Kāpiti Coast DISTRICT COUNCIL

Draft long term plan 2018-38
Consultation - supporting information

Infrastructure strategy

Table of Contents

Executive Summary

Purpose and scope of the strategy

This strategy identifies significant issues for core services (transport, stormwater, water supply and wastewater) over the next 30 years.

Key challenges are:

- infrastructure costs;
- climate change;
- earthquake risk;
- population growth; and
- environmental requirements and objectives.

The management of coastal assets (including seawalls) is outside the scope of this strategy but will be addressed in the next infrastructure strategy in 2021.

Rising costs of infrastructure

The rising costs of infrastructure affect all the Council's assets and require a targeted approach to renewals based on asset condition and criticality.

Transport

Issues include:

- the Council's new ownership of the former state highway;
- repeated road closures resulting from slips following intense storm events;
- the impacts of coastal erosion on roads;
- earthquake risks; and
- traffic congestion.

Stormwater

Issues include:

- flooding of properties;
- earthquake risks;
- the potential effects of new developments on existing flood-prone properties; and
- increasing environmental standards.

Water supply

Issues include:

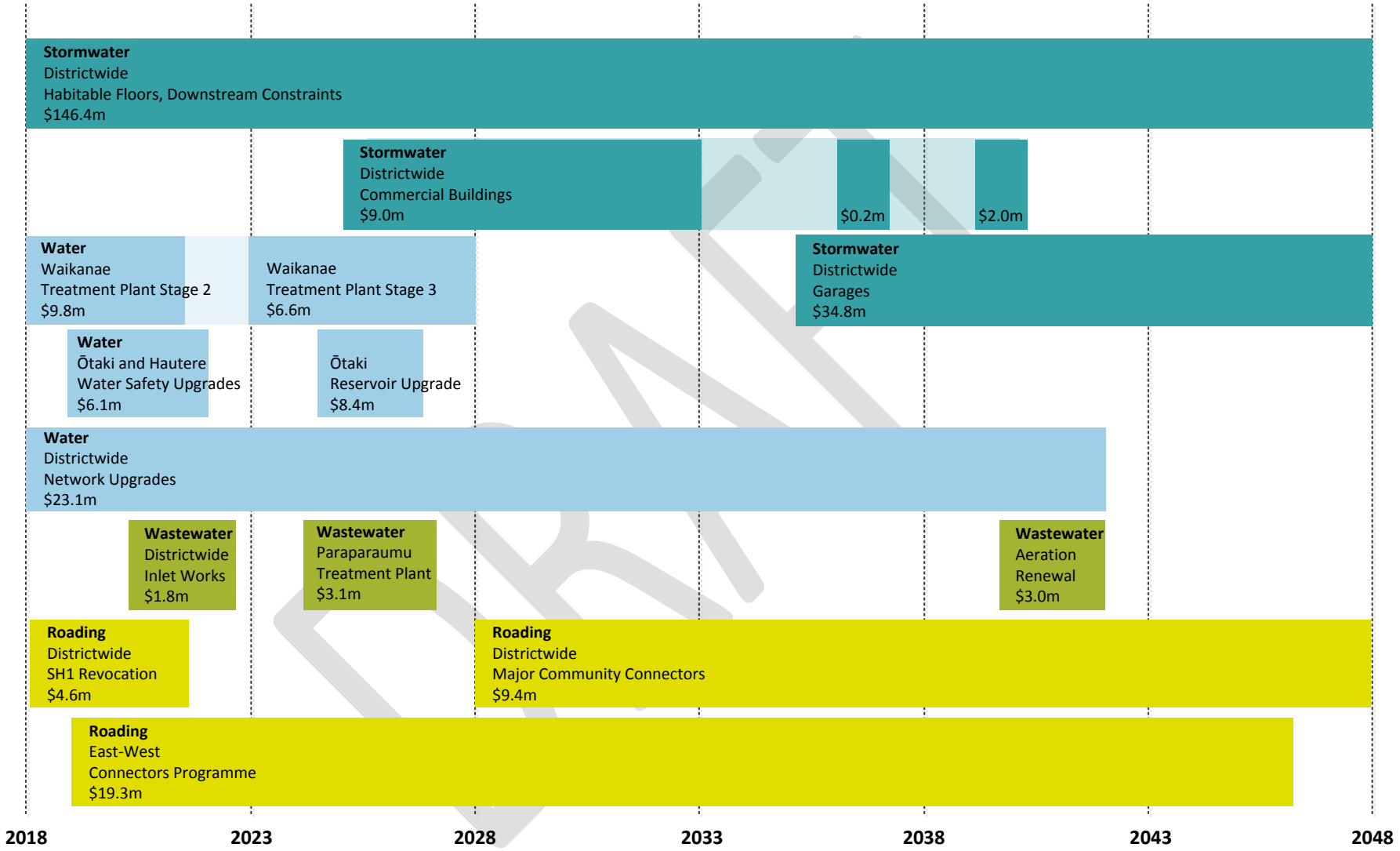
- the renewal of the Waikanae Water Treatment Plant;
- compliance with the Drinking-water Standards for New Zealand 2005 (Revised 2008);
- earthquake risks; and
- environmental management.

Wastewater

Issues include:

- the renewal of the Paraparaumu Wastewater Treatment Plant;
- the impacts of coastal erosion on wastewater pipes;
- earthquake risks; and
- environmental management.

Major infrastructure projects for the next 30 years



Introduction

Overview

The district's most critical transport, stormwater, water supply and wastewater issues over the next 30 years are outlined in this strategy. These issues need to be considered in the context of the Council's proposal to limit capital expenditure to a total of $169m over six years. Achieving this target would enable the Council to slow debt increases and be able to invest in infrastructure progressively to meet the community's needs.

This strategy focuses on the big picture and is complemented by the 2018 activity management plans, which outline comprehensively how transport, stormwater, water supply and wastewater assets will be managed. Future infrastructure strategies are likely to include a broader range of strategic assets.

The financial strategy is currently a separate document, but there is as much alignment as possible between the two interrelated strategies.

The following matters are outside the scope of this strategy:

1. Management of coastal assets. This will be reflected in the 2021 infrastructure strategy.

2. In-depth analysis of the implications of the NIWA (National Institute of Water and Atmospheric Research) climate change report released in August 2017. This is currently being worked through with Greater Wellington Regional Council (GWRC) and the other district councils in the region and will be reflected in the next version of the infrastructure strategy in 2021.

Strategy structure

Part One provides the strategic context for infrastructure in Kāpiti. It considers the changing population, economic trends, proximity to Wellington, past and predicted population growth, technological advances, legislation and GWRC's roles and responsibilities.

Part Two shows how the financial strategy influences this infrastructure strategy.

Part Three lists key challenges that affect the district's infrastructure.

Part Four describes specific issues for transport, stormwater, water supply and wastewater. It also includes options for addressing these issues, and the implications of the different options.

Part Five reflects the most likely financial scenario for asset management, and is based on the preferred options outlined in this strategy and the more detailed information in the asset management plans. It brings together all of the estimated expenditure for transport, water supply, wastewater and stormwater assets over the next 30 years.

Part Six outlines the key assumptions on which this strategy is based, as well as the key risks and uncertainties.

Part One: Strategic Context

Population and demographics

The current population of Kāpiti is estimated at 52,700.[1] By 2048 there are likely to be 13,000 more Kāpiti residents, bringing the population to approximately 66,000.[2]

Population growth

Slower than average population growth has occurred since 2012, but the Kāpiti Coast is now in a period of higher growth. This is based on the addition of approximately 200 new houses per year for the past few years.

Ageing population

Overall, the population is ageing, with lower representation in the workforce, and a higher number of one- or two-person households than occurs in Wellington or New Zealand as a whole.

Compared with the other 67 territorial authorities in New Zealand, Kāpiti ranks second highest in terms of the percentage of the population made up of residents 60 years of age and older. Kāpiti ranks lowest in terms of the percentage of the population in the 20-39 age group.[3]

Between the 2006 Census and the 2013 Census, the age groups with the biggest increase were those that were 50 years and above, and this trend is forecast to continue.

Type of housing

The percentage of unoccupied dwellings in Kāpiti is 12.8%, with the northern part of the district having the highest percentage of unoccupied private dwellings.

The percentage of separate houses in Kāpiti (82.5%) is very high, and only 2% is high-density housing. Paraparaumu Beach South and Raumati Beach have the greatest percentage of medium- and high-density housing in the district.

Even though the number of people per household is decreasing, the size of homes under construction has dramatically increased, from an average of 110m^2 in 1974 to 182m^2 in 2016.[4]

Past and predicted growth

There was a period of rapid population growth in 1990–2008. As a result, many of the farming and coastal areas in the southern portion of the district have been subdivided for residential development, and this pressure for subdivision is now extending to other parts of the district. The development of the Kāpiti expressway is likely to encourage more growth and could further alter land use patterns.

---

[1] Stats NZ. *Subnational population estimates (TA, AU), by age and sex, at 30 June 1996, 2001, 2006-17 (2017 boundaries)*.

[2] The Council uses a population forecast provided by .id that is calculated out 25 years to 2043. A 30-year figure to match the scale of this strategy has been derived by applying the average annual increase to the subsequent five years. This assumption provides an approximate estimated total population of 66,000.

[3] Population data is based on data from Census 2013, compiled by .id.

[4] Statistics New Zealand, We're building bigger 40 years on, October 2016.

Statistics New Zealand classifies Kāpiti as a medium-growth area. The most populated communities in the district are Paraparaumu Beach and Paraparaumu Central (with a total population 18,400 combined) and Waikanae (which had a population of 10,635 in 2013). Almost 60% of Kāpiti residents live in these three areas.[5]

Three significant greenfield development areas are either underway or planned:

- Waikanae North (71.5ha);
- Ngārara (150ha); and
- Airport Industrial (38.5ha).

Waikanae North is a mixed-use development and is already in the construction phase. The Waikanae North development includes a retirement home, retail/commercial area, a school, and 364 residential properties. The resident population of this area is anticipated to be 1,535 and with the area to be fully developed before 2026.

Development at Ngārara is also underway. This is a mixed-use development, as provided for by plan change 80. The Airport Industrial area has been set aside solely for industrial/commercial use.

Economy

Commuters

A significant proportion (36.3%) of the Kāpiti working population work outside of the district, with 22.3% commuting to Wellington City and 13. 4% travelling to other areas of the country for work. This means transport links are essential for the economic wellbeing of the population.

An increase in high-quality jobs in Kāpiti would provide alternatives for the many residents who commute out of the district. Attracting medium and larger businesses is important to balance the high ratio of very small businesses and self-employment, as they would provide a supply of employment opportunities.[6]

Industry sectors

A high proportion of older people in the community provides opportunities for the district's prosperity, because of their level of spending on groceries, health services, transport and communication, as well as on recreation and cultural activities, and education.[7] At the same time, a high proportion of the population with reliance on fixed incomes can challenge the Council's ability to raise income via rates.

The industries that contributed the most to the District's Growth Domestic Product (GDP) in 2016 were:

- Manufacturing
- Rental, hiring and real estate services
- Health care and social assistance
- Construction

[5] Working population data is based on data from Census 2013, compiled by .id.
[6] Page 8, Kāpiti District Economic Development Strategy 2015–18.
[7] Geoff Pearman (Partners in Change), presentation in Nelson, 22 September 2017.

- Professional, scientific and technical services[8]

Other than some construction impacts on the transport network, these types of industry do not place high demands on infrastructure.

Tourism is also a significant and growing sector throughout New Zealand. This creates retail opportunities, but usually in lower-paid types of work.

The 40km of Kāpiti coastline has economic value in terms of tourism, coastal property values and recreation opportunities. The coastline is one of the main features of the district and a major attractor for people to live in and visit the area.

Older workforce

In New Zealand a quarter of people over 65 are still in paid work. This is likely to increase to 31% by 2031, as people live longer, healthier lives. Earnings through self employment for people over 65 are also predicted to increase significantly in New Zealand (from $1.7 billion in 2031 to $2.6 billion in 2051).[9]

Kāpiti businesses employ a high proportion of older workers across all major sectors in comparison with Wellington and national averages. This possibly reflects both the greater flexibility and lifestyle choices of people over 65 who receive superannuation, and the greater number of people who are employed part-time rather than full-time here than in the Wellington Region or New Zealand as a whole.

The Kāpiti District Economic Development Strategy 2015–18 notes that while trends indicate that older people are choosing to stay longer in the workforce, and the 65+ age group brings key economic benefits to the district, there are also disadvantages in having a diminished local labour force that need to be addressed.[10]

Future types of work

The implications of automation are predicted to be far-reaching throughout the world. It could affect a wide range of existing jobs in Kāpiti over the next 30 years, including both professional and manual types of work. Opportunities within the region for labour force retraining and development will be important.

Incomes

Incomes in the Kāpiti district are generally in the middle range, rather than particularly low (less than $15,000) or high (more than $70,000). In the year to March 2016 the mean annual income in Kāpiti was $43,760, which was lower than the national mean of $57,780.

Cost of housing

Kāpiti Coast house values and rental costs have increased significantly in recent years. The average house value at February 2018 was $546,000, an increase of almost 44% in three years. This is a higher increase than for New Zealand as a whole.[11]

[8] Ibid, p4 (Table 1: GDP by 1-digit industry).
[9] Geoff Pearman (Partners in Change), presentation in Nelson, 22 September 2017.
[10] Page 7, Kāpiti District Economic Development Strategy 2015–18.
[11] House value data is QV figures for the three years to February 2018.

Rental costs have also increased over recent years, with rent increasing (from an average of $328) per week in 2012 to $381 per week in 2017.[12]

Proximity to Wellington

Being located so close to Wellington has helped to define the demographic make-up of the Kāpiti Coast. The 45-minute drive to Wellington, along with the electric train link from Waikanae to the city has resulted in a significant proportion of the working population (4,700 people) commuting to Wellington City for employment, and many students attending school in Wellington[13].

The construction of the Kāpiti expressway (and the upcoming Transmission Gully) further increases connectivity between Kāpiti and Wellington.

The transport connectivity, together with the accessible coastline and temperate climate, has resulted in the Kāpiti Coast District becoming a preference for holiday home owners and retirees.

In future, peak oil and possibly volatile energy prices may affect the district by making transport more expensive, unless substantial changeover to electric vehicles has occurred by then. If not, the cost of oil could significantly affect Kāpiti commuters.

Kāpiti settlements and environment

Settlements

Kāpiti Coast District is known as a great place to live and a relaxed coastal community with great access to the natural environment.

There are seven settlements along the Kāpiti coastline, often with both beach settlements and townships further inland. These communities are: Paekākāriki, Raumati, Paraparaumu, Waikanae, Peka Peka, Te Horo and Ōtaki. There are also several rural areas: Reikorangi, Te Horo, Waitohu and the Hautere Plains.

Of the people who work in the district, most people work in a different community from the one in which they live. Therefore connections between these communities and their services are critical.

The construction of the Kāpiti expressway creates both challenges and opportunities for the Council and the district. These include:

- maintaining infrastructure connectivity across the new corridor, including access (roads, cycle and walkways, stormwater and other pipe networks); and
- significant changes to traffic flows and the local access network, as traffic is directed away from the Paraparaumu and Waikanae town centres, and from Ōtaki.

The environment

The natural environment is one of the key features of the Kāpiti Coast and makes residing in or visiting the area highly attractive. The district has a total land area of 731km^2, including coastline, beaches, wetlands, rivers, forests and mountains. One of New Zealand's leading bird sanctuaries, Kāpiti Island, lies off the coast of Paraparaumu.

[12] Data accessed from MBIE Regional Economic Activity Report.
[13] Statistics New Zealand, Census of Population and Dwellings 2013. Compiled by .id

The district's terrain consists of hill country and a coastal plain. In some places the coastal plain is only marginally above sea level.

Much of the coastal plain was once covered with a mix of dense coastal forest and extensive wetlands. As the coastal plain was developed for agriculture and the creation of urban areas, bush was cleared, dunes were flattened, exotic species were introduced, wetlands were drained and filled, river channels were narrowed and flood and coastal protection structures were built.

The Kāpiti Coast has several natural boundaries that define the district. Apart from transport, this landscape is a barrier to sharing infrastructure, such as water supply or wastewater services, with other councils.

Technological advances

Huge changes in technology over the past 30 years have heavily influenced many aspects of life. The rate of change is likely to be even faster and more significant over the next 30 years.

Emerging technologies with impacts for local authorities include: automation, mobile devices, wearable technology, augmented reality, electric vehicles, renewable energy and distributed generation, the Internet of Things (a computing concept that describes the idea of everyday physical objects being connected to the internet)), and big data.

Automation

Automation provides opportunities for managing core infrastructure. For example, stormwater service delivery can be enhanced by automating the complaints data management system.

Drones

Drones have the potential for wide application by councils. They could be used for aerial photography, emergency management (particularly search and rescue), environmental monitoring and regulation (e.g. detecting breaches of air quality regulations), security monitoring and infrastructure assessments.

Augmented reality

Augmented reality technology (using the existing environment and overlaying new information on top of it) can be used to identify underground pipes and avoid accidental pipe strike by third parties. It is already being used for civil defence and gas in Wellington. This information can be used remotely by accessing the Council GIS (geographic information system).

Data management

The Council is currently replacing manual recording of data in the field, including condition inspections and health and safety information, with a programme that will enable easy entry of electronic data using field tablets. This will be a quicker process and will also enable asset managers to mine the data in a way that is not possible with hard copy records.

Big data will also be valuable for environmental compliance monitoring by enabling the Council to combine multiple data sets to identify correlations, including environmental factors such as rain, temperature, environmental indicators and economic indicators.

Internet of Things

The Internet of Things relates to the inter-networking of physical devices, vehicles, buildings and other items. Being embedded with electronics, software, sensors, and network connectivity enables these objects to collect and exchange data without human intervention, facilitating the continuous delivery of real-time data with less reliance on site visits.

Legislation

Resource Management Act 1991

The Resource Management Act 1991 (RMA) clearly states that local government has a role in adapting to the foreseeable effects of changing climate. This role is complementary to the central government responsibility to set national greenhouse gas emissions targets and develop policies to achieve them.

Section 6(h) of the RMA now includes the management of significant risks from natural hazards as a matter of national importance.

National Policy Statement on Urban Development Capacity 2016

The National Policy Statement for Urban Development Capacity 2016 requires councils to ensure that there is sufficient residentially, commercially and industrially zoned land available to meet the demand for growth over the next 30 years.

Local Government Act 2002

Meeting the current and future needs of communities for good quality local infrastructure in a way that is most cost-effective for households and businesses is central to the purpose of the Local Government Act 2002 (section 10).

A development contributions policy is required under section 102 of the Local Government Act 2002 and gives the Council a method for assessing and collecting contributions to fund infrastructure (roads, water, wastewater and stormwater collection and management), which is needed as a result of growth in the district.

Strict rules apply to the setting of development contributions for investment in infrastructure and repayment of debt associated with growth, as outlined below.

- The Council needs to be able to show that the development creates a requirement for infrastructure.
- Contributions need to be used for the purpose for which they are collected and within the locations in which they are required.
- Generally, charging for district-wide assets is discouraged.
- The Council needs to show the links between the expected developments, the infrastructure required, who pays for it, and the cost.

Civil Defence Emergency Management Act 2002

The Civil Defence Emergency Management Act 2002 requires councils to improve and promote the sustainable management of hazards, many of which will be made worse by climate change effects such as storm surges, erosion and flooding.

The following represent challenges for all councils:

- little national ownership of risk reduction;
- no consistent basis to make natural hazard risk management decisions; and
- dispersed information and guidance on natural hazards.

A national policy statement on natural hazards may improve this situation in future.

Greater Wellington Regional Council

Natural hazards

GWRC is specifically responsible for:

- the avoidance and mitigation of natural hazards;
- flood plain management, including working with communities to manage flood risks from the region's rivers and streams; and
- the provision of stop banks. There are 110km of open waterways (streams) in the district and GWRC is responsible for the flood management of 64% (70km) of them. Kāpiti Coast District Council is responsible for the remainder.

Councils across the Wellington region worked together to develop the Wellington Regional Natural Hazards Management Strategy. The purpose of the natural hazards strategy is to deliver greater efficiency in hazards research and planning and greater consistency in the management of natural hazards. The regional strategy will provide a coherent regional framework to inform planning documents, such as city, district and regional plans, long term plans and asset management plans.

Kāpiti Coast District Council has adopted the Regional Natural Hazards Strategy. The Mayor and Deputy Mayor are involved in the mayoral working group, and staff are involved in the steering group that implements the communications, data and planning workstreams of the strategy. As part of its implementation, the Council is working with GWRC to develop a long term plan for flood protection in the district.

Coastal management is also a joint project with GWRC. A condition assessment of coastal structures (public, private, and secondary seawalls) is currently being undertaken.

Kāpiti Coast District Council and GWRC are working together to monitor environmental changes, including sea level rise, now and into the future, to identify trigger points at which the community may need to adapt to a changing environment.

Other regional infrastructure assets

GWRC is responsible for operating regional buses and trains.

Part Two: Financial Strategy

Green line strategy

The Draft Financial Strategy 2018–38 proposes limiting capital expenditure to $169m for the first six years, with an average of $28m per year. This is referred to as the 'green line strategy'.

The objective is to ensure that borrowings stay below a target of 200% of the Council's total operating income. This reduced programme of capital expenditure would result in a significant reduction in the Council's debt over the long term plan period.

If the proposed capital expenditure programme is achieved, this will contribute to a smaller increase in rates in the short term and also allow for some headroom inside the Council's borrowings limit. Over the longer term it will mean that the Council will be in a position to start repaying its debt much earlier than previously anticipated.

However, there is a balance to be struck to ensure that infrastructure assets are still able to operate effectively and provide the necessary levels of service.

Major projects

Major infrastructure projects are still proposed, including upgrades to the stormwater network to a level that protects houses in a 1:100-year event. The indicative cost of this is $489m over 45 years. The initial focus will be on properties that are susceptible to habitable floor flooding.

Other major projects we are planning include the upgrade of the Waikanae Water Treatment Plant at around $17m and we will be investing up to $17.7m to replace the failing timber seawall in Paekākāriki.

Renewals profile

The Council needs to significantly reduce debt before 2045, when a significant proportion of the below-ground assets are likely to require renewal.

Intergenerational equity and depreciation

Debt is one way of smoothing the cost of construction over the generations that make use of, or benefit from, the service. Including depreciation in council operating expenses each year is another way of ensuring that ratepayers pay their fair share – and only their fair share – of the assets they use and benefit from, ensuring intergenerational equity.

Insurance

Kāpiti Coast District Council, together with Porirua, Hutt and Upper Hutt City Councils (collectively known as the Outer Wellington Shared Services Insurance Group) has been purchasing insurance for their respective assets on a combined basis since 2009.

The following graph illustrates the Council's total operating expenses over the next 30 years.

The following graph shows Council's total infrastructure costs both capital and operating over the next 30 years.

Total infrastructure costs 2018-48

Part Three: Key Challenges

Infrastructure costs are increasing

Many of the Council's assets have long life expectancies, but ongoing investment is required to maintain and eventually replace these assets when they reach the end of their useful lives.

Costs for infrastructure and its operation are increasing at a faster rate than the Consumer Price Index. Maintenance costs for a larger asset base and the ageing pipe infrastructure are also increasing.

The choices for managing these costs are:

- increase rates;
- increase debt; and
- reduce spending on infrastructure.

Climate change

The effects of climate change

Climate change will increase the risks from natural hazard events that already occur within the district, particularly as a result of:

- sea level rise increasing the effects of coastal erosion and inundation, and of river flooding in low-lying areas, especially during storm surges;
- increased frequency and intensity of storm events, adding to the risk from floods, landslides, severe wind, storm surge, coastal erosion and inundation;
- rising groundwater tables driven by a combination of increased rainfall and sea level rise; and
- increased frequency and/or severity of drought, placing pressure on water resources and increasing wildfire risk.[14]

The predicted extent of climate change

Sea level rise is currently tracking towards a 0.8m rise by the 2090s, or about 1m by 2115, compared with 1990.

The frequency of extreme winds over this century is likely to increase by between 2% and 5% in winter, and decrease by a similar amount in summer. An increase in westerly winds across New Zealand is likely.

Very heavy rainfall events are likely to become more frequent.

[14] Page 21, Strategic Context — District Challenges and Opportunities, Kāpiti Coast District Council.

Average temperatures are likely to be around 0.9°C warmer by 2040 and 2.1°C warmer by 2090, compared with 1990.[15]

Climate change is expected to increase the rainfall on the Kāpiti Coast, particularly the total magnitude during heavy rainfall events. Data since 1945 for total rainfall does not show, as yet, any statistically significant trends. However, during the past 10-12 years (especially since 2005) there has been an apparent rainfall increase in the Kāpiti Coast District, with 2016/17 being the second-rainiest hydrological year for the entire record – 44% above the 1981–2010 average (1979 was the only year with a higher rainfall).

In terms of heavy rainfall, no obvious trends are present in the data, but it appears that the very extreme, high-intensity peaks are getting higher, as exemplified by the record 12-hour rainfall of 120mm measured during the May 2015 Kāpiti floods. Continued monitoring is essential to better establish if this is normal climate variability or a climate change signal.[16]

Due to the Wellington area's small tidal range, sea level rise will have a greater influence on storm inundation and rates of coastal erosion than in other parts of New Zealand with larger tidal ranges.[17]

Earthquake risk

The Wellington region is located across a complex network of faults. The Institute of Geological and Nuclear Sciences (GNS) has mapped all the known active fault traces within the Kāpiti District, which include the Ohariu fault, Northern Ohariu fault, Gibbs fault, Ōtaki Forks fault and Southeast Reikorangi fault. More information is available on the Council's website[18], including the average recurrence interval for each of these faults, and estimates of when these faults last ruptured.

The Kāpiti Coast area is subject to most earthquake hazards, including strong ground shaking, liquefaction, earthquake-induced slope failure and active fault shifts.[19]

Liquefaction occurs when unconsolidated soils, particularly silty and sandy soils, become saturated with water in a shaking event and behave more as liquids than solids. Liquefaction has a range of associated effects, such as ground subsidence, lateral spreading, landslides, foundation failures, flotation of buried structures and water fountaining. Low-lying areas of the Kāpiti district are at moderate risk of liquefaction.[20]

Population growth

The Kāpiti Coast is classified as a medium-growth district. It is estimated that the population will increase by 0.76% per year on average over the next 30 years. This would take the population to approximately 66,000 in 2048, an increase of more than 13,000 people. The number of additional households expected over the same period is around 5,800.

Feedback from the community as part of the long term plan engagement process in 2017 is that sustainable growth, which is compatible with existing communities, is preferred over actively accelerating growth.

---

[15] Pages 6-7, Climate Change Strategy, Greater Wellington Regional Council.
[16] Advice from Alex Pezza, Greater Wellington Regional Council, provided by email on 16 November 2017.
[17] Page 5, Report summary – *Wellington Region Climate Change Projections and Impacts*, NIWA.
[18] kapiticoast.govt.nz/Our-District/cdem/Earthquakes/Earthquake-Fault-Rupture-Hazards/
[19] *Wellington Regional Natural Hazard Management Strategy Stocktake and Issues Report*.
[20] Ibid.

National and regional requirements

The Council's management of infrastructure needs to align with national legislation, regional policies and rules, and other external objectives.

National requirements

The Resource Management Act 1991, National Policy Statement on Freshwater Management and the New Zealand Coastal Policy Statement all include requirements to manage water use and discharges to fresh and coastal waters sustainably.

The New Zealand Transport Agency (NZTA) has specific requirements that need to be met before it can approve funding. This applies to almost all roading works delivered by the Council.

Regional requirements

GWRC is responsible for water allocation and water quality requirements for the district. A Kāpiti section of the Proposed Natural Resources Plan, with an integrated catchment management approach, is scheduled for development over the next two to four years. In accordance with the National Policy Statement for Freshwater Management, this whaitua (space or catchment) process will set limits on water quality and quantity. The regional council also manages activities in rivers and streams.

District objective

One of the medium-term outcomes proposed for inclusion in the draft 2018–38 Long Term Plan is to improve biodiversity and the environment through sustainable practices.

Part Four: Significant Infrastructure Issues and Options

All assets

A large amount of infrastructure was installed from 1978 to 1986 and is theoretically due for replacement in the 2040s. However, where infrastructure assets remain in good condition for longer than anticipated, there are opportunities to delay replacing them. Investment in asset management condition information enables the Council to make decisions on the optimal time for replacement.

The Council's overall objective is to renew assets steadily, considering the:

- criticality of the asset;
- age profile;
- condition profile;
- level of ongoing maintenance;
- economic lives of the materials used; and
- financial and customer risks.

Asset renewals are also prioritised as follows:

- Lifeline assets are targeted for advanced renewal to maintain operational performance and minimise disruption to service during the renewals.
- Key asset renewals are scheduled based on the understanding of their performance and condition. This is reconfirmed closer to the time of each estimated renewal. This approach is used so that the optimal value of the asset's life is achieved while reducing the risk of impacts on services.
- Timing of non-critical asset renewals are reviewed using operational records and failure information. This 'just in time' approach is used so that the maximum value of each asset's life is achieved.

Issue for all assets: How to efficiently maintain and renew existing assets while meeting capital expenditure targets.

Options	**Implications**
Preferred Targeted renewal based on asset condition and criticality. Identify the optimum time for renewal versus the increasing probability of failure	This approach reflects actual requirements and has lower impacts on rates and/or debt
Renew based on the year that infrastructure was constructed	Many of the renewals may not be necessary. This approach does not reflect current best practice for asset management
Run assets until they fail — fixing or replacing infrastructure when it breaks	This approach risks incurring major increases in costs, and the Council being overwhelmed with breakages. It could also result in critical failure of lifeline assets

Transport

Introduction

The Council's transport network includes sealed and unsealed roads, footpaths, bridges, culverts, signs and streetlights.

The Council has a 30-year programme with identified projects to meet the community's needs relating to growth, increased traffic and safety issues. The road network will grow significantly from 399km in 2017 to 441km in 2021 as a result of the revocation of SH1 between MacKays Crossing and Peka Peka (13.7km), new roads constructed during the M2PP Expressway project (5.1km) on top of the estimated annual growth (3.3km per year). The proposed budgets have been increased to reflect this.

The capital transport projects planned for the next 30 years in the draft 2018–38 Long Term Plan include a link road between Ihakara Street and Arawhata Road and a link between the Waikanae North development and Ngā Manu Reserve Road. The total proposed programme for roading upgrades and improvements for the next 30 years is $54.8m, which includes $16,797 of annual road safety funding from NZTA. For all other projects, funding will be sought in the appropriate time frame. The funding contribution from NZTA will be 50% in 2018/19 and 51% in the following years.

Condition of assets

The Council's roading assets are in good condition overall. The Council carries out proactive assessment of its roads to determine their condition.

Issues, options and implications

Transport Issue 1: The Council will take over ownership and management responsibility of the former State Highway 1.

Because of the construction of the Kāpiti expressway from Mackays Crossing to Ōtaki, 14km of new local road will have been constructed once the Peka Peka to Ōtaki section is completed in 2020, and 38km of the former state highway will have become a local arterial road, to be owned and operated by the Council.

Options	**Implications**
Preferred Increased funding for maintenance and renewal to manage the physical growth of the road network (from 399km in 2017 to 441km in 2021)	Travel patterns are changing as a result of the expressway, and increased funding will enable good integration between with the local network and the expressway
No increase in funding for maintenance and renewal to manage the physical growth of the network	Lack of integration between local roads and the expressway, resulting in a less efficient use of the transport network and a reduced level of service due to poor road condition

A revocation process in which NZTA and the Council work collaboratively to convert the route into a local arterial road is being undertaken before the Council takes over the former state highway. NZTA is undertaking physical works starting 2018/19 along the corridor, which will be funded by NZTA, or by both NZTA and the Council, or by Council, at a cost of $4.6m.

Transport Issue 2: Intense storm events have the potential to cause landslips, blocking the transport network. Repairing access to vulnerable roads is resulting in increased costs for maintenance and renewals.

The frequency of slips on several local roads is increasing on Ōtaki Gorge Road beyond the Blue Bluff slip site, Waterfall Road, and in Paekākāriki. Smaller-scale issues are also occurring on other minor local roads. In the past five years large capital expenditure has occurred, restoring access to roads and reinstating carriageways. As an example, following recent slips, $1.2m was spent to restore access to Ōtaki Gorge Road and Waterfall Road. Although NZTA agreed to co-fund these works, and may continue to do so, the Council must fund the Council's share from council-wide budgets, foregoing other works. Smaller-scale works, such as retaining walls and small slip removal, used up the operational roading emergency budget in the first two months of the 2017/18 financial year.

Roads are affected by increased rainfall, causing landslips and blocking roads. NZTA and the regional transport committee are discussing how to deal with storm events from a funding point of view. In future, whether to keep some roads open if significant and costly slips occur may need to be considered.

Options	Implications
Preferred Do not automatically reinstate assets that are subject to ongoing climate change effects	This approach may affect access to some properties and reserves
Always reinstate existing roads in their current locations	Ongoing high costs for the reinstatement of roads

Transport Issue 3: Coastal roads are vulnerable to sea level rise.

Options	Implications
Preferred Invest in maintaining the existing seawall in both Paraparaumu and Paekākāriki because this wall protects the coastal road (Marine Parade)	Significant capital expenditure
Preferred Work with GWRC and NZTA to identify long-term options for managing the effects of coastal erosion on coastal roads.	Investment of staff time and resources for identifying options and reaching agreement on long term solutions.
Do not invest in maintaining the seawall.	More frequent interruption of traffic, and coastal damage, to Marine Parade.

Transport Issue 4: How to reduce the impact of a significant earthquake on transport assets.

As a lifeline utility, a functioning transport network is critical to enable all other utilities to get up and running and to enable access to all affected areas by emergency vehicles.

Options	Implications
Preferred Ensure Civil Defence Emergency Plans are in place and routinely updated, and mock events practised, to ensure lifeline infrastructure is up and running as quickly as possible following an earthquake	Structural strengthening to withstand all damage from rare, high magnitude earthquakes is not practical or possible, so it is essential to have recovery plans in place
Structural inspections programme to inform a work schedule to increase network resilience where practical	Investment of staff time and resources

Transport Issue 5: New development places additional demands on the transport network.

Development contributions only provide part of the funding required to meet the costs of managing increasing demands on the transport network as a result of new growth and development.

Options	Implications
Preferred Increased funding for maintenance and renewal to meet transport needs associated with new development. Funding of upgrades and improvement projects	The Council has a 30-year programme with identified projects to meet the community's needs relating to growth, increased traffic and safety issues
No increase in funding for maintenance renewal or upgrades to meet demands on the transport network generated by related new development, population growth and economic growth	Increasing congestion and safety risks over time

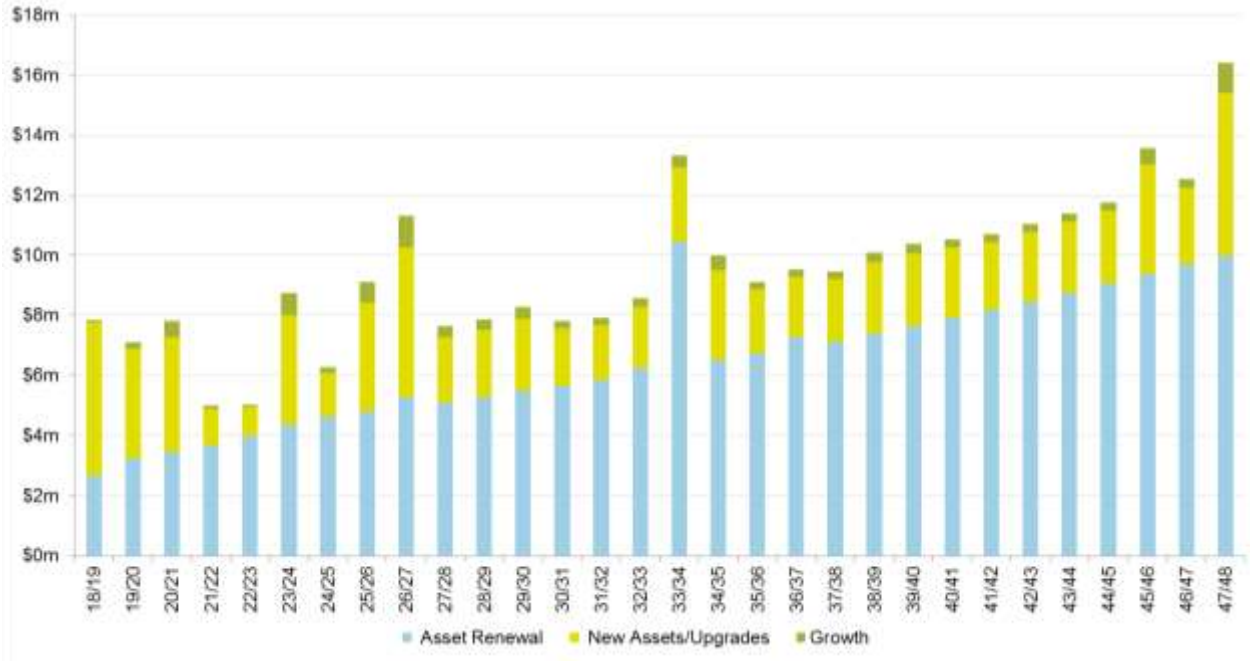
Transport Issue 6: Congestion is currently impeding airport and town centre development.

Options	Implications
Preferred Implement the East-West Connectors programme, including construction of a link road	A business case for the East-West Connectors programme, with a 10-year budget of $19m, was approved by NZTA in October 2017. This programme has informed the Council's budget development for the 2018–38 long term plan and has been moderated to 30 years, taking into account affordability. As it is a high-level programme, further business cases will be developed for individual projects to establish viability and to secure funding. Two projects have been proposed for the 2018–21 period. The Link Road has been proposed for 2023–26 at a cost of $11.6m

Do not implement any projects within the proposed East-West Connectors programme	Development in the airport and town centre areas would be constrained because of the limited capacity of Kāpiti Road and congestion would increase on Kāpiti Road, affecting the level of service

The following graph shows the total planned capital expenditure for the Access and Transport activity (roading) for the next 30 years.

Access and transport – planned capital spending 2018-48



Stormwater

Introduction

Climate change impacts and historical flooding issues have placed continued stress on stormwater infrastructure and it is a council priority to address this.

The Council provides stormwater services in the urban areas of the district (Ōtaki, Waikanae, Paraparaumu/Raumati and Paekākāriki) to protect public property from flooding. Most of the urban areas in the district receive stormwater protection via a system of soak pits, retention ponds and overland flow paths. The district has a relatively small network of reticulated stormwater (pipes).

The main characteristics of the urban systems are:

- coastal areas where stormwater is generally discharged to the sea;
- southern peat and dune areas that do not drain to any water course and are served by pump stations;
- Paraparaumu and Waikanae open water courses with smaller branches that are piped;
- varying design levels across the district depending on when the stormwater infrastructure was installed;

- significant barriers to east/west flow; and
- vulnerability to key climate change factors; for example, sea level rise and storm surges, increasing rainfall and storm events.

The quality of stormwater discharges will be considered during the development of the Kāpiti section of the Proposed Natural Resources Plan.

Condition of assets

Prior to 2017/18, assessments of stormwater asset condition were typically undertaken on an individual basis following a flooding event. As a result, the Council's understanding of the condition of assets across the network is limited.

The Council has now planned to complete more comprehensive condition assessments across the network, staged over several years. The first priority will be assets that are older than the median age of 40 years.

Issues, options and implications

Stormwater Issue 1: Very heavy rainfall has the potential to result in the failure of piped and overland stormwater networks to contain surface water.

Options	**Implications**
Preferred Progressively increase the capacity of the stormwater network to protect all habitable dwellings to a 1:100 level	A budget of $239m (in 2017 dollars) has been estimated for this work, which will be prioritised based on current flood risks. The Council proposes to deliver the programme in 45 years.
Preferred Provisions in the District Plan require hydraulic neutrality for new development	Requires either ground soakage or water storage during heavy rainfall to avoid increasing flows into the stormwater system during peak flows Increases in development contributions may be required to ensure the methods used to achieve hydraulic neutrality effectively avoid adversely affecting other properties in the catchment Stormwater activity is the responsibility of landowners as well as the Council. Privately owned stormwater assets, such as down pipes, ponds and soak pits, form part of the wider stormwater network. A stormwater bylaw may be required to enable the Council to intervene in situations where stormwater infrastructure issues on private land are adversely affecting neighbouring properties
Consider alternative ways to reduce loading on the stormwater system and avoid the need to invest in larger stormwater pipes	As an example, in the Kenakena catchment the Council is considering providing household storage tanks to hold the stormwater from these properties. Modelling shows that even if the holding tanks are paid for by the

Options	Implications
	Council, this option is still cheaper than installing bigger stormwater pipes Residents may be reluctant to have large storage tanks on their properties
Council purchase of the worst affected properties	Capital expenditure costs would need to be compared with the costs of the solutions required to address the stormwater issues
Building of detention dams to hold back stormwater	Capital expenditure costs would need to be compared with the cost of other solutions for addressing the stormwater issues This option is proposed in the draft 2018–38 long term plan for the Wharemauku catchment. The cost of the solution is estimated to be $14m.

Stormwater Issue 2: How to manage the impact of a significant earthquake on stormwater assets.

A major earthquake could change the topography of the district so that stormwater assets could be needed in new or additional places.

Options	Implications
Preferred Have insurance to assist with recovery costs	Costs of insurance
Identify and assess network risks, and strengthen existing stormwater assets to withstand moderate earthquakes with minimal damage	Staff time and resources

Stormwater Issue 3: How to avoid new development exacerbating existing stormwater issues.

Options	Implications
Preferred Invest in urgent upgrades to areas with existing stormwater issues, while limiting the impact of new development through hydraulic neutrality rules and other interventions	Temporary worsening of stormwater issues in some existing urban areas, prior to capacity improvements occurring
Avoid new development in areas in the upstream catchments of properties with existing stormwater issues	Significant constraint on development on residentially zoned land Difficulty meeting the requirements of the National Policy Statement on Urban Development

Stormwater Issue 4: How to carry out maintenance of urban waterways efficiently for stormwater management purposes.

The Council carries out vegetation, sediment and gravel removal from urban streams in order to ensure the 40km of urban waterways have sufficient stormwater drainage capacity during heavy rainfall.

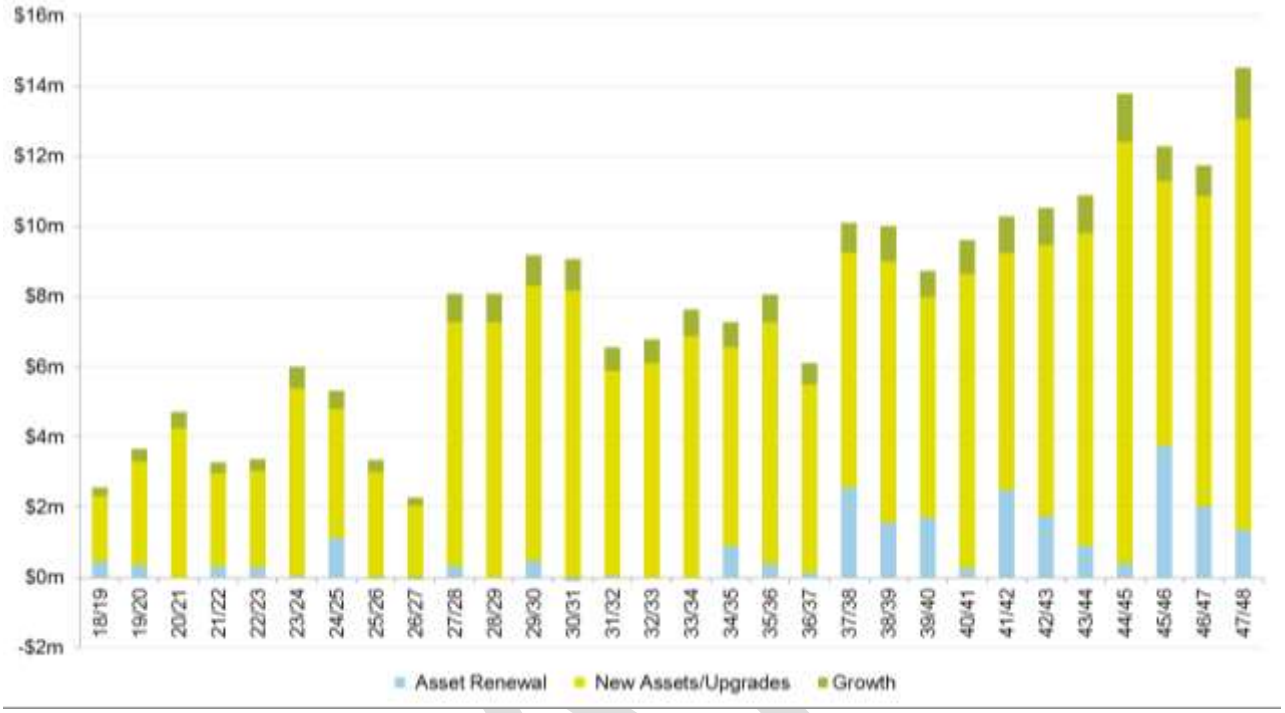
Options	**Implications**
Preferred Gain agreement with GWRC for an amended approach to the consenting process for stormwater maintenance	This would require a different approach to the application of Rules 121 and 122 of the Natural Resources Plan by GWRC
Gain a global consent for stormwater maintenance work in urban waterways	The estimated cost for gaining a global consent is $400,000 or more
Continue to apply for resource consent for individual waterway maintenance consents	A high proportion of the stormwater maintenance budget is currently being spent on gaining consent than on maintaining the flood capacity of the urban waterways, with 12 months required to gain each consent
Do not remove vegetation and gravel from urban streams	Increasing flooding events if waterway maintenance work is not carried out

Stormwater Issue 5: The upcoming whaitua process will set water quality objectives for Kāpiti District.

Options	**Implications**
Preferred Allocate funding for Kāpiti Coast District Council involvement in the whaitua process	Staff involvement will enable the practical implications for stormwater management to be considered and potential solutions for meeting water quality objectives to be developed as part of this process
Do not allocate funding for Kāpiti Coast District Council involvement in the whaitua process	There is a risk that the water quality objectives agreed as part of this process will not take into account the practical implications for stormwater management

The following graph shows the total planned capital expenditure on stormwater for the next 30 years.

Stormwater management – planned capital spending 2018-48



Water supply

Introduction

The Council is responsible for the provision and management of four water supply schemes at Waikanae/Paraparaumu, Raumati/Paekākāriki, Te Horo/Hautere and Ōtaki.

The water supply network consists of 571km of water pipes, five water treatment plants, seven pump stations and 15 groundwater bores.

Long-term water supply

The long-term water supply for Kāpiti has been confirmed and the first stage of river recharge with ground water was completed in May 2015. The scheme allows the Council to increase the amount of water it takes from the Waikanae River by adding groundwater below the treatment plant during very dry periods (ensuring bore water does not enter the water supply). The scheme is designed to service the 32,000m^3 per day peak demand for the population in 2060 during a 1:50-year drought.

In addition, the site for the future dam was purchased to further future-proof the water supply for Kāpiti. It provides security of supply for the next 100 years.

Condition of assets

Based on the Council's most recent assessments, 72% of its water supply pipes are in moderate to very good condition. This assessment is based on industry expected base life knowledge, results of

pipe sampling and risk profiling. The current assessment of pipe condition for the water supply network by proportion of length is shown in the table below.

Condition grading	% of length
Condition grade 1 (Very Good)	32
Condition grade 2 (Good)	18
Condition grade 3 (Moderate)	22
Condition grade 4 (Poor)	24
Condition grade 5 (Very Poor)	3

Asbestos cement pipes were used extensively during the early construction of the district's water supply and wastewater networks and make up over half of the length of the pipes in the ground today. As these pipes deteriorate with age, they will need replacing and a plan is in place to manage these renewals.

Issues, options and implications

Water Supply Issue 1: How to limit capital expenditure over the next three years while maintaining service levels.

Options	Implications
Preferred Further examination of renewal profiles, with collection of specific asset condition information provided to better inform funding profile and works programmes	The required timing for the renewal of the Waikanae water treatment plant (Stage 2) is being reviewed

Water Supply Issue 2: All practical and reasonable steps must be taken to meet all aspects of the Drinking-Water Standards for New Zealand 2005 (revised 2008).

For drinking water, a new 2015/16 mandatory measure requires all providers to report on the extent to which their drinking water supplies comply with parts 4 and 5 of the Drinking-Water Standards for New Zealand 2005 (revised 2008), which list the bacteria compliance criteria and the protozoal compliance criteria.

The Kāpiti drinking water supply met 100% of the bacteria compliance criteria in 2015/16, but not 100% of the protozoal compliance criteria. While the water supply for Waikanae and Paraparaumu/Raumati met 100% of the protozoal compliance criteria, the water supply for Ōtaki, Paekākāriki and Hautere did not.

For Paekākāriki and Hautere, this means upgrades were necessary to reach compliance. While the Paekākāriki water supply had all the appropriate barriers in place, the micro filters were not certifiable due to the age of the existing filter housing. An upgrade of the filters began in 2016/17 and will be completed in 2017/18.

The installation of micro filters at the Hautere supply will also be completed in 2017/18. These micro filters will be in addition to the ultra-violet (UV) and chlorine disinfection that has already been installed, and they will further improve the surety of the water quality from this originally rural scheme.

The Ōtaki supply is compliant an estimated 97-99% of the time, but it is not always compliant when turbidity issues inhibit the effectiveness of the UV treatment process. A planned water treatment plant upgrade will provide a bypass facility to mitigate the non-compliance during turbidity events by running to waste. These upgrades will provide a short-term solution, but in the longer term a reservoir has been planned to provide greater resilience during power failures and for fire fighting.

Options	Implications
Preferred Drinking-Water Standards for New Zealand 2005 (revised 2008) compliance upgrades	More than $5m is proposed for inclusion in the draft 2018–38 long term plan to improve water quality. This includes $4.3m to upgrade the Ōtaki water treatment plant in 2019–21. Provision for additional regulatory scans is also included

Water Supply Issue 3: How to manage the impact of a significant earthquake on water supply services.

The water supply is a lifeline utility, which means it is essential to recover water supply services as quickly as possible after a significant earthquake. Liquefaction of the coastal plains is a possibility, and if this occurs it has the potential to affect the supply of water via the piped network.

The Waikanae water treatment plant is undergoing a continuous renewal programme, which will include significant improvements to its seismic resilience. However, if the reticulation network is disrupted, the Council would need to truck water into affected settlements. The Council has the infrastructure to provide taps at the Ōtaki and Paekākāriki plants so that people can fill their own water containers, but the volume required means this would not be a practical solution for Waikanae and Paraparaumu.

Options	Implications
Preferred Increase the resilience of the community by requiring all new urban properties to have rainwater tanks (through the Proposed District Plan)	Water tanks serve multiple purposes: water conservation; reduced stormwater flows; as well as building resilience by providing on-site water
Preferred Have a recovery plan in place to truck water from a different water treatment plant if a plant is damaged	Having a number of different treatment plants in the district increases the community's options for accessing water in the event of a significant earthquake The Waikanae water treatment plant has been built to high seismic standards and is expected to survive relatively well
Preferred Have insurance to assist with recovery costs	Costs of insurance

Identify and assess network risks, and strengthen existing water supply assets to withstand moderate earthquakes with minimal damage	Staff time and resources

Water Supply Issue 4: How to meet consent conditions efficiently and improve environmental outcomes related to water supply services.

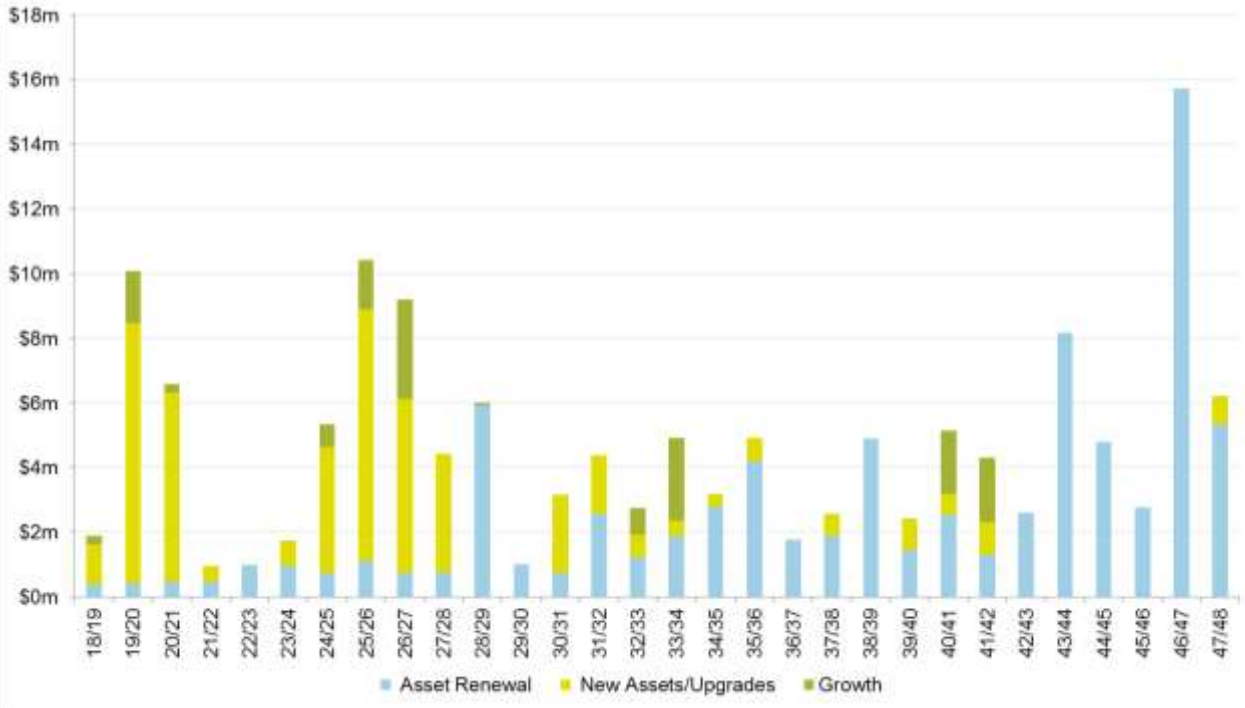
Water supply compliance costs are increasing because the Council is now required to provide more robust, scientific evidence about the impacts of water supply infrastructure, and to give broader consideration to environmental impacts.

There is also an overlap between state-of-the-environment reporting by the regional council and monitoring by the district council of the direct effects of water supply services.

Options	**Implications**
Preferred Work collaboratively with other agencies with monitoring obligations to share data and avoid duplication of collection and analysis	Makes better use of regional and district council environmental monitoring resources
Preferred Make use of technology to increase efficiency and accuracy of data collection, analysis and reporting	Less risk of human error relating to data management Makes better use of people's time, focusing on interpretation of the data rather than data processing

The following graph shows the total planned capital expenditure on water supply for the next 30 years.

Water management – planned capital spending 2018-48



Wastewater

Introduction

The Council has two wastewater treatment plants, which are located in Ōtaki and Paraparaumu. The Paraparaumu wastewater treatment plant will need a new resource consent by 2021 and key renewal processes are planned to maintain the high level of performance of the plant leading into the consent application. Replacing the wastewater network will require an increasing rates commitment in future.

The Paraparaumu/Waikanae/Raumati wastewater scheme has these requirements:

- the Paraparaumu plant will require refurbishment, and the costs relate mainly to renewing the inlet works and aeration system over the next few years ($1.9m and $1.7m respectively in 2018–21 and an additional clarifier of $3.1m in 2021–25). The Council is preparing to renew the discharge consent with scoping, engagement and exploring options, such as discharge to land ($2.6m in 2018–24); and
- the main wastewater pipe from Waikanae to Paraparaumu is nearing capacity so a new rising main will be required for growth in Waikanae. This is scheduled for 2016-19 ($4m).

Condition of assets

Kāpiti has more than 360km of wastewater pipes and 147 wastewater pumping stations. A study initiated in 2015/16 developed a framework for assessing the condition of pumping stations and a

series of key stations were surveyed in 2016–18. Many of the wastewater pipes were installed in the 1970s and ’80s and are now reaching middle age and the pumping stations are of varying ages and condition.

Issues, options and implications

Wastewater Issue 1: How to limit capital expenditure over the next three years while maintaining service levels.

Options	Implications
Preferred Further examination of renewal profiles, with collection of specific asset condition information provided to better inform funding profile and works programmes	A condition and capacity study has been carried out on Paraparaumu wastewater treatment plant and ongoing condition inspections on wastewater pump stations and reservoirs are occurring
Preferred Wastewater pipe relining	This can extend the life of infrastructure beyond the standard renewal time. Relining is useful to cover cracks and holes in wastewater pipes. One factor to consider is it slightly reduces the capacity of the pipe

Wastewater Issue 2: The cost of reinstalling wastewater assets affected by storm events is likely to increase as a result of climate change.

One of the main effects of climate change on wastewater activity will be a potential loss of wastewater pipes through coastal erosion.

Options	Implications
Preferred Do not automatically reinstall assets that are subject to ongoing climate change effects	Managed servicing may entail finding different ways of providing the service in future, such as accessing a property differently; for example, replacing wastewater pipes currently running along the coastline with pipes running underneath inland roads
Always reinstall existing services in their current locations	Increased potential for asset failure Increasing costs due to coastal erosion, requiring either increases in rates or debt to pay for the additional capital expenditure to reinstall existing assets that are subject to climate change effects The need to increase contingency funding for the reinstatement of assets following storm events

Wastewater Issue 3: How to reduce the impact of a significant earthquake on wastewater assets.

Earthquake damage (ground shaking and liquefaction) has the potential to cause significant and long-term disruption to the wastewater system. Pump stations and the piped network in low-lying areas would be particularly vulnerable to liquefaction.

Options	Implications
Preferred Invest in insurance to assist with recovery costs	Costs of insurance
Preferred Have back-up generators available to power the pump stations in the event of the electricity supply being interrupted	The wastewater network has an extensive system of pump stations that must continue to run
Identify and assess network risk and undertake improvements where feasible	Staff time and resources

Wastewater Issue 4: How to meet consent conditions efficiently and improve environmental outcomes relating to wastewater services.

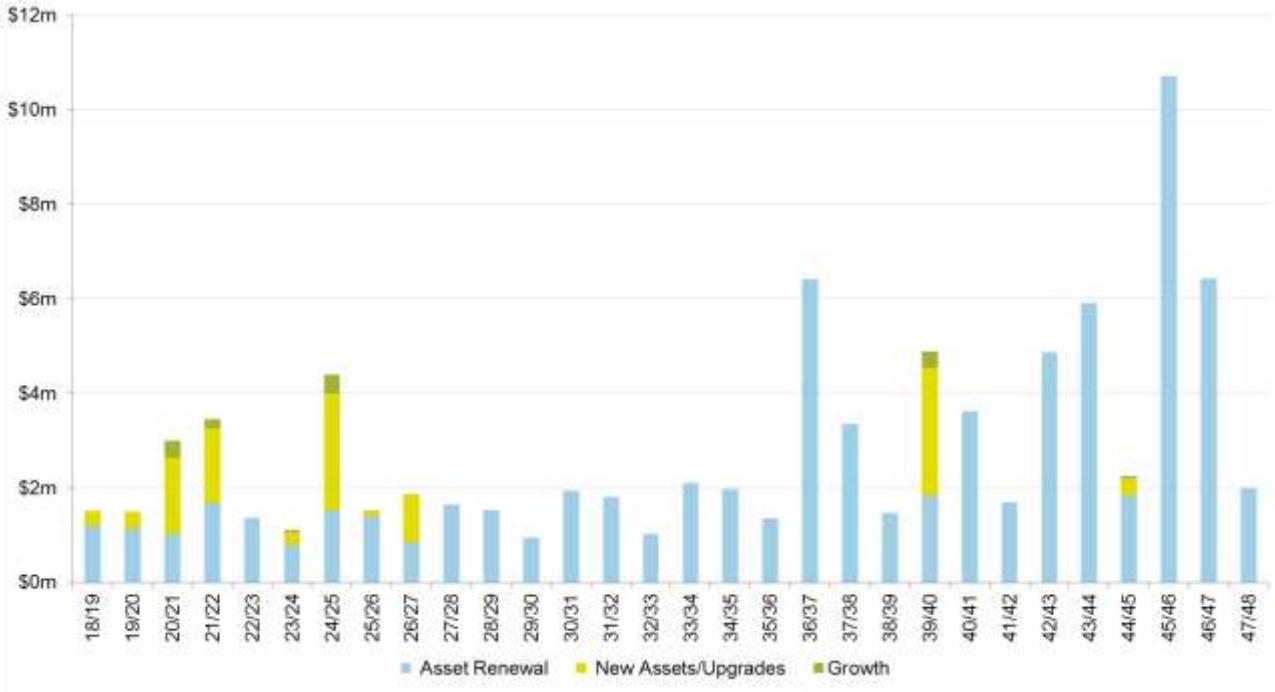
Wastewater compliance costs are increasing because the Council is now required to provide more robust, scientific evidence about the impacts of wastewater infrastructure and give broader consideration to environmental impacts.

There is also an overlap between state-of-the-environment reporting by the regional council and monitoring by the district council of the direct effects of wastewater services.

Options	Implications
Preferred Work collaboratively with other agencies in monitoring obligations to share data to avoid duplication of collection and analysis	Makes better use of regional and district council environmental monitoring resources
Preferred Make use of technology to increase efficiency and accuracy of data collection, analysis and reporting	Less risk of human error relating to data management Makes better use of people's time, focusing on interpretation of the data rather than data processing

The following graph shows the total planned capital expenditure on wastewater for the next 30 years.

Wastewater management – planned capital spending 2018-48



Part Five: Most Likely Scenarios

Transport

Major transport projects over the next 30 years.

Project title	Approximate timeframe	Estimated cost
LED streetlighting upgrades	2018–20	$1.5m
SH1 revocation upgrades	2018–21	$4.6m
East-West connectors programme	2019-46	$19.3m
Includes the following components:		
Ihakara – Kāpiti Link Rd	2023-26	$11.6m
Kāpiti Rd and Rimu Rd cycle lanes	2032-40	$3.2m
Kāpiti Rd bus priority	2045-46	$2.0m
Major community connectors	2028-28	$9.4m
Includes the following components:		
Ngā Manu Reserve to Waikanae Nth link	2029-30	$1.5m
Old SH1 to Waikanae Nth link	2038-39	$1.0m
Huia St to Hadfield Rd extension	2047-48	$3.5m
30-year asset renewal programme	2018-48	$194.5m

Water supply

Major water supply projects over the next 30 years.

Project title	Approximate timeframe	Estimated cost
Network upgrades	2018-42	$23.1m
Waikanae treatment plant upgrade stage 2	2018–21	$9.8m
Waikanae treatment Plant upgrade stage 3	2023-28	$6.6m
Ōtaki and Hautere water upgrades	2019–22	$6.1m
Ōtaki Reservoir upgrade	2024–26	$8.4m
30-year asset renewal programme	2018-48	$81.1m

Wastewater

Major wastewater projects over the next 30 years.

Project title	Approximate timeframe	Estimated cost
Inlet works	2020-21	$1.8m
Aeration system renewal	2020–22	$1.8m
	2039-40	$3.0m
Paraparaumu/Raumati treatment plant upgrade	2023–25	$3.1m
30-year asset renewal programme	2018-48	$75.5m

Stormwater

Major stormwater projects over the next 30 years.

Project title	Approximate timeframe	Estimated cost
Habitable floor flooding	2018–48	$80.4m
Addressing downstream constraints	2018–48	$66.0m
Commercial property flooding	2018–40	$11.1m
Garage flooding	2032–48	$34.8m
30-year asset renewal programme	2018-48	$27.4m

Part Six: Assumptions, Risks and Uncertainties

Assumptions

- New residential and commercial growth occurs close to the existing urban areas.
- Technology does not change service delivery methods significantly.
- Average household sizes decline because of the ageing population (currently based on 2.3 people per household).
- Population growth occurs as predicted. Growth rates are an uncertainty, given that the Kāpiti population growth is largely migration-driven.
- No major disruption occurs, such as could occur from a significant earthquake.
- Frequency and intensity of storm events will increase as per the most recent climate change projections published by NIWA and GWRC.
- There are no significant early failures of assets.
- The resource consent process will not adversely affect costs and timings of planned projects.
- Financial variables such as the BERL local government cost index, interest rates and costs of borrowing do not change so significantly as to require amendments to the long term plan.
- No significant water-using industries establish in the district within the timeframe of this strategy.

Risks

- NZTA's changed funding system means that programme business cases will be required for maintenance activities from 2022 and funding will become competitive. NZTA needs to save money in the Wellington Region, which may lead to the Council undertaking less road maintenance in the future.
- Inability to spend the money required to achieve the desired level of service; for example, the Council's corresponding funding for NZTA-funded projects.

Uncertainties

- The Department of Internal Affairs' Three Waters Review may recommend structural changes to the management and funding of water supply, wastewater and stormwater services.