[INFRASTRUCTURE ANALYSIS]

To inform the development of the Bay of Plenty Regional Spatial Plan

Prepared by NZ Transport Agency on behalf of Invest Bay of Plenty
Final Draft (Revised) September 2014
High level observations

(i) The importance of infrastructure

Infrastructure is a primary enabler of cultural, social and economic opportunities and quality of life. It shapes expectations and behaviours, drives costs, and its provision, timing and quality is often a key determinant of delivering strategic vision, long-term benefits and good community outcomes.

Infrastructure assets and associated services are provided by a wide range of individuals and private and public organisations. The level of public and private investment in infrastructure in the Bay of Plenty is significant. Approximately 43% of councils’ total revenue is spent on the operating costs of core infrastructure (transport, wastewater, water supply, stormwater and solid waste)\(^1\). Nationally these investment classes account for approximately 70-80% of all local authority (except Auckland) capital expenditure\(^2\).

Central government agencies invest significantly in the region (such as state highway improvements and hospital upgrades), along with private business (such as energy and telecoms). Infrastructures tend to have long lifecycles, requiring decision makers who can provide long-term direction, medium-term planning and short-term tactical investment and other responses. Effective infrastructure leadership is often about ensuring consistency of implementation over time to optimise investments and deliver agreed levels of service.

Investing in infrastructure to achieve maximum community outcomes at minimal cost requires both collaboration and trade-offs. There are strong inter-relationships between the type of infrastructure (including social and physical), willingness to pay (affordability) and a delivery model. Pressures on these relationships include economic cycles, expected levels of service, and costs and benefits. Responses to infrastructure investment pressures include integrated planning, regulation, increased efficiencies, as well as innovative and effective solutions. This is shown in Figure 1 below:

\(^1\) Bay of Plenty Local Authority 2014/15 Annual Plans
\(^2\) The Local Government Infrastructure Efficiency Expert Advisory Group Report, pg 28
(ii) Collaborative planning optimises infrastructure investments

Joined up decision making and a collaborative approach is vital to optimise existing infrastructures and the value of additional investments. For example, local government infrastructure often links with, or complements, the substantial infrastructure assets owned and operated by central government, such as the state highway network, the rail network and energy assets. The private sector provides networks of national importance, for example in the telecommunications and energy sectors. Additionally, private developers are significant builders of the infrastructure required for new property developments, often with subsequent transfer to local government ownership\(^3\).

Spatial planning supports effective decision making. It provides an evidence base and a process to enable decision makers to strike the right balances between the competing tensions of willingness to pay (affordability), infrastructure types, and delivery models that create good community outcomes.

The region has demonstrated strengths in working together to ensure investment and other associated decisions are co-ordinated and sequenced. SmartGrowth – a collaboration to improve evidence based decision making and infrastructure investment – was a novel innovation a decade ago, and continues to be a lead example in growth management. InRoads is an example of different organisations working together to manage infrastructure assets and customer service (a collaborative approach between Western Bay of Plenty District Council and NZ Transport Agency for the management and maintenance of the local roads and state highways within the district). There are different models between local authorities and with the NZ Transport Agency elsewhere (e.g. Northland, Gisborne, Auckland and Christchurch). The transport sector has had to adapt and use different management and delivery models as it is subject to significant external cost pressures (e.g.

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\(^3\) The Local Government Infrastructure Efficiency Expert Advisory Group Report, pg 23
costs of bitumen, increasing technical standards) and community expectations; and transport road infrastructure asset expenditure often represents a significant proportion of rates expenditure.

The Bay of Plenty Tertiary Action Plan is another example of collaboration. The parties are working towards a strategic regional direction and priorities for tertiary education in the region in advance of infrastructure investment decisions.

(iii) Regional-scale infrastructure planning can improve community outcomes

Regional-scale assessment and planning supports conversations about implementation options, including collaboration and alternative business models where appropriate, to ensure investment is prioritised and the region is competitive. Joined up planning or a collaborative approach can make the most of regional-scale infrastructure investments by identifying priorities with the greatest public good, minimising inefficiencies and unproductive intra-regional competition, and supporting regional economic development so that the whole region prospers and reaches its potential. Infrastructure planning needs to be undertaken at a strategic and/or macro-level. Currently pieces of infrastructure are planned and provided for in isolation, with little consideration of their interdependencies between other types of infrastructure or the wider network impacts (such as airports).

Bay of Plenty firms and local authorities invest in infrastructures that provide national as well as local benefits. Benefits are maximised when local government and central government are aligned in their planning and decisions about when, where and how much to invest in infrastructure.

(iv) Changes in population and the economy will influence future shape and scale of demand

Population growth, decline and structural change are considered to be key drivers of infrastructure. The Bay of Plenty faces some significant changes in the next three decades in population, the way that people do business and the natural environment. These changes will impact on demand for infrastructure services and require strategies and plans to manage risks and maximise opportunities. Planning needs to go beyond the three year political cycles, and to include all key decision makers.

Population growth and decline both have a direct impact on pressure (or lack thereof) on infrastructure such as transport (roads, rail and airports), water, wastewater, telecommunications, and energy. Other influences on infrastructure include government direction, such as ‘Better Sooner More Convenient’ health care model aiming to provide health care locally, freeing up hospital capacity. Future population decline in the eastern areas of the Bay of Plenty region will create the need for improved linkages, particularly public transportation and telecommunications, and future investment in social infrastructure.

Demographic changes such as structural ageing creates higher overall demand for social infrastructure, puts pressure on hospitals, state and council housing, community and sports facilities and increases demand for cycleways and walkways. There are housing stock implications. An ageing population will need smaller houses and retirement villages closer to amenities will be desirable. An ageing population will also likely increase the use of public transport, so coverage needs to be

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4 The Local Government Infrastructure Efficiency Expert Advisory Group Report, pg 4
examined and stock upgraded to cater for multiple mobility scooters, walkers etc. An ageing population will also need age-related township infrastructure e.g. more seats, clear signage, and dedicated mobility scooter lanes.

(v) Most infrastructures are well managed

Most current infrastructures are fit for purpose, and have governance, planning, and funding processes in place (transport and the three waters are good examples). Where there are significant risks there are mitigation responses being developed or in place (such as the regional council flood protection project, and the Lifelines Group formed under the Civil Defence and Emergency Management Act 2002. Some infrastructures have the potential to be significantly affected by natural hazards (e.g. port, petroleum distribution) and risk management plans are in place.

(vi) The affordability challenge – the need to innovate and collaborate

The government’s policies sometimes lend to centralisation, and elevated decision making to a national or regional scale with investment focused in main centres. This may exacerbate decline in rural populations, and lead to smaller rating bases in some communities which presents affordability challenges in the provision and maintenance of local infrastructure. The trend of drift from rural to urban is already underway and will lead to smaller and older, and usually fixed income, populations carrying the fixed as well as operating costs of core infrastructure and services.

The future challenge is affordability of delivering and maintaining an expected level of service from core public infrastructures such as waters and transport in the face of:

- changes in demand – population increasing in west, decreasing in east, combined with an ageing demographic;
- ageing assets leading to increased operating, maintenance and in turn replacement costs; and,
- increasing costs to keep up with regulation and environmental factors – including compliance, responding to the effects of climate change, and also potentially increased expectations as a result of co-management/co-governance models arising from settlement of Treaty of Waitangi claims.

The affordability challenge is already evidenced in communities and infrastructures. Business as usual business models may not be sufficient or an option for managing costs in the medium- to long-term for some local authorities. Collaborative service delivery models have the potential to improve customer value and mitigate costs. An example of this is a joint local government and NZ Transport Agency project underway to improve road maintenance efficiencies through a range of tactics including how assets are procured, managed, delivered and reported.

Cost pressures will become more pronounced over the coming years as fixed cost structures continue to rise and demographics change. The challenge will be to continuously improve and transition smoothly to different, fit-for-purpose, operating arrangements. It is unlikely that the (inevitable) long-term trends driving infrastructure demand can be reversed.
**Investment in new and innovative infrastructure solutions is required**

Investment will be required to address the current and future demographic and economic trends and to provide opportunities across the region (e.g. improved access to, and quality of, internet services and tertiary education facilities). In some instances a package of investment, might be an approach to provide synergy. A rural example could be high speed internet services, improved tertiary opportunities and business development mentoring. An urban example could be greater collaboration around tourism and airports and business development.

**Better and more consistent information supports effective investment decisions**

Effective infrastructure investment requires an evidence base that includes best estimate forecasts of future demand triggers for investment, and supports testing options and alternative courses of action to manage changes in demand.

Available infrastructure information is at widely varying levels of detail. There is a lack of comprehensive infrastructure planning, reporting and analysis at a regional level, with good information available at a project and district level where infrastructure is provided by local government. Although the picture is clear at an aggregate level, there are challenges when attempting to make comparisons between individual local authorities, private providers and central government. There is a need to have one comprehensive regional ‘infrastructure picture’ that clearly identifies critical infrastructure networks as well as planned and committed investment that can be used to enable joined-up decision-making on the priorities for future investment.
The table below (Table 1) provides a snapshot of opportunities and priorities for regional and local government leadership conversations that have come out of the infrastructure analysis.

<table>
<thead>
<tr>
<th>Infrastructure type</th>
<th>Challenge</th>
<th>Leadership role</th>
<th>Desired outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short Term</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airports</td>
<td>Collaboration to create overarching regional strategy</td>
<td>Influence</td>
<td>Maximise value from investment and services in the Bay</td>
</tr>
<tr>
<td>Flood protection works</td>
<td>Implement regional projects effectively</td>
<td>Decide</td>
<td>Intervention options and outcomes improved</td>
</tr>
<tr>
<td>Public transport</td>
<td>Ensure the public transport model plays its part in urban areas</td>
<td>Decide</td>
<td>Level of service provides choice and delivers target transport outcomes in RTP</td>
</tr>
<tr>
<td>Rail</td>
<td>Ensuring a sustainable business model</td>
<td>Influence</td>
<td>KiwiRail increases investment and services</td>
</tr>
<tr>
<td>Roading</td>
<td>Affordable safe and efficient movement of people and goods</td>
<td>Decide</td>
<td>Long-term regional direction for all transport, and prioritised RLTP activities using a one network approach</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>Targeted investment</td>
<td>Influence</td>
<td>Service improvements support regional growth needs</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Providing education opportunities that will support economic development</td>
<td>Decide and Influence</td>
<td>Effective implementation of BOP Tertiary Plan</td>
</tr>
<tr>
<td>Waters</td>
<td>Finding an affordable way to deliver an agreed level of service</td>
<td>Decide</td>
<td>Sustainable business model</td>
</tr>
<tr>
<td><strong>Medium Term</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td>Effective implementation of new health care model</td>
<td>Influence</td>
<td>Ensure new delivery model meets changing community needs</td>
</tr>
<tr>
<td>Waste</td>
<td>Increased efficiency and waste reduction</td>
<td>Decide</td>
<td>Consider long-term options for waste disposal</td>
</tr>
<tr>
<td><strong>Long Term</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Courts</td>
<td></td>
<td>Watch</td>
<td>Maintain level of service</td>
</tr>
<tr>
<td>Energy</td>
<td></td>
<td>Watch</td>
<td>Maintain level of service and security of electricity supply</td>
</tr>
<tr>
<td>Petroleum products</td>
<td></td>
<td>Watch</td>
<td>Emergency management/Lifelines plans refreshed</td>
</tr>
<tr>
<td>Ports</td>
<td></td>
<td>Watch</td>
<td>Transport and other planning is integrated with Port needs where appropriate</td>
</tr>
</tbody>
</table>
Contents

PART 1: INTRODUCTION AND CONTEXT ...................................................................................................... 11

1. Introduction ........................................................................................................................................... 13
   1.1 Scope of this report .......................................................................................................................... 13
   1.2 National context ............................................................................................................................. 14
   1.3 Regional context ............................................................................................................................. 15
   1.4 Inter-regional context ..................................................................................................................... 18

2 Infrastructure ........................................................................................................................................ 18
   2.1 Role of infrastructure ...................................................................................................................... 18
   2.2 Planning, funding and delivery ........................................................................................................ 19
   2.3 Demand .......................................................................................................................................... 19

3 Regional analysis .................................................................................................................................. 20
   3.1 Regionally significant infrastructure ............................................................................................. 20
   3.2 Need for better and more consistent information ........................................................................... 21

PART 2: INFRASTRUCTURE ASSESSMENTS .............................................................................................. 23

4. Airports .................................................................................................................................................. 25
5. Courts ................................................................................................................................................... 31
6. Energy ................................................................................................................................................... 34
7. Flood protection works ........................................................................................................................ 41
8. Hospitals ............................................................................................................................................... 46
9. Petroleum products (distribution and storage) .................................................................................. 51
10. Ports ................................................................................................................................................. 55
11. Public Transport ............................................................................................................................... 59
12. Rail ..................................................................................................................................................... 65
13. Roading .............................................................................................................................................. 72
14. Telecommunications .......................................................................................................................... 78
15. Tertiary education facilities .............................................................................................................. 83
16. Waste facilities .................................................................................................................................. 87
18. Water (wastewater, stormwater and water supply) ......................................................................... 92

PART 3: APPENDICES ............................................................................................................................... 101

   National Infrastructure Plan 2011 – guiding principles and challenges .............................................. 103
   Analysis of significance of infrastructure ............................................................................................ 102
   Assessment matrix ................................................................................................................................ 104
   Bay of Plenty electricity generation, transmission and distribution ...................................................... 111
   Rural broadband and wireless coverage ............................................................................................... 112
PART 1: INTRODUCTION AND CONTEXT
1. **Introduction**

This document was prepared by the NZ Transport Agency for Invest BOP to inform the development of a Regional Spatial Plan for the Bay of Plenty.

Two core drivers of (changes in) demand for infrastructure are population and the economy. There are a number of technical reports prepared for Invest BOP that address these two demand drivers, and other topics, and those reports have implications for infrastructures. This report does not integrate the information from other technical reports, rather the spatial plan will include relevant and integrated information on infrastructures.

1.1 **Scope of this report**

This document provides a desk top assessment of regionally significant infrastructure at a regional network scale, rather than on individual assets. This regional approach aids in identifying and assessing how the region is serviced as a whole, and within the national context. This analysis incorporates information from Tauranga City, Western Bay of Plenty, Rotorua, Whakatāne, Kawerau and Ōpōtiki Districts and considers Taupō District as appropriate. The report also includes a cross-regional perspective, recognising infrastructures are often networks that cross boundaries.

Fourteen infrastructure types were assessed as being significant to the region, and the results of the assessment are reported in Part 2 of this report. The rationale for including these 14 types is discussed further in Part 3 (Appendix 1). There are local infrastructures that have not been included in this assessment, yet they could have significant impacts on quality of life for communities. These could include economic development opportunities.

1.1.1 **Methodology and limitations**

The report was prepared by undertaking desk-top analysis of existing information using a regional network perspective to assess each infrastructure. Existing literature was reviewed to identify the current state, future pressures and potential issues and opportunities for each infrastructure type, and identify particular linkages/dependencies. A 30-year planning horizon was generally adopted. Each infrastructure assessment was tested in project team workshops and by peer review.

It is important to note that no original research was undertaken as part of this analysis and the accuracy of the conclusions of the referenced reports was relied on. Gaps in information have been recognised, it is difficult to fully compare information for each infrastructure due to different legislation, scales, organisations and widely different infrastructure types.

An explanation of the assessment approach and summary assessment rating is provided in the table below (Table 2). Consistent with the scope of the report, the assessments are at a regional scale. There will be differences in assessment at a sub-regional or local level of detail. For example, trends in one part of the region may lead to a negative impact and assessment rating although at an overall regional scale the assessment is positive.
Table 2: Summary of assessment approach and explanation

<table>
<thead>
<tr>
<th>Assessment approach</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Extent that infrastructure is fit for current purpose and enduring.</td>
</tr>
<tr>
<td>Trend</td>
<td>Outlook based on forecast pressure from drivers of change on future demand, and ability to meet changes in demand.</td>
</tr>
<tr>
<td>Risks</td>
<td>Extent to which governance and management mechanisms are in place to manage future demand and meet agreed expectations. Extent to which corrective action is required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment rating</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Acceptable performance, and appropriate governance management and operational regimes in place to manage current and reasonably forecast changes in demand and supply.</td>
</tr>
<tr>
<td>Orange</td>
<td>Watching brief required on data and/or inter-relationships with other external influences on demand in all or parts of the region.</td>
</tr>
<tr>
<td>Red</td>
<td>Uncertainty that supply will continue to meet forecast changes in demand. Short term risk of failure or inability to meet demand, urgent response (e.g. planning/investment) required.</td>
</tr>
</tbody>
</table>

1.2 National context

A number of government reports have been written in recent times relevant to infrastructure, including the National Infrastructure Plan (NIP)\(^5\) and Local Government Infrastructure Efficiency Expert Advisory Group (LGIEEAG) report\(^6\). Some are more general, addressing topics such as the fiscal challenges facing New Zealand, and the opportunities as well as costs associated with an ageing population. The LGIEEAG March 2013 report provides a good summary of what is driving change in local government delivery of infrastructure. A 2013 Treasury report\(^7\) identifies that “On average we will be healthier, richer, and will live longer in the future. But the future will also require some adjustments. Population ageing, rising demand for certain services and increasing prices means that some things that the government provides will become more expensive – indeed this process has already started”. Another 2013 report\(^8\) identifies that “When an increasing proportion of the population is on a fixed income, local authorities with the oldest populations are more likely

\(^{5}\) National Infrastructure Plan 2011, National Infrastructure Unit.
\(^{7}\) Affording Our Future: Statement on New Zealand’s Long-term Fiscal Position (July 2013), Treasury.
\(^{8}\) Using the United Nations’ Madrid indicators to better understand our ageing population (October 2013), Controller and Auditor-General.
to be the first to face challenges in paying for community services and maintaining, repairing, and replacing infrastructure.” This outlook will be even more challenging for rural communities.

In February 2014, the National Infrastructure Unit published the first cross sector infrastructure evidence base. This evidence base responds to a major constraint identified in the 2011 National Infrastructure Plan regarding lack of data to assess the performance of New Zealand infrastructure. It has been compiled using publicly available information and discussions with infrastructure sectors. The aim is to see infrastructure becoming increasingly joined up, with improved coordination and a reduction in barriers between sectors. The NIP sets out a vision that, by 2030, “New Zealand’s infrastructure is resilient and coordinated and contributes to economic growth and increased quality of life.” It supports this through promotion of better use of existing assets and better allocation of new investment. The NIP sets out guiding principles to respond to infrastructure challenges, which have relevance to decision making at a regional (and local) scale, and key challenges for the country’s infrastructure networks (Appendix 2). The preparation of regional spatial plans builds on this aim for integrated infrastructure planning.

Although Auckland is the only region in New Zealand that has been legislatively required to prepare a spatial plan, Waikato (under direction of the Mayoral Forum) is also in the initial stages of developing a plan. Alignment between the Auckland, Waikato and Bay of Plenty plans and the evidence and assumptions that underpin them is critical to ensure they are complementary documents that tell a coherent upper North Island story.

In addition to spatial planning, all local authorities will soon be required to prepare 30-year infrastructure plans as part of proposed changes to local government legislation. This infrastructure analysis provides high-level guidance for these local plans, and uses an agreed evidence base to ensure alignment between territorial authorities.

It should be noted that to date there has been little or no focus on infrastructure “futures” given projected demographic changes and attendant changing levels of service needs.

1.3 Regional context
There are a number of issues or trends identified that will or have the potential to affect infrastructure provision and management in the region into the future. These are:

- Demographic trends (urban growth and rural decline; an ageing population; population growth in the west and decline in the east)
- Socioeconomics (employment and wealth disparities);
- Natural hazards and climate change.

1.3.1 Demographic trends
The Bay of Plenty’s resident population grew by 4 percent between 2006 and 2013. Population growth has been concentrated in Tauranga City, and the Western Bay of Plenty District. Population projections indicate continued growth in the largest metropolitan areas of Tauranga and Western

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10 BERL, Analysis of Bay of Plenty Employment and Skills, May 2014
Bay of Plenty District from 2016 to 2033; growth for Rotorua until 2027, then decline; and decline elsewhere in eastern areas (Whakatāne, Kawerau and Ōpōtiki Districts).¹¹

There are three key demographic trends/characteristics in the region which impact infrastructure:

1. **Structural ageing – ageing population and declining child-youth population**

   Projections show that the Bay of Plenty will be faced with a rapidly increasing, and proportionally older population over the next 30 years. Throughout the region (except Tauranga) the child-youth population is declining. Fewer younger people are coming through to replace the ageing baby boomers meaning a smaller labour force is available with a likely corresponding reduction in unemployment.

   With an emphasis on the importance of ‘ageing in place’ and building healthy communities, an ageing population has implications for infrastructure relating to the shape of demand, particularly access by older people to community services, events and transport networks.

   The implications of a smaller proportion of child-youth particularly in the east on infrastructure could mean the potential for more school amalgamations or closures.

2. **Māori Youth**

   Māori aged 15-24 years now account for almost 40% of all Bay of Plenty labour market entrants (and are also most represented in growth in unemployed statistics). Their percentage of the population is anticipated to grow more significant with time.¹² The economic success of the region is directly linked to utilising Māori youth to address the predicted labour force shortages. Infrastructure needed to enable this to occur includes the new tertiary facility proposed for Tauranga.

3. **Population growth and decline**

   With predicted population growth only in the metropolitan areas and decline elsewhere in the region, key implications for infrastructure are:

   - The provision of connections between affordable housing areas and the main centres, and providing access and reliable telecommunications to rural and/or remote areas.
   - Over capacity in depopulated areas drives down private and public investment in capital and infrastructure, leads to decreases in land and building occupation levels as residential properties, public buildings and offices are abandoned. Or the closure of public facilities such as schools due to reduced demand and consequent increases in consumption of fuels in transportation to access alternatives.¹³

### 1.3.2 Socioeconomics

A large proportion of the eastern Bay of Plenty region is over represented in the ‘most deprived’ deprivation index category.¹⁴ Other pockets of the region, including Matakana Island, also fall

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¹² BERL, Analysis of Bay of Plenty Employment and Skills, May 2014
¹³ NIDEA, Some information considerations on the implications of projected demographic change for the Bay of Plenty’s SmartGrowth Strategy, May 2014.
within this category. This means that these communities are the most vulnerable in terms of socioeconomic deprivation (based on car and telephone access, receipt of means-tested benefits, unemployment, household income, sole parenting, educational qualifications, home ownership and home living space).

In 2013 there were 118,136 people employed and 11,597 unemployed (a rate of 8.9%) in the region. Māori have a higher unemployment rate of 19%, compared to non-Māori 5.9%, and the labour force is relatively old with 40% of people aged 50 years or older.

Implications for infrastructure include:

- An opportunity to invest in social infrastructure in the east to tap into unemployed, particularly young Māori.
- The importance of stable and reliable telecommunications, roads and public transport to link the east with main centres.
- Implications raised earlier regarding over capacity in depopulated areas.

1.3.3 Natural hazards and climate change

Individually and collectively the potential for natural hazard events and the expected effects of climate change in the region need to be considered in any strategic analysis and future infrastructure investment. Experiences in Canterbury in recent years have demonstrated the severe disruption that can be caused when infrastructure is damaged or destroyed.

1.3.3.1 Natural hazards

The Bay of Plenty is exposed to a wide variety of hazards, including volcanic eruptions, earthquakes, coastal erosion and inundation, tsunami and flooding. Hazards can result in loss of life; disruption to lifelines and services, such as power, water and telecommunications; loss of medical facilities and over extension of emergency services; loss of assets, disrupted economies and delays in service/product provision; inability to access food supplies; severe public health issues; and disruption of society (employment, education, housing). The impact of any or a combination of the above on the social and economic wellbeing of the region’s communities may be significant.

Features of the region which contribute to its vulnerability to hazards include:

- Parts of the region are below sea level (in part due to the 1987 Edgecumbe earthquake) and so are particularly vulnerable to flooding.
- The region is bisected by the Taupō Volcanic Zone, an area of significant volcanic, seismic and geothermal activity, and also includes Mayor Island, a quiescent explosive volcano. The region may also be affected by eruptions occurring in other volcanic centres such as Taupō, Taranaki, Tongariro National Park, Auckland and Kermadecs, as well as submarine and island volcanoes to the northeast of White Island.
- The region is one of the most seismically active areas of New Zealand, particularly in the area encompassed by the Taupō Volcanic Zone and the North Island Shear Belt. The region is also vulnerable to earthquakes occurring outside the region (such as within the Hauraki Rift Zone, west of the Kaimai Range).
- New Zealand is vulnerable to a range of climate conditions with potential to create weather hazards due to its mid-ocean geographical position between the sub-tropical and mid-
latitude belts and landmass structure. Weather events having the greatest potential impact on the region are ex-tropical cyclones originating to the north of the country, bringing heavy rainfall and high winds.

- The region is exposed to coastal hazards over a significant proportion of the coastline. Severe weather events may result in storm surge, and tsunami may be generated from a number of local or distant sources. (Bay of Plenty Civil Defence Emergency Management Group, 2008).

Seismic strengthening requirements for existing infrastructure may place an immediate pressure on maintenance funding that has not been anticipated in asset management plans such as in the courts and tertiary education sectors\(^\text{16}\).

1.3.3.2 Climate change
As this century unfolds, the Bay of Plenty climate will change. As temperatures rise, scientists expect New Zealand’s wind patterns to shift, which will also affect future rainfall. This is likely to have implications for resilience of infrastructures such as water and transport – which are affected by too much and too little rain.

1.4 Inter-regional context
The main focus of this analysis is on infrastructure that lies within the regional administrative boundary. However, infrastructure networks do not stop at territorial or regional boundaries, and in order to plan for them effectively, networks must be viewed as a whole. The spatial plan will take a high level view of critical networks and priorities in order to understand inter-relationships. The detail of individual pieces of infrastructure are already well captured in local planning documents and asset management plans, and therefore are not included within this report.

There are collaborative processes already in place that consider planning and management of infrastructure at a regional or sub-national scale. Relevant groups within the region are listed below:

- Upper North Island Strategic Alliance (UNISA)
- Local Government Infrastructure Efficiency Expert Advisory Group (EAG)
- Bay of Plenty Regional Transport Committee (RTC)
- Bay of Plenty Tertiary Partnership
- SmartGrowth
- Civil Defence Emergency Management Group (CDEMG) – Bay of Plenty.

2 Infrastructure

2.1 Role of infrastructure
Every New Zealander uses infrastructure on a daily basis. The National Infrastructure Plan (NIP) defines infrastructure as the fixed, long-lived structures that facilitate the production of goods and services and underpin many aspects of quality of life.

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\(^{16}\) The effect of an earthquake on the justice system is discussed in the NZ Ministry of Justice 2013 Annual Report.
Infrastructure is important for the services it provides rather than for its own sake. Well-chosen and operated infrastructure can bring benefits that extend for many generations. But infrastructure is expensive to build and maintain, and the current period of fiscal pressure makes it more important than ever that infrastructure investment is based on quality not quantity. Responsibility for infrastructure differs between assets, between different parts of the same networks, and between networks. There is also a mix of public/private infrastructure, and a variety of governing legislation, leading to different drivers and mandates.

Resilient, effective, efficient and coordinated infrastructure networks are vital to a well-running economy. It enables the movement of people, goods and information around the country and around the world. They service housing and households, support the quality of life within communities and connect those communities with each other and the rest of the world.

Effective transport networks, including roads, rail, public transport, ports and airports, enable businesses to get their goods to markets while enabling employees to get to work, students to get to school, visitors to reach destinations, and people to access goods and services. Transport relies on fuel. Businesses and households depend on energy transmission that is reliable and safe. Quality telecommunication networks allow fast and efficient transmission of data and information, connecting buyers and sellers and enabling informed decisions. Water is critical for everyone, including primary industries and many manufacturing processes. Hospitals, courts and education facilities are essential components of society.

2.2 Planning, funding and delivery

Infrastructure is planned, funded and operated by a number of organisations both nationally and locally, from central and local government, to state-owned enterprises and the private sector. These are highly complex tasks which create coordination challenges within and between central and local government and the private sector. Increased attention to integrated planning is required to improve outcomes. This requires planning that cross sectors and jurisdictional boundaries.

The large number of organisations that are involved in infrastructure provision and operations within the region indicates the need to enhance relationships within and across infrastructure sectors. This is already happening through a number of channels; groups such as the Upper North Island Strategic Alliance (UNISA) have been created to address cross-boundary issues and a number of workstreams are either planned or currently underway. Effective planning addresses how individual projects contribute to the wider infrastructure network.

2.3 Demand

Two key drivers of demand for infrastructure are population and economy. As the population has grown the settlement pattern places pressure on the type of infrastructure required and where it is located. Likewise, the growth and the changing makeup of the economy has placed pressure on key infrastructure networks and changed the mix of services required from infrastructure. When population or business declines this also places pressure on the sustainability of levels of service.

Effective planning includes applying understanding of the implications of changing demand and the future options available, with sufficient lead time to plan and implement infrastructure projects at the right time.
Technological advances also lead to changes in demand. For example, changes in telecommunications over the past two decades, including the increasing use of mobile technologies, leading to growing expectations around internet speed and availability. This also can have a displacement effect such as people can sometimes substitute the internet for the need to travel, study or shop. Environmental sustainability can also influence demand. For example, there is a push for cleaner energy and greater energy efficiency linked to climate change concerns.

3 Regional analysis

3.1 Regionally significant infrastructure

From a regional perspective, infrastructure has different levels of significance. Some is important to local communities, while some will be significant to the entire region. Regionally significant infrastructure is likely to provide regional benefit, such as a major road, grid connection or water supply point, as opposed to providing benefits only in the immediate locality. Some is also going to be nationally significant. For example, the regional portion of national networks such as the state highways has an important national function in the movement of people and goods.

The regional-scale focus assesses infrastructure at a network scale, rather than on individual assets. This approach aids identifying and assessing how the region is serviced as a whole, and within the national context. It also supports conversations about collaboration and alternative business models where appropriate, to ensure investment is prioritised and the region is competitive. Infrastructure provision and maintenance often represents a substantial cost to taxpayers/ratepayers, and there are potentially significant savings to be made by taking a strategic view across the region (as well as outside), to identify what is really needed, where, and when.

Regional-scale assessment and planning enables economies of scale to be identified, resources to be shared, and more efficient and effective functioning of infrastructure through removal of barriers, enhancement of linkages, and targeted investment.

For the purposes of this report “Regionally significant infrastructure” is defined as lifeline utility infrastructure and infrastructure fundamental to the long term wellbeing of the community as shown in the diagram below:

The Bay of Plenty Civil Defence Emergency Management Group Plan identifies lifeline utilities that are “essential to the functioning” of the region. For the purposes of the infrastructure workstream,

17 Bay of Plenty Civil Defence Emergency Management Group Plan, 2012-2017, pg 87
these were automatically included in this assessment as being regionally significant infrastructure, on the grounds that they are an immediate community requirement, essential for the functioning of a society and economy. Destruction or significant disruption of this infrastructure would have serious consequences for the health and safety, security and social and economic wellbeing of the Bay of Plenty region.

The infrastructure types meeting this definition are:

- Airports
- Energy
- Petroleum products (distribution and storage)
- Tauranga Port
- Rail
- Road networks
- Telecommunications
- Water (wastewater, stormwater and water supply).

Other infrastructure types were considered as to whether they support services fundamental to the long-term wellbeing of the community, and contribute to the Bay of Plenty’s liveability. An additional consideration was whether they require a multi-agency approach to address any issues that arise and affect more than one territorial area (further detail in Appendix 2). An additional six infrastructure types were included based on this further analysis:

- Courts
- Flood protection works
- Hospitals
- Public transport
- Tertiary education facilities
- Waste facilities

Appendix 3 contains the assessments for each of these fourteen infrastructure topics which are also summarised in each infrastructure’s overview traffic signals.

3.2 Need for better and more consistent information

In the collation of information for this document, it was identified that available infrastructure information is at widely varying levels of detail. Although the picture is clear at an aggregate level, there is a lack of comprehensive infrastructure planning, reporting and analysis at a regional level. Good information is available at a project and district level where infrastructure is provided by local government. There is a need to have one comprehensive regional ‘infrastructure picture’ that clearly identifies critical infrastructure networks as well as planned and committed investment that can be used to enable joined up decision making on the priorities for future investment.

At present there is a lack of comparative data that resulted from inconsistencies in reporting outside of the five main types of infrastructure (roading, sewerage, water supply, stormwater and flood
protection)\textsuperscript{18}. However, from 2015 Councils will be required to provide standardised reporting on the five main types of infrastructure, which will make it easier to benchmark and compare these infrastructures across the region.

There will still be variances between Council led infrastructure and other infrastructures which is a result of the varied nature and scale of each infrastructure, making it difficult to compare infrastructure types and the actual and proposed spending. These circumstances need to be kept in mind when considering the expenditure of each infrastructure.

The breakdown of spending and reporting differs markedly between the various infrastructure providers in their planning documents. There is scope to align these planning and reporting methods in the future to enable robust and accurate comparisons to be made and to enable information to be lined up not only between councils, but with central government and the private sector.

\textsuperscript{18} Local Government Infrastructure Efficiency Expert Advisory Group, March 2013, pg 24
PART 2: INFRASTRUCTURE ASSESSMENTS
4. Airports

4.1. Regional overview
This chapter covers commercial airports in the Bay of Plenty, as well as Taupō Airport which sits just outside the region. There are a number of smaller airfields within the region that have not been included.

Currently the airports operate as individual business units with some collaboration. There are opportunities to reduce duplication of costs, roles and management if the airports choose to work more collaboratively.

The four commercial airports each have a different function with Tauranga having the most aircraft movements and passenger numbers, while Rotorua is the only trans-Tasman jet capable commercial airport in the region.

The potential retirement of the Beech fleet will have an impact on all of the airports and in particular on Whakatāne and Taupō airports as they will require significant upgrades if they plan to accommodate larger aircraft. It is questionable whether sufficient demand exists in these centres to economically fill larger aircraft.

The sustainable growth of aviation in the region is closely linked with economic development, population growth and tourism.
4.2. Context

4.2.1. Why are airports important?

Air transport is important for economic competitiveness because it brings people and firms together. The evidence shows that even as the world becomes more digitally connected, face-to-face relationships will underpin future economic advantage.\(^{19}\) Air services are vital to New Zealand’s economy with almost all tourist arrivals, and 14% of exports by value being carried by air. Additional air services to New Zealand can make a significant contribution to economic growth. Within the Bay of Plenty, commercial airports operate in Rotorua, Tauranga and Whakatāne, with Rotorua being the only fully trans-Tasman jet capable regional airport. Taupō also has an airport that has relevance to the Bay of Plenty region just eight kilometres beyond the regional boundary.

Overall, the Bay of Plenty represents a small part of the national air transport system. Each commercial airport fulfils a different function. Tauranga caters mainly to business and domestic leisure and VFR (visiting friends and relatives) travel and general aviation; Rotorua to business/VFR and domestic and international visitors and general aviation; Taupō to business and general aviation; and Whakatāne to business travel. There is essentially no competition with Air New Zealand for commercial services into and out of each airport. It is important to note the importance of general aviation to all of the airports, for example Air NZ commercial flights account for approximately 10% of total air movements in Tauranga and 45% of total movements in Rotorua.\(^{20}\)

Tauranga Airport’s market share of domestic passengers has increased since 2009 while Rotorua’s share decreased in 2008 and then levelled out. The following graph illustrates the share of domestic passengers of each airport in 2012.\(^{21}\)\(^{22}\)

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\(^{19}\) NZ Core Cities Research Summary (2012) p15.

\(^{20}\) Bay of Plenty Regional Airport Feasibility Study (2006) p 11

\(^{21}\) Draft Bay of Plenty Aviation Stocktake, Background and Discussion Paper (Nov 2013)

\(^{22}\) Taupo Times, Numbers increase for airport (17 August 2012)
Rotorua is the only airport with international facilities and in 2012 it had 22,697 international passengers which was 10% of its total passenger numbers.

Into the future, the viable operation and sustainable growth of aviation in the region will be closely linked with economic development, population growth and tourism. Investment in airport infrastructure and airlines’ commercial decisions to operate services will be directly linked to the economic viability based on external demand.

4.2.2. Linkages

Each of the region’s airports has a different interface with surface transport modes. For example these include:

- Competition between air and road for domestic trips such as Auckland-Tauranga and Auckland-Rotorua trips. There is a large drive market between Auckland and Tauranga/Rotorua as door-to-door road travel times are not dissimilar to door-to-door times associated with air travel.
- Competition between the local airports for Wellington/Christchurch/Auckland trips. Some competition exists for travel between Tauranga/Rotorua and major domestic centres such as Wellington and Christchurch with travellers driving to Auckland airports to pick up services which offer more convenient schedules, greater frequency and, due to the competitive dynamics, significantly lower fares.
- Competition between air and the self-drive tourism market, particularly on the Auckland/Rotorua market.\(^{23}\)

4.2.3. Ownership and governance

Ownership of the region’s airports is a mix of council ownership (Tauranga and Rotorua) and joint ventures with the Crown (Taupō and Whakatāne).

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\(^{23}\) Bay of Plenty Regional Airport Feasibility Study (2006) p3.
4.2.4. Legislative and policy framework

4.2.1.1 National

The Civil Aviation Authority of New Zealand (CAA) is the regulating authority for aviation in NZ. It is a Crown entity responsible to the Minister of Transport and was established in 1992 by the Civil Aviation Act 1990. All Aerodrome operators within NZ are required to provide the necessary infrastructure and facilities for safe and efficient aircraft operations in line with CAA rules, policies and minimum standards.

Integral to aviation operations within NZ is Airways Corporation (Airways). Airways are New Zealand’s air navigation service provider. They control all major air movements within NZ’s 30 million km² of controlled airspace. Airways are a State Owned Enterprise, a fully-owned subsidiary of the NZ Government operating as a commercial business. Connecting New Zealand\textsuperscript{24} summarises the Government’s broad policy direction for the transport sector that includes key actions for the aviation sector.

The legislative/policy environment in which the region’s aviation industry operates appears to be fairly stable.

4.2.1.2 Regional

There is no one strategic plan, specific policy or guidance at a regional level. The Regional Policy Statement mentions that growth can be accommodated at airports within the region, but does not place any guidance on how this may occur. District plans provide some provision for planned airport development and manage surrounding land use.

4.3. Current state and future pressures, trends and planned responses

Each airport has a Master Plan which provides a long-term strategic direction for each airport. However, the plans do not consider potential synergies between other airports or transport modes and there is no analysis provided as to the potential viability of the plans.

Tauranga and Rotorua are currently controlled aerodromes, with no Airways presence at Taupō or Whakatāne due to their small size.

Rotorua is the only fully trans-Tasman jet capable international airport in the region and makes a significant contribution to the regional economy. It is restricted from any further runway extensions by the surrounding topography and land holdings. This limits the growth potential of the airport for increased and larger international flights.

Tauranga is the third busiest general aviation airport in New Zealand and a strategic decision has been made by the airport and its owners not to provide for international services\textsuperscript{25}. Any consideration of the operation of larger domestic jet variants would require some infrastructure upgrades. Restrictions on the further development of the airport include airport noise and adjoining elevated land to the southeast.

Whakatāne is a non-certified aerodrome and is limited to a maximum aeroplane seating capacity of 30 passengers. With the potential retirement of the Beech fleet the airport will need to be upgraded

\textsuperscript{24} Connecting New Zealand: a summary of the government’s policy direction for transport (2011), Ministry of Transport.
\textsuperscript{25} Tauranga City Airport Master Plan (2009).
if it is to meet requirements for larger aircraft, should Air NZ decide there is sufficient demand to warrant the introduction of larger aircraft.

Taupō Airport has an Air New Zealand Beechcraft service as well as a number of small business jet charters. It has accommodated larger domestic turboprop services in the past. There is a risk of reduced services when the Beech fleet is retired.

There is a potential need for future investment in additional infrastructure due to the pending retirement of the Beech aircraft and likely replacement with a larger aircraft.

4.4. Regional issues and opportunities

There appears to be a good understanding from each airport of their operations and their likely infrastructure needs over time. However, there is a lack of overarching regional coordination to provide guidance, and strategic, policy and advocacy support to the aviation industry in the region. There does not appear to be much shared understanding of growth projections which could lead to inconsistent approaches to planning and investing.  

It appears that developing stronger ties between the airports and agreeing a regional approach to airport strategic development would provide a sensible next step. This would allow the building of a consensus on how to approach aviation in the Bay of Plenty and an integrated approach to develop the infrastructure and complementary commercial operation in partnership with general aviation, passenger and freight operators, both domestic and international.

Rotorua

Due to its central location and large catchment, Rotorua is likely to remain popular as a regional airport and it has the added benefit of being a significant tourist destination. It is unlikely that domestic air travel between Auckland and Rotorua would be a commercially attractive option for the majority of operators or domestic tourists.

Anecdotally, there appears to be a market for connecting Auckland, Rotorua and Queenstown for international tourism, in particular from Australia in relation to adventure tourists. The proximity to Taupō also adds to the attraction of Rotorua as a tourist destination, which should further strengthen its tourism related passenger numbers. The attractiveness of Rotorua as a tourism destination also increases the likelihood that international flight numbers could be increased. Rotorua could be promoted and supported as the international airport in the region, due to the existing infrastructure and the strong tourism linkages and potential for growth. However, there are constraints on the size of aircraft that could use the runway.

Tauranga

The growth in population in and around Tauranga and the Western Bay of Plenty, and the Master Plan strategic direction would indicate that Tauranga Airport is likely to remain a regional airport servicing domestic routes, primarily between Tauranga and Auckland, Wellington and Christchurch. Initial growth in passenger numbers could be accommodated through increased services and larger aircraft, which are both within the capability of the current infrastructure. It is unlikely that

26 Draft Bay of Plenty Aviation Stocktake Background and Discussion Paper, (Nov 2013)
27 Draft Bay of Plenty Aviation Stocktake Background and Discussion Paper, (Nov 2013)
Tauranga would target international routes due to the infrastructure upgrades required and biosecurity risks.

**Whakatāne**

Whakatāne Airport is likely to remain a small regional airport or aerodrome. There is little population growth to justify infrastructure investment other than periodic upgrades to facilities. Initiatives to attract more tourism and holiday makers to the town may increase demand but it is anticipated that this can be catered for with the existing infrastructure and facilities. There is a risk to domestic operations around the ageing Beech aircraft fleet, which may result in a reduction of services or require investment in infrastructure.

**Taupō**

There is a risk of service frequencies reducing once the Beech fleet is retired.

### 4.4.1. Lack of a single strategic regional direction

Developing stronger ties between the airports and agreeing a regional strategic approach to airport development would provide an opportunity to lower costs, sharing specialisations and procurement. There is also potential from increased collaboration between the individual airports/districts for a combined regional tourism model. The current individual models result in duplication of costs, roles, and management etc without making the most of regional opportunities. In the development of an aviation stocktake undertaken in 2013, the CEOs of the respective airports agreed to further discussions to better understand these opportunities.28

Each commercial airport appears to have a well-considered and relevant master plan or business plan to develop at an appropriate speed and scale. However these have been developed in isolation and have limited consideration of the impacts on other regional airports or understanding of potential opportunities resulting from collaboration and co-operation across the region.

Overall each airport appears to have an understanding of the market it is serving and a change in these markets could accelerate or slow the need for each airport to invest in upgrades. Information regarding the commercial viability of each of the Master Plans was not available.

### 4.4.2. Potential for a single regional airport

A feasibility study undertaken in 2006 investigated the potential for replacing the region’s three commercial airports with one regional airport located at Paengaroa.29 Overall, it was found that the development was not warranted at that time due to capital costs of construction and land acquisition costs, but recommended a watching brief every 5 to 10 years. Factors that could improve the case for development of a regional airport include faster than forecast population growth or air traffic growth; increasing pressures on land use at existing airports; improvements in regional infrastructure; greater congestion at Auckland Airport and on traffic routes between Auckland and the Bay of Plenty; and changes in aircraft technology.

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28 Draft Bay of Plenty Aviation Stocktake, Background and Discussion Paper (Nov 2013)
29 Bay of Plenty Regional Airport Feasibility Study (Final Draft), 2006
5. Courts

5.1. Regional overview

This chapter covers those courts with dedicated infrastructure within the region, being the High Court, District Court and Māori Land Court. Other specialist courts and tribunals will sit within the region as required and often use the same facilities but do not have specific infrastructure associated with them and therefore have not been included.

There are no significant infrastructural issues for courts in the Bay of Plenty region.

Courts are managed by the Ministry of Justice. Management tends to have a national rather than regional focus. Infrastructure effectively consists of courthouses, although travelling courts may utilise other existing infrastructure suitable for conducting hearings etc. Generally, there is a lack of publicly available information about the quality of assets and services.

The Bay of Plenty does not have a correctional facility and there are no known plans to establish one.
5.2. Context

5.2.1. Why are courts important?
Court infrastructure has a key role in enabling justice services that maintain law and order in societies. A well-functioning justice system is critical for the social wellbeing of people, and inadequacies in the system result in low levels of business confidence and violations of basic human rights. Courts have a wide variety of roles including enforcing the criminal law, resolving civil disputes, upholding the rights of individuals, ensuring that government agencies stay within the law, and explaining the law. The courts are one of the three branches of government, working alongside but independently of the Legislature (Parliament) and the Executive (Cabinet and Ministers outside Cabinet plus government departments).

Independent, fair and efficient courts are an important cornerstone in our democracy. Courts underpin social stability. They give confidence that our rights as citizens can be upheld; that our differences and conflicts can be resolved through law; that those who interfere with our rights can be held to account; that our society can be protected from law breakers; and that the State can be required always to act lawfully.\(^\text{30}\)

5.2.2. Linkages
High Courts, District Courts and the Māori Land Court serve on a regional, sub-regional and district basis. Court infrastructure is dependent on the functioning of other infrastructure such as roading, airports, telecoms, electricity and water.

5.2.3. Ownership and governance
The court system is managed by the Ministry of Justice. A number of statutes govern the services, procedures and conduct in courts\(^\text{31}\). As is the case for the majority of social infrastructure, there is no statute or law that relates specifically to justice infrastructure.

5.2.4. Existing strategic investment signals/plans
Strategies and plans relating to court infrastructure have a national rather than regional focus. The main strategic document is the Annual Report prepared by the Ministry of Justice\(^\text{32}\). This sets out how courts are currently performing, as well as any future strategies to improve court services. The report has a much wider focus than infrastructure but parts relate directly to the provision and maintenance of infrastructure, including investment directions and technological upgrades.

5.3. Current state and future pressures, trends and planned responses

5.3.1. Capacity
The region contains two High Courts (Rotorua and Tauranga), four District Courts (Rotorua, Tauranga, Whakatāne and Ōpōtiki) and one Māori Land Court (Rotorua). At present, there are no correctional facilities located in the region. Higher courts and other specialist courts and tribunals do not have specific infrastructure within the region. Specialist courts such as the Environment Court may sit in the region as required, utilising existing infrastructure (courthouse or otherwise).

\(^\text{30}\) http://www.courts.govt.nz/about/system/role/overview
\(^\text{31}\) http://www.courts.govt.nz/
In terms of physical infrastructure, the courts generally consist of buildings that house courtrooms and administration activities. The High Courts in the region share infrastructure with the District Courts. The Māori Land Court in Rotorua has a separate building and services an area from Te Puke in the west across to Whangaparaoa in the east and inland to the western shores of Waikaremoana. Across to Taupō and Taumarunui at the southern end, heading north to Mangakino and Tīrau returning across the Mangorewa ranges to Te Puke.

There are no existing signals that court infrastructure in the Bay of Plenty region is unable to meet current levels of demand. However, the court system is generally under the pressure of budget constraints. Many social sectors either have insufficient information about asset capacity, or the quality of data available is inconsistent and varies across the region. As such, it is difficult to determine where infrastructure sits in terms of capacity

5.3.2. **Pressures and trends**

Courts are national assets, managed and funded nationally and delivered locally. Population changes and ageing infrastructure is likely to have impacts on infrastructure provision.

5.4. **Regional issues and opportunities**

There is effective national management of assets in place and capability to adjust level of services if required in the future. However, there does not appear to be a regional strategy for court (or prison) investment.

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6. Energy

6.1. Regional overview

This chapter covers electricity generation facilities as well as electricity and gas transmission and distribution infrastructure focusing on regional issues.

Most of the electricity generated within the region comes from small hydro schemes and geothermal stations. Recent significant investment has occurred in the high voltage National Grid and the local distribution networks, including the reinforcement of local transmission in the west of the region.

Demand in the region for energy (electricity and gas) has flattened in the last few years and is reasonably static due to declining industrial load, new consumer technologies and increasing energy efficiency. 34

Electricity transmission and distribution through planned optimisation, maintenance and upgrades will meet forecast demand and solve the grid related issues predicted to occur over the next 5-15 years, and there is adequate electricity capacity to supply the Bay of Plenty’s regional load for the next 20-30 years. 35

The government has a strong focus on renewable energy, and the region has substantial geothermal energy opportunities particularly with iwi.

35 Transpower, Transpower Annual Planning Report 2014
6.2. Context

6.2.1. Why is energy infrastructure important?
Our economy and society are fundamentally dependent on energy to power households, work places, communication technologies, other infrastructures and industry. Energy plays a critical role in everyday life.

Natural gas is currently used for generation of electricity at Edgecumbe, but most gas in the region is used for the production of heat.

6.2.2. Linkages
The Bay of Plenty region is reliant on electricity imported from National Grid connections located in the Waikato region. There is ongoing demand for bottled liquefied petroleum gas (LPG), for businesses and homes throughout the region.

6.2.3. Ownership and governance
The New Zealand Electricity Authority (NZEA) is an independent Crown entity responsible for the efficient operation of, competition in, and reliable supply by the New Zealand electricity industry. Transpower as system operator manages the electricity system to ensure generation matches demand. The Ministry of Business, Innovation and Employment (MBIE) advises the government on energy supply and demand, energy efficiency, conservation and the use of renewable energy sources. The Energy Efficiency and Conservation Authority (EECA) promotes energy efficiency, energy conservation, and the use of renewable sources of energy in a sustainable manner.

The Ministry for the Environment is also involved in the energy sector, including through the development of national instruments and guidance, including the National Policy Statement on Electricity Transmission, National Policy Statement for Renewable Electricity Generation and National Environmental Standards for Electricity Transmission Activities.

Gas is sourced from Maui, Kupe, Pohukura and Kapuni fields among others, from producers (e.g. Todd Taranaki), through wholesalers (e.g. Vector/Todd Energy) to transmitters (e.g. Vector), and distributors (e.g. Vector in the Bay of Plenty) to retailers (Nova, Genesis and TrustPower).

Electricity within the region is generated from a number of sources (Figure 2) – predominantly hydro generation schemes (Kaimai, Matahina, Wheao & Flaxy) owned and operated by TrustPower, with one scheme (Aniwhenua) owned by Todd Energy. Other electricity sources in the region include geothermal power stations (owned by Mighty River Power, Nova Energy, Norske

Figure 2: Location of electricity generators in the Bay of Plenty
Skog Tasman and the Eastland Group), co-generation plants (owned by Carter Holt Harvey, Norske Skog Tasman and Nova Energy) and a gas power station.

The national electricity transmission system (Figure 2) is owned and operated by Transpower New Zealand Limited, a state-owned enterprise. Transpower have approximately 13 substations interconnected through 110kV and 220kV networks in the region and a single 50kV circuit between Waiotahi and Te Kaha.

Electricity in the Bay is distributed from the National Grid by one of three regional lines companies: Powerco to the west, Unison Networks centrally through Rotorua, and Horizons Energy Distribution Limited in the east; or directly to large industrial users Carter Holt Harvey and Norske Skog as shown in Appendix 4.

There are 11 electricity retail companies in the region: TrustPower, Contact, Mercury Energy, Genesis, Energy Online, Nova Energy, Meridian, Tiny Mighty Power, Just Energy, Power Shop, Pulse and Budgie Power.36

6.2.4. Existing strategic investment signals/plans

The national target for electricity generation from renewable sources is 90% by 2025. The New Zealand Energy Strategy 2011-2021 sets the strategic direction for the energy sector and the role energy will play in the New Zealand economy.37

The New Zealand Energy Efficiency and Conservation Strategy 2011 – 2016 is specifically focused on the promotion of energy efficiency, energy conservation and renewable energy.

Regional and sector

The proposed Bay of Plenty Regional Policy Statement identifies the importance of the development, operation, maintenance and upgrading of new and existing electricity generation facilities being of regional and national significance. National and regional energy priorities highlighted include: security of supply, increasing use of renewable energy, and using energy more efficiently.

Bay of Connections (BOC) is an economic development strategy for the region, which is designed to encourage economic growth in the Bay of Plenty through the creation of quality jobs. The Energy Strategy, one of six BOC sector strategies, provides direction for the region’s energy sector. The strategy is currently being updated. The Bay of Connections Action Plan 2011 identifies

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36 What’s my number http://whatsmynumber.org.nz/RetailersInYourArea
37 http://www.med.govt.nz/sectors-industries/energy/strategies
opportunities including the aim to be 100% self-sufficient with secure grid strength; and to become a net exporter of electricity.

6.3. Current state and future pressures, trends and planned responses

6.3.1. Capacity

The Transpower Annual Report 2014 predicts electricity demand for the Bay of Plenty region to grow on average by 1.2% annually over the next 15 years, from 440MW in 2014 to 530MW by 2029. The Bay of Plenty region’s generation capacity is approximately 365MW. The region’s generation is lower than maximum local demand, with the deficit imported through the National Grid during peak load conditions, and any surplus exported during light load conditions.38

Recent upgrades to both National Grid transmission and the local distribution infrastructure (including the reinforcement of local transmission in the west of the region) means future electricity demands will or are planned to be met through optimisation, maintenance and upgrades predicted to occur over the next 5-15 years, and there is regional load capacity for the next 20-30 years.39

There is an extensive piped-gas distribution network that supplies natural gas throughout the region (Figure 3). The Vector line originally built in 1968/69 to transport gas from the Kapuni field in South Taranaki to Auckland and Wellington was extended to Tauranga in 1982 during the substantial gas system expansion. Approximately 8,433,746 GJ of gas was conveyed along the Bay of Plenty pipeline in 2011 at an 82% load factor and making up 2.6% of the national share.40 The proportion of gas conveyed has declined, however the transmission network will require upgrades to maintain throughput. The main critical point limiting throughput for the majority of the region is Pokuru compressor station which repumps pressure so gas can travel longer distances, and the Rotorua and Tauranga laterals (lines branching off the main line to a dead end). In order to resolve these issues, it is proposed to upgrade Pokuru and to loop (or connect) Rotorua and Tauranga to make a circuit.

6.3.2. Pressures and trends

A summary of key Bay of Plenty pressures and trends which will affect infrastructure is provided below:

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38 Transpower Annual Report 2014
39 Transpower, Transpower Annual Planning Report 2014
• New consumer technologies, increasing energy efficiency and declining industrial load (predominantly due to a Norske Skog Tasman mill shutting down) has flattened electricity and gas demand in the region in the last eight years and it is now reasonably static.  

• Increased priority and demand for more sustainable sectors is expected to grow over the next 20 years. The priority will be on providing renewable energy and reducing dependency on non-renewable fuels. Most new large scale generation investments being considered are mainly focused on renewable energy such as wind, hydro, and geothermal. 

• Increasing population growth in Tauranga and the Western Bay of Plenty areas. This will be addressed by planned investment in two new substations.

• Predicted future industrial electricity demand is unclear, there are two schools of thought: the situation could remain the same over the next 5-10 years; or peak demand growth could be back in the next five years or less.

• The gas market (both supply and demand) has declined due to reduced overall field production, and changes in demand e.g. capacity scarcity on Vector’s north pipeline.

6.3.3. Future plans
Transpower and electricity distribution companies (Powerco, Unison Networks and Horizon Energy Distribution Limited), and gas distributor Vector’s planned transmission infrastructure optimisation, maintenance and upgrades (outlined in annual plans and asset management plans) will meet forecast demand and solve the grid related issues predicted to occur over the next 5-15 years.

6.4. Regional issues and options
6.4.1. Issues
A summary of regional issues and solutions are provided below:

• A potential long term issue is the level of service and security of electricity supply for the region as a result of load growth in Tauranga. The region is predominantly supplied by both of the 220 kV Atiamuri–Whakamaru and Ohakuri–Wairakei circuits which connect the region to the rest of the National Grid. If one of these circuits is out of service the region will be on ‘N security’ (a lower level of security where some major assets are not duplicated and customers endure more outages as a result). While the Transpower Annual Planning Report 2014 indicates that no firm options have been developed for the Bay of Plenty region in the longer term (over 20 years), one possible development to address this issue is a connection from north of Tauranga to the existing Waihou substation in the Waikato region. 

• The National Grid limited transmission capacity into and around Rotorua. Transpower is currently discussing options to address this with Unison, including line upgrades between Tarukenga and Rotorua, and/or increased supply transformer capacity at Tauranga and/or Owhata.

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41 Pers com Simon Clarke TrustPower 13/6/2014
42 Bay of Plenty Regional Council, Proposed Bay of Plenty Regional Policy Statement 2013
43 Transpower, Transpower Annual Planning Report 2014
44 Transpower, Transpower Annual Planning Report 2014
• Potential overloading of the National Grid transmission lines at Mount Maunganui. To resolve this Transpower is currently discussing options with Powerco to transfer the load in the Papamoa area to Te Matai.  

• If peak industry growth demand returns in the next five years then additional work on the Kawerau and Edgecumbe 220/110kV interconnecting transformer will be required to increase capacity in the medium term. 

• There is a single Transpower 50kV line located predominantly in a coastal environment between Waiotahi and Te Kaha, which is subject to accelerated rates of corrosion and degradation of the conductors and transformers. Electricity supply to Te Kaha substation poses a particular challenge, with reliability and remoteness issues. Horizon Energy Limited has a set maintenance allocation for the 11kV Te Kaha network budgeted each year to enable the progressive upgrade and replacement of sections of the lines to improve reliability. 

6.4.2. Opportunities

There is significant potential for geothermal and hydroelectric power generation in the region, and iwi have major land holdings with geothermal opportunities. It is anticipated that geothermal resources from the region will significantly contribute to meeting New Zealand’s future energy demand.

Other potential future renewable energy resources for the region include biomass and solar (including water heating and electricity generation). If alternative renewable energy sources generate significant amounts of electricity then a staged National Grid transmission capacity upgrade will be required. 

While currently tidal and wind are not regarded as being significant renewable energy sources in the Bay of Plenty region, they may become economically viable in the future. In 2008 a feasibility study was completed to assess the viability of installing wind generation at East Cape. The study summarised that although there was likely to be sufficient wind to support power generation development, the costs of getting sufficient line capacity to get the power out made the project uneconomic. There is potential for small scale developments, up to 200kW, which could be embedded into a distribution network. 

Other opportunities involve emerging technology which provides better energy consumption information including:

45 Transpower, Transpower Annual Planning Report 2014
46 Transpower, Transpower Annual Planning Report 2014
47 Horizon Energy Asset Management Plan 2014-2024
48 Bay of Plenty Regional Council, Proposed Bay of Plenty Regional Policy Statement 2013
49 Transpower, Transpower Annual Planning Report 2014
50 Bay of Plenty Regional Council, Proposed Bay of Plenty Regional Policy Statement 2013
51 Horizon Energy Asset Management Plan 2014-2024
- Smart Grids - modernised electrical grids that use information and communication technology to gather and act on information in an automated way to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity.

- Smart meters - an electronic device that records consumption of electric energy at regular intervals and communicates that information back to the utility for monitoring and billing purposes. Smart meters enable two-way communication between the meter and the central system.
7. Flood protection works

7.1. Regional overview

This chapter considers those works designed to avoid/minimise the occurrence/severity of (potential) flood events. The focus is on defence infrastructure rather than response or recovery. Coastal defences have not been included as there is no comprehensive information available, presumably as these are for local benefit and under various ownership/management meaning they do not meet the regionally significant criteria.

Flood protection works are important elements of the region’s infrastructure, protecting other infrastructure, people and property throughout the region. The five major rivers and drainage schemes cover much of the region.

Assets are largely owned and managed by the regional council, though there are also private and district/city council assets. Infrastructure is designed to provide an agreed level of service, which is generally met at present.

The key issue in the future will be accommodating the effects of climate change, including increased high intensity and frequency of rainfall events. Significant works are required just to maintain the current levels of service. Management of residual risk will become increasingly significant over time as it becomes unfeasible to maintain the same levels of service.

Conflicts between expected levels of service in the future and affordability of flood protection infrastructure need to be addressed in a long-term strategy. This will require coordination between a variety of agencies and should include working to transition communities, ensuring they understand residual risk and the long-term strategy for different areas (which may potentially include abandonment). It should incorporate stormwater systems and other defence structures (e.g. coastal defences), as well as other hazard infrastructure, such as warning systems, with a focus on risk.
7.2. Context

7.2.1. Why are flood protection works important?
The Bay of Plenty is exposed to a wide variety of hazards which have the potential to significantly impact on the social and economic wellbeing of the region.

Flood protection in particular is important to: protect productive agricultural land, important infrastructure (including roads, hospitals, wastewater facilities, water supplies), and urban areas; provide security, and reduce risk, to existing economic and social developments; protect productive soils from erosion; and protect natural, physical and cultural heritage sites.

Vulnerability to flooding varies throughout the region. Flash flooding, can affect any area where drainage is restricted or unable to cope with unusually heavy downfalls. Eruptions or earthquakes may lead to changes in drainage which could result in flooding. Major storm events will affect multiple areas simultaneously.

The region was affected by severe flooding in 2004 and 2005, and again in 2011 and 2012. In the 2004 floods, this affected several thousand people in the eastern Bay.

7.2.2. Linkages
Flooding has the potential to impact on any infrastructure, either directly or indirectly. Catchments often cross territorial boundaries so involve multiple councils. Figure 4 provides a map of the region’s five major rivers & drainage schemes.

There is a strong linkage with stormwater infrastructure which serves a flood protection purpose through moving and storing stormwater away from urban areas. Failure or non-performance of this infrastructure can exacerbate flooding and place additional pressure on other flood protection infrastructure.

Development and infill housing can also intensify flood risk, due to increased water run-off from roofs and hard impervious surfaces such driveways.
7.2.3. Ownership and governance

The major schemes are managed under the Soil Conservation Rivers Control Act 1941 by the Bay of Plenty Regional Council, which allows for separately rated river schemes on a catchment-by-catchment basis. The regional council manages the Rangitāiki Drainage Scheme under the Rangitaiki Land Drainage Act 1956. The Bay of Plenty Regional Council Floodway and Drainage Bylaw 2008 was established to protect these scheme assets.

Funding is predominantly from the scheme ratepayers. Regional general funds contribute to 20% of the scheme rates (except Rangitāiki Drainage Scheme) to acknowledge the broader benefits provided by the schemes. The Rangitāiki Drainage Scheme is 100% funded from targeted rates over the area of benefit (approximately 29,200 ha). With the exception of the Opōtiki Minor River and Drainage Scheme (which is funded 80:20 like the major schemes), all Minor River and Drainage Schemes are funded 100% by targeted rates.

7.2.4. Existing strategic investment signals/plans

While flood management has been traditionally based around river controls, there has been a shift to a floodplain management focus. This incorporates softer non-asset solutions such as education, planning and development restrictions in floodplain areas."}

The regional council’s River Scheme Sustainability project will prepare a river management strategy for sustainable management of the five major river and drainage schemes (Kaituna Catchment Control Scheme, Rangitāiki-Tarawera River Scheme, Whakatāne-Waimana River Scheme, Waioeka-Otara River Scheme, Rangitāiki Drainage Scheme) for the next 100 years. The goal of this project is to reduce long-term risk of flood hazards while encouraging environmentally and economically sustainable land-use practices and raising awareness, changing attitudes and behaviour in the communities.

The project is expected to consider the long-term risks of flooding hazard and provide a strategy and actions to manage the schemes moving forward. Flood risk strategies may include retreat, adaption or defend. Flood management options in the longer term may or may not include the structural solutions currently employed. Non-structural and other alternative solutions will need to be evaluated.

The Bay of Plenty Regional Council’s Regional Flood Risk Management Framework project has been set up to create a catchment based collaborative approach to managing flood risk in the region working with territorial authorities over the next five years. The desired future situation for flood risk management in the region includes:

- resilient communities with understanding and acceptance of risks to which they are exposed
- affordable flood mitigation and flood risk management
- collaborative catchment management across territorial and regional authorities
- reduction in risk exposure
- enhanced well-being of the Bay of Plenty region.

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7.3. Current state and future pressures, trends and planned responses

7.3.1. Capacity
There are five major rivers and drainage schemes in the region (see Figure 5) which had a combined replacement value in the order of $210 million and provided protection for approximately 22,600 ratepayers as at 2012\(^\text{53}\). The schemes contain a mix of stopbanks, floodways, level control structures, erosion control structures, pump stations, canals and drains. In addition, there are a number of minor rivers and drainage schemes which are managed (but not owned) by the regional council. These consist of various pumping stations and drainage networks on private land that benefit the immediate landowners. The pumping stations are looked after and funded by the landowners. The regional council does not own these assets, however, it does manage several of the schemes.

Outside of the schemes, the regional council additionally provides flood protection to “priority flood-prone areas”. This typically includes priority stream bank erosion control and stream outlet management\(^\text{54}\).

The infrastructure is designed to provide an agreed level of service. The expectations are for 100% compliance with the design levels.

7.3.2. Pressures and trends

Climate change
The region may experience less rainfall in the future, however the intensity and frequency of high rainfall events and seasonal variance is likely to increase. Sea levels are also predicted to rise as a result of climate change. Managing the impact of long-term climate change trends has significantly increased the cost of programmed capital works as climate change requires higher stopbanks to retain the same levels of service, for example.

Affordability
There are relatively small numbers of ratepayers in scheme catchments and this poses a challenge in relation to maintaining levels of service affordably. There is a risk that as floods become more frequent and damaging, excessive repair costs may prevent funding of ongoing routine maintenance. Other risks include economic impacts such as general recession or impact on horticultural/agricultural profitability. With an ageing population comes increasingly fixed incomes in the region, which could also affect ability to pay.

Conflicting needs/expectations
Major land uses within scheme catchments can have conflicting drainage needs (e.g. dairying and kiwifruit) which will need to be managed. There are a wide range of stakeholders that have interest in the development and management of the schemes, including landowners, community groups, and iwi, and they are likely to have different expectations and risk tolerances. Impacts could include increased demand to maintain or increase access to rivers for recreational use; changes in the levels of service required; and increase in demand for development in areas of high risk. A number of

\(^{54}\) Bay of Plenty Regional Council Ten Year Plan 2012-2022, p178.
reports comment on the levels of home and contents insurance uptake in parts of the region which appears to correlate with deprivation levels. This increases the vulnerability of communities and ability to recover.

Co-governance
Bay of Plenty Regional Council has assumed in its Ten Year Plan that there will be a gradual shift to co-governance arrangements as iwi/hapū interests in river systems are settled. This could lead to higher/different expectations around river management and impact on what/how services are provided.

Land use change
The 2011/2012 Rivers and Drainage Schemes Asset Management Plan sets out a number of assumptions in relation to the region’s economy that could impact on demand for flood protection or on the performance of the current schemes: continued urban expansion onto rural land; continued demand for lifestyle blocks on rural land; continued conversion of pine to pasture; and de-forestation of about 10% of plantation forests.

Physical condition
Stopbanks constructed across low-lying peat basins can experience rapid settlement or be damaged by stock, requiring expensive top-up works.

7.3.3. Future plans
There are no expected changes to the current levels of service. However, to accommodate changes expected as a result of climate change, significant works are required to maintain the current levels. The regional council plans to build the capacity of the existing assets over time to meet anticipated climate change predictions.

The regional council is also preparing a Regional Flood Risk Management Framework, programmed to be completed by June 2015. This will identify future levels of service and ongoing sustainability of the schemes.

7.4. Regional issues and options
Management of flood hazards, has shifted from a 'river control/flood control' approach to a more integrated 'floodplain management' approach. Reliance on structural measures, such as stopbanks and river training works, to prevent flood damage is no longer sufficient. Now more modern approaches are to develop 'floodplain management' plans or strategies. These may still make use of stopbanks etc, but also consider land use controls (that is, adjusting activities rather than trying to control the river) and other options such as flood insurance, civil defence procedures and education mechanisms. The region-wide flood management strategy is an important element of this approach.
8. Hospitals

8.1. Regional overview
This chapter considers public hospitals in the region (Rotorua, Tauranga and Whakatāne), as well as Taupō Hospital. There are a number of smaller private hospitals that have not been assessed. Other elements of the region’s health system such as rest homes are similarly not included.

Specialist services require travel to Waikato or Auckland hospitals. These “Inter-District Flows” are adding significant costs to DHBs. Government direction on providing Better Sooner More Convenient (BSMC) health care by keeping services within the community, will mean less people need to be admitted to hospital and therefore less pressure on hospital infrastructure now and in the future.

Current models of health service will not sufficiently meet changing population needs and ageing challenges, given reduced levels of Vote Health funding, skills shortages in the health workforce and out of region patient flow costs. Change in healthcare models are needed to focus on service integration, prevention and early intervention, and optimisation of scarce resources.

Key issues relate to planning for demographic changes; short-term strategic planning horizons; workforce shortages; and reduced funding and efficiency drivers. Hospital upgrades look to address demographic changes however there is uncertainty as to whether they will. Further work is needed in predicting long-term demand using updated population projections, and needs assessments to provide certainty that solutions proposed will meet future demand.
8.2. **Context**

8.2.1. **Why are hospitals important?**
Hospitals play a critical role in supporting communities’ quality of life and health and wellbeing. Hospital infrastructure is an essential component in delivering high quality, specialist health services.

8.2.2. **Linkages**
Hospitals rely in varying degrees on roads, wastewater and water supply, waste, electricity, public transport, telecommunications and gas. All hospitals are required to have a three day back up electricity supply. Disruption to other infrastructure could result in compromised functioning of the hospitals.

8.2.3. **Ownership and governance**
Hospitals are a nationally managed service delivered locally by the various District Health Boards (DHBs). DHBs are responsible for the maintenance and upgrade of their own hospitals. In the Bay of Plenty region there are two DHBs — Bay of Plenty DHB (covering Tauranga, part of the Western Bay, Whakatāne, Ōpōtiki, Kawerau and Te Kaha in the east), and Lakes DHB (covering Rotorua and Taupō).

DHBs receive public funding from the Ministry of Health and are not-for-profit providers. Each DHB is responsible for the delivery of its own public health, primary, secondary and tertiary health services. The Ministry holds some contracts still in public and primary/community health but secondary and tertiary services are owned and operated by DHBs. Primary health organisations (PHOs) provide essential primary health care services through general practices and community-based services.

8.2.4. **Existing strategic investment signals/plans**
Four key strategies currently in place include: the *New Zealand Health Strategy*; the *New Zealand Disability Strategy*; *He Korowai Oranga: Māori Health Strategy* and the *Primary Health Care Strategy*. Regional direction is provided by Regional Service Plans and DHB Annual Plans.

With government direction and focus on ‘Better Sooner More Convenient’ (BSMC) health care, further service integration of secondary care health services from hospitals into primary and community health care, will mean less pressure on hospital infrastructure now and in the near future, shorter lengths of stay in hospital and shifting services closer to home. This initiative is currently being implemented throughout the region’s hospitals.

Whanau Ora supports the further integration of services, improves access for families at risk of greater health inequalities, ensures a seamless continuum of care between services for patients and increased efficiencies.

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Different service models within the eastern Bay of Plenty are proposed to reach poorer, more remote communities. The Bay of Plenty DHB regularly reviews all services provided by Non-Government Organisations to ensure that the mix of quality, safety and patient care, improved health and equity and best value for public health systems is achieved. This is consistent with the ‘New Zealand Triple Aim’ for quality and safety outcomes underpinning service planning and delivery by DHBs to provide: improved quality, safety and experience of care; improved health and equity for all populations; and better value for public health systems resources\(^{59}\).

**Ministry of Health/National Health Board Capital Investment Guidelines**

New hospital infrastructure is funded by capital expenditure from the government and not operating costs. Hospital infrastructure depreciates every year and DHBs can utilise the depreciation of hospital buildings and apply the depreciation to fund renovations. Depreciation is not normally enough to fund new hospital infrastructure so DHBs apply to the Ministry of Health and Treasury for capital funding. The Ministry and Treasury decide the capacity, design and other features of new hospital infrastructure.

All new redevelopments undertaken in Rotorua, Taupō, Tauranga and Whakatāne hospitals are required to meet relevant building standards (including seismic performance) and make them fit for purpose.\(^{60}\)

### 8.3. Current state and future pressures, trends and planned responses

#### 8.3.1. Capacity

Hospitals operate in a network. There are five categories according to the complexity of procedures they carry out and the type of emergency care they provide. Where services are not provided by a Bay of Plenty hospital, funding arrangements are in place enabling the region’s residents to travel outside the region. Where possible efforts are made to minimise outflows of residents to other hospitals and hospitals must be able to provide for their own population in the first instance. The costs of providing these outflow services are met by the DHB of domicile and are referred to as Inter-District Flows (IDFs).\(^{61}\)

The table below sets out current capacity of the four public hospitals. All are currently tracking towards meeting their national targets. However the standard measure of hospital capacity is the number of beds. The information required to determine required bed numbers – such as the needs of a population, trends, length of stay, the complexity of services, the growing demand for acute services – is not available.

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\(^{59}\)Health Quality & Safety Commission, \url{http://www.hqsc.govt.nz/about-the-commission}

\(^{60}\)National Health Board, Lakes DHB Services Improvement Plan \url{http://nhb.health.govt.nz/capital-investment-committee/dhb-capital-projects/lakes-health-services-improvement-plan}

\(^{61}\)Bay of Plenty DHB Annual Plan 2013 – 2014

Lakes DHB Annual Plan 2013-2014

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Rotorua Hospital (Lakes DHB) | 180 beds, recently upgraded[^62^], services a population of 68,590. | Southern Cross Queen Elizabeth – rheumatology and rehabilitation services. Resthomes used for palliative & end of respite care. Park Street Eye Clinic (Tauranga) for eyes and Grace Hospital (Tauranga) for orthopaedics. | Residents in the Murupara/Urewera areas likely to access services at Rotorua Hospital (Lakes DHB) rather than travelling to Tauranga or Whakatāne Hospitals (BOPDHB). Significant outflows to Auckland City Hospital, Auckland City Children’s Hospital and Waikato Hospital for tertiary services and some upper level secondary services. Inflow occurs to Tauranga Hospital for people residing in the Waihi area (Waikato DHB region). The major inflow of people into Tauranga and Whakatāne Hospitals occurs during the Christmas and New Year period with holiday makers. |

Taupō Hospital (Lakes DHB) | 18 beds, currently being upgraded[^63^], services a population of 46,110[^64^]. |  |

Tauranga Hospital (BOP DHB) | 349 beds, currently being upgraded[^65^], services a population of 163,390[^66^]. Contains a clinical school. |  |

Whakatāne Hospital (BOP DHB) | 160 beds, recently upgraded (Project Waka), services an eastern population of 49,520. |  |

### 8.3.2. Pressures and trends

The Bay of Plenty also has some groups with high population health needs (e.g. people with lower socio-economic status, Māori, older people, children, people who live in rural areas). The ageing population, urbanisation and overall increase in population in the region will result in volume changes.

Government has provided direction to be more efficient and effective with resources by integrating more hospital level care into primary and community care aligning with the Ministry of Health 2013 Better Sooner More Convenient policy. Developing more efficient services should result in shorter stays and better utilisation of beds/capacity, but may result in increased demands for primary and community care.

### 8.3.3. Future Plans

All four hospital upgrades are almost complete. In terms of infrastructure, if services are optimised and changes in models of care (such as ‘Better Sooner More Convenient’) are successfully implemented[^66^] then supply should meet demand. However, factors that could change this situation include financial pressures as a result of new initiatives signalled by central government or changes to Inter-District Flows.

[^62^]: Lakes DHB Health Services Improvement Plan
[^63^]: Lakes DHB Health Services Improvement Plan
[^64^]: Statistics New Zealand, Usually Resident Population Count Taupo District 2013 Census
[^66^]: Bay of Plenty DHB 2013 - 2014
8.4. Regional issues and opportunities

The following is a summary of regional issues and opportunities not previously covered in this section:

8.4.1 Issues

- Demographic changes\textsuperscript{67} and associated future pressure from the ageing population is likely to mean increased pressure on hospital infrastructure, existing services, and the workforce. There is a lack of information providing certainty that the hospital upgrades, service integration (including changing the health care model) and other proposed solutions will meet future demand.
- DHBs only plan annually which doesn’t allow for long-term strategic planning of hospital infrastructure. There is no longer the requirement to develop 10 year plans.
- DHBs undertake strategic planning on dated needs assessments. Needs assessment are not undertaken regularly or frequently enough to ensure planning will meet needs or demands.
- The effect of more careful management of Inter-District Flows on patient care pathways is unknown.

8.4.2 Opportunities

- The alignment of Invest BOP with National strategic direction and priorities provide the opportunity to influence national investment, to better achieve regional outcomes both in terms of meeting demand and across infrastructure. For example by aligning infrastructure planning for hospitals and education facilities, procurement for computers, for example, could be undertaken in bulk and savings would be made.
- Increased frequency of needs assessments undertaken to ensure accurate and up-to-date data is collected, that could be aligned and coordinated with infrastructure planning.
- Better planning and utilisation of private hospitals by improving the use of available hospital space in the region. This would improve efficiency and service delivery and reduce waiting times\textsuperscript{68}.
- Continued opportunities for collaboration through service integration of hospital based services into the community (as per the Better Sooner More Convenient policy). This is also likely to reduce demand on hospital based services and extend the capacity and life of hospitals.
- To better understand the Inter-District Flows and what additional service opportunities and associated infrastructure requirements may be needed.

\textsuperscript{67} National Infrastructure Plan, 2011
\textsuperscript{68} Ashton, T Increased use of private hospitals. Health Policy Monitor, 2009 http://www.hpm.org/survey/nz/a14/4
9. Petroleum products (distribution and storage)

9.1. Regional overview

This chapter considers infrastructure associated with the storage and distribution of petroleum products within the region, the functioning of which is essential as a lifeline utility, but also for ongoing economic growth and community wellbeing.

The Bay of Plenty is a major distribution hub for refined petroleum in New Zealand. Approximately 70% of refined petroleum arriving at the Port of Tauranga is from Marsden Point and 30% is imported from international sources.

Infrastructure consists of large storage terminals at Mount Maunganui and road tankers. It is controlled by private enterprises. The petroleum industry in New Zealand is market driven, from storage to distribution and supply. Information on the capacity and resilience of the infrastructure is not readily available as it is considered to be commercially sensitive.

Across the Bay of Plenty demand is well met by existing petrol stations. The stations have well planned and developed logistics and distribution networks, which service the petrol stations on a regular basis.

Petroleum use is expected to remain the main source for transportation and energy for the foreseeable future but there is increasing emphasis on energy efficiency. The biggest risk to petroleum distribution is a natural hazard or electricity shortage restricting distribution.

<table>
<thead>
<tr>
<th>STATE</th>
<th>Market driven for demand and supply.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TREND</td>
<td>Difficult to gauge due to commercial sensitivities.</td>
</tr>
<tr>
<td>RISK</td>
<td>Potential vulnerability of fuel tank terminals impacting on distribution.</td>
</tr>
</tbody>
</table>
9.2.  Context

9.2.1.  Why is distribution and storage of petroleum products important?
Petroleum products are integral to modern life, fuelling transport and industry, generating electricity, and enabling emergency services among other things. Petroleum, in its raw state, is believed to be one of the most important natural resources available as many industries are reliant upon its use.

9.2.2.  Linkages
Fuel has been identified as key to all other lifelines, alongside electricity and transport. Roading, public transport, rail, ports, airports and hospitals are all reliant on petroleum products. Fuel is heavily dependent on transport for distribution, particularly road transport (and vice versa).

The Bay of Plenty is reliant on the Port of Tauranga and terminals located at Mount Maunganui for ongoing bulk fuel supply. The majority of petroleum product is distributed by road directly to the network of service stations.

Electricity is the main infrastructure utility on which petroleum supply infrastructure is reliant. Electricity is required in order for petrol to be removed from petrol tankers, as well as to be pumped from the stations into vehicles. Port and Oil Company regulations stipulate that fuel cannot be unloaded from ships without firefighter capabilities which are also reliant on electricity.

Any disruption of fuel distribution in the region would be felt far wider than just the Bay of Plenty. Central North Island regions are reliant on the bulk supply from Mount Maunganui.

9.2.3.  Ownership and governance
The distribution and storage of petroleum products is market led. However, the New Zealand government has the following roles with regard to ensuring domestic oil security:

- To investigate whether oil supply infrastructure resilience is socially optimal (and not just commercially optimal).
- To ensure that industry can re-establish supply as quickly as possible following a major disruption (e.g. by relaxing normal regulations, and expediting official processes, on a case-by-case, and as appropriate).

Beyond commercial drivers for companies, management of disruptions is an obligation under Section 60 of the Civil Defence and Emergency Management Act 2002. There is a National Civil Defence Emergency Management Fuel Plan and the Bay of Plenty Lifelines Group has developed the Fuel Contingency Plan 2013, in order to ensure lifeline utilities meet their obligations.

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69 Bay of Plenty CDEM Vulnerability Study 2011
9.2.4. Existing strategic investment signals/plans
Due to commercial sensitivities there is a lack of information on forward planning for capacity supply and distribution.

The Bay of Plenty Fuel Contingency Plan aims to consider all aspects of fuel supply, delivery and distribution as well as meeting or addressing public demand effectively during the response to an emergency event.

9.3. Current state and future pressures, trends and planned responses

The quality of assets and the distribution network is controlled by private companies, which run and manage the service stations and road tankers.

In the Bay of Plenty 70% of refined fuel is shipped from Marsden Point and then additives added and stored and distributed by petrol suppliers. The remaining 30% of refined fuel arriving in the BOP is from international sources imported directly by Gull. This is significant to the New Zealand economy, and the Bay of Plenty region, as it is New Zealand’s main distribution hub for petroleum products.

As shown in Figure 5 refined petroleum is shipped around New Zealand with each port servicing a large hinterland using road tankers to distribute product. The Port of Tauranga services the Bay of Plenty, Waikato and Gisborne Regions. However, the distribution network changes in response to changing market demands.

If the Port of Tauranga was affected by an emergency and the terminals damaged, fuel supplies would need to be distributed via road tankers sourced from Auckland and Napier involving large travelling distances. This will impact on the distribution network and available level of service. Some stations may run out of petrol, and/or there may be a delay in the refuelling of stations.

Most of the fuel demand during an emergency will be for emergency services, generators and construction machinery. In order for the public and emergency services to access petroleum products, a stable electricity supply is needed and only a small number of petrol stations are wired to allow a generator back up system. This could have a severe impact on the Bay of Plenty community.

Bay of Plenty Lifelines Group are working with fuel companies on an ongoing basis to secure fuel distribution networks in the event of an emergency or fuel tank terminals not being available. Most service stations believe they could operate without a tanker refill for 2-5 days under normal operating conditions.
All hospitals in the region have onsite diesel fuel tanks for generator supply. This supply is estimated to last three days before refuelling would be required\textsuperscript{70}.

9.3.1. Pressures and trends
Various authorities expect national transport energy use to remain at current levels, and possibly decline until 2016\textsuperscript{71}. Then an increase is expected. Over the next two decades the transport industry is expected to change its energy sources. This is expected to reduce demand on liquid fossil hydrocarbon (petrol/diesel) and increase demand on liquid biofuels (ethanol and bio diesel blends) and electricity generation (due to an expected increase in the use of electric vehicles).

9.3.2. Future plans
No information is available detailing any plans to expand/upgrade current infrastructure.

9.4. Regional issues and options

To continue working with fuel companies on an ongoing basis to secure fuel distribution networks in the event of an emergency or fuel tank terminals not being available.

The region may be ideally placed for the production of liquid biofuels due to the residues from the biomass of wood processing industries\textsuperscript{72}. These can provide forest owners with additional revenue streams from forest residues that are currently wasted, and higher value from the wood produced.

\textsuperscript{70} Bay of Plenty Lifelines Group Fuel Contingency Plan 2013  
\textsuperscript{71} Our Future from Energy, Bay of Plenty Energy Strategy  
\textsuperscript{72} Our Future from Energy, Bay of Plenty Energy Strategy
10. Ports

10.1. Regional overview

This chapter considers infrastructure associated with the Port of Tauranga which is an identified lifeline utility. It does not include infrastructure associated with smaller facilities in Ōpōtiki and Whakatāne. These smaller ports may become commercial entities as aquaculture develops.

The Port of Tauranga is the largest port in the country in terms of total cargo volume and the second largest in terms of container throughput. Increasing volumes of container throughput are expected over the next 30 years and the Port will need to expand berth length to accommodate this. The Port has recently undertaken infrastructure development to meet next stage growth and will expand over time as cargo growth dictates.

There is an international trend towards using larger ships for cost efficiencies and the Port has resource consent to dredge to accommodate these.

The Port is dependent on road, rail, coastal and international transhipping networks to move goods to and from the Port. It will continue to be in competition with the Ports of Auckland especially for dry, containerised cargo.

The Port of Tauranga has positioned itself well to be the hub port for the North Island.
10.2. Context

10.2.1. Why are ports important?
The Port of Tauranga contributes to the flow of 8.6% of national GDP. Ports serve as significant pieces of economic infrastructure and allow producers to reach larger markets, and national/regional or local consumers to access goods produced elsewhere. Ports also make a significant economic contribution to the region they are located in in their own right. They can anchor or attract additional economic activity.

The Port of Tauranga (POT) is the largest port in the country in terms of total cargo volume and the second largest in terms of container throughput. It is regionally and nationally significant for economic wellbeing.

The Port’s location is central to key export commodity sources. It has direct and dedicated access to New Zealand’s largest import market, the capacity to expand its infrastructure, and unrivalled sea, road and rail connections.

10.2.2. Linkages
The POT is one of the three main ports of the upper North Island (alongside Auckland and Northport) and plays a central role in both national and international supply chains. Cargo moving through the ports must be transported from its source by the road and rail network to its ultimate destination. Consequently, it is necessary to consider the availability of transport and storage infrastructure and the efficiency of broader domestic distribution networks outside of the region’s boundaries.

With the obvious exception of heavy bulk cargoes such as logs and petroleum products, Ports of Auckland (POA) and POT compete for much of the freight task of the upper North Island. This is especially true for (dry and refrigerated) containerised cargo. Although land transport costs will factor into importers’ and exporters’ decisions about which to use, the two container ports are close substitutes for overseas cargo. As a consequence, the shares of cargo carried through Auckland and Tauranga are likely to depend upon their capacity to move additional containers, and the marginal cost of doing so. More cost effective and efficient services would influence shippers to change routes and potentially ports.

10.2.3. Ownership and governance
The Port of Tauranga is operated by Port of Tauranga Ltd and has a mixed ownership model with the Bay of Plenty Regional Council being the majority cornerstone shareholder (owning 55 percent of shares through its investment vehicle Quayside Holdings). The balance is held privately. The Port also owns a share of Timaru Port.

10.3. Current State and future pressures, trends and planned responses

10.3.1. Capacity
There is sufficient storage to cope with the expected increased volumes of bulk goods at Mount Maunganui and of containers at Sulphur Point over the next 30 years. The Port of Tauranga performs well on most measures of port efficiency and productivity and at least comparable with, and in some cases better than, Australian and other international ports.73 It is of note that 56% of

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73 http://www.transport.govt.nz/sea/containerproductivitynzports
exports through the Port of Tauranga are wood products, with dairy products playing a far smaller role. Tauranga Port infrastructure has a large land bank, and the ability to grow facilities and cater for increasing cargo volumes.

Port of Tauranga also operates an inland port in Southdown, Auckland and has acquired another freight hub, Tapper Transport, located adjacent to the site, to expand their Auckland business. Dedicated road and rail access streamlines cargo movement to and from the terminal.

Cargo is distributed to and from the port using a combination of road and rail. The primary roads used are State Highway 2, both northwest to Auckland and southeast to the eastern Bay of Plenty and central North Island, and State Highway 29 heading southwest to the Waikato. There is also a dedicated freight rail line, heading both northwest to connect with the North Island Main Trunk line at Hamilton, and southeast to forestry hubs at Kawerau and Murupara.

10.3.2. Pressures and trends

Predicted growth

Container throughput at the Port is predicted to grow by between 2.5% and 3.1% per annum over the next 30 years. Bulk good throughput will also grow at between 1.7% and 2.3% each year.74

Even with the available operating efficiencies, and the additional 170m of berth length recently completed, POT’s berth length will not be sufficient to cater for the projected increase in throughput, and construction of additional berthing will be required. While resource consent will be required, POT plans to extend the current container berth 285m to the south and to extend the current bulk berths by up to 1,000m to the south will be sufficient to address this issue.

Container berthing is the only long-term issue for port infrastructure. Operational efficiencies and bulk berthing and storage space will be able to cater for projected future volumes, although there may be the need for operational reconfiguration.

Larger ships

There is an international trend towards larger container ships due to the cost efficiencies they offer. Increases to maximum ship size on major sea routes appear to be having a ‘cascade effect’ on other routes. In short, the small (and more costly) ships that currently serve minor routes are being gradually displaced by larger ships that are no longer required on major routes.

It is likely that larger ships will be deployed on NZ routes in the medium term future, although the timing may be affected by demand growth for international freight, developments in the shipping market, and infrastructure decisions made in New Zealand.

The Port has secured resource consent to dredge the harbour. The first stage of dredging is due to start in 2014 and will make Port of Tauranga the first port in New Zealand capable of hosting larger container ships with a capacity of 5,000 to 6,000 Twenty foot Equivalent Units (TEU). These new ships will enhance the competitiveness of New Zealand exporters and importers by lowering freight costs.

74 Bay of Plenty Situational Analysis p.22.
It is unlikely that New Zealand will be adversely affected by the trend toward larger container ships. There has been talk of New Zealand’s trade being transhipped through Australian ports, however this risk is likely to be overstated as Australian ports also lack the capacity to handle larger ships at present, and container volumes and cargo handling infrastructure at Australian ports are not significantly larger than those in the upper North Island.

New Zealand’s ports appear to be moving towards a hub and spoke model. If this trend continues as expected, it is likely to reduce the role of regional ports – such as Timaru and Wellington (particularly for container trade) – and concentrate overseas trade through a few major ports, such as Tauranga. The deployment of larger container ships on NZ shipping lines will accelerate this trend as only a few ports will have the trade volumes needed to justify the required investment required to host these ships.

10.3.3. Future plans
As outlined above, the Port plans to undertake dredging to ensure it can accommodate larger ships, as well as increase berthage.

10.4. Regional issues and opportunities

10.4.1. Issues
In general terms, road freight provides greater speed and flexibility at a higher cost, while rail and coastal shipping are better suited for bulk goods, long-distance freight, and less time-sensitive shipments. High domestic freight costs place a premium on having ports located close to population centres and export production locations. Oil price increases will drive increases to shipping costs.

The Port will need to ensure that it continues to provide enough berth space for increasing volumes of cargo.

Inland ports are likely to reinforce competition between Port of Tauranga and Ports of Auckland.75

10.4.2. Opportunities
- The Port has consent to dredge the harbour, starting in 2014, to make the Port of Tauranga the first port in New Zealand capable of hosting container ships with a capacity of up to 6,000 TEU.
- The Tauranga Eastern Link will replace and improve journey times on SH2 south of Tauranga and provide additional capacity from the area which is the source of much of the logs and related product that are exported through the Port.
- There are opportunities to address the need for future additional berth space through construction at Sulphur Point, or repurposing some of the bulk berth space at Mouth Maunganui.
- There are aspirations in the region to develop additional ports to cater for a growing aquaculture industry. These include Ōpōtiki and Whakatāne. Whether these will have an impact at a regional scale remains to be seen.

75 How can we meet increasing demand for ports in the Upper North Island? p.11.
11. Public Transport

11.1. Regional overview

This chapter considers public transport infrastructure. Public transport (PT) provides a number of benefits and is important to the continued development of the region, including increasing the capacity of the road transport system, supporting economic development and social wellbeing generally, and providing access to services and improving liveability and amenity.

Within the region, public transport utilises buses. Infrastructure is largely provided by territorial authorities, while services are the responsibility of the Bay of Plenty Regional Council.

There is very limited dedicated infrastructure beyond the actual vehicle fleet, which has not been included in this assessment. To realise the potential of public transport in the region, additional investment is needed in infrastructure to ensure the appropriate level of service can be provided.

There is significant potential to grow public transport’s share, particularly in Tauranga and Rotorua. Improvements to both services and infrastructure will be required to realise and maintain this potential. An efficient and effective PT network could significantly enhance the region as a place to live and work.

Most pressures will result in greater demand for public transport. In order to deliver on expectations, appropriate infrastructure including bus priority measures will be required and will need to be planned. Currently services drive infrastructure provision, rather than there being a strategic plan to plan for and accommodate future growth.
11.2.   Context

11.2.1.   Why is public transport important?
Public transport supports economic development and population growth; prolongs life of roading infrastructure; increases roading level of service (reduced congestion); reduces reliance on fossil fuels and greenhouse gas emissions (supporting national policy); provides mobility for young/old/disabled/deprived sectors of the community (for some it may be their primary means of transport); supports community/large events; provides linkages within the region and with other regions.

There are two main interchanges in the Bay of Plenty, one located in Willow Street in Tauranga and the second located at Pukuatua Street in Rotorua. These facilities provide passengers with the ability to transfer between services. There are over 500 bus stops in Tauranga – recent investigations suggest these meet a good level of accessibility requirements but not all are sheltered. Rotorua has 112 bus shelters\(^76\) and Whakatāne has six provided in conjunction with commuter services\(^77\). No information was found regarding any specific dedicated infrastructure elsewhere in the region and many rural services operate without bus stops.

11.2.2.   Linkages
There are strong linkages or potential linkages with other infrastructure such as road, rail, the port and airports, as well as health and education services, commercial transport operators and the tourism sector. Improved service levels will increasingly need to be supported by new infrastructure, including new interchanges, additional bus stop infrastructure and park and ride facilities.

Public transport is strongly linked to land use patterns and urban growth patterns. Growth in the western Bay of Plenty needs to be supported with delivery of integrated transport solutions to ensure the efficient movement of people. Future demographic trends across the Bay signal an older population with an increased reliance on rural bus services to ensure accessibility.

Inter-regional connections provided by inter-city or tourist coaches, require dedicated interchanges in the vicinity of urban bus services.

11.2.3.   Ownership and governance
Under current legislation, regional councils have the primary responsibility for planning, contracting, funding and the overall coordination of public transport. Primary responsibility for public transport infrastructure lies with city and district councils, or the NZ Transport Agency in the case of state highways. Section 115 of the Land Transport Management Act 2003 (LTMA) sets out the principles to guide the provision of public transport services. The New Zealand Energy Strategy (NZES) and Energy Efficiency Conservation Strategy (NZECS) 2010 sets out the energy objective for the transport sector as “a more energy efficient transport system, with a greater diversity of fuels and alternative energy technologies.”

Public transport is funded through: revenue from fares; the National Land Transport Fund (administered by the NZ Transport Agency); and the regional council (rates and general funding).

The Tauranga “Bay Hoppers” bus service is provided on contract by Go Bus and “Cityride Rotorua” services are run on contract by Reesby Buses. Both services are managed by Bay of Plenty Regional Council.

The shelters that are provided are a mixture of city council and privately owned/managed structures. The private shelters are managed by Adshel as advertising space.

11.2.4. Existing strategic investment signals/plans

The Bay of Plenty region has adopted an Optimised Transport System (OTS) as the preferred strategic option to consider a hierarchy of interventions to optimise the performance of the region’s land transport system. This seeks to channel an increasing proportion of the projected growth in travel demands into sustainable modes that do not involve single occupancy vehicle use. Public transport, as a more energy and space efficient mode has an important role to play, particularly in providing for short to medium distance journeys within urban areas. Giving effect to the OTS will mean initiatives to:

- improve the efficiency of the region’s public transport services;
- increase frequencies and expand coverage on the Tauranga and Rotorua networks;
- implement real-time information, integrated ticketing and bus priority measures; and
- consider more flexible demand-responsive services outside the main urban networks.

The Bay of Plenty Regional Public Transport Plan 2013 (RPTP) specifies the public transport services that are proposed for the region and the policies that apply to those services (in accordance with the Regional Land Transport Strategy) which primarily support economic, environmental and access benefits.

Relevant policies relate to the provision of infrastructure to implement the ‘accessible journey’ approach; development of bus priority measures on regional strategic corridors; and adoption of best practice measures for the installation and maintenance of infrastructure. In terms of infrastructure, the RPTP signals that improved service levels in the region’s urban centres will need to be supplemented by new infrastructure, including new interchanges in central locations, real-time information, integrated ticketing, bus priority measures, additional bus stop infrastructure, and park and rides.

The Government Policy Statement on Land Transport Funding 2012/13-2021/22 (GPS) sets out the decreasing range of funding available from the National Land Transport Fund (NLTF) for public transport infrastructure. Giving effect to the GPS, the current National Land Transport Programme (NLTP) focuses on activities that best promote economic growth and productivity, provide value for money and improve road user safety. Relevant key investment messages from central government for public transport to the Bay of Plenty are set out below:

- While there is an increase in the indicative NLTP ranges supplied to councils, most of this is required for increased costs in metro rail in Auckland and Wellington.
- The current priority is congestion relief in major urban areas (this includes Tauranga).

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78 Tauranga City Council Ten Year Plan 2012-2022, p82.
79 Bay of Plenty Regional Public Transport Plan 2013, p40.
• Network reviews should identify efficiencies that can be reinvested and existing services should be optimised within existing budgets to provide network efficiency gains, and maximise value for money.

11.3. Current State and future pressures, trends and planned responses

11.3.1. Current State

Public transport in the Bay of Plenty region consists of bus services, as well as some health-related transport services and one ferry service. Infrastructure is not extensive, consisting of interchanges in Rotorua and Tauranga, street furniture (seats, bus shelters, signage), bus stops, bus parks and a lane on Hewletts Road (Tauranga City only), and the bus fleet itself. There is also associated “soft” infrastructure such as call centre/web page, route information and ticketing systems. Tauranga and Rotorua have the most developed infrastructure, with the most extensive urban public transport services operating in the region.

Public buses service Rotorua and Tauranga (including Mount Maunganui and Papamoa) urban centres, as well as some regional services between towns (see Figure 6). Inter-regional services are available through commercial operators. A ferry service operates between Omokoroa and Matakana Island. This ferry receives no operating subsidies but is supported through a historical concessionary fares agreement.

Figure 6: Regional strategic public transport network (source: BOP Regional Public Transport Plan 2013)
11.3.2. Pressures and trends

**Funding**
The government is seeking to reduce subsidies paid by taxpayers and ratepayers by providing incentives to stakeholders to encourage patronage growth. The NZ Transport Agency and regional councils are expected to deliver more efficient and effective services, and there is a strong emphasis on the sector working in true public private partnerships.

The National Farebox Recovery Policy seeks a recovery ratio of 50 percent, averaged across all public transport services in New Zealand. The regional target for fare recovery is 35-40% by 2018.

**Oil prices**
Higher fuel prices will impact on the affordability of private vehicle use for many people. This will drive greater demand for public transport. A downward trend in private vehicle use also equates to less tax revenue and affects the overall transport funding capacity of the government.

**Population growth**
Forecasts indicate the region’s population will continue to grow strongly into the future. This growth, however, will not be uniform and smaller settlements may experience decline. The region is also experiencing growth in transient populations and Rotorua is a significant tourist destination. Access into the growth areas from more remote communities (e.g. to access employment or health, education and other services) will become more important. Over time those satellite communities will likely have higher public transport needs (e.g. increasingly older and/or more deprived).

**Economic growth**
Linked with population growth, economic growth will place increased demand on the region’s transport network, with more commuters seeking to gain access to main urban areas. Public transport has a role in relieving congestion and maintaining/improving accessibility and amenity, in turn increasing economic growth, and therefore ensuring the region can attract and retain skilled workers by providing an attractive place to live and work.

Within the region, there is significant intra- and inter-regional travel for employment. Important intra-regional links include between the Western Bay of Plenty District and Tauranga City, and between Whakatāne and Kawerau. The most significant inter-regional link is between Rotorua and the Waikato region.

**Ageing population**
Compared to the country as a whole, the region has a high (and growing) proportion of residents aged 65 and over. The young and elderly segments of the population correspond to the portion of the population often without access to a car or who are unable to drive, so an ageing population is likely to mean a greater demand for and reliance on public transport. It will also increase demand for accessible transport options, such as “kneeling” buses.

**School bus services**
From 2015 the Ministry of Education is withdrawing funding for ‘out of policy’ school transport in Tauranga, partly due to the improvements in the public transport network. A replacement SchoolHopper service is currently being developed. Modelling indicates the withdrawal of the school bus service would add 8,000-9,500 private trips on to the road network during the morning
peak period and most of the network would experience decreased levels of service if additional public transport choices were not provided. The flow on effect of this includes potentially impeded access to the Port of Tauranga.

**Sustainability**

Public transport has an important role to play in reaching the government’s targets in relation to reducing greenhouse gas emissions, as well as having health benefits through reduced PM$_{10}$ emissions from vehicles. It also represents a more energy efficient mode of transport than private vehicle use (particularly single occupancy).

**Impacts of changes in demand**

Infrastructure provision is currently driven by services (which is a mixture of patronage- and coverage-based services). Greater demand for services would lead to greater demand for associated infrastructure, such as bus priority measures which would in turn reduce travel times, leading to greater demand and increased cost efficiency. A reduction in demand, however, is unlikely to result in reduced customer expectations (i.e. they will still expect at least a similar level of service as now).

11.3.3. **Future plans**

The RPTP signals works that will be needed (i.e. interchanges in central locations, real-time information, integrated ticketing, bus priority measures, additional bus stop infrastructure, and park and rides). The 2012-2022 long term plans of the district councils in the region include a number of projects. The Integrated Transport Strategy for Tauranga (2006)$^{80}$ also identifies a number of relevant projects, however, not all are within the current ten year plan.

11.4. **Regional issues and opportunities**

The low proportion of journeys to work by public transport in urban areas suggests there is scope and opportunity to significantly improve the mode share of public transport. This will require coordinated land use, appropriate parking and public transport policy development, to ensure that future growth and investment in public transport infrastructure and services are mutually supportive. Ongoing service improvements and infrastructure will be required to maintain patronage growth, increase public transport mode share and achieve economic development goals.

A challenge for districts outside of the main urban areas is to provide bus based transport where it is difficult to justify and sustain fixed route services, due to the dispersed and low density patterns of population.

Development of public transport in the region provides an opportunity to proactively manage traffic growth and avoid congestion, potentially extending the life of strategic road corridors and delaying the need for major investment in roading infrastructure.

Overall, there is opportunity to plan now for a comprehensive and sophisticated public transport network in the region that will meet future demand and expectations. This would allow for staging of development and would also ensure that provision of other infrastructure considered public transport needs (e.g. roading projects). It could also seek to address any issues that arise as a result of current mixed responsibilities, particularly between infrastructure and service planning and provision.

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$^{80}$ Note this strategy has been updated (2012) but has not yet been published.
12. Rail

12.1. Regional overview

This chapter considers the region’s rail infrastructure which is an essential component of the transport network, and the most densely utilised section of the national network with over a third of NZ’s rail traffic.

Rail is a facilitator of economic growth. The rail corridor to and from the Port of Tauranga is critical for the movement of freight and New Zealand’s economy. Rail freight traffic is expected to double within the region over the next 10-20 years placing additional pressure on the rail network.

In general, all of the rail assets within the region have adequate capacity to deal with current demand. The major issue for the region is the historical under-investment in rail infrastructure which has led to a poor underlying quality of the network asset. KiwiRail has limited funding available to address this issue.

The Kaimai Tunnel is a particular vulnerability in that the road network would be significantly affected by increased freight volumes should the rail line become unavailable for a period. The condition of the tunnel floor is of concern to KiwiRail, with an estimated $50 million cost to repair.

There is the potential to utilise rail in other parts of the region, specifically related to the movement of goods associated with primary industry, however the large infrastructure costs involved make it prohibitive to private businesses at this time. There are no intra- or inter-regional passenger rail services. There may be opportunities to develop passenger rail services in the long-term but viability is impacted on by the large capital investment costs.
12.2. Context

12.2.1. Why is rail important?
Rail forms an essential part of the region’s transport network and plays a crucial part in the functioning of the economy of the upper North Island and New Zealand.

The region has over a third of New Zealand’s rail traffic making the Bay of Plenty section of the East Coast Main Trunk (ECMT) the most densely utilised sector of the national network outside of the Auckland and Wellington Metro areas, and the Auckland to Hamilton section which carries BOP traffic. It plays a significant freight role in the region with a principal focus on the Port of Tauranga. Currently, there are no passenger services in the region.

KiwiRail has 229km of rail network in the Bay of Plenty (extending from the Waikato in the west to Taneatua and Murupara in the east) as shown in Figure 7. The ECMT and the Mt Maunganui Branch line are of regional and national importance as the main line to the Port of Tauranga, and through to Kawerau. In addition, the Murupara Branch (currently used for forest products) is a strategic rail corridor within the Bay. The Rotorua and Taneatua Branches are currently un-used but are being retained as corridors.

12.2.2. Linkages
Major rail links connecting Bay of Plenty with Waikato and Auckland are critically important to the functioning of all three regional economies and the upper North Island generally. The ECMT between the Port of Tauranga and Waikato carries most of the rail traffic in the region, connecting the Port with inland freight hubs such as MetroPort in South Auckland and potentially Ruakura. There has been significant growth in container volumes railed to and from South Auckland in recent
years, and this growth is expected to continue. Consequently, the rail link between the Bay of Plenty and the Waikato will continue to grow in importance.

The Upper North Island Freight Story identifies strategic road and rail constraints as one of seven critical issues, at an upper North Island scale, that are limiting economic productivity and New Zealand’s ability to reduce the cost of doing business. It identified that the fact that the ECMT is a single track may be a potential long-term future constraint, however noted that recently extended crossing loops have doubled route capacity to 4 trains/hour (up to 900m long). It also recognised that a number of other infrastructure and rolling stock options exist before the capacity of the Kaimai Tunnel becomes a significant constraint.

The Upper North Island Freight Story report also identified the Tauranga Central Rail Corridor (Tauranga CBD to the Port) as a strategic rail link, with constraints related to amenity and reverse sensitivity conflicts as train movements increase and CBD development continues.

The importance of inter-regional connections means that investment in key infrastructure outside the region can have major implications for the Bay of Plenty. For example, the Waikato Expressway will reduce travel times and provide improved journey reliability between Auckland and Cambridge. This will increase the significance of the State Highway 1/29 route for the movement of freight and people between the Bay of Plenty, Waikato and Auckland Regions.

12.2.3. Ownership & Governance
KiwiRail is a State Owned Enterprise. It is a statutory corporation operating as a single entity with multiple business units. Governance is provided by a Board. Nationally KiwiRail provides rail freight services and locomotives for passenger services, operates the Cook Strait ferry passenger and freight services, and maintains and improves the rail network and controls the operations of trains on the network.

The Port of Tauranga is KiwiRail’s key customer in the region and the two work closely together to address any issues that arise.

12.2.4. Existing strategic investment signals/plans
Since 2010 KiwiRail have been implementing a decade long programme of investment to ensure the rail network can deliver the highest levels of service for passenger and freight customers in the form of the $4.6 billion Turnaround Plan.

The Turnaround Plan is KiwiRail’s ten year programme for investing in rail assets. The Plan identifies Auckland to Christchurch as the priority route for investment in the national rail network, while the Auckland-Hamilton-Tauranga connection is identified as another key route. Some investment in the Auckland to Christchurch route will be targeted at improving exit and entry from Auckland by reducing conflicts with commuter services. This will complement recent investment in capacity improvements on the Hamilton-Tauranga rail line and enhance levels of service for rail freight movements to and from the Bay of Plenty.

A key focus of KiwiRail has been to grow the rail freight business and this has particular relevance to the Bay of Plenty region with freight to and from the Port of Tauranga.
The Regional Land Transport Strategy defines rail as part of the critical transport network. The document integrates transport modes and identifies the interdependencies between key road and rail networks.

12.3. Current State and future pressures, trends and planned responses

12.3.1. Asset Quality
In general, the rail assets within the region are in reasonable working order and have adequate capacity to deal with current demand. Since 2005 KiwiRail (and its predecessors) have been addressing many years of under-investment including replacing bridges and sleepers and re-railing. However, if the line is to realise its potential, the overall asset quality needs to step up to increase resilience. As the railway is a single track line the work is best done before traffic levels become so high that doing any work on the lines becomes more disruptive. The repairs to the Kaimai Tunnel floor illustrate the dilemma that while the work is best done now while use is lower, there are real challenges in funding the work with current cash-flows. The signalling system is old and needs replacing, however this can be done in more affordable incremental steps.

12.3.2. Pressures and trends

Links to Port of Tauranga
The ECMT is critical to inter- and intra-regional movements between major industries and the Port of Tauranga. Forty percent of the freight moving to and from the Port of Tauranga moves by rail and volumes are forecast to increase significantly.

Large volumes of freight come from outside the region – these are mainly:

- Logs and timber products from the Waikato for export;
- Dairy products from the Upper North Island for export;
- Imported coal from the Bay of Plenty to the Waikato; and
- Import and export goods moving between the Bay of Plenty and Auckland (particularly through MetroPort inland port).  

Within the region, key flows of dairy products, kiwifruit and aggregates are mainly transported by road, however there is a substantial movement of logs and timber products into the Port of Tauranga by rail from Kawerau and this traffic is growing.

Passenger rail
There is no provision for passenger rail in the Bay of Plenty, and the scale of population make commuter rail not viable within the region. In the future, it may have a role to play providing for the movement of people between major centres in the upper North Island but would require significant investment.

12.3.3. Future plans
Primary industry
One of the key drivers of future economic development in the Bay is likely to be an increase in the production of a range of primary products.

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81 Bay of Plenty RLTS 2011-2041, p 17
The Bay of Plenty accounts for 13% of New Zealand’s exotic plantation forest resources, with the Port of Tauranga operating as the hub for the central North Island wood supply region. The volume of logs from this region is likely to increase substantially which is likely to put particular pressure on the rail links from Murupara and Kawerau to the Port.

**Capacity**

KiwiRail is anticipating that rail freight traffic will double within the region over the next 10-20 years and both maintenance and enhancements will be required on existing lines to increase capacity.

Investment in the rail network should focus on supporting the inter- and intra-regional movement of products to and from the Port to ensure there is sufficient capacity to meet projected freight demand increases, and possible changes in the pattern of demand resulting from the introduction of larger ships.

KiwiRail has confirmed that the Kaimai Tunnel is not a capacity constraint – there is plenty of capacity to accommodate even the most optimistic traffic forecast. The condition of the tunnel base is a resilience risk that must be addressed.

KiwiRail has identified that Joint Officials Group investment ($13M), which included passing loops at Apata and Tamihana (2007-2012) – a cross regional boundaries investment approach – has materially increased capacity along the East Coast Main Trunk. The loops allow opposing trains to pass each other on a single track railway line. The passing loop is one of two new passing loops along the route, and a further three have been extended to allow for 900m trains. This investment had a significant impact on the efficiency and effectiveness of rail freight movements to and from the Port of Tauranga. The Port of Tauranga has also stated verbally that they are investigating options to improve rail options landside at the Port. KiwiRail is similarly looking at capacity enhancements in Southdown which is at the other end of the POT logistics chain. Both initiatives need to work in lock-step.

**Inter-regional movement**

Rail infrastructure investment is key in the movement of freight within and beyond the Bay of Plenty and Waikato Regions and this is likely to continue. Additionally the importance of inter-regional connections means that investment in key infrastructure outside the region will have major implications for the Bay of Plenty transport system.

12.4. Regional issues and opportunities

12.4.1. Area specific issues

**Western Bay of Plenty**

There are a range of issues more specific to the Western Bay not covered elsewhere in this report:

- The Kaimai Tunnel is vulnerable in that the floor is degrading and while KiwiRail can do short term patches, the roading network would be subject to significantly greater demands by increased freight volumes should it become unavailable for extended periods.
- Costs associated with properly upgrading the floor in the Kaimai Tunnel are currently estimated at around $50M.
Potential future maintainability of the existing single track line if freight continues to grow and maintenance windows shorten.

Protection of existing and future corridors in the short term given the continuing growth of the sub-region, particularly in proximity to the rail corridor.

**Rotorua**

There are no current proposals to reopen the Putāruru to Rotorua Line for freight. However, the existing corridor needs to be protected to ensure reuse of the line remains an option in the longer term. Interim uses could be considered for the corridor providing they are compatible with any possible rail uses. Interest has been expressed in having the line opened and dedicated for tourism purposes.

**Eastern Bay of Plenty**

Rail plays a significant freight role transporting logs, wood pulp, paper and cardboard, fertiliser and steel from Murupara and Kawerau to the Port of Tauranga. There is interest in the possible reopening of the line to Taneatua to provide for the transport of logs from the eastern part of the Bay of Plenty region. However, this has not been confirmed by KiwiRail.

Kawerau has industrial land available as well as willing investors however the cost of transporting freight via rail is proving cost prohibitive for businesses.

**12.4.2. Wider regional issues**

- Perception amongst some larger freight generators in the region is that the current funding system does not recognise the full economic benefits of rail as a bulk freight option. For example, current benefit/cost analyses for transport projects work on the basis of a 30 year timeframe whereas rail infrastructure generally has higher initial fixed cost than roading projects with a longer period over which benefits accrue.
- Identifying and designating new rail corridors for the future. The region’s transport system may lack the flexibility to cater for long-term changes in land use and demand if future transport corridors are not identified and protected.
- Decline in general asset condition due to historical under-investment has been reversed to a point from 2005, but asset needs uplift overall.
- KiwiRail have no long term plans for capacity upgrades other than in the yards as there is mainline capacity; rather they are waiting for certain trigger points to be reached before investing in further double tracking.
- High capital costs associated with new infrastructure. KiwiRail has plans for asset renewal and upgrades; at issue is the availability of funding.
- Cost recovery is different between road and rail – for example as a commercial operator Kiwi Rail is expected to recover the cost of capital.
- Safety, issues with level crossings and corridor trespass issues.
- Reverse sensitivity associated with development in the vicinity of rail corridors.
- The development of the region’s inter- and intra-regional road and rail network is heavily constrained by topographical features (such as the Kaimai Ranges, large harbours, rivers, lakes and narrow coastal strips). Geographical constraints mean that the network is prone to access disruptions following natural hazard events.
• The rail network is a critical economic lifeline and should the rail network fail, the road network would be placed under significantly greater demands by increased freight volumes

12.4.3. Regional Opportunities

• Increasing rail’s already significant freight transportation role for the region, especially to and from the Port of Tauranga.
• Investigation into the reutilisation of currently unused portions of the network, particularly in eastern Bay of Plenty and Rotorua.
• Protecting rail corridors, increasing rail capacity in the long-term including inter-regional freight movements.
• Improving rail as an economic option, particularly for freight transportation.
• Taking advantage of the fuel efficiency of rail.
• Electrification and/or technology improvements, these could increase the efficiency of the network
• Rail capacity improvements such as sidings, yards and passing loops on the East Coast Main Trunk line provide relatively low-cost solutions to projected growth in the movements of bulk commodities.
13. Roading

13.1. Regional overview
The road network is currently and will continue to function as the primary means of transport within the region. The road network is essential to the region’s social and economic success in that it can support and enable economic development and performs a critical community accessibility, quality of life and lifeline function.

The region’s road network is well established and developed, and it is supported by a well-developed planning framework. Generally, the road network is sufficient to meet forecast future demands. However, there are a number of issues which will need careful management, including potential further investment to ensure future demands can be met, and addressing future affordability challenges.

There is limited traffic congestion within the region, however, parts of the Tauranga urban network are subject to congestion at peak use times. Parts of the network are susceptible to events (i.e. emergency or natural hazards) which can cause significant disruption to social and business activities. Resilience will continue to be a problem, particularly in coastal locations as climate change leads to more high intensity rainfall events.

Forecast population pattern and age demographic changes will place different demands on the road network. Aligning levels of service with affordability and customer expectations is likely to become more challenging as these changes occur.

The forecast growth within the upper North Island will impact on the region’s road network including by increasing freight movement demands.
13.2. Context

13.2.1. Why is the road network important?
The road network is currently and will continue to function as the primary means of transport within the region. It performs a vital social and economic function, enabling social accessibility, providing a lifeline function and contributing to quality of life. The road network also provides for economic opportunities by providing a means for people and goods to access business opportunities including employment and markets.

13.2.2. Linkages
The Bay of Plenty road network forms part of a wider North Island and national land transport network. Within the region there is a hierarchy of roads which link the key centres of population and areas/locations of business. This includes key roads (primarily state highways) linking Ōpōtiki, Whakatāne, Rotorua and Tauranga. There is also an important arterial network within the larger urban centres of Rotorua and Tauranga.

Key inter-regional state highway links to other regions include State Highway 29 to the Waikato. This is a high volume freight route which links the central North Island and Auckland to the Bay of Plenty and particularly the Port of Tauranga. State Highway 2 links the region to the Waikato (in the north), Gisborne in the east, and joins with the Tauranga Eastern Link and State Highways 33 and 5 to link to Taupō (in the Waikato region) in the south. These links to other regions are particularly important corridors for people and goods movement.

The road network is not the only important inter-regional transport link to and from the Bay of Plenty. The rail network also provides for key freight routes, for example from Kawerau to the Port of Tauranga, and from the Port of Tauranga to Waikato and Auckland.

13.2.3. Ownership and governance
The road network is planned, managed and operated by Road Controlling Authorities (RCAs) which in the Bay of Plenty includes councils and the NZ Transport Agency. Local authorities are responsible for the local road network while the Transport Agency is responsible for the state highway network. The Transport Agency is also a co-investment partner (through the Funding Assistance Rate) with local authorities to deliver local and regional transport programmes, including public transport infrastructure and services.

13.2.4. Existing strategic investment signals/plans
The Bay of Plenty region has a clear policy framework in place setting out the strategic vision and direction for the road network. The regional land transport planning framework includes the:

- Regional Land Transport Plan (currently under development).
- Regional Land Transport Programme & Strategy (both in place): While these documents are to be superseded in 2015 by the Regional Land Transport Plan, they set out a clear long-term (30 year) strategy for the region’s land transport network including the road network. The current RLTS identifies the following transport priorities:
  - Regional transport infrastructure maintenance.
  - Western Bay of Plenty growth.
Eastern Bay of Plenty route security.
Rotorua growth.

- The Regional Land Transport Programme identifies strategic corridors which are designed to implement the regional priorities identified in the RLTS. Each corridor has a set of interdependent and complementary activities that seek to address key outcomes.
- Central government policy direction based around a 3-yearly investment cycle informed by the Government Policy Statement on Land Transport Funding.
- National standards including those developing for road classifications to support a one network approach.

Other key regional and local strategies and plans which provide strategic planning direction and investment signals for the road network include:

- sub-regional spatial plans e.g. SmartGrowth Strategy (in place) and the under-development Rotorua and Eastern Bay of Plenty Spatial Plans;
- regional policy statement and district plans;
- long term and annual plans;
- Tauranga Transport Strategy and the Rotorua Integrated Network Strategy; and
- asset and activity management plans.

13.3. Current state and future pressures, trends and planned responses

13.3.1. Capacity
The region’s roads are a well-developed network of corridors performing reasonably well defined functions (e.g. strategic, local access) focussed on efficient, effective and safe movement of people and goods. In most cases the road network provides for private and commercial light and heavy vehicle movement, public transport, and walking and cycling opportunities.

The road network generally functions well from a network capacity perspective. There is limited traffic congestion experienced by road users in the larger urban centres of the region, such as Tauranga and Rotorua, during peak times.

Figure 7 shows the strategic road network within the Bay of Plenty region and how this links to adjoining regions. The strategic road network and the key arterial corridors within the larger urban centres of Tauranga, Rotorua and Whakatāne that move the majority of people and goods represent the regionally significant parts of the road network. Some parts of the road network are not of regional significance, typically these include local roads and parts of the walking and cycling network or those parts of the network that serve primarily a local function.

The condition of the road network in the region is generally good. In recent years local government and the Transport Agency have placed an increasing focus on aligning levels of service with the...
function of the road. This will be aided through the development of the technical and customer levels of service that are being developed by the Road Efficiency Group.

Parts of the road network within the Bay of Plenty are susceptible to events (i.e. emergencies or natural hazards) which affect the resiliency and availability of the network. The region’s susceptibility to natural hazards has resulted in approximately 330 hours of state highway closures per year over the past four years.\(^{84}\) In some cases, the alternative route is significant, meaning network outages can cause major disruption and cost to businesses, or isolate people and communities from key services and facilities. Network resilience is a particular issue facing parts of the eastern Bay of Plenty (e.g. State Highway 2/Matata Straights; near Ōpōtiki; Waioeka Gorge), and also the western Bay of Plenty (e.g. sections of State Highway 2 north of Tauranga).

**Pressures and trends**

The key future demands or influences relate to the changing population base and its location within the region. Population change can have a strong influence on economic activity by affecting the size of the workforce and local markets. In addition, increasing concentrations of population and economic activity can increase the demand for travel and in turn result in capacity pressures on the transport corridors.

Forecast population changes will place different demands on the road network. For example, population growth in the western Bay of Plenty is likely to see increased growth in private vehicle use. Modelling of regional travel demands found that even in a low travel demand scenario, car-based transport modes (driver and car-passenger) will make up approximately 74% of trips and 85% of kilometres travelled in the region in 2040.\(^{85}\) The Tauranga Urban Network Study identified that a ‘business as usual’ approach would result in levels of private vehicle use that would present

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\(^{85}\) Tauranga Urban Network Study 2012
significant challenges, especially in urban areas at peak times, and have detrimental effects on the economy. These impacts are likely to be different for the eastern Bay of Plenty where a decreasing population base and employment could impact the ability to affordably maintain the network to appropriate levels of service.

The continuing growth in the upper North Island could also influence and place future demands on the region’s road network and particularly inter-regional links (e.g. State Highway 29). Already, there is a strong demand for freight movements within the upper North Island to the Port of Tauranga and this is likely to increase as growth occurs. The Port of Tauranga is also positioning itself to berth larger container ships which could increase freight movements to and from the Bay of Plenty. Managing the demands placed on the road network between freight movement and population growth will be important.

Other significant investment in the upper North Island (e.g. the Waikato Expressway) and land use change (e.g. the establishment of freight hubs, like proposed at Ruakura, or the urban growth south of Auckland) could influence road network demands in the future. The use of rail to move freight will continue to be important.

Climate change is likely to have an impact on the roading network, with increased frequency of high intensity events creating increased resilience issues on the network, particularly in coastal areas and in the eastern Bay of Plenty.

The traffic demand on the Tauranga network is expected to increase particularly due to increased urbanisation and freight movements. The key issue for the region is balancing the local trip demands, the increased urban growth and commuter movements, against maintaining efficient freight access to the Port of Tauranga (Tauranga Transport Strategy 2013).

Forecasts of long term traffic growth are uncertain across Rotorua. There are some isolated hot spots of congestion that need to be assessed in the eastern and urban corridors. For the eastern Bay of Plenty the community needs for a resilient network will remain irrespective of forecast population changes for this area. Local communities will continue to require as a minimum, access to key services and facilities to support quality of life. The changing population base could however impact on the affordability of maintaining the network. Work to understand appropriate levels of service for the road network is already underway as part of a national conversation between local and central government. This has relevance to how the affordability issue could be addressed in the eastern Bay of Plenty.

The increasing freight demand forecast will be an issue needing ongoing monitoring to understand its impact on road condition. Initiatives such as the High Productivity Motor Vehicle (HPMV) programme could lead to less truck movements but in the context of a larger increasing freight demand will need to be monitored.

13.3.2. Future plans

The Bay of Plenty has a well-developed planning framework which has identified the future direction for the regional land transport system, including the road network. Underpinning the future

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86 Tauranga Urban Network Study 2012
planning and response to issues is the ‘Optimised Transport System’ (OTS) approach as described in the current Regional Land Transport Strategy and Programme.

The OTS (refer Figure 8 below) is similar to the Transport Agency ‘Intervention Hierarchy’. It means considering a hierarchy of interventions to optimise the performance of the land transport system. The OTS is being used to identify how the identified future issues can be best addressed.

Figure 8: RLTS Optimised Transport System

13.4. Regional issues and opportunities

13.4.1. Issues

• Changing population base including the demographic profile in different parts of the region resulting in changing needs, affordability and levels of investment.
• Continuing to achieve an integrated planning approach to land use, infrastructure and funding.
• Enabling planned land use change while not compromising the function of the transport network.
• Managing the competing demand between commuter traffic, particularly in urban centres like Tauranga and the increasing demand for inter-regional freight traffic.
• Providing a resilient road network that appropriately meets community and business needs.

13.4.2. Opportunities

• Working collaboratively to plan, manage and fund the transport network, including the road network.
• Promoting a ‘one network’ approach for the customer and response to dealing with future demands e.g. understanding how the rail and road network can work together to address future freight demands.
• Promote increasing walking, cycling and public transport use particularly in urban centres to manage future demands.
• Better understand how land use form and responses can influence demand for the road network.
• Work with freight operators to better understand how future freight demands can be managed to meet customer expectations (both the freight operator and commuter).
• Investigate mechanisms to understand how future affordability challenges can be managed.
14. Telecommunications

14.1. Regional overview
This chapter considers the telecommunications infrastructure which comprises telephone, mobile and internet technologies, as well as TV and radio transmission. It is a facilitator of economic development, as well as providing social wellbeing benefit. The major issue for the region is the varying level of access to telecommunications infrastructure and services, although the roll out of Ultra-Fast Broadband (UFB) and the Rural Broadband Initiative (RBI) will begin to address this.

The infrastructure is privately owned, but also has large amounts of private and public investment. Significant investment is ongoing, including the roll out of 4G services (private sector) and the RBI and UFB programmes (public/private). Realising the full benefit of these investments should be a key focus.

There is some regulatory uncertainty, with reviews being conducted on the Telecommunications Act (2001), the Telecommunications Service Obligation, and the Commerce Commission undertaking a final pricing principle review of Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream Access (UBA) prices. Inconsistency in planning legislation and limitations can cause inefficiencies and hinder new solutions to issues such as location and infrastructure sharing.

Quality and capacity do not appear to be issues in the telecommunications industry in general, although publicly available data to support this is limited at best.

Planning for new infrastructure or upgrades to existing infrastructure need to take into account population projections.

Overall, the market appears to be providing good outcomes in terms of quality, reliability and coverage. Effective and effective and efficient delivery of the next generation mobile and internet networks will be a key enabler of productivity gains.
14.2. Context

14.2.1. Why is telecommunications infrastructure important?
The telecommunications sector provides services directly to consumers, and also indirectly by supporting delivery of other infrastructure based services. It facilitates economic wellbeing, and also contributes highly to social interactions and wellbeing across the region.

Telecommunications infrastructure includes all those assets which enable the exchange of information between two or more parties, and incorporates all telephone, mobile and internet technologies as well as TV and radio transmission. The copper legacy network providing telephone and low capacity broadband connections, the fibre network enabling content rich data and video transfer, mobile phone base stations, wireless nodes and broadcast transmission stations all comprise telecommunications infrastructure.87

14.2.2. Linkages
The telecommunications sector provides benefits for society and all the other infrastructure networks88. Beyond being a simple productivity enabler, telecommunications and fast broadband are already shaping how social infrastructure is delivering education, health and justice services 89.

The benefits of broadband will be inter-regional, for example there is substantial trade of goods and services between Auckland and Tauranga, and enhancing growth in one region can promote growth in the other90.

14.2.3. Ownership/governance and existing strategic investment signals/plans
The telecommunications services market opened to competition in 1989. Since then, private telecommunications planning and product advances have developed the market, with the government role largely confined to that of regulator.

Although the sector is privately owned, there is also large investment made by both public and private parties. Nationally there has been public sector investment of $1.35B in Ultra-Fast Broadband and a further $300M in the Rural Broadband Initiative, both of which are being rolled out in the Bay of Plenty (see Appendix 5 for maps showing coverage in the region).

The National Environmental Standards for Telecommunication Facilities came into force on 9 October 2008. The Standards essentially allow for the installation of telecommunications infrastructure as a permitted activity, creating a nationally consistent planning framework. There is currently regulatory uncertainty, with reviews being conducted on the Telecommunication Act and the Telecommunications Service Obligations, and the Commerce Commission undertaking a Final Pricing Principle review of both Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream Access (UBA) prices.

87 Auckland Regional Infrastructure Inventory (2009, p. 31).
88 The Business Growth Agenda Progress Reports, Building Infrastructure (2012) p. 21
89 Infrastructure 2013, National State of Infrastructure Report
90 The benefits of broadband for the BOP and Auckland (2011) p. 6
14.3. Current state and future pressures, trends and planned responses

14.3.1. Capacity

A snapshot of national infrastructure is set out in the table below:

<table>
<thead>
<tr>
<th>Existing telecommunications infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Southern Cross Cable – an undersea cable of three fibre pairs by which NZ receives data from the world and the Tasman2 cable, connecting NZ to Australia</td>
</tr>
<tr>
<td>A nationwide copper cable network</td>
</tr>
<tr>
<td>Fibre networks</td>
</tr>
<tr>
<td>Television and radio signals delivered across radio spectrum</td>
</tr>
<tr>
<td>Three cellular mobile networks</td>
</tr>
</tbody>
</table>

Tauranga is ahead of the national averages for telephone and mobile phone access however a substantial percentage of households are still without any telecommunications access in the eastern sub-region, in particular the Ōpōtiki and Kawerau Districts (9.5% and 7.1% respectively). Additionally, some parts of Whakatāne and Ōpōtiki Districts have limited mobile phone cover.¹⁹¹

There is a significant gap between broadband availability, service, speed and quality in urban and rural areas and this is pronounced across the Bay of Plenty region due to the diversity of its communities.

Fibre optic cables are increasingly being installed (in urban areas) while new mobile phone networks and extensions to broadband networks are underway. In addition, telecommunication and information transfer infrastructure are undergoing major technological change and regulatory reform.

The National Infrastructure Plan notes that future demand for communications technology outstrips current communications infrastructure. This is due in part to the fact that New Zealand’s copper network cannot be upgraded to provide the speed and capacity consumers expect in the medium term, and investment in wireless cannot provide a complete alternative in the short-term.

Overall, the sector appears to be in a strong position; however, there is a significant lack of publicly available data (especially at a regional level) in comparison to some other infrastructure sectors. As a result, a lot of the information is provided at a national level which is not useful for planning at a regional scale.

4.2.1.3 Fixed line services – telephone and broadband

Broadband uptake in the Bay of Plenty sits at 54% compared to 63% nationally. On average broadband penetration in urban areas is higher. Despite this low percentage, both internet access and access via broadband in the Bay have risen faster than the national average between 2006 and 2009.

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Tauranga, Rotorua, Taupō, Turangi, Te Puke, Whakatāne, Kawerau, Katikati, Ōpōtiki, Te Puna, Ōhope, Omokoroa, Waihi Beach, Edgecumbe and Murupara now have access to broadband connections between 10Mbps and 20Mbps.\(^{93}\)

The rural areas of the Bay of Plenty are part of the Rural Broadband Initiative (RBI). The government has reached agreements with Telecom and Vodafone for a $285M infrastructure roll out (nationally) which will bring increased and faster broadband to rural areas over the next six years.

**Fibre**
Main centres in the Bay of Plenty are included in the Ultra-Fast Broadband (UFB) initiative, through either Ultrafast Fibre Limited (Tauranga) or Chorus (Rotorua and Whakatāne).

**Mobile**
Cellular mobile networks are operated by Vodafone, Telecom and 2degrees. Mobile connections continue to increase nationally, although at a slower pace than in previous years. There are still areas within the region with limited mobile coverage – specifically areas of the Ōpōtiki and Whakatāne Districts.

**TV and Radio Transmission**
The upper North Island switched from analogue to digital TV signal on 1st December 2013. This frees up the spectrum that analogue television uses (700MHz) which will then be available for the next generation of mobile telecommunications and data services such as 4G.

**Satellite Broadband**
Satellite broadband is available to rural customers who are out of reach of broadband, it is faster than dial up, but is still one of the slower broadband technologies.\(^{94}\) Satellite broadband is more expensive to install and has higher ongoing costs, major providers are Farmside and Wireless Nation.\(^{95}\)

14.3.2. **Pressures and trends**
Overall, the sector appears to be in a strong position; however, there is a significant lack of publicly available data at a local level in comparison with some other infrastructure sectors making analysis difficult.

Demand continues to rise in both urban and rural areas, with particular increases in demand for mobile services in urban areas and internet in rural areas. Data requirements are also increasing across the board, alongside a trend of increasing data caps. With certain areas of the region projected to decline in population, there is the potential that costly infrastructure may be provided in areas where it may not be required long-term.

\(^{93}\) Bay of Plenty Situational Analysis (2013) p23.
\(^{94}\) http://www.wirelessnation.co.nz/index.php/satellite-broadband
\(^{95}\) http://www.therural.co.nz/country-living/rural-broadband-options-in-new-zealand
14.3.3. Future plans
There is a significant lack of publicly available data and forecasting is particularly difficult in this sector due to the speed of technology change\textsuperscript{96}, with high interdependency between this sector and other sectors/infrastructures\textsuperscript{97}. As the sector is privately owned, albeit with some government investment in certain areas, the future direction of the telecommunications sector will need to be considered by both public and private parties, and any solutions will need to be driven by both\textsuperscript{98}.

14.4. Regional issues and opportunities

14.4.1. Issues
There is a significant gap between broadband availability, service, speed and quality in urban and rural areas within the region. The upgrades to infrastructure in the region will not reach all communities meaning unequal access to telecommunications services. Quite often, the areas with least access have declining, relatively youthful populations and high levels of social deprivation.

The sector has raised concerns around the constraints on building infrastructure, specifically relating to reverse sensitivity issues. This is especially the case where increasing demand will require new mobile towers to be built in urban areas. The sector has also raised concerns about inconsistency of planning legislation, which increases compliance costs and can cause delays.

The speed of technological changes in the telecommunications industry can readily outstrip timely planning provisions.

There is regulatory uncertainty, with reviews being conducted on the Telecommunication Act and the Telecommunications Service Obligations, and the Commerce Commission undertaking a final pricing principle review of both Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream Access (UBA) prices.

With limited data and modelling publicly available, it is difficult to forecast the specific local, regional or national implications for copper, mobile, fibre and other telecommunications assets.

14.4.2. Opportunities
New broadband and mobile coverage in rural areas is expected to enable a major boost to rural productivity.

The switchover to digital television has freed up the radio spectrum in the 700 megahertz band for new uses, most likely 4G mobile broadband services.

There is the potential for improved remote management and monitoring of infrastructure systems and optimisation of infrastructure uses. This is already seen in the telemetering of water usage in the region.

\textsuperscript{96} National Infrastructure Unit: Evidence Base: Telecommunications sector: 2014 p2
\textsuperscript{97} Infrastructure Evidence Base: Telecommunications Sector (2014)
\textsuperscript{98} Infrastructure Evidence Base: Telecommunications Sector (2014)
15. Tertiary education facilities

15.1. Regional overview
Tertiary facilities provide education opportunities that contribute to the economic and social wellbeing of the region. There is good vocational tertiary infrastructure in the Bay of Plenty, however, these facilities will need ongoing maintenance and upgrading to address changing demands and technology.

This chapter considers the following facilities: University of Waikato Coastal Marine Field Station; Bay of Plenty Polytechnic; Te Whare Wānanga o Awanuiārangi; Waiairiki Institute of Technology; and Te Wānanga o Aotearoa.

There is a lack of niche research-led tertiary/university infrastructure to support both existing and anticipated tertiary needs of the region, and future growth in areas highly relevant to regional economic development.

The Bay of Plenty Tertiary Action Plan will implement the National Tertiary Education Strategy with a regional perspective. It will provide clear guidance for institutions, industry and regional agencies, as to current and future tertiary education requirements for the region and how they might fill any gaps or leverage opportunities.

Various parties have committed to invest funds into a Tauranga shared tertiary campus to provide a research and development hub.

Future demographic changes in the Bay of Plenty will impact on the demand for tertiary infrastructure, and how services can be delivered across the region (e.g. utilising the internet). The youth population in Tauranga is likely to remain stable, while the rest of the region is likely to experience a declining youth demographic.
15.2. Context

15.2.1. Why is tertiary education infrastructure important?
Tertiary education facilities provide an essential social service to a large geographical area, and form part of the wider social infrastructure network. They provide educational opportunities that provide residents skills and knowledge to contribute to the local and national economy. They also contribute to the attractiveness of the region as a place to live and provide employment opportunities.

15.2.2. Linkages
Educational facilities depend on other infrastructure to function including water, transportation, telecommunication networks, energy and waste disposal facilities.

There is a network of tertiary facilities throughout New Zealand, each providing different services and courses. Within the region the Bay of Plenty Tertiary Partnership (made up of Bay of Plenty Polytechnic, Te Whare Wānanga o Awanuiārangi, Waikato University and Waiariki Institute of Technology), supported by regional agencies, is working to collaboratively develop a network of complementary tertiary infrastructure, aligned to regional skill and workforce needs.

15.2.3. Ownership and governance
The tertiary facilities identified above are all publically owned establishments. This means that, while these facilities operate largely like a business and compete for student numbers, they are dependent on government funding and must comply with certain expectations set by national government.

The main legislation that governs education in New Zealand is the Education Act 1989. Under this the National Tertiary Education Strategy sets out the five year strategic direction and associated priorities that the government wishes to work towards.

The Bay of Plenty Tertiary Action Plan is a good example of parties working together in advance of infrastructure investment decisions to a regional solution. It is also an example of how each part of the region can play its role to the benefit of all. Tauranga city has the scale and range of infrastructures in place needed to support a university, and a collaborative approach will enable services to be delivered to the regionally distributed population, targeting BOP-specific regional employment skills niche needs. Other infrastructures such as the internet will support the regional delivery model.

The Bay of Plenty Tertiary Action Plan will implement the National Tertiary Education Strategy with a Bay of Plenty perspective. It will provide clear guidance for institutions, industry and regional agencies, as to current and future tertiary education requirements for the region and how they might fill any gaps or leverage opportunities.

The Bay of Plenty Tertiary Partnership is working to identify opportunities to strengthen the tertiary education offerings of the region. In particular, the Tertiary Partnership is focused on:

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99. The importance of social infrastructure is discussed in the National Infrastructure Plan 2011
100. Tertiary Education Strategy 2014-2019
• Increasing tertiary education participation and attainment in the region, particularly for Māori.
• Developing a highly educated and skilled workforce that is aligned to regional needs.
• Facilitating research for sector development and innovation to help support overall economic growth and community development in the region.

The intent of the Bay of Plenty Tertiary Partnership is to operate as a collaborative network of tertiary campuses, each providing distinct, but complementary provision aligned to regional needs.

15.2.4. Existing strategic investment signals/plans
There are no publicly available documents that outline the strategic investment plans of each tertiary institute. Annual reports provide a very limited assessment of the state of educational infrastructure capacity and plans for growth, meaning there is only limited information publicly available on the future infrastructural plans of tertiary institutes in the Bay of Plenty.

15.3. Current state and future pressures, trends and planned responses

15.3.1. Capacity
The region appears to be well serviced by vocational tertiary education infrastructure, however there is little information available on the existing capacity and quality of tertiary education infrastructure.

15.3.2. Pressures, trends and future plans
• Funds been committed to build a new shared tertiary campus in Tauranga. This campus aims to provide niche tertiary level research programs strongly relevant to Bay of Plenty economic requirements, such as in the coastal marine science area, without competing against other out-of-region providers for wider tertiary education needs.
• Tertiary education infrastructure is highly influenced by central governmental direction on funding and required standards.
• The Bay of Plenty Tertiary Action plan (as guided by the National Tertiary Education Strategy) will set the strategic direction and priorities for tertiary education in the region.
• Demographic change and future economic demands across the region will impact on the demand for education infrastructure. For example it is becoming increasingly important for primary sector workers across New Zealand to have some form of post-school qualification. In the future, jobs will be more specialised and will require people with strong educational backgrounds. Staff will need to be more highly skilled, increasing the demand for diplomas and certificates, especially those provided as in-work training through industry training organisations.
• The facilities offered by other tertiary education providers may influence the decisions of students to attend an institution outside the region.

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101 Bay of Plenty Times "$15m to make Tauranga city campus a reality", 24 July 2014
15.4. Regional issues and opportunities

15.4.1. Issues

- Tertiary education facilities are funded centrally but operate as separate business entities competing for the same student base.
- There is a lack of niche research-led tertiary university infrastructure to support both existing and anticipated tertiary needs of the region, and future growth in areas highly relevant to regional economic development.
- Youth demographics will be changing in the region, with a small increase in Tauranga while the rest of the region will face a decreasing youth population.
- While there is a net decline, Māori youth comprise 25% of the population (compared with 14% nationally) and one-half of the Bay of Plenty’s young Māori are between 0-24 years of age making them crucial to the future economic and social wellbeing of the region.

15.4.2. Opportunities

- The Bay of Plenty Tertiary Action Plan will set the strategic direction and priorities for tertiary education in the region.
- Further collaboration and co-investment into the Tauranga shared tertiary campus.
- Using strategic regional approach to upgrading existing vocational tertiary education facilities to ensure that a coordinated approach is taken to address changing demands and technology needs.

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103 Report by Professor Natalie Jackson, National Institute of Demographic and Economic Analysis, October 2011.
16. Waste facilities

16.1. Regional overview

This chapter considers the region’s waste infrastructure. The Bay of Plenty is dependent on privately owned and operated Waikato landfills (Tihiroa and Hampton Downs) for municipal waste (which comprises 24% of the region’s waste), and smaller cleanfills and landfills within the region for other waste types (53% of the region’s waste). Rotorua District Council owns and operates its own municipal landfill and a bylaw prohibits any waste from outside the District being disposed of at this landfill.

Rotorua, Hampton Downs and Tihiroa landfills have capacity and consents to operate until 2030-2035. However, there is no information regarding plans beyond this.

The region-wide population is increasing along with consumption which generates more waste. The majority of waste comes from construction, demolition and industrial commercial uses. Half of the waste disposed to municipal landfill could be diverted. The cost of waste disposal will increase.

Waste needs to be viewed as a resource, increasing the diversion of waste to be reused. Innovative options for disposing of waste in and/or outside of the region should be examined.

The Government’s focus on efficiency and waste reduction is key and one of the ways to achieve this is through public and private sector collaboration.
16.2. Context

16.2.1. Why is waste infrastructure important?

The appropriate management of waste reduces resource use, and promotes sustainable management, while protecting public health and safety. In particular hazardous and toxic material needs to be properly disposed of to prevent contamination of the environment. Improper waste disposal could lead to social and economic problems such as costs associated with treating diseases. Resource efficient production methods and beneficial reuse reduces waste for disposal and creates new opportunities.

The majority (87%) of waste across the Bay of Plenty and Waikato Regions comes from industrial, commercial and greenwaste sources, 13% comes from kerbside and Council drop-off (excluding greenwaste). Of this total waste stream approximately 24% of the total waste goes to municipal landfill, 53% to non-municipal landfill (not defined as disposal site under Waste Management Act 2008 and exempt from levies), and 23% is diverted/recycled.\(^{104}\)

With the region’s population growing it is important that the focus is not just on managing and mitigating the effect of waste materials, but on addressing the ways in which materials are used, Safe and secure disposal sites are important, but resource efficient production methods, reprocessing and recycling facilities the amount of waste being disposed of.

16.2.2. Linkages

Large volumes of waste are being transported to privately-owned landfills out of the region\(^{105}\). The majority of the region’s municipal waste is transported west out of the region to either Tirohia (Paeroa) or Hampton Downs (north Waikato) for disposal. These waste flows create a strong reliance on the roading network for effective transport of municipal waste, as shown in Figure 9\(^{106}\).

16.2.3. Ownership and governance

The Waste Minimisation Act 2008 is in place and the New Zealand Waste Strategy has been revised. The New Zealand Waste Strategy has two goals: reducing the harmful effects of waste; and improving the efficiency of resource use.

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\(^{104}\) BOP Waste and Resource Efficiency Strategy (2013), p15

\(^{105}\) BOP Waste and Resource Efficiency Strategy (2013) p 11

\(^{106}\) BOP Waste and Resource Efficiency Strategy (2013), p13
All territorial authorities in the region have adopted their Waste Management and Minimisation Plans (WMMPs) and the Bay of Plenty Regional Council has updated its Regional Waste Strategy to align with this new framework.

Refuse transfer stations, recycling and reprocessing facilities within the region are either publicly or privately owned and operated. There are two key private operators: Transpacific and Envirowaste.

16.2.4. Existing strategic investment signals/plans

The Bay of Plenty Waste and Resource Efficiency Strategy 2013 aims to support local councils, businesses and communities to be more effective and efficient in waste management and minimisation, guiding waste management out to 2023. The strategy sets up a Waste Resources Advisory Group that includes public, private and community representatives with a vision of working together for a more resource efficient region. Actions and funding associated with the implementation of the Strategy is provided for in the Regional Council 2014/15 Draft Annual Plan.

The Bay of Plenty Regional Council is aware of a number of waste-to-energy proposals being developed by the private sector. These proposals use innovative technology and could have a significant impact on the economy and waste disposal in the region if successfully implemented.

16.3. Current state and future pressures, trends and planned responses

16.3.1. Capacity

Historically most territorial authorities provided landfills within their district, but the high cost of compliance for landfills accepting municipal waste (municipal landfills) has resulted in their rationalisation and privatisation. Large volumes of waste are now sent out of the region for disposal. (as shown in Figure 11) Rotorua District has the only municipal landfill owned and operated by a territorial authority. A bylaw prohibits any waste from outside the Rotorua District being disposed of at this landfill.

There are no concerns about the capacity of the out of region municipal landfills or regional fill sites to continue accepting waste. Demand, and economic viability will influence the development of waste facilities and services.

Councils and private operators provide a range of facilities and services to recover, reuse or reprocess resources. Capacity appears to be adequate and responsive to demand.

16.3.2. Pressures and trends

The Waste Minimisation Act changed the approach of waste disposal to promoting waste minimisation, and introduced a levy on materials disposed of at municipal landfills. This aimed to encourage waste minimisation. The levy provides support to waste minimisation activities but has created an anomaly as the disposal of non-municipal waste at lower standard landfills is not levied. The government continues to seek greater efficiency from the public sector through reform of the Local Government Act. There are increased efforts of collaboration between territorial authorities, regional councils, and industry including sharing knowledge, systems, and processes. As much of the waste industry is privatised it can be difficult to control the collection, transfer, recycling and/or disposal of waste without public sector intervention or support. However the private sector is

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107 BOP Waste and Resource Efficiency Strategy (2013) p 16
increasingly finding economically viable opportunities to deliver services. For example a new privately owned transfer station in Rotorua diverts waste from the Rotorua municipal landfill, while a number of private operators provide composting or vermi-composting services within the region on a commercial basis.

The waste collection and disposal market is highly competitive and is determined by cost rather than proximity to landfills or local authority boundaries. In a highly competitive market private competition and reduced territorial authority ownership and/or operation of waste facilities will continue.

There will be continued pressure on existing waste processing facilities from the increasing population and consumption.

Research and innovation is one of the focus areas of the Regional Waste and Resource Efficiency Strategy. The introduction of waste-to-energy technology proposals could have a significant impact on the economy and waste disposal in the region if successfully implemented. This type of innovation could generate employment, produce energy and divert waste, however, due to the commercially sensitive issues there is limited information available.

There is potential for increased costs associated with waste disposal arising from the Emissions Trading Scheme and future possible increases in the waste levy.

16.3.3. Future plans
The Rotorua, Tirohia and Hampton Downs landfills have capacity until 2030-2035 and disposal plans following this are unknown. Market forces are expected to ensure private operators continue to provide services and facilities. Facilities associated with the diversion of waste from landfills are also likely to continue developing. Vermi-composting of a range of materials including pulp and paper processing by products, sewage sludge and greenwaste is well established. Interest in food waste diversion is high in both the private and public sector.

16.4. Regional issues and opportunities
16.4.1. Issues
- Rotorua, Tirohia and Hampton Downs landfills have capacity until 2030-2035 and disposal plans following this are unknown.
- There is a lack of facilities for municipal waste in the eastern Bay of Plenty. Half of the waste disposed of at municipal landfills could readily be diverted (through recycling or organic waste). Given predicted growth in consumption as a result of population increase, waste generated in the region will increase.
- Limited and variable waste data is available for the Bay of Plenty region both for council-controlled waste streams and those managed by the private sector (due to commercial sensitivities), particularly in relation to quantities, types of waste, and consideration of diverting waste materials. Further there is an absence of a coordinated mechanism or

108 Bay of Plenty and Waikato Regions Waste Stocktake Report for Bay of Plenty and Waikato Regional Councils 2013
109 Bay of Plenty and Waikato Regions Waste Stocktake Report for Bay of Plenty and Waikato Regional Councils 2013 – As identified in TA Waste Minimisation Plans
110 Bay of Plenty and Waikato Regions Waste Stocktake Report for Bay of Plenty and Waikato Regional Councils 2013
central repository for gathering, analysing and disseminating data. The un-monitored movement of waste between regions is a further complication.\footnote{Bay of Plenty and Waikato Regions Waste Stocktake Report for Bay of Plenty and Waikato Regional Councils 2013}

- The distance to disposal for municipal waste is an issue, especially in the east, as well as the associated costs of shipping waste out of the region. For example Ōpōtiki is 188km from the nearest municipal landfill in Tokoroa and 233km from Tirohia.
- Mana whenua values and concerns regarding waste need to be accounted for.
- Costs of waste disposal will increase e.g. Emissions Trading Scheme/climate change.

### 16.4.2. Opportunities

- The opportunity for waste to be viewed as a resource, increasing waste diversion through private sector and territorial authorities’ action. This may include further investigation into innovation opportunities such as waste-to-energy projects and other reuse options.
- More consistent national regulations and compliance monitoring particularly for private disposal to land operators who fall outside of Waste Minimisation Act levy requirements.
- Prioritising and delivering initiatives identified in the Waste and Resource Efficiency Strategy and the Bay of Plenty and Waikato Regions Waste Stocktake.
- Resource Efficiency – developing ways to change behaviour through education, and promotion.
- Opportunities to save costs and/or increase efficiency and effectiveness through collaboration in jointly managing waste disposal including recycling and organic wastes.
- A coordinated approach to data and information gathering and dissemination. This would include the standardisation of terminology, consistency between districts, enforcement of measuring and reporting requirements, and a comprehensive system of data management and regular reporting.
- Promoting increasing linkages between generators and processors. This is particularly important that generators identify waste correctly so that it can be disposed of appropriately.
18. Water Services (sewerage treatment, stormwater and water supply)

18.1. Regional Overview

This chapter considers the region’s essential water services infrastructure which comprises water supply, wastewater and stormwater infrastructure.

The responsibilities for water services infrastructure are divided between territorial authorities. There is a range of acts and guidelines that are important in the sourcing, management, distribution and quality of water services.

The main issue for the Bay of Plenty in terms of water services infrastructure will be working together to maintain the affordability of services while addressing ageing infrastructure, population change and legislative requirements. Asset condition information and performance indicators are reported differently between councils so accurate and comparative assessment is difficult at present. New reporting requirements introduced under the Local Government Act will require consistent reporting between authorities.

Most of the future pressures will be in the main urban areas (including growth areas), due to population change, changes in weather patterns, sea level change and rising community and cultural expectations in relation to service delivery.

Sewerage infrastructure issues include impacts from increased high intensity storm events (resulting in flooding and stormwater infiltration), and increased consenting requirements resulting in increased cost of compliance.

For water supply, identified issues include the allocation of water (productive vs. urban usage), managing demand, high cost asset renewal programmes and capacity upgrades and water quality and water source restrictions of volume.

Existing stormwater infrastructure is aging and was originally designed for lower intense rainfall events. This is now under pressure by increased intensification and community increased service expectations.
18.2. **Context**

18.2.1. **Why is water services infrastructure important?**

Water services infrastructure enables economic, social, tourism and cultural activities to take place in both urban and rural communities. Access to drinking water is a basic human right, and wastewater and stormwater networks contribute to the management of health and flood hazards in the community.

18.2.2. **Linkages**

Water is a critical resource. Water (and water infrastructure) is a fundamental enabler of, and contributor to activities such as electricity generation, gas production and distribution, and hospitals. Without water (both supply and disposal), commercial, industrial, primary production, education facilities and homes would not function.

Water services infrastructure also provides indirect services to all other regionally significant infrastructures. For example, stormwater infrastructure contributes to flood management in urban areas, enabling the effective and efficient operation of the roading network.

18.2.3. **Ownership and governance**


The take, irrigation and discharge of water is primarily governed by the Bay of Plenty Regional Council through the Regional Water and Land Plan and the resource consent process. The physical reticulation (provision, use and storage) infrastructure is owned and managed by territorial authorities under the Local Government Act 2002 (LGA) and Health (Drinking Water) Amendment Act 2007. Territorial authorities are only responsible for the infrastructure located within their respective districts. The National Environmental Standard for Sources of Human Drinking Water developed under the RMA is also relevant. The LGA, Local Drainage Act (1908) and RMA provides the main legislative framework for storm water management.

**Integrated land use planning**

Council’s Long Term Plans facilitate provide integrated decision making and co-ordination of resources and infrastructure funds to meet community outcomes. These outcomes are also facilitated through the land use provisions in the District Plans i.e. directing development to where infrastructure has capacity.

SmartGrowth is an example of how a collaborative approach between government and non-government agencies is being used to plan for an integrated land use and infrastructure approach for the western bay sub region.

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112 National Infrastructure Plan 2009 p. 39-41
18.2.4. Existing strategic investment signals/plans
The efficient management of water as a resource is high on the national agenda. In 2013 further freshwater reform proposals co-led by the Ministry for the Environment and the Ministry for Primary Industries were announced but are currently on hold.\(^{113}\)

Performance indicators on infrastructures currently vary between councils, making it difficult to benchmark and compare the quality of service provided. However, from 2015 the new LGA standardised reporting requirements will change this situation for flood protection, the three waters and footpaths and roads. Local authorities will be required to incorporate the performance measures in the development of their new 2015-2025 long-term plans and 2015/2016 annual reports.\(^{114}\)

18.3. Current state and future pressures, trends and planned responses

18.3.1. Capacity
The National Infrastructure Plan divides the water system into two categories: urban water and productive water. Urban water, also known as the ‘3 waters’, is the system that supplies residential, commercial and industrial users with safe drinking water, and manages sewerage and stormwater. Productive water refers to the systems that support primary production through rural water supply and irrigation, this will be further discussed in the environmental area as it is more resource use focused. The following table provides an overview of water infrastructure:

<table>
<thead>
<tr>
<th>Potable water supply infrastructure</th>
<th>Stormwater infrastructure</th>
<th>Sewage and sewage treatment infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intake Structures</td>
<td>• Primary Network (catering to lower Annual Resturn Intervals (ARIs) and generally provided through a piped netowrk)</td>
<td>• Urban and non-urban wastewater treatment plants</td>
</tr>
<tr>
<td>• Water processing and treatment plants</td>
<td>• Secondary Network (catering to the higher ARIs and provided for through retention/detention ponds, overland flowpaths and pipe and pump station networks)</td>
<td>• Wastewater sewers and pipe network</td>
</tr>
<tr>
<td>• Bore, storage reservoirs and dams</td>
<td></td>
<td>• Pump stations</td>
</tr>
<tr>
<td>• Pipe network that supplies residential, commercial and industrial activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pump stations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Water supply**
- In districts with larger urban populations, specifically Tauranga, Rotorua, Western Bay of Plenty and some parts of Whakatāne, some water infrastructure may reach capacity in the future. To address this, councils have put in place a series of high cost asset renewal programmes and capacity upgrades. This will ensure that future demand for water is met and levels of service are maintained.


\(^{114}\) Department of Internal Affairs website 8 sept 2014
• Asset renewal and maintenance of existing infrastructure is a significant focus for councils, for example aging infrastructure such as asbestos cement pipes that break with ground movement, are identified in ongoing renewal programs. New infrastructure is planned in areas where high urban growth is predicted, such as Papamoa and Pyes Pa in Tauranga.

• In districts with smaller urban areas, such as Kawerau and Opotiki, water supply infrastructure is able to accommodate predicted population levels and no significant capacity issues have been identified. Both districts have in recent times invested in major upgrades to meet high water quality standards. The Ministry of Health has advised Opotiki that the township has the only supply in the Eastern Bay of Plenty to meet the “secure source” status defined in the New Zealand Drinking Water Standards.

• Some districts have a strong focus on managing demand through water metering as a way of lowering demand and deferring infrastructure upgrades. For example Tauranga, Whakatane and Opotiki have volumetric charging in place, and water metering will be introduced in Western Bay of Plenty before 2018.

• Legislation that requires increased levels of service for water treatment results in increasing costs of compliance for water supply infrastructure.

Sewerage and Sewage Treatment

• Sewerage assets in the Bay of Plenty region are in fair to good condition, however, some older asbestos and concrete infrastructure is ageing and requires replacement and/or refurbishment. Whakatane has identified significant issues at two of its sewage treatment plants due to corrosive gas damage and ageing of outfall pipes. Opotiki township reticulation can suffer excessive infiltration when the adjacent rivers are in flood and the cause and cost implication of remediation is currently being assessed.

• Capacity is generally good at present. The Long Term Plans of Tauranga, Western Bay of Plenty and Opotiki state that most sewage infrastructure will be able to accommodate a certain percentage of population growth without requiring additional upgrades or works. Some districts such as Rotorua and Western Bay of Plenty are investigating reticulation for some small communities to address water quality issues resulting from discharges and uncontrolled nutrient overland flows, however affordability is a problem.

• Stormwater and/or groundwater infiltration of the sewage system is a key issue affecting infrastructure capacity. These issues arise partly due to a combination of aging infrastructure and original lower infrastructure standards creating inadequate stormwater infrastructure, as well as a lack of ongoing monitoring to address increased infiltration resulting from cross connections between stormwater and sewage discharges. The majority of funding outlined in Long Term Plans is directed towards maintenance of existing infrastructure. The Whakatane Long Term Plan states that maintenance to ensure infrastructure is working correctly and ‘fit for purpose’ is increasingly costly, and as a result, some larger projects have been deferred.

• All of the Long Term Plans also direct investment towards smaller infrastructure projects such as pumping stations upgrades, new sewerage schemes, and the replacement of septic tanks.

• Major projects include the construction of the Southern Pipeline in Tauranga to be completed in 2016. The cost of this pipeline is approximately $102.4M, and the purpose of
the pipeline is to relieve existing sewerage infrastructure pressure, and accommodate future population growth.

- Legislation requiring increased levels of service for water treatment prior to discharge creates increasing costs of compliance for sewage treatment infrastructure.

4.2.1.4 Stormwater

- The two main issues for stormwater infrastructure are quantity and quality of discharge. There are existing infrastructure capacity issues in urbanised areas within Tauranga, Whakatane, Western Bay (Waihi Beach) and Rotorua and less pressure on stormwater infrastructure in the small urban and non-urban areas in Opotiki, Western Bay of Plenty and Kawerau. Urbanised areas experience higher levels of pressure due to original systems being designed to provide for lower levels of service (in existing urban areas) and may not be in line with current community expectations. Further, increases in impermeable surfaces without additional infrastructure or on-site management provided can increase flood risks.

- A significant portion of funding is directed towards maintenance and upgrade of existing infrastructure and renewal of asset life expectancy. In the Western Bay of Plenty, projects focusing on new developments have been deferred in favour of ensuring that existing infrastructure meets legislative requirements.

- Investment in new infrastructure primarily focuses on urban growth nodes and flood protection works. In some of the less populated or poorer areas, compromise will be necessary between the increasing demand for higher levels of service and affordability.

- Capital expenditure in Tauranga is directed towards both brownfield stormwater improvement works and new infrastructure with a focus on low impact design for urban growth areas. Tauranga are also developing a wider Stormwater Strategy towards better understanding and planning for future stormwater improvement works to reduce existing flood risks. Western Bay of Plenty has identified several structure plans as key areas for investment from 2015 onwards.

- Flooding problems in existing areas are a major issue for many districts, including Tauranga and Whakatāne. The Long Term Plans identify two main reasons for this: the location of existing settlements, and urban intensification.

- There are informational gaps relating to assets, and how assets would perform in a ‘1 in x number of years’ flooding event, with varied levels of knowledge/modelling undertaken by each District.

- Flood risk resulting from intense rainfall vents will be exacerbated by future climate change, which will bring more intense weather events.

- Cross-regional effects are difficult to identify and manage due to the district-based management of stormwater. Stormwater discharges from different districts may have the same ‘end point’ in a specific catchment. If the run-off is not managed effectively, the environmental effects created by the quality and quantity of discharges represent an additional cost to authorities.
18.3.2. Pressures and trends
Community and cultural expectations for consistent water supply and a safe, efficient and high quality water system are increasingly rising. Central government mandates or legislation may impose additional water regulation measures on water quality, or higher standards for stormwater and sewage treatment or discharge. However, the ability for territorial authorities to meet the demands for increased levels of service is highly dependent on the institutional capacity, levels of debt and available funding of the particular council.\textsuperscript{115} This is especially the case in the Bay of Plenty with changing population patterns including increasing urbanisation, decreasing population in the east and an ageing demographic.

The increasing cost of ‘marginal’ improvements in water supply quality and sewage treatment is significant and should be subject to cost benefit analysis of alternate options, with careful consideration of future population changes.

Long Term Plans in the BOP identify climate change and the resilience of infrastructure as a significant pressure that will be exacerbated in the future affecting both the sources of water, as well as the water infrastructure itself.

The National Infrastructure Plan identifies an increased demand for productive water as a key pressure on water infrastructure. There is a need to balance the demand for water between urban and productive uses, and for environmental quality to be taken into account in these decisions.\textsuperscript{116} Demand for irrigation for rural productive use is growing and is set to grow into the future. Irrigation projects vary in size and scale, and some irrigation projects may be very large and require significant investment.

18.3.3. Future plans

Maintenance and upgrading of existing infrastructure
The pressures on infrastructure will continue to be assessed and projects identified in individual council asset management plans and long term plans.

New infrastructure
Key infrastructure projects are planned for water, sewage treatment and stormwater infrastructure. These include:

- Installation of district-wide water metering in Western Bay of Plenty.
- Construction of the Southern Pipeline in Tauranga.
- Initiation of the Waiari Water Treatment Plant, to be constructed over three stages.
- Upgrades to the Te Maunga Wastewater Treatment Plant.
- Investment in acquiring land and installing infrastructure in identified urban growth nodes and areas with structure plans in Tauranga and Western Bay of Plenty.
- Upgrade of the Opotiki sewer reticulation and possible extensions to meet growth related to the new aquaculture projects.

\textsuperscript{115} Report of the Local Government Infrastructure Efficiency Expert Advisory Group 2013 p. 46
\textsuperscript{116} National Infrastructure Plan 2011 p. 43
**Spatial mapping**

Councils are already utilising spatial mapping tools to map the location of assets and attach asset information. Mapping may be used to map catchments, update flood information and determine overland flow paths.

### 18.4. Issues and opportunities

#### 18.4.1. Potential for collaboration

At present water services infrastructure is separate and managed by each respective council, there is little cross-boundary collaboration, with the exception of some SmartGrowth directives such as the Omokoroa pipe line and the shared Waiari resource consent. Ongoing issues for waters include the cost of renewing aging infrastructure, declining population, and expectations of increasing high levels of service (set by both community expectations and regulation) are likely to result in increased costs across a decreasing or aging population.

An overarching regional strategy to stocktake the existing resources, infrastructure and issues within the region and plan for the future management of both the resource and required infrastructure needs to be undertaken. This strategy needs to review the increasing cost of consent compliance against need. The viability and value of increased collaboration by combining water supply, sewerage and stormwater services on a sub-regional scale should be further investigated.

In the Bay of Plenty, with the exception of Tauranga and Kawerau, most districts have relatively widely dispersed communities with many not enjoying some or all water services. For those that have water services, existing schemes are funded by targeted rates and hold levels of service, operational and renewal strategies specific to the affordability of the communities they serve. The dispersion and geographic location rule out interconnection of such schemes and there needs to be further investigation as to how this can be addressed. In sub-areas with declining population and poor prospects for economic growth, intergenerational impacts of funding will also have to be assessed.

#### 18.4.2. Issues

- Water supply, sewerage and stormwater are subject to legislative requirements and consent conditions. High costs are associated with ensuring that infrastructure meet these requirements and consent conditions. In order to maintain affordability for the community, some councils defer new infrastructure projects in favour of maintenance and upgrades.
- Cross-boundary effects of water supply, stormwater and sewerage discharges are not well documented in the region.
- In areas experiencing population decline, it may become increasingly difficult to maintain current service levels.
- Councils identify population change, economic growth, climate change, cost of compliance and community wellbeing as factors that determine future infrastructure investment. An issue is therefore ensuring that sound investment decisions are made in light of uncertainty and changing conditions.
18.4.3. Opportunities

- Technological advances are likely to lower the cost of collecting and storing information on water assets. It may further enable new stormwater management techniques such as low impact stormwater design techniques.
- Opening up overland flow paths in areas with a high flood risk and stormwater management system beyond its capacity. Territorial authorities should consider opening up overland flow paths by acquiring low lying land. This may be more cost effective than upgrading the stormwater infrastructure of the particular catchment.
- To review the cost of compliance across the water services industry against the real benefits gained from any marginal increases in water quality.
PART 3: APPENDICES
## Appendix 1
### Analysis of significance of infrastructure

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Is it fundamental to people’s wellbeing &amp; liveability of the Bay?</th>
<th>Is a multi-agency approach required to address any issues?</th>
<th>Does it impact on more than one territorial area?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Transport</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>PT infrastructure connects people to essential services and connects communities</td>
<td>NZTA, councils, private operators</td>
<td>PT services operated between towns, regions etc.</td>
</tr>
<tr>
<td>High Courts and Prisons</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>High Courts and Prisons are fundamental for maintaining law and order</td>
<td>Ministry of Justice, Police, private operators</td>
<td>High Courts and Prisons cater for multiple areas across territorial boundaries</td>
</tr>
<tr>
<td>Flood Protection and Control Works</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Flood protection and control works are fundamental for societal wellbeing in flood prone areas</td>
<td>Regional and district councils, private land owners, civil defence</td>
<td>Multiple territorial authority areas</td>
</tr>
<tr>
<td>Hospitals</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Fundamental to health and wellbeing of region’s population</td>
<td>District Health Boards, local health centres, emergency services</td>
<td>Impacts entire region – all territorial authority areas</td>
</tr>
<tr>
<td>Tertiary Education Facilities</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Fundamental to social wellbeing of the population as well as facilitating economic wellbeing</td>
<td>Ministry of Education, private providers</td>
<td>Affects more than one region.</td>
</tr>
<tr>
<td>Waste Facilities</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Fundamental to public health and environmental wellbeing.</td>
<td>Ministry for the environment, regional and district councils, private operators</td>
<td>Affects multiple regions (waste taken outside the region)</td>
</tr>
<tr>
<td>Major Event Facilities</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Enhance social and economic wellbeing however are not considered ‘fundamental’</td>
<td>A multi-agency approach is not required in all instances to address issues</td>
<td>Catchment is often larger than one territorial area for large event facilities</td>
</tr>
</tbody>
</table>
Appendix 2
National Infrastructure Plan 2011 – guiding principles and challenges

NIP guiding principles to respond to infrastructure challenges:

- Investment is well analysed and takes sufficient account of potential changes in demand.
- National infrastructure networks are able to deal with significant disruption and changing circumstances.
- Maintain a consistent and long term commitment to infrastructure funding and utilise a broad range of funding tools.
- It is clear who is making decisions, and on what basis, and what outcomes are being sought.
- Regulation enables investment in infrastructure that is consistent with other principles, and reduces lead time and uncertainty.
- Infrastructure decisions are well coordinated across different providers and are sufficiently integrated with decisions about land use.

NIP key challenges for the country’s infrastructure networks:

- 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.
- Poor coordination between different infrastructure providers leads to suboptimal outcomes. Decisions over land use and infrastructure investment could be better integrated.
- New Zealand’s infrastructure is vulnerable to outages, including through natural hazards, and we have insufficient knowledge of network resilience at a national level.
- 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. This is particularly relevant for the Bay of Plenty region due to the rapidly changing population makeup.
- The regulatory environment does not support long term infrastructure development and contributes to unnecessary costs and uncertainty.
- The performance of infrastructure assets is not transparent. It is not always clear who is accountable for decisions.
### Appendix 3

**Summary assessment matrix of Regionally Significant Infrastructure**

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Current State</th>
<th>Trend (future pressures)</th>
<th>Risk</th>
<th>Key interdependencies</th>
<th>Area affected</th>
<th>Agencies involved</th>
<th>Potential response options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The region’s airports are operating efficiently, if in isolation. There is no overarching strategic direction or plan for the Region.</td>
<td>Demand will increase in growth areas. Population decline and areas serviced by smaller airports may lose services.</td>
<td>Retirement of the Beech fleet will affect Whakatāne and Taupō airports and may require them to upgrade to continue to operate. Consideration needs to be given to changing population needs and where the demand for services will be.</td>
<td>Road network, tourism operators, hospitals, public transport, tourism/businesses.</td>
<td>Region, and particularly the smaller airports (such as Whakatāne &amp; Taupō) where there is a strong reliance on Beech fleet.</td>
<td>Air NZ, Councils, Crown, Airways, CAA</td>
<td>Increase collaboration across the region, create a strategic plan for the region, and potentially upgrade where necessary.</td>
</tr>
<tr>
<td><strong>Courts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Able to accommodate demand in the short term, but subject to financial constraint</td>
<td>Crime rates may decrease overall, but some areas will experience an increase in population</td>
<td>There is no immediate infrastructure investment required for court infrastructure</td>
<td>Critical infrastructure such as water, electricity, telecoms. As well transportation networks.</td>
<td>Region</td>
<td>Ministry of Justice Other government agencies</td>
<td>Increasing technology. Merging of District Courts in cases where population cannot sustain infrastructure</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Current State</td>
<td>Trend (future pressures)</td>
<td>Risk</td>
<td>Key interdependencies</td>
<td>Area affected</td>
<td>Agencies involved</td>
<td>Potential response options</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Flood protection works</td>
<td>Current infrastructure appears to be performing at design standard.</td>
<td>Bigger defences to maintain current level of service required to cope with climate change. Demographic changes and affordability will be an issue.</td>
<td>Infrastructure failure could have wide-reaching impacts including disrupting other infrastructure and cannot be easily substituted. The increasing pressure forecast (i.e. from climate change) will be incremental, allowing time to adapt.</td>
<td>Other infrastructure is vulnerable to flood events, either directly or indirectly, including roads, wastewater and water supply Particularly linked with stormwater infrastructure.</td>
<td>Region</td>
<td>Local and Regional Council, Scheme owners/managers</td>
<td>Increasing focus on regional flood risk management. Existing infrastructure upgraded Increasing investment in soft options. Managed retreat from high risk areas.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Current State</td>
<td>Trend (future pressures)</td>
<td>Risk</td>
<td>Key interdependencies</td>
<td>Area affected</td>
<td>Agencies involved</td>
<td>Potential response options</td>
</tr>
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<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>--------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Hospitals</strong></td>
<td>All four hospitals have or are being upgraded, efforts being made to optimise and integrate common services into primary providers (e.g. GPs) and centralise specialist services</td>
<td>Ageing population, rate of funding growth reducing, workforce shortages, new technology, cost of patient flows out of the region</td>
<td>The current health care models are clinically unsustainable, unaffordable &amp; will not meet future demand. Change is required</td>
<td>Transport (roads, public, airport, helicopters), energy, communications</td>
<td>Region</td>
<td>Ministry of Health, Midland DHB’s, GP’s, Public Health Units, Councils, public transport providers</td>
<td>Monitor impact of “better sooner more convenient” policy integrating services into the community. Provide upgrades to address demand as required.</td>
</tr>
<tr>
<td><strong>Petroleum products (distribution and storage)</strong></td>
<td>Market driven for demand and supply</td>
<td>Difficult to gauge due to commercial sensitivities</td>
<td>Potential vulnerability of fuel tank terminals impacting on distribution</td>
<td>Strong linkages with transport and electricity supply. All other infrastructure reliant on petroleum one way or another</td>
<td>Region</td>
<td>BOP CDEMГ BOP Lifelines Group Port of Tauranga</td>
<td>Increasing the number of service stations that have generator backup</td>
</tr>
<tr>
<td><strong>Ports</strong></td>
<td>Adequate capacity for current demand and plans in place to be able to accommodate future demand including larger ships.</td>
<td>Increase in the volumes of freight, move towards larger ships, and continued competition with Port of Auckland.</td>
<td>The Port itself has limited risks other than general resilience issues associated with unknown climate change impacts.</td>
<td>Road, rail, private businesses, international markets,</td>
<td>Nationally</td>
<td>Regional Council, private stakeholders, private businesses, NZTA, KiwiRail</td>
<td>Upgrade when required.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Current State</td>
<td>Trend (future pressures)</td>
<td>Risk</td>
<td>Key interdependencies</td>
<td>Area affected</td>
<td>Agencies involved</td>
<td>Potential response options</td>
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<tr>
<td>Public Transport (PT)</td>
<td>Meets current demand</td>
<td>Trends will result in higher demand (with changing needs) and expectations</td>
<td>Failure to maintain/improve PT infrastructure will result in loss of patronage and impacts on roading infrastructure in particular</td>
<td>Roading network, health, education, rail, airports, port</td>
<td>Region</td>
<td>Councils NZ Transport Agency MoE DHB Operators</td>
<td>Maintain/upgrade existing services and facilities. Provide new dedicated services to encourage new demand.</td>
</tr>
<tr>
<td>Rail</td>
<td>Single track but recent installation of passing loops means network can cope with predicted capacity. Current state of infrastructure is poor however it is currently coping with load.</td>
<td>Rail freight demand is expected to double within the region over the next 10-20 years.</td>
<td>Providing timely investment for necessary network upgrades and renewals.</td>
<td>Port of Tauranga, MetroPort (Auckland), Strategic Road Network</td>
<td>Region</td>
<td>KiwiRail, TCC, Port of Tauranga, BOP Regional Council, NZTA</td>
<td>Protecting existing and potential future rail corridors. Increasing rail capacity for freight in the region. Investigation into currently unused parts of the network.</td>
</tr>
<tr>
<td>Roading</td>
<td>Well-established network with some issues at specific locations.</td>
<td>Increasing demands for people and goods movement but affecting parts of region differently.</td>
<td>Affordability of network maintenance and improvement in context of changing land use, population base and</td>
<td>Land use Other transport networks (e.g. rail, sea, air), public transport.</td>
<td>Region</td>
<td>NZ Transport Agency Local authorities KiwiRail Ministry of Transport</td>
<td>Collaborative approach to land use and transport planning/funding. Maximise use of existing network. Demand management. Increase understanding of customer needs, e.g.</td>
</tr>
</tbody>
</table>
## Telecommunications

**Current State**: Generally good however there are pockets in the East of the region with limited or no access to any telecommunications infrastructure.

**Trend (future pressures)**: Increased demand for data and services however RBI and UFB initiatives are in place to improve access.

**Risk**: Declining population in some areas means there might not be enough demand to justify investment in providing access. Areas with no telecoms may require access for lifeline purposes.

**Key interdependencies**: Lifeline relevance for health and emergency services as well as communication important for business, education and community wellbeing.

**Area affected**: Region

**Agencies involved**: Telecommunications companies/ Central Government/Local Government

**Potential response options**: Better understand freight needs of the region.

### Public transportation, electricity and water services

**Current State**: Region

**Trend (future pressures)**: Increased population and private provision. Government direction for increased efficiency.

**Risk**: Reliant on out of region municipal disposal. Private ownership resulting in transport (road)

**Area affected**: Region

**Agencies involved**: Rotorua DC, BOPRC, Private Operators, Transfer Station operators.

**Potential response options**: Further collaboration and co-ordination between private and public operators increasing efficiencies. Decide on future infrastructure.
<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Current State</th>
<th>Trend (future pressures)</th>
<th>Risk</th>
<th>Key interdependencies</th>
<th>Area affected</th>
<th>Agencies involved</th>
<th>Potential response options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water (water supply)</td>
<td>Supply generally sufficient. Ongoing renewal programs manage aging infrastructure.</td>
<td>Population change, increasing community expectations, climate change and increasing regulations. Also water allocation issue (productive versus urban usage).</td>
<td>in lack of coordination, data and control.</td>
<td>Water is a critical resource linked to all regionally significant infrastructures.</td>
<td>Local or subregional, depending on whether issue relates to source, treatment or reticulation system</td>
<td>Local and regional councils, central government (setting regulation)</td>
<td>Ongoing renewal/maintenance of infrastructure. Manage demand through water metering. Investigate new technologies and collaboration opportunities between providers. Review cost of compliance and level of service provided against benefits gained from increases in water quality.</td>
</tr>
<tr>
<td>Water (storm water)</td>
<td>Ageing infrastructure that was originally designed for lower intensity rainfall events. Some urban areas have capacity problems.</td>
<td>Increased impermeable surfaces in existing urban areas, increased community expectations, population change, climate change and sea level rise.</td>
<td>Costs increasing for existing stormwater infrastructure in the medium term. Further analysis and collaboration required.</td>
<td>Water is a critical resource linked to all regionally significant infrastructures.</td>
<td>Local or subregional depending on catchment.</td>
<td>Local and regional councils, central government (setting regulation)</td>
<td>Ongoing renewal/maintenance of infrastructure. Flood risk &amp; overland flow path mapping. Opening up overland flow paths in areas beyond capacity. Increased monitoring and enforcement of cross connections.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Current State</td>
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<tr>
<td>Sewerage Treatment</td>
<td>Ageing infrastructure with ongoing renewal costs. Impacts on infrastructure from high intensity storm events resulting in flooding and stormwater infiltration.</td>
<td>Increasing regulations resulting in increased cost of compliance, populations change, climate change and sea level rise and community expectations.</td>
<td>Costs increasing for sewerage treatment infrastructure in the medium term. Further analysis and collaboration required.</td>
<td>Water is a critical resource linked to all regionally significant infrastructures.</td>
<td>Local or subregional depending on catchment.</td>
<td>Local and regional councils, central government (setting regulation)</td>
<td>Ongoing renewal/maintenance of infrastructure. Increased monitoring and enforcement of cross connections. Investigate new technologies and collaboration opportunities between providers. Review cost of compliance and level of service provided against benefits gained from increases in water quality.</td>
</tr>
</tbody>
</table>
Appendix 4
Bay of Plenty electricity generation, transmission and distribution

Figure A: Bay of Plenty Powerco Distribution Network 2013. Source Powerco Asset Management Plan 2013.

Figure B: Horizons Energy Distribution Ltd distribution network 2014

Figure C: Unison Networks 11kV distribution network. Source Unison Network Asset Management Plan 2013
Appendix 5
Rural broadband and wireless coverage

Rural broadband initiative coverage map
Wireless access