
National Infrastructure Plan 2011



New Zealand Government

Ministers' Foreword

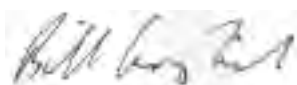
The publication of the second National Infrastructure Plan marks another important step in this government's commitment to ensuring New Zealand has the infrastructure to support our economic growth aspirations.

The Canterbury earthquakes have highlighted the critical role that infrastructure plays in our day to day lives. In the hours and days following the earthquakes, power, water and communication services and air, road and rail travel were critical to ensuring the basic needs of residents in the quake zone were met. Emphasis now is on repairing damage to infrastructure and, where possible, making networks more resilient.

The government is committed to rebuilding Canterbury and this will require significant investment in the short to medium term. Regardless of this funding pressure this government remains committed to its existing infrastructure investment throughout the country and to continuing to look for additional projects that would make a significant positive impact on productivity and economic growth. Auckland, as the largest and fastest-growing metropolitan region, faces significant infrastructure demands on it. The government is already making very large investments in key infrastructure particularly in the areas of transport, electricity transmission and telecommunications and will continue to work with the region to analyse and evaluate future large infrastructure projects to ensure that the appropriate investment is made at the right time.

The first Plan, published in March 2010, signalled our intention to deliver large scale investment and reform in some key infrastructure priorities and we have followed through:

- » Roads of National Significance
- » Ultra Fast Broadband investment and Rural Broadband
- » Ongoing regulatory reform
- » KiwiRail Turnaround Plan



Hon Bill English
Minister for Infrastructure

- » Rugby World Cup
- » Commuter rail upgrades in Auckland and Wellington
- » Electricity transmission

While there is still a lot of work to be completed in these areas, the government's focus is now shifting to ensuring policies are well implemented and monitored to achieve the right results.

Beyond this, the government has prioritised work in the next three years on the following areas:

1. Working with Canterbury infrastructure providers to rebuild infrastructure to get the economy working again as well as considering how to build greater resilience.
2. Providing a comprehensive approach to investment in Auckland which is fair to all New Zealanders, and which helps implement government responsibilities through the Auckland Spatial Plan.
3. Achieving significant improvement in the management of government owned social infrastructure assets to deliver better services to the public and explore alternative procurement methods.
4. Focusing land transport investment on supporting exporters (e.g. completing RoNS and improved rail services to ports).
5. Improving the ability to monitor performance across all infrastructure sectors.

This Plan sets out a twenty year vision, which is directional but not directive, and a programme of work, led by the National Infrastructure Unit and involving a range of agencies, to progress this vision.



Hon Steven Joyce
Associate Minister for Infrastructure

Foreword: National Infrastructure Advisory Board

The National Infrastructure Advisory Board consists of members from the private sector and outside central government and was established to advise the National Infrastructure Unit and the Minister for Infrastructure and to act as a conduit between infrastructure stakeholders and the government.

The Board provides advice on infrastructure project appraisal, capital asset management issues and the development of the National Infrastructure Plan. In this context the Advisory Board has been closely involved with the development of this edition of the National Infrastructure Plan. We believe it highlights where progress has been made in developing New Zealand's infrastructure

and pinpoints areas where we must do better if economic growth is to be accelerated. In Part Two of the Plan you will see an evaluation of the state of each infrastructure sector that draws on the views of Ministers and the Board. In some sectors there are significant challenges still to be met and it is the responsibility of not only the government but of all infrastructure providers, developers, regulators and users to ensure that the performance of each sector improves over time.

The Board intends to work closely with the government to help achieve the three-year action plan and to ensure that a much stronger information base is available to produce the next edition of the Plan in 2014.



Dr Rod Carr

Chair, National Infrastructure Advisory Board

Members

Dr Rod Carr (Chair) is Vice-Chancellor of the University of Canterbury and a former managing director of Jade Software Corporation. Dr Carr was also Deputy Governor of the Reserve Bank and has held senior executive roles at the Bank of New Zealand and National Australia Bank. Dr Carr is a director of the Canterbury Employers' Chamber of Commerce, Lyttelton Port Company Ltd and Taranaki Investment Management. He is a Trustee of the Christchurch Earthquake Appeal Trust.

Mr Lindsay Crossen was New Zealand operations manager, then chief executive, for Fulton Hogan New Zealand Group from 1998 to 2008. He is currently a group civil engineer with Fulton Hogan and a director of Infratrains NZ Ltd and Lyttelton Port Company Ltd.

Dr Arthur Grimes has been a Reserve Bank director since 2002. He is a senior fellow of Motu Economic and Public Policy Research, chairman of Hugo Group, and adjunct Professor, University of Waikato.

Dr Terence Heiler is an engineer with many years' experience as a consultant and engineering researcher (NZAEI Lincoln College Director). He has management and governance experience including seven years as a director of Landcare Research Ltd.

Mr John Rae has been involved in banking in New Zealand and London in various treasury and capital market roles and has a background in private equity, venture capital and corporate finance transactions. Mr Rae was until recently the former Managing Director of the Stevenson Group and is currently chairman of the New Zealand Council for Infrastructure Development.

Mr Alex Sundakov is executive director of Castalia. He is an economist who has worked at the New Zealand Institute of Economic Research, the International Monetary Fund, and the Treasury.



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ISBN: 978-0-478-37851-1 (Online) 978-0-478-37850-4 (Print)

<http://www.infrastructure.govt.nz/plan/2011>

PURL: <http://purl.oclc.org/nzt/i-1389>



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Executive Summary

The National Infrastructure Plan is a strategic, future focused document that places infrastructure in the context of economic and population growth. It seeks to provide common direction for how we plan, fund, build and use all economic and social infrastructure. It covers the transport, telecommunications, energy, water and social infrastructure sectors.

Vision

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

Principles

The following guiding principles provide a platform for infrastructure development and signal how the country should move forward and make better decisions in the future.

Investment Analysis

Investment is well analysed and takes sufficient account of potential changes in demand.



Resilience

National infrastructure networks are able to deal with significant disruption and changing circumstances.



Funding Mechanisms

Maintain a consistent and long term commitment to infrastructure funding and utilise a broad range of funding tools.



Accountability and Performance

It is clear who is making decisions, and on what basis, and what outcomes are being sought.



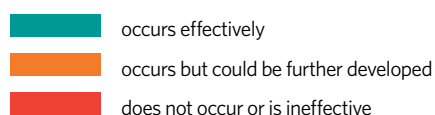
Regulation

Regulation enables investment in infrastructure that is consistent with other principles, and reduces lead times and uncertainty.



Coordination

Infrastructure decisions are well coordinated across different providers and are sufficiently integrated with decisions about land use.



Strategic Opportunities

The following is a snapshot of the strategic opportunities that will help achieve vision and goals that have been identified in each sector.

Transport

Ensuring a stable regulatory environment.

Supporting growth in Auckland.

Improving the overall effectiveness and efficiency of the network.

Telecommunications

Public and private sector take up UFB infrastructure.

Greater efficiency in telecommunications networks.

Energy

Further develop and improve the electricity regulatory regime.

Improve the information base available to support further investments in petroleum and minerals sectors.

Water

Better demand management practices and consistent performance criteria for water infrastructure.

Promote partnerships and activities within the sector.

Ensure that management of water assets contributes to improved social, economic, environmental and cultural well-being of communities.

Social

Alternative approaches to the funding delivery and management of assets and associated services.

Improved spatial consideration of social infrastructure to support growing communities.

Greater use of shared services by local government.

Three-Year Action Plan

Government is committing to the following actions to give effect to the vision and principles and to move towards the next edition of the Plan in 2014.

- 1 Central government will commit to developing and publishing a ten year Capital Intentions Plan for infrastructure development to match the planning timeframe required of local government.
- 2 Increase understanding of and encourage debate on the use of demand management and pricing in infrastructure sectors.
- 3 Improve access to information on current infrastructure performance to create certainty about when, where and how infrastructure development is occurring, including consideration of whole of life costs.
- 4 Develop performance indicators for each sector on the stock, state and performance of central and local government infrastructure assets as well as those managed by the private sector.
- 5 Work with regions to develop more strategic infrastructure planning at a macro-regional level. Consider where adoption of spatial planning would produce optimum outcomes, particularly in metropolitan areas.
- 6 Improve scenario modelling to more accurately project likely infrastructure investment requirements from the short to very long term.
- 7 Use lessons from Christchurch to significantly enhance the resilience of our infrastructure network. This may include developing improved seismic design standards, reviewing organisation culture to improve performance in emergencies and identifying ways to quickly return services to full operational capacity.
- 8 Explore alternative sources of funding, and implement funding tools that can be used to manage the current portfolio more effectively.

In addition to these actions, the National Infrastructure Unit will work with other government agencies and private sector groups to ensure there are:

- » Improved partnerships and greater communication on infrastructure issues.
- » A broader research programme to provide a stronger evidence base for decisions.
- » An annual state of infrastructure report that updates the progress being made against the action plan.

Part One

A National Plan for Infrastructure





PHOTOGRAPHY: SIMON DEVIITT

Introduction

Infrastructure is critical to all aspects of modern living, allowing us to enjoy the quality of life we have become accustomed to and providing a platform that enables us to compete in the global economy. Every New Zealander uses infrastructure on a daily basis, while the business community relies on it to deliver goods and services to customers.

The recent Canterbury earthquakes provide a new dimension to infrastructure provision, and have highlighted the importance of quality infrastructure. While there will be short-term funding pressures because of the sizable investment required to rebuild Christchurch, this will not result in cancellation of investment elsewhere.

*'Infrastructure' is the fixed, long-lived structures that facilitate the production of goods and services and underpin many aspects of quality of life.
'Infrastructure' refers to physical networks, principally transport, water, energy and communications.*

Given the critical role that infrastructure plays in the economy, the government is taking a more strategic approach to infrastructure planning and investment. The National Infrastructure Plan seeks to provide common direction for how we plan, fund, build and use all economic and social infrastructure.

The overall purpose of the National Infrastructure Plan is to improve investment certainty for businesses by increasing confidence in current and future infrastructure provision.

The government's focus is necessarily on economic growth and on helping New Zealand businesses become more productive to raise the living standards of all New Zealanders. This is why a major focus of the National Infrastructure Plan is on providing businesses with greater certainty and confidence about current and future infrastructure provision. Furthermore, the government also realises that infrastructure forms the backbone of all New Zealand communities, and that every individual New Zealander needs a greater level of confidence about infrastructure provision, costs and service levels.



There are two key outcomes the government would like to drive through its infrastructure strategy:

Better Use of Existing Infrastructure

We must make better use of our existing assets. The people of New Zealand collectively own more than \$115 billion of infrastructure assets. Getting more from the current stock of infrastructure is about looking at how assets are used, identifying opportunities for improved management, finding better ways of managing demand and ensuring users' expectations are understood.

Better Allocation of New Investment

New Zealand needs to be smarter about investing in new infrastructure. Allocation of new investment in economic infrastructures (water, transport, energy and communications) needs to prioritise economic growth, particularly the export sector. The government will prioritise investment where there are adequate returns and these are underpinned by robust analysis through a well understood and transparent process.

Investment in new infrastructure, as with the management of existing assets, must focus on delivering services and outcomes rather than just building assets.

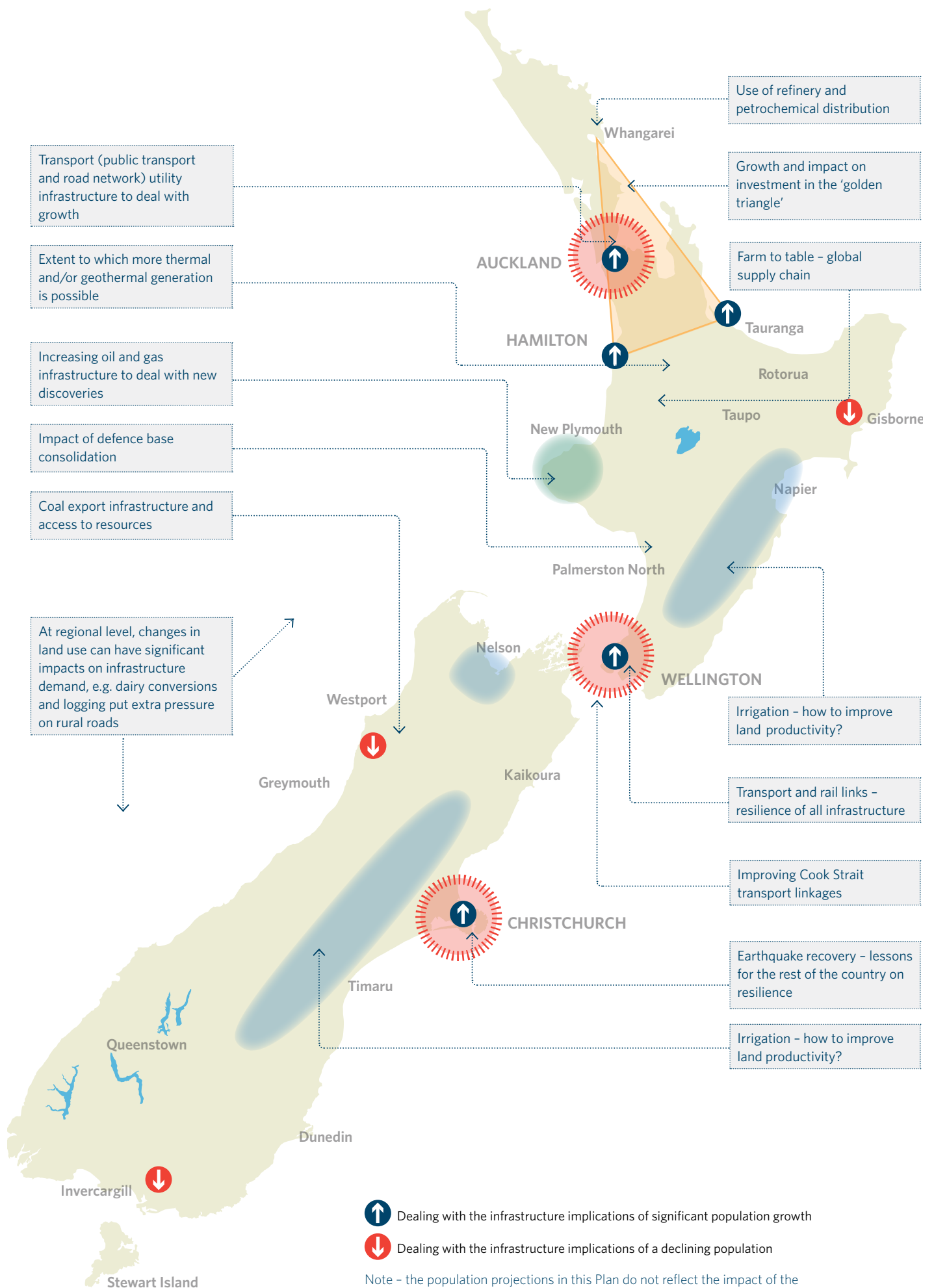
Infrastructure Challenges

New Zealand's infrastructure performs well in most areas. However, to achieve the government's goal of faster economic growth, infrastructure must perform even better. The key challenges are:

- 1** Infrastructure **investment** is well analysed at the project level but there is insufficient consideration of how assets function as a network or address potential changes in demand.
- 2** New Zealand's infrastructure is vulnerable to outages, including through natural hazards, and we have insufficient knowledge of network **resilience** at a national level.
- 3** The volatile nature of infrastructure **funding** creates a lack of certainty and continuity for infrastructure providers. There is insufficient use of the tools available to generate revenue and manage demand.
- 4** The **performance** of infrastructure assets is not transparent. It is not always clear who is **accountable** for decisions.
- 5** The **regulatory** environment does not support long term infrastructure development and contributes to unnecessary costs and uncertainty.
- 6** Poor **coordination** between different infrastructure providers leads to suboptimal outcomes. Decisions over land use and infrastructure investment could be better integrated.

In addition to these challenges, there are a number of detailed trade-offs that this Plan does not seek to address.

The opposite map shows some of the big issues that must be resolved in the near future.



- ↑ Dealing with the infrastructure implications of significant population growth
- ↓ Dealing with the infrastructure implications of a declining population

Note - the population projections in this Plan do not reflect the impact of the Canterbury earthquakes.



Roles

National Infrastructure Plan

The Plan is directional but not directive. It places infrastructure in the context of New Zealand's broader economic goals and is anchored in the reality of its fiscal outlook. It sets a clear course for the future so that infrastructure providers from all sectors have a common understanding of national level expectations and policy settings.

This is a strategic document rather than a plan of what to build, when and why. It sets out investment principles and identifies what the government wants to achieve long-term. There is a tension between the need for national direction and the numerous autonomous decision makers. The Plan provides a high level strategy which reduces uncertainty for decision-makers.

The Plan does not seek to resolve all the issues that might exist in any region, sector or part of the economy. It does seek to identify the biggest areas of contention, and suggest a way forward. Given the long lead times for infrastructure and the long asset life, many of these challenges will take a number of years to resolve.

Central Government

Central government has two key roles:

- » **Regulator** – Better regulation is a key principle for improved delivery of infrastructure. The government is seeking to further develop effective infrastructure markets and reduce uncertainty for infrastructure providers through regulatory reform.
- » **Provider** – The government is a major provider of social and economic infrastructure. For economic infrastructure, the government has promoted the development of markets to determine and incentivise the best investments.

The government aims to reduce its investment in those sectors in which markets are working well (e.g. energy) while retaining its influence through sound long-term planning and regulation. This will allow government to prioritise investment in public goods where there is little private sector investment.

This Plan responds to the absence of a cross-sectoral infrastructure strategy, which has meant that investment decisions have lacked context. The government will ensure its own investment decisions align with the outcomes sought in this Plan, and will encourage investment from other sources.

The government will continue to have a role as a provider in the following sectors:

- » **Transport** – A lead role through assets managed by New Zealand Transport Agency (NZTA) and Kiwirail.
- » **Telecommunications** – Following current ultra fast and rural broadband investments, the government will focus on ensuring the regulatory regime operates effectively.
- » **Energy** – As a majority shareholder in a number of state-owned enterprises (SOEs).
- » **Water** – Including to crowd in other investors and act as a catalyst investor for irrigation projects.
- » **Social infrastructure** – To deliver public goods that the market cannot.

In addition to the information contained in the Plan, the Investment Statement, released as a companion to the Budget, clearly shows the government's assets, liabilities and future investment intentions and brings this important aspect of financial management into line with other regular fiscal reporting.

Local Government

Local government is a significant owner of transport, water and social infrastructure and has a mandate to improve investment decisions, asset management and regulation to support New Zealand's economic growth. Central government will ensure that local government has the right tools to achieve this.

Private Sector

The private sector plays a critical role in the provision of infrastructure. The government encourages greater involvement of the private sector, as investors in economic infrastructure and as partners of government to deliver social infrastructure. In addition to investment, the private sector provides skills and expertise in planning and design, construction and asset management.

Iwi and Māori Entities

Iwi and other Māori entities will have a role to play in supporting infrastructure development in New Zealand. In this regard work undertaken through the Māori Economic Taskforce and other initiatives provides a foundation for iwi to identify the types of projects they would like to be involved in and the nature of that involvement. The government supports iwi and Māori entities using this Plan to inform them of the infrastructure priorities facing the country and the types of projects that might be of interest to them.

State of the Nation

New Zealand's economic infrastructure allows the economy to function and grow. Recent government investment in infrastructure has gone some way to addressing historical under-investment but there are still challenges that require better solutions. Domestic and overseas businesses have expressed low levels of confidence in New Zealand's infrastructure, and to address this, planned investment must target problem areas within a strategic and long term framework. The World Economic Forum's Global Competitiveness Report rates New Zealand's infrastructure performance as weaker than that of other areas, e.g. the strength of our institutions or the openness of the economy. Whether or not the perceptions are fair, they exist, and therefore affect business and investor behaviour.

Across infrastructure sectors, asset performance is either variable or not reported. Therefore providing a national snapshot of our infrastructure assets is not as simple as it should be. The next edition of this Plan must be based on better information about asset condition and performance to allow more informed decisions and efficient and effective investment.

This plan has a 20-year timeframe and underlines the government's commitment to ongoing investment in infrastructure and to improving its overall performance.



Assets

New Zealand's infrastructure networks are some of our country's most valuable assets. Annual investment in infrastructure from all sources runs to many billions of dollars.

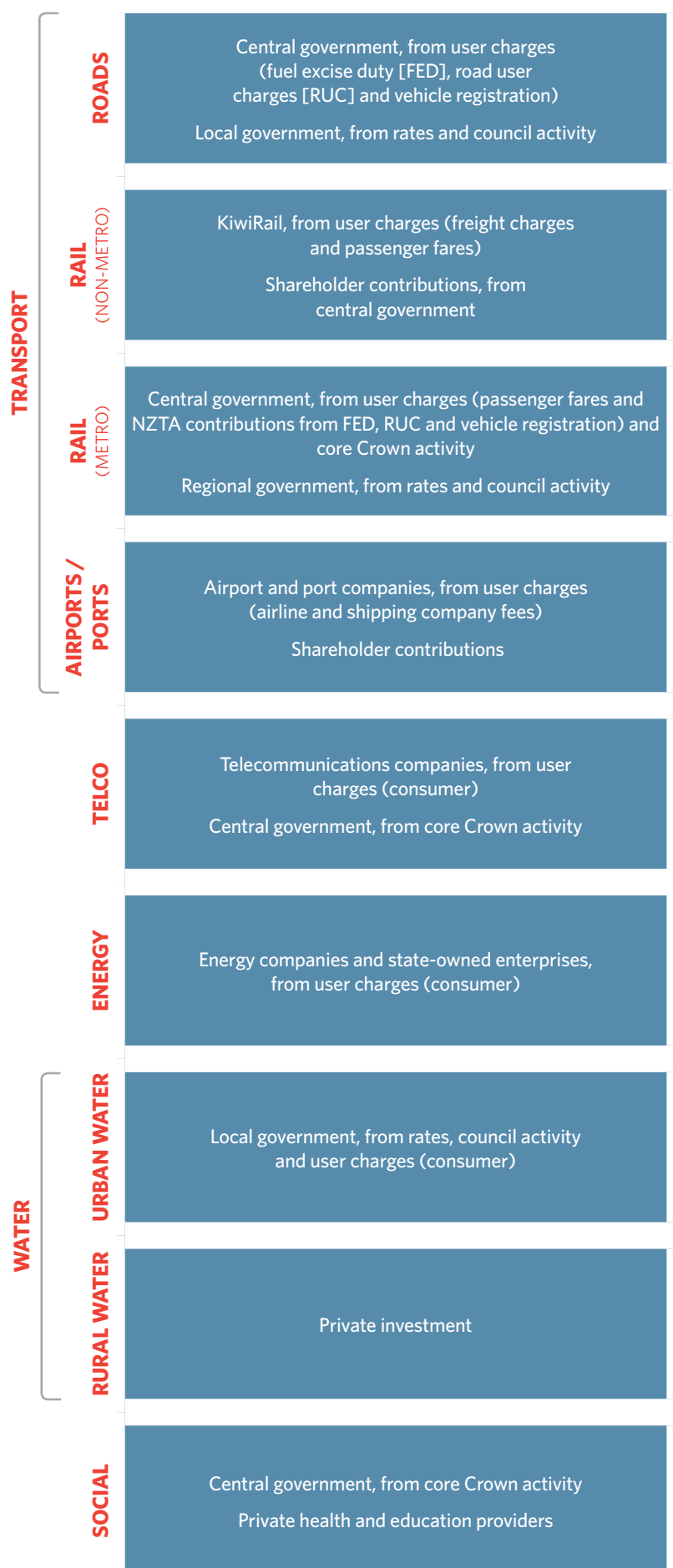
The diagram opposite is a snapshot of infrastructure assets by sector and sub-sector. It is designed to illustrate the many parties involved in funding and managing infrastructure assets and give a sense of scale for each sector. While spending data is for central government only (due to data availability), remaining columns cover all major assets, private and public owned.

The revenue and funding column sets out the range of revenue sources administered by central and local government, state-owned enterprises and private entities to fund infrastructure provision. Most assets are funded through a mix of user charges and general revenue sources such as taxation, rates and shareholder funds. The second column lists spending by central government over a four-year period. Funding from all sources is administered by the asset managers listed in column three, who are responsible for implementing major investment decisions and managing ongoing operations and maintenance. The fourth column is the value of all infrastructure assets in each sector, the sum of all publicly available asset values.

A number of issues with this data are acknowledged and we are continually improving its accuracy and completeness. See note below.

Source: The Treasury. The data in this table has been collated from publicly available annual reports and information releases. Social infrastructure refers to education, health, housing and justice sectors. Capital spending excludes spending by state-owned enterprises. Valuation data is incomplete in some sectors, notably private healthcare and education, ports and airports. Values have not been adjusted to account for missing data, other than for private education infrastructure where an indicative value has been derived from the proportion of students enrolled at private institutions. For the purposes of this table, infrastructure values are for fixed long-lived assets, and exclude land and work in progress where specified in data sources. Valuation methodologies vary and may not be consistent and comparable. All data should be treated with caution.

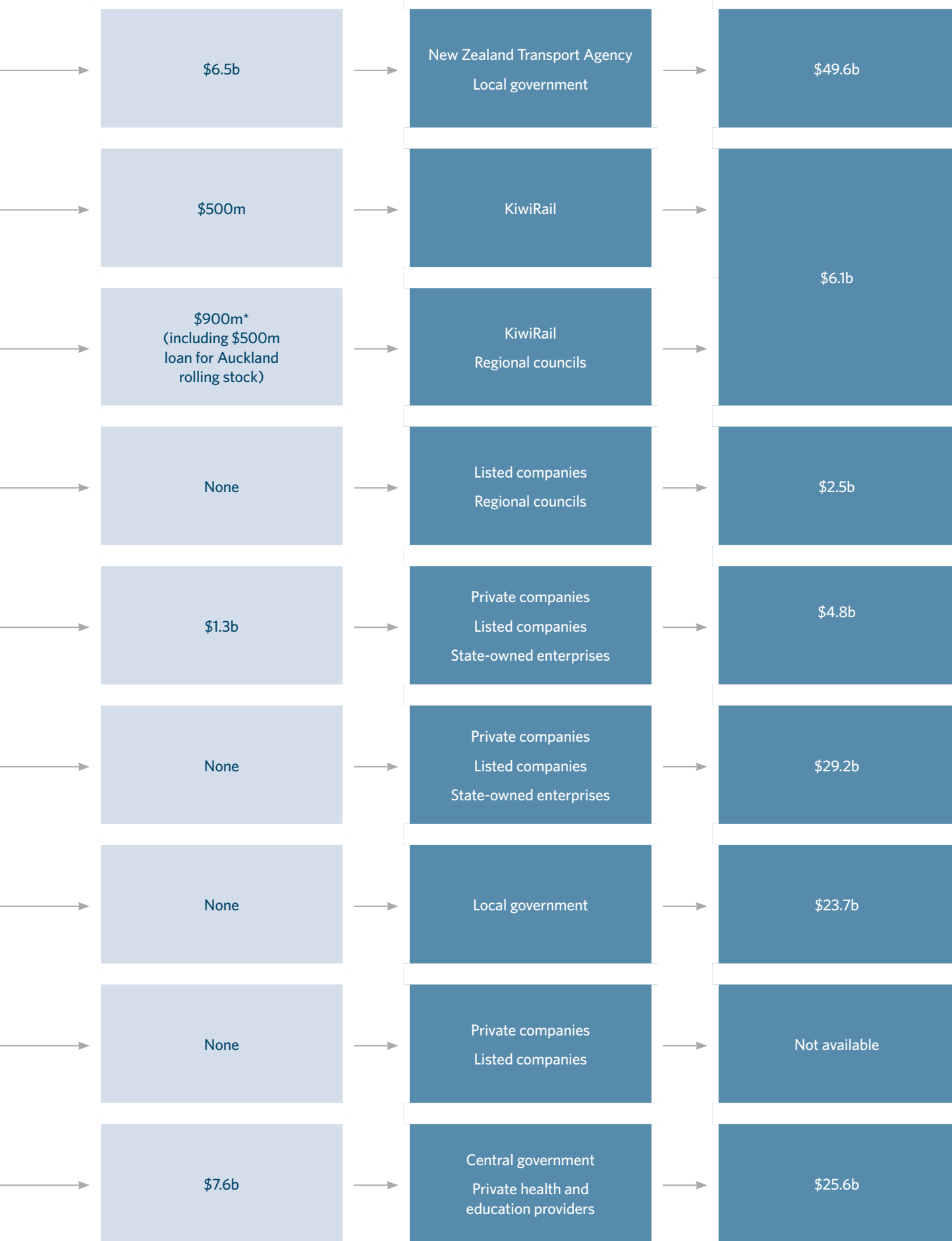
FUNDING AND REVENUE SOURCES



CENTRAL GOVERNMENT CAPITAL EXPENDITURE - 2011/12-2014/15

ASSET MANAGERS

VALUE OF ASSETS (WHERE REPORTED)



A Growing New Zealand

New Zealand will be a very different place in 20 years' time. Providing accurate predictions of the future is an impossible task given the number of variables. A number of high level trends will shape our economy (including global trends around climate change, technology and peak oil), and with it the demands for infrastructure. Two of the key factors that influence the level of investment we can and should make in infrastructure are population and economic growth rates. There are many other factors that will influence our future, such as the rate of change in technology and our adoption of it, our ability to use natural resources and fiscal constraints.

Population

Population growth and internal population movement will have a strong impact on how to plan for and develop infrastructure in the future. Demand for some types of infrastructure is correlated with population growth. This means that infrastructure requirements increase as the number of people using the infrastructure increases.

In particular, increasing populations require additional transport options, provision of network utilities (water, wastewater, stormwater, gas, electricity, phone/internet), as well as social infrastructure. While New Zealand's population is projected to increase to over 5 million by 2031, what is of greater significance to decision-makers is where this growth occurs.

Population growth in the regions – from natural increase (births less deaths) and net migration (arrivals less departures) – is projected to vary considerably. Most regions will grow, with Auckland growing the fastest. A breakdown of regional population forecasts demonstrates the challenges associated with growing and/or declining populations. A further challenge is trying to plan and provide for infrastructure when population change is difficult to predict.



1 NORTHLAND REGION

2 AUCKLAND REGION

3 WAIKATO REGION

4 BAY OF PLENTY REGION

5 GISBORNE REGION

6 HAWKE'S BAY REGION

7 TARANAKI REGION

8 MANAWATU REGION

9 WELLINGTON REGION

10 TASMAN REGION

11 NELSON REGION

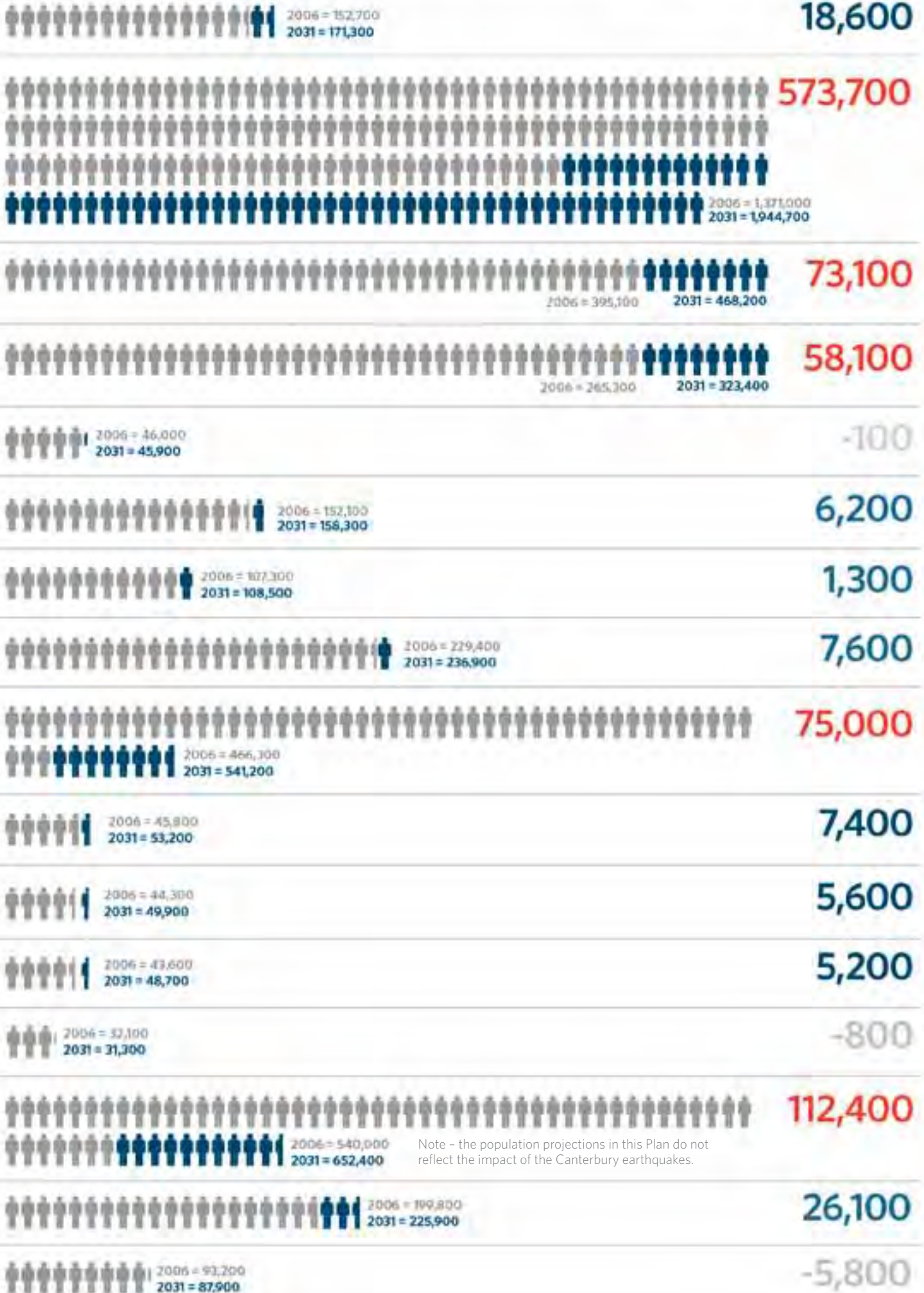
12 MARLBOROUGH REGION

13 WEST COAST REGION

14 CANTERBURY REGION

15 OTAGO REGION

16 SOUTHLAND REGION



Note - the population projections in this Plan do not reflect the impact of the Canterbury earthquakes.



Economic Performance

Closing the economic gap with Australia within 15 years is likely to require average real GDP per capita growth of above 4 percent, more than twice New Zealand's average rate over the last two decades. The Treasury currently forecasts average real GDP per capita to grow about 2.1 percent in the medium-term (from 2012 to 2015). Figures beyond that are based on Statistics New Zealand demographic projections and an assumption of 1.5 percent per annum productivity growth. These projections see real GDP growth per capita trending down to around 1.3 percent between 2020 and 2030.

Infrastructure is an important component of the government's strategy for achieving faster economic growth. Investment in productive infrastructure is part of the government's Medium-term Economic Agenda, which is aimed at lifting New Zealand's long-term growth rate and reducing the economy's vulnerability to further economic shocks.

Infrastructure has a dual role in this strategy. It underpins growth by providing the supporting networks demanded by a growing economy. It also catalyses growth by creating new economic opportunities. The government's investment in irrigation infrastructure (p. 43) is an example of catalytic infrastructure investment.

Much of the analysis in this document focuses on ensuring infrastructure meets the demands of a growing economy. High-quality infrastructure attracts industry and business to New Zealand. Infrastructure is crucial to supporting export-led growth. For example, water and energy underpin New Zealand's primary production industries, and transport and communications networks connect us to overseas markets.

Historical data confirms that demand for some infrastructure increases as the economy grows. The case studies presented on pages 27 and 36 use historical relationships to estimate how demand for transport and energy infrastructure could increase under a higher economic growth path. This gives us some sense of the scale of the challenges ahead.



A Vision for New Zealand's Infrastructure

New Zealand's infrastructure is resilient and coordinated and contributes to economic growth and increased quality of life.

Infrastructure is a long-term investment, so our planning needs to be future-focused and our vision ambitious. New Zealand needs to strive for significant improvements to how we plan, deliver and manage our infrastructure assets. To achieve this vision, small, consistent steps must be taken by multiple players.

The National Infrastructure Plan lays out the government's vision for New Zealand's infrastructure by 2030. It seeks to guide infrastructure users, providers and regulators in a common direction over the next 20 years and to support the decisions these groups make about the use, provision and regulation of infrastructure.

The National Infrastructure Plan is a necessarily 'strategic' document. To implement the strategy, the government will work with many parties, including improving the workings of government agencies.

By 2030 We Will Have Achieved This Vision If:

- » Businesses and investors are confident that the infrastructure environment is responsive to their needs.
- » Infrastructure providers are working in an integrated manner to resolve long-term challenges and the short- to medium-term priorities for investment.
- » Many parties (from public and private sectors) are involved in managing our assets with clear roles and responsibilities.
- » Investment in infrastructure supports the productive and tradable sector (goods and services).
- » Investment improves our global connectivity.
- » All infrastructure providers focus on getting more from existing assets before new investments are considered.



Guiding Principles

The guiding principles provide a platform for responding to each of the challenges. They set the government's aspiration for infrastructure and signal how the country should move forward and make better decisions in the future.

Each guiding principle will have different implications for decision makers in each sector. The government wants to be part of a continuing dialogue with key stakeholders to ascertain how we collectively achieve success.

For each guiding principle the current situation and future direction are summarised.

Investment Analysis

Investment is well analysed and takes sufficient account of potential changes in demand.

Resilience

National infrastructure networks are able to deal with significant disruption and changing circumstances.

Funding Mechanisms

Maintain a consistent and long term commitment to infrastructure funding and utilise a broad range of funding tools.

Accountability and Performance

It is clear who is making decisions, and on what basis, and what outcomes are being sought.

Regulation

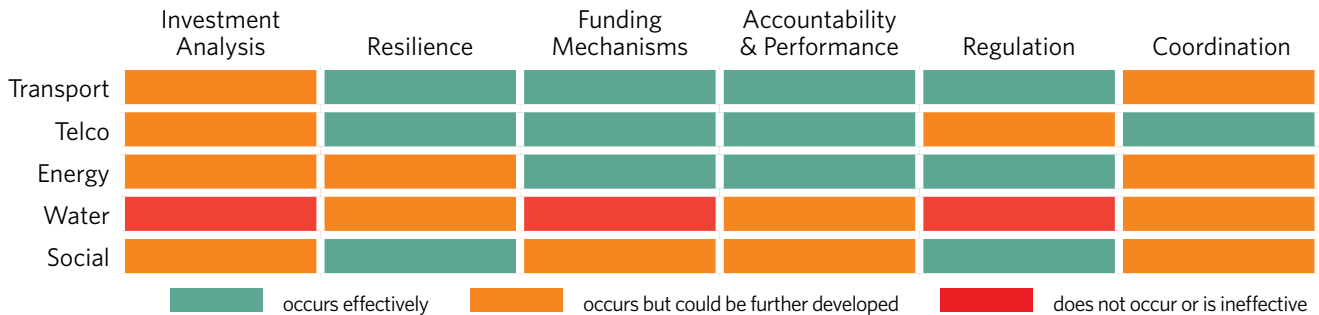
Regulation enables investment in infrastructure that is consistent with other principles, and reduces lead times and uncertainty.

Coordination

Infrastructure decisions are well coordinated across different providers and are integrated with decisions about land use.

Opportunities for Improvement

Infrastructure Ministers and the National Infrastructure Advisory Board have assessed each infrastructure sector's current performance against the principles.



Investment Analysis

Investment is well analysed and takes sufficient account of potential changes in demand.

Current Situation

Many parties are involved in infrastructure investment. The approach taken varies across government, local government, private investors and infrastructure providers as does the level of capability.

There is currently strong analysis of the costs and benefits of individual infrastructure projects. The standard cost benefit analysis undertaken on projects is a valuable tool for prioritising within a sector and comparing different projects to meet a given demand. It is less effective when used to prioritise between sectors or to factor in future need.

There is often a lack of consideration of how individual projects contribute to the wider infrastructure network. Also, limited understanding of the implications of changing demand means there is not sufficient protection of future options given the long lead times for infrastructure projects.

Future Direction

Infrastructure investment should support economic growth. To achieve this, infrastructure investment will be subject to rigorous analysis and based on consistent evaluation methodologies. Given the long lead times and life spans of infrastructure, this may mean erring on the side of slight over-investment, rather than risking significant under-investment. Decision makers should consider and allow for future options, rather than lock in configurations or investments that rule out further expansion.

Future investment decisions should consider:

- » Future demand and then build extra capacity and development options into new infrastructure.
- » The value of developing networks of infrastructure.
- » Wider economic benefits including those created by more efficient land use and resource allocation.
- » The costs and implications of ownership over the life of the asset/network.



Resilience

National infrastructure networks are able to deal with significant disruption and changing circumstances.

Current Situation

The topic of resilience has taken on renewed importance in recent months with Canterbury being hit by two major earthquakes in five months. The city's infrastructure was damaged in the first earthquake, but most services were quickly restored. The second earthquake caused far greater damage to essential infrastructure, and is a significant test of New Zealand's infrastructure resilience.

The concept of resilience is wider than natural disasters, and covers the capacity of public, private and civic sectors to withstand disruption, absorb disturbance, act effectively in a crisis, adapt to changing conditions, including climate change, and grow over time. Of particular importance is the resilience of lifeline utilities, disruptions to which can have serious consequences for businesses and communities.

Future Direction

The government will work with infrastructure providers to improve network resilience. Both physical and system resilience are crucial. This means:

- » Design and construction standards (where cost-effective) that ensure infrastructure is able to withstand natural hazards and long term changes in circumstances such as those resulting from climate change.
- » Organisations and networks of organisations with the ability to identify hazards must share information, assess vulnerabilities, and plan for and respond to emergencies.
- » Acknowledging the value of adaptability and redundancy in the network to improve business confidence.
- » Identifying and managing cross-sectoral dependencies, such as power supply for communications infrastructure. Engineering Lifelines groups have already undertaken work in this area and are a model to be emulated by other sectors.



Funding Mechanisms

Maintain a consistent and long term commitment to infrastructure funding and utilise a broad range of funding tools.

Current Situation

Infrastructure is a key enabler of economic growth and quality of life. However, New Zealand's public sector investment in infrastructure has historically been lumpy and subject to significant swings, particularly in the face of recessions and other fiscal pressures. In hard times it is easier to cut capital spending than anything else.

Given the close relationships between population growth, economic growth and infrastructure investment, volatility in infrastructure investment tends to lock in patterns of under-investment in core economic infrastructure, followed by attempts to catch up. Periods of significant economic or population growth can be constrained by infrastructure deficits. High levels of infrastructure investment enhance business confidence in the economy generally. It also provides certainty, around which the infrastructure industry can make its own investments, and be best positioned to meet the needs of government.

Commitment must be backed by funding. The development of New Zealand's infrastructure requires a long-term and strategic approach to funding from both central and local government. It must also be recognised that, at a fundamental level, the challenge is not about capital. The challenge is in raising the revenue that can either directly fund investments, or can service the capital raised to make investments.

Future Direction

The government's consistent commitment to infrastructure funding will be demonstrated by:

- » Maintaining commitment to investing in economically productive infrastructure. Notwithstanding current fiscal pressures and the potential cost of recovery from the Canterbury earthquakes, there will not be wholesale deferral or cancellation of infrastructure programmes where there is a strong case for investment.
- » Encouraging the use of alternative funding tools to provide additional revenue and manage demand.

Accountability and Performance

It is clear who is making decisions and on what basis, and what outcomes are being sought.

Current Situation

Infrastructure is governed by multiple parties from central and local government and the private sector under a number of decision making models, from highly devolved to being managed within government departments. Management structures have a strong influence on the overall performance of the asset. In some cases it is not clear where accountability lies and what outcomes are being sought or delivered.

Overall governance and policy responsibilities impact on the ability to make changes within a sector to improve performance. This results in fragmented decision-making and produces inconsistencies at a national level.

Future Direction

In the future there needs to be:

- » Stronger indicators of performance to ensure that the right outcomes are occurring from our infrastructure investments, including acknowledgement of risk.
- » Ongoing review of the assets currently held by central and local government to ensure that they remain fit for purpose and are managed under the correct ownership structure.
- » Clear consideration of governance and/or ownership structures to deliver improved return on investment and service delivery.



Regulation

Regulation enables investment in infrastructure that is consistent with other principles, and reduces lead times and uncertainty.

Current Situation

Regulation influences all points of infrastructure lifecycles, from demand to investment, management to disposal. Regulation should be designed to improve infrastructure efficiency by increasing competition and addressing monopolies. Consistent with the government's stated goals for regulatory reform, efficiency may be improved by removing unnecessary regulatory requirements.

Many pieces of regulation have an obvious link to infrastructure, but it is important that our focus extends beyond things like the Resource Management Act, Utilities Act and Public Works Act. Because infrastructure is fundamental, minor changes in what might seem like unrelated policies may have a significant impact on whether we achieve the vision for infrastructure. For example, changes in the number of children per teacher will have a significant impact on the infrastructure we require for school property.

A number of problems with the current regulations and processes used to design, plan and deliver infrastructure have been identified:

- » Lack of clarity and consistency of national objectives, direction and standards.
- » Protection of existing infrastructure from threats to operation, and increasingly complex site and route protection tools.
- » Complex and inflexible approval processes.
- » Lack of robust and integrated decision making.
- » Inefficient and inadequate land acquisition and land use planning processes.

Infrastructure investments can take many years to identify, design, consent and construct. Regulation designed to balance the economic, environmental and social consequences of infrastructure development creates a range of challenges, and involves multiple parties including developers, central and local government, and the courts.

A long-term perspective is frequently absent from infrastructure-related regulation. For example, existing water rights do not provide certainty for assets with lives of 50 to 100 years, and planning documents could better ensure that future infrastructure expansion is catered for.

Future Direction

The government has committed to a programme of regulatory reform to ensure that the right infrastructure is available at the right time and in the right place. Regulation affecting infrastructure needs to balance short- and long- term objectives. Future efforts should focus on streamlining infrastructure delivery and being more efficient in the way we use infrastructure. Specifically, regulation will:

- » Support low-cost, secure services for consumers, while ensuring sufficient investment in maintenance and new capacity.
- » Deal with issues such as excess demand and congestion.
- » Balance short-and long-term objectives and encourage resilience in infrastructure assets to improve investor confidence.
- » Preserve the integrity of the current stock of built infrastructure (for example the noise envelopes at major airports).
- » Aim to resolve the resource allocation issues affecting infrastructure productivity in a fair and transparent manner.
- » Clarify the division of roles and responsibilities between local and central government to support efficient infrastructure development.
- » Support productivity growth in the infrastructure sector generally.



Coordination

Infrastructure decisions are well coordinated across different providers and are integrated with decisions about land use.

Current Situation

Infrastructure delivery is a highly complex task which creates coordination challenges within and between central and local government and the private sector.

In the past, insufficient attention has been paid to land use, planning has occurred in silos and there has been an unwillingness to cross both sector and regional boundaries. Also hampering coordination efforts is a lack of consistency of timeframes and outcomes being sought by the various plans. While there are a number of sector-specific examples of long-term planning (e.g. the Transpower 2040 Strategy) as well as medium-term funding directions (e.g. Government Policy Statement on land transport funding), coordination across sectors is poor.

Future Direction

Improving coordination is one of the biggest challenges facing infrastructure in New Zealand and will require new tools and processes to succeed. Specifically:

- » Land use and infrastructure decisions will be integrated and coordinated across different providers to ensure, a common direction and greater certainty.
- » Regional infrastructure plans that take a strategic approach to infrastructure requirements and management across larger economic regions will be considered.
- » Greater coordination and cooperation between sectors will be encouraged to achieve optimum infrastructure outcomes.

Three-Year Action Plan

Government is committing to the following actions to give effect to the vision and principles and to move towards the next edition of the Plan in 2014.

- 1 Central government will commit to developing and publishing a ten year Capital Intentions Plan for infrastructure development to match the planning timeframe required of local government.
- 2 Increase understanding of and encourage debate on the use of demand management and pricing in infrastructure sectors.
- 3 Improve access to information on current infrastructure performance to create certainty about when, where and how infrastructure development is occurring, including consideration of whole of life costs.
- 4 Develop performance indicators for each sector on the stock, state and performance of central and local government infrastructure assets as well as for those managed by the private sector.
- 5 Work with regions to develop more strategic infrastructure planning at a macro-regional level. Consider where adoption of spatial planning would produce optimum outcomes, particularly in metropolitan areas.
- 6 Improve scenario modelling to more accurately project likely infrastructure investment requirements from the short to very long term.
- 7 Use lessons from Christchurch to significantly enhance the resilience of our infrastructure network. This may include developing improved seismic design standards, reviewing organisation culture to improve performance in emergencies and identifying ways to quickly return services to full operational capacity.
- 8 Explore alternative sources of funding, and implement funding tools that can be used to manage the current portfolio more effectively.

Part Two

Sectors





PHOTO COURTESY: MANUKAU HARBOUR CROSSING ALLIANCE

Introduction

This section assesses the current situation, current work programme and key issues in each of New Zealand's major infrastructure sectors. Each sector starts with a 'traffic light' assessment building on the views of Ministers and the National Infrastructure Advisory Board.

Looking forward, we set out strategic opportunities, a vision for the future and indicators of what success will look like in each sector.

Transport



■ occurs effectively
 ■ occurs but could be further developed
 ■ does not occur or is ineffective

Key Issues

Investment Analysis – Investment decisions are not yet aligned closely enough with the growth in demand for services, in part because demand predictions are relatively unsophisticated and unreliable. Auckland in particular has a number of decisions to make about how to improve its transport infrastructure.

Coordination – Decisions about land use need to be well integrated with transport decisions (including the provision of public transport). Central and local government could better coordinate their respective decisions in these areas.





Current Situation

New Zealand has a well-established and extensive transport network, that supports the movement of freight and people by a range of modes on four key networks (rail, sea, road and air). The ultimate transport outcome is an improved ability of people and freight to move efficiently and safely from beginning to end. Transport is not an end in itself but plays an important facilitating role in economic activity and social connectivity. Modal integration, efficient supply chains, high quality infrastructure, and a safe and efficient vehicle and aircraft fleet are key components of a successful transport system. The quality of transport infrastructure, how comprehensive transport networks are and how they are managed will all affect the contribution that transport makes to the functioning of a successful economy.

In general, New Zealand’s transport infrastructure is well-developed and able to meet current demands. However, as in most countries, there are specific issues which warrant attention and specific localities where economic and population growth place severe pressure on some aspects of our transport infrastructure.

New Zealand's Transport Network

KEY

- State Highway network
- Rail network
-  Ports
-  International airport
-  International airport (limited services)
-  Domestic airport (scheduled services)





Movement of People

The safe movement of people occurs at local, metropolitan, inter-regional and international levels. At each level different performance is needed from the transport network.

At the local level, well maintained local road infrastructure is facilitated through local government ten year plans. On local networks people are able to choose from a range of transport choices, and the quality, location and design of infrastructure can have a significant influence on those choices – such as whether to walk, cycle, use a private vehicle or take public transport. New Zealand’s urban centres offer the greatest number of choices in terms of shared modes of transport (taxis, buses, commuter trains, car-pooling). In rural areas and small towns, low population density and long distances reduce shared mode options considerably, resulting in a high reliance on the private motor vehicle. Small rating bases and large rural land areas also place pressure on the ability of some councils to meet growing maintenance bills before considering future upgrades to services that may be sought by local ratepayers.

In large metropolitan areas, population growth and increased economic activity are key contributors to traffic congestion, placing pressure on existing road and rail infrastructure. Traffic congestion contributes to lost productivity, and is most severe in Auckland.

Moving people within and between regions is important for domestic and international tourism industries. Some of our most-loved tourism locations, such as Northland, Coromandel and Milford Sound, are also quite remote: it is important for the country’s economic performance that they remain safely accessible. Further to this, small regional airports have a low volume of flights and therefore, low revenue but retain high fixed infrastructure and maintenance costs.

The key focus is on creating the most efficient mix of transport options to benefit all New Zealanders and visitors, while also promoting improved transport efficiency in the future.

Movement of Freight

Efficient movement of freight into, out of, and across New Zealand, is of critical importance to economic performance. Transport infrastructure supports the movement of exports from production, to port and then to market. As transport can be a large component of the cost of supplying goods to markets, any improvements in efficiency will make a significant difference to the competitiveness of our products.

It is not simply about moving goods in and offshore. A well functioning domestic freight sector links raw materials with processors, distributes goods to retailers and consumers.

Some key issues for freight movement:

Most freight in New Zealand is moved by road. Coastal shipping and rail (with the improvements that the government is supporting through the KiwiRail Turnaround Plan) provide alternative networks. A more strategic approach to logistics management may result in different decisions being made in the future. Longer term, the logistics required for the overall supply chain need to be considered alongside land use decisions.

The volume of surface trade and New Zealand’s distance from global markets means it is vulnerable to changes in international shipping patterns. New Zealand’s primary ports need to retain flexibility in their operations to continue to meet challenges like larger ships and less frequent port calls. A port sector that is competitive both domestically and internationally is a must for our tradables sector. Ultimately, ports operate in a commercial environment in New Zealand and, provided regulatory settings are appropriate, this framework should continue. This will be important for ensuring port infrastructure is expanded in the future if necessary.

Attention must be paid to the impact of land use decisions on the transport network. Also, transport technology affect infrastructure, and road user charges reflect this. Changes to allow for heavier trucks, and thus fewer journeys to deliver a given amount of freight provide a maintenance and renewal challenge. Aligned with a more strategic approach to land use considerations is the need to examine the resilience of our supply chains across the country. The key focus is on ensuring that each mode understands the demand pressures and development plans of the other modes and responds with their own investment decisions accordingly. Greater certainty and consistency in developed plans will allow logistics operators to operate in a more integrated way benefiting exporters, the economy and community in general.

Current Work Programme

Across the transport network the government plays both a direct role, through its investment in creating new or improving existing road and rail and managing existing roads, and an indirect role through facilitating investment in other sectors by integrating land use decisions with transport needs, and by facilitating a stable regulatory environment.

The Roads of National Significance (RoNS) shows the government's commitment to transport investment in order to improve productivity and safety in a key part of the network which will support economic growth. The government is also moving ahead with a number of midsize highway projects that bring economic benefits to the relevant regions.

In addition to the state highway development, the National Land Transport Fund (NLTF), which local government matches investment in, provides up to \$650 million per annum for maintenance and renewal of local roads, passenger transport subsidies and infrastructure for walking and cycling. The NLTF also invests in:

- » State highways (existing and new)
- » Road policing
- » Research/community programmes

The government has committed \$750 million over three years (subject to performance progress) towards the KiwiRail Turnaround Plan. The objective of this investment is for KiwiRail to achieve independent, commercial viability in the next ten years. The investment is based on projections of a doubling freight task by 2040, and growing recognition that road transport alone is unlikely to support the efficient movement of this freight in the long term. The investment aims to provide a real commercial-based choice of road, rail and coastal shipping to support the creation of an integrated logistics framework for New Zealand.

A \$2.3 billion development of the metro rail network in Auckland and Wellington is currently underway, funding new rolling stock, traction systems and signal systems.

Safer Journeys is a strategy to improve road safety over the next ten years. It includes a set of proposed actions to alter our interactions with the transport system. They include how we change the roading infrastructure and vehicle fleet as we introduce a safe system approach.

Regulatory reform is a key part of the current work on the transport network. For example:

- » In 2010 the government implemented a rule amendment which allows permitted vehicles to travel above the normal weight and dimension restrictions. Changes to the rule are designed to improve freight productivity and, will over time, reduce the number of vehicles required to service the freight task.
- » Consultation is currently underway on a draft State Highway Classification system. The Classification system will categorise state highways in New Zealand according to their use, with a long-term view to match use to level of service. This will enable more efficient application of state highway investment.
- » In the aviation sector the government regularly negotiates air service agreements with other nations. The objective of these agreements is to ensure New Zealand airlines may access other nations with minimal restrictions, and vice versa.

The government is planning to amend the Land Transport Management Act 2003 (LTMA) to improve the planning and delivery of land transport infrastructure and services. This will reduce the regulatory burden and compliance costs for organisations involved in the LTMA processes.

Sector Overview



Ports: New Zealand has 16 ports, servicing both international and domestic freight movements. The majority of international freight travels through the ports of Tauranga, Auckland, Lyttelton and Otago. Ports are usually owned by local government with the larger ports partly privately owned.

Airports: New Zealand has 8 international airports and 28 regional airports with scheduled services. Airports are largely owned by local government, with some airports owned in part by central government. Airways New Zealand, a state-owned enterprise, provides air traffic infrastructure.

Rail: There are 4,000km of rail tracks in New Zealand, servicing both freight and metropolitan routes. KiwiRail owns the rail network while local government manages metro services.

Roads: New Zealand has approximately 62,000km of paved and 32,000km of unpaved roads. These assets are owned by both local and central government. Central government is responsible for \$25 billion of state highways, the largest single asset on the Crown balance sheet.

Vision

A transport sector that supports economic growth by achieving efficient and safe movement of freight and people.

Goals

The goals for transport infrastructure are to have:

- » A long-term strategic approach to transport planning which maximises the potential synergies between regional planning and central government strategies.
- » A flexible and resilient transport system that offers greater accessibility and can respond to changing patterns in demand by maintaining and developing the capacity of the network. Improve operational management practice and the use of demand management tools especially in urban areas experiencing significant growth.
- » A network of priority roads that will improve journey time and reliability, and ease severe congestion, boosting the growth potential of key economic areas and improving transport efficiency, road safety and access to markets.
- » A continued reduction in the number of accidents, deaths and serious injuries that occur on the network.
- » A public transport system that is robust and effective and offers a range of user options that will attract a greater percentage of long term users.
- » A rail system that enables the efficient movement of freight and complements other modes of passenger transport and freight movement.
- » Sea and air ports that are linked to the overall transport network to support efficient nationwide movement of passengers, domestic goods and exports and imports and are able to respond to technological changes and changing international safety and security standards.



Case Study: Transport Demand

Based on historical trends, light passenger vehicle kilometres travelled are projected to increase by 14.4 percent in the 20 years to 2030. The Ministry of Transport modelling uses historical and projected data for fuel and vehicle prices, GDP, inflation and population.

With just one percent higher annual growth in real GDP, vehicle kilometres travelled could increase by 27.4 percent over the same period. If transport patterns change, the situation in 20 years could be very different to that shown here.

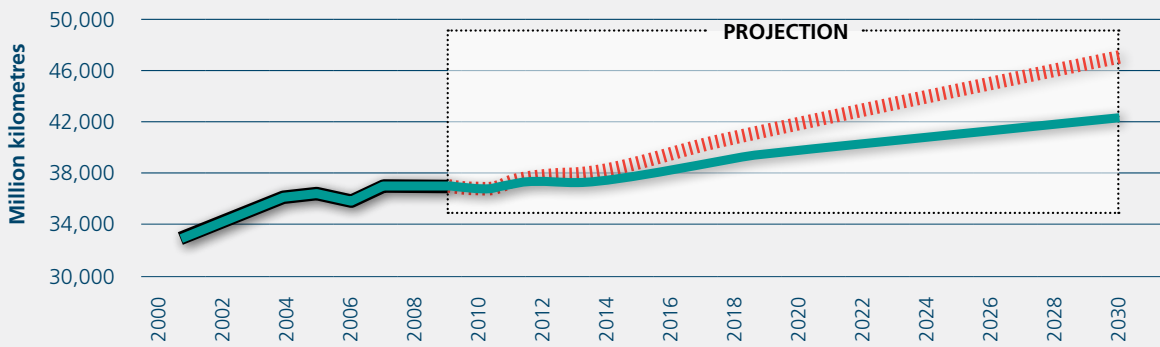
It is difficult to translate these overall trends into infrastructure pressures and appropriate responses, as the latter are location specific. In general, increases in light passenger traffic lead to increased costs from building new roads, maintaining the existing network and enhancing traffic management infrastructure such as traffic lights and traffic islands.

Over the same period, freight tonnes per kilometre travelled are projected to increase by 27.7 percent. Under a higher growth path the increase could be as much as 61.1 percent. This reflects increased movement of goods in a high growth economy.

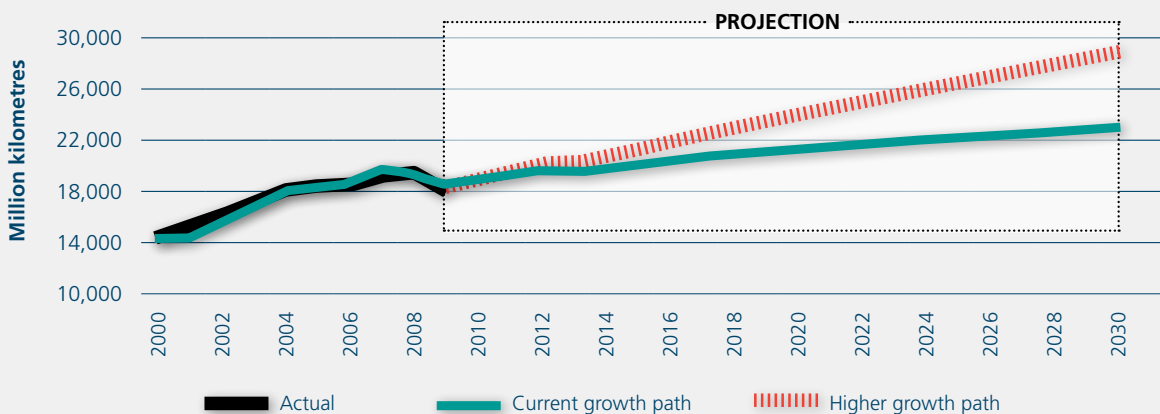
Increases in freight movement will put pressure on New Zealand's road, rail and port infrastructure. Developing these networks to provide the right level of service in the right location, and support the export sector will be a key focus for transport infrastructure providers.



Light Passenger Vehicle Kilometres Travelled (incl motorcycles)



Freight Tonne Kilometres Travelled



Source: Ministry of Transport

Strategic Opportunities

To meet its economic goals, New Zealand needs well-functioning transport corridors to get exports to market as quickly and efficiently as possible.

While not directly funding these assets, the government will ensure port and international airport owners are confident that the regulatory environment is stable and transparent and that it will support their future investment. The government is looking to ports to improve their productivity and therefore improve New Zealand's international competitiveness.

The government is supporting Auckland in the development of a spatial plan because it recognises the potential of the plan to address some of the coordination issues in Auckland's transport sector and to provide greater coordination of land use decisions with transport investment.

To facilitate economic growth, Auckland will need large scale investment in key projects. The government will work with the region to analyse and evaluate future large projects to ensure that appropriate investment decisions are made and that the infrastructure is built at the best time to achieve optimum uptake and value. Currently the Auckland CBD Rail loop and an additional harbour crossing are topical, however, as the spatial plan is developed other projects may become apparent. Projects such as these will also need to be considered in the context of other infrastructure priorities for the region and the period over which they will be required.

The RoNS are the government's commitment to creating a roading network to support our economic growth goals. They are the major roading investment for the next ten years. In parallel to this work there must be a focus on using the roading network as efficiently as possible. This journey has begun with recent changes to modernise the road user charges system, the state highway classification programme and investment in ramp signalling and other forms of traffic management technology. In the future New Zealand will require a more sophisticated road pricing system to enable management of demand through pricing.

Increased public transport reliability and patronage will be supported through investment in public transport in major urban areas, where analysis suggests it is most needed. Specific examples are bus ways, park and ride facilities, bus lanes, bus priority information systems and integrated ticketing systems.

To ensure that the strategies for the Auckland and Wellington metrorail networks are well-aligned with other regional priorities, the government has clarified governance arrangements and is pursuing a metrorail operating model, whereby regions have greater autonomy and responsibility over these operations. The model is predicated on regions taking responsibility for the standard of service they wish metrorail to deliver. The government will then signal the role that it expects metrorail to play in the overall network's ability to move people efficiently and will support local government in its decision making.



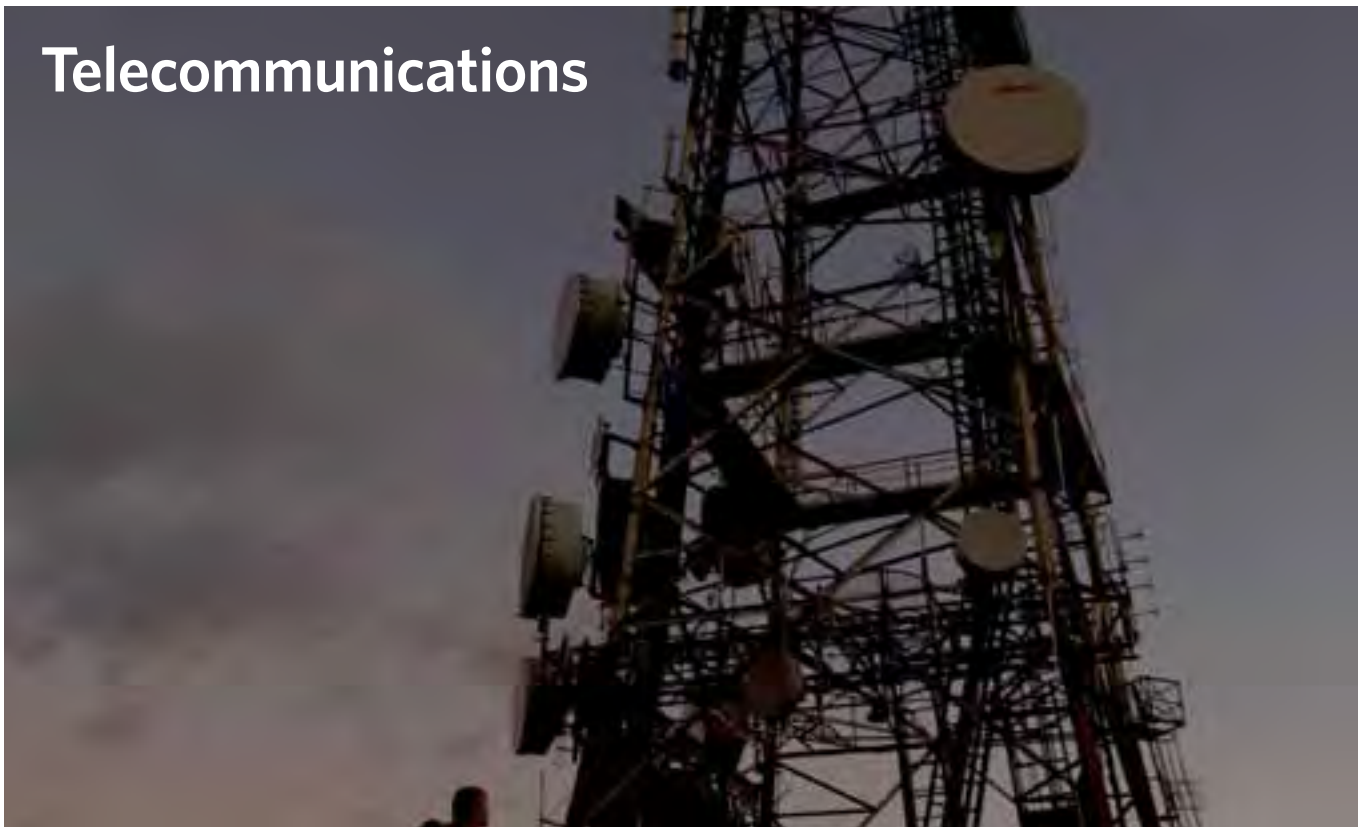
What Will Success Look Like?

The transport sector is well served by a range of indicators. However, at a national level, the following indicators are most relevant to the critical issues identified in this Plan:

- » Reduced incidents of severe urban congestion
- » More efficient freight supply chains
- » A reduction in deaths and serious injuries
- » Better use of existing transport capacity
- » Resilient and secure transport network
- » More transport mode choices

The Ministry of Transport website provides a comprehensive set of indicators used to measure the performance of the transport sector in New Zealand.

Telecommunications



■ occurs effectively ■ occurs but could be further developed ■ does not occur or is ineffective

Key Issues

Investment Analysis - Investment in telecommunications infrastructure is not always timely or sufficient and has led to gaps in services to consumers (which the government is in the process of rectifying through broadband investment).

Regulation - The ongoing regulatory challenge is to ensure legislation keeps pace with technology and market developments.

Current Performance

The telecommunications sector is growing in importance. The benefits of information and communications technology for society and for other infrastructure sectors covered by this Plan are growing.

Future demand for communications technology outstrips current communications infrastructure. New Zealand's copper network cannot be upgraded to provide the speed and capacity consumers will expect in the medium term, and investment in wireless, while strong, cannot provide a complete alternative in the short-term.

While there has been some investment in fibre networks in major urban centres in New Zealand, it is clear that the market has not been ready, or may not have adequate incentives, to build the infrastructure required to deliver fibre on scale quickly. Furthermore, fibre may have not been initially

deployed to those users that will provide productivity gains (e.g. schools, hospitals) as they may not always be the most commercially attractive targets for private investment. Finally, there is a significant gap between broadband availability, services, speed and quality in urban and rural areas.

These issues constrain opportunity for communications technology to contribute to the economy through improvements in efficiency (e.g. through the use of communications in health and education and for business transactions) and through the creation of new markets (such as film production). In addition, improvements to communication options in rural areas could lead to improvements in productivity.

New Zealand's expenditure on telecommunications infrastructure as a percentage of GDP is lower than the OECD mean. New Zealand is in the middle of the OECD pack for average advertised broadband download speeds, but the cost of accessing broadband and mobile telephone appears to be higher than in most other OECD countries. There are signs of improvements, however, with the number of broadband subscribers per 100 inhabitants increasing faster in New Zealand than in other OECD countries since 2006.

Significant regulatory changes have increased competition in the sector, however maintaining a regulatory regime flexible enough to keep pace with changes in technology is likely to be an ongoing challenge for the government.

Current Work Programme

The government is currently implementing the Ultra-Fast Broadband (UFB) initiative and Rural Broadband Initiative (RBI). The UFB initiative will see fibre-optic cable made available to 75 percent of New Zealanders over the next ten years, with an emphasis on businesses, schools, health services and greenfield developments in the initial six years. The government is investing up to \$1.5 billion in this network. The RBI will provide much improved broadband connectivity to rural schools, health providers, businesses, farms and households, and will be funded by industry through the proposed Telecommunications Development Levy.

The switchover to digital television will free up radio spectrum in the 700 MHz band for new uses, most likely 4G mobile broadband services. The Ministry of Economic Development is working on frequency and planning allocation issues for the band and expects to release a discussion document later in 2011. Given the increasing demand for data and spectrum it is likely that consideration of 5G will not be far behind.

The government is working to ensure that radio spectrum legislation and policy frameworks keep pace with technological developments and make efficient use of the spectrum resource. It is currently scoping the need for a review of the Radio Communications Act in the 2011/12 period to identify and address any necessary improvements.

The government is also developing a Cyber Security Strategy designed to identify the skills and structures necessary to effectively contain or mitigate a major intrusion on government or critical infrastructure.

Finally, the government is undertaking work on the resilience of the telecommunications network. In particular it is looking at how to ensure the appropriate governance and operation of communications for emergency services.

Vision

Telecommunications services increasingly support New Zealand's position as a competitive business location and improve living standards.

Goals

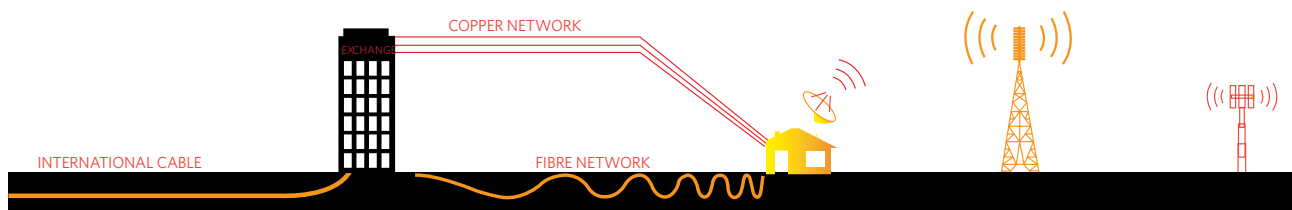
The goals for telecommunications infrastructure are:

- » Urban and rural New Zealanders have access to quality, competitively priced voice and internet connectivity.
- » High-speed, high-capacity broadband infrastructure is readily available to most New Zealanders and to sectors that contribute to economic growth and the infrastructure can meet capacity needs over the medium to long term.
- » Local and national telecommunications infrastructure is used efficiently to maximise overall capacity and minimise cost to consumers.
- » Key telecommunications networks are reliable, secure and resilient.
- » Legislation and policy frameworks keep pace with technological developments, and balance intervention to encourage competition with sufficient certainty to invest.





Sector Overview



International cable:
New Zealand receives data from the world across the Southern Cross Cable, an undersea cable of three fibre pairs which passes through Auckland on a path from Australia to Hawaii.

Copper network:
Telecom operates a nationwide copper cable network and TelstraClear has hybrid fibre-coaxial cable networks in Wellington and parts of Christchurch. Together these provide around 1,876,000 fixed line connections.

Fibre network:
TelstraClear and FX Networks operate national fibre-based backhaul networks, providing intercity connectivity. Vector and Citylink operate fibre networks. These networks typically connect businesses only.

TV and radio transmission:
Television and radio signals are delivered across radio spectrum throughout New Zealand. State-owned enterprise Kordia broadcasts digital television from 54 transmitters across 18 sites.

Mobile network:
Three cellular mobile networks operate in New Zealand –Telecom XT, Vodafone and 2degrees. Telecom also operates a CDMA cellular network which it intends to close down in 2012. The number of mobile connections active in the 90 days to 30 June 2010 was 5,024,000.

Strategic Opportunities

UFB has the potential to significantly shift the New Zealand telecommunications sector. The government's investment is an opportunity for industry members to be involved with the new broadband network as a network or retail service provider, or to compete with the network.

The telecommunications sector, businesses and other sectors will need to consider how to take advantage of the new opportunities that fibre and faster broadband networks provide to encourage innovation and the development of new products and services which can grow New Zealand's export base and contribute to significant changes in GDP.

The government will especially encourage uptake of the network in areas of which it is a primary funder, for example education and health, and will work with Local Fibre Companies and any successful bidders in the RBI to efficiently deploy the RBI and UFB networks. This will involve close coordination with the sector, other government agencies, local government and Māori.

The government will also undertake work to encourage greater efficiency in telecommunications networks, for example through encouraging shared access to transmission towers under the RBI, and considering what role it can, or should, play in encouraging efficient traffic management and data storage in New Zealand. It is also interested in ensuring we maintain effective international connections and that we maintain the security and resilience of our networks, both within New Zealand and in our linkages to the rest of the world.

In the longer term, New Zealand needs to continue to play an active role in the International Telecommunications Union (ITU), the United Nations body that leads world telecommunications policy, APEC and OECD fora. These international bodies are overseeing convergence and harmonisation of technical standards and changes in the way the internet operates and is governed.

The government will focus on ensuring that the regulatory regime reflects the impacts the RBI and UFB will have on the market. For this reason it has signalled a review of the Telecommunications Service Obligations and a more fundamental review of the Telecommunications Act to commence in 2016. This review will also take into account any developments that occur in relation to copper, cable, fibre and wireless technologies. The government aims to balance intervention to encourage competition with sufficient certainty to invest.



What Will Success Look Like?

The telecommunications sector has a comprehensive monitoring system in place, including with international and national benchmarking indicators. A selection of these relevant to the Plan include:

- » An improved ranking on consumer cost indicators.
- » Improved broadband penetration rates.
- » Increasing average consumer broadband connection speed.
- » Industry investment in telecommunications infrastructure continues at a steady or increasing rate compared to the last decade.

Energy



occurs effectively
 occurs but could be further developed
 does not occur or is ineffective

Key Issues

Investment Analysis - The market framework does not always ensure that the projects of most value to the overall energy network are completed first.

Resilience - New Zealand's energy mix will need to change over the next 20 to 40 years, in part because of resilience issues. Our electricity market is currently highly reliant on rainfall and increasingly wind and other less weather-dependent renewable sources (e.g. tidal and geothermal) are being developed. Reliance on thermal energy during periods of unfavourable weather brings its own climate change challenges.

Current Performance

New Zealand has an abundance of diverse energy resources. Our geological history has provided us with rich mineral and petroleum resources, only a small proportion of which have been tapped to date. Our geography and climate provides us with mountains from which large rivers flow, enabling hydro power. Sitting on the Pacific Ring of Fire, we have access to

geothermal energy. Our wind resources are as great as the world can offer. We have plentiful untapped solar energy and could potentially harness the power of the oceans that surround us for marine energy. Extensive farming and forestry areas offer opportunities to utilise biomass to yield heat, electricity and biofuels.

This Plan focuses on the infrastructure required to extract, generate, store and distribute energy. It discusses natural resources and markets where these affect infrastructure development. Electricity, oil and gas are addressed separately as each has its own infrastructure network. Coal is also a key source of energy, however it relies primarily on transportation infrastructure rather than requiring its own network.

Electricity

Investment in electricity generation appears likely to keep pace with demand. Transmission infrastructure has suffered from historic under investment leading to aging infrastructure and capacity that hasn't kept up with demand growth. However, transmission upgrades are now on track to address previous underinvestment, with \$3 billion invested in transmission upgrades since 2003. With much of New Zealand's electricity

generation occurring away from major population centres, the reliability of the national grid is the key determinant of our ability to cope with demand increases.

Information on asset age and performance of the distribution network is of variable quality due to the fragmented nature of the market (28 distribution companies in New Zealand). All lines companies disclose ten-year asset management plans, which are reviewed annually by the Commerce Commission.

Oil

Oil infrastructure has been highly reliable, with no significant supply interruptions to date. However, some storage terminals may be near the end of their useful life and some investment and rationalisation in these areas can be expected over the next ten years.

Gas

Gas infrastructure has also been highly reliable and the majority of infrastructure assets have an expected lifespan of 30 years plus. However there are some capacity constraints on Vector's Northern Pipeline, which serves Auckland and Northland, resulting in periods where the Marsden Point refinery does not receive as much gas as is optimum and meaning that no new major load can be added in this area under current contractual arrangements without major new investment.

Current Work Programme

Electricity

The electricity market has recently undergone several significant changes as part of the market reforms following the 2009 Ministerial Review of the Electricity Market. These changes include the creation of a new industry participation code, the transfer of assets between state owned generators (both virtual and physical), the transfer of approval for grid

update plans to the Commerce Commission, disestablishing the Electricity Commission and establishing the Electricity Authority (an independent crown entity). The changes aim to improve competition and constrain price increases, increase security of supply, and ensure effective and stream-lined governance. The majority of the changes were contained in the Electricity Industry Act 2010.

The government will monitor the outcome of these changes over the next 2-3 years to ensure they deliver a more competitive, responsive and responsible electricity sector for the long-term benefit of all New Zealand electricity consumers.

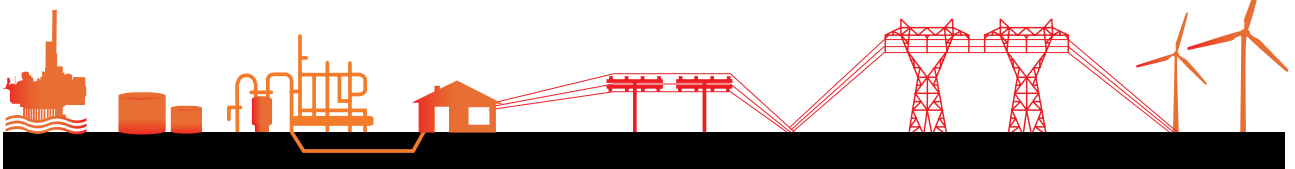
Oil

In 2009 the government announced the Petroleum Action Plan to encourage exploration and production of petroleum in New Zealand. The Action Plan comprises a number of core workstreams being carried out by the Ministry of Economic Development, including implementing of a seismic data acquisition programme, improving the quality of information provided by the industry participants to the government of the Crown's petroleum resources, and reviewing our regulatory, royalty, tax and legislative arrangements. Further discoveries of petroleum deposits in New Zealand would lead to a significant boost to New Zealand's economy.

Gas

Investment decisions in gas infrastructure are entirely private. Recent investment in oil and gas infrastructure includes the Kupe production station, the Ahuroa gas storage facility and the refinery upgrade and expansion. There is an expectation that private sector investment will continue to meet the country's ongoing demand requirements. Gas Industry Co is working with industry participants and large groups of end-users to resolve the competition concerns arising from Vector's capacity constraint on its Northern pipeline and to assess the need for new investment.

Sector Overview



Oil extraction and processing: New Zealand's oil is extracted from 18 fields in the Taranaki region and almost all of it is exported. Imported crude oil is processed at Marsden Point Oil Refinery, which produces 75 percent of the 8.5 billion litres of fuel consumed in New Zealand each year.

Oil transport and storage: A pipeline from Marsden Point to Auckland carries 40 percent of total fuel volumes, with the remainder transported by two ships to a network of ten coastal terminals. The largest storage facility is at Wiri in South Auckland: 33 percent of New Zealand's fuel consumption passes through each year.

Gas: Natural gas is extracted from 18 fields in Taranaki and is the source fuel for 20 percent of the country's electricity supply. Gas is reticulated to 260,000 customers, both industrial and residential.












Electricity distribution: Electricity connections from substations to buildings are owned by 28 local lines networks that are both publicly listed and community-owned. Lines companies range in size from Vector (700,000 end users) to Buller Electricity (4,000 end users).

Electricity transmission: The national grid includes approximately 12,000 km of high voltage transmission lines and is owned and operated by Transpower, a state-owned enterprise.

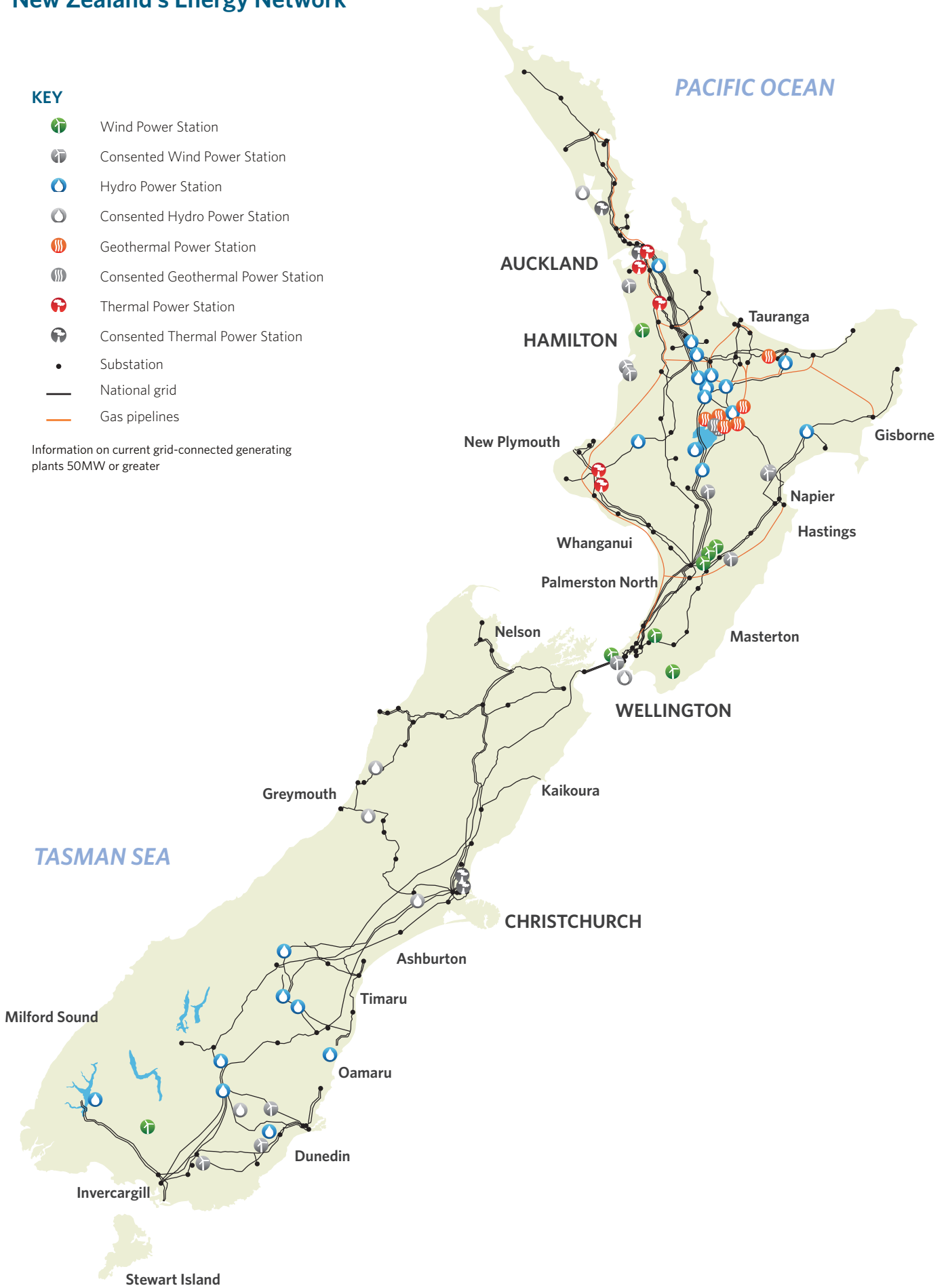
Electricity generation: Generation infrastructure includes over 200 power stations. 79 percent of New Zealand's electricity is generated from renewable sources. See map opposite for details.

New Zealand's Energy Network

KEY

-  Wind Power Station
-  Consented Wind Power Station
-  Hydro Power Station
-  Consented Hydro Power Station
-  Geothermal Power Station
-  Consented Geothermal Power Station
-  Thermal Power Station
-  Consented Thermal Power Station
-  Substation
-  National grid
-  Gas pipelines

Information on current grid-connected generating plants 50MW or greater



Case Study: Electricity Demand

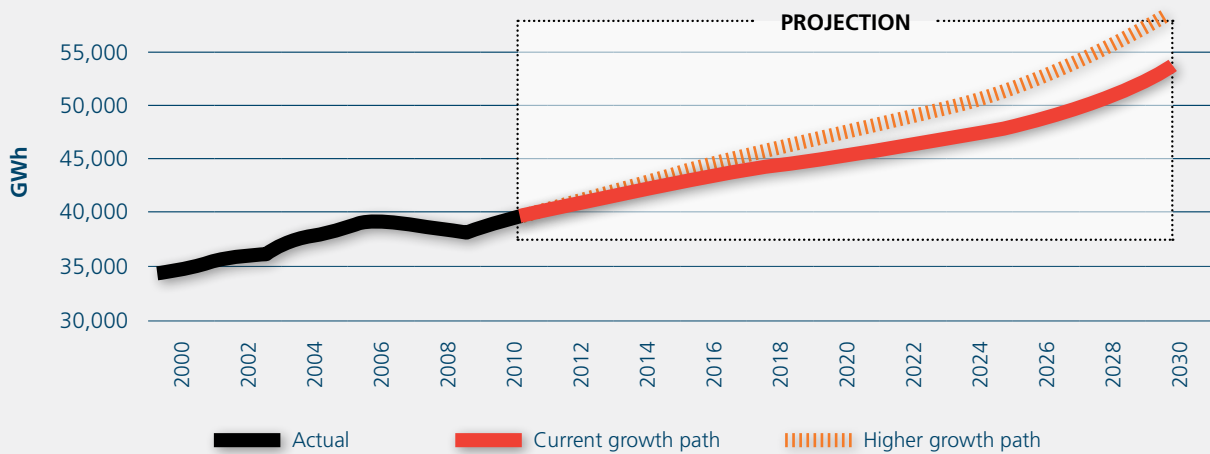
Demand for electricity is projected to grow by around 33 percent over the next 20 years on the Treasury's current forecast economic growth path. This additional demand is expected to be met by new sources of renewable electricity generation (geothermal, wind and hydro), supported by more flexible 'peaking' generation from gas and diesel. To cover the costs of this new investment, wholesale electricity prices will need to rise.

With just one percent higher annual growth in real GDP, electricity demand could grow by 46 percent over the same period. The amount of additional gas likely to be available for electricity generation is limited, so this additional demand will need to be met by large amounts of renewables. Although New Zealand has a large endowment of renewable electricity generation potential, costs will increase as lower quality resources are exploited, and there may be environmental limits on the amount of renewable electricity generation New Zealand can develop.

Significant investment in new generation and transmission will be required to meet this additional demand. The capital cost of new generation to meet demand under the current growth path is in the order of \$14 billion, and could be as high as \$21 billion if the higher growth path is achieved. It is worth noting that resource consents are apparently not a barrier to meeting demand. Current consented capacity totalling almost 3,000MW could generate an extra 14,000 GWh of electricity per annum, which would meet demand past 2030 in the current growth path and up to the late 2020s in the higher growth path.

In part because of New Zealand's geography and the location of natural resources (such as water for hydro generation), our electricity system is relatively complex. Transpower's 'national grid' connects various generation sites to consumers via a network of nearly 12,000km of transmission lines. Transpower estimates that that it could spend between \$5.5 and \$7 billion on our current growth path to enhance and develop its assets over the next 20 years, including \$3 billion already committed.

Demand for Electricity



Source: Ministry of Economic Development



Vision

Infrastructure to support diverse sources of reliable and renewable energy at competitive prices.

Goals

The goals for energy infrastructure are to:

- » Promote and develop the country's renewable energy resources.
- » Encourage investment in petroleum exploration and production.
- » Facilitate swift uptake of new energy technologies.
- » Ensure secure and resilient supplies of all major forms of energy.
- » Improve energy efficiency for homes, businesses and transport systems.
- » Ensure best-practice environmental management for energy projects, including reducing emissions.

Strategic Opportunities

Population growth and changing demand for energy (driven by environmental issues as well as changing demand profiles) mean that the sector needs to be robust and aware of emerging trends. Trends that might have a tangible impact on energy requirements (both amount and timing) include the cost of international oil, decreasing cost of large- and small-scale renewable generation, energy efficiency improvements, smart meters, smart appliances, second generation biofuels, general advances in technology and electric vehicles.

Over the next 40 years, New Zealand's energy mix is expected to change, and there will be significant changes in technology and infrastructure. As a small, stable, democratic country with an open, internationally-focused economy, New Zealand is in a good position to attract investment and build on existing strengths.

We are seeking to further develop and improve the regulatory regime by monitoring governance in the electricity industry, particularly the implementation and impact of the 2009 market reforms. This will focus on ensuring regulatory settings maximise the return to New Zealanders and require environmentally responsible mining practices and by finalising work on price-quality regulation in the electricity and gas sectors, providing regulatory certainty for companies looking to invest.

The government will continue to support the further development of the energy market by monitoring the gas governance arrangements being developed by Gas Industry Company and undertaking a broad review of the gas industry in the future. It will also work with industry associations and councils to remove unnecessary barriers to the use of small and medium-scale renewable electricity technologies and to improve resilience in the energy network. The Emissions Trading Scheme and its review will provide an incentive for renewable energy development.

The government will take steps to significantly improve the information base available to market participants by providing accurate resource information to encourage competitive bidding for exploration and petroleum and mineral fuel territory, including funding for seismic studies in prospective basins. It will provide information and modelling that identifies international and national trends to aid decision making. In addition it will monitor developments in gas hydrate extraction technology, and opportunities for applying it to potentially large reserves in New Zealand.

Long-term planning will allow the sector to respond to issues arising from demand growth, resilience and external pressures.

Exploring new sources of energy is of key importance given the projected demand growth and information on current energy reserves. This exploration is also a vital component of export market development for New Zealand energy and technologies.

What Will Success Look Like?

The energy sector is well monitored, and has a number of well established indicators. Increasingly, the policy tensions that exist in the energy sector are reflected in the indicator choices:

- » Further reductions in electricity system interruption indices.
- » Maintenance or improvement of New Zealand's position in the OECD league table for electricity prices.
- » Greater transparency of costs and increasing ability of consumers to manage their own demand and costs.
- » Reducing greenhouse gas emissions from energy use per capita.
- » Increased domestic production of oil and gas.

Water



INVESTMENT ANALYSIS

RESILIENCE

FUNDING MECHANISMS

ACCOUNTABILITY & PERFORMANCE

REGULATION

COORDINATION

occurs effectively

occurs but could be further developed

does not occur or is ineffective

Key Issues

Water infrastructure issues are broken into the two distinct areas of urban and productive water sectors.

Urban Water Infrastructure

Funding Mechanisms - Local authorities are confronted with competing interests on multiple fronts. The lack of alignment between the increasing requirement to meet national objectives and local funding and accountability is a concern.

Accountability & Performance - There is currently insufficient good information available at local or national level to develop a consistent and credible understanding of the current state of urban water assets. That situation will improve with the reporting changes and greater emphasis on clarity, consistency, and quality of financial reporting required under amendments to the Local Government Act 2002.

Productive Water Infrastructure

Investment Analysis - Water allocation regulatory frameworks need to provide sufficient incentives for long-term investors in large water infrastructure projects - particularly in the rural irrigation and hydro-generation sectors. Given the range of public benefits that would occur as a result, coordination of interested parties is critical as a step change from current practice due to the increasing scale, complexity and cost of future irrigation infrastructure. Currently poor investment incentives exist and there is limited appreciation of the risks and opportunities in this type of investment by financial markets.

Coordination - The existence of the network of hydro-generation schemes that place pressure on other energy sources requires a full understanding of competing interests and attracting capital investment to areas of productive returns.

Regulation - Better use of water for rural irrigation in drought prone areas would provide a greater degree of certainty and resilience for local and regional economies reliant on returns from productive resources. The current regulatory framework does not adequately support improved technical efficiency and performance of current on-farm and off-farm irrigation infrastructure.

Current Situation

New Zealand's water infrastructure provides for the needs of both urban communities and primary producers, and manages wastewater and excess water (stormwater). Good water infrastructure management can reduce the risks of ecosystem stress, provide opportunities for recreation, tourism and customary use, provide for good public health, contribute to New Zealand's clean, green image, and add to investors' confidence that our workforce is well served. Water and water bodies are also a tāonga for Māori, and iwi have a traditional relationship as kaitiaki with water and water bodies.

The primary production sectors (e.g. agriculture and viticulture), local authorities, industries, energy companies, environmental interest groups, and increasing numbers of consumers are competing for the same water resources. Water is New Zealand's competitive advantage for our export industries, which are fundamental to future economic growth.

Water infrastructure in New Zealand can be discussed under two very different groups of assets:

- » **Urban water infrastructure:** This network provides safe and potable water, manages wastewater and stormwater, services business and residential water needs and treats trade and industrial waste.
- » **Productive water infrastructure:** This asset group includes infrastructure required for productive activities – such as irrigation, hydro-generation, agro-processing, rural domestic supply and stock water. Investment in these assets is at a crossroad, particularly in relation to large infrastructure projects, as investors look for increased certainty (including security in relation to water allocation) and better clarity on the role of the government.

A diagram outlining the sources and infrastructure associated with urban water and productive water is on page 45.

Urban and productive water infrastructure faces different issues, although there are interlinked policy issues and regulatory settings relating to water quality and allocation, ownership, and regulation. Given this Plan's focus on water 'infrastructure' it is not the place to resolve or prioritise allocation and quality issues. These are being considered in the context of the Fresh Start for Fresh Water programme, which includes the work of the Land and Water Forum.

Of all the sectors analysed in this Plan, the management, regulatory settings and governance relating to water infrastructure will require the most attention in the next three years. This work will allow the next version of the Plan to set out a sustainable approach to water infrastructure management into the future.

Urban Water Infrastructure

The three types of water (water supply, wastewater and stormwater) are largely delivered by local government which owns water assets (funded by ratepayers and consumers) and which is well-placed to make decisions on competing local interests and preferences on service levels, commensurate with local conditions and local resources. Local authorities must make decisions balancing a range of potentially

competing interests such as:

- » The interests of different water users (from irrigation, commercial to household use).
- » Community preferences and resources.
- » Capital expenditure on water assets versus other capital expenditure.
- » The interests of current versus future communities.
- » Local/regional benefits versus national benefits.

The competing demands, differing service needs and available resources mean different councils take different approaches to water asset management.

Two key challenges need to be considered and planned for over the next three years:

- » Whether there are sufficient resources in each local authority area or community to meet the cost of deferred maintenance on aging assets, preferences for local services and, in some cases, national requirements. For example, communities most in need of improved reticulated systems are often the least able to afford it.
- » The extent to which there may be a 'hidden' long-term investment problem in the urban water sector. While the ten-year period for long-term plans has significantly improved performance targets, infrastructure 'gaps' could occur in the medium to long-term (20 to 50 years) or even further out.

Until recently there has been a lack of nationally consistent financial and asset information. However, 2010 amendments to the Local Government Act 2002 sought to improve the transparency and accountability of local government decision making and financial management. This includes the requirement for local authorities to:

- » Report on the actual and planned costs of urban water services.
- » Use a consistent set of performance measures so that service levels can be compared between communities.

The amendments also extend more the period for which local authorities can enter into water contracts from 15 to 35 years to enable realistic timeframes for entering into long-term capital projects.





A common concern is councils' reluctance to fully charge for the full costs of providing potable water services, which leads to inefficient use of water and asset management. The Local Government Act 2002 provides a great deal of flexibility in how local authorities recover the costs of providing water services. This flexibility enables communities and councils to decide what degree of cross-subsidisation, if any, is appropriate for the delivery of water services. At present, a lack of information on asset condition, performance and levels of service does not allow a firm conclusion to be reached about whether a greater level of national direction is required on how councils charge for water.

Productive Water Infrastructure

Water is utilised for many productive purposes, and there are many views as to which uses are the most economically beneficial. Use decisions are often not made by any single decision maker. In most areas the environmental effects of water abstraction, discharges to water, and land use changes are managed under the Resource Management Act. Water quality is degrading in some rivers and streams and a greater focus is required on diffuse discharges (e.g. pollution from urban stormwater, animal effluent and fertilizer run-off), to address these effects on the environment. Well-designed and well-operated water infrastructure – both urban and rural – can contribute to the effective management of water quality problems.

Hydro generation infrastructure is critical to maintaining energy supply security. While this is addressed in the Energy section of the Plan, there are challenges relating specifically to competing water demands.

The area of New Zealand currently irrigated is approximately 620,000ha. This area comprises a combination of individual irrigators and community-based irrigation schemes. The area of irrigated land in New Zealand has expanded by about 150,000ha in the last decade. Individual farm scale development (drawing largely on groundwater and run-of-river water sources) accounts for approximately 81 percent (as groundwater consents) of this area.

Vision

Water infrastructure will contribute to healthy and safe communities, promote the social, economic, environmental and cultural well-being of those communities, and will provide a competitive advantage for New Zealand's primary producers and industry.

Goals

The goals for water infrastructure are that:

- » Water infrastructure is developed and operated to use water most efficiently.
- » Central and local government work and plan collaboratively to better align national interests with local funding and accountabilities.
- » Large-scale water infrastructure projects are planned to deliver economic, environmental and community benefits, while also providing certainty for the rural irrigation industry to allow irrigation projects which contribute to economic growth and balance the environmental and economic impacts of change.
- » A consistent set of performance measures are developed and implemented so that service levels can be compared between communities and a national assessment of water assets is enabled.
- » A broader range of asset, demand and allocation management tools (including quality standards and pricing) are used to maximise the benefits derived from water assets.
- » To better integrate land and water management, incorporating the views of iwi and other stakeholders.

Current Work Programme

A significant part of the government's current work programme is the Resource Management reform programme, including the Fresh Start for Fresh Water (FSFW) programme which includes the government's response to the Land and Water Forum's recommendations. The FSFW programme is where overarching water policy matters will be determined, including:

- » The governance structures, processes and methodologies needed to set water quality and quantity limits, within which water infrastructure will need to operate.
- » Tools for achieving those limits and managing water efficiently within them, including work on allocation models, consenting issues, and transferability of available water.

Other current or recent government policy and regulatory settings work include:

- » The development and promulgation of regulations, under the Local Government Act 2002, on financial reporting relevant to core local authority assets, and rules for performance standards.
- » The Ministry of Health will allocate up to \$10 million per year to drinking water subsidies for small communities between 2011 and 2016 with funding to be prioritised to those in the greatest need. This will help some local authorities with particularly poor communities achieve minimum water quality standards.

- » The Ministry of Health is undertaking a review of the 2007 amendment to the Health Act 1956.
- » The National Policy Statement (NPS) for Freshwater Management comes into effect on 1 July 2011. The NPS requires regional councils to set resource use limits for water quality and quantity, allocate water efficiently, manage water and land in an integrated way in catchments, and engage with iwi on water management and reflect their values and interests in water policy.
- » The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 came into effect on 10 November 2010. The regulations require the measurement and reporting of water taken under resource consents that are larger than 5 litres a second.
- » Beginning in 2011/12, the Ministry of Agriculture and Forestry will allocate \$35 million over 5 years to the Irrigation Acceleration Fund to support the development of irrigation infrastructure. Developments will include infrastructure for water harvesting, storage and distribution (which will be integrated with regional work).

Sector Overview



Water supply: Local authorities are responsible for most potable water supplies in New Zealand. Water systems take water from rivers or underground aquifers, treat it, pump it to reservoirs and then distribute it through a network to consumers. Metropolitan Auckland's supply is sourced from nine dams, the Waikato River and a groundwater source in Onehunga, and treated at six plants across the region. The estimated optimised replacement cost of council water systems was \$11.4 billion in 2009.

Distribution: 960,000 households and buildings are connected to a centralised water supply, and 527,000 or 55 percent of these connections are metered (though not all metered properties are charged for water by volume).

Wastewater: Wastewater systems treat and dispose of potable water that has been degraded by household or other use. Most systems dispose of treated waste into waterways or coastal waters, although a few provide for land-based disposal. The estimated optimised replacement cost of council wastewater systems in 2009 was \$12.7 billion.

Stormwater: Territorial authorities provide urban stormwater drainage through piped networks and open drains. The estimated optimised replacement cost of council stormwater systems was \$8.9 billion in 2009.

Irrigation: Irrigation infrastructure includes the assets required for flood, spray and micro irrigation systems. 620,000ha (1.5 percent) of New Zealand's land by area is equipped for irrigation, 84 percent of which is in the South Island.

Strategic Opportunities

There are significant strategic opportunities to pursue with infrastructural development of water. Fundamental requirements include the need:

- » To promote partnerships and activities within the disparate interests.
- » To promote the sustainable management of water through investigating the options for better demand management practices in allocation, and ownership and charging for water infrastructure.
- » To recognise that water asset management has a role in promoting the social, economic, environmental and cultural well-being of communities.



Urban Water Infrastructure

There are three key areas of opportunity to improve the urban water infrastructure sector. These are:

- » Improved management of urban water assets.
- » More efficient water use.
- » A regulatory environment which recognises local authorities', (and therefore communities') ownership interest in water assets, and the devolved management responsibilities, while also delivering on national objectives.

In relation to the better management of urban water assets, the government will:

- » Recognise local government's ownership interest by ensuring all governance options are considered in a collaborative manner.
- » Consider standardising the future format, content and style of local authority asset management plans.

In relation to the more efficient water use, the government will:

- » Work with local government to educate water users about the real costs of water, and that volumetric charging does not imply or require private ownership of water assets.
- » Facilitate sharing of best practice in the procurement, asset management, and funding of water-related infrastructure amongst local government.
- » Identify common cross-sector alternative methods for long-term procurement that have the potential to provide significant gains.
- » Work with local government to improve asset management capability across the sector.

In relation to the regulatory and policy environment, the government will:

- » Seek to reduce compliance and transactions costs that are derived from central government policy. This will include identifying ways of improving coordination when interacting with local government.
- » Identify significant projects nationwide that will benefit from alternative procurement and delivery models to increase the access to world's best practice water management skills.
- » Collaborate with local government through Local Government New Zealand (LGNZ) to establish a consistent and clear decision-making framework between central and local government for all infrastructure.
- » Establish a flexible but common platform for reporting against the '3 Waters' infrastructure.
- » Continue to work on the best means of regulating drinking water quality standards, with the medium term aim of achieving optimal compliance with a national standard, should that aim be economically viable.

Productive Water Infrastructure

The challenges for productive water infrastructure are similar in some ways to those of urban water. That is, water allocation and certainty of regulatory environment are key for investors. The strategic opportunities vary between infrastructure types. The focus here is on irrigation, but clearly hydro generation in New Zealand provides a significant contribution to electricity security of supply. Ways to provide long-term certainty of investment are currently being explored.

There is significant unrealised potential for further irrigation development. Realising this opportunity would contribute positively to economic growth – some estimates suggest additional irrigation could increase agricultural exports by over \$4 billion p.a. by 2026.

Further development of irrigation will require access to 'new' water through:

- » Improved use and management of water resources currently allocated for irrigation use, including capital upgrades of existing irrigation scheme infrastructure.
- » New infrastructure development, particularly for water harvesting, storage and distribution.

The opportunity from improved utilisation and capital upgrades of existing schemes is significant in its own right. Irrigation New Zealand has estimated that the combination of improving on farm technical and management efficiency and replacing open irrigation races with piped distribution systems could provide for an extension of up to 30,000ha (an extra five percent in area) within current local community irrigation schemes in Canterbury and north Otago. These initiatives must be encouraged, and barriers to achieving these efficiency improvements removed.

For the most part, new infrastructure development will need to draw on more complex water resources and involve water harvesting and storage at times of higher river flows for later use. This will require civil engineering structures and distribution networks that are larger both in scale and cost than existing local community scheme developments. Some intervention or catalyst action by government may be required to enable these investments to occur. Decisions on such an expansion would need to consider how risks to water quality are managed, given the potential impact on water quality from such an increase.

The scale, complexity and capital requirements of regional scale irrigation and rural water infrastructure proposals will require third party investment, and probably multiple investors. High standards of commercial governance will be required. Return on investment will need to accrue to both infrastructure investors and irrigating farmers.

The Irrigation Acceleration Fund will provide support for irrigation infrastructure proposals to the 'investment ready' prospectus stage. This assistance reflects the scale and complexity of regional scale rural water infrastructure developments. Support for the development of regional water management strategies will be retained.

Subsequent to schemes becoming 'Investment Ready' the Crown will consider taking a minority equity position where schemes meet certain criteria, which would likely include the circumstances of each project from a commercial and economic viability perspective. However, the Crown will be seeking to ensure that its willingness to consider equity investment on a case-by-case basis does not 'crowd out' private investment.



Case Study: Auckland's Urban Water Infrastructure

Using Statistics New Zealand population projections, Watercare estimates that Auckland's daily demand for water could increase from 370,000m³ today to 504,000m³ in 2030 and 636,000m³ in 2050. This projection is based on current water consumption for the Auckland metropolitan supply of 280 litres per person per day. Domestic consumption is around 175 litres per person per day.

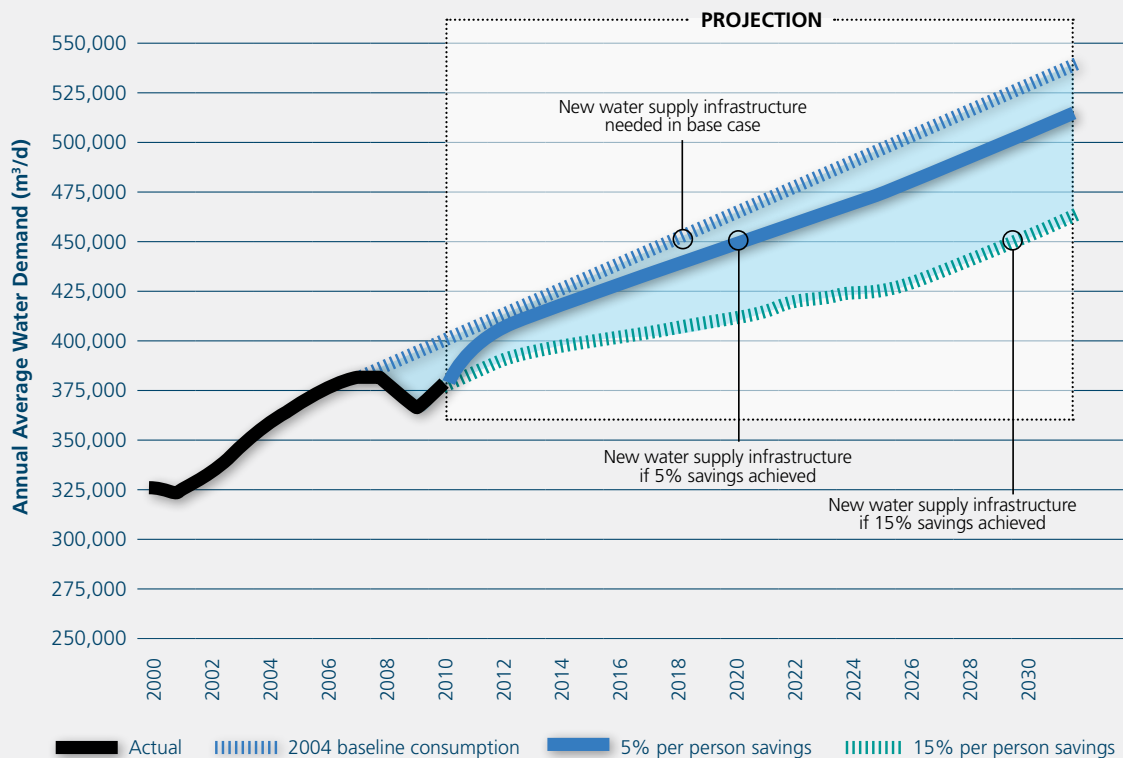
Under these projections, the region will require a new source of water and associated infrastructure as early as 2021. Investments of this magnitude can be very expensive, and Watercare expect the new pipeline and treatment facilities to cost as much as \$300 million.

Managing Auckland's water demand could delay the need for this investment. Water conservation measures and increased urban density - meaning fewer gardens to water - could reduce consumption to 255 litres per person per day, delaying the need for a new pipeline by a decade. This would mean significant savings for Auckland consumers.

Careful modelling of demand is essential for Watercare to maintain a secure supply. Large-scale water infrastructure can take up to 10 years to establish, including the time taken to raise investment capital through customer charges, communicate with stakeholders, gain resource consent, and design and construct the asset. Watercare routinely assesses demand over 50 years to ensure it can respond effectively.



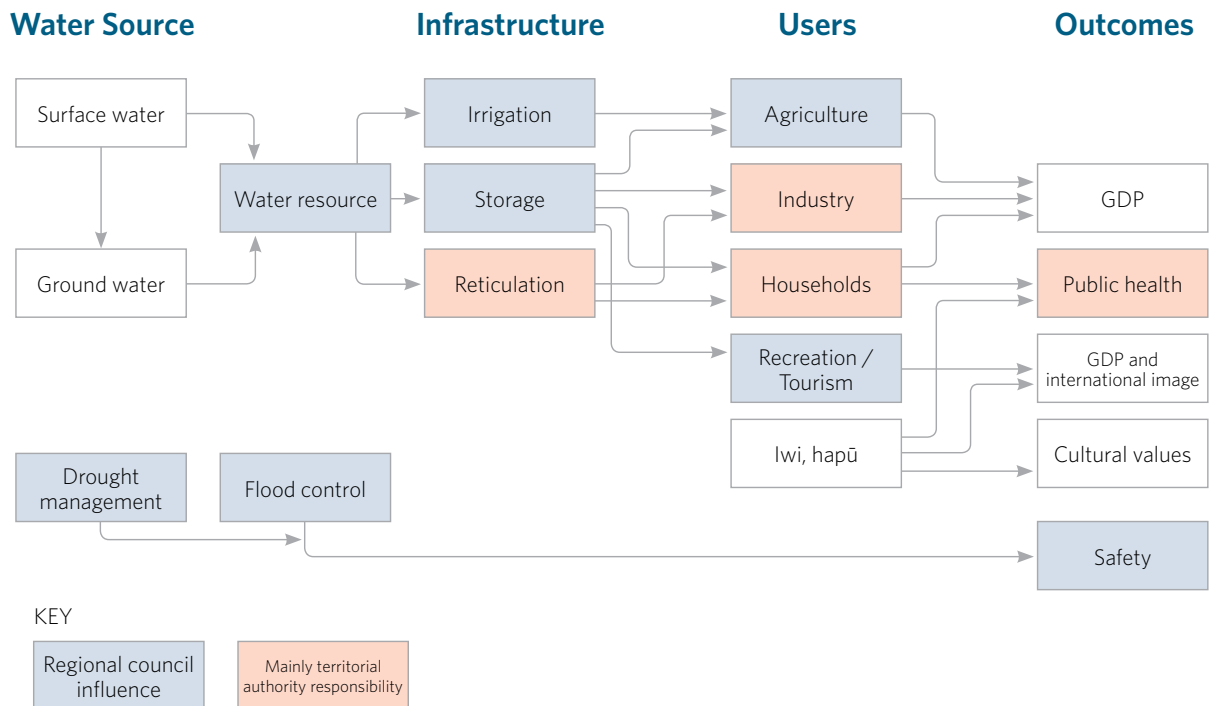
Demand for Water in Auckland



Source: Watercare



Water: From Source to Outcomes



What Will Success Look Like?

A key challenge for the water sector is to identify and implement a range of common and agreed indicators that will allow benchmarking at a national level. Work on these indicators will occur in the coming 12 months, however, a set of interim indicators may measure:

- » The proportion of households/businesses metered and volumetrically charged.
- » Whether potable water quality improves.
- » The quality of discharges from urban systems, and whether water quality in receiving environment improves.
- » The value of production from irrigated land increases.
- » The efficiency of water use (including evaluating leakage) improves.

Social Infrastructure



Key Issues

Accountability & Performance - The lack of a whole of network approach in many sectors leads to inefficiencies, a lack of oversight on overall network performance and poorly coordinated decisions. At a local level, the history of amalgamation in New Zealand and our geographic spread means that many communities are managing assets that are duplicated in some cases many times over.

Investment Analysis - Insufficient attention is given to the whole of life cycle costs of assets and the implications of ownership. This means that too often the 'lowest' immediate cost solutions are procured on an ad hoc basis, but significant problems arise later (e.g. leaky buildings problem for schools);

Funding Mechanisms - At any level of government there are fiscal pressures which, when combined with demographic changes (e.g. an ageing population) and a lack of alternative funding streams, create a future gap between funding and capital intentions.

Coordination - Asset management decisions by either central or local government can be made in isolation of broader 'network' objectives. Interaction between social infrastructure assets and other networks (in particular transport) need far greater weight in the decision making process.



Current Performance

Central Government

The government is actively exploring how the current network of social infrastructure assets can respond to future pressure. This means better management of assets that are under pressure and also looking at those that are under-utilised to see if these can be retired to facilitate investment in areas where need is greater.

In sectors such as health and education, improving how services are delivered may have a significant impact on how demand is managed and thus when further investment is required. In the housing sector the government is looking at how the current base of assets can be used more effectively.

In July 2010 the government set out its expectations for better capital asset management, emphasising the need for high quality business cases for new investments, and for reporting by capital-intensive agencies on their ten-year capital expenditure intentions.

Value for money is one way of measuring state sector performance at a high level. If a better outcome is achieved for a given cost or if the same outcome is achieved for a lower cost, then value for money can be expected to improve.

Well developed business cases are one way of demonstrating whether value for money is being achieved. A robust business case should provide:

- » An explicit and systematic basis for decision-making.
- » Clear accountability for the use of public resources.
- » An effective communication tool for engaging stakeholders.
- » Assurance to funding agencies, suppliers, and other partners by demonstrating affordability and achievability.
- » A robust plan for post-implementation review including the management of risks and the delivery of expected benefits on time and within budget.

The government has agreed that for all new capital projects greater than \$25 million an alternative procurement method such as a Public Private Partnership (PPP) must be considered. A PPP will only go ahead where analysis clearly demonstrates that there will be enhanced services and better value for taxpayers. This policy demonstrates the government's commitment to injecting greater commercial rigour and increased focus on purchasing outcomes into Crown asset procurement.

Local Government

Local government has a broad mandate to provide infrastructure (including transport and water infrastructure). Social infrastructure provision varies from council to council, but typically, every community needs a range of social infrastructure assets to provide quality of life. Changes to the Local Government Act 2002, and ongoing responsibilities to prepare long term plans mean local government is regularly refreshing its understanding of the pressures facing their constituency over the coming ten-year period. One problem with a ten-year focus is that infrastructure assets are long lived, and there may be a tendency to push deferred maintenance beyond the ten-year period.

Vision

Social infrastructure supports the social, economic and fiscal goals of central and local government.

Goals

- » Provide social services in a manner that is both affordable and provides for the well-being of communities.
- » Promote the use of accurate performance measures so that value for money can be assured.
- » Actively manage balance sheets to ensure the role of assets owned by government remain clear, and where necessary, new assets are acquired while surplus assets are divested.
- » Ensure that rigorous and consistent analysis is used so that the right assets are procured, at the right time, and using the right method.
- » Central and local government are well coordinated and exploit synergies in the building and delivery of services.
- » Social assets are delivered using the best model for whole of life cycle cost consideration, and which deliver the best value for money services.
- » Governments consider the broader strategic outcomes sought from the management of and investment in social infrastructure assets, including a spatial and network dimension.



Strategic Opportunities

The government has signalled its approach to investing in social infrastructure assets in the Investment Statement. In particular, this notes that *"Government places the highest priority on ensuring social services and infrastructure can be delivered to an appropriate quality level"* (p 93).

The government is actively investigating a number of broader strategic opportunities, including:

- » Alternative approaches to the funding, delivery and management of assets and the delivery of services associated with them.
- » Greater use of shared services by local government.
- » Increasing contestability in social housing.
- » A much clearer service model at a national level is needed which defines the performance expectations and levels of service. This should include a clearer framework for whether services are required to serve national, regional or local catchments / customers.
- » Delivery of services in a more affordable manner through better management of assets, and with more clearly defined performance standards.
- » Avoiding the costs associated with poor community facilities and services.
- » Facilitating the spatial mapping of social infrastructure assets, and linking this with better spatial planning in communities where growth challenges exist.

What Will Success Look Like?

The diversity of social infrastructure services makes creating a common set of indicators challenging. However, some indicators that cross asset classes and reflect the key drivers of government policy include:

- » Service outcomes are specified and used as a basis for determining asset performance across all sectors.
- » Asset procurement uses a whole of life cycle cost approach.
- » Spatial coordination of government investment, including co-location of services (particularly in Auckland is increased).
- » Procurement efficiency, including use of alternative procurement methods, is increased.
- » Capital intensity (e.g. value of assets used to deliver a service relative to number of users).

Case Study: Education Infrastructure

Student population projections from the Ministry of Education indicate that demand for New Zealand primary school places will peak around 2019. Demand for secondary school places is expected to peak around 2025. Combined with expected regional population changes that will increase demand in some areas and reduce it in others, the schools data offer a clear picture of the need for flexible infrastructure investment. Investment in school property must respond to students' needs in the long term, wherever students are located, and must not simply plan for peak demand.

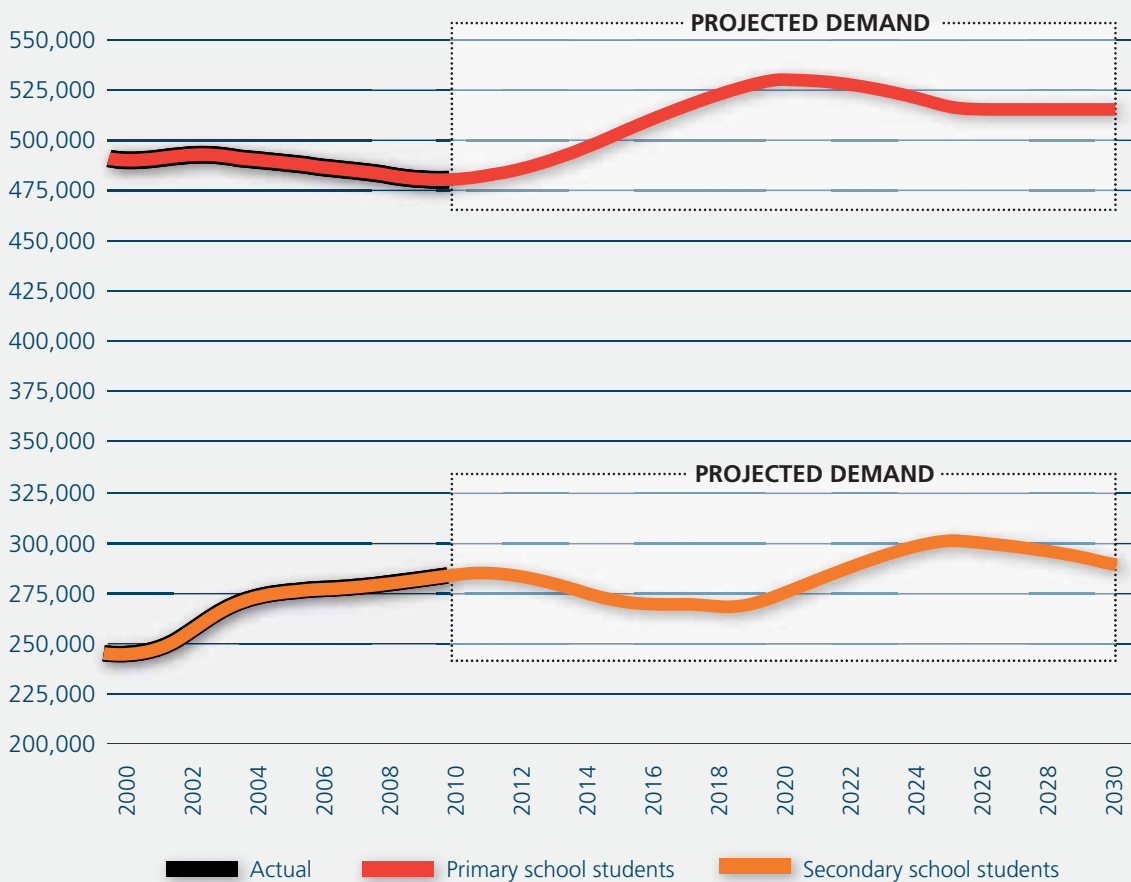
While this Plan does not deal with social infrastructure in detail, the education example demonstrates that underlying demand drivers are often similar for economic and social infrastructure.

Our social infrastructure investment decisions must therefore be well-informed and may require challenging policy decisions to ensure we make smarter use of infrastructure.



Changes to how the government assesses the need for new teaching rooms to meet roll growth could make a significant difference to the level of investment required to deliver education outcomes. Problems with existing schools (e.g. leaky buildings, aging assets) demonstrate that social infrastructure assets require investment models that consider whole-of-life cycle costs and procurement processes alongside demographic change.

Demand for Schools



Source: Ministry of Education

Part Three

Implementation



The ongoing success of the National Infrastructure Plan revolves around its ability to set a vision and then to make measurable progress towards achieving it.

The Plan identifies a number of actions for government and provides some guidance on the opportunities for local government and the private sector.

The first edition of the plan provided a number of short term priorities for infrastructure investment and regulatory reform. In addition, it provided a stock-take of infrastructure in New Zealand, and identified a number of proposed projects around the country.

This second edition sets out a vision, principles and goals to provide an 'operating framework' for infrastructure decision-makers. At the coal-face, decisions are based on the best information available. However, at a national level the information available is variable in relation to the stock, state and value of infrastructure assets. Specific actions are required to allow the next version of the Plan, scheduled for 2014, to provide greater direction to decision makers. In building towards 2014, the Crown will work with infrastructure providers and managers to collect improved national information and trends.

The implementation program for the Plan will be provided on the National Infrastructure Unit website (www.infrastructure.govt.nz). This will include a breakdown of all the actions arising from this Plan, and which agency is responsible for leading implementation and reporting back on progress in the interests of transparency.

In addition to the overall nationwide work programmes, the two cities of Auckland and Christchurch face significant infrastructure challenges, which require specific infrastructure tools. Auckland, as the largest and fastest-growing metropolitan region, faces significant infrastructure demands and the new Auckland Council's Spatial Plan will provide one framework for addressing these. Christchurch, and the wider Canterbury region have a large rebuilding task ahead, which the new Canterbury Earthquake Recovery Agency will manage. These are discussed further in the following pages.

The government is committed to the short-term actions that will allow the Plan to deliver on a long term perspective.

Evolution of National Infrastructure Plans



Focus on Auckland



The Challenge

As outlined in this Plan, New Zealand as a whole faces some significant infrastructure challenges. Many of these are felt most acutely in our largest and fastest growing city. While Auckland will account for 60 per cent of New Zealand's future population growth, is a strong productivity performer, boasts high wages, and is our international gateway, it also faces significant social and economic challenges as well as opportunities for economic growth. Auckland's future growth has to be well managed and the government is already investing in key infrastructure sectors.

In the past, Auckland has suffered particularly from infrastructure issues associated with:

- » **Coordination** – Infrastructure investment decisions made by central government departments and agencies (including transport, education, health, justice) and local government in Auckland are often poorly coordinated with each other and with land use and other strategies for the city.
- » **Funding** – Auckland's infrastructure aspirations are often disconnected from funding and implementation realities, and funding priorities and strategies are often misaligned. Not enough effort has been made to explore alternative options for funding and financing high-value projects, including using pricing to manage demand and raise revenue.
- » **Resilience** – Building resilience into the energy and telecommunication sectors is of key importance if Auckland is to be a globally competitive city in which investors have confidence. For example, all sources of electricity generation are south of the city and feed through one of only two major transmission lines.

The Opportunity

The Royal Commission on Auckland Governance was established in October 2007 to respond to a growing concern that the region's development was being held back by fragmented local government arrangements. The Commission's key recommendation, when it reported in March 2009, was the amalgamation of all eight local authorities in Auckland into a new single unitary authority called the Auckland Council. This and many other recommendations were adopted and implemented by the current government.

The governance reforms have, in the Auckland Council, created an organisation of significant scale and influence, with a real opportunity to help tackle the important issues facing the region. The Auckland Council will have a greater ability to:

- » Make key strategic decisions, prioritise investments, raise capital, and partner with the private sector and central government.
- » Develop a robust evidence-base and expertise on the growth pressures facing the region, and understand the urban growth management and infrastructure investment that will deliver both realistic and achievable outcomes in the long term.
- » Develop expertise in project assessment and delivery, and in the operation of large and complex infrastructure networks.

This creates enormous opportunities for Auckland and New Zealand. The key document to help ensure these opportunities are realised is the Auckland Plan (or Auckland Spatial Plan), also a key Royal Commission recommendation adopted by the government.

The Auckland Plan

The Auckland Plan is a broad-based strategy for the management of Auckland's growth, its aim is to enable the type of urban growth required to make Auckland more competitive and productive. The Auckland Plan is intended to be a 30-year economic, environmental, social and cultural strategy for the management of Auckland's growth and development. Its aim is to enable the type of urban growth required to make Auckland more competitive, productive and prosperous. The development of the Auckland Plan will be an important opportunity to identify, negotiate and agree on priorities and actions across multiple parties including local and central government, the private sector and non-government organisations.

The Auckland Plan will be a strategic instrument rather than a regulatory one, but the strategy it contains will influence statutory instruments such as the Auckland Unitary Plan, and therefore resource consent and other decisions made in Auckland.

The Auckland Council launched the "Auckland Unleashed" discussion document for engagement and consultation on 23 March 2011, leading up to the release of the Auckland Plan in December 2011.



The Role for Central Government

As the largest investor in Auckland's infrastructure, the investment decisions that central government makes, and how it engages with the Auckland Council and the Auckland Plan, will have a significant influence on Auckland's future and the realisation of the agreed strategy for growth.

The Auckland Plan will not alter the fundamentals of how central government budgets for or makes infrastructure investment decisions, but it will be a key vehicle for negotiating and agreeing on joint strategic priorities and actions between central government and the Auckland Council. If implemented successfully the Auckland Plan will help central government meet its objectives.

The government expects the billions of dollars that it is already investing in Auckland to deliver outcomes, and expects better use to be made of current infrastructure assets. The Auckland Plan provides a coordination and information-sharing tool to help deliver better outcomes, by ensuring that agencies' investment decisions are aligned (where possible and appropriate) with each other and with local government and private sector infrastructure investment and landuse decisions.

To work, the Auckland Plan will need to acknowledge and reinforce central government's objectives for New Zealand, and complement central government interventions, funding and decision-making processes. At the same time central government will need to consider changes to current policy settings or funding scenarios if the Auckland Plan demonstrates that there are better ways of achieving things. Central government's spending decisions should always be informed by the best available evidence, and there is opportunity for the Auckland Plan to bring useful evidence to light.

Central government agencies will work closely with the Auckland Council and all Aucklanders in the development of the first Auckland Plan. There is an expectation that government agencies will, as part of good business case development and overall decision-making, consider the Auckland Plan (and the landuse, growth and infrastructure strategy it contains) in their own investment decisions and strategies.



Focus on Christchurch

Christchurch was struck by two large earthquakes on 4 September 2010 and 22 February 2011. The February earthquake had a human toll of 181 dead, and there was significant damage to buildings and infrastructure in the CBD and residential areas, especially in the city's eastern suburbs. Christchurch has continued to experience aftershocks, including two that caused further damage to infrastructure on 13 June, and these are likely to continue for some time.

Damage to Infrastructure

Most of the network infrastructure in Christchurch was disrupted, or was constrained, in the initial hours after each earthquake. The networks showed some resilience, in that lifelines operators were able to make temporary repairs to progressively return services in the short-term, but it will be many years before all services are fully restored.

Following the February earthquake, the effects on infrastructure were:

- » **Transport** – Minor damage to state highways, with local roads and structures (bridges etc) affected by shaking and liquefaction, while cordons around damaged areas of the CBD have led to traffic management issues. Lyttelton Port and

Christchurch International Airport suffered some disruption, but were operational relatively quickly. Air traffic control was out of action for several hours, which had flow-on effects for air travel over much of the country.

- » **Communications** – Initial disruption was due to cell sites being damaged or losing power, with some on batteries/generators for several weeks, but overall service was maintained.
- » **Energy** – Initial disruption of electricity was gradually restored to most of the city, sometimes with temporary lines.
- » **Water** – Council-owned water assets were significantly damaged. Drinking water has been progressively restored to suburbs over time. Waste/storm pipes were damaged in the eastern side of the city and it is likely that a full rebuild will take many years.
- » **Social** – Forty-three Christchurch schools suffered moderate to serious damage, with six so badly damaged that their facilities are unusable – most are working out of temporary/shared locations; the majority of local and central government services were relocated to areas outside the CBD; some damage to the hospital occurred.

Coordination

After the September earthquake, a Minister for Earthquake Recovery was appointed. Recognising that the February earthquake was above the scale that local authorities can be expected to respond to, the government established the Canterbury Earthquake Recovery Authority (CERA) as a government department.

During its establishment phase, CERA will:

- » Establish and maintain close working relationships with local councils, other local and central government agencies, Ngāi Tahu, businesses, and the local community.
- » Coordinate and prioritise recovery planning by central government agencies.
- » Gather information necessary to assess the best approach(es) to the long-term recovery and then work on a long-term recovery strategy.
- » Review and oversee existing operations on the ground and work towards structures and arrangements that will be necessary for effective and coordinated rebuilding and recovery of Christchurch.

CERA has significant powers, similar to those that apply in a state of emergency, so the model includes a number of fora and review panels. One of CERA's goals, consistent with the National Infrastructure Plan, is to increase coordination amongst other agencies working in this area.



Challenges and Opportunities Ahead

The immediate challenges for CERA and the local authorities are to restore basic infrastructure to the residents and businesses in Canterbury, moving from temporary fixes to longer-term solutions. At the same time, councils are continuing to progress infrastructure rebuilding in the wider Canterbury area affected by the September earthquake, e.g. land remediation in Kaiapoi.

Decision-makers will balance a desire to act quickly to restore services and confidence against the opportunity to redesign and rebuild New Zealand's second largest city, with incentives to try innovative approaches to deliver infrastructure and quality of life.

This National Infrastructure Plan focuses on population and economic growth as two key drivers of infrastructure demand. The earthquakes have impacted both of these, with people leaving the area (a mixture of permanent and temporary exits) and a significant impact on business productivity in affected areas (with a resulting decline in employment and the rating base). There will be a population influx and increased economic activity associated with rebuild, but this is at the expense of other productive activity, and there are challenges in predicting what the size and make-up of Christchurch will be after this period.

The significant rebuilding task ahead also has implications for the availability of construction personnel across the country (and internationally, given similar pressures in Queensland and Japan), and thus risks overheating the construction market and increasing the price of other infrastructure developments.

Looking wider than Christchurch and Canterbury, the earthquake raises questions about infrastructure and building standards across the country, especially around whether structures built before the current standards need assessment and strengthening. The recently-announced Royal Commission on the Canterbury Earthquake will examine issues around the built environment in the Christchurch CBD and the adequacy of the relevant building codes and standards into the future. This flows into the wider resilience points referred to in this Plan.

Work programme

This Plan recognises a number of Ministerial priorities for infrastructure, guiding principles to set the government's aspiration for infrastructure, and a three-year programme of action to give effect to the principles. In addition, the Plan signals actions within each sector, which link back to the principles.

Over the next three years, the National Infrastructure Unit will work with other government and private sector agencies to give effect to the actions in this Plan, and will report on activities and progress at www.infrastructure.govt.nz.

The overall approach involves a mixture of:

- » Maintaining a high level of dialogue with stakeholders, and developing partnerships.
- » Working with industry stakeholders to identify opportunities for better regulation.
- » Improving the practice of government as an asset manager.
- » Research into infrastructure issues to allow improved management in the future.
- » Reporting on a regular basis against the vision, goals and principles set out in the Plan, and on infrastructure performance.

Partnerships

No one organisation – government or otherwise – can achieve the vision set out in this document in isolation. Partnerships and good communication are therefore crucial.

One of the key relationships is between central and local government. The Canterbury earthquakes demonstrate the significant investments that local governments have and their critical importance to daily life and the economy. While each local authority is accountable to its community, the government must also understand the total effect of local government on the country's economy, and work with local government to improve performance reporting.

Action

The government will develop a coordinated communications program with key stakeholders and partners in each sector to allow regular and meaningful communication on infrastructure issues, including identifying and collating information on regulatory barriers. Initially (2011 to 2012), this will focus on how to implement the immediate priorities and actions in this Plan.

Government Agencies

The government has a number of agencies responsible for delivering infrastructure – in particular social infrastructure (e.g. education, health, justice). The government is also a major investor in some sectors (such as energy/electricity) through SOEs and a number of agencies have a monitoring role with these agents. In addition, the government will provide a stable and transparent regulatory environment in each sector.

Action

Given the significance of the government sector, and the need for leadership, the government will focus on how to improve the efficiency and performance of its own assets and asset management systems. This will include learning lessons from those agencies that are leaders in asset management within the government.

Research

The New Zealand infrastructure market involves a number of players from the government to the private sector. While the government owns a number of assets, most sectors have clear pricing structures that are linked to demand. This allows infrastructure providers to deliver an appropriate level of service relative to demand. However, collating consistent information on asset performance at national level in some sectors is challenging (e.g. urban water systems).

In many cases, different decisions might be made in the future if better data was available now. The government believes that further research into the infrastructure market in New Zealand is critical to achieving the vision set out in the Plan. Initial priorities for research topics for the government or other infrastructure providers are:

- » Demand management and modelling.
- » Creating national datasets of projects and performance measures.
- » Benefits and costs of alternative procurement models.
- » Regulatory barriers – the real costs.
- » Resilience – understanding network resilience issues relating to assets, coordination and end-user expectations, including seismic and other forms of geophysical and environmental research.
- » Continuing to refine models on externalities and Cost Benefit Analysis to improve decision making in a New Zealand context.

Actions

Government will develop a research framework for infrastructure which feeds into its broader funding programme for research, science and technology based on these initial priorities.

Government will seek support for research from other infrastructure providers.

Reporting

Reporting on progress against the indicators and outcomes sought in this Plan will provide a regular report card on progress. The National Infrastructure Unit will coordinate the preparation of a national state of infrastructure report, and this will be maintained as a web-based service at www.infrastructure.govt.nz. The context of this report will include:

- » An overview of near term central government investment plans.
- » An overview of local government investment plans and any trends emerging from analysis of LTPs.
- » Sector and regional reporting of major planned infrastructure projects. This will include an aggregate understanding of project stage (e.g. value of projects at feasibility study stage, construction etc).
- » An assessment of these investment plans in terms of the guiding principles in this Plan, and any analysis of links between investment and demand to identify any major or emerging gaps - both by region and by sector.
- » Reporting against any specific implementation issues identified in this plan (e.g. The Auckland Spatial Plan, Christchurch recovery plan).
- » An assessment of progress against the performance indicators in this Plan.

Action

Government will produce an annual Infrastructure State of the Nation report, and maintain this information in a web-based format.



Framework for Infrastructure

