infrastructure Unit. As the year closes out, it is a good chance to reflect on the continued journey towards resilient and coordinated infrastructure that contributes to economic growth and increased quality of life. The year has seen significant advances made in developing a stronger evidence base and shared understanding of the future pressures on our national infrastructure and how well our existing infrastructure is performing. We have seen a continuation of the large investment programme that has been underway for a number of years and a continued focus and a maturing understanding of resilience thinking and implementation. Significant developments have occurred in the regulatory environment and we have significant challenges remaining in our two largest cities – the timing of investment into Auckland's transport network and the sequencing and coordination of the Christchurch rebuild. Water remains an area of focus, especially our understanding of urban water assets and performance and progressing towards allocation and efficiency tools for productive water. Overall, we see that progress has been made this year but more is still to be done and we look forward to working with you on the continuing journey.

Of particular note, we announce a change in the National Infrastructure Advisory Board with Lindsay Crossen shifting into the role of Chair as Dr Rod Carr prepares to finish his term. Welcome Lindsay and a big thank you to Dr Carr for his leadership and guidance over the past 4 ½ years.

Elsewhere in this edition of *Infrastructure Update* we profile the recent National State of Infrastructure and BGA progress reports, highlight some interesting publications from across the world, including the 2013 UK Infrastructure Plan, and introduce a new "5 minutes with" slot. Finally, we have articles on the new infrastructure ITO - InfraTrain, Next generation structural technologies, and the Networked Infrastructure Project: Connecting Christchurch to the World.

Have a great festive season and we look forward to working with you next year as we continue the Plan journey.

National Infrastructure Unit

Progressing the evidence base - February

NIU is almost at the point of publishing the Evidence Base, and we would like to thank everyone for their contributions and engagement in this project.

The evidence base will comprise four elements:

- a performance assessment of the current state of each of our sectors;
- a set of scenarios and trends looking at potential future pressures;
- a resilience assessment; and
- the 10-year capital intentions plan.

The evidence base utilises the data and expertise of the sectors, rather than creating new models or data sources, bringing together the information into one, whole-of-New Zealand picture. It has been a massive undertaking to pull this together for the first time in New Zealand, and we welcome your comments and thoughts on it.

NIU intends to publish the evidence base in early February 2014, and we welcome your feedback on the conclusions we draw and the issues we highlight. We will be running a series of workshops across the country in March, and details of these will be published early in the new year. In the meantime if you would like further information please contact info@infrastructure.govt.nz

NIU website and mailing list

Keep an eye on the NIU website for our latest papers, presentations or reports:

www.infrastructure.govt.nz

To provide feedback or be added to the mailing list for this newsletter and other publications, please send us an e-mail at:

info@infrastructure.govt.nz

Collaboration is a key principle of the Plan and we are regularly around the country working with and talking to the infrastructure sector. Please contact us if you would like to share your thoughts and ideas.

Treasury:2654097v1

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National Infrastructure Advisory Board

The National Infrastructure Advisory Board has met twice over recent months, firstly in October with a focus on productive water and secondly in November, looking at Auckland Transport. In both cases the importance that infrastructure plays in enabling economic activity was very clear, as was the scale of the investment proposed and the challenges it poses.

The November meeting was hosted in Auckland by the New Zealand Council for Infrastructure Development. The day included a visit to see 'Alice', the largest tunnel boring machine in the Southern Hemisphere, and a bus tour through the areas where various projects are being considered. The day concluded with a wide ranging discussion with key funders and planners followed by the NZCID AGM and a forum with Local Government New Zealand.

Board changes

After 4 ½ years as Chair of the Board, Dr Rod Carr is stepping aside ahead of the completion of his term in April 2014. Lindsay Crossen has been appointed by the Minister of Finance to the role of Chair, effective this month. Recognising the extensive range of other positions that Dr Carr holds, including as Chair of the Reserve Bank Board and Vice-Chancellor of the University of Canterbury, we have appreciated his substantial commitment and sage advice over the years. Thank you and welcome Lindsay to the role.

About the Board

The National Infrastructure Advisory Board was set up in 2009. It provides both the Minister and the NIU with advice and perspectives on the infrastructure work programme – policies, projects and the National Infrastructure Plan.

Members and contact

Board members are: Lindsay Crossen (Chair), Dr Rod Carr, Matthew Birch, Margaret Devlin, Kathryn Edmonds, Edward Guy, Dr Terence Heiler and John Rae.

The Board can be contacted via the NIU e-mail at: info@infrastructure.govt.nz



Infrastructure 2013: National State of Infrastructure Report

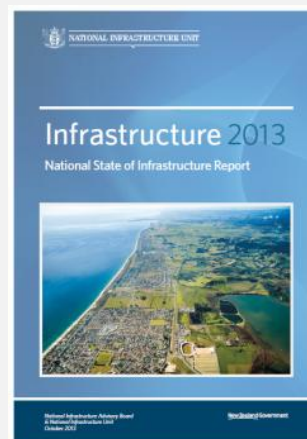
Released in October, Infrastructure 2013 is the second National State of Infrastructure Report we have prepared. The purpose of this report is to look at progress and happenings over the past year, identifying key areas of progress against the outcomes and principles of the Plan. The report also briefly looks at some of the outstanding opportunities and challenges ahead and identifies the priority areas for focus from a Plan perspective.

Building on the development of a more robust evidence base, the report also includes a short numbers section where using the 'Pressure – State – Response' framework, we highlight some of the data and metrics.

The format of the report is similar to the 2012 report and the Plan with a separate page on each infrastructure sector and special reports on Auckland and Christchurch.

The National Infrastructure Advisory Board have written a stimulating foreword setting out their views on the progress to date.

The report is available at: <http://www.infrastructure.govt.nz/plan/2011implementation/2013report>



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Demand management publications

Released in October, the two Demand Management documents are the next step in encouraging debate and sharing best practice.

In the think-piece written by the National Infrastructure Advisory Board, the Board puts forward their view that supply side solutions are no longer sufficient to respond to increasing demand in New Zealand, and that other options must be considered.

The Board “believes a twin track approach which considers demand management and supply side options together must be adopted to optimise both existing and future investment, and we would like to see demand management as a component of every infrastructure business case across New Zealand. It should be considered as a substitute for supply side options before any commitment is made to build new infrastructure, and we strongly urge central and local government, as well as the private sector, to ensure that it has been considered before any new projects are approved.”

In the companion discussion paper, the NIU have sought to illustrate the variety of tools available within Demand Management and to highlight and promote good practice across New Zealand.

We have defined demand management as active intervention to influence demand for something. It is used in order to best match current and future resources to requirements and to ensure delivery in the best value for money way.

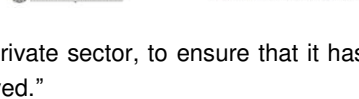
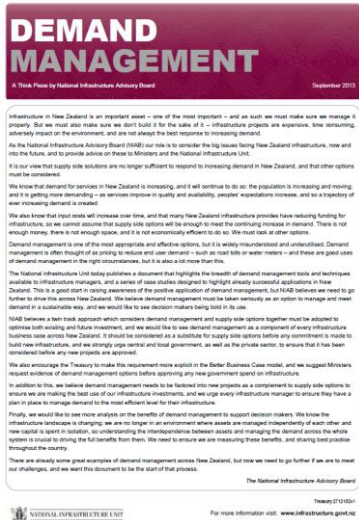
Demand management may be used to increase, decrease, or maintain demand. It may also be used to change the level of demand over a time period, rather than change the overall level of demand.

The discussion paper outlines several tools and techniques for demand management including altering the way in which needs are met (e.g. moving people from individual cars to public transport); technology (e.g. dual flush toilets); and short term campaigns to make immediate change (e.g. limiting water usage in a drought).

The document also includes a discussion on the economic benefits of demand management and includes two case studies – AA Real Time Information system and Transpower demand response.

Further case studies will be released over time and we would welcome further examples.

Copies of both documents are available at: www.infrastructure.govt.nz



Business Growth Agenda 2013 Progress Report

The Business Growth Agenda Progress Report 2013 was released in November.

In a joint release with Hon Steven Joyce, Minister of Economic Development, Hon Bill English, Minister of Finance said “a lot is being accomplished through the Government’s investment in infrastructure. We’ve announced the next generation of transport projects for Auckland, including the City Rail Loop and the East-West link. The Prime Minister announced last week that Transmission Gully will start construction next year.”

“More than 320,000 premises are now able to connect to ultra-fast broadband. And we’ve announced the first 11 Special Housing Areas to increase housing supply – the most important way to get on top of housing affordability,”

Nearly half of the around 350 BGA initiatives have now been completed, with many more in the implementation phase. A report in the first half of next year will outline further progress and the future direction of the BGA.



Further info on the BGA is available at: <http://www.mbie.govt.nz/what-we-do/business-growth-agenda>

Natural hazard risk-based planning toolbox now available

GNS Science has released a toolbox to support natural hazard risk-based land use policy and plan development in local government. Developed with planners, it offers an approach that focuses on the consequences of natural hazard events (including those to lifelines and critical buildings). The toolbox outlines techniques, practice steps and options for enabling local government to review multiple natural hazard risks, both within councils and with external stakeholders.

The toolbox is presented in three key themes:

1. Setting the scene for why this approach is important;
2. The five step risk-based approach for natural hazards; and
3. Examples of implementation.

Highlights include how to incorporate community engagement processes; a risk-based district plan chapter; and national and international examples. A full report on the project is also available.

The toolbox and full report is available at: <http://www.gns.cri.nz/Home/RBP/Risk-based-planning/A-toolbox>

Contact: Wendy Saunders, w.saunders@gns.cri.nz

Risk based planning

A toolbox

Project background

Setting the Scene

Risk-based planning approach and steps

Examples

Assumptions, limitations and uncertainties

Site map

Feedback

A toolbox for risk based land use planning for natural hazards

This toolbox aims to support risk-based land use policy and plan development in local government. It offers a new approach where consequences of natural hazard events are the focus. It presents techniques, practice steps and options for enabling local government to review multiple natural hazard risks, both within councils and with external stakeholders.

The toolbox is presented in three key themes:

- setting the scene for why this approach is important;
- the five step risk based approach for natural hazards and;
- examples of implementation.

This toolbox is offered as a resource and guide, and is not intended as a prescription or as an off-the-shelf solution to successful management of natural hazards.

Setting the Scene

Why this approach is important, general information and principles of engagement

Risk based approach

Steps and actions of each phase of the approach

Examples

Implementation examples

- [Site Index](#) – a full index of the guide
- [What this toolbox does and does not do](#) – the limitations and assumptions of the approach
- Full report can be downloaded here - [Misc Series 67 Risk-based planning_report.pdf](#) 3.32 MB
- [About the project](#) – background to the project and developers
- [Feedback](#) – this toolbox will continue to evolve, so let us know what you think, or your experience of using the toolbox

last updated 26.09.13

Intelligent Transport Systems Action Plan

On 20 November the Minister of Transport released the government's Intelligent Transport Systems Action Plan for public consultation. The Ministry invite your comments on the plan by 17 Jan 2014. Comments can be sent to technology@transport.govt.nz. They are especially interested in your thoughts on the 10 priority actions listed in Section 6 of the Action Plan.

Intelligent Transport Systems have the potential to increase the efficiency and safety of all transport modes in New Zealand and it is important that the policy and regulatory settings are right to support the uptake of the systems. Many systems are already in place and improving how existing infrastructure is used. The NIU encourages you to review the Action Plan and provide feedback to the Ministry of Transport.

For further information please visit <http://www.transport.govt.nz/ourwork/intelligenttransportsystems/>

Intelligent Transport System

Action Plan 2014-18

November 2013

New Zealand Government

ISBN 978-0-478-07261-7

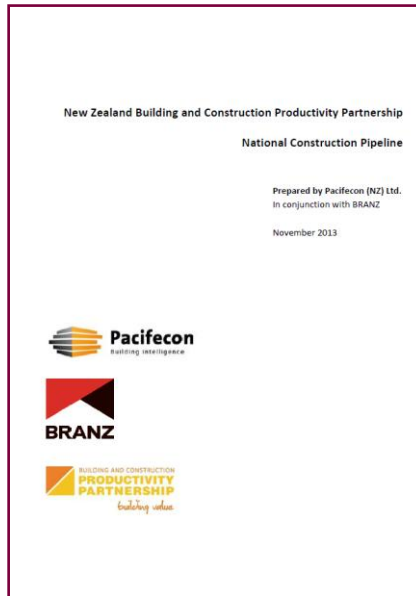
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National Construction Pipeline

A joint report from the Productivity Partnership, BRANZ and Pacifecon, the National Construction Pipeline forecasts national construction demand for the next 6 years ending March 2019. Released on 10 December, the report forecasts the nature and timing of future building and construction work by type and region, complemented by information on known non-residential building and construction intentions.

The report highlights a number of significant findings:

- ▶ Unprecedented levels of demand - The previous highest level of building and construction was in 2007 when over \$26 billion was constructed. The forecast peak in 2016 is \$32 billion, 23% higher.
- ▶ High rates of growth over a longer period than at any time in the last 40 years. The report raises the challenge of how to sustain four or more years of 10%+ growth.
- ▶ Auckland dominates the national demand for building and construction, even taking into account the Canterbury rebuild. Auckland accounts for about a third of all building and construction work and is expected to grow by 68% over the forecast period.
- ▶ Auckland's residential building is forecast to more than double between now and 2017.



The report is available at: <http://buildingvalue.co.nz/publications>

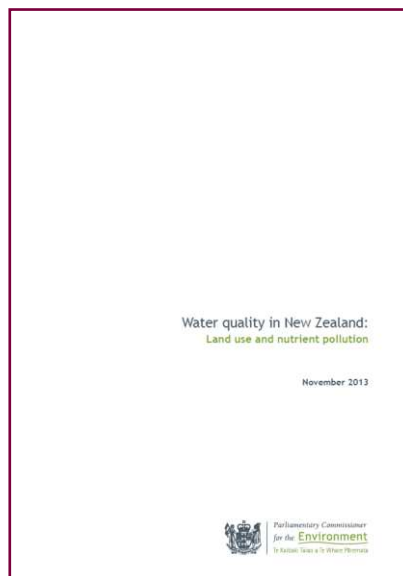
Water Quality in NZ - PCE

Released on 21 November with significant media coverage, the latest Parliamentary Commissioner for the Environment Report focuses on land use and impact on water quality – in particular nitrogen and phosphorus.

The report concludes that understanding the links between land use, on-farm practices and water quality is essential for developing policies that achieve good outcomes – healthy rivers, lakes, estuaries and aquifers.

Reaction to the report has been varied but it does provide further insight into the challenges faced by productive water infrastructure.

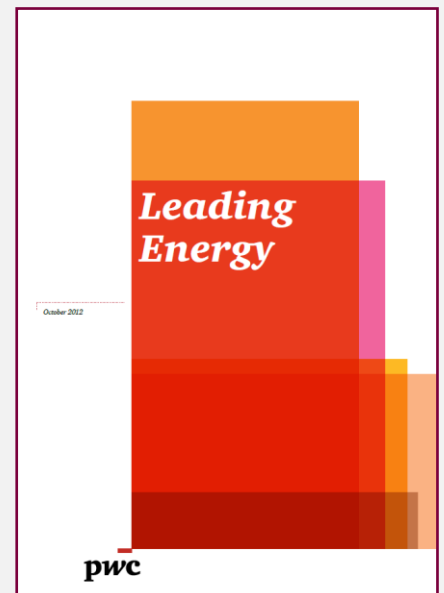
<http://www.pce.parliament.nz/publications/all-publications/water-quality-in-new-zealand-land-use-and-nutrient-pollution>



Leading Energy – PWC Report

Providing an overview and analysis of the electricity sector, PWC have included sections looking in more detail at revenues/sector returns, generation, and retail market share. Some of the observations include:

- ▶ "... in the short to medium term, prices are likely to remain constrained due to uncertainty in relation to electricity demand and recent additions to the generation fleet."
- ▶ stagnant demand has led to a number of generation projects being put on hold, or delayed until demand shows signs of improving.
- ▶ During FY12 there were no significant generation plants commissioned.
- ▶ Smart meters - noting the piecemeal rollout has challenges and may negate the full realisation of benefits. "A more collaborative approach by sector participants is critical to maximising the value of smart meters, and ultimately more broadly smart grids."



A copy of the report can be found at: <http://www.pwc.co.nz/energy-utilities-mining-industry-sector/publications/leading-energy/challenges-changes-ahead-for-nz-power-companies-november-2013/>

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5 minutes with ... Dr Janet Stephenson

In a new series, the NIU newsletter will feature short interviews with members of our infrastructure community, to highlight interesting projects underway across the sectors. Our first in the series is an interview with Dr Janet Stephenson, Director of the Centre for Sustainability at the University of Otago. If you have a project that you would like to feature in a future interview, or know someone who would, please let us know.

Hello Janet! You're currently working on some interesting projects in the energy sector?

Hi NIU. Yes I am. I am the Principal Investigator for the Energy Cultures research programme, and an Associate Investigator for the Green Grid research programme.



Can you tell us a bit more about the projects please?

Energy Cultures 2 is a 4-year research project to develop the knowledge and tools to achieve significant energy savings, and increased competitiveness through energy efficiency. The Energy Cultures research programme examines habitual patterns of energy use, and what needs to change to support changes in energy behaviour. The programme has two parts: Efficiency Transitions in Households and Businesses; and Future Transport. More information can be found on our website:

<http://www.otago.ac.nz/csafe/research/otago049909.html>

The Green Grid research programme, which is being carried out in a joint program led by the University of Canterbury and with the University of Auckland, will use modelling of future trends in renewable electricity generation trends in household uptake of photovoltaic cells, electric vehicles and demand management, together with in depth knowledge of electricity networks and power management, to ensure that New Zealanders have access to reliable, safe, and affordable renewable energy. More information can be found on our website at <http://www.otago.ac.nz/csafe/research/energy/otago050285.html> and on the EPECentre's web site at www.epecentre.ac.nz

When will they deliver?

The projects are both just at the start of Year 2 so findings are only just starting to emerge, but two reports will be out shortly:

- ▶ Home Energy Management Systems: One of the sub-projects we have almost completed is a review of actual and potential technologies in the global market suitable for in-home demand-side management. A report will be published shortly.
- ▶ Transport Transitions: Another of our sub-projects has scoped current activities across NZ in the area of what we are calling 'transport transitions', i.e. towards lower/more efficient energy use. The report, also due to be published shortly, covers some 86 examples across businesses, councils and community/NGO groups.
- ▶ The EPECentre, who is leading the project from the University of Canterbury, also has some early findings, summarised in their papers at: <http://www.epecentre.ac.nz/research/>



How can people get involved?

We have many collaborations already, but we're in the process of setting up a website specifically for Energy Cultures, which will profile our research and provide opportunities for easy linkage with researchers.

INFRASTRUCTURE UPDATE

UK Infrastructure Plan

We have reproduced a few extracts below from the recently released UK National Infrastructure Plan 2013.

“The government recognises that meeting the UK’s infrastructure ambitions requires a long-term sustainable plan, which means taking a cross-cutting and strategic approach to infrastructure planning, funding, financing and delivery. That is why it published the first ever National Infrastructure Plan (NIP) in 2010, with subsequent updates in 2011 and 2012, which enabled it to take a holistic view of the challenges facing UK infrastructure and its approach to meeting them. The National Infrastructure Plan 2013 takes this further and sets out the government’s plan for the next decade and beyond.”

“The National Infrastructure Plan 2013 sets out a refreshed, forward-looking list of the government’s ‘Top 40’ priority investments, to ensure it continues to look towards new investment priorities. These investments are a subset of the overall infrastructure pipeline, and are clearly identified in the pipeline itself. They represent around £180 billion of the total pipeline.”

The UK Treasury estimates that average annual infrastructure investment has increased to £45 billion per year compared to an average of £41 billion per year between 2005 and 2010.

“Whilst investment in infrastructure is rising, the government recognises the need to ensure that it strikes the right balance so that its infrastructure objectives are achieved in a way that is consistent with reducing the deficit and based on an affordable and sustainable level of consumer contribution.”

“The overall value of the pipeline has increased from over £309 billion to over £375 billion of investment, made up of large individual projects and capital programmes of investment worth £50 million and over. The increase has been driven mainly by the inclusion of long-term capital commitments for roads, flood defences and science set out at the 2013 Spending Round; and allocation or provision of the next price control periods for regulated utilities.”

“Having a strong policy and funding framework in place; a clear set of objectives and priority investments; and an effective approach to securing the necessary financing is all crucial to the successful delivery of vital national infrastructure”

“However, the government also recognises that it needs to take steps to ensure that these initiatives translate to tangible delivery outcomes – and in a way that is effective, efficient and provides value for money for taxpayers and consumers. In part, that means ensuring that it is equipped to deliver the projects and programmes for which it has direct responsibility on time, within budget, and with the right results. More broadly, it means ensuring that even the investments over which it does not have direct control – those that will be delivered by the private and regulated sectors – are operating in conditions that enable them to do the same.”

A copy of the Plan is available at: <https://www.gov.uk/government/collections/national-infrastructure-plan>

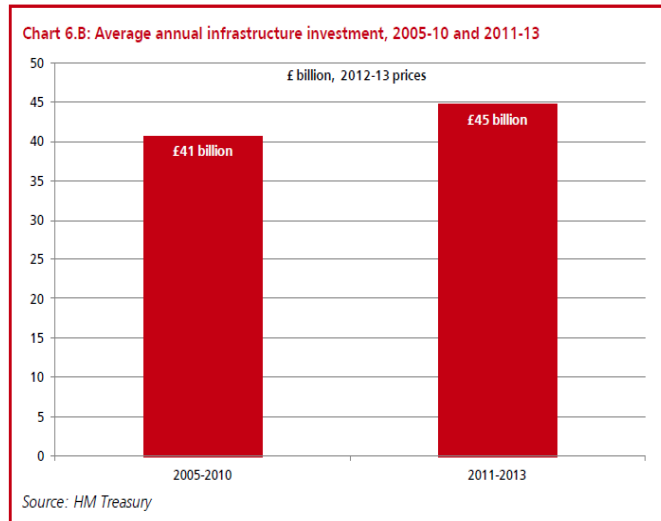
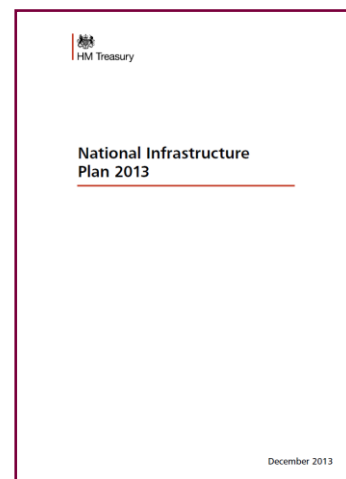


Table 2.A: The number of projects and programmes in the Infrastructure Pipeline

Sector	Number of projects	Number of programmes	Overall value (£m)
Communications	1	6	14,395
Energy	275	40	218,899
Flood	42	25	3,959
Intellectual Capital	6	2	855
Transport	121	62	121,463
Waste	34	0	2,304
Water	1	31	15,195
Total	480	166	377,072

Source: HM Treasury Major Infrastructure Tracking unit

We have a close interest in what other countries are doing, especially when considering long term infrastructure planning, and are interested in your feedback on the different approaches and what we can learn from.

INFRASTRUCTURE UPDATE

Building the new Infrastructure Industry Training Organisation

A major new Industry Training Organisation (ITO) for the infrastructure sector has been created through the merger of existing ITOs InfraTrain New Zealand (civil infrastructure) and the Electricity Supply ITO (ESITO).



The ITO will play a key role in how infrastructure is provided for the country's future prosperity by:

- ▶ Defining national skill standards and qualifications required by the infrastructure industry.
- ▶ Brokering training to meet the needs of people working in infrastructure, employers and the wider industry.
- ▶ Providing information about skill demand to industry, employers, training providers and people working in infrastructure.

The creation of an infrastructure centric ITO has been driven by a requirement for closer alignment to government policy. Developing New Zealand's infrastructure through a National Infrastructure Plan has been identified as a key area forming the Business Growth Agenda, and the ITO will be central to this.

Former InfraTrain Chair Alister Harlow says that the merger brings together two successful ITO's who have good engagement with their sponsoring industries. It will provide a stronger ITO with broader sector coverage, and a greater capacity to meet the needs of the infrastructure industry.

Industry sectors covered by the infrastructure ITO

Civil	Electricity
<ul style="list-style-type: none">▶ Civil construction and maintenance▶ Roothing, pavement surfacing & roadmarking▶ Utilities▶ Rural contracting▶ Civil engineering▶ Surveying	<ul style="list-style-type: none">▶ Generation▶ Transmission (National Grid)▶ Distribution▶ Retail (telephone contact centres)

Although InfraTrain and ESITO officially merged on 1 October, it's very much business as usual and customers are unlikely to notice any changes for a while. Trainees and their employers will continue to deal with the same InfraTrain or ESITO staff member, and training and assessment will work in the same way as before.

Once the foundations of the ITO have been put in place, the organisation will be renamed and rebranded. It is anticipated that this will happen in the first half of next year.

Former ESITO chairman John McEnteer said, "We want this to be a smooth well planned transition and as a consequence the changes won't be sudden. We wish to take our time to ensure we capture the best from both ITOs for an even better organisation in the future."

Helmut Modlik (right) has started as the new CEO. Helmut was previously Chief Executive of Telco Technology Services.

Mr Modlik says, "I'm delighted to have the opportunity to lead this organisation and am feeling a mixture of excitement and responsibility. Ensuring that the infrastructure industry has the trained people it needs to contribute to the prosperity of the country is extremely important. I am looking forward to working with all the staff from the merged organisations as well as our industry partners to make sure our goals are achieved."



Further information - <http://www.infrastructureito.org.nz/>

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NEXT GENERATION STRUCTURAL TECHNOLOGIES

A guest article provided by University of Canterbury.

The long-term social and economic costs of earthquakes are highly dependent on how the built environment responds to the events.

Modern building codes demand that critical infrastructure, such as hospitals, power stations and key lifeline bridges must be available post-earthquake to ensure optimal response and minimal disruption. Equally, the ability of businesses to return to regular operation is vital for a functioning economy.

Low-damage structural concepts have, at their heart, a range of novel energy dissipation devices. These devices are used to dissipate energy and mitigate response to shaking in place of traditional design approaches that rely on structural yielding and damage to dissipate energy, but at the cost of downtime, repair or demolition.

The UoC have developed high force to volume energy dissipation devices, 96 of which have been used in the new \$40 million Kilmore St Medical Centre - one of the first new, major structures to rise in downtown Christchurch following the 2010 and 2011 earthquakes. The Kilmore St facility is an innovative, low-damage seismic-resistant design.

The devices plastically extrude to absorb energy and reduce response - much like making Play-Doh spaghetti or squeezing toothpaste out of a tube - and dissipate large amounts of energy to reduce motion in a damage-free manner.

These devices have been extensively tested at the UC with funding from the Natural Hazards Research Platform. The device project is the result of an eight-year collaboration led by Dr Rodgers, Professor Geoff Chase and Associate Professor Greg MacRae at UC, as well as postgraduate students.

The devices will enable the creation of more resilient cities and communities that are far more resistant to the physical and economic damage that results from large earthquakes, and are contributing to the emergence of a new, more resilient Christchurch.

This uptake by the local structural engineering consultant and building owners is a strong recognition of the potential of these research outcomes. All of the devices were produced locally in Christchurch, through a start-up manufacturing company, ensuring that the inflow of reinsurance money remains within the local economy, providing jobs and support to economic recovery.

Together with local industries, the research outcomes, achieved through funding from the TEC, FRST, MBIE, Fulbright NZ and the EQC has seen this research go from laboratory bench-top to building implementation, with design, manufacturing and testing all remaining local.

Overall, the support of this research over the last eight years has seen this research move from conceptual design, through development, experimental testing and analysis, to the point that it plays an integral role at the forefront of the Christchurch rebuild - allowing Christchurch to be rebuilt as a city that stands significantly more prepared and resilient for the next seismic event.



Bench to Building:

For further information, please contact:

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Lead Extrusion Dampers located in key structural locations



A new, resilient, hospital complex at the heart of the Christchurch rebuild

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Networked Infrastructure Project: Connecting Christchurch to the World

A guest article provided by Joe Gamman, Education and Development Manager, Cement & Concrete Association of New Zealand (CCANZ)

The Networked Infrastructure Project: Connecting Christchurch to the World wants to position Christchurch as the world's field demonstration site for sensors in the built environment.

The re-building of an entire CBD in a developed country is a unique opportunity to demonstrate the benefits of highly networked urban systems rather than a possibility taken on trust from the sales brochure. We believe that this kind of real-world opportunity will be attractive to a number of large multi-national companies who are already jostling for position in the world-wide market for utilities and infrastructure management and the vast number of start-up companies who view a digitally connected real-world as the next big thing in internet commerce. By creating a system that allows the world to come and participate in the Christchurch rebuild we can see first-hand what the future needs of this emerging industry sector actually are and build our own export driven sector in time to take advantage of overseas opportunities.

The infrastructure market is vast: literally a multi-trillion dollar market segment involving new developments in Asia and the substantial investment required for the renewal of dated infrastructure in the developed world. Indeed, NZ is no exception and without even considering the Christchurch rebuild, our national investments in road, electrical and water infrastructure alone are billions of dollars. We believe that there is substantial opportunity to understand how city infrastructure can be managed as a system by installing sensors in as much of the infrastructure in Christchurch as possible.

It's important to note that this is not to ensure historical measures of operational management are maintained but to discover and also to capitalise on the data generated via analytical methods to generate new and improved capabilities for real-time management and data-driven maintenance. This market segment alone is potentially billions of dollars in savings over the coming decades. Furthermore, by targeting new data analytic techniques as a core application, there is a unique opportunity to create high-value weightless export products that work seamlessly with large multi-national players in this market space – players such as SAP, IBM and Microsoft.

We are proposing that NZ does not compete with these companies directly but rather, by collaborating with them at scale, here in Christchurch, we will have a front row seat to spot and develop products (physical and analytical) for market segments that, while too small for them are more than large enough for even a large NZ company. We're calling these the "\$100 million tranches" and in a market measured in trillions of dollars there will be large numbers of these niches available for exploit but only if we can build a compelling story on a background of deep credibility. We believe that story could be a national commitment to building the first 21st century city in Christchurch as an example of what everyone will be building in the coming decades.

Due to the expansive nature of the project and the inability for any single company to fully appropriate the benefits of investment, we have focused our initial work in investigating collaborative frameworks for intellectual property development. We are looking for a framework that will allow a company like IBM to showcase their own cutting edge technology while at the same time allowing NZ researchers to focus and patent on complementary areas of expertise with a view to having their work commercialised if possible. We think we have outlined the key aspects of this framework and identified a number of issues that need to be addressed at the outset.

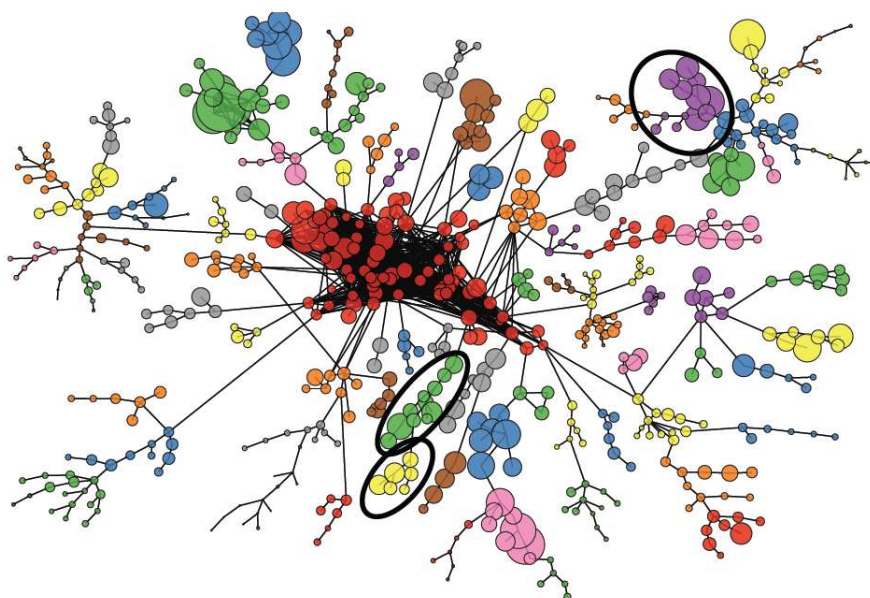


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Our second major theme has been the development of a rich data set that will allow us to quantify our research capability – if we wish to develop deep expertise in niche areas we need tools that allow us to make objective decisions on where these areas are developing naturally within our research sector and invest appropriately. If successful, a tool such as this would be invaluable for actors such as the NZIF or angel investors as an input to aid their decision making.

Our work to date acknowledges at the outset that a multi-decade project like this needs to be self-sustaining as soon as possible and strong connections between venture capital and research are critical policy decisions that need to be designed and not left to chance.

Our final objective is to build a ground-swell of support within NZ for making Christchurch the world's demonstration site for sensor's in the built environment – without support across the entire spectrum of R&D, venture capital, industry and government, we will not be able to make a compelling proposal for support and build something the world's best will eagerly come to be part of. We can do it, and do it well for sports, why can't we do it for our economy?



Patent-space is a network of 632 different types of technology as determined by International Patent Classification (IPC) code. Each node represents a technology - node size indicates the number of patents filed in that area. Pairs of nodes are connected when geographical regions tend to have a revealed comparative advantage with respect to both technologies. Colours indicate "communities" of technologies - groups of technologies which cluster together. The indicated communities at the bottom of the diagram correspond to measurement and sensing technologies (green community) and to geophysical measurement (yellow community). The networked infrastructure project would grow New Zealand's capability in both of these areas. Also highlighted is the community of nodes relating to digital communication (purple, upper right). Graphic provided by: Prof Shaun Hendy and Dr Dion O'Neale

Upcoming events

- ▶ Freshwater Management Forum, Wellington, 18 – 19 Feb 2014, <http://www.conferenz.co.nz/>
- ▶ Downstream, Energy sector annual strategic forum, Auckland, 5-6 March 2014, <http://www.nzdownstream.co.nz/>
- ▶ The Energy Conference, Wellington, 19-21 March 2014, <http://www.theenergyconference.org.nz/>
- ▶ Infrastructure Funding Conference, Wellington 31 Mar – 1 Apr 2014, <http://www.conferenz.co.nz/>
- ▶ New Zealand Infrastructure Summit, Auckland, 1 – 2 April, <http://www.informa.com.au/>
- ▶ Irrigation NZ Conference and expo, 7 – 9 April, Hawkes Bay, <http://www.irrigationnz.co.nz/>
- ▶ Stormwater 2014, Water NZ, Christchurch, 14 – 16 May, http://www.waternz.org.nz/Category?Action=View&Category_id=321
- ▶ LGNZ National Conference, Nelson, 20 – 22 July, <http://www.lgnz.co.nz/home/about-lgnz/lgnz-conference-2/>
- ▶ Water NZ Annual Conference/ Expo, Hamilton, 17 – 19 September http://www.waternz.org.nz/Event?Action=View&Event_id=43