



NATIONAL INFRASTRUCTURE UNIT

Earthquake Resilience

Impacts and considerations for the NZ Economy

Construction Clients' Group

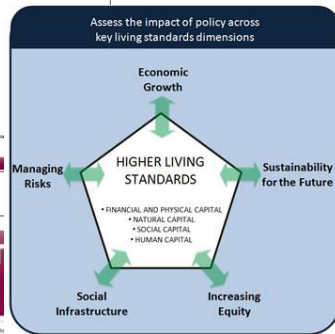
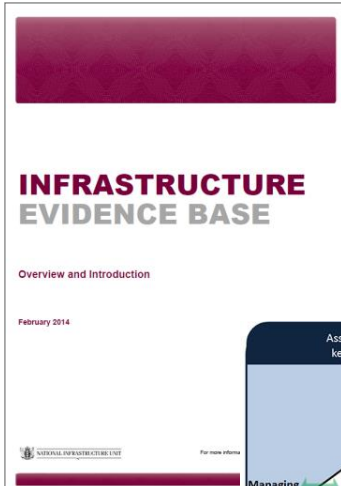
25 March 2015

Content

- National Infrastructure Unit
- Economic context
- Evidence Base
- Resilience
- Experience
- Forward approach
- Empowering business



The National Infrastructure Unit



- Established 2009, within Treasury.
- Work with central government, local government and private sector, to
 - Look across all the infrastructure sectors to facilitate, and co-ordinate
 - Promote common understanding/consideration of future challenges
- Informed by the National Infrastructure Advisory Board.
- Focused on supporting delivery of “*High performing infrastructure supporting higher living standards*”.



Strategic Framework

Infrastructure policy and thinking is coordinated and guided through the National Infrastructure Plan, first released in 2010 and followed up in 2011.

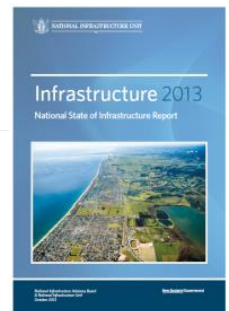


- Strategic future focused document – common direction for how we plan, fund, use infrastructure
- A key purpose is increased certainty
- Two outcomes – demand and supply
- Six principles to underpin policy development and advice

The 2010 Plan was a valuable first step, providing context, key investment principles and an initial set of priorities.



With the National Infrastructure Advisory Board, “State of the Nation” reports were published in 2012 and 2013. These provided a review of the past year and a look ahead to the next year.



Vision
By 2030 New Zealand's infrastructure is resilient, coordinated and contributes to economic growth and increased quality of life

Outcomes

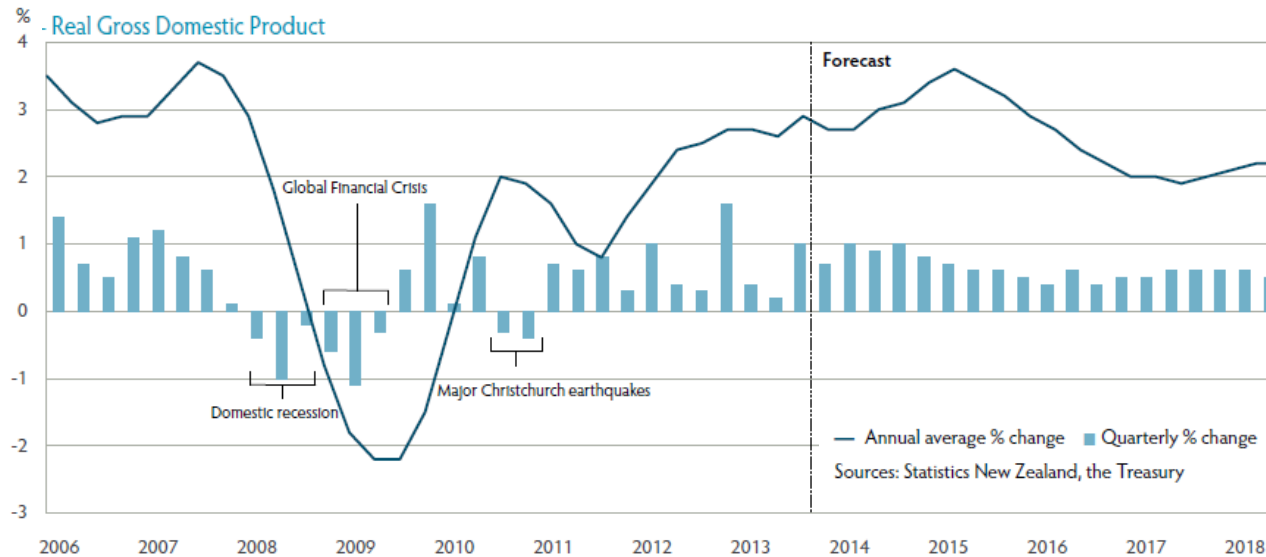
Better use of existing infrastructure	Better allocation of new investment
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Principles

Investment analysis	Accountability/ Performance
Resilience	Regulation
Funding mechanisms	Coordination



Economic Context

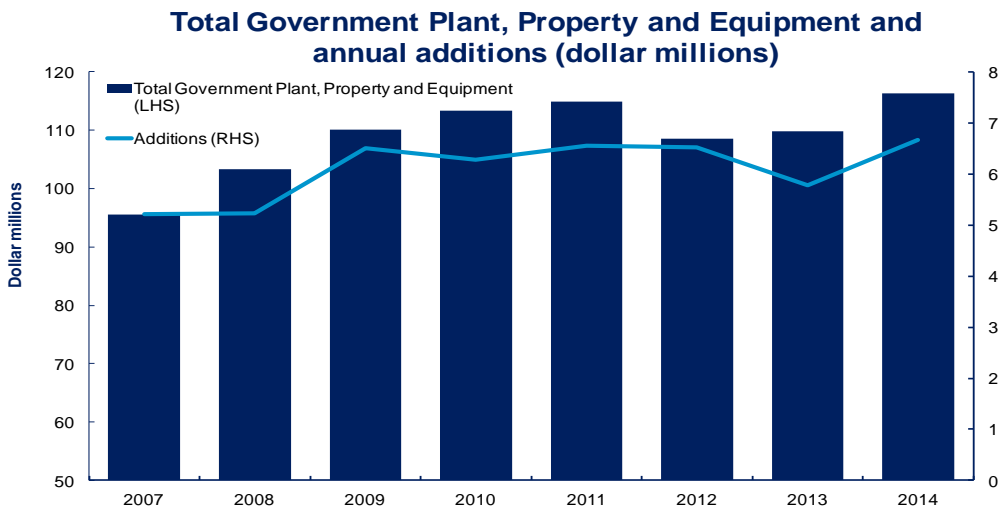


- New Zealand has sizable manufacturing and service sectors complementing a highly efficient export-oriented agricultural sector (with commodities accounting for around half of total goods exports.)
- Exports of goods and services account for around one third of real expenditure GDP.
- The economy is growing solidly, with real GDP up 3.9% in the year to June 2014, and the outlook remains positive. This is flowing through to job growth and wages rising faster than inflation.
- The fiscal position has improved markedly over the past six years. However, the large fall in export prices (particularly for dairy products) and softer domestic inflation (down to only 1.0% in the year to September) are adversely impacting on forecasts of nominal GDP and therefore tax revenue.
- We still have a “productivity gap” compared to other OECD nations.



Government Objectives

- The Government's long-term debt objective requires net debt to remain consistently below 35% of GDP and to be brought back to no higher than 20% of GDP by 2020.
- Consistent with this, the objective for the operating balance is to return to an operating surplus sufficient to meet the Government's net capital requirement, including contributions to the Government Superannuation Fund.
- The current short-term fiscal intention is for the operating balance excluding gains and losses to be returned to surplus as soon as possible and no later than 2014/15, subject to any significant shocks.
- Current forecasts are for net core Crown debt to peak at 28.7% of GDP in 2015/16, and for the operating balance excluding gains and losses to be returned to surplus in 2014/15.



Source: The Treasury

\$60 billion
Potential Auckland transport investment
over next 30 years

\$3.8 billion
Projected Crown spend on local
infrastructure and crown assets in
Christchurch

\$45 billion
Replacement value of three waters assets



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Infrastructure's contribution

In NZ

Recent work by Treasury on the future economic story identifies the role infrastructure plays through the dimensions of prosperity, sustainability and inclusiveness.

- **Prosperity** – Infrastructure is fundamental to moving people, information and freight to and between businesses and markets.
- **Sustainability** – Strengthened planning and management can better utilise existing assets and target expenditure to deliver infrastructure that is resilient and fit for purpose in the long-term.
- **Inclusiveness** – Infrastructure enables individuals to engage with and participate in the economy, social and recreational activities.

This is reflected in the shared description of a successful New Zealand economy developed by the economic Chief Executive's, and especially in their third priority:

High quality natural and built environment that supports future economic growth

The opportunity

Infrastructure plays a significant role in supporting Government priorities, ranging from housing to export growth to education.

Each year, the Government spends approximately \$30 billion with third party suppliers and on average \$5-6 billion of property, plant and equipment is added to the government balance sheet.

Better decision making and a focus on a long-term investment approach can deliver flexibility and create opportunities for the medium term fiscal strategy.





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National Infrastructure Evidence Base

2015

Summary of findings

- The overall state of New Zealand infrastructure is positive.
- New Zealand has broadly the right infrastructure, in the right place, providing the right quality of service.
- However, there are a number of challenges ahead and traditional systems will not be sufficient to meet these.
- To overcome these challenges, New Zealand needs to develop a more sophisticated approach to infrastructure management.
 - A more holistic approach to asset management
 - Better use of data and more effective decision-making
 - Adopting innovative approaches that move away from supply-side solutions
 - Regional and inter-agency collaboration
 - More integrated planning regulation
 - Resilience



Nine Systemic Challenges

Summary of the nine long-term and systemic challenges to be addressed		
Vision	Economy	Regional integration and collaboration
Data and asset management	<p>Resilience: Understanding of criticality and key pinchpoints/bottlenecks. Shift to interdependencies, levels of service and community preparedness. Longer-term view, increased focus on adapting to slower changes over time eg climate change</p>	Governance and tools
Demand management	Regulations / standards	Funding and procurement



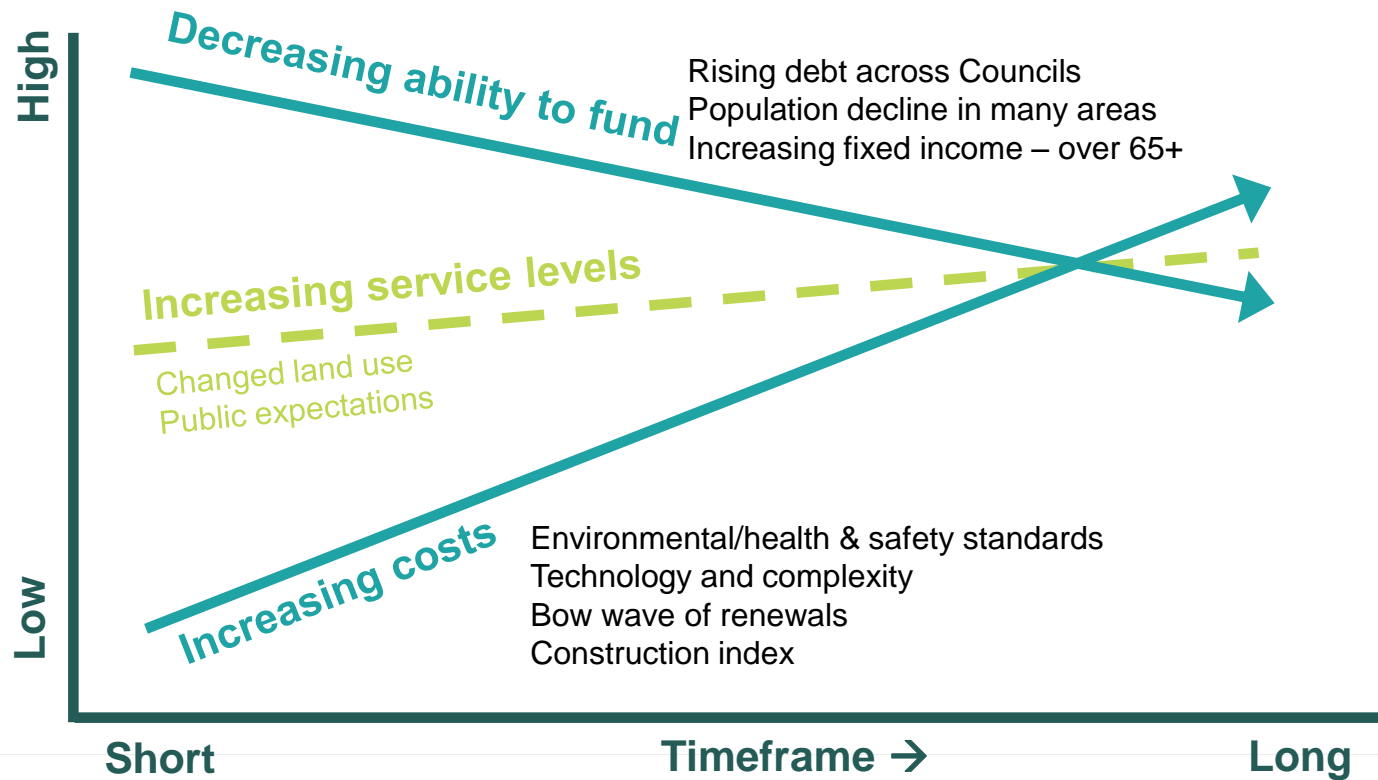
Two stories and the headwinds

From the first national infrastructure evidence base two stories were emerging:

The first is focused on managing the demands of growth in major urban areas

The second is managing long term provision in areas of population decline.

The chart to the right summarises the second of these stories.



Between 2011 and 2031, 56 TLAs (84%) are projected to decline overall in ages 0-64.





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Resilience

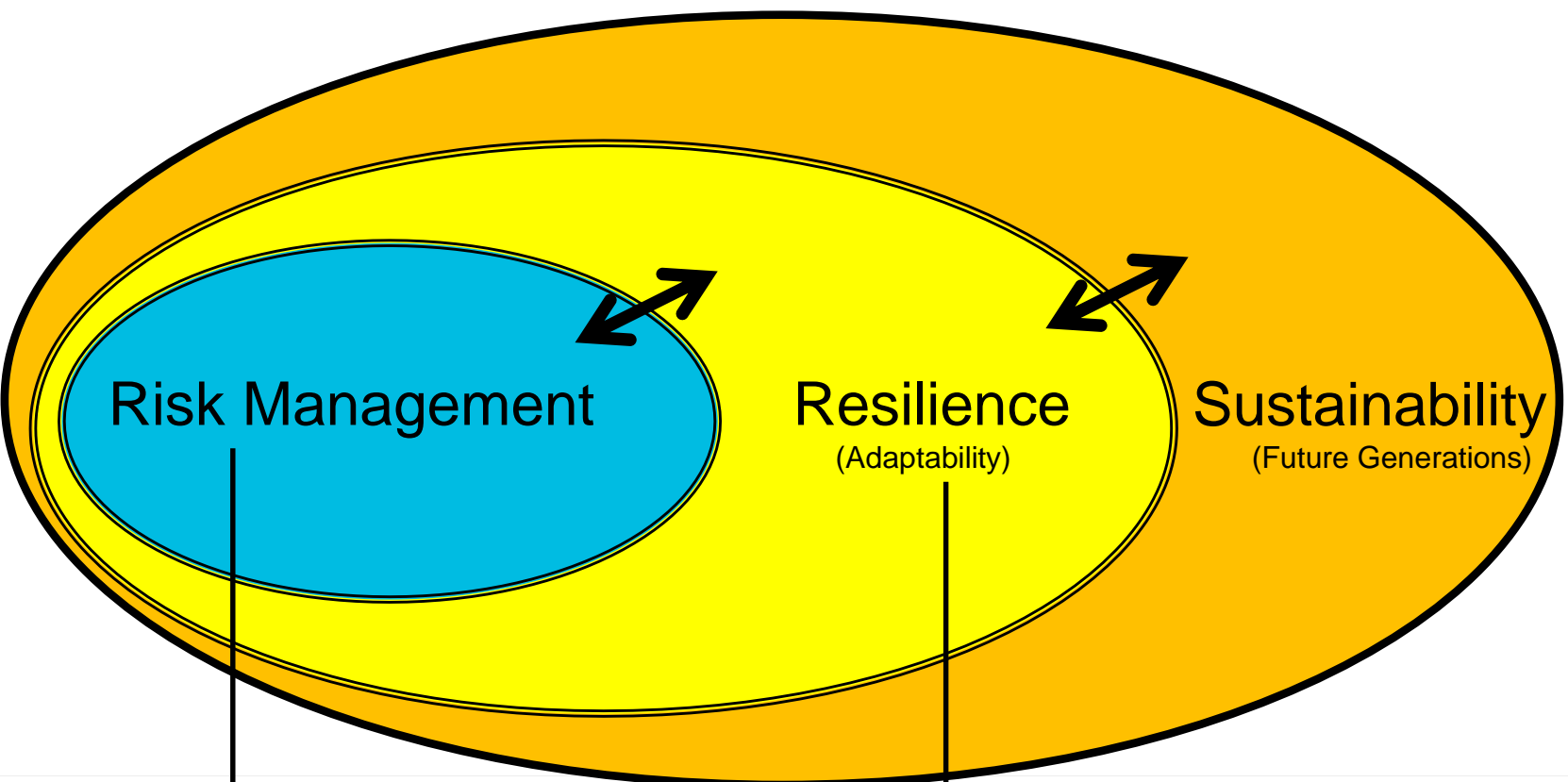
Resilience – Ground Truthing ...

- Infrastructure fails
 - Some parts of infrastructure more important
 - Some infrastructure sectors more important
 - We live in a dynamic and changing world
 - Infrastructure resilience enables a resilient economy and communities
-
- Can be cheaper
 - Emergent as well as shock events
 - Natural, socio-natural and technological hazards
 - Not always about making things stronger
 - Beyond codes, regulations, guidelines & policy
 - Includes decommissioning infrastructure
 - Often achieved by operational changes



Risk, Resilience and Sustainability

(Linking to Treasury's Living Standards Framework)

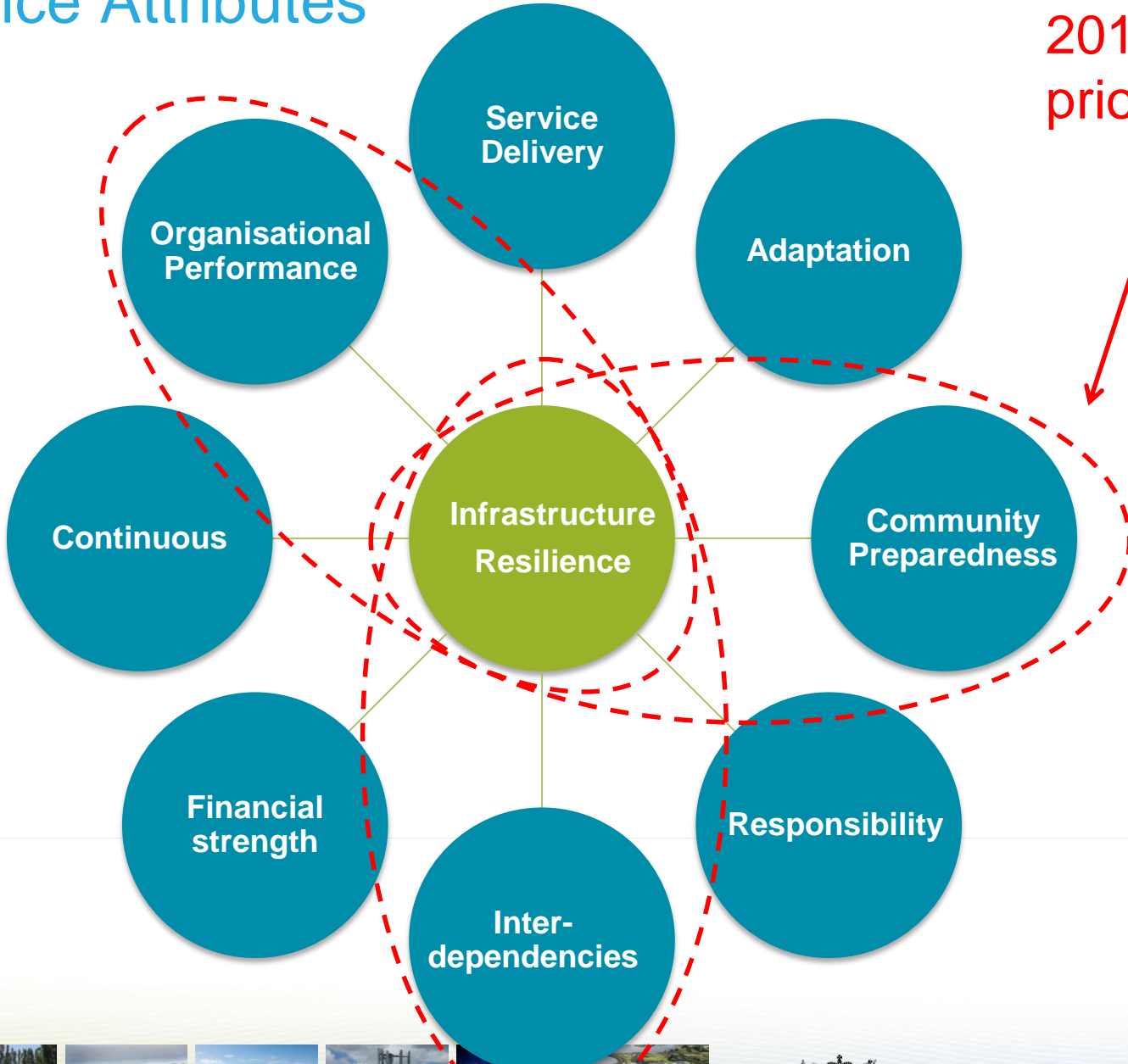


- Known Knowns
 - Variability can be readily described
- Known Unknowns
 - Limitations, assumptions

- Unknown Unknowns
 - Black swan
 - Threats where you have an adversary
 - Complex system risks with dynamic interdependencies



Resilience Attributes



2015/16
priorities



Resilience Attributes

- **Service Delivery**
 - Focus on national, business and community needs in the immediate and longer term
- **Adaptation**
 - National infrastructure has capacity to withstand disruption, absorb disturbance, act effectively in a crisis, and recognises changing conditions over time
- **Community Preparedness**
 - Infrastructure providers and users understand the infrastructure outage risks they face and take steps to mitigate these. Aspects of timing, duration, regularity, intensity, and impact tolerance differ over time and between communities
- **Responsibility**
 - Individual and collaborative responsibilities are clear between owners, operators, users, policy-makers and regulators. Responsibility gaps are addressed
- **Interdependencies**
 - A systems approach applies to identification and management of risk (including consideration of interdependencies, supply chain and weakest link vulnerabilities)
- **Financial Strength**
 - Financial capacity to deal with investment, significant disruption and changing circumstances
- **Continuous**
 - On-going resilience activities provide assurance and draws attention to emerging issues, recognising that infrastructure resilience will always be a work in progress
- **Organisational Performance**
 - Leadership and culture are conducive to resilience, including: Resilience Ethos, Situational Awareness, Management of Keystone Vulnerabilities and Adaptive Capacity. Future skills requirements are being addressed



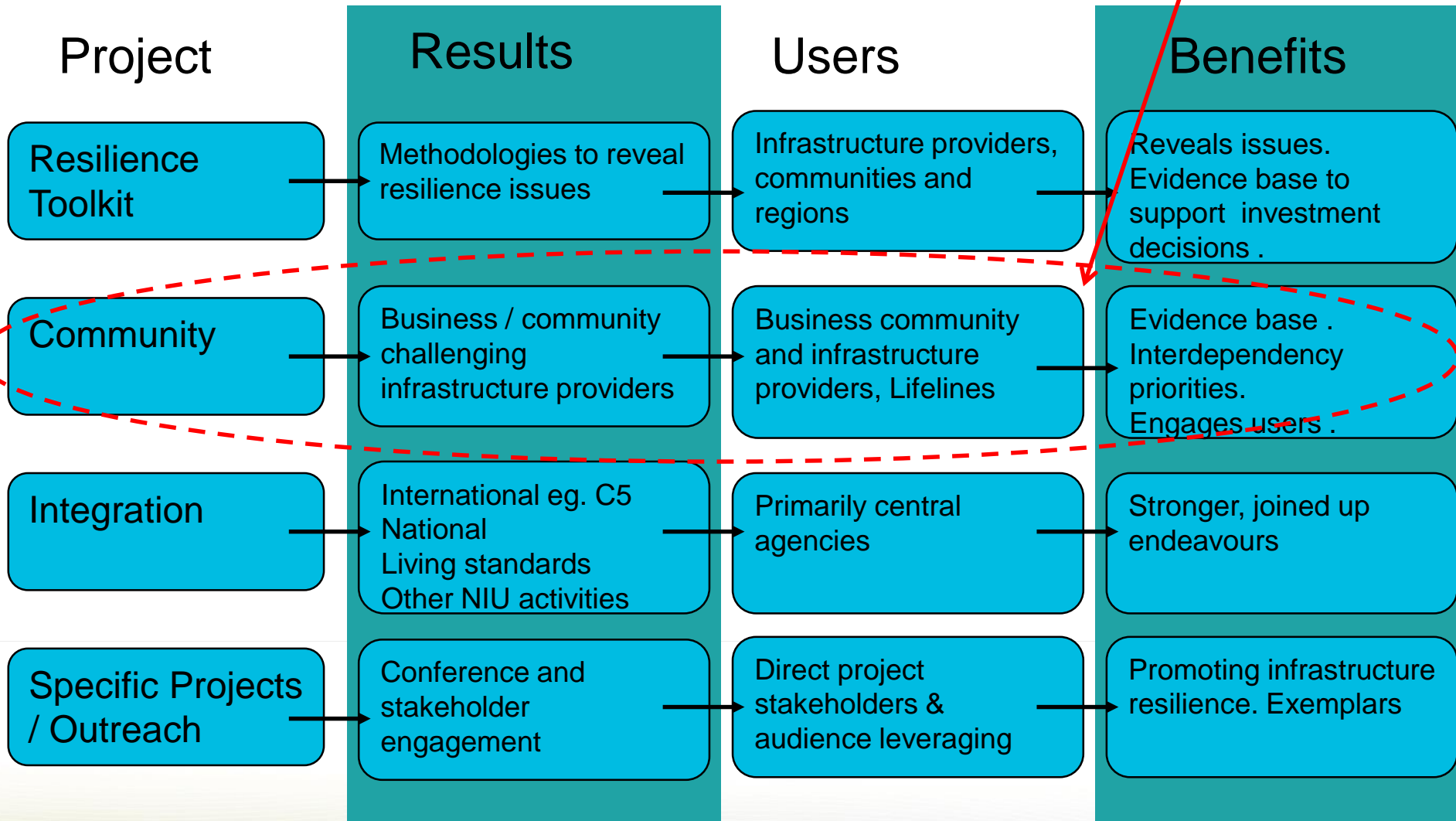
Experience to date

- Slow rate of uptake
- Dealing with systems of systems, complex
- Confirmation that standards and regulations contribute strongly but can at best provide only part of the solution
- Confirmation that “measuring” resilience should not be the priority. Conversations and narratives are more revealing
- Infrastructure service providers are (in general) giving insufficient attention to CDEM Act responsibilities ie. Lifelines
- Interdependencies are extremely important and current efforts are insufficient. We have no evidence to prioritise across infrastructure.



Driving Improved Resilience ...

2015/16 priority businesses



Resilience toolkit



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Resilience Toolkit approach ...

- NIU is facilitator / influencer / coordinator
- Regulation is a last resort
- Seek to use existing tools
- Recognise that resilience depends on perspective
- Need an iterative process to integrate perspectives within and between (interdependencies)
- Open source “non-proprietary” preferred
- (Very) low barriers to entry (better that tools are being applied)
- Staged increasingly detailed tools
- Enable preliminary self assessment
- Encourage private sector application of detailed tools
- Develop over time (address research and practice gaps progressively)



Organisational Resilience

- Released August 2014

What is Organisational Resilience? >

Organisational resilience refers to a business's ability to adapt and evolve as the global market is evolving, to respond to short term shocks—be they natural disasters or significant changes in market dynamics—and to shape itself to respond to long term challenges.

Discover your organisation's resilience potential now

1

Respond to the HealthCheck indicators

All you need is a basic awareness of your organisation.

2

You get immediate insights into your current organisational resilience capability

This process will help you become more aware.

3

You receive potential treatment options

Practical ways to respond and grow your organisational resilience capability.

Take the free organisational resilience HealthCheck now

Discover your organisation's resilience potential now

Indicator	Low resilience indicator	ANSWER	High resilience indicator	Your score	Possible max score
<p>Low High</p> <p>1 2 3 4</p>					
Leadership and culture attribute					
<i>Strong leadership to provide good management and decision making during times of challenge and adversity, as well as continuous evaluation of strategies and work programs against organisational goals.</i>					
11	Leaders display behaviours fearful of adversity	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Leaders display decisive leadership, innovation and seek opportunity, including in times of adversity		
12	Leaders do not 'walk the talk' nor demonstrate behaviours aligned with the organisation's values	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Leaders 'walk the talk' and demonstrate behaviours aligned to the values of the organisation		
13	Leaders are reactive and act under duress	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Leaders are balanced and strategically focussed to ensure the organisation is acting with control and foresight		
1.1 Leadership	14 Leaders are compliance driven, process focused	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Leaders are outcome driven / results focused	0	20
15	Leaders are oblivious to the needs of people working below them	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Leaders care for the wellbeing of their people and their ability to thrive in times of adversity		
16	Leaders are afraid or unwilling to make decisions without permission from senior management	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Leaders are empowered to make decisions and are supported in doing so by senior management		
17	Lack of visible executive and management buy-in to the need for resilience	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Highly visible executives/senior management resilience champions and leader advocacy of the resilience agenda		



National Resilience

Global Resilience (~ HYOGO Framework)

National Resilience (~ MCDEM/DPMC Framework)

Community Resilience (~ Rockefeller Framework)

Infrastructure Resilience

Regional Infrastructure Resilience
(~ **Regional Vulnerability Assessments**)

Project &
Programme
Sustainability
Tools

Civil Defence Emergency
Management



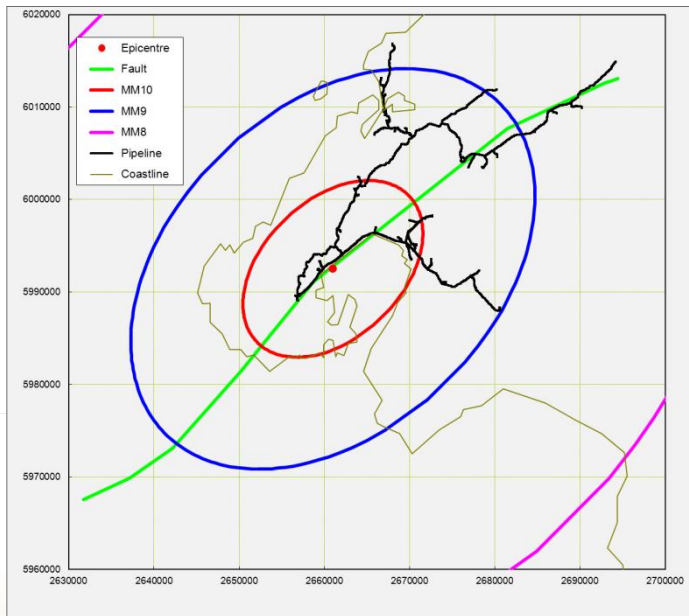


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Lifelines Work



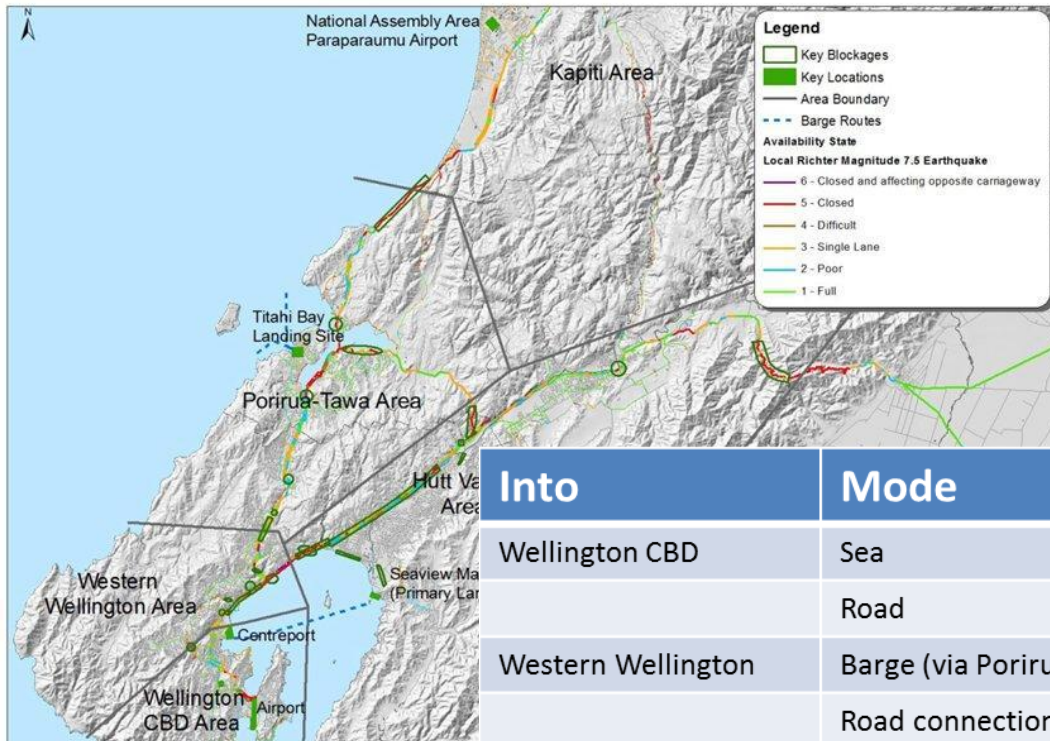
Lifeline Utilities Restoration Times



	Gas restoration time (days)	Power restoration time (days)	Water restoration time (days)
Hutt Central and Western Hills	80	60	25/40
Porirua, Mana, Plimmerton and Pukerua Bay	60	40	75
Northern /Western Wellington suburbs	60	60	45/55
Wellington CBD	80	95	55
Airport and Eastern Wellington suburbs	80	60	70



Restoring Wellington's transport links



Into	Mode	Time
Wellington CBD	Sea	4-5 days
	Road	120 days
Western Wellington	Barge (via Porirua)	5-7 days
	Road connection to Porirua and Tawa	3 weeks
Porirua	Barge	5-7 days
	Road connection to the Wellington CBD area	3 weeks
Lower Hutt	Barge	5-7 days
	Road connection to the Wellington CBD area	8-10 weeks
Upper Hutt	Road connection to Lower Hutt	3 days to 2 weeks
Kapiti	Road connection to the Upper North Island	1-4 days





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Empowering Business

Resilience Advice to Building Occupiers

Action: Being extended to Business operators

To include specific reference to infrastructure services

- **Understand the wider context of your building & key activities**
 - Owner/tenant, one or more buildings, geographic spread, neighbourhood, access routes, infrastructure
- **Look hard at what your building is used for and how disruptive if not available**
 - Look at how each building is used, how time critical are the operations
- **Life safety performance compared with serviceability performance**
 - Life-safety risks, functionality post event/s, how long to repair
- **Prioritise effort and investment**
 - Think about your buildings resilience as an investment rather than a compliance decision
- **Consider resilience from multiple perspectives**
 - Not only structural, not only earthquakes, fixtures, services, infrastructure
- **Plan for the unthinkable**
 - Consider people, premises, processes, technology. Engage with occupiers
- **Tenancy agreement**
 - Owner/tenant roles and responsibilities
- **Your risks are my risks**
 - Communities
- **Don't rely on insurance to put things right**
 - Insurance may not bring back customers!!
- **Brief consultants on “big picture” considerations**
 - Understanding and appreciation of matters above



Your feedback is most welcome.

Resilient is something you are not something you do



National Infrastructure Unit

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