Draft Infrastructure Strategy

INTRODUCTION

1.1. THE KAWERAU DISTRICT

Kawerau lies in the Eastern Bay of Plenty region, 100 kilometres southeast of Tauranga and 58 kilometres east of Rotorua. An enclave of 22 square kilometres surrounded by the Whakatane District, the Kawerau District is comprised mainly of urban, industrial and commercial land and has a small area of rural land.

Kawerau's natural resources include the Kawerau Geothermal Field, the Tarawera River and natural springs which produce an abundant supply of good quality water. Kawerau's geology is the result of the Mount Tarawera eruption. Soils in the District are ash/pumice, highly porous and although poorly compacted, are able to be compacted with work. The District topography is generally flat to rolling.

Kawerau enjoys hot summers and mild winters days, after a sometimes cold frosty morning. In summer the daily maximum temperature averages 23.7 degrees Celsius and on some days can reach more than 30 degrees Celsius, making Kawerau one of the warmest places in New Zealand.

The Kawerau district estimated population according to the 2023 census is 7,820 which represented a 4.8% increase in population since 2018 (previous census) or around 1% population growth per annum. Census figures show that Kawerau has close to the highest number of people per dwelling in the country, which indicates a shortage of housing for the district.

Stats NZ has projected that the population will remain relatively static for the next 20 years (medium projection scenario) to a total population of just under 8,000 by 2043. However, the growth figure could be higher as Kawerau continues to provide employment opportunities through industrial development and has affordable housing.

Kawerau currently has a higher proportion of older people and a higher proportion of young people when compared to the rest of the country. The population projections show that over the next 15 years (to 2038) the number of young people (under 15) will reduce by 12.7 percent while the people that are over 65 will increase by 46.2 percent.

The unemployment rate in Kawerau is just under 11 percent for 2023 (12% percent in 2018) compared to 3.3 percent for all of New Zealand. This means the Kawerau District has approximately 3 times the national rate for unemployment. One of the main contributors to this higher percentage is the cheaper cost of living in Kawerau and the readily availability of amenities.

Council has based its Infrastructure Strategy on these figures, and is confident that the projected population trends will continue to be positive. Economic development interventions, such as industry clustering facilitating industrial development and employment opportunities in the district and residential developments will continue to provide the opportunity for the district's population to grow.

1.2. PURPOSE OF THE STRATEGY

The overall purpose of the Infrastructure Strategy is to help Council and the community make informed decisions about the major infrastructure decisions and investments, which will need to be made over the next 30 years. This Strategy specifically addresses the Roading, Stormwater, Water Supply and Wastewater activities. Other activities that have significant assets and infrastructure such as pools and buildings are outside the scope of this document.

The Strategy outlines:

- The key infrastructure issues which must be addressed over the next 30 years.
- The main options for dealing with those issues.

- The implications of those options for residents and businesses in terms of cost and service delivery.
- Council's preferred scenario for managing these issues

This Strategy was developed in conjunction with Council's Financial Strategy (and Long Term Plan), district growth expectations, engineering analyses, and technical information. This feeds directly into the respective activities' asset management plans.

Infrastructure expenditure contributes to the following Community Outcomes:

Services: Council facilities and services are accessible, age-friendly, effective, efficient and affordable, now and for the future.

Development: Council works in partnership with the community and businesses to attract people to visit, live and do business in Kawerau and to enhance economic and employment opportunities for our community.

Activity: Council facilitates a vibrant community life with opportunities for creative, cultural and recreational activities.

For the Kawerau District Council (Council), infrastructure spending equals approximately 42 percent of operating expenditure and is around 80 percent of total capital expenditure for the next 10 years. Expenditure that both maintains the standard of Kawerau's infrastructure and is affordable now and in the future will provide a platform for economic development, contribute to the quality of life for the Kawerau community and help Kawerau remain an attractive place to live and do business.

Council infrastructure has a total value at 30 June 2024 of $58.7 million and over the next 9 years, $35.0 million (including inflation) will be spent on renewals and improvements to infrastructure. Over the full 30 year infrastructure strategy period, $120.6 million (including inflation) is planned to be spent.

1.3. ASSUMPTIONS AND DRIVERS

Developing and maintaining infrastructure and the associated capital expenditure is driven by the following considerations:

- Levels of Service
- Future growth and development of the District
- Additional infrastructure required and increased complexity of infrastructure.
- Replacement options for aging, damaged and failed infrastructure.
- Replacement schedules of existing infrastructure.

These considerations are evaluated by bearing in mind public consultation, engineering analyses, available technical information and other Council strategies (Financial and Service Delivery).

Based on these considerations, adequate capital investment requirements can be developed and included in the long term plans and year investment strategies.

1.3.1. Levels of Service

Based on community feedback from previous LTP consultation, it is assumed that levels of service will remain the same for stormwater and wastewater. There is no increased or reduced demand for service and there is no provision in this strategy for any increase in the level of service for these activities.

The stormwater system is designed to manage rainfall run-off and mitigate surface water flooding. Stormwater is collected almost exclusively from the roading network and channelled through a network of pipes into natural waterways. It currently consists of approximately 31.5 km of stormwater pipes, together with cesspits, manholes, stormwater outfalls, and other components.

There are currently 2,880 properties connected to the wastewater system and services a population of 7,900. It is estimated that the system currently has capacity for a population of around 10,000, and it is not anticipated that the population will exceed that number for the period of this strategy.

Council maintains and operates a water supply network in a manner that is fit for purpose and does not compromise public safety There are currently 2,910 properties connected to the water supply network and services a population of 7,900. It is estimated that the system currently has capacity for a population in excess of 10,000, but it is not anticipated that the population will exceed that number for the period of this strategy.

For water supply, increases in the levels of service in the previous 10 years were due to central government regulations (chlorination and fluoridation) and were funded externally. Future mandated increases in levels of service are very hard to predict and will most likely be externally funded and are not included in this Infrastructure Strategy. There is an increase in the level of service for water supply in 2026/27, with the construction of a manganese removal plant at a cost of around $1 million.

The reason Council is installing this plant is to remove the manganese from the water which causes discoloration and potentially affects the taste. This plant will provide an additional usable source for water and therefore increase capacity and resilience.

The community is served by a 43 km roading network (excluding SH 34) as well as 73 km of footpaths and 1,074 streetlights, which provides access to all the properties within the community and enables travel in and around the district. Increases in Levels of Services for roading is to increase mobility access (primarily wheelchair and mobility scooter access) and is included in this Infrastructure Strategy. This also includes operational activities such as removing trees that may damage footpaths and removing lips and falls mechanically.

1.3.2. Future Growth and Development

The current Kawerau District population is estimated to be 8,000 residents. The current infrastructure is sufficient for 10,000 residents. It is not expected that the Kawerau district population growth will exceed 2,000 new residents over the 30 year Infrastructure Strategy period.

New subdivision developments localised infrastructure (roading, reticulation, pumpstations etc.) are all installed and funded by the developers. It is therefore not required to include additional domestic use infrastructure.

Council is undertaking a residential development on Stoneham Park, which when completed will establish around a hundred sections. The development will be done over 5 stages at a total cost of $12 million to be completed in 2031. The development includes an estimated cost of $6.0 million in additional infrastructure which, when completed, will be added to Council's assets along with the additional depreciation costs. The breakdown of these costs is not available at this point in time and therefore has not been included in the 2025 – 2034 Long Term Plan.

The reason Council is undertaking this development is to provide additional reasonably priced residential sections for the community. The community has in the past asked Council to provide more affordable housing. Also, recent statistics indicate that Kawerau has one of the highest number of people per residential property. The funding for this development is from subsidy (better off funding) and the sale of sections. The whole development will require approximately 65 section sales to breakeven.

There is interest from heavy and light industry to invest in the district and utilise municipal services and infrastructure. Any industrial or commercial use will require resource and trade waste consents and agreements from Council. The additional burden on the existing infrastructure can therefore be controlled to ensure that the existing infrastructure is sufficient.

Additional infrastructure that may be needed to allow new industries and businesses in the district may then be appropriately planned and funded through developer contributions or external funding when needed.

Therefore, only limited additional infrastructure is included in this Infrastructure Strategy, primarily to support the development of the Putauaki Industrial block (connections to existing reticulation) and connections to the planned Stoneham Park and other small sub-divisions.

1.3.3. Additional and increased complexity of infrastructure

There is currently no additional infrastructure planned for any of the Council activities covered by this Infrastructure Strategy. Additional water supply infrastructure (Fluoridation of the water supply) is funded externally and will be completed before this Strategy period.

Minor improvements and upgrades of the wastewater treatment plant and stormwater outfalls are included in this Strategy.

Additional roading infrastructure will be funded through the New Zealand Transport Agency, and only the Council contributions are included in this Strategy.

1.3.4. Replacement Options

New materials and methods to replace infrastructure are continuously being developed. This Infrastructure Strategy utilises the latest replacement costs to replace aging and failing infrastructure with the latest products and most cost effective installation methods.

It is expected that newer products and methods will be developed, however these products and methods will generally be more cost effective and require less investment. However, at the same time Health & Safety and other regulatory costs are expected to increase. It is not realistic to estimate future cost savings and increases other than inflationary increases.

The financial forecasts for the first ten years of this Strategy have been adjusted for projected inflation rates in the BERL Local Government Cost Index listed in Table 1 below. The financial forecasts for years 11 to 30 have been inflated by year 10 rates.

Table 1: Inflation adjusters

Year ending	Roading	Property	3 Waters	Pipes	Staff	Other
June 2025	3.0%	3.5%	5.9%	3.5%	4.0%	2.9%
June 2026	3.0%	3.0%	5.6%	3.5%	3.5%	2.7%
June 2027	3.0%	2.9%	5.4%	3.5%	3.3%	2.6%
June 2028	3.0%	2.7%	4.9%	3.2%	2.8%	2.6%
June 2029	2.8%	2.4%	4.6%	3.1%	2.6%	2.2%
June 2030	2.7%	2.4%	4.3%	2.9%	2.4%	2.1%
June 2031	2.4%	2.2%	3.3%	2.8%	2.2%	2.1%
June 2032	2.4%	2.2%	3.0%	2.6%	2.1%	2.0%
June 2033	2.4%	2.1%	2.4%	2.5%	2.0%	2.0%
June 2034	2.3%	2.1%	2.3%	2.4%	1.9%	1.9%

1.3.5. Replacement Schedules

The quantity of pipes and valves and other Three Waters infrastructure is recorded in Council's Asset Finda software programme. The data has been taken from as built plans and a high level of verification as to the location of the pipe, diameter, valve and manhole locations has been undertaken. The underlying information about the quantities of the assets is around 95% accurate.

Replacement schedules for reticulation and other Three Waters are based on their installation dates estimated lifetimes.

The roading assets are recorded in the RAMM asset management system. The roading assets are all above ground and are easy to verify.

The condition of the roading assets are evaluated on a regular basis by external contractors and consultants and is well understood. Replacement schedules are based on these condition assessments, New Zealand Transport Agency funding and Council performance indicators and levels of service.

1.3.6. Quality of Data

All roading data is recoded both in Excel spreadsheets as well as in the NZTA mandated RAMM database. A data validation project was undertaken by WSP in 2021 to verify the information contained in the RAMM database. Overall, the data was found to be reliable and therefore management concludes that there is a 99% accuracy of roading asset data.

For stormwater assets all formal asset management financial reporting including valuation is currently held in Excel spreadsheets. This is being migrated into the AssetFinda system. It is estimated by management, following a recent location and verification exercise for cesspits and manholes, that the data for stormwater is 95% accurate.

Similarly, for wastewater assets all formal asset management financial reporting including valuation is currently held in Excel spreadsheets. This is being migrated into the AssetFinda system. Management has concluded that the accuracy of wastewater data is approximately 90% for location, quantity and materials.

For water supply services, management has recently undertaken a significant review of the asset data, which included rezoning the location of the network so as to provide more meaningful data. Overall, it is believed the location, quantity, and materials are 98% accurate, while the diameter of the pipe network is 95% accurate.

1.4. RISK MANAGEMENT

The estimated useful life of each class of Council infrastructure is set out in the Statement of Accounting Policies in the current Long Term Plan.

Overestimating useful lives could lead to earlier than forecasted failure and emergency replacement, which is generally significantly more expensive than planned replacement. This is especially true for critical infrastructure, and hence critical infrastructure is replaced earlier than the expected useful service life.

Underestimating useful life could mean that infrastructure is replaced before it needs to be. This increases the planned capital expenditure and requires higher levels of asset depreciation. Assets that are not critical and have a very low failure consequence are therefore replaced only when there is an observed decline in integrity or if failures are starting to occur.

1.5. INSURANCE

A funding arrangement between central and local government will enable certain infrastructure, such as reticulation systems, to be restored after a natural disaster. The arrangement provides that central government would meet up to 60 percent of the cost and Council the remaining 40 percent. Council has insurance of $30 million to meet its share of the cost in the event of a disaster.

1.6. FUNDING AND AFFORDABILITY

Council funds the depreciation expense for each activity apart from non-strategic assets and a percentage of depreciation from 2023/24 (to recognise the uncertainty around the 3 waters legislation and to reduce the proposed rate increase). Council has funded depreciation since 1998 and is planning to fully fund the depreciation on its strategic assets by 2037/38. These depreciation funds are set aside in reserves and used to pay for renewals. The exception is the replacement of the water pipes which Council is funding from loans ($14.0 million). The Long

Term Plan anticipates that Council will have depreciation reserves of approximately $10.4 million at 30 June 2034 and there will be sufficient reserves during the remaining period of the strategy to fund all the necessary infrastructure renewals.

Council previously made the decision to fund the annual depreciation and set aside the money to pay for future renewals because it believed that it was financially prudent to do so and also ensured that the cost of these assets was spread equitably and affordably over each generation of ratepayers. Similarly borrowing (up to 50 years) will ensure that there is intergenerational equity for the funding of these assets.

The effects of climate change, increasing environmental regulations or the need to improve resilience for earthquakes may require Council to increase its investment in upgrading its infrastructure.

1.7. STRATEGIC ISSUES FOR INFRASTRATURE

1.7.1. Renewal Options and Funding

Kawerau was purpose-built and much of the reticulation infrastructure was constructed over a short period of time. For the previous 70 years, Council's main focus has been on maintenance of these assets. The older infrastructure is nearing the end of their lifetimes and needs to be replaced in the next 30 years. The uniformity in age means that this will occur in large chunks and create expenditure 'spikes'.

Council has adopted a strategy to 'smooth' the renewal of its infrastructure assets. For the stormwater and wastewater infrastructure, Council has divided the reticulation network into six zones based on the estimated average date when each zone was developed. Renewal/replacement expenditure for each zone is averaged over five to ten years. This allows for the spread of renewals and reducing spikes in the renewal schedules. Age is not the only criteria for replacement. Final replacement decisions also include information on the condition, reliability and maintenance of the assets. The cost of these renewals will be funded from reserves.

For the water supply infrastructure, Council has subdivided the network into smaller zones for the purpose of a prioritised replacement programme developed to replace pipes installed prior to 1996, by 2029. The reason for this strategy for water supply is to replace those pipes that have a significant build-up of manganese, which contributes to the discolouration of the water, and also potentially are due for replacement in the next 5 to 15 years. This cost of the water pipe replacement will be funded from loan, as there are insufficient reserves set aside to meet these replacement costs.

Council's overall objective is to maximise the life of the district's infrastructure without compromising service. This reduces the overall cost to the community in the long term.

1.7.2. Legislation Changes

The Local Water Done Well legislation requires councils to review the way water services are delivered to the community. The two options available are:

- Council continues to deliver water services via an in-house business unit
- Water services are delivered via a multi council controlled organisation

Council's preferred option is that water services will be delivered via an in-house business unit and the 2025 – 34 Long Term Plan has been prepared on this basis. This also means the water services assets are retained by Council and are therefore included in this strategy.

There are some minor additional costs to implement this option and also changes to how Council funds these services.

Council has incorporated the costs and the funding changes into the Long Term Plan.

1.8. LINKS TO OTHER STRATEGIC DOCUMENTS

Public infrastructure supports activities that contribute toward the economic, social, cultural and environmental wellbeing of the Community. In addition to the activities' infrastructure discussed in this Strategy, Council owns its public parks, reserves, buildings and facilities. The parts that make up those networks and structures and the tools and equipment used to manage and maintain them, are known as Council's assets.

Every three years Council develops a Long Term Plan which sets out the range and level of services it will provide to meet identified community needs and community outcomes and indicates anticipated expenditure on assets for the next 10 years.

Each year Council adopts an Annual Plan, which contains the budget for council services. Council's ability to deliver services and to do so at a reasonable cost depends on the condition, performance and risk profile of its assets.

In this way, Council's Infrastructure Strategy is closely linked to its Annual Plan and Long Term Plan.

This Infrastructure Strategy was developed in conjunction with the Kawerau District Council Long Term Plan 2025-2034. It will underpin and be integrated into both that document, and the Annual Plans over the next thirty years.

SECTION TWO

2. Roading

2.1. ROADING ASSETS

Roading assets include the road carriageway, street lights, footpaths, kerbs and channels, bridges and culverts as well as street lights and other traffic services. The net value of Council's roading assets at 30 June 2024 is $22.3 million.

The key components of the roading network is listed in Table 2 below:

Table 2: Key Roading asset components

Population served (2023)	7,820
Length of Roads (kms)	43
Length of Kerbs (kms)	77
Structures: 1 bridge, 6 culverts	7
Street Lights	1,064

The allocated life expectancy of the roading and footpath pavement and other structures is 80 - 100 years based on professional knowledge and local conditions. Small areas in the Kawerau District network failed earlier due to high sub-surface water levels. These have been rebuilt with adequate drainage. It is not expected that any other areas in the district will fail earlier than expected.

The allocated life expectancy of the roading seal is 18 - 20 years in normal areas and 13 years in areas where there is geothermal activity. These life expectancies are based on local experience and NZTA recommendations.

The allocated life expectancy of streetlights is 12 years, although this may increase with the replacement of conventional streetlights with LED lights. Streetlight cabling and poles life expectancy is 30 and 60 years respectively.

In general, roading assets in the district lasts longer than other areas due to lower traffic loading. Areas subject to geothermal activity do decrease faster and have a shortened allocated lifetime.

Expenditure on roading renewals is shown in *Figure 1* below. The current levels of renewals matches the funding provided by NZTA. NZTA currently subsidises roading asset renewals by 75%. The strategy anticipates that renewals will increase progressively from 2034 to maintain the assets in the present condition. However, it is unknown whether NZTA will continue to match this increased expenditure and Council will need to determine whether to meet the shortfall or accept a lower level of service.

The most likely scenario is that NZTA will fund the roading assets renewal at the current level of service in the short and medium term (until 2033). When it is clear what levels NZTA will fund after 2033, a decision may need to be made by Council whether to keep the current level of service at additional ratepayers expense, or lower the level of service.

The footpaths are replaced at a rate of 1.2% of the total network per year. The areas that have most deteriorated are replaced, and not necessarily according to their age. This strategy proposes to increase the footpath replacement to 2.1% per year at 2034, as a large proportion of the network will reach 80 years of age by that date.

Alternatively, the rate of footpath expenditure could be increased immediately to 2% of the total network per year. This will however exceed the agreed NZTA footpath replacement and increase rates by approximately 1.5%. This will smooth the increase in roading renewals.

It is however likely that NZTA may increase its funding to match the required asset renewals, and therefore the current strategy is to follow the roading renewals programme as presented in *Figure 1*.

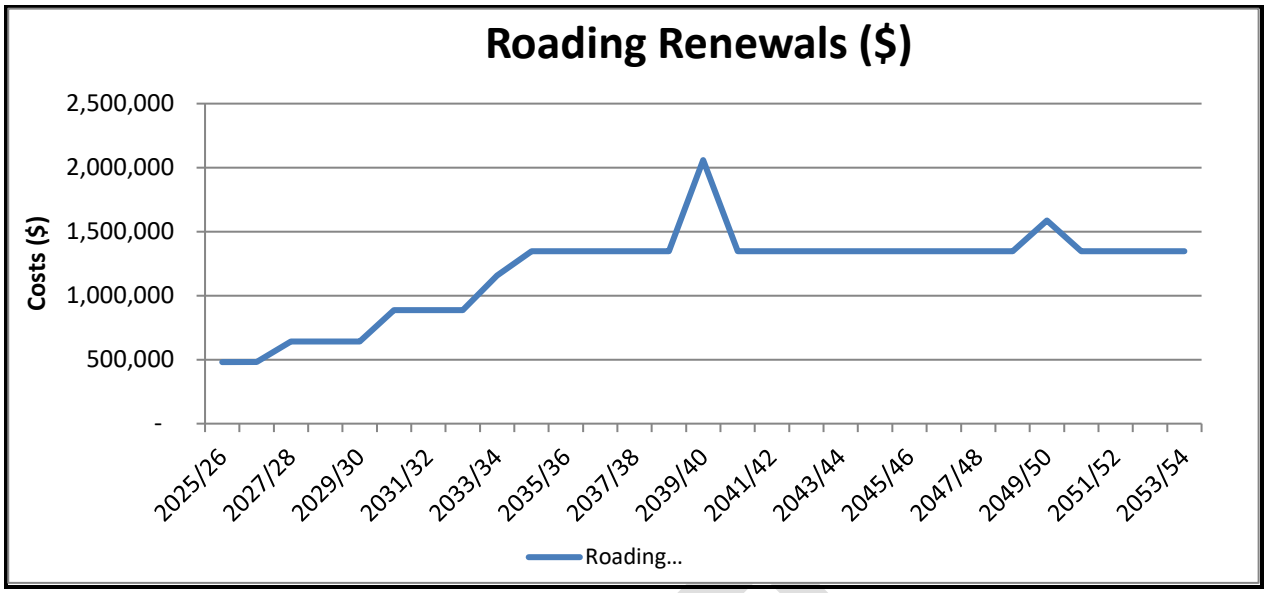


Figure 1: Roading renewals annual expenditure (Stated in todays $)

2.1.1. Improved Technology

The conversion of streetlights to LED luminaries was completed in 2018 and no further improvements are planned.

There are no other improved technologies foreseen in the next 30 years that will significantly affect the cost to replace or frequency of replacement of roading assets.

2.1.2. Environmental Effects

Prolonged high rainfall periods caused high water tables that damaged roading pavements and footpaths. Affected areas have been replaced early with underground infrastructure that will reduce the effect of high water tables.

The roading network has been highly resilient to localised rainfall flooding events.

Other climate change impacts such as sea level rise and increases in droughts and floods are unlikely to have significant impact on the roading infrastructure.

2.1.3. Earthquake Resilience

The roading network suffered no damage in the 1987 Edgecumbe earthquake event, which indicates that the network is at minimal risk from small to moderate earthquakes. Likewise following the earthquake swarms Kawerau experienced in March 2023, there was minimal damage. There is always a possibility however, that another earthquake of a similar or greater magnitude could cause more serious damage. Significant damage to the roading infrastructure is limited to the bridge and culverts in the district.

2.1.4. Increased Use

The existing network has sufficient capacity to accommodate predicted changes in volume without any detectable impact. This strategy does therefore not take into account any moderate to large changes in vehicle traffic volumes.

SECTION THREE

3. Stormwater

3.1. STORMWATER ASSETS

The Stormwater activity involves Council disposing of stormwater from the roading network, repairing or replacing unsound pipes and other stormwater structures, cleaning pipes and cesspits and planning to meet future requirements, and improving operations. Stormwater is collected predominantly from the roading network and channelled through a network of pipes into natural waterways.

Stormwater assets include cesspits, piping and manholes as well as the stormwater. The net value of Council's stormwater assets at 30 June 2024 is $6 million.

The key components of the roading network is listed in Table 3 below:

Table 3: Key Stormwater asset components

Length of piping (kms)	31.5
Number of cesspits	783
Number of outfalls	20
Number of manholes	538

The network is predominantly concrete pipes and manholes with some earthen ware, PVC and PE in the town centre where it is impacted by Geothermal. The more modern smaller diameter pipes are PE.

The allocated life expectancy of stormwater pipes, manholes, cesspits and outfall structures is 70 - 100 years based on professional knowledge and local conditions. In geothermal areas, all concrete pipes have been replaced with more appropriate PVC and PE pipes, or relined where possible.

Areas subject to geothermal activity do decrease faster and a shorter 40 year lifetime is applied.

Expenditure on Stormwater renewals is shown in *Figure 2* below.

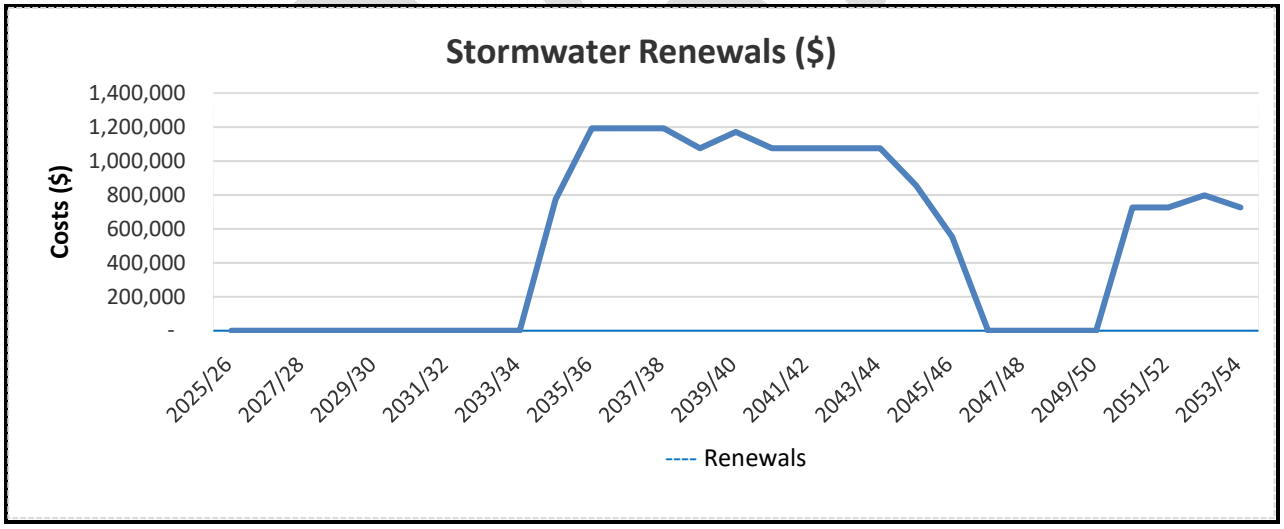


Figure 2: Stormwater renewals annual expenditure (Stated in todays $)

Council plans to replace approximately 18 kilometres of Stormwater pipes over the twelve years (2034 – 2046) and a further 4.9 kilometres from 2050 to 2054.

3.1.1. Improved Technology

Thrusting of smaller pipes is significantly more cost effective than traditional digging and has reduced the replacement costs of smaller stormwater pipes.

Relining of larger pipes is very cost effective and has become the standard way to replace stormwater pipes that have not collapsed.

3.1.2. Environmental Effects

The change in climate has resulted in increased rainfall intensities in recent years.

The ensuing increased water flows have exceeded pipework capacity and runoff from farmland inundated a number of homes in 2017, following an extreme rainfall event (300mm in 8hours).

Following this event a number of flow diversion and retention structures were built to manage water runoff from future heavy rainfall. In addition 2 culverts under River Road were replaced in 2021 to eliminate debris build up on dividing walls and reduce the risk of property being flooded.

Prolonged high rainfall periods caused high water tables that damaged roading pavement and footpaths. Council installed a passive drainage system to remove water damaging the roads that were connected to the stormwater system. Council is also planning further mitigation work to prevent sub-surface water from flowing through private property and further damaging the roading network

Other climate change impacts such as sea level rise and increases in droughts and floods are unlikely to have significant impact on the stormwater infrastructure.

3.1.3. Earthquake Resilience

The stormwater network suffered no damage following the 1987 earthquake event, which indicates that the stormwater network is at minimal risk from small to moderate earthquakes. Likewise following the earthquake swarms Kawerau experienced in March 2023, there was minimal damage. There is always a possibility however, that another earthquake of a similar or greater magnitude could cause more serious damage. Stormwater pipes are being replaced and relined with polyethylene (PE) which is more flexible than traditional concrete and is able to withstand earthquakes.

SECTION FOUR

4. Water Supply

4.1. WATER SUPPLY ASSETS

The Kawerau District water supply network comprises springs, pumps, reservoirs and pipes. It distributes potable (drinkable) water to around 2,745 households, 5 large industrial plants and approximately 160 businesses. The water is principally sourced from a bore field with two springs that may be consented and utilised.

From source the water is treated (UV and Chlorine) and then pumped to three reservoirs, from where it is delivered to consumers by gravity. Large water users have metered supplies. The net value of Council's water supply assets at 30 June 2024 is $16 million. Key components of the system are summarised in Table 4 below:

Table 4: Key Water Supply asset components

Number of properties connected	2,910
Length of piping (kms)	80
Number of pumping stations	2
Number of treatment plants	1
Number of water sources	3

The Water Supply network reticulation consist of Steel, AC and PVC/PE pipes. Up to June 2021, pipes were generally replaced after regular failures occurred. However, Council resolved from 1 July 2021 to replace all the AC and steel pipes over a 6 year period ($2.0 million annually).The network is being replaced with polyethylene pipes (PE) and after 2029, only polyethylene (PE) and PVC pipes will remain.

Council will replace approximately 27 km of water supply pipes over the next 4 years at a cost of $9.4 million. This will mean that no further pipe renewal will need to occur for at least 30 years apart from the gravity and rising mains to the reservoirs and treatment plant.

Also in 2026/27 Council is planning to install a manganese removal plant as this will improve the quality of water and give the activity additional resilience for the future.

Expenditure on Water Supply renewals is shown in *Figure 3* below.

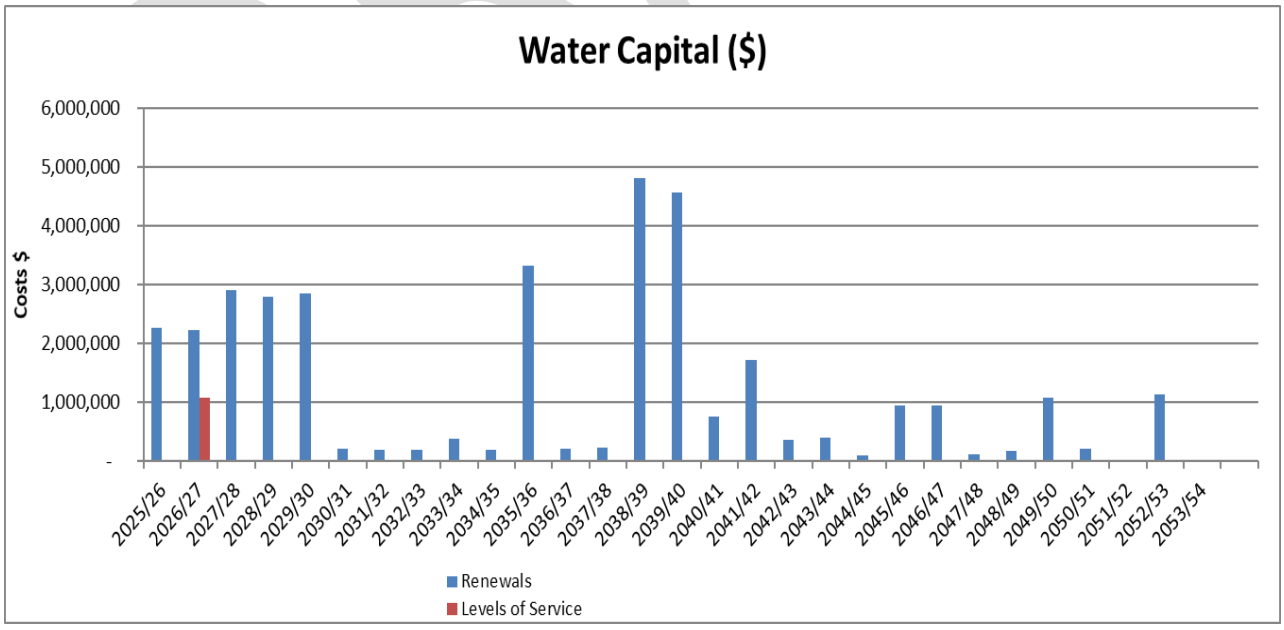


Figure 3: Water Supply renewals annual expenditure (stated in todays $)

Following the 3 years of pipe renewals, the next expenditure spike in 2034/35 is for renewal of the small reservoir on Monika Lanham Reserve followed in the next couple of years by replacement of

trunk and gravity mains. The current main source of water is the Tarawera bores which were fully upgraded in 2021-23. The first of two springs, the Umukaraka Spring is being upgraded in 2029/30.

The Pumphouse spring is currently not used, except when there is water shortages, because of the high levels of manganese in the water, which causes discolouration. Council plans to have a manganese removal plant installed in 2026/27, so this source of water will be available.

The gravity main from the Umukaraka Spring to the treatment plant is made from AC pipe, is 3,200 metres long, and 450 mm in diameter. Installed in 1968, it is showing some signs of deterioration. Umukaraka Spring water has a low pH value (i.e. high acidity level) which is contributing to the deterioration in the gravity main. The gravity main is not under pressure so the pipe is expected to last for 70 years. However, if there are any failures to the Tarawera borefield, this would be the main water supply for the district and therefore the spring head and gravity main pipe are considered critical infrastructure. The main line will be relined with a polyethylene liner in 2037-2039.

The small reservoir on Monika Lanham reserve suffered some damage during the Edgecumbe earthquake and further deteriorated due to low pH water. The reservoir is currently being assessed to confirm the remaining life. The reservoir is planned to be replaced by a larger 4.5 million litre reservoir in 2034/35, however this date may be brought forward depending on the structural evaluation outcome.

4.1.1. Improved Technology

Thrusting of smaller pipes is significantly more cost effective than traditional trenching and laying and has reduced the replacement costs of water supply pipes.

The replacement pipe material (polyethylene) is a significant improvement on the material that currently comprises the network for Three Waters reticulation. This material is expected to last longer and is considerably easier to maintain. It has greater flexibility than previously used materials and is able to withstand the effects of earthquakes.

4.1.2. Environmental Effects

The change in climate has resulted in increased rainfall intensities in recent years. It may also cause increased and prolonged droughts.

Local demand for water is not expected to increase markedly over the life of this strategy. The Bay of Plenty Regional Council will undertake a review of the water allocations when issuing resource consents. Water for human consumption is given high priority compared with other uses (e.g. irrigation or industry) so minimal impact is expected in relation to Kawerau's water supply infrastructure. If the Regional Council was to reduce the maximum amount of water that Council could take, Council would have to start imposing water restrictions in summer.

There would be no additional costs associated with this risk; however, it would result in a reduced level of service for the community.

Other climate change impacts such as sea level rise and increases in droughts and floods are unlikely to have significant impact on the water supply infrastructure.

4.1.3. Earthquake Resilience

The water supply network suffered no damage in the 1987 event, which indicates that the water supply network is at minimal risk from small to moderate earthquakes. Likewise following the earthquake swarms Kawerau experienced in March 2023, there was minimal damage. There is always a possibility that another earthquake of a similar or greater magnitude could cause more serious damage.

Water supply pipes are being replaced or relined with polyethylene, which is more flexible than traditional concrete and AC pipes and is better able to withstand earthquakes.

SECTION FIVE

5. Wastewater

5.1. WASTEWATER ASSETS

The Kawerau District wastewater network comprises of Toby and larger industrial connections with testable and non-testable backflow prevention, small pipes connecting users to the network, and large pipes, manholes, and pumpstations to carry wastewater to the treatment plant. Treated sewage is discharged to ground at the rapid infiltration basins in Spencer Avenue. The screened solid waste is sent to landfill, and the biosolids are processed through worm farming. The service collects wastewater from around 2,715 households, 5 large industrial plants and approximately 160 businesses. Large trade waste clients' wastewater is metered.

The net value of Council's water supply assets at 30 June 2024 is $14.3 million. Key components of the system are summarised in Table 5 below:

Table 5: Key Wastewater asset components

Number of properties connected	2,880
Length of reticulation (kms)	62.6
Number of pumping stations	6
Number of treatment plants	1
Manholes	772
Wastewater treated (avg m^3/d)	2,200

The wastewater network reticulation consists of concrete/earthenware, AC, PVC and PE pipes. Pipes are generally replaced after regular failures occur. However, in geothermal areas, the network has been replaced with polyethylene pipes prior to the anticipated life of these pipes. It is anticipated that the lifetimes of polyethylene pipes in this area will be approximately half of the life in the non-geothermal areas (40 years).

PVC and PE pipes (which have been estimated to have a life of 80 years) will not reach the end of their lifetime during this Infrastructure Strategy but their lives will be evaluated and applied in future strategies.

Council will replace approximately 19 km of pipes over the next 9 years and a further 28.5 km of pipes from 2034 to 2054.

Expenditure on Wastewater renewals is shown in *Figure 4* below.

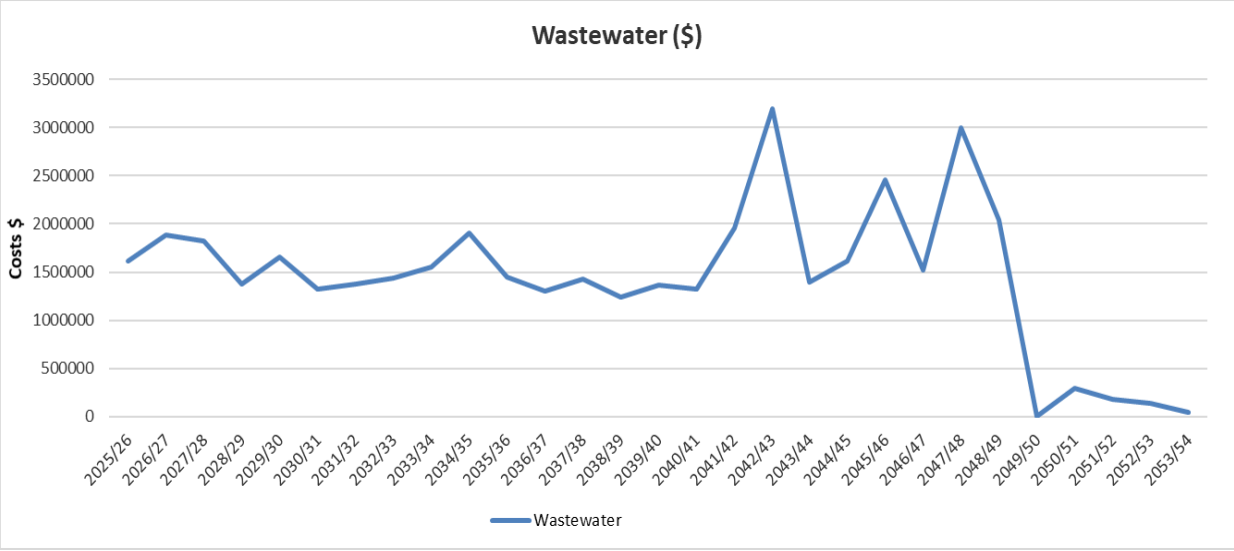


Figure 4: Wastewater renewals annual expenditure (Stated in todays $)

The largest portion of wastewater renewal expenditure over the thirty years is for the replacement of wastewater pipes. The expenditure spike in 2042/43, 2045/46 and 2047/48 is for additional pipe renewals and upgrades to the wastewater treatment plant.

5.1.1. Improved Technology

Thrusting of smaller pipes is significantly more cost effective than traditional trenching and laying and has reduced the replacement costs of wastewater pipes.

The replacement pipe material (polyethylene) is a significant improvement on the older material that currently comprises the network for Three Waters reticulation. Polyethylene is expected to last longer and is considerably easier to maintain. It has greater flexibility than previously used materials and is able to withstand the effects of earthquakes.

5.1.2. Environmental Effects

The change in climate has resulted in increased rainfall intensities in recent years. It may also cause increased and prolonged droughts.

The prolonged high rainfall events between 2022 and 2024 and corresponding high water levels did not affect the treatment plant or the rapid infiltration basins. There were no changes observed in the capacity to dispose of treated waste water or process biosolids. Also no changes in environmental ground water test results were observed.

Other climate change impacts such as sea level rise and increases in droughts and floods are unlikely to have significant impact on the wastewater infrastructure.

5.1.3. Earthquake Resilience

The wastewater network suffered no damage in the 1987 Edgecumbe earthquake event, which indicates that the wastewater network is at minimal risk from small to moderate earthquakes. Likewise following the earthquake swarms Kawerau experienced in March 2023, there was minimal damage. There is always a possibility that another earthquake of a similar or greater magnitude could cause more serious damage. Wastewater pipes are being replaced or relined with polyethylene which is more flexible than traditional concrete/earthenware and AC pipes and is able to better withstand earthquakes.

SECTION SIX

6. Conclusion

6.1. TOTAL REPLACEMENT PROGRAMME

The costs associated with the proposed renewals/upgrades (including inflation) for roading, water supply, wastewater and stormwater are shown in the table below:

Table 6: Cost of Replacement Programme

Renewal	Most likely scenario
Roading:	
Roading renewals 2025 - 54	$53,557,300
Water:	
Water reticulation renewals 2025 - 54	$34,129,100
Wastewater:	
Wastewater renewals 2025 - 54	$42,021,300
Stormwater:	
Stormwater renewals 2025 - 54	$26,036,200
Total	**$155,753,900**

The proposed infrastructure replacement programme for the next 29 years as well as the annual renewal and operational (including inflation) is shown in the following tables:

Table 7 (a): Renewal Programme 2025 – 54

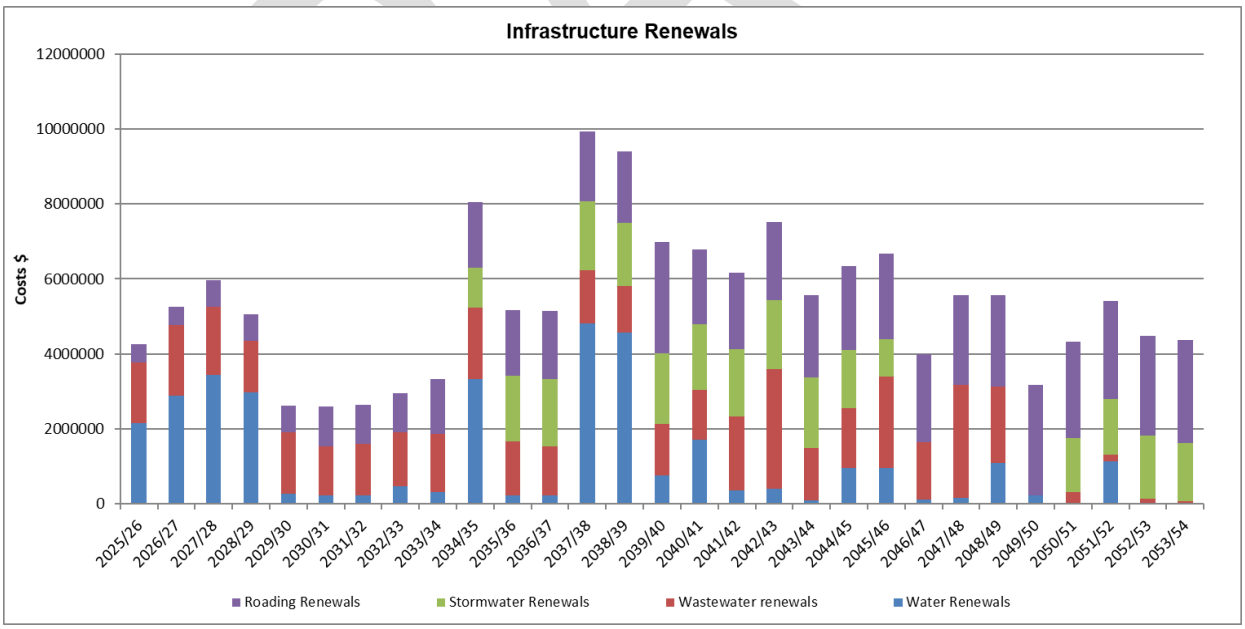
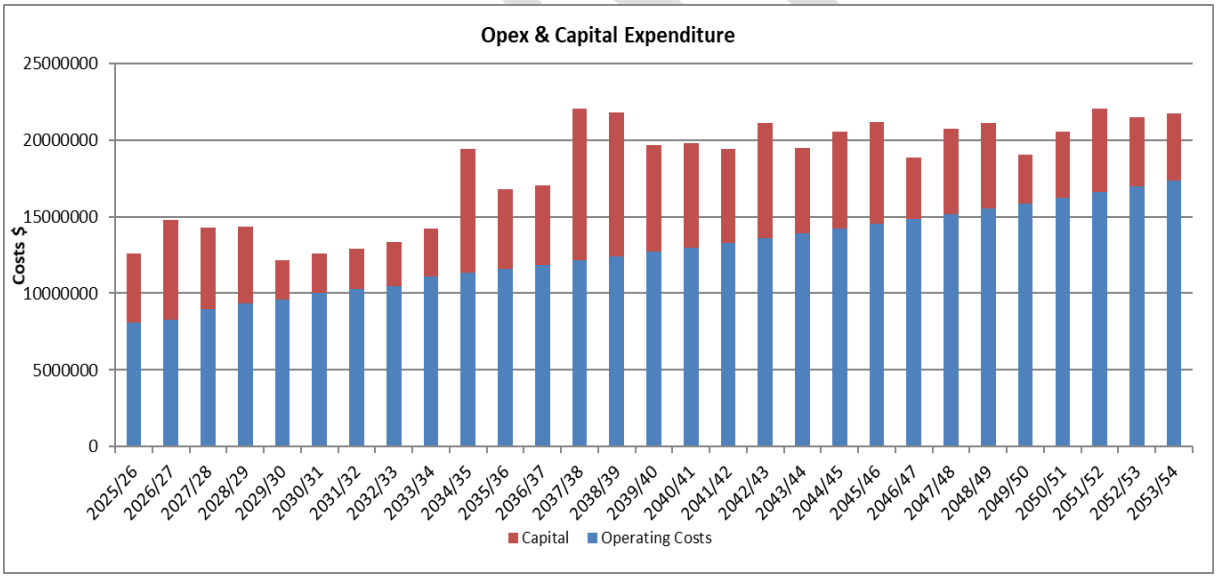


Table 8 (b): Renewal Programme 2025 – 54

Year	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35
Water	2,228,836	2,913,092	2,798,410	2,842,120	211,490	183,110	187,950	386,120	197,170	3,327,598
Wastewater	1,742,400	1,963,070	1,797,540	1,371,260	1,623,290	1,318,670	1,369,010	1,432,700	1,550,740	1,906,702
Stormwater	-	-	-	-	-	-	-	-	-	1,064,192
Roading	543,177	555,026	763,624	774,811	780,522	1,051,213	1,062,616	1,068,223	1,367,310	1,745,895
	4,514,413	**5,431,189**	**5,359,574**	**4,988,191**	**2,615,302**	**2,552,993**	**2,619,576**	**2,887,043**	**3,115,220**	**8,044,387**

Year	2035 - 2040	2040 - 2045	2045 - 2050	2050 - 2054
Water	10,574,955	3,518,166	2,526,961	1,160,712
Wastewater	6,789,718	9,484,422	9,019,037	652,708
Stormwater	8,942,874	8,843,755	985,673	6,199,686
Roading	10,317,702	10,541,716	12,415,095	10,570,355
	36,625,249	**32,388,059**	**24,946,766**	**18,583,461**

Table 9: Annual Operating and Capital Expenditure for Infrastructure 2025 – 54



The following table shows the length of pipe replacement programmed for the Three Waters over the next 30 years.

Table 10: Annual Pipe Replacements for Three Waters 2025 – 54