Draft Long-term Plan 2021-41

Consultation – supporting information

Infrastructure Strategy

Kāpiti Coast
DISTRICT COUNCIL
Me Huri Whakamuri, Ka Titiro Whakamua

Infrastructure Strategy 2021-2051

Executive summary

This Infrastructure Strategy sets out Council's approach to managing the District's core infrastructure services (transport, stormwater, water supply, wastewater and coastal assets) for the next 30 years.

Key challenges that are common across all of these services include:

- Population growth;
- Climate change and resilience;
- Legislative and regulatory changes;
- Delivery of the work programmes; and
- Affordability.

Key issues specific to each asset group are summarized in Table 1. The Strategy sets out the preferred options for responding to each issue and the potential implications of those options.

Table 1: Key issues specific to each asset group

Water supply

- Legislative and Regulatory Compliance
- Climate Change Planning
- Resilience
- Delivery of a Significant Capital Work Programme

Wastewater

- Legislative and Regulatory Compliance
- Climate Change Planning
- Resilience
- Delivery of a Significant Capital Work Programme

Stormwater

- Resilience and Climate Change
- Delivery of Capital Work Programme
- Growth
- Regulatory Compliance
- Flood Risk
- Stream and watercourse maintenance

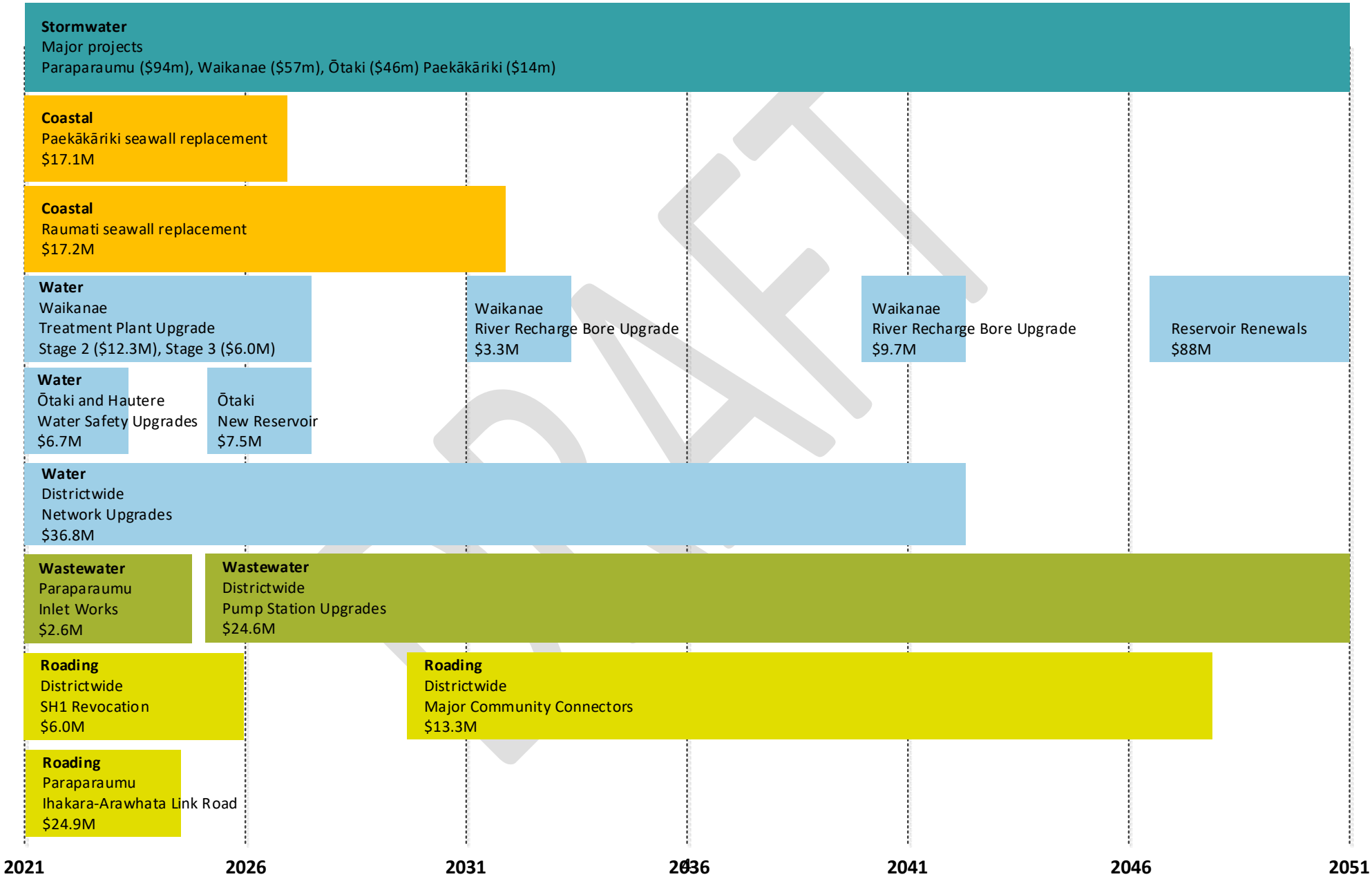
Coastal

- Climate Change
- Resilience
- Fit For Purpose
- Public infrastructure risk
- Property Owners Expectations
- Community Wellbeing

Access and Transport

- Fit For Purpose Network
- Resilience and Climate Change
- Demographic Change
- Connectivity
- Road safety

Major infrastructure projects proposed



Introduction

Overview

This Strategy sets out Council's approach to managing the District's core infrastructure services (transport, stormwater, water supply, wastewater and coastal assets) for the next 30 years.

This Strategy has been developed in accordance with s101B of the Local Government Act, which requires councils to develop an infrastructure strategy that identifies:

- Significant infrastructure issues facing the local authority for at least 30 years;
- The principal options for managing those issues; and
- Any implications of the proposed management options.

While the individual asset management plans comprehensively outline the level and timing of investment needed to operate, replace, renew and upgrade existing assets, the Strategy combines the plans to summarise the Council's strategic approaches to asset management across the core infrastructure.

This Strategy is ambitious in order to position the district for projected population growth, respond to the climate change emergency, and support the district's recovery from COVID-19. It sits alongside the Financial Strategy, which outlines the required rating and debt levels to fund the required investment in the district's infrastructure. Together the two strategies outline how Council intends to balance investment in assets and services with affordability.

The Strategy has been written in alignment with the values and visions of Te Whakaminenga o Kāpiti and our iwi partners, and incorporates community feedback that was received during the development of the Long-term plan 2021-41 when we asked the community about the issues that matter most. The Strategy shares the assumptions of the Long-term plan 2021-41, particularly in regards to population and climate change projections which are discussed further below.

Strategy structure

Part One sets out the strategic context for infrastructure service delivery in the Kāpiti Coast District.

Part Two identifies issues and challenges that are likely to impact across the District's infrastructure services over the next 30 years, and outlines the various options Council has to manage these issues.

Part Three explains the relationship between the Infrastructure Strategy and the Financial Strategy, which is essential to the overall success of the work plans for each infrastructure service. While the planning and delivery of projects within each asset management plan (e.g. replacements, renewals, and upgrades of assets) is heavily influenced by Council's current financial position, the Financial Strategy has been developed to support the Infrastructure Strategy to ensure that future funding will be available as required.

Part Four identifies the significant issues and challenges that are specific to each asset group, outlines the preferred options Council will use to manage these issues, and then combines the expenditures across the asset groups to provide a full picture of infrastructure services over the next 30 years.

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

Part One: Strategic Context

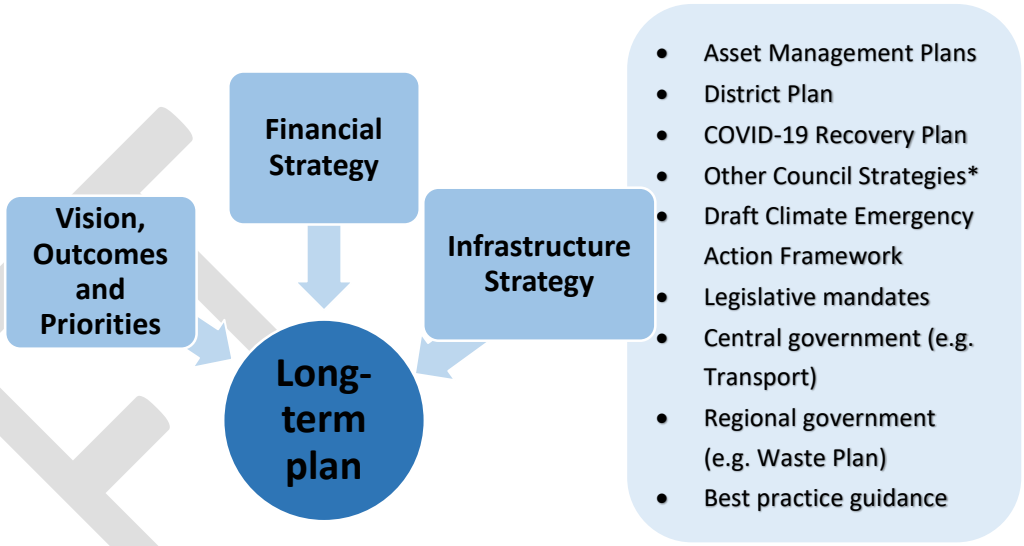
The Toitū Kāpiti vision is of a vibrant and thriving Kāpiti, with strong and safe communities and a deep connection to the natural environment. Infrastructure services are fundamental to the Long-term plan's Toitū Kāpiti vision as they are essential for the social, economic, environmental and cultural well-being of the district.

This strategic context section starts by situating the Infrastructure Strategy within the Long-term plan and Council's wider framework of strategies and plans; provides a brief overview of the District's population and demographics; and then starts to identify important considerations for the planning and delivery of infrastructure services, including growth and development, climate change, COVID-19 recovery, the local government legislative and regulatory environment, and technological advancements.

Relationship with the Long-term plan

The Infrastructure Strategy and the Financial Strategy both feed into the Long-term plan as foundational documents (Figure 2). It is important to note, however, that the Long-term plan covers a 20-year timeframe while the Infrastructure Strategy covers a 30-year timeframe.

Detailed information within the Infrastructure Strategy comes from the individual asset management plans, which draw on Council's wider framework of strategies and plans, legislative mandates, central and regional government plans, and best practice guidance. The Infrastructure Strategy pulls together the information from the asset management plans to summarise the infrastructure services that will be provided over the next 30 years.



* Note: Other Council strategies include the Growth Strategy, Transport Strategy, Stormwater Strategy, Coastal Management Strategy, Sustainable Water Management Strategy, Open Space Strategy, and Economic Development Strategy. Currently, several of these strategies are undergoing review.

Figure 2: The Infrastructure Strategy's position within the Long-term plan

Population and demographics

As of June 2020, the estimated resident population of the Kāpiti Coast District was 57,000 people.

The District has a large population of older residents, a relatively high number of people who are not in the labour force, and a high number of

residents on fixed incomes.[1] The district has several areas of high deprivation and, according to the 2018 Census, the median income was the 2nd lowest in the Wellington region ($29,700 compared to $36,100 for the entire region).

The Kāpiti Coast District is not homogenous, however, and there are mixed statistics around key social indicators such as housing, with very high home ownership (fifth highest in the country) and very low rental affordability (the fifth lowest in the country).

In Waikanae Beach and Otaki Beach there is a relatively high proportion of unoccupied private dwellings (approximately 30%) compared with the nationwide average (10.2%). These generally serving as holiday homes or vacation rentals. At the same time, the district continues to attract young families due to the lifestyle and proximity to the Wellington labour market, with those who commute into Wellington for work earning considerably higher incomes than the district average.[2]

The District includes approximately 40 km of coastline from Paekākāriki to north of Ōtaki, and the western Tararua Ranges to the Tasman Sea. The majority of residents are scattered from north to south in coastal communities, with the largest centres in Paraparaumu, Waikanae and Ōtaki.

These variations across the district mean that Council must plan infrastructure to serve a range of needs and expectations across a wide geographic area, while also being mindful of affordability, not only in regards to the services offered, but also in relation to rates, fees and charges.

Growth and development

The Kāpiti Coast District continues to grow, primarily from new residents relocating to the district from other parts of the Wellington Region. Between 2013 and 2018, the district's population grew at an annual average of 1.8% compared to the 0.8% forecast for the same period. For 2019 and 2020, this level of growth continued at 1.4% and 1.8% respectively, according to Statistics New Zealand's provisional residential population estimates.

Due to the recent levels of higher-than-forecast growth, in combination with future anticipated growth, a revised growth forecast has been developed to inform the Long-term plan 2021-41. While this revised forecast reflects the potential impacts from Covid-19 in the short term, with reduced migration and economic activity limiting growth in the first three years, it anticipates growth to then recover to levels similar to those experienced in recent years.

The revised growth forecast suggests that the district population will increase at an annual average rate of 1.5% to reach a total population of 85,658 by 2050. This equates to an increase of 30,155 additional people.

A significant aspect of this growth and development relates to the district's position within the wider Wellington Region. Although Kāpiti makes up only 11% of the regional population, it is closely linked to the Wellington Region via the transport networks, the labour and employment markets, and the wider regional economy (to the north and south).

Accessibility will increase even more once Transmission Gully is complete (anticipated in September 2021), and the emerging Wellington Regional Growth Strategy and the National Policy Statement on Urban Development

[1] According to the 2018 Census, the median age in the Kāpiti Coast District is 47.9 which is 2% higher than it was in 2013; 40% of residents are not in the labour force compared to 31% nationally; and estimates suggest close to 40% receive income from New Zealand superannuation or Work and Income, compared to approximately 25% in the wider Wellington Region.

[2] According to the 2018 Census, 17.8% earn over $70,000 per annum compared to 17.2% nationally.

(NPS-UD) are anticipated to further enable and support growth up the western coastal corridor from Tawa to Levin.

Climate change

In May 2019, Kāpiti Coast District Council declared a climate emergency and reaffirmed its commitment to carbon neutrality by 2025.

While these declarations were partly in response to local calls for action, they were also in recognition of (i) the ever-increasing costs the district is facing now, and more so over the coming decades, from coastal erosion and flooding, and (ii) the important role that Council serves as a district-wide leader in greenhouse gas (GHG) emissions reductions.

Mitigation refers to the actions that are taken to reduce emissions and/or increase the ability of natural processes to absorb GHG emissions. Reducing GHG emissions is important for slowing down (or perhaps even reversing) the rate at which the climate is changing.

Council has had a Carbon and Energy Management Plan since 2012 and, under Toitū Envirocare's Carbon reduce scheme, Council carries out an annual emissions inventory. For the 2018/19 financial year, Council operations emitted gross 2,867 tCO2e, down 77% since 2009/10 and on track to meet the 2021/22 goal of an 80% reduction in organizational emissions. These reductions were achieved through a range of actions, including energy conservation and installation and uses of renewable energy. Through provision of services and the management of assets – particularly in regards to infrastructure assets - Council continuously looks for opportunities to reduce GHG emissions.

Without a global reduction in GHG emissions, climate changes (e.g. severe storm events, flooding, coastal erosion, sea-level rise, and changes to local biodiversity) will intensify, putting natural and built environments under increasing pressure and risk.

Climate change projections for the Kāpiti Coast District include increases in mean temperature, annual rainfall, mean sea level, and inundation, as well as significant increases in the frequency and intensity of storm surge events causing more surface water flooding and impacting the district's groundwater (Appendix 1). While there is still some uncertainty about the nature and significance of these impacts, including how quickly they will happen, Council must incorporate these projections into its planning processes.

COVID-19

The COVID-19 pandemic has impacted the district in a number of ways. For infrastructure services, the two most important considerations relate to (i) the impact of COVID-19 on the social and economic wellbeing of the district and (ii) the impact of COVID-19 on the global supply chain, which affects the availability and cost of infrastructure equipment and expert contractors.

Social and economic wellbeing

Section 10 of the Local Government Act states that local authorities must promote the social, economic, environmental, and cultural well-being of communities in the present and for the future. Affordability has long been an issue in the district, and this has been worsened by the COVID-19 pandemic. Both the district and regional economies were relatively strong prior to COVID-19, but since COVID-19 there is greater uncertainty and concern across the community about loss of income, redundancies and inabilities to pay rents and mortgages.

The district's unemployment rate had been trending downward for the past several years, but rose sharply to 3.7% in the quarter to June 2020 due to the pandemic. At the same time, the district's annual average of Jobseeker Support recipients rose higher than the average of the past ten years. Feedback from local health and social service organisations is that utilisation of social services (e.g. food banks) and rates of homelessness have noticeably increased as well.

Council has adopted a COVID-19 Recovery Plan that includes a wide range of actions to be carried out by Council. While many of these actions seek to support and promote local businesses, enable new job skill training programmes, and strengthen residents through a variety of social wellbeing initiatives, the Recovery Plan also relies on infrastructure provision and management as a key recovery tool. By maintaining existing levels of operational expenditure, accelerating already-funded capital projects where possible, and using procurement policies that try to prioritise support to local businesses and supply chains, Council can increase spending in the local economy.

Global supply chain

Due to COVID-19, New Zealand is also feeling the impact of disrupted international supply chains.

Even before COVID-19, all councils were experiencing cost escalations at all stages of an asset's lifecycle. These cost escalations were associated with increasing demands for partner and stakeholder engagement; increased requirements for resource consent applications, compliance, and risk management; and rising costs for procurement and delivery. While these cost escalations were already starting to impact the costs and delivery timelines for major infrastructure projects, the post-COVID disruptions are likely to further challenge Council's ability to deliver strategic capital projects as planned.

Legislative and regulatory context

To meet its aims for climate action, transport, housing and water, Central Government has recently made some substantial changes to legislation that will be undoubtedly impact local government infrastructure services.

Since the Long-term plan 2018-38, the Acts that are likely to have the biggest impact on infrastructure services include:

- The Local Government (Community Well-being) Amendment Act 2019;
- The Climate Change Response (Zero Carbon) Amendment Act 2019;
- The Kāinga Ora - Homes and Communities Act 2019;
- The Urban Development Act 2020;
- The Taumata Arowai –Water Services Regulator Act 2020; and
- The Resource Management Amendment Act 2020.

To support the implementation of these Acts, Central Government has also established several new delivery mechanisms. Te Waihanga (the Infrastructure Commission) and Taumata Arowai (the Water Services Regulator) will work in partnership with Waka Kotahi (the NZ Transport Agency), He Pou a Rangi (the Climate Change Commission) and Kāinga Ora (Homes and Communities) to deliver on the Government's objectives.

Following the establishment of Taumata Arowai, Government launched the Three Waters Reform Programme in July 2020. This is a three-year programme to reform local government three waters service delivery arrangements. As this programme is still in process, the impacts on local government are not yet known.

More recently, on 10 February 2021, Government announced its intentions to appeal the Resource Management Act and replace it with:

- The Natural and Built Environments Act (NBA) to provide for land use and environmental regulation;
- The Strategic Planning Act (SPA) to integrate with other legislation relevant to development, and require long-term regional spatial strategies; and
- The Climate Change Adaptation Act (CAA) to address complex issues associated with managed retreat and the funding and financing of adaptation.

Te Mana o te Wai

Another change that significantly impacts Council service delivery is the concept of Te Mana o te Wai, which was introduced as part of the National Policy Statement for Freshwater Management; the National Environmental Standards for Freshwater, Sources of Drinking Water, and Wastewater; and other associated regulations under the Resource Management Act.

Te Mana o te Wai is a concept for managing all waters in a way that gives priority to the health and wellbeing of water (quantity, quality and ecology). The concept of Te Mana o te Wai encompasses the Three Water Reform Programme, the Essential Freshwater programme, and other Resource Management Act functions and duties. All persons and duties in these functions must give effect to Te Mana o te Wai.

Te Mana o te Wai generally aligns with the values and visions of mana whenua, which helps Council honour its Te Tiriti o Waitangi obligations. However, in terms of infrastructure service delivery – particularly in relation to wastewater and stormwater – it adds additional layers of complexity as Council carries out planned infrastructure work.

One approach for addressing these challenges is through the Greater Wellington Regional Council whaitua committees. These committees (which are made up of local community members and representatives from iwi, local authorities, and Greater Wellington Regional Council) aim to develop Whaitua Implementation Plans that set out how water catchments are to be managed now and for future generations. While other whaitua committees have already been established across the Wellington Region, the Kāpiti Coast Whaitua Committee is still in the early stages of establishment. Council intends to be fully engaged in this process as it will have significant implications for water source allocation and stormwater discharge quantity and quality.

Part Two: Financial Strategy

The Financial Strategy is fundamental to the success of the Infrastructure Strategy.

While the Infrastructure Strategy provides details about the level and timing of investment needed to operate, replace, renew and upgrade assets, the Financial Strategy outlines the required rating and debt levels to fund these investments.

While it is important to successfully deliver planned projects, it is also important to ensure that costs remain affordable to ratepayers. Affordability continues to be a significant issue for the Kāpiti Coast District, and both strategies must take this consideration into account.

The four primary options that Council has to maintain affordability are:

- using a staged delivery approach for project planning;
- upskilling Council's ability to manage and deliver projects;
- canvassing for external funding options; and
- maximizing interest and borrowing expenditure.

Staged delivery

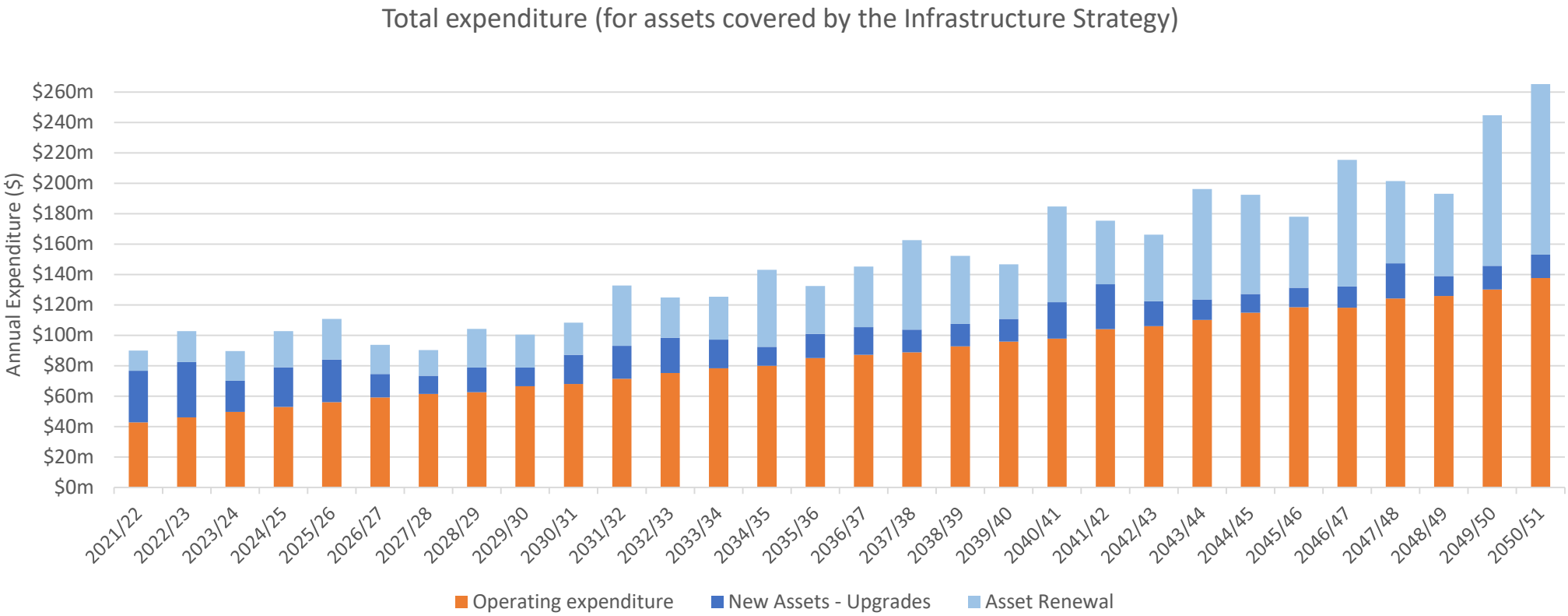
Decisions to expedite projects or deliver higher LOS can require increases in capital development funding. Therefore, to keep rates affordable, achieve the desired LOS, and replace critical and strategic assets when required, Council must stage delivery and prioritise across all of its activities.

Table 1 at the start of this Strategy shows how projects are staged across all of the asset groups, and more information is available in each asset management plan.

This approach helps to ensure prudent management, and lowest whole-of-life costs rather than short term savings, for planned capital works. This keeps the work programme achievable, manages debt levels, and maintains affordability.

Maximising interest and borrowing expenditure

By working to reduce debt, Council will have the capacity to replace key assets as they wear out and build the infrastructure needed to accommodate expected growth, with an acknowledgement that some projects will be carried out more quickly than others.


Total expenditure (for assets covered by the Infrastructure Strategy)
Annual Expenditure ($)
$260m
$240m
$220m
$200m
$180m
$160m
$140m
$120m
$100m
$80m
$60m
$40m
$20m
$0m
2021/22
2022/23
2023/24
2024/25
2025/26
2026/27
2027/28
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2041/42
2042/43
2043/44
2044/45
2045/46
2046/47
2047/48
2048/49
2049/50
2050/51
Operating expenditure
New Assets - Upgrades
Asset Renewal

Part Three: Issues and Options

While the strategic context section in Part One highlights a number of issues that are of particular importance to infrastructure service delivery, this section discusses the most significant challenges in more detail, identifies the principal options for managing these challenges, and identifies any issues that might be associated with those options.

Those challenges that are most significant across infrastructure services include:

- growth and development;
- natural hazards, many of which are predicted to increase in frequency and intensity due to climate change;
- the impact of COVID-19, particularly on the global supply chain; and
- the changing legislative and regulatory context.

Growth and development

While growth will bring many opportunities to the district, it can also pose a number of challenges. Population growth can place increasing demands on Council's existing assets and services and, when growth is unplanned and unchecked, it can harm the health of waterways and threaten indigenous biodiversity. More greenhouse gas emissions (through, for example, transportation and energy use) could increase the district's contribution to the climate crisis, and housing pressures could increase demands to develop lands that are at risk to a range of natural hazards (e.g. flood, earthquake and land instability).

In order to realise the opportunities that growth can offer, Council needs to have a robust Growth Strategy underpinned by the most accurate population projections available.

Growth Strategy

In the short-term, the current Proposed District Plan accommodates growth through currently zoned areas, including greenfield activity in the areas of Ngārara and Waikanae North. An urban development plan change in 2022 will look to review heights and densities in existing urban areas, and potentially allow for some land that is already included in the District Plan to become a future urban development zone, thereby allowing for even more development, particularly to the north of the district in Ōtaki.

In the long-term, however, these changes alone will not be sufficient so further plan changes and additional infrastructure will be required, particularly in order to meet the growth that is predicted to occur during the latter half of this Infrastructure Strategy. Council's Growth Strategy is currently under review, with Council promoting an integrated and people-centered approach to urban development. This means making strategic planning decisions and investments for liveable communities.

Infrastructure services must be planned alongside existing and future residential and business spaces that will be primarily within walking distance of public transport. It is vital that this urban development planning be cognisant of current and future infrastructure compliance requirements and any other limitations that may arise, particularly those that may already be compounded by a changing climate and ageing infrastructure.

Population forecasts

While even the best population forecasts only represent a snapshot in time, some will remain true and reliable for longer periods than others. Because

the Kāpiti Coast District is currently experiencing rapid change[3], the population forecasts require frequent updates.

Population forecasts are important for asset planning because they dictate where infrastructure is required and how many consumers will be using those services. A population forecast that is too low could mean that infrastructure services will be insufficient to meet demand or that the Development Contribution Policy will not be requesting large enough contributions from developers. On the other hand, a forecast that is too high could mean that Council has spent money on infrastructure services that were not required or collected greater contributions from developers than were required.

Climate change and natural hazards

Natural hazards pose risks to infrastructure assets, and climate is expected to exacerbate the frequency and intensity of natural hazard events.

Council has used climate change assumptions provided by Greater Wellington Regional Council for the Kāpiti Coast District (Appendix 1). These assumptions predict that the Kāpiti Coast will experience rising sea levels, as well as increases in average annual temperatures, annual rainfall and rainfall intensity, and increases in wind intensity and number of windy days. While the District is also predicted to experience increasing numbers of growing days which will promote crop growth, it may also experience drought-like conditions at certain times of year. While not necessarily exacerbated by climate change, earthquakes always pose a risk.

These predicted changes will put the District at increased risk from natural hazard events such as floods, landslides, storm surge, coastal erosion, and inundation. Without proper management plans, these changes could contribute to biodiversity losses, environmental harm, and threats to social, cultural and economic wellbeing – often within communities that are already at risk.

To assist in incorporating climate change considerations into asset and activity planning across Council, a Sustainability and Resilience team has been created in the Infrastructure Services unit. This team provides detailed climate change information and advice across Council to enable evidence-based planning for both climate change mitigation and adaptation.

The Team has also developed a draft Climate Emergency Action Framework to support the Long-term plan 2021-41. This Framework establishes common principles to ensure alignment across Council on the goals and objectives of Council's climate change response, and will support emissions reduction (mitigation), adaptation, and the transition to lower emissions living. In addition, while Council receives regular updates on climate change-related work through quarterly updates, the team intends to improve the governance and reporting framework over the next year to ensure consistency across Council.

Driven by tikanga Māori approaches – including kaitiakitanga (intergenerational sustainability), manaakitanga (care and reciprocity), and whanaungatanga (connectedness and relationships) – Council's current approach to adaptation is to maintain and protect essential public assets. For some assets there are clear legislative obligations to do this (e.g. essential infrastructure and utility services). For other assets, while there might not be a legislative obligation, there may be instances where it could be deemed unreasonable not to protect the asset. This test of reasonableness is measured in terms of the extent and frequency of an asset's failure, the cost of repair and the asset's criticality.

[3] As stated in the strategic context section, between 2013 and 2018, the district's population grew at an annual average of 1.8% compared to the 0.8% forecast for the same period.

At times, adaptation planning necessitates working with local communities. As an example, the Takutai Kāpiti Coastal Adaptation Project is establishing a community assessment panel that will identify and evaluate a range of feasible options for adaptation along the coast.

Detailed analyses on the impact of climate change on each activity and information on specific projects and plans to address these impacts can be found in the individual activity management plans. While Greater Wellington Regional Council has provided climate change assumptions for the District, much of the detailed analysis that is carried out in regards to the impact of climate change on strategic assets is undertaken by specialist experts.

Changing legislative and regulatory environment

The changing legislative and regulatory environment will undoubtedly impact Council infrastructure services, with some changes being more significant than others.

In December 2020, the New Zealand Government declared a climate emergency and launched The Carbon Neutral Government Programme requiring the public sector to achieve carbon neutrality by 2025. Since Council had already set a goal for carbon neutrality by 2025, the initiative did not require a change in Council policy. Council hopes that the initiative might provide additional support to all levels of government, including regional and local governments, in order to reach the target.

On the other hand, changes introduced through initiatives such as the Three Waters Reform Programme or the Resource Management Act Reform will have significant impact on Council. Early indications from the Three Waters Reform Programme are that, at some stage, water and wastewater assets may transfer to Taumata Arowai. This change, alongside others like the Government's intentions to replace the Resource Management Act with three new Acts, will significantly impact the role of local government, particularly in regards to how plans are developed, how infrastructure services are delivered, and what role councils will have.

It is expected that these changes will take some time and that services will still be required throughout any establishment and transfer periods so, in the meantime, Council is assuming a status quo position until told otherwise and continues to plan and finance accordingly.

To keep abreast of these changes, Council is increasing its resource allocation so that Council representatives can participate in these discussions. As an example, Council has signed the Three Waters Reform Memorandum of Understanding and is participating in the first stage of the reform programme. In addition, Council has incorporated these uncertainties into its risk management plans.

Project delivery during COVID-19

Because one aspect of the COVID-19 Recovery Plan is the use of infrastructure provision and management as a key recovery tool, the impact of COVID-19 on the global supply chain could become a significant challenge.

In the Recovery Plan, Council commits to maintaining existing levels of operational expenditure and accelerating already-funded capital projects where possible in order to raise employment and increase spending in the local economy as much as possible.

Accelerating already-funded capital projects requires us to greatly increase our capacity to deliver infrastructure projects compared to previous years. As such, Council's ability to deliver is essential to carrying out this aspect of the Recovery Plan. This means that the impact of the pandemic on the global supply chain could create some significant problems and, because the global impact is not entirely understood, the duration of the impact is difficult to determine.

Increasing our capacity to complete our capital works programme will likely involve using alternative delivery and procurement models, such as alliance partnerships and collaboration with neighbouring councils. This includes longer term procurement models, and bundling multiple projects into consolidated packages of work.

Evolving the Council's project management office function will also improve our capacity to deliver our capital programme. Until recently, our ability to deliver capital projects relied mostly on the capacity of individual business units to initiate and deliver projects themselves. Our project management office will expand to manage certain key projects and will maintain an overview of the entire capital works programme.

Options and implications

The following table outlines the principle options for addressing the significant issues and implications of each. Not all assets groups will face the same significant issues over the period of this Strategy. The significant issues will not affect each asset group equally, or in some cases at all. In addition, the significant issues are not mutually exclusive, and that a change in one affects the others.

Issue	Options	Implications
Affordability – maintaining and renewing existing assets in a cost-effective way	**Our preferred option** 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. A targeted approach means that decisions on renewing assets must factor in several layers of information – asset age and construction material is used as a starting point and overlaid with other known factors including condition profile, the criticality of the asset, and desired versus current levels of service. Condition of underground assets can be difficult to assess. Depending on the type of asset we may use a combination of methods to assess condition, including CCTV inspections or sampling of pipes when maintenance is undertaken.
	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.
Climate change – risk of damage to assets by storm	**Our preferred option**	

events that are increasing in severity and frequency	Do not automatically reinstate assets that are subject to ongoing climate change effects, review based on asset criticality.	This approach may limit access to some properties and reserves (in the case of roading assets).
	Always reinstate existing assets in their current locations	Ongoing high costs for the reinstatement of assets.
Risk of damage to assets from a severe earthquake	**Our preferred option 1** 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
	Our preferred option 2 Have insurance to assist with recovery costs	Increasing costs of insurance
	Our preferred option 3 (water supply) 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
	Our preferred option 4 (water supply) 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.
	Our preferred option 5 (wastewater) 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 risks, and strengthen existing assets to withstand	Significant staff time and resources required.

	moderate earthquakes with minimal damage .	
Legislative compliance – ensuring we meet all legislative and consent-driven requirements	Increased resource and budget Compliance monitoring software	Additional cost, both operating and capital.
Growth – providing the right infrastructure at the right time to accommodate population increases	– Growth Strategy – Development Contribution Policy – Strategic Asset Management Approach	
Project delivery – ensuring we can deliver our proposed capital works programme	– Project Management Office – Shared services – Agile/strategic procurement – Additional resources – Improved project delivery	Resource consenting process is a risk that can often add time to delivery of projects. This can be mitigated by early engagement with Greater Wellington Regional Council and ensuring Project Delivery plan makes adequate allowance for consenting time delays.

Significant infrastructure decisions

The following table outlines the significant decisions we expect to make about capital expenditure, when we expect to make them, the principal options we expect to consider and the approximate costs associated.

Significant decision required	Timing	Principal options and approximate costs
Improving drinking water resilience in Ōtaki	2021	Build a new reservoir to service Otaki ($7.5m)
Improving drinking water resilience in Ōtaki		Link Main Riverbank Road
Protecting vulnerable infrastructure assets along Raumati coastline	2022	Replace the Raumati seawall
Improving drinking water resilience in Waikanae		Waikanae Beach Improvements
Improve road connection between Paraparaumu Beach and town centre	2021	Build link road between Ihakara St and Kāpiti Road ($31.5m)
Ensure Ringawhati Rd remains accessible	2025	Extend Ringawhati Rd bridge ($1m)

Part Four: Our asset groups

In this section we provide more information on each of the core asset groups and the most likely scenario. Collectively, this information provides a comprehensive overview of Council's planned infrastructure services for the next 30 years.

Water Supply

The Council is responsible for the provision and management of 4 water supply schemes at Ōtaki, Te Horo/ Hautere, Waikanae/ Paraparaumu/ Raumati, and Paekākāriki.

Thirty-year goal

Council's priority is a water supply system that is robust, to ensure sufficient drinking-water is available for the immediate future and for generations to come. The system must also be able to cope with emergencies and the long-term impacts of climate change.

Risk-prioritised investment balances future renewals and upgrade programmes, giving Council confidence in its investment decision making while also increasing the system's resilience and ability to sustainably supply water to the district.

Key Issues and Challenges

- Te Mana o te Wai as an umbrella concept over regulatory and environmental compliance; security and safety compliance of drinking water supplies with the establishment of Taumata Arowari[4], including compulsory training and mandatory treatment; the National Policy Statement on Freshwater Management, National Environmental Standards, the proposed Natural Resources Plan and the Kāpiti Whaitua chapter include policy on water allocation and ecological minimum flows. Realising Te Mana o te Wai and ensuring regulatory compliance may require additional/earlier investment.
- Climate Change Planning. Mitigation through reducing emissions associated with drinking water collection, treatment and distribution. Adaption to and from more severe events (drought, more intense rainfall), potential saltwater intrusion on groundwater, and damage to structures, particularly in coastal areas
- Resilient Supplies, Systems and Processes. Issues related to drinking water resilience that Council wishes to address are:
    - Continuous supply of compliant and safe drinking water
    - Improve treated water storage for times where source water quality deteriorates
    - Renewing aged infrastructure
    - Providing redundancy within water treatment plants to improve operational flexibility
- Delivery of a significant capital work programme to maintain levels of service and support growth. Significant investment is required to provide strategic trunk mains to service growth areas in Waikanae and ultimately service storage for the Ōtaki networks.
- Provide demonstrable cost effectiveness recognising the need for the services to be affordable. Prudent investment in water supply infrastructure is required to ensure that Council can meet its financial

[4] Taumata Arowai, the water services regulator, will be established in 2021. Council expect water supply assets will remain in Council ownership for at least the first five years, and that they will transfer to another entity at some point in the following 10years. As a lifeline water supply will be required throughout the establishment and transfer period, we have planned and financed accordingly.

rates and debts targets while maintaining or improving levels of service. Council will make evidence based decisions on the balance of risks and benefits for projects.

Key Projects

Major projects significantly impacting these expenditure forecasts are focused on resilience, security and safety of drinking water supplies. These projects include:

Water Supply – most likely scenario			
Challenge	Project	Forecast $	Year
Legislative and Regulatory Compliance	Waikanae Consent renewals	$262,000 $164,000 $209,000 $715,000	2023-29 2033/34 2041/42 2047-49
Climate Change Planning	Waikanae ki Uta ki Tai (collaborative restoration catchment project)	$350,000	2021-31
Resilience	Waikanae Water treatment plant renewal stage 2 (capacity and seismic) Waikanae Water treatment plant renewal stage 3 Drinking water safety improvement upgrades (Otaki and Hautere/Te Horo) Ōtaki Water Supply Storage – new reservoir Resilient water supply- network renewals	$12.3M $6.0M $5.4M $7.5M $264M	2021-23 2023-27 2021-23 2021-26 2021-51
Delivery of a Significant Capital Work Programme	River recharge bore upgrades Water Supply network upgrades for pressure, firefighting, storage and LOS	$3.3M $9.7M $10.1M $14.6M	2032-34 2040-42 2021-27 2028-37

Asset performance and levels of service

Assets	Levels of Service	Targets
Water intake structures (2) Ground water bores (15) Water treatment plants (5) Bulk water supply mains (17kms) Service reservoirs (12) Pump stations (6) Water distribution mains (451 kms) Water service lines (103 kms) Water network hydrants, valves, and fittings (2,500) Water meters and boxes (23,410)	We provide continuous potable water supply that meets New Zealand drinking water standards. We encourage the sustainable use of potable water and aim to reduce water loss from our water network.	*Solely DIA mandatory measures. All 2019-20* Attendance Achieved Resolution Achieved Bacteria & protozoa standards Four of the five treatment plants achieved full compliance. Complaints Not achieved Water consumption Achieved Water Loss Achieved

Of our five water treatment plants, the Tasman Road treatment plant in Ōtaki has historically not meet the drinking water standards for brief periods during the year. One of the key projects planned in 2021-23 is an upgrade to this treatment plant to improve water safety and ensure that it complies with drinking water standards year-round.

We do not propose any changes to levels of service in this Long-term plan cycle. The key projects and most likely scenarios address any risk or and maintain current levels of service.

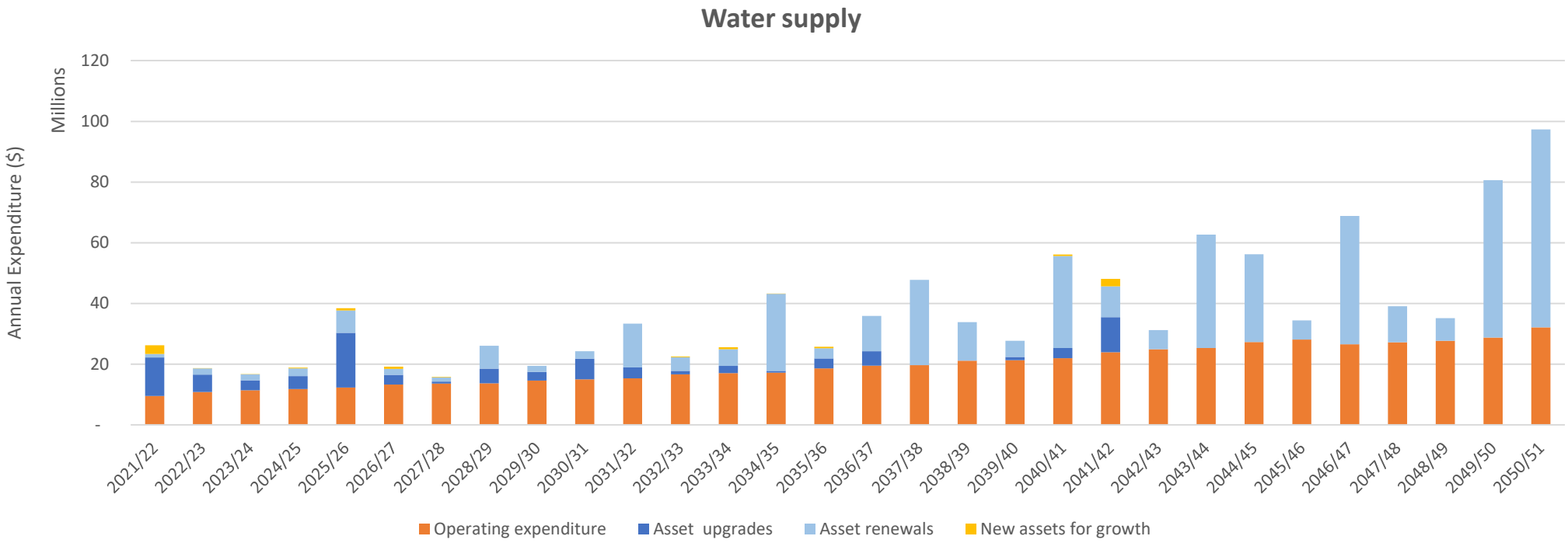
Asset condition

Kāpiti's pipe network is relatively young with the majority of pipes installed in the 1970s and 1980s. Based on the Council's most recent assessments, 73% of its water supply pipes are in moderate to very good condition. This assessment is based on 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 following table.

Condition grading	% of length
Condition grade 1 (very good)	32
Condition grade 2 (good)	18
Condition grade 3 (moderate)	23
Condition grade 4 (poor)	24
Condition grade 5 (very poor)	3

Financials

The following graph shows the total planned expenditure for the Water Supply activity for the next 30 years.



Wastewater – wai para

The Council is responsible for the provision and management of two wastewater treatment schemes serving Waikanae, Paraparaumu and Raumati, and Ōtaki. Paekākāriki and most rural areas of the district have no public wastewater infrastructure.

Thirty-year goal

An effective and efficient wastewater service now and into the future, which balances ongoing performance, risk and resilience. Lifecycle investment for ongoing performance, to allow future projected growth and ensuring the mauri of our environment is maintained within Te mana o Te Wai.

Key Issues and Challenges

- Legislative and Regulatory Compliance: specifically the establishment of Taumata Arowai[5] introduction of Te Mana o Te Wai and meeting the National Policy Statement for Freshwater Management. A step change is required moving from reactive management to strategic management, whilst meeting existing levels of service.
- Climate Change Planning: Changes to treatment processes and capability to reduce emissions and allow adaptation to effects and issues.
- Resilient Supplies, Systems and Processes. Issues related to wastewater resilience that Council wishes to address are:
  ≈ Continuous containment, reticulation, treatment and sustainable discharge of treated wastewater
  ≈ The rise of the water table is hastening the degradation of pipes in the network
  ≈ Providing redundancy within wastewater treatment plants to improve operational flexibility
  ≈ Renewing aged infrastructure
- Delivery of a significant capital work programme to maintain levels of service and support growth. While recognising the need for the services to be affordable

Key Projects

Major projects significantly impacting these expenditure forecasts are focussed on increasing capacity to cater for economic growth, as well as renewals. These projects include:

Wastewater – most likely scenario			
Challenge	Projects	Forecast $	Year
Legislative and Regulatory Compliance	Paraparaumu Wastewater Treatment Plant Inlet Works WWTP renewals Ōtaki WWTP renewals	 $2.6M $37.3M $17.0M	 2021-25 2021-51 2021-51

[5] It is likely that the ownership, operation and maintenance of the wastewater schemes will change from Council to a new utility in the next five years.

Climate Change Planning	Wastewater pump station upgrades	$19.4M	2031-51
Resilience	Network upgrades Waikanae duplicate rising main	$1.6M $1.6M	2024-28 2021-23
Delivery of a Significant Capital Work Programme	Network renewals	$131M	2021-51

Asset performance and levels of service

We do not propose any changes to levels of service in this Long-term plan cycle, unless there are legislation or regulatory changes. The key projects and most likely scenarios address any risk and/or maintain current levels of service.

Assets	Levels of Service		Targets
Service connections (15,000) Pipes (310km) Manholes, valves, fittings (920) Pump stations (155) Treatment Plants (2) Storage tanks and ponds (4)	Our wastewater system management practices ensure that we respond efficiently and effectively to wastewater system blockages, faults and overflow issues We comply with our resource consent conditions and our receiving natural environments are not damaged by effluent discharge and are enhanced where possible		Solely DIA mandatory measures for 2019-20 Response Achieved Resolution Achieved Complaints Achieved Dry weather overflows Not achieved. There were 41 dry weather overflows 2019-20 (out of a total of 20,410 connections). Consents compliance Achieved

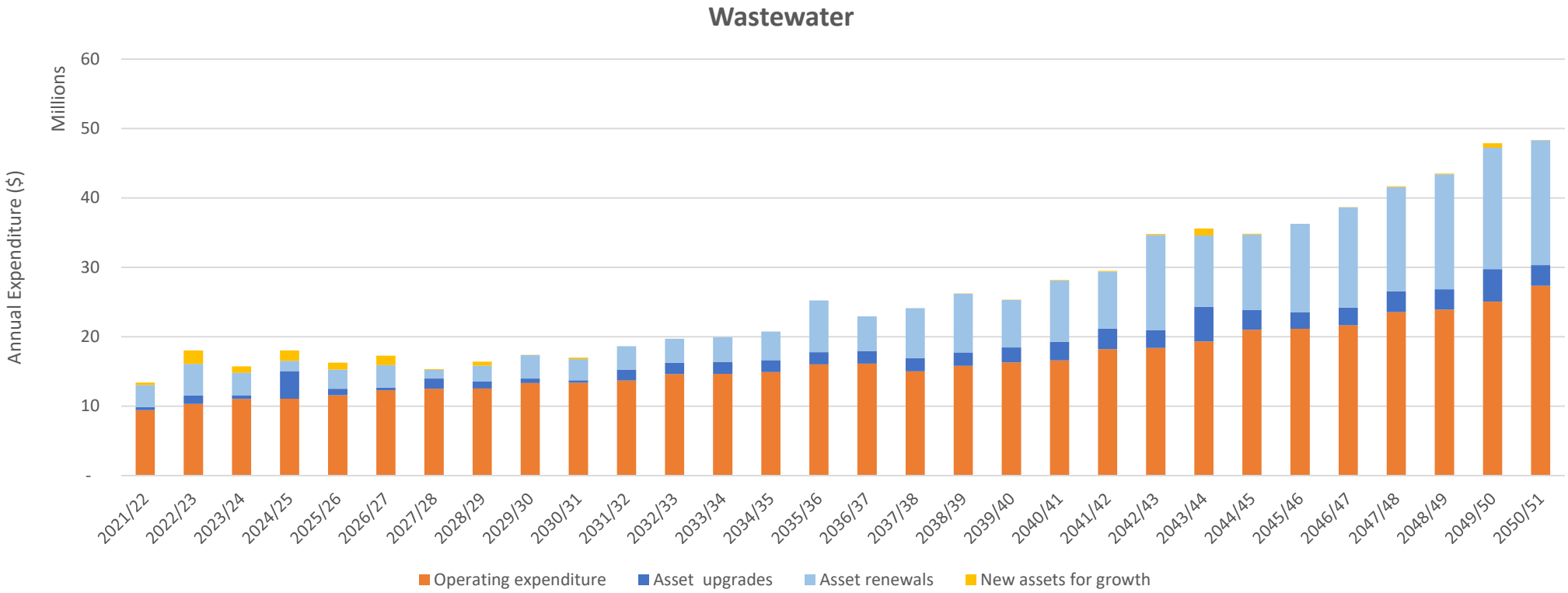
Asset condition

The condition of wastewater assets, where known, is generally good. A condition and capacity assessment of the Paraparaumu Wastewater Treatment Plant was completed in 2016. Further investigation of the network and pump stations are planned in the next three years. The following table summarises the Paraparumu-Waikanae wastewater scheme asset conditions.

Asset Type	Condition	Last Assessment/Comment
Network	Unknown	No formal assessment completed. HAL Consulting is assessing capacity.
Pump Stations	Good / Unknown	Only 24 of 122 pump stations have been inspected. In general, the condition of the pump stations inspected is good.
WWTPs	Good	In general the plant is in moderate condition. Various age-based replacements and capacity upgrades have been recommended.
Consents	Existing	Consents are in the process of being renewed.

Financials

The following graph shows the total planned expenditure for the Wastewater activity for the next 30 years.



Stormwater – wai āwhā

Council operates stormwater systems to manage surface water runoff from the districts urban catchments to provide a degree of protection against rainfalls of a moderate intensity. The service helps ensure public health, safeguards property and the environment. These systems are located at:

- Paraparaumu
- Waikanae
- Otaki
- Paekakariki

Thirty-year goal

To improve stormwater collection, treatment and disposal across the districts urban catchments while protecting the receiving environments, ensuring water quality and reducing risks to human health and property from flooding.

We are looking to more holistic working; integrating the planning and management of catchments, land use and receiving environments and the holistic health and well-being of a water body. Embracing Te Mana o te Wai to comply with the regulatory and environmental compliance framework.

Using more sustainable, blue-green network[6] strategies in the delivery of the stormwater service will include planning controls (e.g. setbacks, minimum floor levels, onsite detention, WSUD) on development and design principles to hold water in the landscape. We will work collaboratively, and in partnership with tāngata whenua, the community and our stakeholders on multi benefit projects that consider the social dimensions of water, water cycle perspectives and help target investments to risk

Key Issues and Challenges

• Resilience and Climate Change: Increasing occurrence of greater intensity and frequency of events are predicted and becoming more common, overwhelming assets and challenging network resilience.

• Delivery of Capital Work Programme: to achieve levels of service, meet regulatory compliance and support growth, whilst addressing a historic underspend in stormwater.

• Growth: The district is growing, and new developments increase stormwater runoff and require increased downstream capacity. Property owners have increasing expectations to protection, and developers have expectations that Council will eliminating the flood hazards to make more developable land available.

• Te Mana o te Wai – and wider regulatory compliance: Requirements for managing all waters in a way that prioritises the health and wellbeing of the water (quantity, quality and ecology).

• Flood Risk: over 600 flooding complaints each year, 30% of urban properties designated at risk in a 1:100-year event, nearly 50% of the stormwater infrastructure is under capacity for a 1:10 year event. Upgrading the infrastructure to the required standard requires a significant investment.

• Stream and watercourse maintenance: A discretionary activity, requiring resource consent. Consenting is an expensive, time consuming task, demanding an assessments of environmental effects including cultural and ecological impacts.

[6] blue- green networks are an holistic way of planning based around waterways (blue) and planting parks and tracks(green). The network has both environmental and recreational values. These can be managed together through a combination of infrastructure, ecological restoration and urban design to connect people and nature.

Key Projects

Key projects planned over the term of this Plan are shown in the following table:

Stormwater – most likely scenario			
Challenge	**Category**	**Forecast**	**Years**
Resilience and Climate Change Delivery of Capital Work Programme Growth Regulatory Compliance Flood Risk Stream and watercourse maintenance	Major projects - Paraparumu	$94M	2021-51
	Major projects - Waikanae	$57M	
	Major projects - Ōtaki	$46M	
	Major projects – Paekākāriki	$14M	

Asset performance and levels of service

Assets	Levels of Service	Targets
Pipes = 216km Open waterways = 52.7km Number of pump stations = 18 Nodes and structures =10,383 Service lines = 3,029	Council respond to problems quickly	Median response time to attend a flooding event from notification to attendance on site Urgent: < 24 hours ✓ Achieved (2018/19) Achieved (2019/20) Percentage of all buildings that have been inundated due to minor flooding are visited within four weeks Target - 90% ✓ 2019/20 - 100% 2018/19 - 100%
	Council provide stormwater systems that protect the natural environment	Measure compliance with council's resource consents for discharge from its stormwater system. No abatement notices ✓ Achieved (2018/19) Achieved (2019/20)
	Council provide reliable and efficient stormwater disposal systems	Major flood protection and control works are maintained, repaired and renewed to the key standards as defined in the Council's activity management plan Achieve ✓ Achieved (2018/19) Achieved (2019/20)

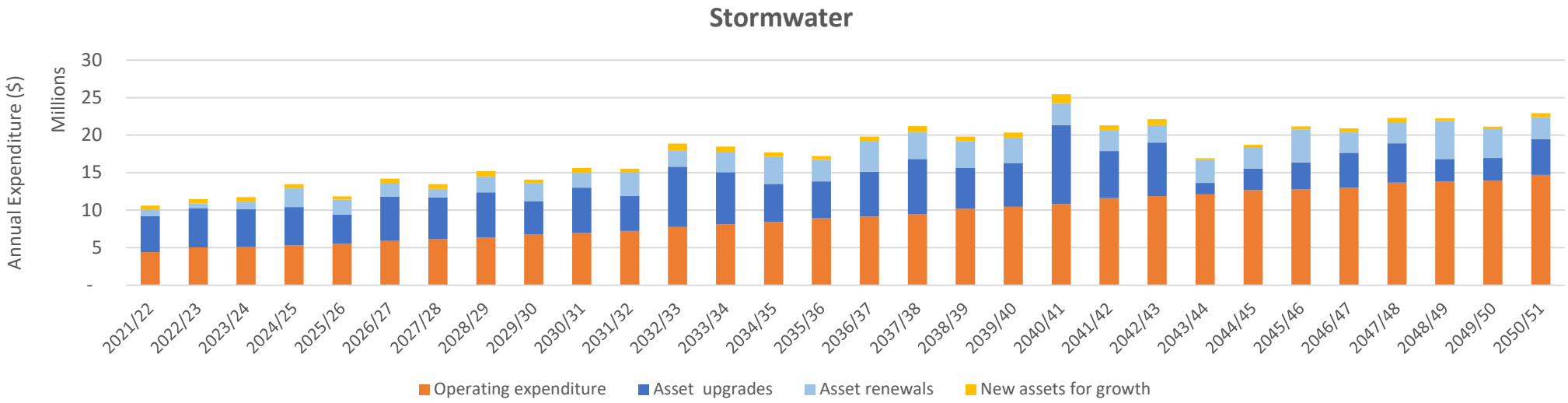
We do not propose any changes to levels of service in this Long-term plan cycle, unless there are legislation or regulatory changes.
The key projects and most likely scenarios address any risk or and maintain current levels of service.

Asset condition

Due to the relatively low age of the piped network (median age less than 40 years, and the financial constraints in completing detailed assessments, the assessment of asset condition is largely based on sighting of assets by service crews when undertaking maintenance. However, a more detailed asset inspection regime to inspect all piped assets over 40 years of age commenced in year 2017/18 and will continue in future and will underpin the renewal programme as appropriate.

Financials

The following graph shows the total planned expenditure for the Stormwater activity for the next 30 years.



Coastal Management – whakahaere takutai

The primary purpose of our coastal asset activity is to protect people and property against the ocean for present and future generations. As well as assets, Council also undertakes dune replenishment and beach renourishment to manage the effects of coastal hazards on existing development and infrastructure.

Thirty-year goal

Kāpiti's coastline is essential to community and the sustainable management of the coastal environment is critical to the community's wellbeing. We support wellbeing through providing accessible beach and coastal areas, and enhancing ecological and amenity.

Dune reshaping and planting help restore damaged ecosystems to a more natural state as well as protecting the boundary between coastal and terrestrial land that can be threatened by coastal erosion. This includes protecting public roads, water and drainage infrastructure by maintaining council-owned seawalls as long as is practical and through facilitating beach protection projects.

Our work with the community needs to pragmatically and prudently manage the risks of increased erosion, sea levels and storm intensity on Kāpiti's coast– increased flooding risk, lives and property at risk. We also need to balance the protection of the environment, anticipated growth and the management of our assets against community expectations, increasing risks and political and financial challenges.

We will understand our communities, whilst educating them to the hazards and risks, and acknowledging that failure will occur.

Adaptation work to hazards that our assets and communities face will include land-use planning restrictions on high risk susceptible land. The most prudent, yet contentious, being ensuring no new development on, and /or Long-term retreat from, high risk coastal and flood prone areas. These decisions will not be easy. The climate crisis presents both the easiest and the hardest decisions we have ever faced. The easiest because protecting assets and property from rising seas and flooding rivers makes sense. We must stop building and developing on flood plains. The hardest because of long-term investment in assets and property in risk areas.

When we make a decision we ask; will this put people and property at risk, or commit us to futile Long-term funding to protect assets? Along with stakeholders we should make decisions based on decreasing Long-term risks and ensuring intergenerational equity.

By 2030 with an informed community we have formulated and are implementing appropriate bold and brave strategies and plans. A planned approach to fight or flight, retreat or rebuild, or protecting assets at high risk which is be considerably less painful and costly than managing the risks through reactionary measures.

Key Issues and Challenges

• Climate Change: Increasing occurrence of severe weather related events have caused damage to assets and coastal erosion is affecting some areas. Finding affordable solutions for this reality is a significant challenge.

• Resilience: There is a cumulative effect of coastal erosion, sea-level rise and tectonic land movements on our coastline. While there is still some uncertainty about how significant these impacts will be, and how quickly they will happen, there is a need for us to start planning for our future and appropriate response is to be developed

• Fit for Purpose: the majority of the hard defense structures built on public land are poor in condition and have limited residual life left. Replacing these assets to the required standards requires a significant investment.

• Public infrastructure risk – significant wastewater assets, roading assets, and walkways are protected by seawalls. Failure of seawalls will compromise these strategically important infrastructure assets

• Level of protection – a change in focus will be required to assess realistic design criteria for coastal structures. This will require a more adaptive approach when renewing coastal protection structures and setting Levels of service and protection.

Key Projects

Coastal management – most likely scenario			
Challenges	**Project**	**Forecast $**	**Year**
Climate Change Resilience Fit For Purpose infrastructure Public infrastructure risk Community Wellbeing	Paekākāriki seawall replacement	$17.1m	2021-27
	Wharemauku block wall	$4.1m	2021-25
	Raumati South seawall replacement	$13.6m	2021-31
	Renewals – refurbishment, replacement of coastal assets	$9.6m	2021 -2041

All coastal asset renewal work will be funded by the annual depreciation provision where funds are available.

Asset performance and levels of service

Assets	Levels of Service	Targets
Length of seawalls = 5.9km Number of beach outlets = 69	Council respond to problems quickly We keep our beach outlets clear to avoid flooding	Respond within 48 hours to urgent requests to repair sea walls or rock revetments Target 90% ✓ 100% (2018/19) 100% (2019/20) Stormwater beach outlets are kept clear Target 90% ✓ 100% (2018/19) 100% (2019/20)

We do not propose any changes to levels of service in this Long-term plan cycle. The key projects and most likely scenarios address any risk or and maintain current levels of service.

Asset condition

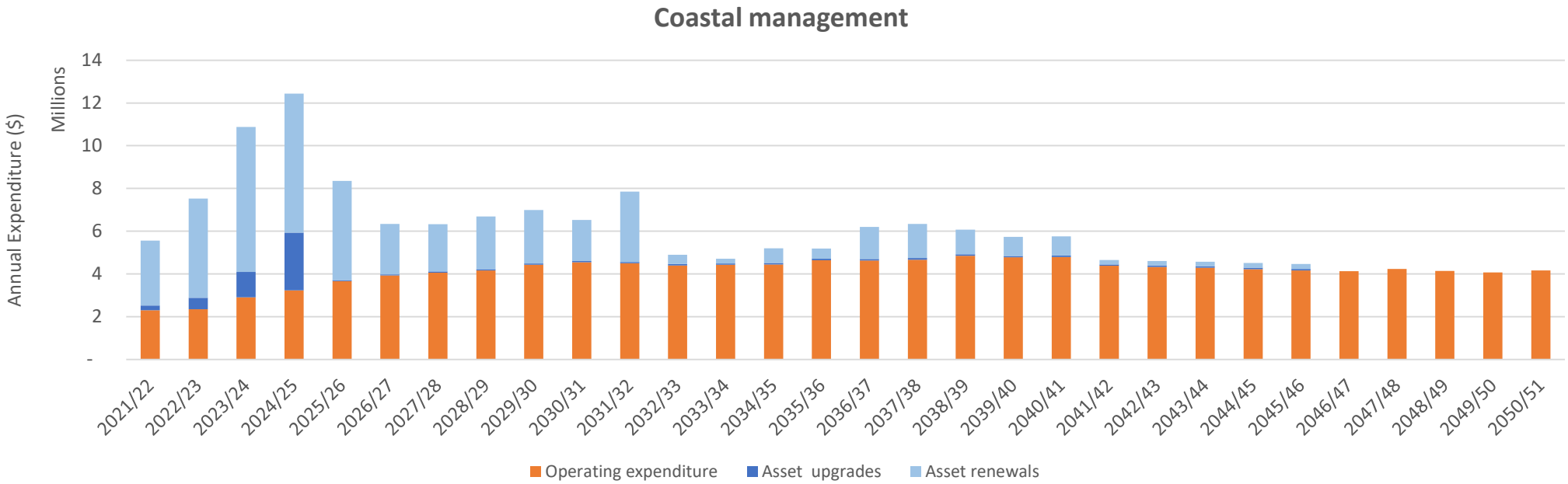
The following table summarises the condition of coastal assets based on the results of an assessment undertaken in 2016/17.

Asset type	Condition assessment
Beach outlets	Out of the 69 beach outlets 15 are in extremely poor condition and the remaining are in moderate condition
Paekakariki Seawall	Out of the 960 m of the wall 140m in poor condition, 480m in moderate condition. Remaining 340m is at low risk of failure in the immediate future
Raumati Seawall – Phase 1 (From 3 Garden Road to 203 Rosetta Road)	This 987 m long section has no rock protection and in poor condition
Raumati Seawall – Phase 2 (From 203 Rosetta Road to 52 The Esplanade)	This 1602 m long section is with rock protection at the toe and in moderate condition

Raumati Seawall – Phase 3 (From 52 to 108 The Esplanade)	This 513 m long section is built with rock and timber and in moderate condition except the first 20m which is in poor condition
Wharemauku Block wall (From 71 Wharemauku to 7 Raebern Lane)	This 170 m long block wall need strengthening with rock at the crest and toe
Seawalls in various other locations	6 seawalls (shorter lengths) are in poor condition and remaining are in moderate condition

Financials

The following graph shows the total planned expenditure for the Coastal Management activity for the next 30 years.



Access and Transport – putanga me te waka

We develop and maintain a roading network that provides access and enhances community connectedness. We encourage and support residents to use active transport modes or public transport by providing footpaths,

Thirty-year goal

We want to enhance community connectedness through the creation of well-planned physical transport system that allows for the reliable, efficient and safe movement of peoples and goods. A system that offers mode choice that enables people to act in a sustainable way.

Our transport system establishes kaitiakitanga as a guiding principle. Access and transport provision will create safe, high quality and attractive places. People will feel safe using a mode of their choice. Mass transit and e-mobility technologies blend flawlessly into urban streetscapes from buses, rail to monorail and electric vehicles. They deliver a smaller environmental footprint and optimise land use. At the same time the health and wellbeing of communities is improved as a result of increased activity, improved access to key social infrastructure and local business are supported and enabled by the activity. Investment decisions will help remedy or mitigates effects on the environment, including road run off and transport based emissions.

Travel will become more accessible and affordable for all users. We obtain maximum external funding, optimise rates funding and sustain economic activity. Infrastructure spending will be prioritised to ensure that new developments contribute towards solutions rather than add to existing pressures.

cycleways, shared paths and passenger transport infrastructure. We allocate space on the network to match the needs of all user groups so people can easily get around the district by their preferred means and have a safe journey.

Resilience will be built into the network including alternative routes and effective and reliable options for mode choice, as well as ensuring construction standards and emergency measures are in place to ensure that damage is as limited as possible and recovery is swift.

Key Issues and Challenges

- Fit For Purpose: Current network use differs from the past, and the level of investment needs to support users and different modes of travel now and in the future.

- Resilience and Climate Change: Increasing occurrence of severe weather related events have caused damage to assets and coastal erosion is affecting some structures and challenging network resilience. Extraordinary events are becoming more common; this affects user experience.

- Demographic Change: across Kāpiti is in the younger and older groups. Our transport networks should better suit the older and younger age groups.

- Connectivity The Wellington Northern Corridor improvements are, and will continue to change travel patterns, this is evident in congestion, some poor connectivity, and service provider workload. In the short term Northern Corridor project continue to affects the availability of suppliers and competition for work.

- Road safety indicators are getting worse, vulnerable users need to be kept safer.

Key Projects

Access and Transport – most likely scenario			
Challenge	**Project**	**Forecast $**	**Year**
Fit For Purpose Network	Bridges Major projects include: - Kāpiti Road & Marine Parade culverts - Matatua Side Culvert - Ringawhati Bridge extension - Sealed pavement maintenance and resurfacing increases - State Highway Revocation	 $2.65M $1.8M (share) $0.85M Increasing from $2.8m per annum in 21/22 to $5.5m in 30/31 $6M	 2022/23 2024/25 2025/26 2021-31 2021-26
Resilience and Climate Change	Drainage renewals	*Increasing from $0.7m per annum in 21/22 to $3.3m in 31/32*	
Demographic Change	Sustainable Transport Strategy (due to be adopted by Council Jan 2022)		
Connectivity	East West Connectors (Ihakara-Arawhata Link Road)	$25.2M	2021-24
Road safety	Safe Network Programme /Road to Zero	$1.8m per annum	2021- 2031

Asset performance and levels of service

Assets	Levels of Service	Targets
Sealed Roads 399km Foot & shared paths 486km Unsealed roads 13km Streetlights 5091 Transport signs 5022 Traffic signals 16 Drainage assets 6571	Our transport network allows for the safe and efficient movement of people and goods Our transport network is affordable and reliable and users can easily get around the district by their preferred means	Residents that agree that the existing transport system allows for easy movement around the district 80% ✓ 75% 2018/19 81% 2019/20 Number of serious and fatal crashes on district roads Five-year rolling average reduces (from 9.8 2014-18) No change 2018-19 ✓ Reduction (9.6) 2019- 20 Average cost of local roading is comparable with similar Councils in NZ (ONRC peer group) Achieve ✓ 2018/19 Achieved 2019/20 Achieved

We do not propose any significant changes to levels of service in this Long-term plan cycle. The key projects and most likely scenarios address any risk or and maintain current levels of service.

Asset condition

Access and Transport assets include sealed and unsealed roads, drainage assets, and footpaths as well as streetlights and traffic services and minor assets. The availability of condition information varies across the asset types.

Our sealed roads are assessed using a range of methods including road roughness and condition index, and these show that our roads are in good condition overall. The results of a survey of tyre grip on the road surface are due in 2021.

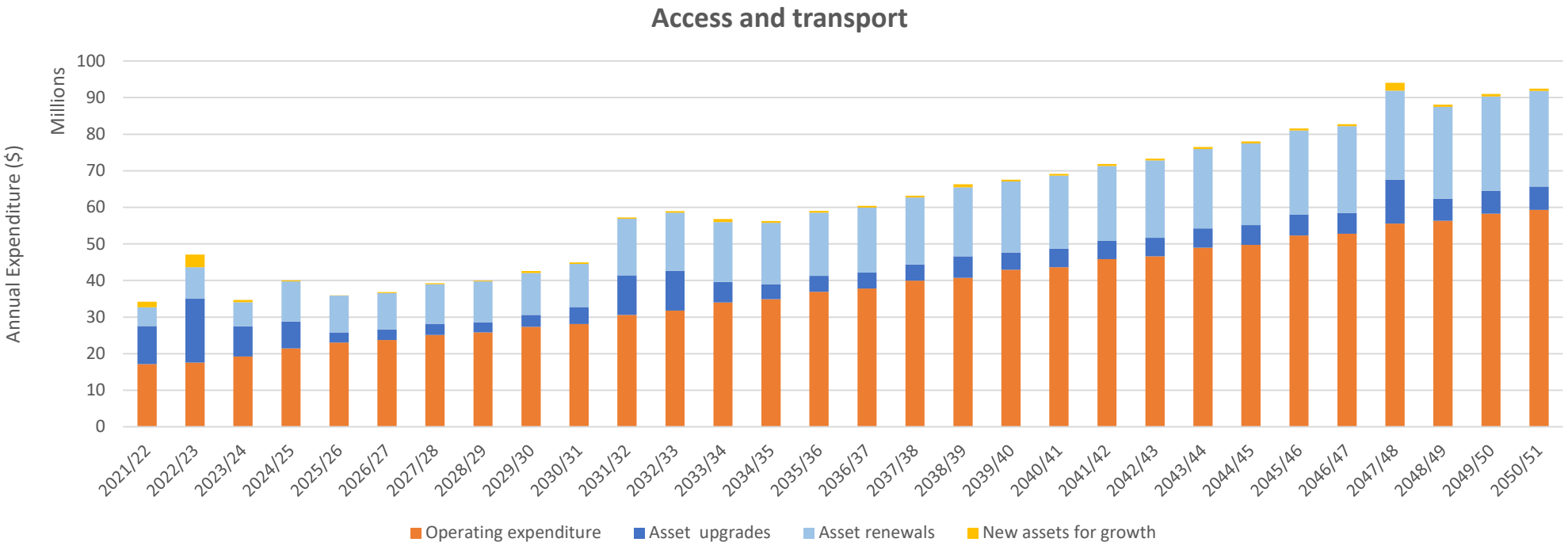
We are into our third year of a five-year survey of our footpath condition and most of the assets assessed are rated as being in good or excellent condition.

Nearly all of Council's drainage assets (e.g. kerb and channel, and sumps) are less than 40 years old and are in satisfactory condition overall. A need for replacement is established following inspections or complaintsThe Council's bridge network is in generally good condition due to regular inspections and maintenance. Reactive bridge inspections are also undertaken following earthquake and flooding events.

Our resident opinion survey in 2019/20 showed that 72% of residents are satisfied with the condition of our roads, while 66% are satisfied with the condition of our footpaths.

Finances

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



Conclusion

This strategy has outlined the significant issues and challenges for our access and transport, coastal, stormwater, water supply and wastewater services over the next 30 years.

Key challenges are:

- Delivery of Capital Work Programme;
- Climate Change and Resilience;
- Regulatory Changes and Compliance

Practicing kaitiaki and kaitiakitanga with our community and environment, taking a tikanga Māori approach and working with tāngata whenua iwi is critical to our ability to deliver many of the projects outlined in the strategy.

To help navigate and provide certainty to the changes and challenges faced, realise our toitū Kāpiti vision and ensure the wellbeing of our land, our waters and our people we need to make some significant decisions about capital expenditure required over the 30 years. To do this we must continue to use prudent, lifecycle approach best practice asset management as the basis for evidence based planning decisions and investment.

Kāpiti has a critical and broad role in ensuring the well-being of our communities. We also need to continue to provide essential services while dealing with growth and development, legislative and regulatory changes, the impacts of a changing climate, all while our financial future is uncertain. To meet these challenges, over the next decade as kaitiaki of our people and our whenua, we need to:

- Radically reduce greenhouse gas emissions,
- Plant more trees and restore the vitality of natural systems
- Embrace Te Mana o te Wai
- Increase local, regional and national resilience and self-sufficiency
- Be socially responsible
- Work together, in partnerships and collaboration
- Ensure Deliverability
- Create an environment that is resilient and able to sustain, support and nourish its communities.

2020 challenged our communities and gave us insights and has shown us what is possible. Alongside unique and valuable knowledge and cultural practice that have been passed down through generations we have an unprecedented opportunity to re-set our direction to a more sustainable future. It is a once in a generation opportunity to change.

This section provides the strategic context for infrastructure in Kāpiti. As well as the council's vision and outcomes, it reflects the challenges and influences. It considers the changing population and predicted growth, technology and industry changes, affordability and economic trends, legislation and regulatory reforms, and threats to our environment – including our changing climate.

Infrastructure management is in the midst of a radical reshaping and transformation across all infrastructure fields. As well as addressing supply and skill shortages, adapting to the climate emergency and recovering from COVID-19, New Zealand is also in the midst of a legislative and regulatory change, increasing customer expectations and environmental compliance as well as publicised issues around underfunded and aging assets.

Urban planning and management is moving from being isolated to a transdisciplinary holistic arena, where different disciplines inspire each other to identify synergies and mutually beneficial solutions.

Over the next couple of decades there will be opportunities for real-time adaptability, agility, and less rigid business and market structures to help us adapt to situations such as the environment, technology and people. These opportunities will provide an increasing emphasis on ethics of responsibility, toward employees, suppliers and the ecological world.

In the twenty-twenties and twenty-thirties, business will be indispensable in addressing interconnected social, ecological and economic challenges that are all interconnected. These interconnected solutions facilitate a tikanga Māori approach. This means changing and adapting how we do business along entire value chains, establishing collaborative agreements, social and equitable procurement and developing new business models. Business must be at the very heart of attempts to find solutions to climate change, resilience of our ecological systems and adding to the ultimate goal of social prosperity and wellbeing.

Appendix 1: Climate change projections for Kapiti

The projections provided in this table have been compiled mostly by Greater Wellington Regional Council (GWRC) and are:

- from two reports prepared by NIWA for GWRC: *Climate change and variability – Wellington Region* (June 2017) and *Wellington Region climate change extremes and implications* (December 2019)[A];
- presented as a 20-year average for two future periods: 2031-2050 (termed 2040) and 2081-2100 (termed 2090); and
- compared with a recent baseline climate of 1986-2005 and/or 1981-2010 (termed 1995).

Changes that have already happened (verified by measurements): As of 2020, the Greater Wellington Region has already warmed by about 0.8 degrees in total since the industrial revolution. Over a third of this warming (about 0.3 degrees) has happened since 1995. This overall warming has been associated with several additional climatic changes, including increases in weather extremes and a significant disruption of weather patterns and displacement of the seasons (e.g. winters starting later). Insurance data confirms a marked increase of weather-related claims in New Zealand over the last decade.

Predicted changes (estimated by climate models): At least a third of the warming predicted for mid-century has already happened since the 1995 baseline. If emissions are reduced by half this decade, and further reduced to net negative by mid-century, most of the high-end projections for late century can be avoided.

Additional information potentially required: concerns over groundwater levels have already been raised as an issue, and are currently under discussion. The most recent groundwater work (that we are currently aware of) for the District dates back to 2012. Discussions are occurring across the Infrastructure Group to determine whether more information is required in this area. We would be interested in feedback on who else might need groundwater information, who might have more recent groundwater information, and whether there are other variables not considered below.

Kāpiti Coast whaitua					
Variable / period	2040	2090	Baseline – 1995 or as stated [B]	Uncertainty	Commentary
Average annual temperature	+0.5°C to 1°C above the 1995 baseline (+1.0°C to +1.5°C above pre-industrial)	+1°C to +2.7°C above the 1995 baseline (+1.5°C to +3.2°C above pre-industrial)	~14°C. Average winter = 6°C, and average summer = 21-22°C.	There is less uncertainty for scenarios in which significant emissions reductions occur, and more uncertainty for	Maximum warming to occur in autumn and winter, least in spring Note reference to 'above the 1995 baseline' versus 'pre-industrial': About 0.5C of warming has already happened from pre-industrial (1880-1909) to the 1995 baseline.

Variable / period	2040	2090	Baseline – 1995 or as stated [B]	Uncertainty	Commentary
				models with high emissions	
Average annual rainfall	0% to 5% increase above the 1995 baseline	0% to 10% increase above the 1995 baseline	~1000mm on the southern coast, ~1200mm on the northern coast, ~1300mm in the foothills, and 1700mm at the highest elevations from 1971-2000.	There is a large uncertainty in the range of changes due to model differences and emission scenarios.	Greater likelihood of increased average annual rainfall in autumn, winter and spring.
Amount of rain falling during heavy rainfall days	0% to 10% increase above the 1995 baseline	0% to 15% increase above the 1995 baseline	Mean annual days with >25mm from 1971-2000 = 8 along the southern coast, 11 on the northern coast, 12 in the foothills, and 17 at the highest elevations.	There is a large uncertainty in the range of changes due to model differences and emission scenarios.	Greater likelihood of increased average annual rainfall in autumn, winter and spring.
Extreme rainfall magnitude: 6-12 hour duration, 100 year Average Recurrence Interval	6% to 12% Increase above the 1995 baseline	12% to 32% Increase above the 1995 baseline	~ 14.8 mm/hr for a 6 hour duration, 100 year ARI at Paraparaumu Airport, ~ 13.3 mm/hr for a 6 hour duration, 100 year ARI in Otaki township.	Although the uncertainty in rainfall range are high, extreme rainfall increases are more certain due to the increased amount of water vapour that the	These projections are from NIWA's High Intensity Rainfall Design System (HIRDS), which estimates the magnitude and frequency of high intensity rainfall at any point in New Zealand.

Variable / period	2040	2090	Baseline – 1995 or as stated [B]	Uncertainty	Commentary
				atmosphere can hold as it gets warmer.	
Sea level rise	0.12 to 0.24 metres above the 1995 baseline (0.38 to 0.5 metres above pre-industrial)	0.68 to 1.75 metres above the 1995 baseline (0.94 to 2 metres above pre-industrial)	Mean sea level (MSL) was 0.196m above WVD53 from 2005-2011, and 0.250m above WVD53 from 2012-2018.	There is very high confidence in sea level rise projections, probably more so than any other variable.	The projected sea level rise for 2090 is based on the most recent International Panel on Climate Change (IPCC) models plus an estimated additional contribution from Antarctica, based on papers published in *Nature* in 2018. Note the difference between the 1995 baseline and pre-industrial, as we have already had about 26cm of sea level rise prior to 1995. More regular storm events in the fragile coastal environment may also mean faster and more significant coastal retreat.
Number of hot days (above 25°C) per year	Between 5 and 10 days increase above the 1995 baseline	Between 5 and 50 days increase above the 1995 baseline	4		Measurements taken at Paraparumu Airport More recent NIWA reports state: ~ 12 along the southern coast, ~ 9 along the northern coast, and ~ 6 inland
Number of frost nights (below 0°C) per year	Up to 5 days reduction above the 1995 baseline	Up to 15 days reduction above the 1995 baseline	12		Measurements taken at Paraparumu Airport More recent NIWA reports state: ~ 9 for most of the District

Variable / period	2040	2090	Baseline – 1995 or as stated [B]	Uncertainty	Commentary
Change in the intensity of wind during windy days	Up to 2% increase above the 1995 baseline	Up to 3% increase above the 1995 baseline	Mean annual wind speed = 16.2 km/hr		Measurements taken at Paraparumu Airport
Change in annual number of windy days	Up to 4 days increase above the 1995 baseline	Up to 6 days increase above the 1995 baseline	Days with gusts > 63 km/hr = 77. Days with gusts > 96 km/hr = 8.		Measurements taken at Paraparumu Airport
Change in annual growing degree days (GDD)	Increase between 0 and 300 GDD units above the 1995 baseline	Increase between 200 and 900 GDD units above the 1995 baseline	Average annual growing degree-days > 5°C = 2949, >10°C = 1299		Measures potential for crop and pasture growth. Note: GDD counts the number of days that are warmer than 10 degrees Celsius in a year. Measurements taken at Paraparumu Airport
Change in annual potential evapotrans-piration deficit (mm)	Increase between 40 and 80 mm above the 1995 baseline	Increase between 40 and 100 mm above the 1995 baseline	902mm = mean annual potential evapotrans-piration		Measures drought intensity. Evapotranspiration is the the process by which water is transferred from the soil, plants and other surfaces to the atmoshphere. The evapotranspiration deficit is the difference between how much water could potentially be lost and how much is actually available. When the deficit is high, plants do not have the full amount of water they need for growth. Measurements taken at Paraparumu Airport

Variable / period	2040	2090	Baseline – 1995 or as stated [B]	Uncertainty	Commentary
Change in rivers' mean annual low flow discharge (MALF)	Decrease up to 40% above the 1995 baseline	Decrease up to 40% above the 1995 baseline	This will vary for each river. See the water team for more information		Measures water shortage in the catchments. River discharge is the volume of water flowing through a river channel. A low flow is typically a seasonal phenomenon occurring at the driest time of the year, and measured by the average flow of the river over a set number of days. The lowest running 7-day average in a year will be the MALF.
Change in rivers' mean annual flood discharge (MAF)	Between 20% decrease and 60% increase above the 1995 baseline	Increase up to 60% above the 1995 baseline	This will vary for each river. See the water team for more information	There will be variations depending on the catchment	Measures flood potential in the catchments. In contrast to the MALF, the MAF is a measure of the annual maximum flow.
Changes in number of days of very high and extreme forest fire danger	50% to 100% increase above the 1995 baseline	100% to 150% increase above the 1995 baseline	2.0 VH+E days per annum		Number of days of Very High and Extreme (VH+E) forest fire danger. Measurements taken at Paraparumu Airport. These figures are based on an average of IPCC models. Individual models can show much higher increases of up to 700%.

Key environmental impacts	• Increased flood intensity • Increased coastal inundation (some areas to become permanently inundated) • Increased erosion • Reduced soil fertility • Decreased water quality • Groundwater quality and availability pressures • Saltwater intrusion • Groundwater intrusion (high water tables, that will increase further) • Increased pressure on water storage • Biodiversity losses • Increased pests such as wasps and rodents • Ocean acidification • Decline in fish population • Increased wildfire • Increased allergies (e.g. pollen)
Key impacts on people and communities* * Source: KCDC. This short list is from an initial brainstorm. It is likely that there will be many more impacts.	• Impacts on residential and commercial properties – flooding, erosion, or even total destruction in extreme instances • Inability to purchase insurance • Loss of jobs • Loss of local food production / changes to traditional harvesting methods • Potential disruption to transport systems • Damage to, or complete loss of, sites of environmental or cultural significance • Increasing social, cultural, environmental, and economic vulnerability – often to communities that are already at greatest risk

[A] NIWA has compiled these projections from a number of sources. Many are from NIWA's Regional Climate Model, which was developed by the averaging of six climate models based on The Fifth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (2013). These six climate models were chosen by NIWA because they provide the most accurate results when compared to historical climate patterns in the New Zealand and southwest Pacific region.

Climate change projections are carried out for four greenhouse gas concentration scenarios, called Representative Concentration Pathways (RCPs). The four RCPs project different climate futures based on future greenhouse gas concentrations. RCP2.6 is a mitigation scenario requiring significant reduction in greenhouse gas emissions, RCP4.5 and RCP6.0 are mid-range scenarios where greenhouse gas concentrations stabilise by 2100, and RCP8.5 is a high concentration scenario with greenhouse gas emissions continuing at current rates. When specific projections are

required, RCP4.5 and RCP8.5 are usually selected as these offer projections based on a mid-range reduction or the maintenance of the status quo.

[B] The baseline data have been pulled from the following sources:

- Chappell, PR. 2014. *The Climate and Weather of Wellington*. NIWA
- NIWA. June 2017. *Climate change and variability – Wellington Region.*
- NIWA. December 2019. *Wellington Region climate change extremes and implications.*
- NIWA. November 2007. *Updated Climate Change Scenarios for the Kapiti Coast*.
- NIWA. *High Intensity Rainfall Design System V4 (HIRD)*. www.hirds.niwa.co.nz.
- NIWA. May 2019. *Coastal Storm Surge Inundation Maps for the Kāpiti Coast*.

Appendix 2: Infrastructure Asset Management

This section of the Infrastructure Strategy provides a general overview on Council's approach to asset management, describes Council's current infrastructure services, and provides an update on the capital works programme from the 2018 Infrastructure Strategy.

Asset management planning

Council has a well-established approach to asset management planning, based on the ISO 55000 Asset Management Standards. A key aspect of this approach is the Asset Lifecycle Model, which aims to optimize cost, risk and performance across the asset lifecycle.

The four phases of the asset lifecycle are plan and design, build or acquire, operate and maintain, and replace or dispose. Council maintains its assets until they reach the end of their useful lives, after which they will then be renewed, upgraded or replaced in order to maintain the required levels of service.

Whereas each asset management plan includes more information on the asset management processes underpinning each plan's development, this section provides a general overview on Council's approach to the collection and management of asset information.

Asset knowledge, criticality and maturity

Levels of service (LOS) refer to the nature of the services that Council delivers to the community. LOS are generally defined and measured via performance targets for factors like quality and capacity, reliability, safety, cost, and legislative compliance.

Desired or expected LOS are based on community needs, community expectations, and Council's strategic goals. Changes in the District (e.g. population growth, demographic changes, natural hazard events) can lead to changes in community needs and expectations and/or changes in Council's ability to deliver previously agreed LOS.
Comparisons between desired and actual LOS influence asset management planning, particularly in relation to the timing and quality of maintenance renewals and upgrade works. As these decisions can have significant financial implications, an asset's useful life is reviewed regularly in accordance with:

- Its age and condition profile;
- The criticality of the asset;
- Degree of risk;
- Ongoing maintenance requests;
- Desired versus current LOS; and

- The differing economic lives of individual assets.

In order to establish actual LOS and manage assets using the lifecycle approach, knowledge and information about the assets is crucial; such knowledge underpins each asset management plan, thereby enabling evidence-based decision making. Asset knowledge covers age, condition, performance and value.

Another important aspect is the criticality of the assets. Critical assets are defined as those that have a higher consequence of failure in terms of the impact a failure would have on the community, the environment, the organisation's objectives, and the asset plans.

A criticality framework developed in 2013/14 is used to identify and manage risks across the infrastructure services. This framework provides a consistent approach to assessing the potential impacts on people and the environment if an asset were to fail. Because this framework allows for comparisons across services, it can be used to prioritise inspections and investigations, refine maintenance and renewal strategies, identify high risk information gaps, and increase confidence in the timing and scale of capital expenditure.

The level of maturity expected for asset management is a strategic decision for Council. Levels of maturity beyond a core or basic approach are determined according to a variety of criteria, such as the costs and benefits derived from more advanced planning; legislative requirements; the size, condition, criticality, and complexity of the assets; and customer expectations.

Asset conditions, data confidence, criticality, and asset management maturity are all based on 1 – 5 rating scales.

Table 2: Rating scales for asset condition, data confidence level, criticality, and asset management maturity

Scale	Asset Condition	Data Confidence	Criticality	Maturity
1	Excellent	Systematic and fully optimised data programme	Significant, region wide, Long term disruption and significant cost to restore service	Advanced - Programmes are driven by optimised decision making, risk management, and service level /cost trade-offs. Improvement programmes are focused on maintaining ongoing practice
2	Some minor maintenance work required	Reliable data in information system with analysis and reporting	Major disruption over an extended period	Intermediate – AMP includes strategic context, analysis of condition and performance assessments, customer engagement in levels of service, and ODM/risk management is applied to projects.
3	Maintenance is required to return to the expected level of service	Sufficient information to support basic analysis	Moderate, with serious localised impacts and cost	Core – AMP covers approach to risk, condition and performance assessments, demand forecasts, 10-year financial

				plans and an improvement plan.
4	Requires a significant upgrade	Basic or incomplete information based on assumptions	Minor service disruption	Basic- AMP contains basic information on assets, service levels, planned works, and financial forecasts.
5	The asset is unserviceable.	No asset register	Negligible social or economic impact	Aware – there are intentions to develop AMPs

Note: Condition, confidence in data completeness and accuracy, and asset management maturity definitions are based on the International Infrastructure Management Manual framework. The criticality codes are based on the Global Criticality Rating and subsequently developed by the New Zealand Treasury – National Infrastructure Unit and published in the New Zealand Asset Metadata Standard – Potable Water Release Version 1.0.

Current infrastructure services

The core infrastructure services included in this Strategy are:

- water supply,
- wastewater,
- stormwater,
- coastal assets, and
- transport.

More information on each asset group is provided in Part Five. Table 3 provides basic information on each asset group.

Table 3: Replacement value and rating scales for existing infrastructure

Asset Group	Optimised Depreciated Replacement value	Asset Condition	Data Confidence	Criticality	Maturity
Water Supply	$121,202,331	2 - Good	B - Reliable	1 – Lifeline	Intermediate
Wastewater	$135,851,289	2 - Good	B - Reliable	1 – Lifeline	Intermediate
Stormwater	$66,817,888	2 - Good*	B - Reliable	**	Intermediate
Coastal	$7,891,000	4 - Poor	B - Reliable	3 - Key	Basic
Access & Transport	$455M (DRC)	3 - Satisfactory	A - Highly to B - Reliable	1 – Lifeline	Intermediate

* Prior to 2017 the median age was less than 40 years. A systematic asset inspection regime based on NZ pipe inspection manual commenced 2017/18. It is currently 50% complete.

**No formal criticality assessment has been undertaken for the stormwater activity and assets

Status of the 2018 capital work programme

Council prepared its first Infrastructure Strategy as part of the Long-term plan 2015-35, and a second in the Long-term plan 2018-38. Most of the information and assumptions in these preceding strategies remain valid today. For this reason, the 2018 Strategy has been used as a base for the development of this 2021 Strategy because this enables an enduring approach to infrastructure decision making.

Table 4 provides an update on the infrastructure project delivery that has occurred for water, wastewater, stormwater, and transport in the first three years of the 2018 Infrastructure Strategy.

Table 4: Update on 2018 Infrastructure Strategy Projects

	Project	Cost (2018)	Time	Status 2020
Water supply	Network upgrades	$23.1M	2018-42	Design, investigation and procurement options are underway. There have been some delays experienced due to the Three Waters Reform requiring resources to be reallocated in the interim, but Council is still well positioned to deliver as planned.
	Waikanae Treatment Plant, stage 2	$9.8M	2018-21	
	Otaki and Hautere water safety upgrades			
	30-year asset renewal programme	$81.1M	2018-48	
Wastewater	Paraparaumu Wastewater Treatment Plant, inlet and aeration works	$3.6M	2020 -22	On going
	30-year asset renewal programme	$75.5M	2018-48	On going
Stormwater	Habitable floors	$80.4M	2018- 48	On going
	Downstream constraints	$66M	2018- 48	On going
	30-year asset renewal programme	$27.4M	2018- 48	On going
Transport	LED streetlights	$1.5M	2018-19	Complete
	SH1 revocation upgrades	$ 4.6M	2018-21	On going
	East- West Connector	$ 23.1M	2019-46	On going
	30-year asset renewal programme	$194.5M	2018-48	On going

Note: The management of coastal assets was not included in the 2018 Infrastructure Strategy.