

INFRASTRUCTURE **EVIDENCE BASE** **2015 Refresh**

Overview and Introduction

March 2015



NATIONAL INFRASTRUCTURE UNIT

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EVIDENCE BASE

Overview and Introduction

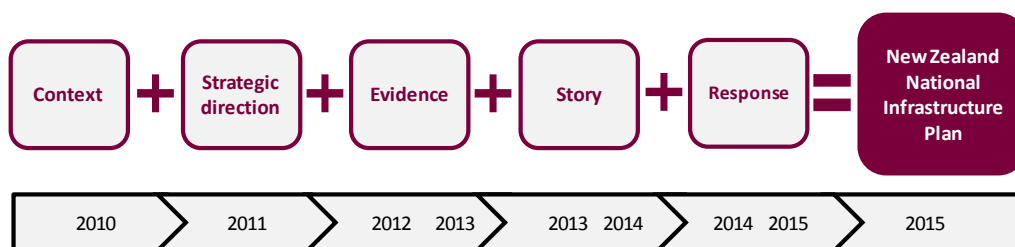
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Introduction by the National Infrastructure Unit

Last year, we published New Zealand's very first cross-sector, whole-of-New-Zealand Infrastructure Evidence Base. This included an assessment of the current performance for each infrastructure sector, scenario and trend analysis of potential future pressures, a resilience assessment and a *ten-year Capital Intentions Plan*.

The 2014 Evidence Base helped to establish a shared understanding of the current state of New Zealand's infrastructure, and allowed stakeholders across the sectors to agree on the nature of our strengths, weaknesses, opportunities, and future challenges. The process was a crucial first step because, as was noted in the *2011 National Infrastructure Plan*, there are significant difficulties in finding quantitative evidence on our infrastructure assets and how well they are performing. Building a consensus around available information on the state of our infrastructure allows us to focus collectively on a shared response to the challenges ahead.

It is in this spirit that we have provided an update to the Evidence Base. Later this year, we will be releasing the *2015 New Zealand Infrastructure Plan* which will describe how New Zealand can collectively respond to the infrastructure challenges we face. It will define the future vision of our infrastructure and provide a strategic framework and action plan to achieve our goals. This updated *Evidence Base* is intended to inform the *Plan* by capturing developments over the last 12 months to sectors' *performance indicators* and by building upon the 2014 *ten-year Capital Intentions Plan*; it is intended to build consensus across the infrastructure community on what this means for the state of our infrastructure.



This document has been created in collaboration with stakeholders across all sectors and the National Infrastructure Unit (NIU) would like to thank everyone for their support and help in updating it. As the NIU now looks forward to the next few months and the delivery of the *2015 New Zealand Infrastructure Plan*, we would encourage all of our stakeholders to join the debate and use the opportunity to help shape the future of infrastructure in New Zealand. Further information on how you can do this can be found in “*Next Steps*” below.

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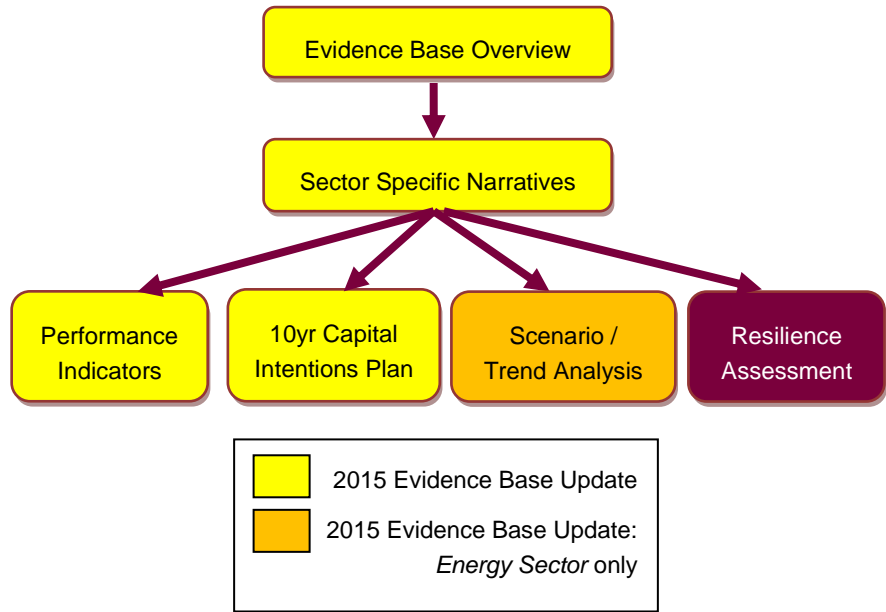
Methodology

The 2014 evidence base was presented in two layers:

- An overview document containing overall key messages from across sectors; and
- Sector-specific narratives.

These layers were informed by the four elements of the evidence base:

- Performance measures of current infrastructure assets;
- Scenario/trend analysis of potential future pressures on infrastructure;
- A resilience assessment; and
- A *ten-year Capital Intentions Plan*.



The last 12 months have seen some changes and updates to the *performance indicators* across sectors, the *Capital Intentions Plan* and new information to update the energy sector's *scenario/trend analysis*, which have in turn allowed NIU to update the *sector-specific narratives* and the *overview*. NIU has focused on updating these elements to ensure that the platform for developing the *2015 New Zealand Infrastructure Plan* is based upon the most recent evidence. The original evidence base framework and methodology, including the original scenario/trend analyses, can be found on the NIU's website under the *2014 Evidence Base* (<http://www.infrastructure.govt.nz/>).

Overall Messages

This updated Evidence Base generally reinforces the messages of last year's publication; New Zealand has broadly the right infrastructure, in the right place, providing the right quality of service.

Nevertheless, as was noted in last year's *Evidence Base*, there are a number of challenges ahead and traditional systems will not be sufficient to meet these. These include:

- **Understanding future levels-of-service requirements:** Planning for future levels-of-service needs to become more strategic by becoming more closely aligned with financial planning, especially given that future service requirements may need a different asset mix with different funding requirements. Equally, estimations around asset renewals, their timing and their costs vary between and within sectors, and need to be better understood to ensure that they can be adequately planned for;
- **Population and demographic shifts are changing the demands placed on our assets:** New Zealand's population is broadly shifting away from rural regions and into urban centres. Demographically, our population is aging. These present challenges to minimise the risk of stranded assets in shrinking populations and highly-pressured assets in growing urban regions, as well as the need to ensure the country's infrastructure is able to cope with the demands of older citizens. Changing populations also present challenges for infrastructure and integration with land use planning;
- **Technological developments create uncertainties and risks, but also opportunities:** Technology may be used to deliver services more effectively and with greater value-for-money, although planners need to ensure infrastructure is "future proofed" as far as possible and able to accommodate changing service delivery requirements;
- **Longer-term adaptation and resilience:** All infrastructure sectors have weakest-link vulnerabilities, and interdependencies between infrastructure sectors present increasingly complex resiliency issues.

To overcome these challenges, New Zealand needs to develop a more sophisticated approach to infrastructure management. This approach includes:

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- **A more 'holistic' approach to asset management:** In order for asset management practices throughout sectors to be truly strategic in their approach to future affordable service delivery, they need to become more deeply integrated with broader processes, particularly financial management, procurement systems and customer levels of service. This will ensure that asset management strategies are not only aspirations, but can be funded and effectively delivered;
- **Better use of data and more effective decision-making:** Better use of data and analytics will allow sectors a fuller understanding of the pressures placed upon their networks, and the likely timing and cost of future investment. It will be important to ensure that strategically meaningful information is collected, and that it adequately feeds into decision-making processes;
- **Adopting innovative approaches that move away from supply-side solutions:** Managing demand and optimising existing networks will become more important as shifting populations and forthcoming asset renewals place further pressures on infrastructure networks. Energy, transport and water in particular have the potential to adopt pricing regimes that reflect the true benefits and costs to users to optimise networks;
- **Regional and inter-agency collaboration:** Greater collaboration between local and central government, across agencies, and between local councils is growing in importance to optimise the use of existing infrastructure, avoid duplication, share services and draw on combined expertise;
- **More integrated planning regulation:** A more joined-up and consistent approach to planning legislation, particularly between the Resource Management Act (RMA), Local Government Act (LGA), and the Land Transport Management Act (LTMA), is necessary to provide certainty to investors and suppliers that plans can be funded and delivered and to lower the costs of compliance;
- **Resilience:** While current infrastructure is relatively resilient, all sectors have weak-link vulnerabilities. Preliminary assessments of sectors were made as part of the 2014 Evidence Base, and action plans are in place where required. The actions above all contribute strongly to improved resilience.

In summary, the evidence base continues to show a positive picture for New Zealand's infrastructure. There will be future challenges, yet we are encouraged by current initiatives and the willingness of infrastructure sectors to respond to these issues.

Key Changes

The majority of the 2014 Evidence Base and its implications for policy prioritisation still remain relevant. Key additions made in this update include:

- **Urban water:** Due to the significant new information from the Water New Zealand national performance review and the LGNZ 3-Waters National Information Framework, most sections and indicators have been updated.
- **Productive water:** Key updates relate to resource consent data and capturing some of the broader issues within the sector such as those around water quality and regulation.
- **Energy:** Key updates include; addition of coal to the discussion and recognition that renewable thermal fuels (e.g. biomass) contribute to total energy, reference to the continuing relatively low oil and coal prices starting to impact on investment decisions, reduced concern regarding shorter-term gas supplies to thermal power stations and acknowledgement that declining energy intensity is not necessarily a good measure for economic growth. Increased attention is given to the 150,000 kilometres of electricity distribution network and the projected investment over 10 years of \$8.6bn. More stringent health and safety regulations are adding to current costs.
- **Transport:** There have been updates where the most recent data sets have been made available, including the addition of active transport infrastructure where distinct from roading infrastructure, inclusion of further international benchmarking information, and a summary of work underway by the Road Efficiency Group and other industry groups in the last 12 months to strengthen asset management practices and drive productivity in the roading sector.
- **Telecommunications:** The updates included in this chapter are the latest time series data from the Commerce Commission Annual Monitoring Report, new international data from the OECD, the Global Information Technology Report, an update on the UFB and RBI programmes, and some additional information on emerging trends.

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- **Social sectors:** The format of this chapter has been updated to reflect the format used for the other sectors. The chapter captures the findings of the Treasury's *2014 Investment Statement* and covers initiatives over the past 12 months throughout the social sector designed to improve asset management and performance measurement.

As a result of these updates, the overall messages for each sector have evolved slightly and are summarised in the following table:

Sector	Strategic Messages
Urban Water	Variability of data is reflected in the differing levels of asset management maturity across the sector with a number of local authorities lacking foundational practices – consistent data standards, understanding of critical assets, and links to decision making are particular areas to focus on strengthening.
	There are significant untapped opportunities for water providers to realise benefits from alternative governance and service provision arrangements.
	Compliance with regulatory standards is prima facie an issue of significant scale; in many cases, well under 50% of providers are always complying with resource consent conditions for waste and storm water.
	The bottom line: The dramatic improvement in the quantity of information available over the past year has enabled a more informed conversation to occur but it has also highlighted the challenges parts of the sector face and the need for an overall step change in capability, asset management maturity and alternative governance and service provision arrangements.
Productive Water	There is large variation in the condition, age and efficiency of irrigation infrastructure, and a correspondingly wide range of asset management practices from immature through to comprehensive programmes.
	There is investment uncertainty regarding future nutrient management expectations - the ability to intensify land use alongside mitigation costs for existing land use.
	Sub-optimal infrastructure development may occur if inefficient processes are adopted to address the necessary iterative cycle of uptake, design, finance and consent considerations within business case risk management.
	The bottom line: Existing and future schemes (and the associated land use) face increasing liability, changing management structures, higher environmental standards and greater investor scrutiny. This raises affordability and intergenerational issues and a need to better understand where the costs and benefits sit, requiring transparent and robust investment analysis.
Energy	The overall condition of the New Zealand energy system is seen as good; quality is generally above targets, with sufficient service availability and adequate management. Equally, New Zealand's high renewable electricity component provides unique benefits and market opportunities compared to other countries.
	Electricity distribution businesses are under increasing stress due to ageing assets, consumers' increasing supply quality expectations, and emerging technologies such as household scale photovoltaic generation which may reduce demand projections. Adapting to technology changes and shifting focus to customer control and managing demand will be crucial to responding to these challenges.
	In oil, 70 percent of the petroleum fuel consumed in New Zealand each year is processed by a single refinery, and NZ has options for responding to domestic supply emergencies affecting supply pinch points. Gas transmission capacity is expected to be sufficient for short-to-medium term supply/demand scenarios. The next step change in gas investment is likely to be associated with a significant new gas find. Matching coal quality to demand requirements is an increasing challenge.
	The bottom line: Overall, asset condition is considered to be good and capacity adequate for the short to medium term. Technology changes and a shifting focus to customer control and demand management loom on the horizon.
Transport	Transport asset quality and management practices appear adequate overall, but with limited resilience and redundancy in some key assets at bottlenecks across all modes.
	Capacity constraints exist on key parts of the network and opportunities exist to improve asset performance through better allocation of investment and demand management of the network. This requires a balance between new or improved transport links and existing network optimisation, especially urban commuter and strategic freight routes.
	In Auckland and our other cities, demand management, improved investment analysis and fuller consideration of transport systems in urban design and planning regimes will be critical to achieving network benefits. Developments in technology will continue to offer innovative solutions.
	The bottom line: The challenge now is to consolidate gains from completed and planned investment and to maximise existing network performance through demand management and better allocation of investment.

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Telecommunications	Significant investment is ongoing, including the rollout of 4G services (private sector) and the RBI and UFB programmes (public / private). Realising the full benefit of these investments is a key focus for all parties.
	There is significant uncertainty in the market, which should be addressed by the completion of reviews of the Telecommunication Act, the Telecommunications Service Obligations, and the Final Pricing Principle review of UCLL and UBA prices.
	Inconsistency in planning legislation and limitations can cause inefficiencies and hinder new solutions to issues such as location and infrastructure sharing.
	The bottom line: The market appears to be providing good outcomes in terms of quality, reliability and coverage. Effective and efficient delivery of the next generation mobile and internet networks will be a key enabler of productivity gains in NZ.
Social Sectors	There has been substantial improvement in recent years, especially in asset management and capital planning.
	There is still a gap between most agencies' desired level of asset management and current practices. However, initiatives are underway at central government level which attempt to address these and local government requirements also come in to effect this year.
	There will be significant challenges ahead caused by aging assets and demographic changes.
	The bottom line: The social sectors need to continue to improve asset management practices and the use of data to effectively address future challenges.

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International Benchmarks

The aspiration of our infrastructure is to underpin a prosperous and inclusive New Zealand, and a crucial aspect of achieving this is ensuring that it supports strong economic performance. As a result of New Zealand's remote location, our infrastructure needs to support good international connections which ensure higher two-way flows of people, ideas, capital, data, goods and services.

Given NIU's focus on international connectivity, we have explored the incorporation of international benchmarks into the Evidence Base. Good international benchmarks allow New Zealand to understand how our infrastructure is performing in relation to other countries, and where our relative challenges and opportunities lie to increasing our attractiveness to the international community.

A good benchmarking index requires hard indicators that allow for fair and accurate comparison between countries. Though some between-country indicators exist for certain infrastructure performance measures, an accurate aggregated measure for 'all of infrastructure' between economies has not been produced.

Where available, we have included relevant international comparisons in each sector chapter.

At an aggregate level, the most useful information comes from the *Global Competitiveness Report* which provides some indication of business' perceptions of New Zealand, including on infrastructure. However, it must be noted that as the infrastructure score is based significantly on the judgements of businesses across different countries whose expectations and values will be different, the comparability across jurisdictions is fundamentally limited. Equally New Zealand's score and ranking is based on only 41 respondents.

Nevertheless, there is value in looking at the trend of the score given to New Zealand's infrastructure, which provides some insight into business' views of our infrastructure and how this has changed over time.

International Benchmarking

The World Economic Forum: 2014-15 Global Competitiveness Report

- Provides an overview of the competitiveness of 144 economies around the world with a score and a ranking for each country. This is also disaggregated, with scores and rankings on a number of contributing 'pillars', including a score for an economy's infrastructure;
- The overall score is generated for each economy based on statistical data and a qualitative survey when this is not available. The infrastructure ranking is largely based on the opinion survey of businesses from each economy, given the absence of good quality comparable statistical data. New Zealand had 41 respondents;
- New Zealand's infrastructure score was 5.3 out of seven, a score which has continually increased since 2011;
- There is limited value in comparing countries' infrastructure scores, because each score is based largely on the judgements of different businesses from different economies with different expectations and values;
- Nevertheless, for completeness, New Zealand has an overall ranking of 17 out of 144 countries, with a rank of 29 out of 144 for infrastructure. New Zealand's infrastructure score contributes only 5% towards our overall country score.

The Economist Intelligence Unit: Liveability Rankings 2014

- A city-based ranking used to assess which cities around the world provide the best and the worst living conditions for its citizens, using qualitative and quantitative measures;
- Auckland ranked 10th out of the 140 cities assessed with an overall rating of 95.7 out of 100. This includes an infrastructure score of 92.9 out of 100.

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Next Steps

NIU's key areas of focus for 2015 will be the publication of the *2015 New Zealand Infrastructure Plan* and building consensus around the proposed solutions and the roles of stakeholders in delivering them. This updated Evidence Base is intended to provide a common platform to inform that process.

The NIU will hold a **New Zealand Infrastructure Forum** in Wellington on **31 March - 1 April** to progress the responses to New Zealand's infrastructure challenges. The Forum will include a number of speakers and panel members from across the infrastructure community, and the focus will be on sharing ideas, facilitating discussion, and creating consensus on the necessary solutions.

After building the findings from the Forum into the NIU's draft strategic framework and action plan, we will hold a series of **regional workshops** from **13 April** to discuss the more detailed aspects of the draft Plan. It is important to note that the regional workshops will not be substitutes for the New Zealand Infrastructure Forum; they will be used to discuss the next iteration of detail and the specifics of the proposed action plan. We therefore greatly encourage all of our stakeholders to attend the New Zealand Infrastructure Forum. Following the workshops, the developing *Plan* will largely be settled and the focus will move to final refinements.

Details of the Forum, including speakers, the agenda, and relevant papers, have been published on the infrastructure website (www.infrastructure.govt.nz/) alongside this Evidence Base update. Details of the regional workshops are also on the website and will be published again in the NIU newsletter.

We encourage all of our stakeholders to contact the NIU about attending the New Zealand Infrastructure Forum; it will be a unique opportunity to influence New Zealand's infrastructure agenda and contribute your views. NIU can be contacted at info@infrastructure.govt.nz. We look forward to hearing from you.

