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ROTORUA
LAKES COUNCIL
Te kaunihera o ngā roto o Rotorua

30 Year Infrastructure Strategy
2021-2051

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Contents

1.0	Executive Summary	1
1.1	Introduction	1
1.2	Assets at a glance.....	1
1.3	Current asset state.....	2
1.4	Significant issues.....	3
1.5	Funding depreciation	4
1.6	Overall investment strategy.....	5
2.0	Introduction.....	7
2.1	Purpose of this strategy	7
2.2	Significant issues.....	8
3.0	Strategic Context	14
3.1	National context	14
3.2	Rotorua context	14
3.3	Strategic infrastructure linkages.....	17
3.4	Emerging infrastructure trends	19
4.0	How We Manage Infrastructure.....	20
4.1	Achievements since 2018	20
4.2	Strategic principles	20
4.3	Levels of service.....	21
4.4	Risk management	24
5.0	Infrastructure Overview.....	27
5.1	Assets at a glance.....	27
5.2	Water supply.....	36
5.3	Wastewater	45
5.4	Stormwater.....	56
5.5	Land transport	65
6.0	Financial Summary.....	74
6.1	Decisions we expect to make.....	74
6.2	Summary of key financial assumptions	74
6.3	Funding depreciation	75
6.4	Financial forecasts	76
6.5	Funding implications.....	79
7.0	Assumptions and Uncertainty	80
7.1	Uncertainty and implications.....	80
7.2	Reliability of information	80
7.3	Key planning assumptions	81

1.0 Executive Summary

1.1 Introduction

Rotorua Lakes Council (RLC) is responsible for the provision of key services that support the daily life of the Rotorua community. Our physical infrastructure needs to be adequate to meet the community demand now and the projected future demand as our city grows. This 30-year Infrastructure Strategy summarises our plan to provide additional infrastructure capacity to support our growth in a measured and fiscally responsible way, while maintaining and renewing the infrastructure we have already.

This Infrastructure Strategy sets out the work we need to do to maintain our core infrastructure in a stable condition to ensure we provide a reliable service to our community. The core physical infrastructure we provide to enable our community to function are land transport (roads and footpaths) and three waters (drinking water, stormwater and wastewater).

The purpose of an Infrastructure Strategy is to identify significant infrastructure issues for a council during the period covered by its strategy, the principal options for managing those issues, and the implications of those options. This strategy includes the core infrastructure assets identified in section 101B (6) of the Local Government Act being:

- Water supply
- Sewerage and the treatment and disposal of sewage (wastewater)
- Stormwater drainage (stormwater)
- Roads and footpaths (land transport).

1.2 Assets at a glance

RLC own and manage \$1.446 billion (replacement value as at June 2020) of infrastructure assets which can be summarised as follows.

Table 1 Asset summary

Activities	Description
Water supply 	Ten defined supply areas including three urban areas Eleven water sources Nine water supply treatment plants Approximately 768km of pipelines 15 water pump stations
Wastewater 	405 km of gravity pipelines and 150km rising mains Services three urban areas of Rotorua (Ngongotahā, city and eastern suburbs) and some rural lakeside communities Two wastewater treatment plants 81 wastewater pump stations
Stormwater 	284km urban reticulated pipelines 153km of open drains Service three urban areas of Rotorua (Ngongotahā, city and eastern suburbs) Reporoa land drainage scheme
Land transport 	1,008 km of roads - 886 km sealed and 122 km unsealed 82 road bridges 26 major culverts 385 km of footpaths 43 km of shared paths, 4.8km of cycle lanes and 1.3km of cycle paths 140 bus shelters

Source: RLC's Revaluation FY20 CPI (as at 25 September 2020)

1.3 Current asset state

The current state of our assets in terms of age has been assessed for the major land transport and three water asset classes (29 in total). This has been assessed as the percentage of design life expended and remaining useful life (median). It was found that most major assets classes are quarter to halfway through their design life. A summary of this analysis is provided in Section 5.1 of this strategy.

Gravity wastewater mains, stormwater mains and street lighting brackets are asset classes identified in poor or at risk categories (based on age analysis only). These asset classes need to be monitored to ensure the future renewal programmes are adequate, as shown in Table 2, based on the age analysis only (as described above).

Table 2 Renewal investment based on current asset state

Activities	Major asset classes	Renewal investment	Renewal action
Water supply 	Backflow, meters, plant	–	Business as usual, continue with normal monitoring and renewals
	Mains	↑	Start planning for renewal investment
Wastewater 	Gravity mains, other	↑↑	Asset at risk, accelerate investigation and increase investment A focus area is to assess the condition of the wastewater gravity mains with an accelerated CCTV survey programme. This will help provide evidence to develop condition-based renewal for this asset class and inform the 2024 Long Term Plan.
	Pressure mains, manholes, plant chambers, grinder pumps	–	Business as usual, continue with normal monitoring and renewals
	Other	↑	Start planning for renewal investment
Stormwater 	Mains	↑↑	Asset at risk, accelerate investigation and increase investment Start planned condition surveys of stormwater pipelines. This will also help us to develop condition-based renewal programme.
	Consents	↑	Start planning for renewal investment
	Channels, other	–	Business as usual, continue with normal monitoring and renewals
Land transport 	Bridges	↑	Start planning for renewal investment Complete the survey of large culverts and replace the assets assessed in very poor condition. This will contribute to strengthening our transport network resilience.
	Footpaths, street lighting (poles and lights), surface water channels, minor structures, retaining walls, islands, signals, traffic facilities, Pavement – surfaces	–	Business as usual, continue with normal monitoring and renewals
	Street lighting – brackets	↑↑	Asset at risk, accelerate investigation and increase investment

Activities	Major asset classes	Renewal investment	Renewal action
	Drainage	↑	Start planning for renewal investment Complete the survey of large culverts and replace the assets assessed in very poor condition. This will contribute to strengthening our transport network resilience.
	Railings	↑	Start planning for renewal investment
	Pavement – basecourse	↑	Start planning for renewal investment

It is intended to complete this analysis with future infrastructure strategies and through the activity / asset management plans. This will ensure we keep our core infrastructure within acceptable industry benchmarks to ensure sustainable future investments.

Asset condition and performance has been assessed at a high level for each activity and is covered in Section 5.1 of this strategy.

1.4 Significant issues

There are significant issues facing our city, which may intensify in future years unless RLC takes active steps to manage and mitigate them. These strategic issues will impact on what infrastructure we deliver, where and how.

In preparing this strategy, we have identified seven strategic issues that need to be at the forefront of infrastructure planning and decision making. Table 3 summarises key strategic issues, implications and Council's response. Section 2.2 of this strategy details the actions we will take to respond to the key strategic issues at district level as these are common to all activities.

Table 3 Significant issues affecting our infrastructure

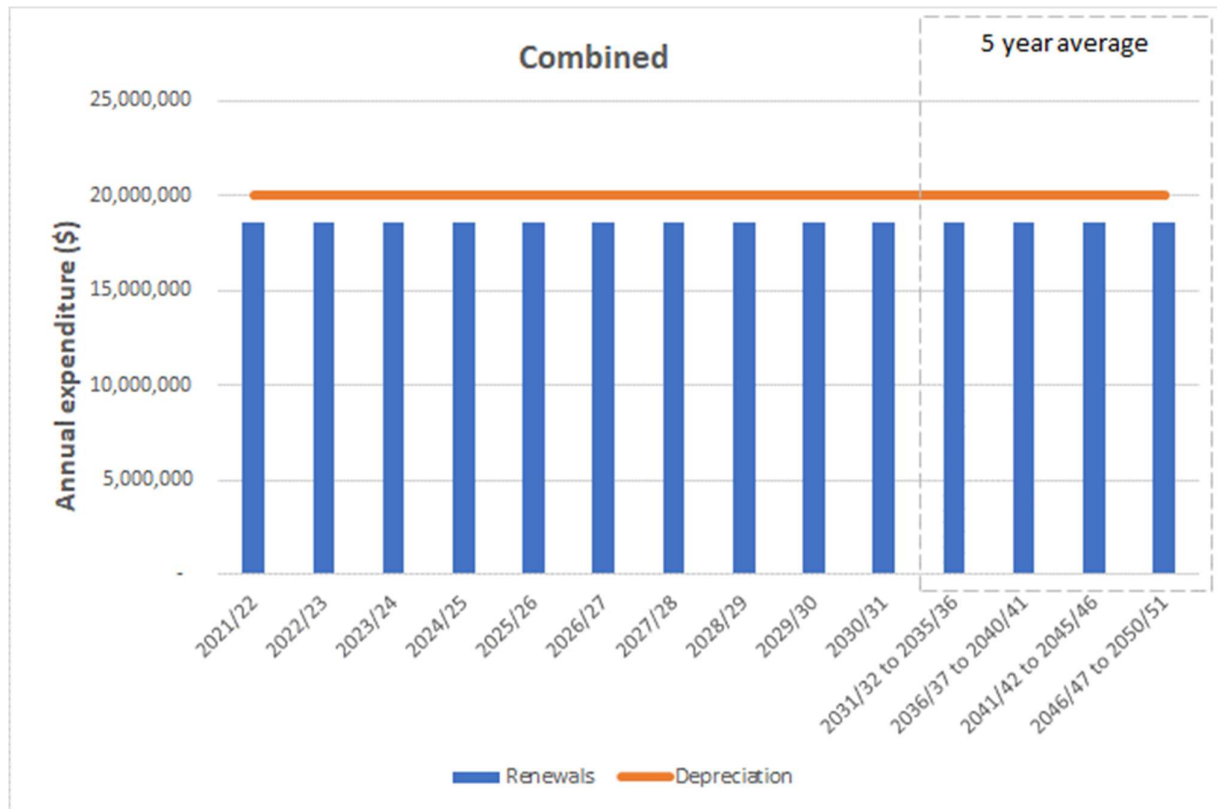
Strategic issue	Implications	Council's response
1. Maintaining assets in a stable, reliable, and safe condition	- We know that we need to continue to invest in our core infrastructure. We need to keep ahead so there is not an unsustainable deficit that is unaffordable for our current and future ratepayers. - Investment is also required to ensure that our assets meet the levels of service to our communities, meets legislative requirements, and resilient to any disruption.	- Implement risk based critical asset renewal - Critical asset condition assessment as a priority - Systematic proactive maintenance
2. Meeting future demands on infrastructure	- It is difficult to predict the timing for growth enabling infrastructure undertaken by RLC, particularly in the new world with the global pandemic. Under one scenario, the economy slows with significant job losses in the district. Under a different scenario, more land needs to be developed to meet the strong housing demand. - Housing is one of the biggest issues the Rotorua community faces. Identified issues include a shortfall of 1,500 to 1,750 homes (as at the end 2019), homeless, and increasing waiting list for social housing. - As a result, Te Arawa and RLC have identified safe, secure housing for all our people as our top shared priority to ensure positive, thriving communities. This is a council priority for the 2021 Long Term Plan.	- Implement Master Plans for optimal capital investment to meet demand in sequence of proposed developments - Te Arawa and RLC developed the He Papakāinga, He Hāpori Taurikura Homes and Thriving Communities Strategic Framework (2020). RLC's infrastructure asset groups including three waters and land transport need to be aligned to the strategic framework for future demand planning.

Strategic issue	Implications	Council's response
3. Managing the impacts of legislative and policy change	There are significant changes to legislation that are either planned or underway that will impact the delivery of core infrastructure including water reforms, Freshwater management, Zero Carbon, Road to Zero Strategy, and new Government Policy Statement on Land Transport.	- Awareness and compliance with Standard Operating Procedures - Reflect changes in financial planning - Participate and influence freshwater management and three waters reforms
4. Embedding cultural values into the way we manage our infrastructure	- It can take considerable time and cost to ensure our capital projects are culturally appropriate and supported by our community. In some cases, we need to explore alternative options and stage appropriate solutions overtime. - Increasingly, legislation is requiring that iwi have a greater role in the governance or decision making for key assets such as water.	- Apply relationship protocols - Meet cultural elements and performance in designs - Reinforce partnership with iwi
5. Climate change and environmental sustainability	- We are preparing for the impacts of climate change on the infrastructure assets as we are already experiencing impacts such as prolonged droughts and higher temperatures. Increased frequency and intensity of high rainfall events, which creates flooding risks and a health risk for our potable / drinking water. - It is expected that this will impact the core infrastructure particularly: - Quantity and quality of water available from water supply sources - Flood management and hazard risk to infrastructure - Road slips isolating communities such as Tarawera.	- Design infrastructure for climate change demands - Ongoing emission reductions - Identify and apply mitigation responses - Adaptation of existing systems to climate demands
6. Resilience of critical infrastructure	- A key focus is strengthening the infrastructural resilience of our core assets. - Infrastructure resilience is tested in Rotorua as it is exposed to a variety of natural hazards including earthquake, landslides, flooding, volcanic eruption and storms. These natural disasters can cause considerable damage to infrastructure assets and affect delivery of service.	- Prioritise interventions based on risk - Develop redundancy for critical parts of infrastructure
7. Maintaining institutional knowledge and capability (i.e. people resilience).	- Many of RLC's senior engineers are nearing the end of their careers. This reflects a national issue of limited capability and capacity in the industry. - It is recognised that there is a need for technical staff to be developed and have real opportunities to be retained within the industry long term.	Optimise the balance of residual and contracted capability to ensure Council has an integrated capacity to address emerging demand

1.5 Funding depreciation

Figure 1 shows the annual renewals of \$18.5 million versus annual depreciation of \$20 million for the combined core assets. This shows that the forecast renewal expenditure for all activities is maintained to broadly match depreciation over the 30 year period. The gap is mainly due to wastewater renewals being less than annual depreciation at this point in time. We expect that this gap will reduce as we collect better data on the state of our wastewater assets and develop condition-based renewal programmes.

Figure 1 Combined renewals and depreciation (uninflated) 2021-2051



1.6 Overall investment strategy

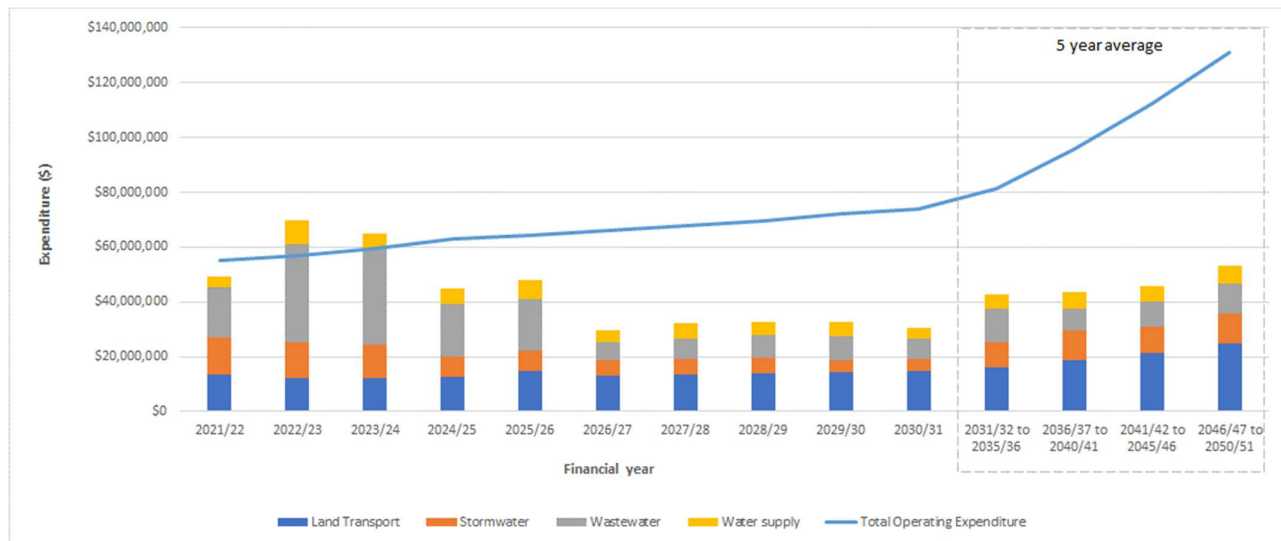
Table 4 shows the total expected capital and operational expenditure for each infrastructure activity over the 30 year period 2021 to 2051.

Table 4 Expected total operating and capital expenditure (inflated)

Activity	Capital Expenditure			Operational Expenditure
	Renewals	Growth	Levels of Service	Operating
Water Supply	\$139,074,187	\$16,988,859	\$17,037,683	\$524,161,156
Waste Water	\$232,550,281	\$63,252,518	\$71,547,092	\$955,864,331
Stormwater	\$136,794,283	\$122,808,855	\$22,799,047	\$290,406,717
Land Transport	\$327,646,278	\$24,573,623	\$185,428,097	\$978,517,503
Sub Total	\$836,065,029	\$227,623,854	\$296,811,920	\$2,748,949,708
Total	\$4,109,450,511			

Figure 2 shows the most likely scenario for total operating and capital expenditure for combined assets.

Figure 2 Combined infrastructure operational and capital forecast (inflated) 2021-2051



Over the next 30 years it is expected that:

- planned expenditure on renewals across all infrastructure activities is generally constant
- capital expenditure on levels of service improvements is focused on strengthening infrastructure resilience for core infrastructure
- the Rotorua Wastewater Treatment Plant Upgrade in the first ten years takes a large portion of the capital expenditure programme (growth and levels of service)
- capital expenditure for installing bulk infrastructure to service future growth areas and infill areas, and to support the Homes and Thriving Communities Strategic Framework
- resealing about 7% of our roads each year for the next 30 years to ensure assets renewed sustainably.

2.0 Introduction

Rotorua Lakes Council (RLC) is responsible for the provision of key services that support the daily life of the Rotorua community. Our physical infrastructure needs to be adequate to meet community demand now and the projected demand as our city grows. This 30-year Infrastructure Strategy summarises our plan to provide additional infrastructure capacity to support growth in a measured and fiscally responsible way, while maintaining and renewing the infrastructure we already have.

This Infrastructure Strategy sets out the work we need to do to maintain our core infrastructure in a stable condition to ensure we provide a reliable service to our community. The core physical infrastructure we provide to enable our community to function are land transport (roads and footpaths) and three waters (drinking water, stormwater and wastewater).

Our infrastructure must be safe, reliable and in a stable condition to meet future demand and our levels of service. We want no shocks or surprises, so we aim to understand what we have and ensure that it is fit for purpose. To do this we need to understand and plan for how infrastructure will need to change to remain fit for purpose. Change can be required to meet new technologies, environmental considerations (such as carbon neutrality), changing community expectations and patterns of use.

We need to consider how our population is changing and what impact this may have on demand for our core infrastructure. We need to be able to answer the questions: Where do we need to provide new capacity? Where and how might we redevelop redundant capacity or transform our infrastructure?

We also need to consider how the national, regional and local economies are changing with the impact of the global pandemic. As a nation we have learnt from the global financial crisis that it is not wise to cut spending in core infrastructure. The 2021 Infrastructure Strategy outlines the investment programmes to ensure we are meeting our legislative obligations as well as maintaining service levels to our communities. This investment will also stimulate our local economy as part of Council's Rotorua Economic Recovery Plan: Build Back Better. We have learnt through the various national lockdowns how important essential services are for the community and our core infrastructure must be reliable 24/7.

The 2021 Infrastructure Strategy is broadly aligned with the intent of the 2018 strategy, and we aim to clearly present information gaps for our core assets and the steps to gather this evidence in the short to medium term. We wish to understand the state of our assets better to inform our works programmes.

2.1 Purpose of this strategy

The Infrastructure Strategy aims to ensure that our infrastructure services are provided to an appropriate standard. This strategy will identify the significant capital decisions that we need to make over the next thirty years to deliver safe, reliable, and stable infrastructure that keeps pace with demand and the changing face of our city.

The strategy is a component of the Long Term Plan. It identifies what we are going to do to provide our services, manage our infrastructure, continue to grow our city sustainably, care for our environment, and overcome our issues and challenges. It aligns with our Financial Strategy, in which we determine what we can afford to do, when we can afford to do it and how we will fund it.

Through our Long Term Plan and subsequent annual plans, we will consult with our community about our infrastructure plans, balancing risks and financial trade-offs to allocate funds to maintain, renew and improve our core infrastructure to meet the agreed levels of service.

This strategy has been prepared in accordance with the requirements of section 101B of the Local Government Act 2002. This strategy includes the core infrastructure assets identified in section 101B (6) of the Local Government Act being:

- Water supply
- Sewerage and the treatment and disposal of sewage (wastewater)
- Stormwater drainage (stormwater)
- Roads and footpaths (land transport).

The purpose of an infrastructure strategy is to identify significant infrastructure issues for a council during the period covered by its strategy, the principal options for managing those issues and the implications of those options. This strategy also outlines the most likely scenario for the management of a council's infrastructure assets during its 30-year period, the estimated costs of managing those assets, the nature and timing of expected significant capital expenditure decisions and the assumptions on which the scenarios are based.

2.2 Significant issues

There are significant issues facing our city, which may intensify in future years unless RLC takes active steps to manage and mitigate them. These issues will have a flow on impact on what infrastructure we deliver, where and how.

RLC operates in a financially constrained environment which requires regular trade-offs to be made between competing priorities. We struggle to achieve our priorities within our means, needing to fund deferred maintenance and renewals of our infrastructure assets, and fund our ambitious economic growth plans as these are pivotal in driving future employment and prosperity for our community. Strategic issues have been identified that make it hard to balance our infrastructure services while meeting our strategic priorities and regulatory requirements.

Given the nature of our community, we need to keep rates affordable. Many in our community are already under financial pressure, which is likely to be exacerbated by the predicted economic downturn and rise in unemployment in the aftermath of the Covid-19 pandemic. We must find other ways to generate revenue, and partners committed to investing in the development of our city. Central government is already taking a lead on funding our transformational projects, such as the Kāinga Ora housing development.

In preparing this strategy, we have identified seven strategic district infrastructure issues that need to be at the forefront of infrastructure planning and decision making.

- Maintaining assets in stable, reliable and safe condition
- Meeting future demands on infrastructure
- Impacts of legislative and policy changes
- Embedding cultural values
- Climate change and environmental sustainability
- Resilience of critical infrastructure
- Maintaining institutional knowledge and capability (i.e. people resilience)

Table 5 details the implications and the actions we will take to respond to the key strategic issues at district level as these are common to all activities. The significant issues for each activity are covered in Section 5.

Table 5 Significant district issues affecting our infrastructure

Significant district issues	Discussion and implications	Council's response
Ongoing effort to maintain assets in stable, reliable and safe condition	We know that we need to continue to invest in our core infrastructure. We need to keep ahead so there is not an unsustainable deficit that is unaffordable for our current and future ratepayers. Investment is also required to ensure that our assets meet the levels of service to our communities, meets legislative requirements, and resilient to any disruption.	Land transport: We monitor the age and condition of our transport assets through inspections and analysis in our RAMM database. We also monitor and report on our customer and technical service levels for the infrastructure assets (this applies to three waters as well). We report to our funding partner Waka Kotahi New Zealand Transport Agency (Waka Kotahi) on various performance measures and we are compared with other similar sized councils. Three waters: We are moving towards proactive and risk-based waters renewal strategy as good industry practice, rather than using asset age. To enable this, we will be gathering evidence in the next three to ten years to inform our renewal programmes with a focus on water supply and wastewater assets. Capacity drives our stormwater upgrades more than the current asset state. We are surveying our critical below ground wastewater assets in the short to medium term (about 20% of our pipelines). The assessment programmes are being accelerated through our long-term contractor.
Meeting future demands on infrastructure	Rotorua is continuing to grow, with substantial greenfields development predicted, along with intensification of existing residential areas. While much of our infrastructure has capacity to provide for some of this growth-related demand, our service provision is not consistent. Factors such as more extreme storm events (climate change) are already placing pressure on our infrastructure in some locations. It is difficult to predict the timing for growth enabling infrastructure undertaken by RLC, particularly in the new world with the global pandemic. Under one scenario, the economy slows with significant job losses in the district. Under a different scenario, more land needs to be developed to meet the strong housing demand. Housing is one of the biggest issues the Rotorua community faces. Identified issues include a shortfall of 1,500 to 1,750 homes (as at end 2019), homeless, and increasing waiting list for social housing.	All activities: Develop and periodically update the district's growth model. Optimise the infrastructure capital programmes to ensure investment provides for current and future demand. Run different scenarios in the growth model so infrastructure planning is agile and aligned with the national and regional economies and other factors. In 2019, RLC and the Ministry of Housing and Urban Development worked together to understand the housing challenges in the Rotorua District. This informed the development of Te Arawa and RLC's He Papakāinga, He Hāpori Taurikura Homes and Thriving Communities Strategic Framework (2020). The strategy describes the challenges the district faces and the strategies that will be used to ensure everyone can enjoy a good quality of life, now and into the future. This strategy belongs to the communities of the Rotorua district, and is overseen by the critical partnership between Te Arawa, the wider community and RLC. RLC's infrastructure asset groups including three waters and land transport need to be aligned to this strategic framework for future demand planning. Land transport: There is an ongoing annual traffic counting programme to understand current vehicle demand. The travel time reliability is being established across five routes. Once the benchmarks for travel time are established, RLC will monitor these to understand the effectiveness of various programmes.

Significant district issues	Discussion and implications	Council's response
	As a result, Te Arawa and RLC have identified safe, secure housing for all our people as our top shared priority to ensure positive, thriving communities. This is a Council priority for the 2021 LTP.	Three waters: Use the master plans to identify and plan for the infrastructure and investment required in the growth areas of the city. The capital investment for bulk infrastructure is included in RLC's Long Term Plan process. We have developed master plans for the identified growth areas of the city to plan for where new three waters infrastructure will be required.
Legislative and policy changes	There are significant changes to legislation that are either planned or underway that will impact the delivery of core infrastructure: Water reforms – The pending water reforms will impact the way we deliver three waters to our communities and the cost of providing these services. The Government's latest Three Waters Reform Programme is strongly encouraging Councils to aggregate at regional / sub regional level to be considered for the funding package. Regional approaches will be favoured for the funding with conditions attached.	Three waters: We will maintain a watching brief on the Government's Three Waters Reform Programme and evaluate other options as information becomes available. We have entered a long-term wastewater contract that could be expanded to cover water supply at a later stage.
	Freshwater Management - The Action for Healthy Waterways package sets higher standards around the cleanliness of swimming spots, includes a new bottom line for nitrogen toxicity, sets controls for farming practices like winter grazing and how much synthetic fertiliser is used, and requires mandatory and enforceable farm environment plans. There are new requirements with the National Policy Statement for Freshwater Management 2020 including giving effect to Te Mana o to Wai, improving degraded water bodies, and maintaining or improving all others using bottom lines, and an expanded national objectives framework.	Three waters: Rotorua Te Arawa Lakes Strategy has been developed with partner organisations Te Arawa Lakes Trust and Bay of Plenty Regional Council for a holistic and integrated management approach, and as the platform for co-management
	Zero Carbon - The Climate Change Response (Zero Carbon) Amendment Act includes a target of reducing emissions of biogenic methane within the range of 24 to 47% below 2017 levels by 2050, and an interim target of 10% by 2030. It also has a target of reducing net emissions of all other greenhouse gases to zero by 2050.	All activities: The Zero Carbon Act will impact Council's asset portfolios including three waters and land transport. The Act does not explicitly exclude any activities such as methane produced at wastewater treatment plants. We have developed a Climate Change Action Plan on a pathway through Global Covenant of Mayors for Climate and Energy (refer to below).

Significant district issues	Discussion and implications	Council's response
	Road to Zero - The Government has recently released its proposal for the new road safety strategy, Road to Zero. The proposed Vision Zero is based on a world leading approach that says no death or serious injury while traveling on our roads is acceptable.	Land transport: Road safety is an ongoing focus with mandatory reporting. We consider safety elements with all our programmes for managing the land transport activity from road marking, capital improvements at intersections to community education programmes. We will continue to implement our multi-faceted programmes to address safety issues. We will start to implement the Road to Zero Strategy to assess and prioritise safety risks across the network in a holistic manner.
	Government Policy Statement - The Government Policy Statement on Land Transport (2021) (final September 2020) signals Government's shift to investing in improving people's wellbeing and the liveability of places with a separate inclusive access. This recognises the importance of society. Modal shift and Urban form are major issues to address.	Land transport: The Rotorua Modeshift Plan is being developed in collaboration between Waka Kotahi, Bay of Plenty Regional Council and Rotorua Lakes Council. It is a strategy to deliver on multi-modal approach.
Embedding cultural values into the way we manage our infrastructure	It can take considerable time and cost to ensure our capital projects are culturally appropriate and supported by our community. In some cases, we need to explore alternative options and stage appropriate solutions overtime. Increasingly, legislation is requiring that iwi have a greater role in the governance or decision making for key assets such as water. Some councils are responding by establishing co-governance models for water, iwi advisory boards and formalising processes for input from iwi.	All activities: We have adopted this approach with finding an acceptable solution for the Rotorua Wastewater Treatment Plant. The three parties (RLC, Te Arawa Lakes Trust and CNI Iwi Holdings) have Kawenata (a partnership agreement) to find the right outcome for mana whenua and the wider Rotorua community. The kawenata has been guided by Te Tūāpapa o ngā Wai o Te Arawa (Te Arawa Cultural Values Framework) and under the agreement, the parties will work to develop a long-term solution. Agreement of stakeholders is sought before new infrastructure projects commence to ensure cultural requirements are embedded in the design solution and have been included in the capital project costings.
Climate change and environmental sustainability	We are preparing for the impacts of climate change on the infrastructure assets as we are already experiencing impacts such as prolonged droughts and higher temperatures. Increased frequency and intensity of high rainfall events, which creates flooding risks and a health risk for our potable / drinking water. It is expected that this will impact the core infrastructure particularly: - Quantity and quality of water available from water supply sources - Flood management and hazard risk to infrastructure	All activities: The Sustainable Living Strategy is part of our Rotorua 2030 Goal of commitment to environmental leadership. It includes an objective on approaching post-carbon economy through greater energy efficiency and reduction in greenhouse gas emissions. Current initiatives include: - Designing stormwater systems for increased rainfall modelling - Promoting cycling and walking and developing facilities to support active transport - Upgrading wastewater treatment plant, including increasing holding capacity to better manage inflows during storm events. As part of our Climate Change Action Plan, we have taken the following approaches as a response to climate change.

Significant district issues	Discussion and implications	Council's response
	– Road slips isolating communities such as Tarawera. BOP Regional Council Climate Change Action Plan 2019 proposes the setting of greenhouse gas emissions targets for the region. This will include a focus on: – Promoting and supporting a shift to more sustainable transport modes – Improving the efficiency of buildings and infrastructure in the region – Supporting the use of renewable energy.	– Emissions reduction - Adopting an emissions reduction target that aligns with the New Zealand national target – Mitigation - Identified five priority themes to shape our actions for the next ten years. This includes Transportation and urban form and Leadership, advocacy and economic opportunity themes. – Adaptation – Identified key areas where we need to reduce our vulnerability to the impacts of climate change. Refer to Section 4.4 - Risk Management on specific proposed climate change actions.
Resilience of critical infrastructure	Infrastructure resilience is tested in Rotorua as it is exposed to a variety of natural hazards including earthquake, landslides, flooding, volcanic eruption and storms. These natural disasters can cause considerable damage to infrastructure assets and affect delivery of service. Ultimately the effect of the Rotorua Geothermal Field on underground assets is that gas and heat speed up material decomposition whilst metal above ground assets are affected by the corrosive gases. As a result, asset lives are reduced by as much as 50%. Parts of the transport network are susceptible to weather related events. However, most of the network has alternative routes except for Tarawera community. It is important to respond to incidents such as closed roads due to road slips or under slips, as well as keeping the road drains fully maintained.	All activities: Renewals planning – Our critical assets are the priority for our renewal programmes. Non-critical assets are managed on reactive repairs / replacement. We renew our assets with a risk based approach as follows: – Public safety renewals are implemented with shortened timeframes using the best information available – Renew assets classified as critical before the end of their effective life – Run to failure non-critical assets and replace reactively. Refer to Section 5 on our strategic approach for each activity. Land transport: Operational response - We will continue with our operational response including closed roads due to road slips or under slips. We will continue with road drainage maintenance including hotspots in urban areas that are prone to blockages and cause flooding. Alternative routes – We will continue to accommodate emergency diversions from State Highway routes in collaboration with NZTA. We will invest in risk mitigation on vulnerable sections of the transport network. Lakeside communities - We will continue to utilise emergency planning for potentially isolated communities. We will explore capital investment options to strengthen resilience for the isolated lakeside communities where practical and affordable. Capacity of bridges - We will continue to aim for network that meets mass limit rules. Our focus will be to further investigate and strengthen the identified bridges where practical to cope with new mass limit rules. Three waters: Operational response – Standby generators are located at large pump stations and treatment plants. Infrastructure planning - Critical three water assets have been identified at a high level. Three Waters Infrastructure Resilience Study completed. Low pressure systems are used for new wastewater pipelines located in lakeside communities and hilly terrains.

Significant district issues	Discussion and implications	Council's response
Maintaining institutional knowledge and capability (i.e. people resilience)	Many of RLC's senior engineers are nearing the end of their careers. This reflects a national issue of limited capability and capacity in the industry. It is recognised that there is a need for technical staff to be developed and have real opportunities to be retained within the industry long term. This is exacerbated with the global pandemic crisis in 2020 resulting in stopping any new hires as well as increasing compliance requirements.	All activities: Develop a workforce capability plan for core infrastructure including creating a pipeline of qualified staff with clear career pathways and suitable training opportunities including apprenticeships. Adapting and strengthening our people is important for resilience as well as our hard infrastructure.

3.0 Strategic Context

3.1 National context

New directions and expectations are being set by central government which include the reinstatement of the four well-beings in the *Local Government (Community Well-being) Amendment Act 2019* and the re-introduction of Treasury's Living Standards Framework.

Local authorities are now required to play a broad role in promoting the social, economic, environmental, and cultural well-being of their communities, taking a sustainable development approach.

Water reforms are a key focus for central government. The Taumata Arowai Water Services Regulator Act has been passed and the complementary Water Services Bill is expected to be passed later in 2020. This is likely to include significantly strengthened compliance, monitoring and enforcement. Reforms may require significant change for three waters, including major investment in new infrastructure, systems, and processes to meet new standards.

Increasingly, legislative reform is moving to enhance the statutory requirements for Māori involvement in the management of key taonga or assets. Water holds a central role in Māori sense of identity and well-being, which has been recognised in the Water Services Regulator Act with the establishment of a Māori advisory board for the water regulator and increased engagement requirements by local government with their local iwi.

Changing expectations of local government place further pressure on already constrained budgets. Many councils, like RLC, are facing issues maintaining their current service levels, renewing aging assets, and future proofing for growth, while managing the impact on rates and debt levels.

While the medium and longer-term impacts of Covid-19 on the New Zealand and Rotorua's economy have not yet been realised, these may include increased unemployment, the need for increased rates remissions, and a decline in retail and tourism related income. The effects of the pandemic may significantly impact RLC's projected financial position.

3.2 Rotorua context

3.2.1 Mana whenua

Rotorua was established over one hundred years ago, with the signing of the Fenton agreement between the Crown and Ngāti Whakaue on 25 November 1880.

According to oral history, many of Rotorua's Māori residents trace their ancestry to Tamatekapua, the captain of the Arawa canoe that is believed to have arrived in New Zealand six centuries ago. Kahumatamomoe, a Te Arawa ancestor, is then said to have journeyed inland where he discovered Lake Rotorua and settled at what is now Kawaha Point.

Today, Rotorua continues to have a strong Te Arawa culture and manaakitanga (hospitality) which underpins the experience sought by many tourists to the district. We are considered a centre for Māori culture and expression.

The partnership with mana whenua is embedded in the way RLC works. A partnership agreement with Te Tatau o Te Arawa, who represents the collective interests of Te Arawa, captures our shared vision and goals and our intention to build an enduring partnership that is beneficial to the Rotorua community.

Major infrastructure projects require significant input from mana whenua to ensure cultural considerations are understood and provided for, alongside other factors. Our aim is to collectively agree what and how our new infrastructure is constructed to ensure our growth is sustainable and we protect the values and taonga that make our district special.

3.2.2 Our district

Within New Zealand, Rotorua's volcanic landscape of lakes, calderas and geothermal features is unique. The compact size of the city, the geothermal features and the ready access to parkland, lakes, forests and rural landscapes, are attractive for residents and visitors alike. The total size of the Rotorua district is 261,906 hectares. This consists of 41% forest, 43% agriculture and 8% lakes. The region includes 18 lakes, three major rivers and seven geothermal fields.

Climate change will impact the Rotorua district. We need to plan for the impact of an increased number of storm events on our core infrastructure and the impact of increased temperatures on the quality and availability of our drinking water supply and on the levels of our lakes and rivers.

3.2.3 Natural hazards

The two major natural hazards that impacts Rotorua district are geothermal and flooding.

The Rotorua Geothermal System is one of twelve systems in the Bay of Plenty Region and is a by-product of volcanic activity in the Taupō Volcanic Zone. The Taupo Volcanic Zone is a geothermal field extending from White Island off the Bay of Plenty Coast to Mt Ruapehu far to the south.

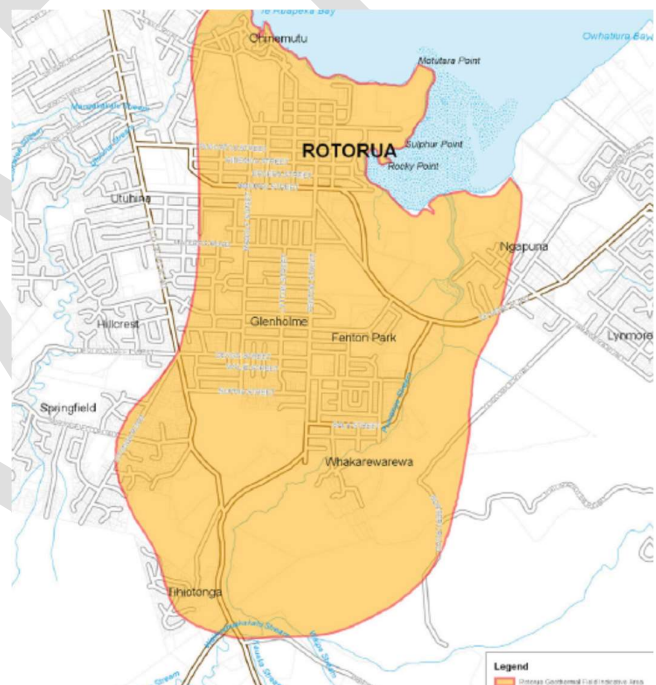
The Rotorua Geothermal System underlies part of Rotorua City, from the southwestern end of Lake Rotorua to the Whakarewarewa Valley, as shown in Figure 3. Geothermal hazards include high temperature fluids and steam, gas, ground collapse and hydrothermal eruptions. About 20% of our underground assets are affected as the gas and heat speed up material decomposition. Above ground assets of metallic material are affected by the corrosive gases.

The urban stormwater systems were designed to cater for the initial development and engineering standards at that time. As the development area expands, the existing stormwater system requires increased capacity. Flooding sometimes occurs where growth planning has occurred in ad hoc manner and infrastructure has not been upgraded.

3.2.4 Our economy

A strong tourism sector has been a key element in our district's economic success. While Rotorua has a diverse economy including forestry and wood processing, agribusiness, research and manufacturing, tourism is its largest employer. In 2019, international overnight visitors made up 35% of visitors to Rotorua while domestic visitors were 65% of our overnight visitors.

Figure 3 Indicative boundary of Rotorua Geothermal System



Source: Bay of Plenty Regional Council, *The Science Story* (July 2019)

The impact of the Covid-19 pandemic on our economy is not yet fully understood and is evolving rapidly. In the short term, Covid-19 may impede our rate of growth, given the immediate impact of closed borders on international tourism and the flow on effect on employment. However, increased domestic tourism may somewhat ameliorate any anticipated downturn in our tourism related activity. Long term impacts on the economy are still being assessed at a national level in collaboration with local government.

Government initiatives are also expected to mitigate the impact of the pandemic on our local economy. For example, the construction of social houses as part of the Kāinga Ora initiative.

Long term projections are that Rotorua will continue to experience strong growth in tourism, with approximately 60% growth in overnight visitor numbers predicted by 2051. We are continuing to master plan for growth, ensuring we understand and plan for what new infrastructure or capacity we will need, where and when.

3.2.5 Our community

The Rotorua Lakes district is home to approximately 76,200 people. Our population is projected to continue growing, reaching approximately 90,800 by 2051 (under the baseline scenario).

Our population is aging. Currently, 15% of our population is aged 65 years or above, which is projected to increase to 23% by 2051 (under the baseline scenario). While we have many young people, 22% of our population is under 14, this is expected to decline to 18% by 2051.

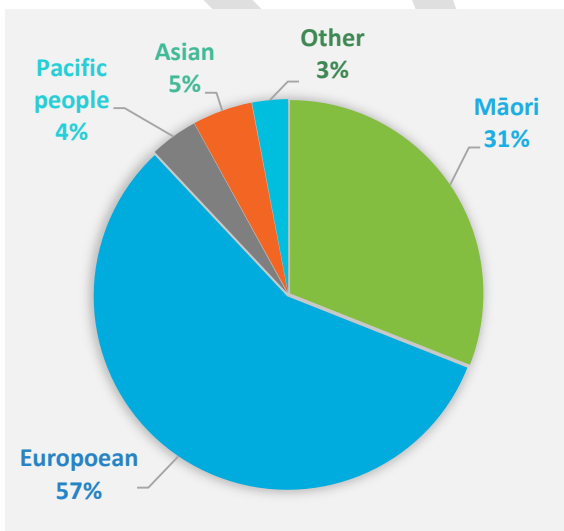
While Rotorua has a diverse range of family structures, the predominant household type, 32%, is couples without children. Family households make up 41% of households, 13% of which are single parent families. While our economy is improving, many in our community are struggling financially. In 2019, 1/3 of households without children and 25% of households with children were either in public housing or receiving an accommodation supplement.

The number of households is projected to grow from 29,000 in 2020 to 37,000 in 2051 (under the baseline scenario). Given the aging population the average household size is also expected to fall.

Approximately one third of our district's population identifies as Māori (refer to Figure 4).

In 2019, 35,600 people were employed in Rotorua district. Employment is projected to increase, with an additional 10,000 people employed by 2051. This growth in employment is predicted to principally occur in public administration and safety, health care and social assistance, education and training and arts and recreation services industries.

Figure 4 Ethnic composition of Rotorua Lakes district



Source: Infometrics, Rotorua District Employment, Population, Household and Visitor Projections (March 2020)

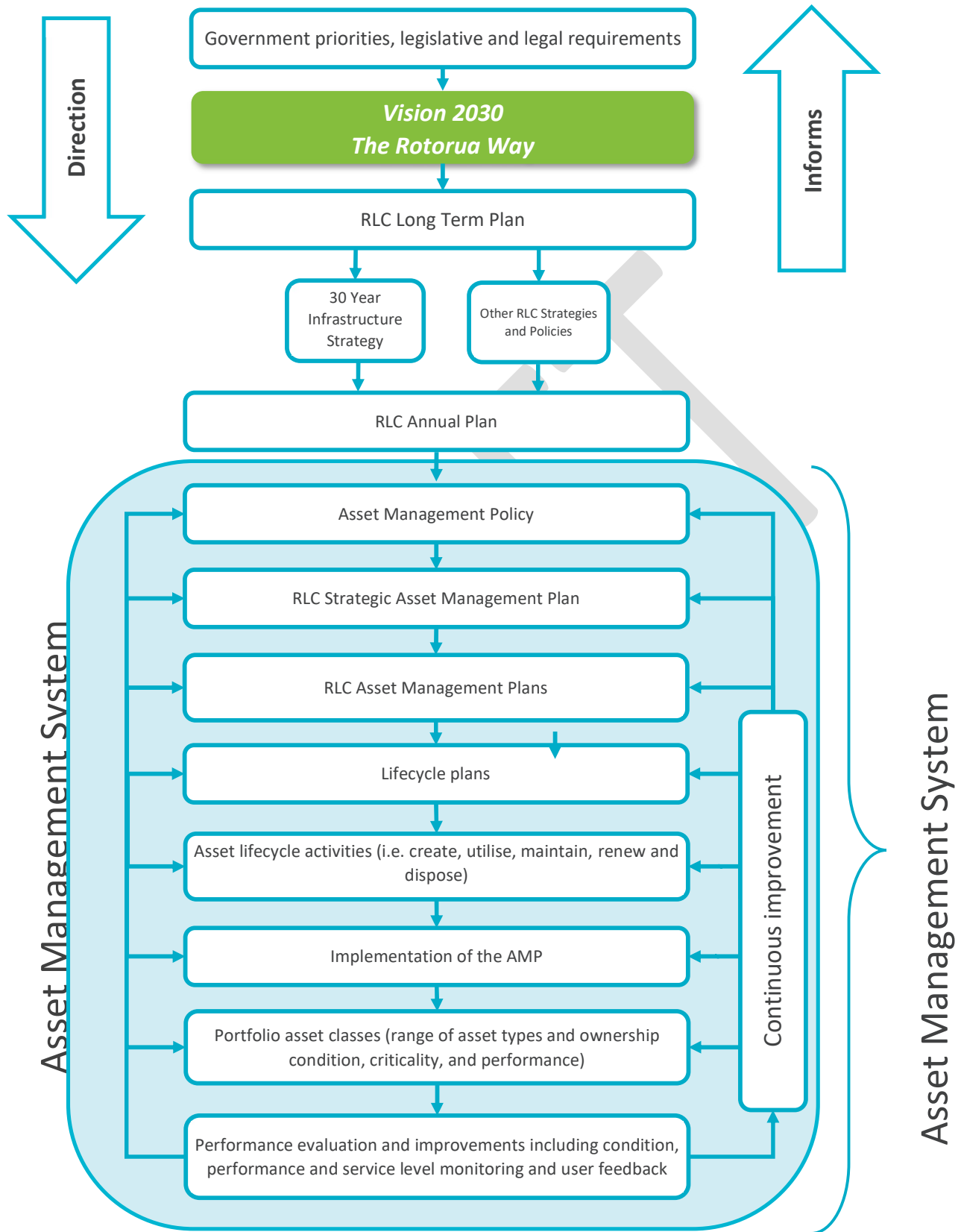
3.3 Strategic infrastructure linkages

RLC's Vision 2030, the Rotorua way, seeks to continue developing the Rotorua district in a way that responds to growth but at the same time retains and works to enhance the unique character of our place that is special to us all. Supporting this vision are seven goals.

	Papa whakatipu - outstanding places to play
	Waahi pūmanawa - vibrant city heart
	Whakawhanake pākihi – business innovation and prosperity
	Kāinga noho, kāinga haumarū - homes that match needs
	He hāpori pūmanawa - a resilient community
	He huarahi hou - employment choices
	Tiakina to taiao - enhanced environment

The link between our strategic vision and goals in Vision 2030 and our asset management framework are illustrated in Figure 5. Importantly, this link is in two directions. Our strategic documents direct our infrastructure planning, the nature and level of our asset management investment, and our asset management system provides key information and inputs that inform our strategic thinking.

Figure 5 The relationship between RLC's strategic documents and the Asset Management System



3.4 Emerging infrastructure trends

In developing this strategy from an infrastructure service delivery view, RLC has considered what the district and community may look like in thirty years' time, and what that might mean for its infrastructure. At a high-level RLC anticipates for infrastructure assets that:

- modes of transport will continue to change. Although building from a low base, an increasing proportion of our community is already moving to the use of bikes, electric bikes and electric scooters as their preferred mode of transport. In thirty years, autonomous cars may be the dominant transport type, with significantly reduced traffic volumes. Our transport corridors will be repurposed and segmented to provide for a broader range of transport modes.
- patterns of use and the volume of traffic using our roads may change. Following the Covid-19 pandemic, more people may permanently shift to home-based working. We anticipate this trend may continue.
- our core infrastructure will contribute to RLC's zero carbon objectives, with sustainable solutions the norm
- we will continue to be an amazing destination for domestic and international visitors and our infrastructure will have the capacity to service the demand safely and reliably
- we will have an enduring partnership with Māori on infrastructure co-design and implementation that is recognised internationally as an exemplar of best practice in co-governance and management
- through investing in its young people, the Te Arawa will have developed substantial capability, capacity and expertise in infrastructure planning and will be contributing significantly to the development of our city
- the percentage of our population identifying as Māori will have increased, as more Māori return to the area as they approach retirement age
- new communities have developed and are thriving in our greenfield areas.

4.0 How We Manage Infrastructure

4.1 Achievements since 2018

We have made some progress on implementing the key actions identified in the 2018 Infrastructure Strategy, as outlined below.

Table 6 Summary of key achievements

Asset class	Achievements since 2018
Water supply 	- Developed a Water Supply Master Plan (2020) to guide long term planning to consider interrelated issues including consent requirements, resilience, demand management as well as growth - Developed an aggressive demand management programme to ensure water is managed sustainably (still to be implemented) - Boundary Backflow Prevention Policy was adopted to further safeguard the quality of our water supply - Mamaku Water Treatment Plant upgrade completes all our water sources meeting water quality standards
Wastewater 	- RLC has worked with key stakeholders including iwi to explore and identify a better, more sustainable wastewater treatment and management alternative - Developing sewerage scheme proposals for the lakeside communities to mitigate the impacts on the lake water quality - A resource consent application has been lodged for the proposed upgrade of the existing plant - The wastewater treatment plant to service both the Rotoma and Rotoiti communities has been constructed and commissioned - RLC has entered into a long term contract with an experienced operator as a partner to manage the wastewater network and treatment - Developed Wastewater Master Plan (2020) to guide long term planning to consider interrelated issues including consent requirements, resilience, environmental performance as well as growth
Stormwater 	- The Comprehensive Stormwater Resource Consent for the urban areas was lodged with the Regional Council (but has not been approved) - Developing a Stormwater Master Plan (similar to water supply) to ensure that we make cost effective investment decisions
Land transport 	- Speed Limit Bylaw - new speeds on Hamurana Rd and many other district streets - Ranolf to CBD cycleway and shared path completed adding to the urban cycleway network - The procurement process for the single integrated Roding Network Maintenance and Management Contract was completed and contract awarded - Set up of the steering group for the development of the Rotorua Modeshift Plan in collaboration between Waka Kotahi, Bay of Plenty Regional Council and Rotorua Lakes Council

4.2 Strategic principles

We will manage our core infrastructure in accordance with the following principles:

- Reliable, safe infrastructure now and into the future
- Prudent management of our infrastructure, including keeping abreast of trends
- Partnership with Māori
- Managing risk and resilience
- Planning for climate change
- Strong sustainability practices and environmental protection.

4.3 Levels of service

The level of service framework in Figure 6 below, shows the alignment and strategic linkages between our Vision 2030, 2030 Goals (Community Outcomes), Infrastructure Strategy, Asset Management Plans and the activities. Major long term service level changes and implications are identified in the Infrastructure Strategy. Section 5 of this strategy identifies changes in service level at activity level.

The customer levels of service for infrastructure are set out in Table 7 which include customer outcomes (i.e. responding to unplanned water interruptions) as well as meeting legislative requirements (i.e. compliance with resource consents). The technical Activity (Asset) Management Plans provide supporting detail and technical levels of service for each activity, performance measures and past results against targets. The performance measures include mandatory for reporting to Department of Internal Affairs, customer and technical, and measures used for reporting to Waka Kotahi against the One Network Road Classification.

Figure 6 Levels of service framework

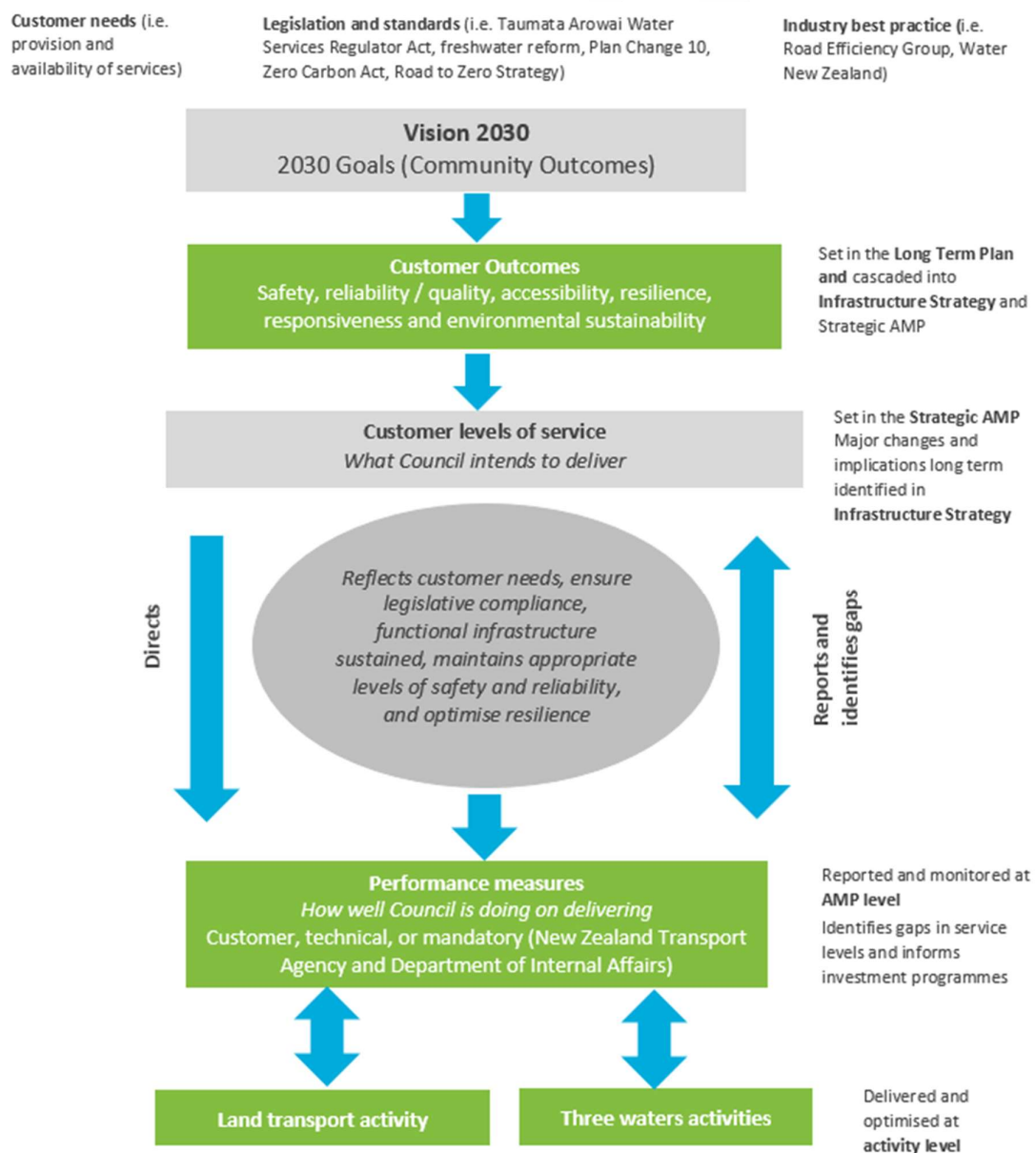


Table 7 Customer levels of service

2030 Goals (Community Outcomes)	Customer Outcomes	Customer levels of services – activity outcomes			
		Water supply 	Wastewater 	Stormwater 	Land transport 
Resilient community / Enhanced environment / Homes that match needs   	Safety	Water is safe to drink	Mitigate the risk of environmental and public health impacts	Stormwater systems protect houses from flooding in urban areas	Provides safe network for users and community to use
		Good quality water is supplied to consumers			
Resilient community / Business innovation and prosperity  	Quality / Amenity / Reliability	To provide reliable water networks	To provide reliable wastewater networks	To provide reliable stormwater networks	Provide an effective and good quality transport network
					Footpath assets are fit for purpose
					Provide reliable travel times in and around the city
Resilient community 	Resilience	Water supply disruption during natural disaster events is minimised	Wastewater disruption during natural disaster events is minimised	Stormwater disruption during natural disaster events is minimised	Access is provided to the network of local roads
Business innovation and prosperity 	Accessibility / Availability	Water pressure and flow appropriate for its intended use	All urban residents are provided with adequate wastewater provision	All urban residents are provided with adequate stormwater outlet	Community has access to a range of travel choices
					The land transport network is managed in a manner that assists the economic development of the district

2030 Goals (Community Outcomes)	Customer Outcomes	Customer levels of services – activity outcomes			
		Water supply 	Wastewater 	Stormwater 	Land transport 
Business innovation and prosperity 	Responsiveness	Provide prompt responses for service	Provide prompt responses for service	Provide prompt responses for service	That customer service requests are dealt with promptly and appropriately
Enhanced environment 	Environmental sustainability	Water resources are used efficiently and sustainably	Protection is provided to the environment	Protection is provided to the environment	Effects on the natural environment are minimised

4.4 Risk management

The approach for managing our core infrastructure balances risk and performance while providing cost effective services. Infrastructure risks can be considered in terms of global, national, corporate and asset risks, as conceptualised in Figure 7. At an activity level, these various infrastructure risks need to be considered holistically as part of the asset management planning approach, and not taken in isolation. The Activity / Asset Management Plans for each activity provides the detail as to how this is addressed.

Figure 7 Infrastructure risk concept



4.4.1 Global threats - climate change impacts and actions

Climate change is a major management issue facing all infrastructure providers and the built environment. The major trends expected by 2040 to be as a result of climate change for Rotorua's climate are (based on risk assessment of Intergovernmental Panel on Climate Change and NIWA).

- A change in frequency of extreme rainfall events, 5% increase in frequency.
- Average temperature increase of 1.1° Celsius.
- Climatic drought duration increasing by 7%.

RLC's overarching response to climate change is detailed in Section 2.2 including the development of the Climate Change Action Plan. Our specific proposed actions are outlined in Table 8 at activity level with further detail in each activity / asset management plan.

Table 8 Proposed climate change actions

Activity	Most likely effect due to climate change	Proposed actions
Water supply	– Access to water (land / springs ownership) – Potential contamination of water sources from extreme flooding events – Vulnerability of critical pipelines to land slips	– Investigate additional water sources for future years through the Water Supply Master Plan process – Review the Water Safety Plans including investigate mitigation measures – Continue to use seismically resistant materials for critical assets
Wastewater	– Inflow and infiltration increases, and reduces pipeline capacity during events resulting in more overflow events – Increased electricity costs to pump highly diluted wastewater due to higher volume of inflow and infiltration – Pump station vulnerability due to flooding inundation	– Identify wastewater pump stations at risk due to flooding inundation – Development of cost effective inflow and infiltration programme and policy direction on private laterals – Assessment of critical underground wastewater pipelines – Entered into a long term wastewater contract to have appropriate resources for keeping the wastewater network resilient.
Stormwater	– Increased flooding due to pipe capacity issues – Land stability issues	– The development of the Stormwater Master Plan that takes into consideration climate change modelling and levels of uncertainty for infrastructure design
Land transport	– Road slips / under slips – Erosion undermining road sections and bridges – No / limited access to communities with single roads	– Identification of critical bridges and culverts and development of renewal management strategies – Increased need to waterproof road surfaces (more sealing lengths) – Increased frequent inspection / maintenance of road drainage systems – Identification of vulnerable road corridors to water erosion, slips, undermining – Entered into a long term road maintenance contract to have appropriate resources for keeping the land transport network resilient

4.4.2 Key national risks

The key national risks that we are managing are summarised in Section 2.2 – Significant Issues, and mostly related to legislative changes. It is expected that these risks will increase with the proposed three waters reforms and Action for Healthy Waterways as there will be increased compliance and quality management requirements. The new Government Policy Statement on Land Transport signals the Government's shift to investing in improving people's wellbeing and the liveability of places.

4.4.3 Corporate risk context

Our approach to risk management is defined in our Risk Management Policy (2018). We are committed to organisation wide risk management principles, framework and processes that ensure consistent, efficient and effective assessment of risk in all planning, decision making and operational processes. A culture of risk management ensures RLC understands and considers risk when making decisions. It also recognises that risk management can also provide opportunities for improvement.

Our risk management approach is underpinned by the following risk hierarchy (decreasing order):

- Corporate risk register
- Activity risk register
- Project risk assessments.

4.4.4 *Key asset risks*

We manage our asset risks through our asset management planning process, maintaining our institutional knowledge and capability supported by our service providers. The asset management planning process follows an annual cycle. The latest asset information including risks, and user requirements are analysed and input to the development of the renewal forward work programmes.

The overarching approach for renewal programmes is to define timely asset replacement and the consequences (i.e. a reduction in level of service or increase in risk) if these are deferred (although these practices are still evolving). This helps inform the decision makers and prioritise the significant capital programme. The Activity / Asset Management Plans contain the justification for programmes to inform the budgets.

A key element of our asset management planning approach is to define our critical and non-critical assets. This helps us with the day to day operations of the core infrastructure as well as our renewal strategies. An overarching principle is not to have any unforeseen critical asset failures. Our risk based approach to renewing our assets gives priority to public health issues first then critical assets (refer to Section 2.2). This will ensure we have resilient infrastructure.

5.0 Infrastructure Overview

5.1 Assets at a glance

5.1.1 Asset summary

We own and manage \$1.446 billion (replacement value as at June 2020) of infrastructure assets which can be summarised as follows.

Table 9 Asset summary

Activities	Description
Water supply 	• Ten defined supply areas including three urban areas • Eleven water sources • Nine water supply treatment plants • Approximately 768km of pipelines • 15 water pump stations
Wastewater 	• 405 km of gravity pipelines and 150km rising mains • Services three urban areas of Rotorua (Ngongotahā, city and eastern suburbs) and some rural lakeside communities • Two wastewater treatment plants • 81 wastewater pump stations
Stormwater 	• 284km urban reticulated pipelines • 153km of open drains • Service three urban areas of Rotorua (Ngongotahā, city and eastern suburbs) • Reporoa land drainage scheme
Land transport 	• 1,008 km of roads - 886 km sealed and 122 km unsealed • 82 road bridges • 26 major culverts • 385 km of footpaths • 43 km of shared paths, 4.8km of cycle lanes and 1.3km of cycle paths • 140 bus shelters

Source: RLC's Revaluation FY20 CPI (as at 25 September 2020)

5.1.2 Current asset state – age

The current state of our assets in terms of age is summarised in the following table for each activity at major asset class level. This has been assessed as the percentage of design life expended and remaining useful life (median). The current state of our assets in terms of condition and performance is detailed in the following sections for each activity.

This shows that most major assets classes are quarter to halfway through their design life. Gravity wastewater mains, stormwater mains and street lighting brackets are asset classes identified in poor or at risk categories (based on age analysis only). These asset classes need to be monitored to ensure the future renewal programmes are adequate.

Specific actions for asset classes identified to increase renewal investment are:

- A focus area is to assess the condition of the wastewater gravity mains with an accelerated CCTV survey programme. This will help provide evidence to develop condition based renewal for this asset class and inform the 2024 LTP.

- Start planned condition surveys of stormwater pipelines. This will also help us to develop condition based renewal programme.
- Complete the survey of large culverts and we will replace the assets assessed in very poor condition. This will contribute to strengthening our transport network resilience.
- Start asset condition surveys of the critical above ground assets and take samples of critical below ground assets. Start analysing breaks of the underground pipes. Use this data collected on our critical assets to inform the development of risk based renewal programmes.

It is intended to complete this analysis with future Infrastructure Strategies and through the Activity / Asset Management Plans. This will ensure we keep our core infrastructure within acceptable industry benchmarks to ensure sustainable future investments.

Table 10 Total remaining useful lives based on age

Activities	Major asset class	Median across asset class		Renewal investment
		% of design life expended	% of remaining useful life	
Water supply 	Backflow	27%	73%	–
	Mains	43%	57%	↑
	Meters	30%	70%	–
	Plant	20%	80%	–
Wastewater 	Gravity mains	63%	37%	↑↑
	Pressure mains	8%	92%	–
	Manholes	46%	54%	–
	Chambers	8%	92%	–
	Grinder pumps	32%	68%	–
	Other	53%	47%	↑
Stormwater 	Mains	64%	36%	↑↑
	Channels	5%	95%	–
	Consents	54%	46%	↑
	Other	40%	60%	–
Land transport 	Bridges	53%	47%	↑
	Footpaths	38%	62%	–
	Street lighting – poles	47%	53%	–
	Street lighting – brackets	63%	37%	↑↑
	Street lighting – lights	37%	63%	–
	Drainage	56%	44%	↑
	Surface water channels	35%	65%	–
	Minor structures	32%	68%	–
	Railings	54%	46%	↑
	Retaining walls	18%	82%	–
	Islands	20%	80%	–
	Signals	33%	67%	–
	Traffic facilities	40%	60%	–
	Pavement – basecourse	54%	46%	↑
	Pavement – surfaces	50%	50%	–

The grades for categorising the percentage of the remaining useful lives are:

Table 11 Grades for remaining useful lives

Grade	Grade description	% of remaining useful life
1	Excellent Fit for future	% of RUL $\geq$ 85%
2	Good Adequate for now	85% > % of RUL $\geq$ 60%
3	Fair Continue with normal monitoring	60% > % of RUL $\geq$ 40%
4	Poor At risk	40% > % of RUL $\geq$ 10%
5	Very poor Unfit for sustained service	% of RUL < 10%

The grades for categorising the percentage of the total design lives expended are:

Table 12 Grades for design lives expended

Grade		Renewal investment	% of design life expended
1	–	Business as usual	% of design life expended $\leq$ 40%
2	–	Continue with normal monitoring and renewals	40% < % of design life expended $\leq$ 50%
3	↑	Start planning for renewal investment	50% < % of design life expended $\leq$ 60%
4	↑↑	Asset at risk, accelerate investigation and increase investment	% of design life expended > 60%

5.1.3 Asset condition and performance

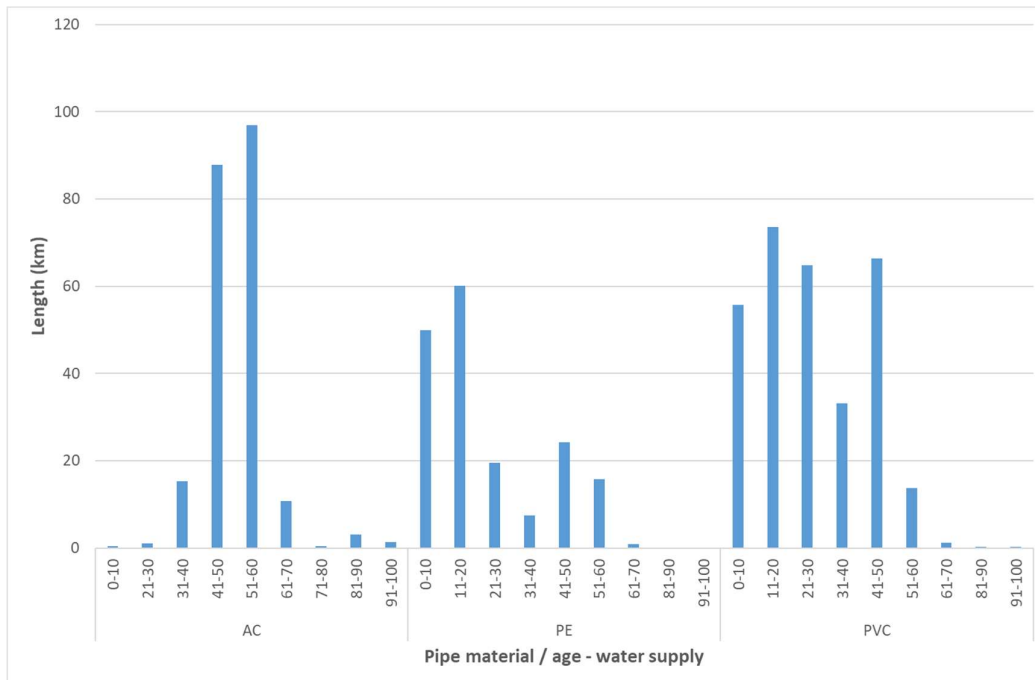
Water supply

There are gaps in our knowledge of the three water assets and we have plans underway to improve this as noted above. There may be implications on maintaining the levels of service as well as increased costs for unplanned maintenance with assets failing. This is mitigated by:

- Ongoing monitoring of the achievement on meeting the performance measures as set out in our Asset Management Plans and against acceptable industry benchmarks (this applies to wastewater and stormwater as well)
- A proactive regime is in place to monitor the proper balance between planned and unplanned maintenance expenditure to understand trends overtime with our Network Maintenance Contractors / Partners.

Most of the water supply pipelines (or 64%) are plastic pipes (PE and PVC materials) as presented in Figure 7. They are between 10 and 50 years old so are considered relatively young.

Figure 8 Water supply pipeline age and material



Source: RLC's Infor (as at July 2020)

Our oldest watermains are asbestos concrete pipe material (28% of the pipelines) and are between 40 and 60 years old. This group is indicative of the problematic pipe materials that are known to fail. These assets will need replacement in the short to medium term. There is a replacement programme in place to address the asbestos concrete pipelines. There is risk that customers will have unacceptable water outages as it takes time to implement our targeted renewal programme. We have complete records of the pipe material types and age.

We have defined our critical water supply assets that are significantly important to our community at a high level as cross country mains, mains between water sources / head works and reservoirs, rising mains, pump stations, treatment plants, reservoirs, and pressure control valves. We still need to record this criticality at asset component level in our asset management system as good industry practice (this applies to wastewater and stormwater as well).

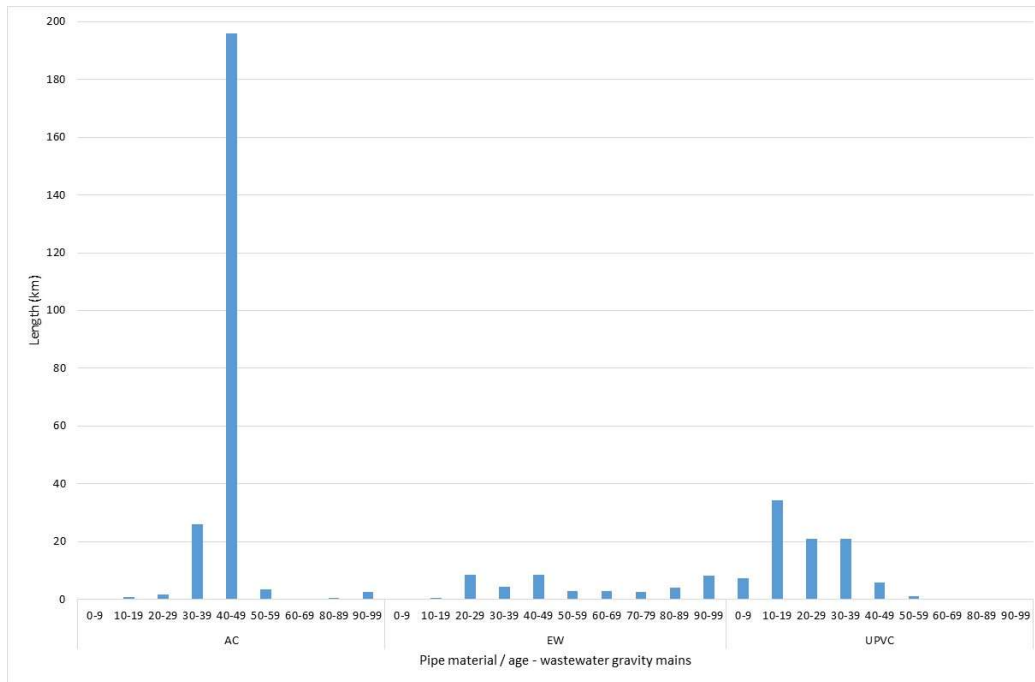
Asset performance of Council's water supply network is assessed in terms of water leakage and water quality as follows:

- Water leakage - Council assessed its water losses as part of the water master planning process as noted above. Water loss can happen for a range of reasons, including leaks and breaks in the network and this results in Council treating more water than is needed. Part of this programme was assessing the assumed real water losses using an acceptable industry benchmark known as the Infrastructure Leakage Index. The three supply areas were assessed at 2.5 for Eastern, 3.2 for Central and 4.6 for Ngongotahā (without the demand management programme). The area with the highest water loss performance indicator was Ngongotahā. As an indicator, between 4 and 6 is considered poor leakage management. Note that an index less than 4 equates to possibilities for further improvement.
- Water quality – Council has a suite of plans and processes to provide assurance that it is providing safe drinking water. These include the water safety plans, operating procedures, and operations and maintenance manuals for the treatment plants.
- Council's water quality is measured monthly against the mandatory performance measures and reported in the Annual Report. All nine water treatment plants are now compliant with the New Zealand Drinking Water Standards with the recent Mamaku plant upgrade.

Wastewater

About half (57%) of the wastewater network (underground gravity mains) is made of asbestos concrete material and most are 30 to 50 years old as shown in Figure 9. Asbestos concrete pipe material is known to be brittle. Although there is less than 10% of our rising mains in asbestos concrete pipe material, these need to be replaced. These are our critical assets and have unacceptable consequences if they fail (i.e. overflow incidents and potentially environmental pollution of waterways).

Figure 9 Wastewater pipes by material and age



Source: RLC's Infor (as at July 2020)

We intend to get a better understanding of the current state of the wastewater assets with our long term contractor with a focus on the critical below ground assets as noted above. There is a large amount of asbestos concrete pipes of similar age that may need to be replaced at a similar time, but we need to gather evidence to inform the renewal programme.

We have defined our critical wastewater assets that are significantly important to our community at a high level as rising mains, pump stations and treatment plants. We understand the asset condition of our above ground assets operationally, but these have not been assessed formally to date.

Asset performance of Council's wastewater network is assessed in terms of overflows and inflow and infiltration as follows:

- **Dry weather overflows.** A dry weather overflow is an uncontrolled wastewater discharge that is not associated with a rain event. All pump stations are connected to a monitoring system so we can monitor and report failures. This helps us to effectively mitigate dry weather overflows from entering the environment and for reporting to the Regional Council.
Dry weather overflows are reported on as a mandatory performance measure and to the Bay of Plenty Regional Council. Blockage incidences occur from time to time but our asset performance for dry weather overflow events meet the industry accepted benchmarks.

- **Wet weather overflows.** These incidents occur periodically, mainly during significant rainfall events at weak points in the system such as pump stations and low lying areas where gully traps are inundated with floodwaters. A wet weather overflow has limited environmental effect as it is diluted and the need to address this is being tested.

We have a known overflow hotspot at Victoria Street where two pump stations feed into a large gravity main. During high intensity rainfall events, both pump stations experience significant flow increase that necessitates all pumps in each pump station to operate simultaneously for prolonged periods. This can result in wastewater overflows at the receiving manhole. The increase in flow is a quick response to rainfall and is mainly attributed to inflow and infiltration to the network system.

- **Inflow and infiltration.** We know operationally that some of our catchments are leaky. This is the term used to describe groundwater and stormwater entering into dedicated wastewater system resulting in the system becoming overloaded and overflows occurring.

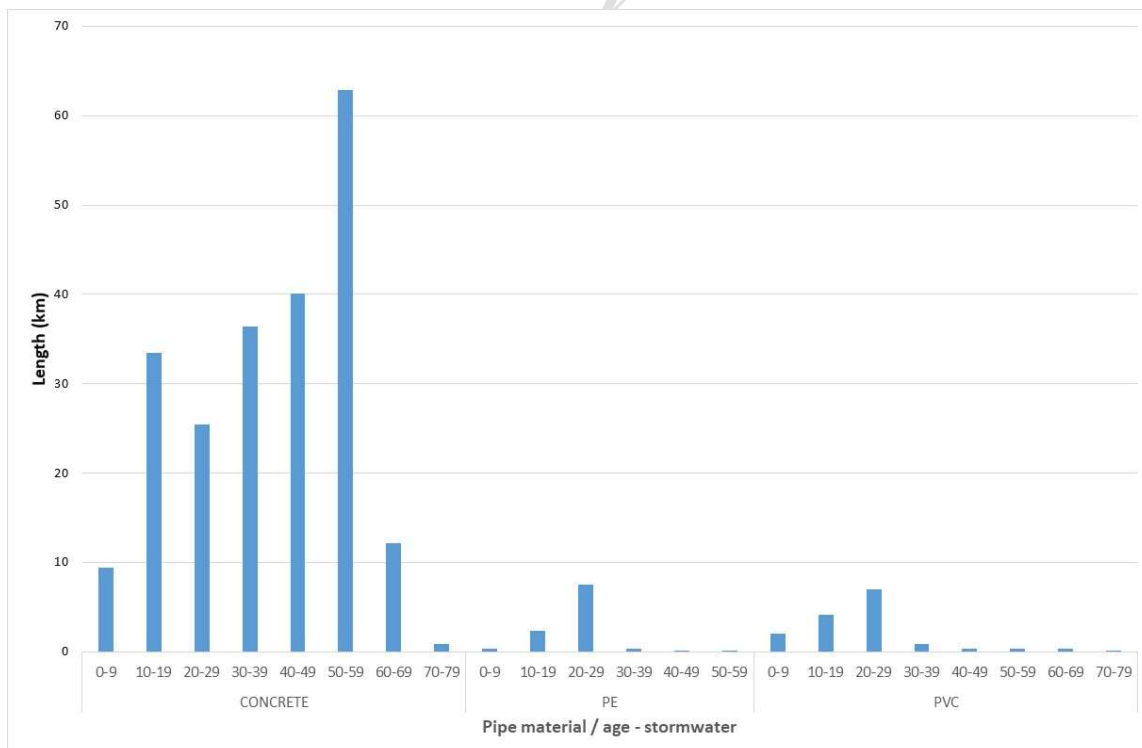
As part of improving the network resilience, we intend to assess inflow and infiltration across the catchments to prioritise our efforts and develop a cost effective and targeted programme. A preliminary assessment of a leaky catchment (Pukuatua and Ranolf Streets) showed that there was not significant improvement after the rehabilitation works of the defective pipes.

Effective inflow and infiltration management will be achieved through ongoing detection and reduction strategies employed by our long term contractor, and policy direction on private laterals established. The inflow and infiltration programme will also inform our proposed wastewater capital works programme, so all the interrelated issues are considered at catchment level.

Stormwater

Most of the stormwater network (78%) is concrete material and most are 10 to 50 years old as shown in Figure 10. Although there is a proportion of the network towards the end of its life of 80 years, stormwater assets can generally still function if there is structural integrity (i.e. no major defects).

Figure 10 Stormwater pipes by material and age



Source: RLC's Infor (as at July 2020)

Asset condition has not been formally assessed for the stormwater network to date. We intend to move to a programme of planned condition surveys to help us better understand the state of our stormwater assets.

We have defined our critical stormwater assets that are significantly important to our community at a high level as pump station, rising main, culverts and ponds.

Asset performance of our stormwater network is assessed in terms of capacity constraints (flood protection) and stormwater quality. More than 70 habitable floors flooded from the 29 April 2018 event including the Ngongotahā catchment as noted above. There was one flood incident reported in 2018/19 as a mandatory performance measure.

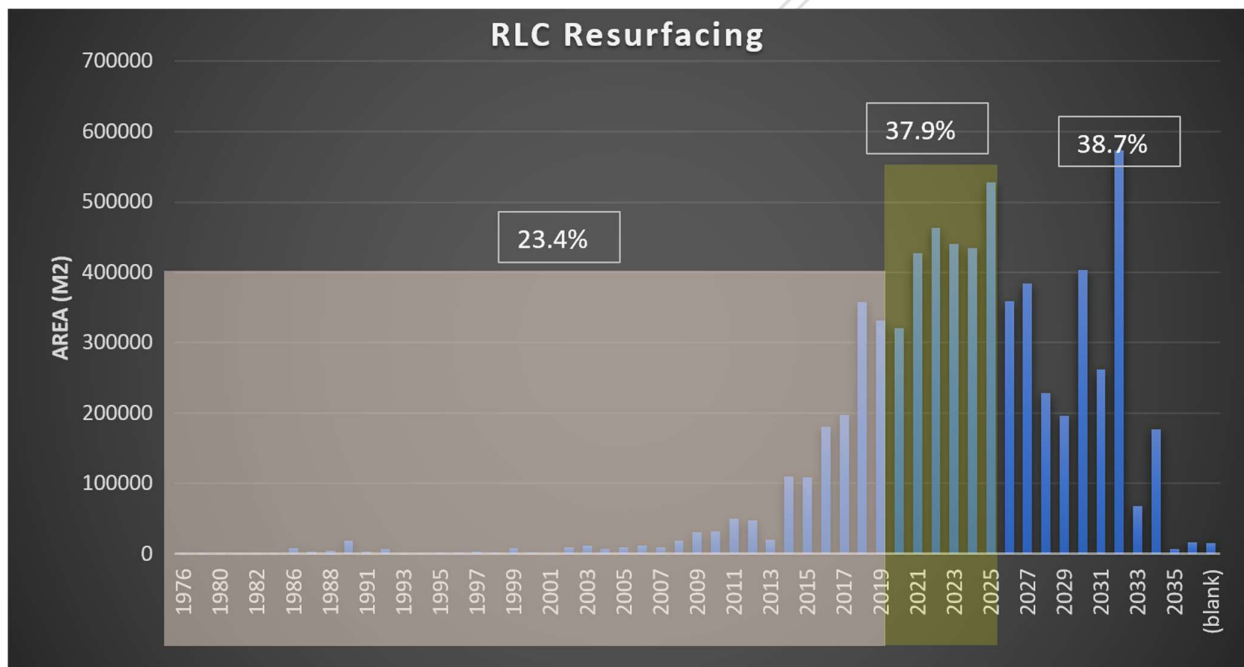
Land transport

Performance and condition across the various land transport asset classes is as follows:

Pavements

As our assets continue to age, they also deteriorate and require replacement to be kept in a fit for purpose condition. In regard to the road surfacing, 23.4% of the network sealed area has exceeded the theoretical asset life and 37.9% due to be resealed within the next five years, as shown in Figure 11. This shows that most assets are resurfaced within the optimal time (7 to 8% per year). Some assets have exceeded their predicted design life but generally are performing adequately. Most of the network is performing adequately but cannot sustain reduction in investment levels.

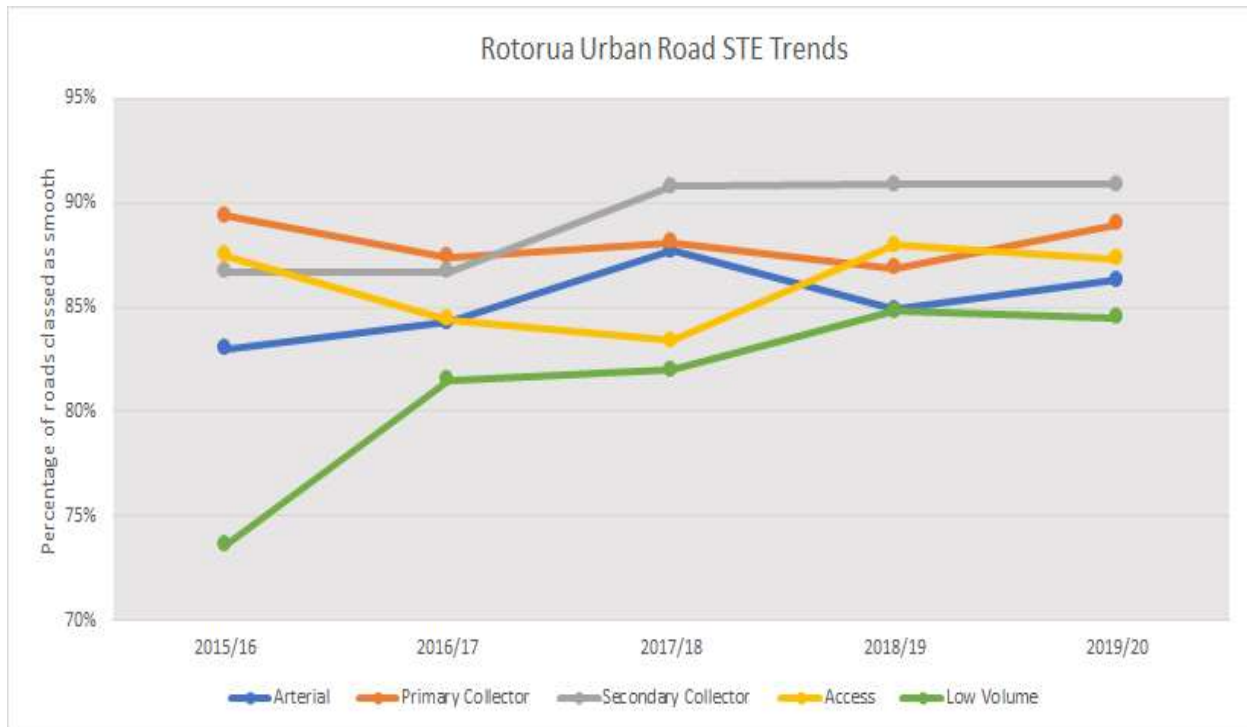
Figure 11 Resurfacing age profile



Source: RLC RAMM database (as at June 2020)

The average quality of roads is measured in terms of Smooth Travel Exposure. In this area, Rotorua Lakes Council performs well when benchmarked against our peer groups (Grey, South Waikato, New Plymouth and Queenstown Lakes District Councils). The trends in Figure 12 by the road classification categories show an improvement year on year.

Figure 12 Ride quality trends



Source: ONRC Reporting Tool

Critical road condition – Waka Kotahi’s One Network Road Classification is used to categorise the criticality of roads with a consistent framework nationally. The condition of the urban roads in terms of peak roughness is better than our peer group. On rural roads we do not perform as well on higher classification roads compared to these peers. Overall Council generally performs well when benchmarked and trends show an improvement year on year as noted above.

Road safety – The national reporting on road safety suggests that there is a trending increase in crash rates in some road categories. While the baseline is low, Council is a partner in the Road to Zero Strategy and supports the philosophy of this strategy. Statistics for the last five years highlight that our crash trends are increasing. The 2019/20 results show an increase across all classifications and the need to keep investing in safety activities and initiatives and investments to drive these results downwards. Road safety remains a major focus.

Unsealed road condition – The condition of our unsealed roads is heavily influenced by the weather, particularly the rain. A general lack of aggregate and running surface, due to lack of funding, makes repairs to scouring, aggregate loss, corrugations and potholes to have limited long-term lasting effect. Add forestry logging activities which exacerbate the issue as their loadings accelerate deteriorations. Our roads were never designed to sustain harvesting loads, and this continues to be an ongoing challenge.

Unsealed road performance – The unsealed network is inspected monthly in accordance with Council’s Roding Maintenance Standards (2020). The road network maintenance contractor utilises a specialised smart phone application to carry out visual and roughness assessment on a cyclic basis. This is used to help in the management of the unsealed network.

Bridges

Bridge condition – Over half of the bridge stock (55%) are over 50 years old (oldest being 88 years old), a further 19% is between 21 and 49 years old and the remainder less than 20 years old. The useful life of bridges for Council is currently set at 100 years. Asset condition is not currently recorded in the RAMM database.

Bridge performance – It is important that Council’s bridge network is accessible to heavy vehicles that support the district’s economy. Changes in legislation allows heavier, longer, higher and more trucks on New Zealand roads and need to ensure the resilience of our infrastructure meets these factors. There are currently eight bridges that are inadequate for the heavy vehicles (known as 50Max High Productivity Motor Vehicles).

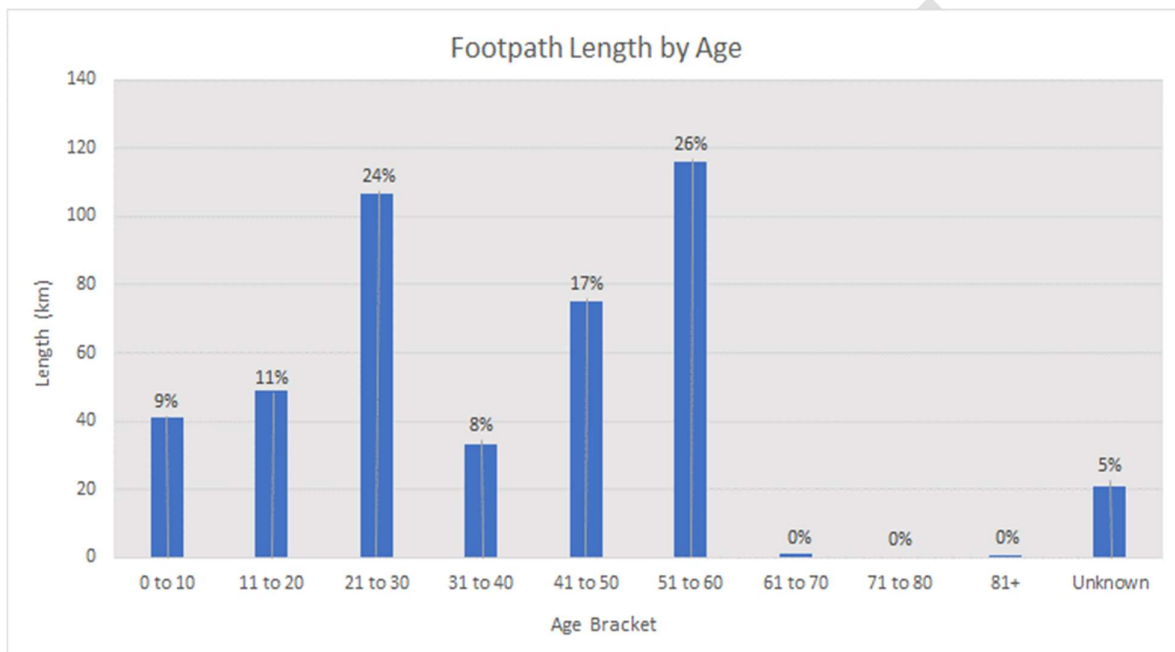
Footpaths

Footpath condition – Most of the footpath network (or 89%) is constructed from concrete, with 6% asphalt concrete and the remaining 5% from other materials (such as timber, metal or interlocking blocks). Useful life for concrete footpaths is set at 100 years. This puts 70% of the network length under halfway through their asset life as shown in Figure 13.

The asset condition of footpaths is assessed through the identification of defects with inspections. There is limited condition data held in the RAMM database about the footpaths.

Footpath performance - There is approximately 80km of footpaths that do not meet RLC’s current minimum width standard of 1.4m. Asset condition along with footpath width are used to inform our footpath renewal programme.

Figure 13 Footpath length by age



Source: RLC RAMM database (as at August 2020)

Road drainage

Catchpits – Over half of the assets (64%) are over the useful life of 50 years. Keeping the renewal programme up with the rate of deterioration is important.

Culverts – Most of the assets (88%) are over 50 years old and have a useful life of 100 years, so are half-way through their life. Culverts play an important part in the drainage management process that allows the network to remain open. We are surveying our large culverts (greater than 600mm in diameter) to assess the condition grades. Keeping these critical assets in good condition is important for strengthening our transport network resilience.

5.2 Water supply

5.2.1 Background

We are responsible for the provision of safe drinking water to ten defined water supply areas. Nine water treatment plants supply reticulated schemes with approximately 768km of pipes supplying properties through approximately 24,180 connections.

Public water supply is provided to domestic, commercial, industrial, and rural communities to ensure public health. Our commercial and industrial water users are metered as well as the rural users. The three urban schemes (Central, Eastern and Ngongotahā) supply a total of 78% of all water demand. The Central scheme accounts for 58% of all district water supply.

5.2.2 Water key challenges

Renewing infrastructure

Asset age is generally still used for planning the water renewals programme. Although the water supply network is relatively young and therefore in generally good condition, we know that we need to adopt a proactive and risk-based renewal strategy as good industry practice. We intend to undertake asset condition surveys of the critical above ground assets and take samples of critical below ground assets.

We will start analysing breaks of the underground pipes. We will use the data collected on our critical assets to inform the development of risk based renewal programmes.

Providing for growth

Servicing new development areas

The Rotorua Lakes district is projected to increase in population. The Central and Eastern areas are where most of the development and growth are forecast to occur. These two areas are projected to have 3,201 and 4,150 additional household units by 2051 respectively based on the latest growth projections (as at March 2020).

Based on our Water Supply Master Plan (2020), the Central area is forecast to accommodate this additional demand if the existing consented take is rolled over and the proposed demand management programme is implemented. This will mean that no new source will be required until 2051. The two springs (Waipa and Hemo) that supply the Eastern area have sufficient capacity to accommodate this additional demand if the existing consented takes are rolled over.

Our current practices for growth planning are considered ad hoc. We know that strategic planning is important to guide long term infrastructure planning. We have developed the Water Supply Master Plan (2020) as an overarching framework to consider interrelated issues including consent requirements, resilience, demand management as well as growth and also promoting interconnection of the three large urban supplies. The Water Supply Master Plan is the basis for implementing our capital works programme.

Restrictive consent conditions

Most of the current water take consents are all expiring in the next ten years. The current abstraction limits may not necessarily be rolled over. If the water take is reduced, alternative sources will need to be developed such as groundwater. The consent for the Ngongotahā area has been successfully negotiated with revising the demand projections.

Managing risk and strengthening resilience

Infrastructure resilience

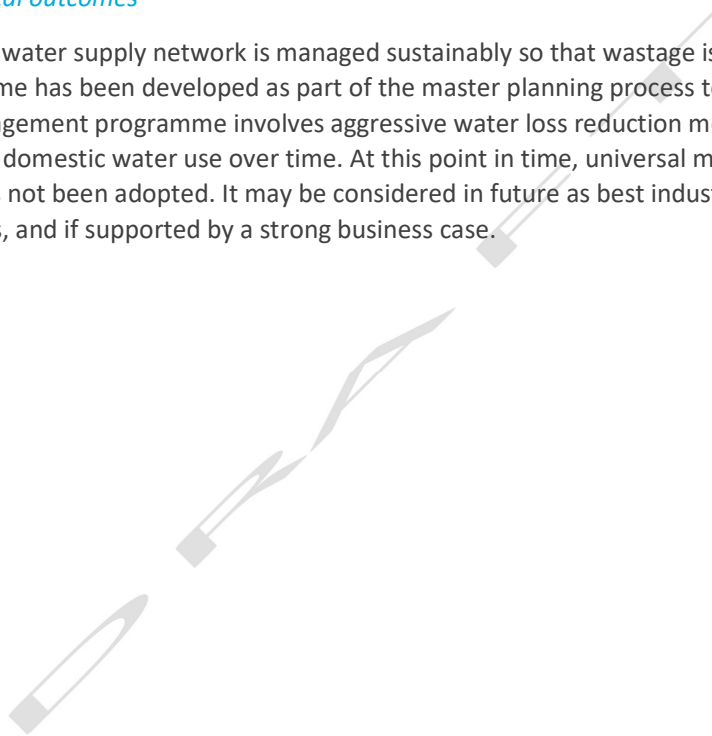
A key focus is strengthening our infrastructural resilience as some of our assets have limited redundancy. We have adopted an integrated approach with our water supply master planning process to consider growth, consenting requirements as well as reducing risk.

We have investigated improvements to strengthen resilience particularly between the Central and Eastern supply areas. This includes providing redundancy for the main spring that supplies the Eastern area with the duplication of the rising main from the Waipa pump station and installing a second storage tank. It also includes the interconnection of the Eastern and Central supply areas, and provision of link between the Ngongotahā and Central supply areas.

Seismic resistant materials are considered when we replace critical assets. Factors that are considered include location and consequences. We undertake a pragmatic evaluation at the renewal planning stage on a case by case basis.

Improving environmental outcomes

It is important that the water supply network is managed sustainably so that wastage is minimised. A demand management programme has been developed as part of the master planning process to plan for growth. The adopted demand management programme involves aggressive water loss reduction measures, nominal reduction of per capita domestic water use over time. At this point in time, universal metering (i.e. metering all water connections) has not been adopted. It may be considered in future as best industry practice and strong environmental benefits, and if supported by a strong business case.



5.2.3 Significant issues and options

Significant issues for the water supply activity and principal options for managing these issues are detailed in the following table. The highlighted option is preferred as the most likely scenario and when Council expects significant decisions will be required. Note that risk is assessed with the option undertaken. Indicative cost estimates are provided for evaluating wide range of options only and not part of Long Term Plan budgets (this applies to wastewater, stormwater and land transport).

Table 13 Significant issues and options for water supply

Significant water supply issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
Implications of the Government's three waters reform and changes to legislation are likely to result in higher standards for water treatment and compliance costs, and changes to Water Services Delivery Models.	1. Continue with water services remaining in house.	- There are likely to be increased costs to address health / safety concerns / issues from the Taumata Arowai - This will be resourced through existing budgets - Not eligible for funding through Government's three waters reform programme - Government may force amalgamation for councils that do not collaborate regionally		✓ Current budgets are known (\$55.6m for capital projects for 10 years inflated)	✓ Current budgets are known (\$56m for capital projects for 10 years inflated)	✓ Current budgets are known (\$61.5m for capital projects for 10 years inflated)	H
	2. Explore aggregation at regional / sub regional level with neighbouring councils to determine best service delivery model and be eligible for the Government's funding package.	- Costly to set up water Council Controlled Organisation but will be eligible for central government funding - A dedicated water Council Controlled Organisation with no other competing priorities will be expected to better prioritise investment decisions across the region leading to better environmental and community outcomes than the Councils can individually achieve - Potentially loss of community involvement in water decisions - Council needs to opt into reform programme to be eligible for		✓ Higher level estimates from industry of reduction in capital programme with aggregation (1.25% reduction per year, indicative estimated cost \$650k reduction in capital programme)	✓ Reduction in capital programme with aggregation (indicative estimated cost \$480k reduction in capital programme over 10 years in real terms)	✓ Reduction in capital programme with aggregation (indicative estimated cost \$385k reduction in capital programme over 10 years in real terms)	H

Significant water supply issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
		funding		over 10 years in real terms)			
	3. Maintain a watching brief on the Government's Three Waters Reform Programme and evaluate other options as information becomes available.	- Central government may force amalgamation for councils that do not aggregate regionally - Implications from water reforms on service delivery including the impact of Taumata Arowai and changes to legislation are still unfolding and happening at a rapid pace	Option 3 is preferred as the most likely scenario - Continue to keep watching brief to understand the best service delivery option for our community. RLC has set up a long term wastewater contract that potentially could be expanded to cover water supply at a later stage. Decision required by Council – Decision on participating in reforms and preparation for the formation of water services entities expected from late 2021 to 2023 (legislation is still being passed)	✓ Current budgets are known (\$55.6m for capital projects for 10 years inflated)	✓ Current budgets are known (\$56m for capital projects for 10 years inflated)	✓ Current budgets are known (\$61.5m for capital projects for 10 years inflated)	H
Resource consents need renewing but there is uncertainty about what the conditions involve.	1. Secure new resource consents at current abstraction limits.	- Dependent on early engagement with stakeholders and iwi to be successful - This option is dependent on the Regional Council rolling over current abstraction limits - Additional / alternative water sources not required - Dependent on implementing aggressive water loss management programme - There are additional capital costs to develop new water source /s if the consent quantities are not rolled over	Option 1 is preferred as the most likely scenario - Allocate funding and resourcing to secure new resource consents and monitoring of conditions. Decision required by Council – Underway and decision expected by the Regional Council by 2026. Decision required before expiration of current consents: - Waipa and Hemo Springs: January 2024 - Karamu-Takina Spring: October 2026 - Rewarewa Spring: October 2026 - Wai-iti Stream: October 2026 - Lake Rotoma: October 2026 - Mamaku Bores: January 2031	✓ \$0.7m by 2024 (2 springs for Eastern water supply); \$1.37m by 2026 (4 other supply sources); (this may increase if cannot roll over current consent quantities)	\$0.15m by 2031 (2 bores for Mamaku water supply)	-	H
	2. Investigate alternative supplies and / storage for Central and Eastern supply areas if consent not rolled over and capital investment required.	- Dependent on early engagement with stakeholders and iwi to be successful - Takes time to plan, consult including cultural issues, secure funding, and implement new capital works		✓ \$2.02m (2 new bores) for Eastern water supply (10 new bores) for Central	✓ \$1.01m (1 new bore) for Eastern water supply	✓ \$1.01m (1 new bore) for Eastern water supply	H

Significant water supply issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10 (2025/26 to 2026/27)	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
	3. Reduce demand through aggressive water loss management programme.	– Demonstrates to the Regional Council using water wisely – Reduces the volume of water needed from the springs and costs to treat the water – Achieves good benefits but may require universal metering to be fully effective long term	Option 3 is preferred as the most likely scenario - Undertake aggressive water loss management programme. Decision required by Council – This is conditional on budget being adopted then the water loss management programme can be implemented.	✓ \$300k (based on \$30k per annum on demand management activities)	✓ \$300k over ten years	✓ \$300k over ten years	M
Information on water supply asset condition is limited.	1. Continue to respond reactively to any defects / asset failures and use age as the basis for the planned renewal programmes.	– Water outages to customers may become unacceptable particularly for priority customers such as schools, hospitals, industry, and vulnerable users – The water renewal backlog may become unacceptable		✓ Budget impacts are known short to medium term (\$4.8m operational costs pa in total to respond)	✓ Budget impacts may be significant in the medium term (about \$5.5m+ operational costs pa in total to respond)	✓ Budget impacts may be significant in the long term (about \$6m+ operational costs pa in total to respond)	H
	2. Undertake condition surveys of critical above ground assets and start analysing breaks of underground assets.	– The replacement of critical assets (above and below) is risk based and planned to ensure adequate funding available and time to implement – The unplanned water interruptions to customers are kept to a minimum acceptable level – Data is analysed and used to develop risk based renewal programmes – The non-critical water assets are still achieving the level of service	Option 2 is preferred as the most likely scenario - Undertake condition surveys of critical above ground assets. Take samples of critical below ground assets as good industry practice. Start analysing breaks of underground assets to ensure meeting customer levels of service for outages. Decision required by Council – This is conditional on budget being adopted then the condition surveys can be implemented.	✓ \$3m renewals per annum (this may change as more information becomes available)	✓ \$3m renewals per annum	✓ \$3m renewals per annum	M

Significant water supply issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
	3. Undertake condition surveys of all water supply assets (critical and non-critical / above and below assets).	Higher costs for extensive condition surveys		✓ Budget impacts may potentially be significant (about \$0.5m to \$1m pa)	✓ (about \$0.5m to \$1m pa)	✓ (about \$0.5m to \$1m pa)	M
Strengthening our infrastructural resilience as some of our critical assets have limited redundancy.	1. Continue with adopted risk management approach and strengthening resilience at scoping design stage for renewal and new works projects.	- Option 1 is the current general approach - Opportunities are identified progressively as assets fail or upgraded - Any significant expenditure would mitigate the high risk	Option 1 is preferred as the most likely scenario (ongoing) - Continue to look for opportunities to strengthening infrastructure resilience at scoping design stage for renewals and new works projects Decision required by Council – This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.	✓ Medium cost for resilience strengthening as part of capital projects (about \$1.8m+ over ten years)	✓ Medium cost for resilience strengthening (about \$1.8m+ over ten years)	✓ Medium cost for resilience strengthening (about \$1.8m+ over ten years)	M We have time to implement upgrades
	2. Replace the critical assets with modern materials and install duplicate mains to mitigate the risks in the Central (Matipo Utuhina Water Treatment Plant rising main) and Eastern supply areas (Waipa rising main).	- Options 2 and 3 are interlinked - The existing critical asset for the Central Supply Area is asbestos concrete material and less likely to fail once replaced with modern material - The aged rising mains will be replaced with new assets and be more robust	Option 2 is preferred as the most likely scenario (medium term) - Undertake the critical asset replacement and install duplicate mains to mitigate the risks in the Central and Eastern supply areas Decision required by Council – This is conditional on budget being adopted then the capital works can be implemented.	✓ \$1.47m	-	-	M Reduces asset risk with this approach
	3. Connect the Central and Eastern supply areas with an emergency main to mitigate risk for priority customers, which will also provide additional temporary supply during peak demand to avoid exceeding consented water take limits.	- Provides additional supply during emergencies for priority customers such as hospitals and schools - Provides additional temporary supply during peak demand to avoid exceeding consented water take limits - Improves security of supply and fire flow capacity to the Scion Innovation Park Development Area	Option 3 is preferred as the most likely scenario (medium term) - Undertake the emergency connecting mains to strengthen resilience between the two largest supply areas. Decision required by Council – This is conditional on budget being adopted then the capital works can be implemented.	✓ \$2.95m (for 2 new reservoirs) and \$1.82m for (for connecting mains between Eastern and Central)	✓ \$0.6m (connecting main upgrade in Tarawera Road - Eastern to Central link)	-	M Reduces asset risk with this approach

Significant water supply issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
	Construct a new 1,000m ³ storage tank at Eastern Reservoir 1 Site in Tarawera Road and another 3,500m ³ storage tank adjacent to Tarawera Road reservoir # 2.						
Limited strategic planning to enable growth on the city fringes.	1. Continue with ad hoc planning approach for water provision in growth areas based on Spatial Plan.	– Bulk infrastructure is not planned to meet current or future demand, or sequenced – Spatial Plan not based on the latest demand projections (used for 2018 Long Term Plan) – District is unattractive for developers as Council difficult to work with – Development occurs ad hoc		✓ Low cost from existing resources and budgets (about \$250k pa for minor capital growth projects)	✓ Low cost from existing resources and budgets (about \$250k pa for minor capital growth projects)	✓ Low cost from existing resources and budgets (about \$250k pa for minor capital growth projects)	H
	2. Use the Water Supply Master Plan to guide long term planning and the capital works programme to address current and future demand for enabling sustainable development.	– Bulk infrastructure is planned holistically – Based on realistic forecast of development, where it will likely occur and when	Option 2 is preferred as the most likely scenario - Implement and use the Water Supply Master Plan to guide long term planning and the capital works programme. Decision required by Council – This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.	✓ \$10.1m total (for ten years)	✓ \$6.2m total (for ten years)	✓ \$1m total (for ten years)	M

5.2.4 Water supply expenditure forecasts

Figure 14 presents the expenditure forecast for water supply which is based on the following assumptions:

- Demand forecasts are based on the adopted demand management programme.
- The current water take consents for the Eastern, Central and Hamurana Kaharoa areas will be renewed without any reduction from the current abstraction limits.
- Additional capital investment to develop new source will be required if current water takes limits are reduced.
- Universal water metering will not be adopted during the ten year Long Term Plan period unless supported by a strong business case.
- Existing service levels will be maintained.
- Legislation with the three waters reform will have a significant impact on this activity and at a rapid pace.
- We will provide services at the levels forecast in our Water Supply Asset Management Plan and 2021 Long Term Plan.
- Over the next 30 years it is expected that Council's major capital expenditure items include Asset condition - district wide pipe renewal programme
- Infrastructural resilience - Eastern and Central Supply Area improvements to address risk, security of supply and meet future demand.

Figure 14 Water supply expenditure forecasts (inflated)

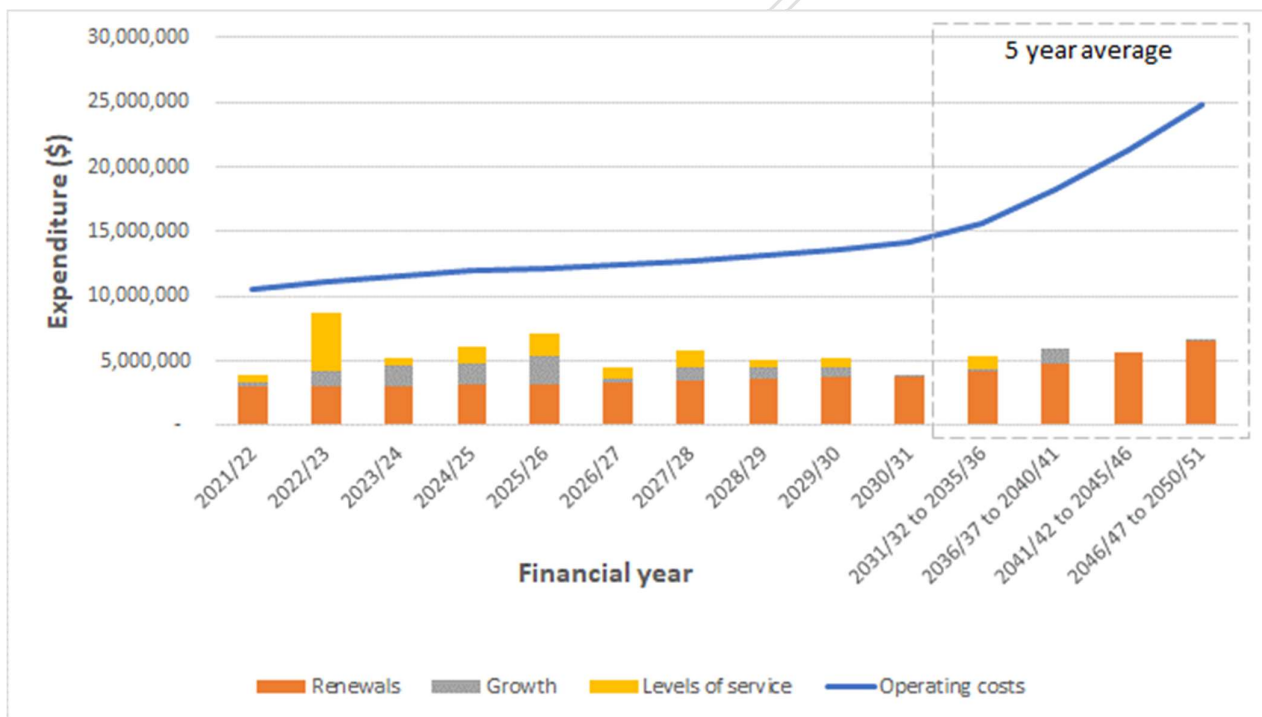
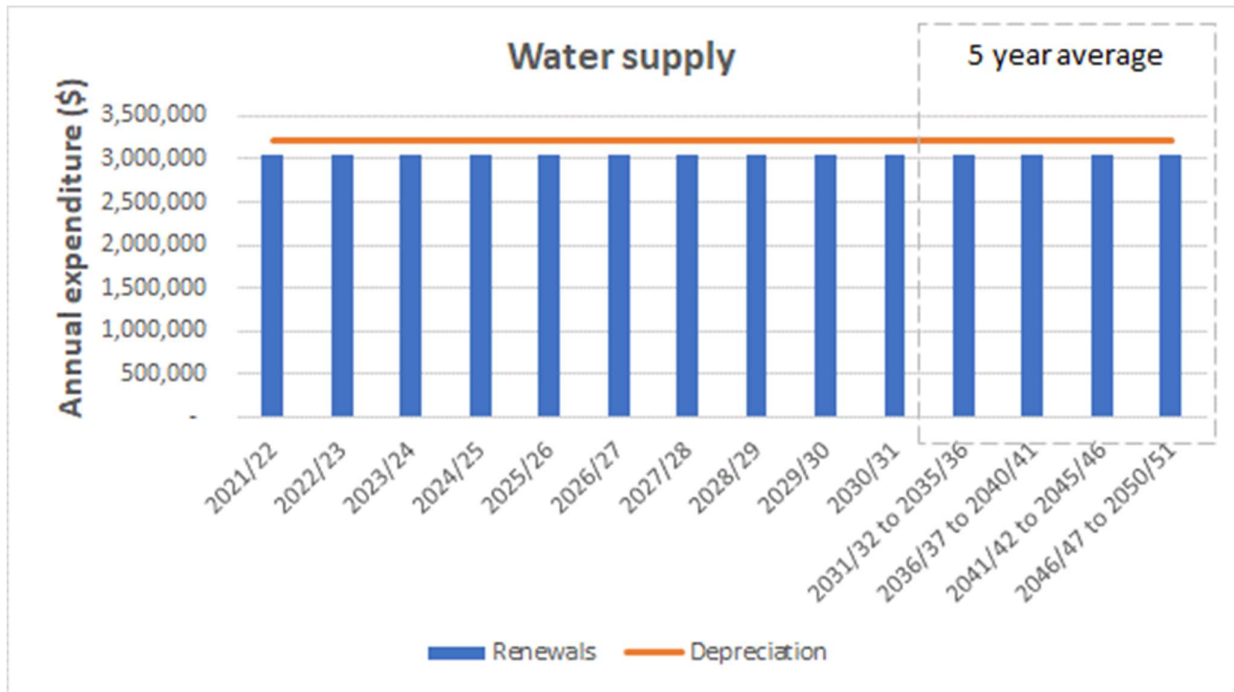


Figure 15 shows that our forecast renewal expenditure of \$3 million per annual is maintained to broadly match the annual depreciation of \$3.2 million.

Figure 15 Water supply renewals versus depreciation (uninflated)



5.2.5 Funding this activity

Council funds its water supply activity through:

- uniform annual charge for unmetered properties (included with the property rate charges)
- volume charge for metered properties (where meters are installed) based on the actual volume of water consumed.

5.3 Wastewater

5.3.1 Background

We are responsible for the collection, treatment and disposal of wastewater from the three urban areas of Rotorua (Ngongotahā, city and eastern suburbs) as well as some rural lakeside communities. The public wastewater network of approximately 405km of gravity mains and 150km of rising mains that protect the community's public health and the receiving environments from the effects of wastewater and by-products. Two wastewater treatment plants service properties through approximately 22,696 connections.

Resource consents are required for discharging into water bodies and onto planted forestry and are issued by the Bay of Plenty Regional Council. The main purpose of a consent is environmental protection and is driven by the Resource Management Act. These consents are subject to requirements that restrict the volume of water that can be discharged and stipulate the water quality parameters the discharged water must meet.

5.3.2 Strategic wastewater challenges

Renewing infrastructure

We have limited information available for the current state of our underground assets and this is a focus in the short to medium term. We are surveying our critical below ground wastewater assets in the short to medium term (about 20% of our pipelines). The assessment programmes are being accelerated through our long-term contractor. A renewal programme will then be developed, and a significant capital investment programme is expected. We also need to formally understand the asset condition of our above ground assets (such as treatment plants, rising mains, and pump stations) as these are our critical assets.

Providing for growth and changes to levels of service

Resource consents

RLC, Te Arawa Lakes Trust and CNI Iwi Holdings have agreed to work together towards a new long-term solution for discharge of wai tātari (recovered wastewater) from the Rotorua Wastewater Treatment Plant. Currently, the treated effluent from the plant is irrigated to pass through the land in Whakarewarewa Forest before the groundwater discharges to Lake Rotorua to protect the lake water quality. Discharging through irrigation of Whakarewarewa Forest is no longer viable as a sustainable option for several reasons including cultural concerns. We are working with iwi on a solution that is culturally acceptable, including developing alternative solutions if necessary.

The three parties have Kawenata (a partnership agreement) to find the right outcome for mana whenua and the wider Rotorua community. The kawenata has been guided by Te Tūāpapa o ngā Wai o Te Arawa (Te Arawa Cultural Values Framework) and under the agreement, the parties will work together to develop a long-term solution.

The parties have agreed to a Sustainable Forest Approach that will include upgrading the Rotorua Wastewater Treatment Plant, and the medium-term continuation of discharging treated wastewater in Whakarewarewa Forest – though modified in a more culturally appropriate and environmentally sustainable way than the current system.

Although an agreement has been reached, there are still major milestones to be achieved for the long-term solution for discharge of wai tātari from the Rotorua Wastewater Treatment Plant. These milestones will not be known prior to finalising the 2021 Long Term Plan due to the complexity and scale of wastewater treatment. The costs in the 2021 Infrastructure Strategy are high level and therefore indicative and provided for completeness.

The key milestones for the treatment plant upgrade and Sustainable Forest Approach workstreams are (independent of each other):

- Treatment plant upgrade:
 - Secure the resource consent for the construction of the plant (expected in mid-2021)
 - Confirm design and construction cost for the upgrade with our long term contractor (expected in late 2021)
 - Undertake the construction, testing and commissioning of the plant (over four years)
- Sustainable Forest Approach:
 - Collaborate with iwi on the final form of the forestry discharge (may overlap resource consent process)
 - Secure the bridging consent of five years to continue with current spraying regime
 - Secure the resource consent for the preferred Sustainable Forest Approach option
 - Undertake the construction, testing and commissioning of the preferred option (over three year period)

The upgraded Rotorua Wastewater Treatment Plant and new discharge point is expected to be undertaken over a five year period (i.e. from July 2021 to 2026).

Lake water quality

The Rotorua Te Arawa Lakes are important for our District, regionally and nationally. They are often known as the jewels in the crown. They are also important to iwi historically and traditionally but also for the future. They are recognised for the future wealth they can bring to the region.

Due to the significance of the lakes, the Rotorua Te Arawa Lakes Strategy has been developed with partner organisations Te Arawa Lakes Trust and Bay of Plenty Regional Council for a holistic and integrated management approach, and as the platform for co-management.

The communities of Lake Tarawera, Lake Rotoehu (Kennedy Bay and Otautu Bay), Ngamotu and Mamaku are currently serviced by private wastewater systems. They are at risk of polluting our lakes. The new East Rotoiti / Rotomā Wastewater Treatment Plant has capacity to cater for additional demand (Lake Rotoiti and Rotoehu communities). The Lake Tarawera community may require a public scheme to be installed to protect the lake water quality as well as provide public health protection.

Servicing growth

We service growth in the following three ways:

- Installing bulk infrastructure for new development areas
- Extending services areas
- Servicing other sewerage scheme areas with Council reticulation and treatment plants with initial focus on the communities of Lake Tarawera, Lake Rotoehu and Mamaku (as noted above).

There is pressure for Council to service other small communities / villages currently serviced by private wastewater systems. This includes the private scheme at Kainga Ora village which was previously a forestry housing settlement.

Long term wastewater approach

There are significant wastewater challenges driven by higher future consent requirements, environmental protection, Government's freshwater reform programme coupled with growth which will require significant investment. To address the significant wastewater issues that we are facing, we have entered into a long term contract with an experienced operator as a partner to manage the asset risks and provide cost certainty.

Future challenge - Lake Rotorua nutrient management

The Bay of Plenty Regional Council's Lake Rotorua Nutrient Management Proposed Plan Change 10 introduces rules to limit the amount of nitrogen entering Lake Rotorua from land use. The rules will affect rural properties in the Lake Rotorua Catchment as well as our Rotorua Wastewater Treatment Plant.

Lake Rotorua can cope with 435 tonnes of nitrogen a year from all sources in the catchment (urban and rural areas). The 435 tonnes have been shared and the Rotorua Wastewater Treatment Plant was given a Nitrogen Discharge Allocation of 30 tonnes, for the 2001 to 2003 benchmark period.

Our existing plant and land treatment system typically removes up to 370 tonnes of nitrogen a year. Increased volumes of stormwater and groundwater into our wastewater system reduces the treatment plant's ability to effectively remove nitrogen. After the proposed upgrade, the Rotorua Wastewater Treatment Plant will have increased ability to remove nitrogen and is anticipated to remove up to 450 tonnes of nitrogen a year by 2051.

Low levels of nutrients are returned to our environment even with best wastewater treatment practices. By 2031, the nitrogen discharged to the lake will be around 34.7 tonnes in an average rainfall year (41 tonnes in a high rainfall year). By 2051, the nitrogen discharged to the lake will be around 39 tonnes in an average rainfall year.

To protect lake water quality, we need to ensure the total load of nitrogen to the lake from all sources does not increase. As our population grows, we need to offset the increasing level of nitrogen discharged from the treatment plant with an equivalent reduction elsewhere. There are a number of ways we can achieve this:

- Buying, acquiring or transferring nitrogen discharge allocations.
- Actions to directly reduce the nitrogen entering the lake.

We are investigating charging an environmental fee (or a transfer of nitrogen in lieu of payment) that will be used to offset the increasing load of nitrogen in the treatment plant discharge as the population and community grow. The proposed environmental fee is still under discussion.

5.3.3 Significant issues and options

Significant issues for the wastewater activity and principal options for managing these issues are detailed in the following table. The option preferred as the most likely scenario has been identified and when Council expects significant decisions will be required.

Table 14 Significant issues and options for wastewater

Significant wastewater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
Implications of the Government's Three Waters Reform including strengthening the stewardship of wastewater and stormwater with regional councils remaining primary regulators, and changes to the Water Services Delivery Models.	1. Continue with water services remaining in house.	- There are likely to be increased costs to address health / safety concerns / issues from Taumata Arowai - This will be resourced through existing budgets - Not eligible for funding through Government's three waters reform programme - Government may force amalgamation for councils that do not collaborate regionally		✓ Current budgets are known (\$165m for capital projects for 10 years inflated)	✓ Current budgets are known (\$100m for capital projects for 10 years inflated)	✓ Current budgets are known (\$102m for capital projects for 10 years inflated)	H
	2. Explore aggregation at regional / sub regional level with neighbouring councils to determine best service delivery model and be eligible for the Government's funding package.	- Costly to set up water Council Controlled Organisation but will be eligible for central government funding - A dedicated water Council Controlled Organisation with no other competing priorities will be expected to better prioritise investment decisions across the region leading to better environmental and community outcomes than the Councils can individually achieve - Potentially loss of community involvement in water decisions - Council needs to opt into reform programme to be eligible for funding		✓ Higher level estimates from industry of reduction in capital programme with aggregation (1.25% reduction per year, indicative estimated cost \$2m reduction in capital programme over 10 years in real terms)	✓ Reduction in capital programme with aggregation (indicative estimated cost \$900k reduction in capital programme over 10 years in real terms)	✓ Reduction in capital programme with aggregation (indicative estimated cost \$650k reduction in capital programme over 10 years in real terms)	H

Significant wastewater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
	3. Maintain a watching brief on the Government's Three Waters Reform Programme and evaluate other options as information becomes available.	- Central government may force amalgamation for councils that do not aggregate regionally - Implications from water reforms on service delivery including the impact of Taumata Arowai and changes to legislation are still unfolding and happening at a rapid pace	Option 3 is preferred as the most likely scenario - Continue to keep watching brief to understand the best service delivery option for our community. Decision required by Council – Decision on participating in reforms and preparation for the formation of water services entities expected from late 2021 to 2023 (legislation is still being passed).	✓ Current budgets are known (\$165m for capital projects for 10 years inflated)	✓ Current budgets are known (\$100m for capital projects for 10 years inflated)	✓ Current budgets are known (\$102m for capital projects for 10 years inflated)	H
Expectations from stakeholders, regulator, and iwi for continued compliance to the standard / consent for the lake water quality.	1. Continue to meet existing resource consent conditions long term to keep within consented water quality limits to minimise the impact of the treated effluent discharged from the wastewater treatment plants.	- Meets current minimum resource consent requirements - May not result in substantial positive environmental improvements - Unlikely to receive long-term resource consent on the current terms		✓ Current budgets are known (part of wastewater operational activity budget about \$200k pa)	✓ Current budgets are known (part of wastewater operational activity budget about \$200k pa)	✓ Current budgets are known (part of wastewater operational activity budget about \$200k pa)	M
	2. Continue to implement the Rotorua Te Arawa Lakes Strategy with partner organisations Te Arawa Lakes Trust and Bay of Plenty Regional Council for a holistic and integrated management approach.	- Better alignment with Māori values and community aspirations - Meets longer term vision for the lakes as set out in the Rotorua Te Arawa Lakes Strategy - Improves lake water quality	Option 2 is preferred as the most likely scenario - Continue to implement the Rotorua Te Arawa Lakes Strategy with the partner organisations. Decision required by Council – This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.	✓ Current budgets are known but solution still to be agreed upon with consenting process; \$60m for Rotorua Wastewater Treatment Plant upgrades and Sustainable Forest Approach; \$22.5m for Tarawera wastewater scheme; indicative estimated cost \$6m	✓ Current budgets are known (about \$200k pa for ongoing support)	✓ Current budgets are known (about \$200k pa for ongoing support)	M

Significant wastewater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
				to \$8m+ for Rotoehu wastewater scheme			
Information on wastewater asset condition is limited.	1. Continue to respond reactively to any defects / asset failures and use age as the basis for the planned renewal programmes.	- Wastewater asset failures may become unacceptable and result in public health and / or environmental pollution issues due to overflows - The wastewater renewal backlog may become unacceptable - There is significant proportion of underground wastewater assets of asbestos concrete material and similar age that may fail in a short timeframe		✓ Budget impacts are known short to medium term (\$9.8m operational costs pa in total to respond)	✓ Budget impacts may be significant in the medium term (\$10.5m+ operational costs pa in total to respond)	✓ Budget impacts may be significant in the long term (\$11.5m+ operational costs pa in total to respond)	H
	2. Undertake condition surveys (CCTV) of critical below ground and above ground assets as scheduled in the long term contract.	- Critical and aged asbestos concrete pipelines replaced before failure - Minimises public health and environmental risks to an acceptable level consistent with industry best practice - The replacement of critical assets (above and below) is risk based and planned to ensure adequate funding available and time to implement - Condition data is available, analysed and used to develop risk based renewal programmes - The non-critical wastewater assets still achieve the service levels	Option 2 is preferred as the most likely scenario - Undertake condition surveys of critical below ground assets with accelerated programme. Undertake condition surveys of critical above ground assets as scheduled. Decision required by Council – Trility have been engaged by RLC. CCTV survey is part of Trility's contract scope and will be the main basis for pipe replacement.	✓ CCTV surveys are part of the Trility contract (about \$250k to \$350k pa)	✓ (about \$200k pa)	✓ (about \$200k pa)	M
	3. Undertake condition surveys of all wastewater assets (critical and non-critical / above and below assets).	- Assets are replaced before they fail repeatedly but not linked to risk or service levels - Additional operational expenditure required for assessments		✓ Budget impacts may potentially be significant (about \$750k to \$1m pa)	✓ Budget impacts may potentially be significant (about \$750k to \$1m pa)	✓ Budget impacts may potentially be significant (about \$750k to \$1m pa)	M

Significant wastewater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
Implications of the Bay of Plenty Regional Council's Proposed Plan Change 10	1. Buying, acquiring or transferring Nitrogen Discharge Allocations.	- Requires proposed environmental fee to be accepted in the community - Directly links polluter and land use development with funding environmental improvements - Polluter pays principle still relatively new nationally	Option 1 is preferred as the most likely scenario (and longer term) - Buy, acquire or transfer Nitrogen Discharge Allocations funded by the proposed environmental fee. Decision required by Council – This approach may be contentious with the community. Expected full Council decision will be required in 2022 to 2024.	✓ Options for charging proposed environmental fee still to be agreed and adopted; Develop policy internally and engagement process (about \$200k); then implement policy at about \$200k pa initially	✓ Ongoing implementation of policy at about \$20k pa	✓ Ongoing implementation of policy at about \$20k pa	H
	2. Actions to directly reduce the nitrogen entering the lake.	- May take time to implement and see tangible outcomes with lake water quality improving - Involves various stakeholders - May not reduce the total load of nitrogen into lake - Eliminates pollution at source rather than mitigation options - Better alignment with iwi values and community aspirations		✓ May require parties external to Council to action; Rotorua Treatment Plant upgrade \$60m will reduce; Council will enforce through trade waste compliance (about \$100k pa)	✓ Council will enforce through trade waste compliance (about \$100k pa)	✓ Council will enforce through trade waste compliance (about \$100k pa)	H
Limited strategic planning to enable growth on the city fringes.	1. Continue with ad hoc planning approach for wastewater provision in growth areas based on Spatial Plan.	- Bulk infrastructure is not planned to meet current or future demand, or sequenced - Spatial Plan not based on the latest demand projections (used for 2018 Long Term Plan) - District is unattractive for developers as Council difficult to work with - Development occurs ad hoc		✓ Low cost from existing resources and budgets (about \$250k pa for minor capital projects)	✓ Low cost from existing resources and budgets (about \$250k pa for minor capital projects)	✓ Low cost from existing resources and budgets (about \$250k pa for minor capital projects)	H
	2. Use the Wastewater Master Plan to guide long term planning and	Bulk infrastructure is planned holistically	Option 2 is preferred as the most likely	✓	✓	✓	M

Significant wastewater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
	the capital works programme to address current and future demand for enabling sustainable development.	– Based on realistic forecast of development, where it will likely occur and when	scenario - Implement and use the Wastewater Master Plan to guide long term planning and the capital works programme. Decision required by Council – This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.	(about \$38.2m in total for growth capital projects)	(about \$25m in total for growth capital projects)	(about \$5m estimated in total)	

5.3.4 Wastewater expenditure forecasts

Figure 16 presents the expenditure forecast for wastewater which are based on the following assumptions:

- The Government's freshwater reforms to improve ecological health will require a higher environmental standard.
- The conditions and cost implications of the future resource consents for the Rotorua Wastewater Treatment Plant are uncertain.
- The Rotorua Wastewater Treatment Plant upgrade and Sustainable Forest Approach costs are indicative as some workstream elements (including resource consents) are still to be secured and therefore the final design and extent of the upgrade and preferred option (for the Sustainable Forest Approach) are not yet known.
- Legislation with the three waters reform will have a significant impact on service delivery for this activity and at a rapid pace.
- We will work towards offsetting the increasing level of nitrogen discharged from the Rotorua Wastewater Treatment Plant through Nitrogen Discharge Allocations.
- Effective inflow and infiltration management will be achieved through ongoing detection and reduction strategies employed by our long term contractor, and policy direction on private laterals established.
- We will provide services at the levels forecast in our Wastewater Asset Management Plan and 2021 Long Term Plan.

Over the next 30 years it is expected that Council's major capital expenditure items include:

- Upgrade of Rotorua Wastewater Treatment Plant and Sustainable Forest Approach to meet higher environmental standards and growth in the District in the first five years of this strategy (\$60 million)
- Installing new public schemes for the communities of Lake Tarawera, Lake Rotoehu (Kennedy Bay and Otautu Bay), Ngamotu and Mamaku
- District wide pipe renewal programme to initially address the critical gravity mains in poor condition the replace assets as they deteriorate
- Bulk infrastructure to service future growth areas in central, eastern and western network zones and infill areas and to support the Homes and Thriving Communities Strategic Framework.

Figure 16 Wastewater expenditure forecasts (inflated)

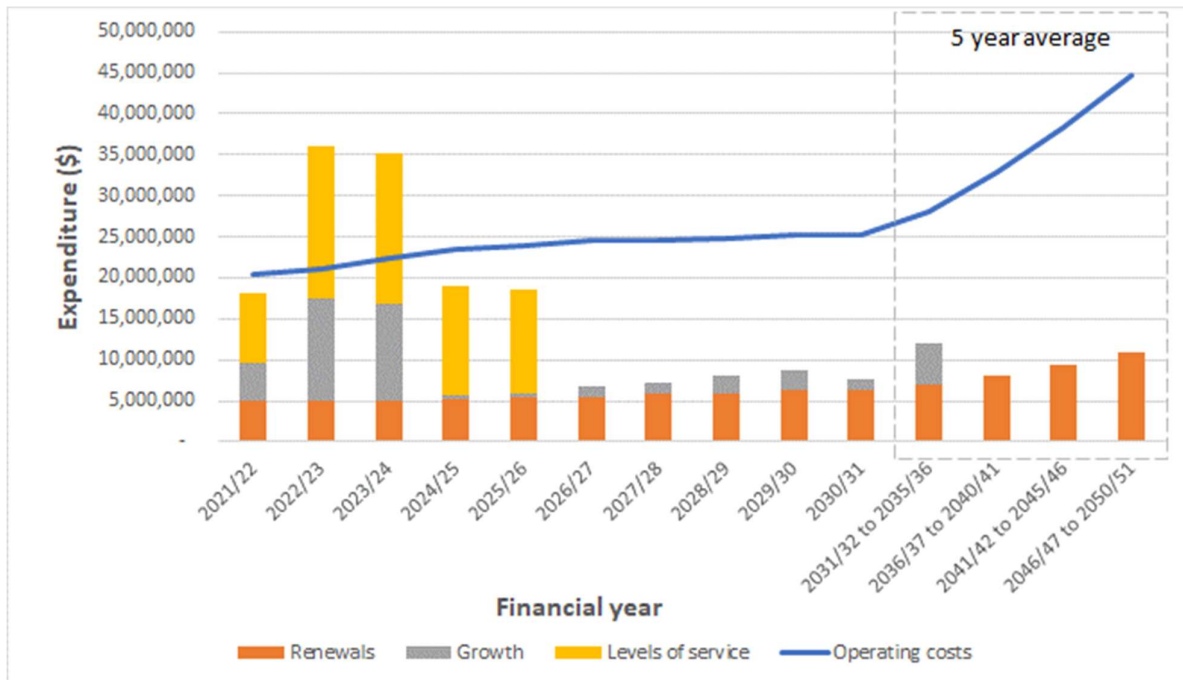
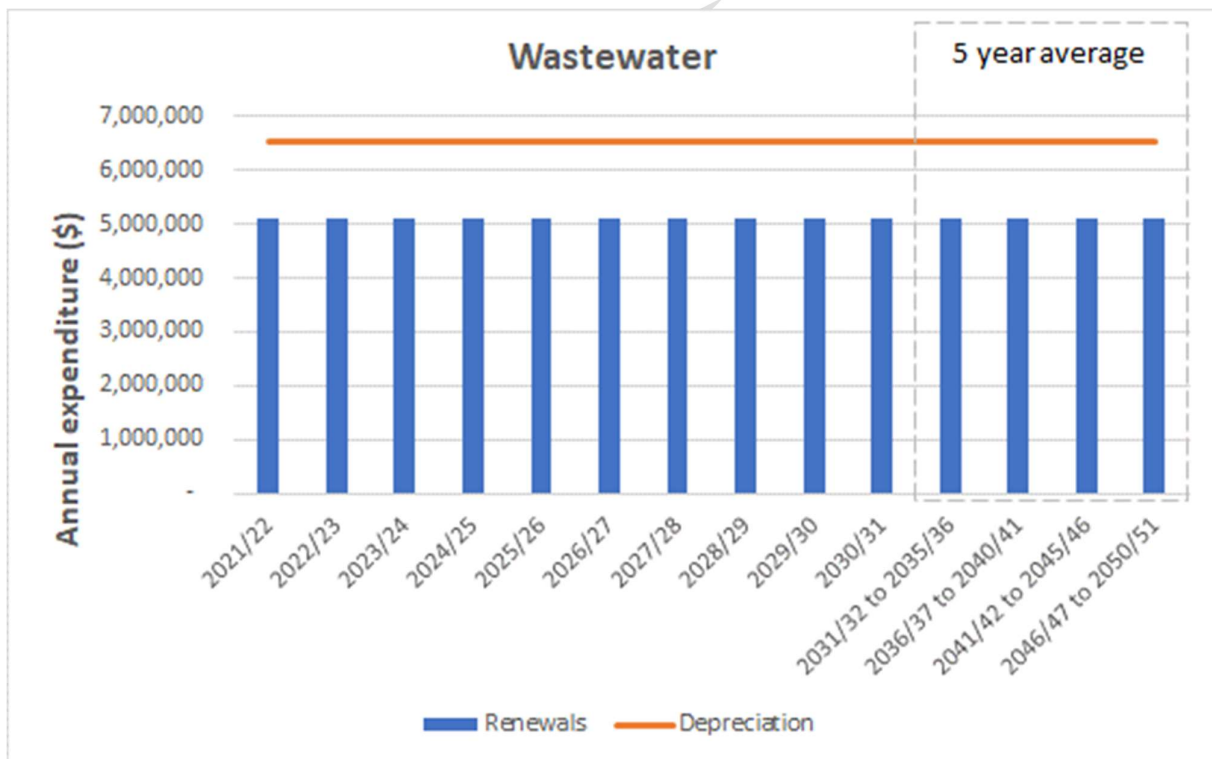


Figure 17 shows that our forecast renewal expenditure of \$5.2 million per annum is slightly less than the annual depreciation of \$6.5 million. We expect that this gap will reduce as we collect better data on the state of our wastewater assets and develop condition-based renewal programmes.

Figure 17 Wastewater renewals versus depreciation (uninflated)

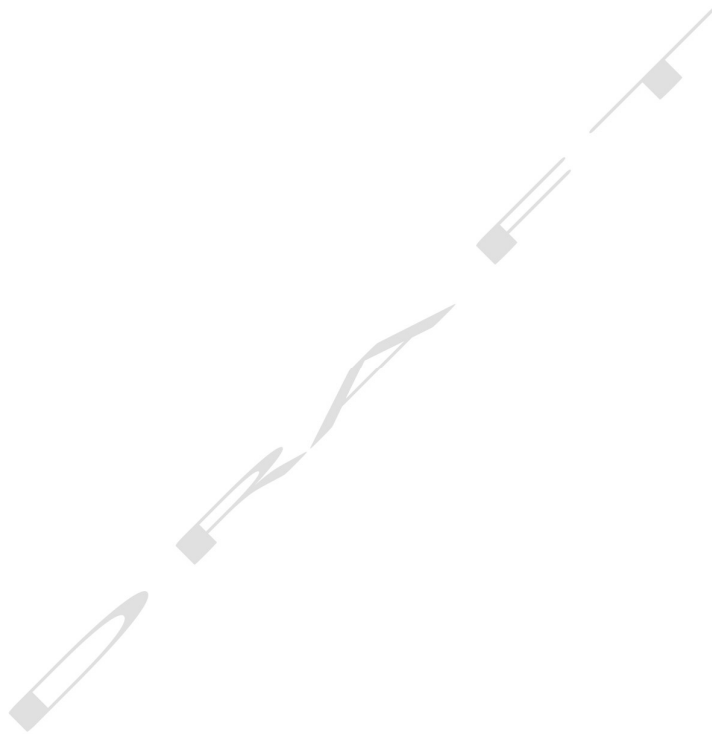


5.3.5 Funding this activity

Council funds its wastewater activity through:

- targeted rate for sewerage disposal based on a per pan charge in urban serviced areas

- separate targeted rates for the capital costs for connected properties in defined rural areas
- trade waste fees and charges.



5.4 Stormwater

5.4.1 Background

Stormwater is the runoff of rainwater which requires management and disposal using various drainage systems. The stormwater activity protects people and property from flood damage. It also minimises the adverse effects of stormwater discharges into the lakes and waterways of the district. We are responsible for 284km of urban reticulated pipelines and 153km of open drains.

There is stormwater reticulation servicing the three urban areas of Rotorua (Ngongotahā, city and eastern suburbs). The stormwater activity also includes the Reporoa land drainage scheme which serves the farming community.

5.4.2 Strategic stormwater challenges

Asset information and knowledge

Traditionally the stormwater activity is mainly a reactive service compared to water supply and wastewater activities. We have limited asset condition information and knowledge of our stormwater network. Condition surveys have generally only been undertaken in response to an issue. We intend to move to a programme of planned condition surveys to help us better understand the state of our stormwater assets.

Providing for growth and changes to levels of service

Resource consents

The Comprehensive Stormwater Resource Consent for the urban areas has been lodged with the Regional Council but has not been approved. At this stage we do not know what the minimum discharge standards will be. This will be influenced by the Government's suite of freshwater reforms to improve the freshwater ecological health. We know that there will be higher requirements than we currently have including comprehensive reporting. This will require us to be more proactive in stormwater management than our current practices.

Servicing growth areas

Although our population is projected to continue growing, stormwater demand is linked indirectly to population growth with the creation of impervious or paved surfaces. This is not a linear relationship. Demand for stormwater infrastructure is directly related to the creation of imperviousness and rainfall.

We do know that the existing stormwater systems at the bottom of catchments cannot cope with the effects of growth in urban areas (brownfield and greenfield development). These stormwater assets are undersized, and any additional paved surfaces may result in localised flooding.

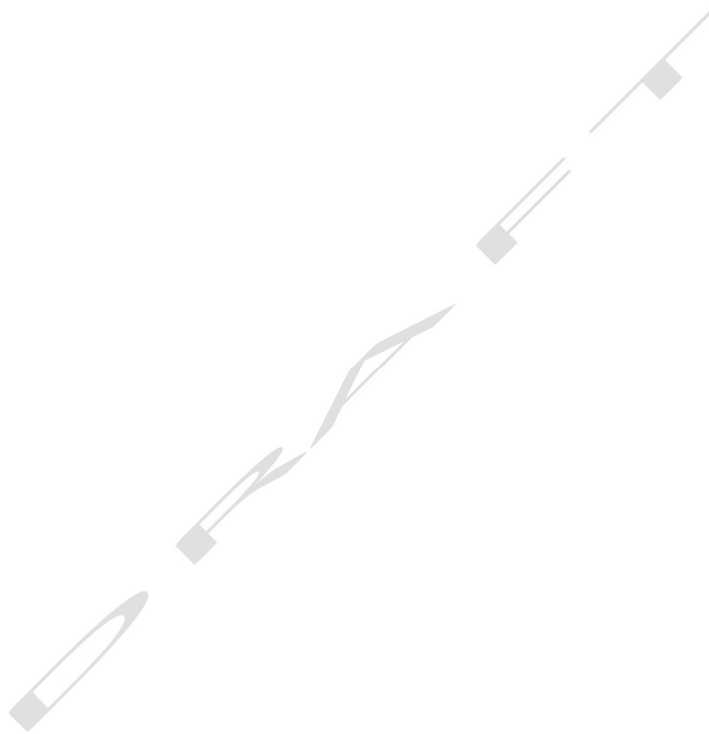
We will need to invest more in bulk stormwater infrastructure to enable development and cater for increased scale and severity of rain events due to climate change impacts. We are developing a Stormwater Master Plan (similar to water supply) to ensure that we make cost effective investment decisions and install bulk infrastructure at the right location, at the right size and at the right time.

The Rotorua Stormwater Masterplan is being prepared for the eastern and western parts of Rotorua where most of the development is expected to occur. The objectives of the masterplan are to:

- bring together and build on prior flood studies
- identify integrated flood management solutions to facilitate future urban growth
- consideration of practical solution to address existing system deficiencies where possible (result of changing design standards and/or previously approved developments without providing appropriate additional system capacity)
- identify water quality treatment opportunities where practical.

Managing risk and asset performance

There was a major storm event on 29 April 2018 in Rotorua District. Although there was flooding throughout the district, the Ngongotahā catchment experienced severe flooding. We will need to further invest in stormwater infrastructure for the Ngongotahā and the other impacted catchments to mitigate the risk and effects of future flood events and ensure public safety.



5.4.3 Significant issues and options

Significant issues for the stormwater activity and principal options for managing these issues are detailed in the following table. The option preferred as the most likely scenario has been identified and when Council expects significant decisions will be required.

Table 15 Significant issues and options for stormwater

Significant stormwater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
Implications of the Government's Three Waters Reform including strengthening the stewardship of wastewater and stormwater with regional councils remaining primary regulators, and changes to Water Services Delivery Models. The initial focus for the three waters reforms for stormwater will be collecting performance information as relatively limited data currently exists and promoting best practice. The Government may also set minimum standards for stormwater discharges after the initial phase of collecting performance information.	1. Continue with water services remaining in house.	– This will be resourced through existing budgets – Not eligible for funding through Government's three waters reform programme – Government may force amalgamation for councils that do not collaborate regionally		✓ Current budgets are known (\$79m for capital projects for 10 years inflated)	✓ Current budgets are known (\$101m for capital projects for 10 years inflated)	✓ Current budgets are known (\$102m for capital projects for 10 years inflated)	H
	2. Explore aggregation at regional / sub regional level with neighbouring councils to determine best service delivery model and be eligible for the Government's funding package.	– Costly to set up water Council Controlled Organisation but will be eligible for central government funding – A dedicated water Council Controlled Organisation with no other competing priorities will be expected to better prioritise investment decisions across the region leading to better environmental and community outcomes than the Councils can individually achieve – Potentially loss of community involvement in water decisions – Council needs to opt into reform programme to be eligible for funding		✓ Higher level estimates from industry of reduction in capital programme with aggregation (1.25% reduction per year, indicative estimated cost \$1m reduction in capital programme over 10 years in real terms)	✓ Reduction in capital programme with aggregation (indicative estimated cost \$1.3m reduction in capital programme over 10 years in real terms)	✓ Reduction in capital programme with aggregation (indicative estimated cost \$1.3m reduction in capital programme over 10 years in real terms)	H
	3. Maintain a watching brief on the Government's Three Waters Reform Programme and evaluate other options	– Central government may force amalgamation for councils that do not aggregate regionally – Implications from water reforms on service delivery including the impact of Taumata Arowai and changes to legislation are still	Option 3 is preferred as the most likely scenario - Continue to keep watching brief to understand the best	✓ Current budgets are known (\$79m for capital projects	✓ Current budgets are known (\$101m for	✓ Current budgets are known (\$102m for capital projects	H

Significant stormwater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
	as information becomes available.	unfolding and happening at a rapid pace	service delivery option for our community. Decision required by Council – Decision on participating in reforms and preparation for the formation of water services entities expected from late 2021 to 2023 (legislation is still being passed)	for 10 years inflated)	capital projects for 10 years inflated)	for 10 years inflated)	
The implications of the National Policy Statement for Freshwater Management 2020 on RLC's water quality improvements. This will dictate the re drafting of the Regional Policy Statement and will be the basis for assessing our Comprehensive Stormwater Resource Consent applications and setting conditions.	1. Negotiate with the Regional Council to ensure the conditions are similar to the lodged application.	- Consent requirements are understood and budgeted for - May not achieve good environmental outcomes - Potentially not meet new requirements of the National Policy Statement for Freshwater Management 2020		✓ Current budgets are known (about \$50k to \$100k pa)	✓ Current budgets are known (about \$50k to \$100k pa)	✓ Current budgets are known (about \$50k to \$100k pa)	H
	2. Develop evidence based strategy and programmes to be more proactive in stormwater quality than our current practices, aligned with the new requirements.	- Meets longer term vision for the lakes as set out in the Rotorua Te Arawa Lakes Strategy - Improves freshwater quality - Achieves good environmental outcomes but may not be immediate - There may ongoing operational costs that need to be considered as well as capital before adopting this approach - Aligned to the new requirements - Supports Council's vision of enhanced environment and protects the unique character of Rotorua	Option 2 is preferred as the most likely scenario - Develop evidence based strategy and programmes to be more proactive in stormwater quality. Decision required by Council – Strategy will be expected to be adopted by Council in the medium term (2024/25 to 2025/26).	✓ Strategy development including data consolidation about \$200k for external support; Stormwater quality capital improvements about \$0.5m pa	✓ Stormwater quality capital improvements indicative estimated costs \$0.5m to \$1m pa	✓ Stormwater quality capital improvements indicative estimated costs \$0.5m to \$1m pa	H

Significant stormwater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
Significant challenges with addressing the flooding in the existing area of the Ngongotahā Catchment and other impacted urban catchments after the major April 2018 storm event.	1. Continue to respond reactively to flood events and manage operationally.	- Politically unacceptable at local, regional, and national levels - Potential risk to life - High level of property damage - Local communities disrupted - Unaffordable for community to address as not planned for - Does not allow time to adapt and / mitigate to climate change effects		✓ Budget impacts may be significant after a major flood event; about \$0.5m pa for minor capital and \$3m pa for service level improvements including capacity	✓ Budget impacts may be significant in the medium term if analysis requires greater investment; indicative estimated costs \$5m+ pa	✓ Budget impacts may be significant in the long term if analysis requires greater investment; indicative estimated costs \$5m+ pa	H
	2. Continue to develop Comprehensive Flood Risk Management Plan collaboratively with the Regional Council, iwi, key stakeholders, and the community (as recommended by the independent panel).	- Identifies predicted habitable floors that may flood in future district wide and how Council will mitigate this (may not necessarily be large pipe solution) - Effect of climate change on stormwater infrastructure can be planned long term	Option 2 is preferred as the most likely scenario - Continue to develop Comprehensive Flood Risk Management Plan to help better understand predicted habitable floor flooding. Decision required by Council – This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.	✓ \$5m over ten years for addressing local flooding issues only.	✓ \$5m over ten years for addressing local flooding issues only	✓ \$5m over ten years for addressing local flooding issues only	H
	3. Develop an Emergency Management Plan, in conjunction with the community, including clearly understood and communicated trigger levels for flood warnings and evacuations (as recommended by the independent panel).	- Coordinates efforts of the different agencies involved - Improved communication and readiness of the community - Improves resilience of people - Supports vulnerable people in the community particularly the elderly - Risk to life minimised	Option 3 is preferred as the most likely scenario - Develop an Emergency Management Plan as a high priority that can be used district wide. Decision required by Council – The Emergency Management Plan will be developed within existing budgets and does not require formal	✓ Low cost from within existing budget (\$50k to \$75k from operational budget; one off cost)	-	-	M

Significant stormwater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
			Council adoption to implement.				
	4. Develop the investment programme to address the high priority flood prone areas in all urban catchment.	– The risks and effects of future flood events are mitigated – There is time to plan and implement flood protection works – Improvement works to ensure public safety (ie risk to life), property damage and disruption to local communities – Effect of climate change on stormwater infrastructure can be planned long term	Option 4 is preferred as the most likely scenario (longer term) - The process and learnings from the extensive flooding in the Ngongotahā Catchment are applied to all urban catchments. Develop investment programmes prioritised district wide using hierarchy of flood mitigation options. Working with Regional Council on options. Decision required by Council – RLC's share of the investment programmes will be presented to full Council for approval as part of the Long Term Plan three yearly cycles (ie 2024, 2028, 2031).	✓ Budget impacts expected to be significant. It is expected that most of the investment will be required on the Regional Council's stormwater network. (indicative cost share \$5m to \$10m in total)	✓ Budget impacts expected to be significant (indicative cost share \$5m to \$10m in total)	✓ Budget impacts expected to be significant (indicative cost share \$5m to \$10m in total)	M Reduces flood risk to acceptable level
	5. Ask private owners to invest in their own flood resilience solutions (i.e. flood readiness plans, ground contouring to prevent the overland flow from entering the house).	– Difficult to enforce – Requires high level of community engagement – May be politically unacceptable – Improves resilience of people instead of hard asset solution – Ongoing operational and development issues to respond to		✓ Low cost from within existing budget (\$15k pa - part of staff costs to enforce / educate)	✓ Low cost (\$15k pa - part of staff costs to enforce / educate)	✓ Low cost (\$15k pa - part of staff costs to enforce / educate)	M
Limited strategic planning to enable growth on the city fringes. Existing stormwater systems at bottom of catchment cannot cope with the effects of growth in	1. Continue with ad hoc planning approach for stormwater provision in growth areas based on Spatial Plan.	– Bulk infrastructure is not planned to meet current or future demand, or sequenced – Spatial Plan not based on the latest demand projections (used for 2018 Long Term Plan) – District is unattractive for developers as Council difficult to work with – Development occurs ad hoc – Flooding is exacerbated with additional		✓ Low cost from existing resources and budgets (about \$250k to \$500k pa for capital growth project)	✓ Low cost from existing resources and budgets (about \$250k to \$500k pa for capital growth project)	✓ Low cost from existing resources and budgets (about \$250k to \$500k pa for capital growth project)	H

Significant stormwater issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
urban areas (brownfield and greenfield development).		impervious areas into existing stormwater networks			growth project)		
	2. Use the Stormwater Master Plan (once completed) to guide long term planning and the capital works programme to address current system deficiencies (where practical) and future demand for enabling sustainable development and mitigate environmental risk from more runoff.	– Bulk infrastructure is planned holistically – Based on realistic forecast of development, where it will likely occur and when – Opportunities to regenerate existing urban areas incorporating water sensitive design and improving amenity values for the community	Option 2 is preferred as the most likely scenario (longer term) - Implement and use the Stormwater Master Plan to guide long term planning and the capital works programme. Decision required by Council – This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.	✓ \$40m for Eastern and Western growth enabling upgrades	-	-	M

5.4.4 Stormwater expenditure forecasts

Figure 18 shows the forecasted expenditure for stormwater which are based on the following assumptions:

- The Comprehensive Stormwater Resource Consent will be impacted by the new requirements of the National Policy Statement for Freshwater Management 2020 through the Regional Policy Statement.
- Legislative and regulatory changes will require stormwater treatment.
- Legislation with the three waters reform will have a significant impact on this activity and at a rapid pace.
- We will continue to replace end of life infrastructure with infrastructure sized to accommodate climate change.
- We will provide services at the levels forecast in our Stormwater Asset Management Plan and 2021 Long Term Plan
- RLC will use the Central Government funding for accelerating the Eastern and Western growth enabling upgrades.

Over the next 30 years it is expected that Council's major capital expenditure items include:

- Stormwater reticulation enhancement to address local flooding
- Stormwater network expansion for Eastern and Western growth enabling upgrades.

Figure 18 Stormwater expenditure forecasts (inflated)

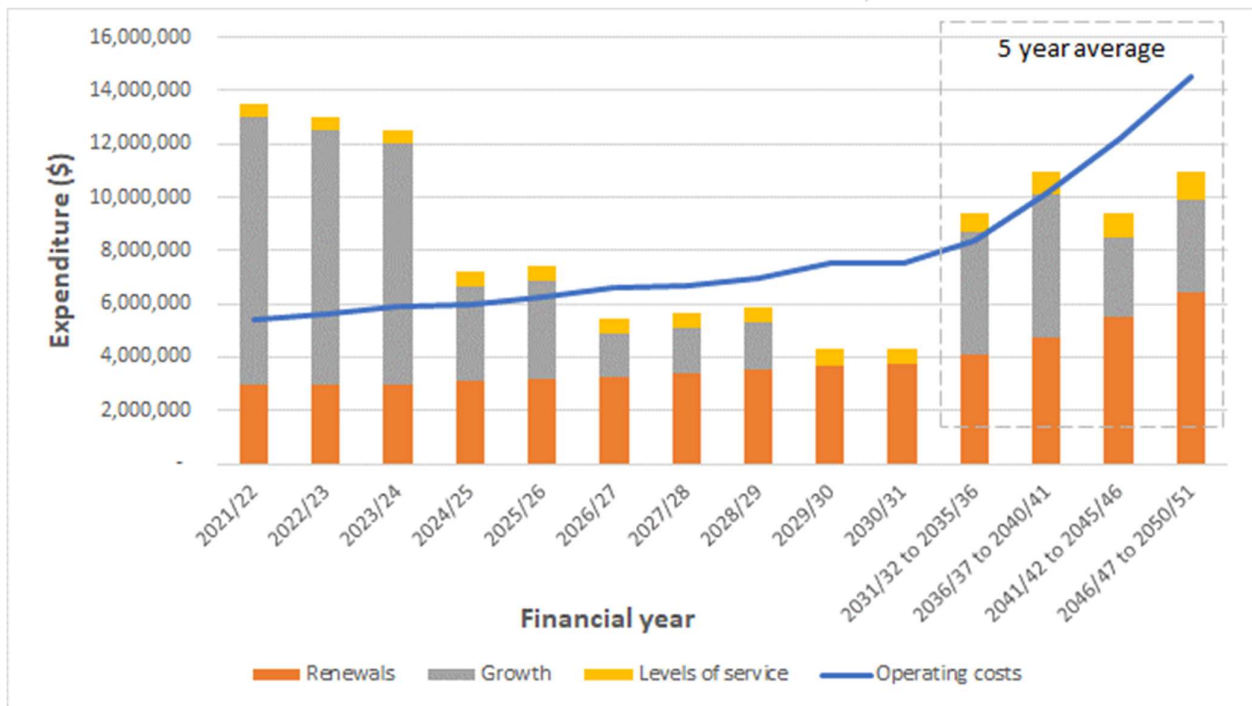
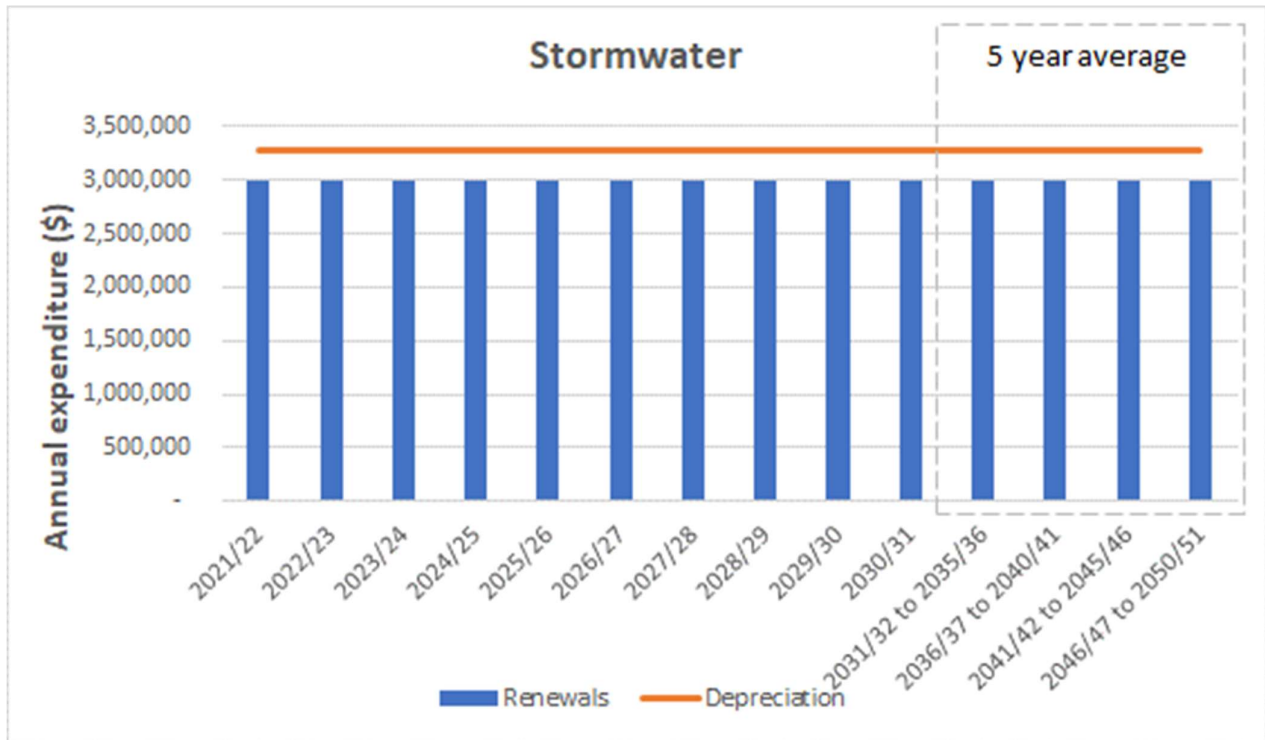


Figure 19 shows that our forecast renewal expenditure of \$3 million per annum is maintained to match annual depreciation of \$3.27 million.

Figure 19 Stormwater renewals versus depreciation (uninflated)



5.4.5 Funding this activity

We fund our stormwater services through the general rates (as a uniform annual general charge). RLC has secured Central Government funding for the Eastern and Western growth enabling upgrades (\$22.5 million for the first three years).

5.5 Land transport

5.5.1 Background

Council owns and manage land transport assets including over 1,000km of roads (sealed and unsealed), 82 road bridges, 385km of footpaths, 43km of shared paths, 5,061 streetlights and 10,555 signs to mention a few. Rotorua is in the heart of the North Island and its transport system plays a key role in connecting the central and upper North Island. Rotorua has key routes that connect primary industry with the Port of Tauranga, is a tourist destination, and provides tourism links to Taupo, Waikato and Auckland. Rotorua Airport is regionally significant and serves both the district's tourism and business sectors.

5.5.2 Strategic land transport challenges

Renewing infrastructure

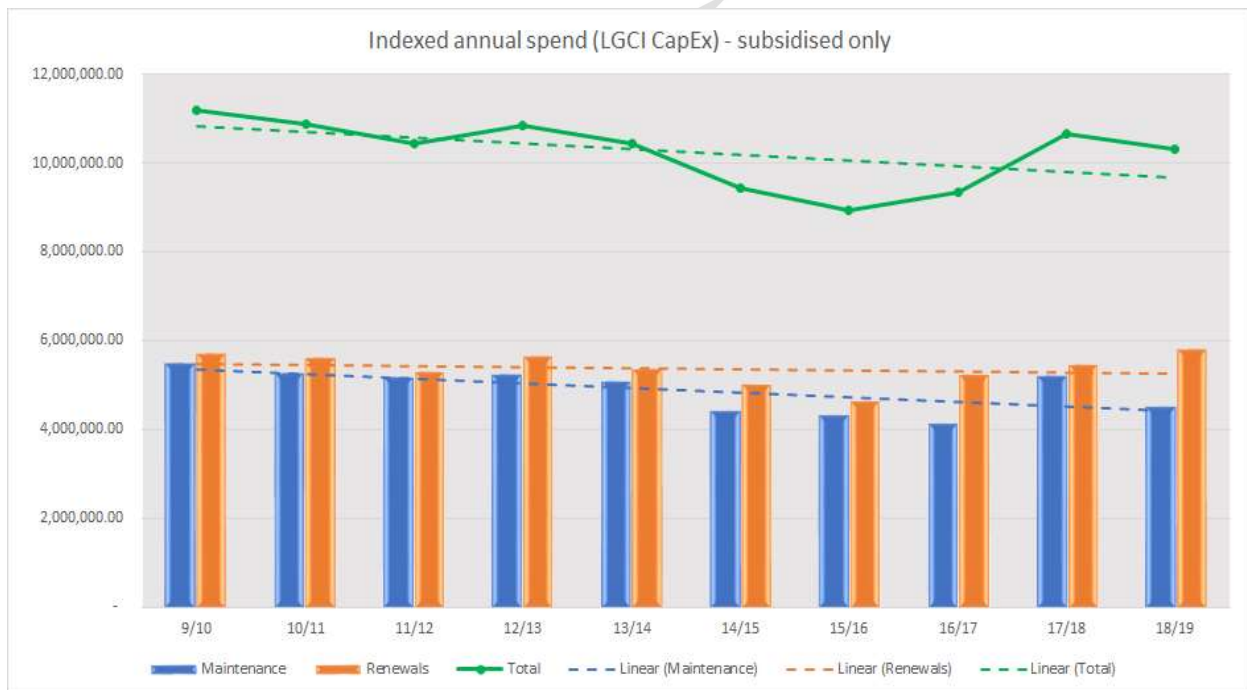
Sustainable investment programmes

Our sealed and unsealed networks have generally maintained condition but need to invest at a sustainable level and cannot accommodate funding reductions. Less than optimum funding levels may result in higher long-term costs.

There has been constant pressure over time to reduce funding particularly operational funding. This will potentially be aggravated by COVID-19. The reduction in funding puts both maintenance and renewal programmes at levels that will not keep pace with the rates of deterioration which will compound over time.

Figure 20 highlights the reduced annual funding for the last ten years. The greatest reduction has been in operational budgets which results in deferred maintenance.

Figure 20 Historical budget trends



Source: RLC's financial data

Impacts of forestry on pavement condition

Increasing logging activity over the last few years has also had a significant adverse impact on our unsealed roading network that was not designed to carry heavy traffic loads. This results in accelerated pavement failures. Government legislation promotes heavier, longer, wider, and higher vehicles to increase freight efficiencies. Our roads typically were historically not designed for the quantity and loading associated with logging haulage.

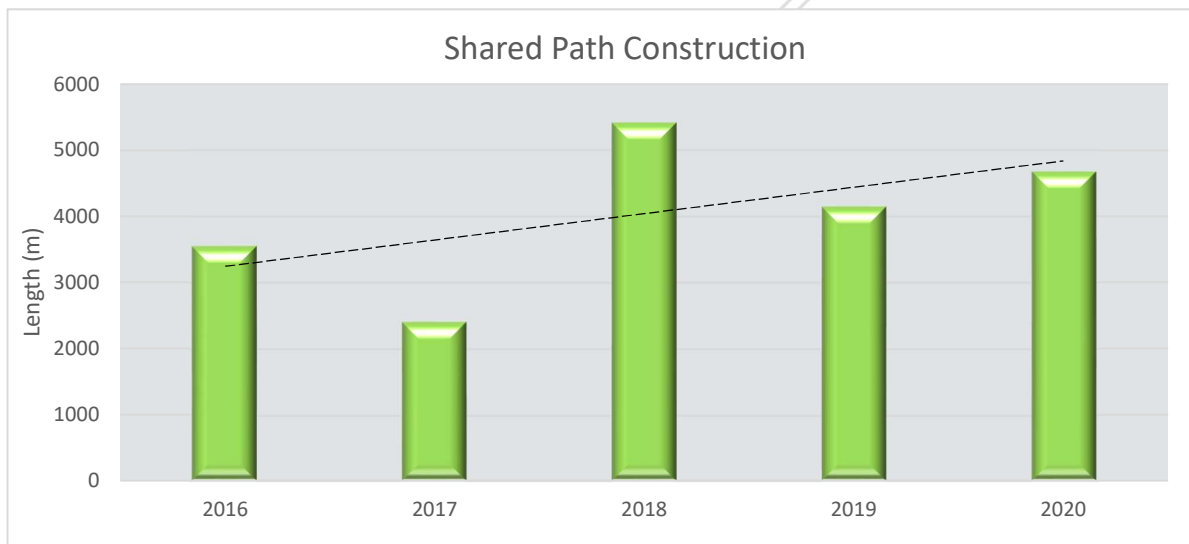
Mode demand

There is strong demand for providing transport infrastructure for multi transport modes especially cycling facilities and mobility access (refer to Figure 21). This comes directly from community groups representing these interests. It also aligns with the step changes outlined in Arataki through 'Transform urban mobility'.

In addition, passenger transport services provide a key transport option for both students and the general public. Patronage numbers for Rotorua CityRide and Murupara / Ruatāhuna bus services has been steadily reducing over time. Users are put off buses as they are perceived to be unreliable and journey times take longer than private vehicles. This adds to the traffic congestion in our city.

We need to reset how we approach mode demand and align with national direction. Mode share is one of the key strategic responses that RLC will invest in. The outcomes of such investments are multi-faceted including improved efficiency, reduced carbon emissions and decarbonised transport, and improved public health. We are developing the Rotorua Modeshift Plan in collaboration between Waka Kotahi, and Bay of Plenty Regional Council. We will continue to invest in expanding our cycle network.

Figure 21 Historical construction of shared and cycle lanes



Source: RLC's RAMM database (as at June 2020)

The Rotorua Modeshift Plan is a strategy to deliver on multi-modal approach. The change of transport modes is supported by data obtained on annual cycle counts. Results show that cycling is up 36% from 2019 results and 81% from the 2016 results.

Changes in legislation and policy

Transport legislation and strategy changes

There are significant changes to legislation that are either planned or underway that will impact the delivery of core infrastructure as outlined in Section 2.2 Significant Issues. The key changes to legislation that impacts the land transport activity includes Road to Zero Strategy, Zero Carbon Act and the new Government Policy Statement on Land Transport (2021) (final September 2020).

The One Network Framework is being developed nationally to provide a common language to reflect the role transport corridors play in the movement of people and freight across all land transport modes, the social spaces they provide and their role in providing access to adjacent land. This will ensure investment decisions are made consistently by local authorities rather than in an ad hoc manner. The network under this framework will be classified under a movement and place dimensions. Council will use the framework to guide its decisions on its transport network in the next Long Term Plan planning round. This will ensure that the transport network is accessible for the community, particularly the aging population.

New standards / regulations

Increases in infrastructure standards, regulations and legislation costs need to be met and adhered to. This has resulted in higher rates and services when the contract was tendered in early 2020. Cost escalations was 13% higher than expected, but in the lower quadrant than experienced from other Local Authorities.

Managing risk and increasing resilience

Rotorua's transport network is critical for the movement of people, goods and services, and for the daily operation and management of utility networks that support the people's wellbeing and the economy. In addition, the local road network provides a key detour route for State Highways when they are not available. Council has, in general, a resilient network that provides alternative transport corridors should an incident or event result in road closure. The one corridor with no alternative route, that potentially could impact on a significant number of people, is Tarawera Road serving the Lake Okareka and Lake Tarawera communities.

Nine bridges were identified as not capable of taking 44 tonnes based on a desktop screening. We will continue to aim for network that meets mass limit rules. Our focus will be to further investigate and strengthen the identified bridges where practical to cope with new mass limit rules.

The Rotorua district has the potential to be affected by several types of natural hazards which need to be considered to ensure resilience is built into our transport routes and increase their reliability. The major hazards that occur fall into two categories of occurrence:

1. High probability events include storms which result in road closures due to flooding, slips and tree fall. These events can compromise access and services.
2. Low probability events include earthquakes and volcanic activity, which while infrequent, have potential to cause significant transport disruption.

The Rotorua district has distinct natural characteristics which makes it known nationally and internationally for its geothermal activity. It is also exposed to variety of natural hazards including earthquakes and volcanic eruptions as noted in Section 3.2. The natural hazards are taken into account when new infrastructure is installed.

5.5.3 Significant issues and options

Significant issues for the land transport activity and principal options for managing these issues are detailed in the following table. The option preferred as the most likely scenario has been identified.

Table 16 Significant issues and options for transport

Significant land transport issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
Safety – Crash trends are increasing and need to keep investing in safety activities, coupled with current practices will not meet the Government's new direction as set out in the Road to Zero Strategy	1. Implementation of current safety initiatives including targeting programmes to address safety issues with a risk-based approach, addressing site issues at specific locations and community education	– May not necessarily assess and prioritise safety risks across the network – Fatal and serious crash numbers are likely to increase with associated costs and impacts on the health system – Not meeting key strategic direction set by the GPS – Negative perception of RLC and its road management		✓ Current budgets are known (\$545k pa for Road Safety Promotion; about \$1.2m+ part of capital projects)	✓ Current budgets are known (\$545k pa for Road Safety Promotion; about \$1.2m+ part of capital projects)	✓ Current budgets are known (\$545k pa for Road Safety Promotion; about \$1.2m+ part of capital projects)	H
	2. Reset RLC's road safety programme so aligned with the Road to Zero Strategy along with safety education programmes and seek increased funding to implement	– Increased funding required – Increased safety for users of the district's transport network – Achieve set KPIs	– Option 2 is preferred as the most likely scenario - Reset RLC's road safety programme so aligned to the Road to Zero Strategy and seek increased funding to implement. – Decision required by Council – Revising the Road Safety Programme is part of ongoing network management	✓ Requires additional LTP and external funding for each individual capital works project (\$545k pa for Road Safety Promotion; about \$1.5m+pa for capital projects)	✓ Requires additional LTP and external funding for each individual capital works (\$545k pa for Road Safety Promotion; about \$1.5m+pa for capital projects)	✓ Requires additional LTP and external funding for each individual capital works (\$545k pa for Road Safety Promotion; about \$1.5m+pa for capital projects)	H
Sustainable infrastructure - Funding will not be sufficient to maintain the transport	1. Current maintenance and renewal programmes reduced in response to corporate drivers of expenditure reduction, particularly operational	– Deterioration of the network and ultimately increased costs – Not meeting the agreed levels of service – Assets are deteriorated to a point that the		✓ Current budgets are known (\$8.8m pa for	✓ Current budgets are known (\$8.8m	✓ Current budgets are known (\$8.8m pa for	H

Significant land transport issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
assets to agreed level of service and at a sustainable level		- community cannot afford to pay for - Investment burden is shifted to the next generation to pay for - Compromises safety and resilience		maintenance programmes and \$7.3m pa for renewal programmes)	pa for maintenance programmes and \$7.3m pa for renewal programmes)	maintenance programmes and \$7.3m pa for renewal programmes)	
	2. Fund the maintenance and renewal programmes at a sustainable level	- Appropriate level of investment that maintains transport assets in perpetuity - Ensures assets are functional and meets levels of service - Keep transport network within acceptable industry levels for asset renewals - Ensures safety issues are addressed - Supports the commercial that uses our roads and therefore the district's economy	Option 2 is preferred as the most likely scenario - Fund the maintenance and renewal programmes at a sustainable level. Decision required by Council – This is conditional on budget being adopted as part of the Long Term Plan then the maintenance and renewal programmes can be implemented.	✓ \$8.9m pa for maintenance programmes and \$7.4m pa for renewal programmes. Requires additional LTP and external funding	✓ \$8.9m pa for maintenance programmes and \$7.4m pa for renewal programmes. Requires additional LTP and external funding	✓ \$8.9m pa for maintenance programmes and \$7.4m pa for renewal programmes. Requires additional LTP and external funding	H
Efficiency – Challenge to manage future traffic growth from interaction with state highway, SH30A revocation, and land development proposals and appropriate funding	1. Continue with current initiatives including strategic growth planning, demand management and relationship building with NZTA	- Not providing adequate infrastructure for economic prosperity - Not meeting key strategic direction - Longer travel times throughout the city - Ongoing weight restrictions on bridges - Loss of network resilience - Development occurs ad hoc		✓ - Current budgets are known (\$164k pa for operational traffic management)	✓ - Current budgets are known (\$164k pa for operational traffic management)	✓ - Current budgets are known (\$164k pa for operational traffic management)	M
	2. Understand the impacts of State Highway changes including SH30A revocation on local road network. Coupled with RLC collaborating with other agencies such as Kainga Ora and Waka Kotahi on supporting city growth and the provision of timely bulk infrastructure including commitment to adequate funding.	- Improved economic performance - Bulk infrastructure is planned holistically - Supports integrated planning for the city including with other agencies - Wider community benefits such as quality housing and improved amenity values - Increased safety outcomes	Option 2 is preferred as the most likely scenario - Integrate the design between the state highway system and local roads. Collaborate with other agencies on supporting city growth and the provision of timely bulk infrastructure including commitment to adequate funding.	✓ \$2.3m for capital support for growth (years 4 to 10). Additional operational budget as a result of SH30A revocation; Additional capital budget to enable	✓ - Additional operational budget; Additional capital budget (about \$3m+ to support growth)	✓ - Additional operational budget; Additional capital budget (about \$3m+ to support growth)	H

Significant land transport issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
			– Decision required by Council – This is conditional on budget being adopted so the growth driven programmes can be implemented.	growth			
Mode demand – Increasing demand for multi modes and need for infrastructure to support this and Rotorua’s bus services not attractive for users with steadily reducing patronage numbers	1. Continue with providing infrastructure to support the regional bus services	– Do not meet community requirements around mode demand – Do not meet government objectives of alternative transport modes – Patronage numbers continue to decline – Bus shelters perceived as unsafe and unattractive for users		✓ Current budgets are known (\$81k pa for bus shelter renewals)	✓ Current budgets are known (\$81k pa for bus shelter renewals)	✓ Current budgets are known (\$81k pa for bus shelter renewals)	M
	2. Adjust current programme including improved public transport network, developing urban cycle network, upgrading footpaths to cater for full range of users, coupled with developing a new multi-mode shift plan, Rotorua Modeshift Plan	– Increased share for various modes and reduced demand for car journeys – Arrests decline in patronage numbers – Holistic approach to mode share working with NZTA and BOPRC – Provides greater transport options to support changing demographics (i.e. aging population), increasing cycle demand and user expectations – Achieves better outcomes including improved efficiency, reduced carbon emissions and improved public health	– Option 2 is preferred as the most likely scenario - Adjust current programme and develop and implement the Rotorua Modeshift Plan to achieve better outcomes. – Decision required by Council - The Regional Council will adopt the Rotorua Modeshift Plan and RLC will then implement it (expected in 2022/23).	✓ Mode demand budgets cover bus shelters, footpath renewals and cycleway network; Budget to implement Modeshift Plan not known (\$4.1m pa for cycleways bus shelters and footpaths)	✓ Medium costs for implementation expected (about \$4.4m+pa)	✓ Medium costs for implementation expected (about \$4.4m+pa)	H
Resilience – Parts of the network are vulnerable and susceptible to weather related events. Multiple problems to	1. Continue with current initiatives including addressing stability issues where risk is high, undertake resilience assessments with planning capital projects, maintain Emergency Management Planning	– Lack of investment in resilience programmes will make the network more vulnerable to both high and low probability events – Increased delays in the ability for the network, businesses and communities to		✓ Current budgets are known (\$350k pa bridge strengthening)	✓ Current budgets are known (\$350k pa bridge strengthening)	✓ Current budgets are known (\$350k pa bridge strengthening)	H

Significant land transport issue	Options	Implications of the options	Most likely scenario for managing the issue	Year 1 to 10	Year 11 to 20	Year 21 to 30	Risk (L/M/H)
address including some lakeside communities with only one corridor, some bridges are not rated the new mass limit rules, and drainage maintenance needed to reduce risk of asset failure.	and collaborate with NZTA on suitability of diversion routes	- recover from events – Not meeting community outcomes and risk of isolating communities – Bridge damage resulting in network disconnection – Impact on the safety of road users – Ongoing weight restrictions – Limitation to the type of freight vehicles able to use Council roads					
	2. Explore capital investment options for strengthening resilience for the isolated lakeside communities where practical and affordable	– May not be physically practical or economically viable to address with capital solution – Provision of an alternative and safe route if main route disrupted		✓ Potentially high capital costs (<i>indicative estimated costs</i> \$10m+)	✓ Potentially high capital costs (<i>indicative estimated costs</i> \$10m+)	✓ Potentially high capital costs (<i>indicative estimated costs</i> \$10m+)	M
	3. Continue with the accelerated programme to assess the condition of the large culverts. Replace the large culverts assessed in poor and very poor condition over ten years. Investigate and strengthen the bridges with weight restrictions to cope with new mass limit rules.	– Improved journey reliability and functionality of the network – Reduces risk of failure of the road drainage systems – Results in lowered risk of failure of pavements during storm events (i.e. road slips or under slips)	– Option 3 is preferred as the most likely scenario - Complete the condition of the large culverts and replace assets in poor state. Coupled with investigate and strengthen the bridges with weight restrictions to cope with new mass limit rules. – Decision required by Council – This is conditional on budget being adopted then the large culvert renewal and bridge strengthening programme can be implemented.	✓ Large culvert renewals part of structural renewals at \$350k pa. Bridge strengthening programme part of Low Cost Low Risk budget covering other initiatives and varies each year (estimated about \$250k pa)	✓ Large culvert renewals part of structural renewals at \$350k pa. Bridge strengthening programme (estimated about \$250k pa)	✓ Large culvert renewals part of structural renewals at \$350k pa. Bridge strengthening programme (estimated about \$250k pa)	H

5.5.4 Transport expenditure forecasts

Figure 22 presents the expenditure forecast for transport which are based on the following assumptions:

- Waka Kotahi will continue to provide us with subsidised funding for the road network over the next 30 years at the current levels.
- We will continue to fund at the levels in the Long Term Plan and ten year forecasts stated in our Long Term Plan.
- The Rotorua Modeshift Plan will provide the framework for a change in transport modes.
- We will provide services at the levels forecast in our Land Transport Activity Management Plan and 2021 Long Term Plan.

Over the next 30 years it is expected that Council's major capital expenditure items include:

- \$3.8 million to reseal 7% of our roads each year for the next 30 years to ensure assets renewed sustainably
- Replace the large culverts in poor condition
- Development of an urban cycleway network holistically
- Upgrading of the footpath network to cater for range of users
- Strengthening bridges to cater with new mass limit rules.

Figure 22 Transport expenditure forecasts (inflated)

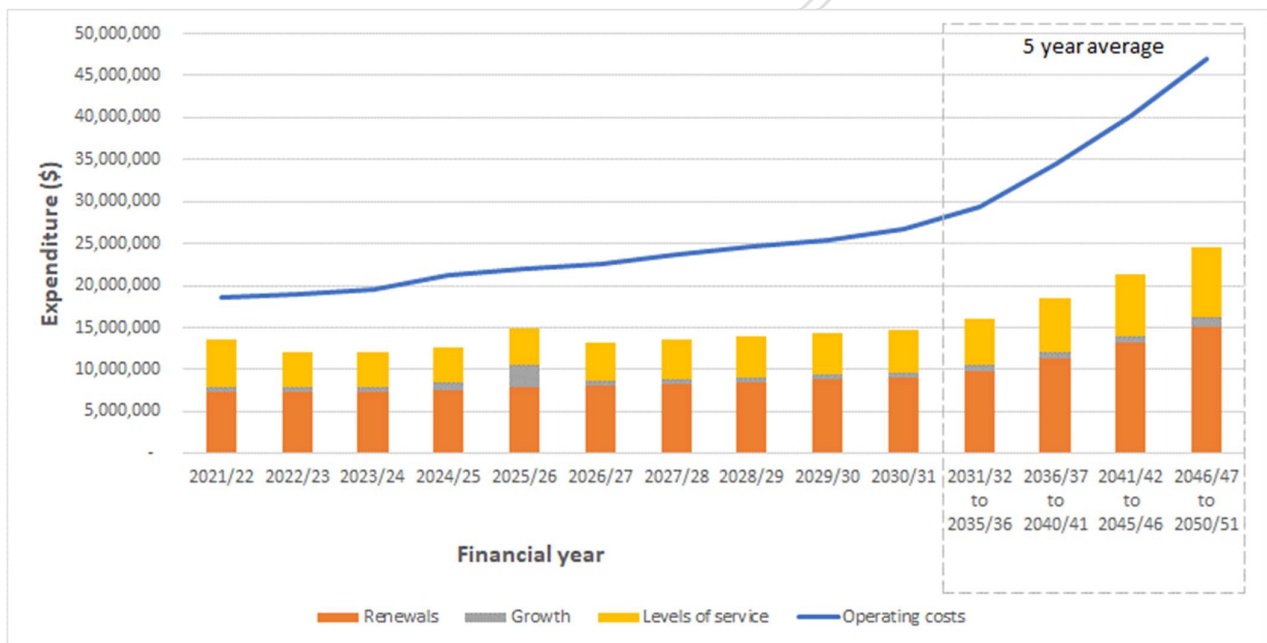
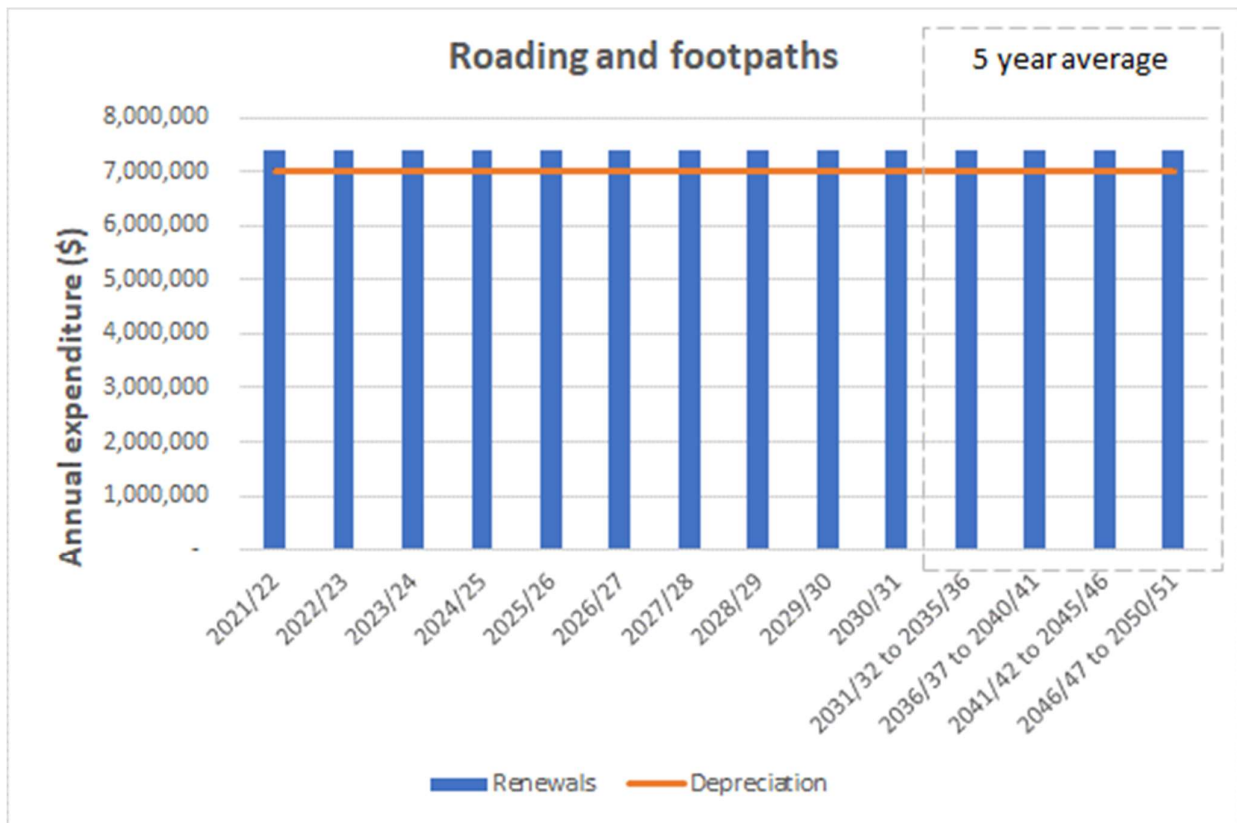


Figure 23 shows that our forecast renewal expenditure of \$7.4 million (subsidised) is maintained to match depreciation annual depreciation of \$7 million.

Figure 23 Transport renewals versus depreciation (uninflated)



5.5.5 Funding this activity

We fund our land transport services from a range of sources:

- Waka Kotahi subsidies (FAR)
- Targeted rate based on land value
- Fees and charges for road corridor access applications
- Other funding sources.

6.0 Financial Summary

6.1 Decisions we expect to make

We will need to make a number of key decisions over the duration of our strategy. Some of these decisions will be significant to the District and some will not. We consider our decision on three waters service delivery the most significant decision we will have to make.

Other key decisions and action that will need to be made by elected members over the next 30 years include:

Table 17 Summary of key decisions

Key decision	Decision required by Council
We will gather evidence particularly the condition of our critical assets in the next three to ten years to help us develop robust and risk based renewal programmes.	This is conditional on Long Term Plan budget being adopted then the condition surveys can be implemented. The wastewater network surveys are part of the Trility contract.
We will implement the Eastern and Central Supply Area improvements to address risk, security of supply, enable development, and meet future demand.	This is conditional on Long Term Plan budget being adopted then the capital works can be implemented.
We will work towards offsetting the increasing level of nitrogen in the urban discharge through Nitrogen Discharge Allocations.	Expected full Council decision will be required in 2022 to 2024.
We will continue to develop Comprehensive Flood Risk Management Plan collaboratively with the Regional Council, iwi, key stakeholders, and the community (as recommended by the independent panel).	This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.
We will use the process and learnings from the extensive flooding in the Ngongotahā catchment and apply to all urban catchments. We will develop investment programmes prioritised district wide using hierarchy of flood mitigation options.	RLC's share of the investment programmes will be presented to full Council for approval as part of the Long Term Plan three yearly cycles (ie 2024, 2028, 2031). It is expected that most of the investment will be required on the Regional Council's stormwater network.
We will implement the Road to Zero Strategy to prioritise safety risks across the network holistically.	Revising the Road Safety Programme is part of ongoing network management.
We will continue with our maintenance and renewal programmes that targets interventions at appropriate levels consistent with good industry practice and meeting agreed levels of service.	This is a current practice and will continue. This option is shown for completeness and therefore no formal Council decision is required.

Further detail is provided in each activity significant issues and options tables.

6.2 Summary of key financial assumptions

The financial assumptions for the most likely scenario for the district are as follows:

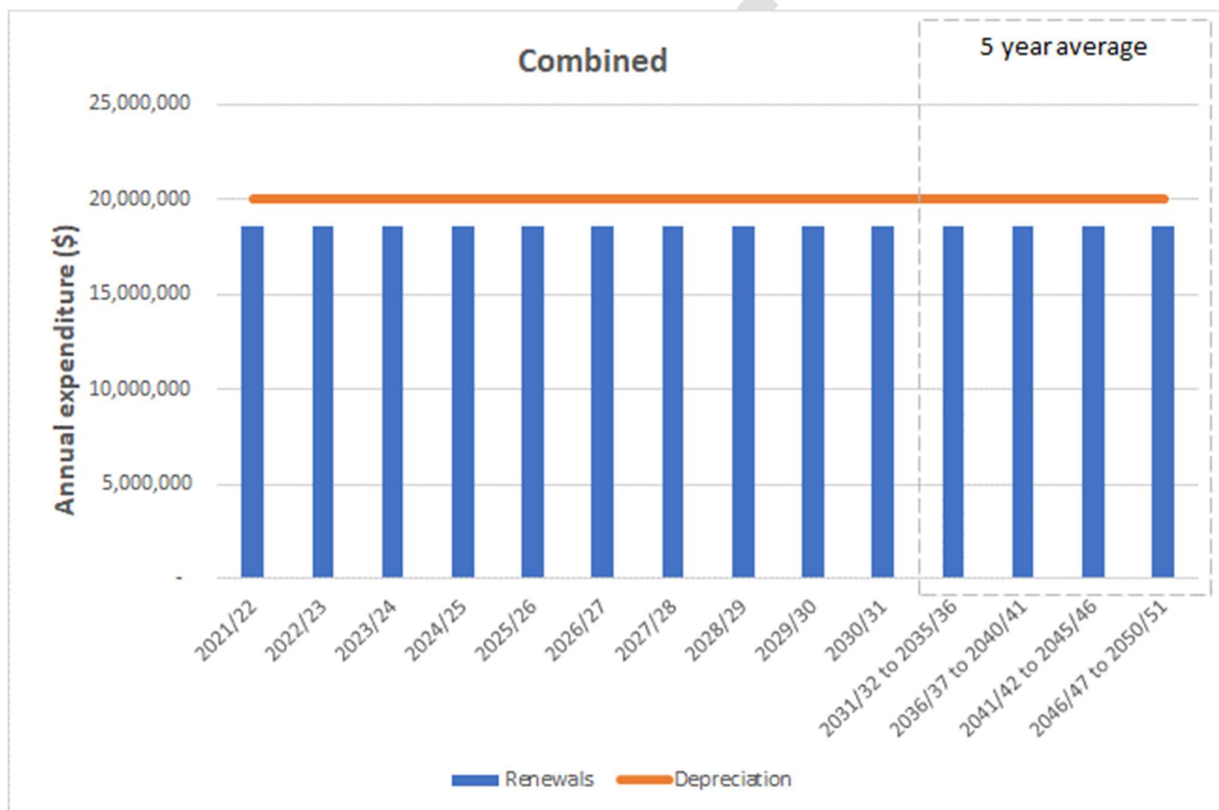
- There will need to be significant expenditure in the long term to meet higher environmental standards for wastewater discharges.

- There will need to be significant expenditure in the long term to meet requirements for the management of three waters and implement water reform requirements.
- We will maximise the useful and economic lives of our assets.
- We will use risk management practices to maximise assets and the management of risk of a critical asset failing.
- Climate change impacts will increase requiring better management of assets.
- There will be increased costs for the acquisition, implementation, compliance and monitoring of resource consents.
- Waka Kotahi will continue to provide subsidised funding to the Council for the road network over the next 30 years at the current level.
- All financial information presented in our strategy includes inflation, except for the graphs which present the renewal and depreciation expenses.

6.3 Funding depreciation

Figure 24 shows the annual renewals of \$18.8 million versus annual depreciation of \$20 million for the combined core assets. This shows that the forecast renewal expenditure for all activities is maintained to broadly match depreciation over the 30 year period. The gap is mainly due to wastewater renewals less than annual depreciation at this point in time. We expect that this gap will reduce as we collect better data on the state of our wastewater assets and develop condition-based renewal programmes.

Figure 24 Combined renewals and depreciation (uninflated) 2021-2051



6.4 Financial forecasts

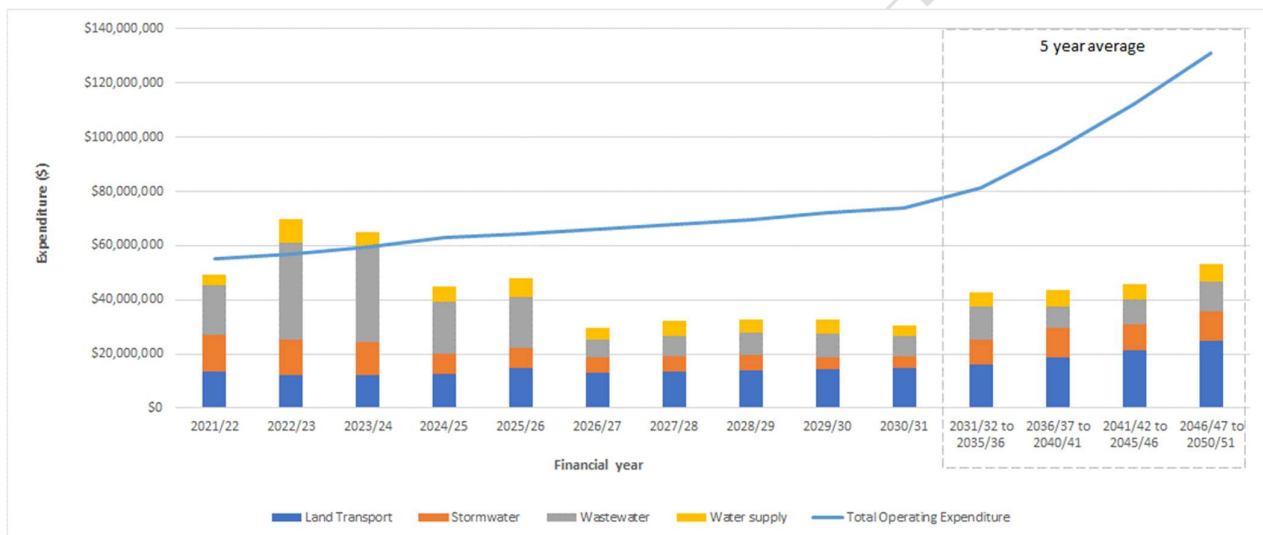
Table 18 shows the total expected capital and operational expenditure for each infrastructure activity over the 30-year period 2021 to 2051.

Table 18 Expected total operating and capital expenditure (inflated)

Activity	Capital expenditure	Operational expenditure
Water supply	\$173,100,729	\$524,161,156
Wastewater	\$367,349,891	\$955,864,331
Stormwater	\$282,402,184	\$290,406,717
Land transport	\$537,647,998	\$978,517,503
Total	\$1,360,500,803	\$2,748,949,708

Figure 25 shows the most likely scenario for total operating and capital expenditure for combined assets.

Figure 25 Combined infrastructure operational and capital forecast (inflated) 2021-2051



Source: RLC's draft LTP budget (as at 22 March 2021)

The breakdown by capital categories for each activity over the 30 year period 2021 to 2051 is summarised in

Table 19 and in Figure 26. This shows that renewals are 61% of the total capital expenditure followed by levels of service at 22% and growth by 17%.

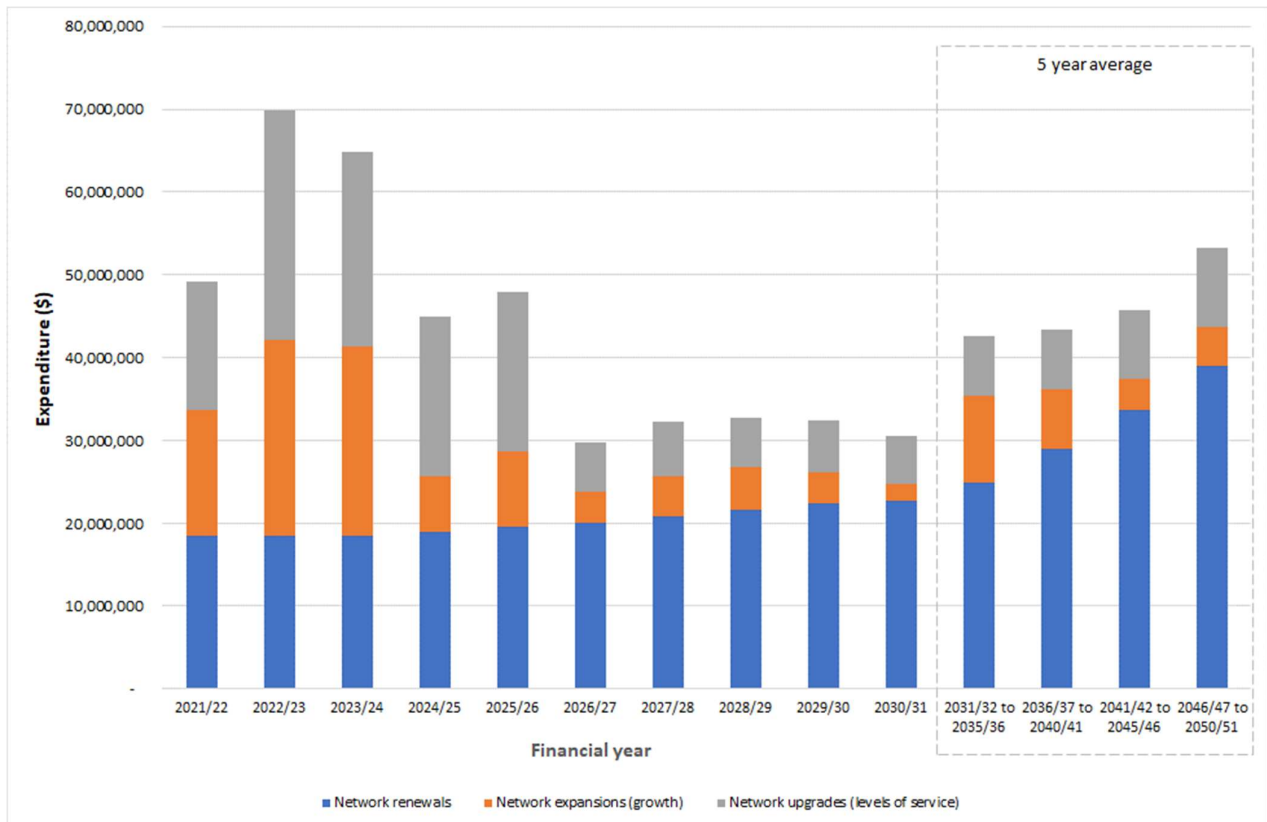
Note that the operational expenditure totals include overheads and depreciation costs.



Table 19 Combined capital expenditure by category (inflated)

Activity	Capital Expenditure			Operational Expenditure
	Renewals	Growth	Levels of Service	Operating
Water Supply	\$139,074,187	\$16,988,859	\$17,037,683	\$524,161,156
Waste Water	\$232,550,281	\$63,252,518	\$71,547,092	\$955,864,331
Stormwater	\$136,794,283	\$122,808,855	\$22,799,047	\$290,406,717
Land Transport	\$327,646,278	\$24,573,623	\$185,428,097	\$978,517,503
Sub Total	\$836,065,029	\$227,623,854	\$296,811,920	\$2,748,949,708
Total	\$4,109,450,511			

Figure 26 Combined capital expenditure by category (inflated)



Source: RLC's draft LTP budget (as at 25 February 2021)

Over the next 30 years it is expected that:

- planned expenditure on renewals across all infrastructure activities is generally constant
- capital expenditure on levels of service improvements is focused on strengthening infrastructure resilience for core infrastructure
- the Rotorua Wastewater Treatment Plant Upgrade in the first ten years takes a large portion of the capital expenditure programme (growth and levels of service)
- capital expenditure for installing bulk infrastructure to service future growth areas and infill areas, and to support the Homes and Thriving Communities Strategic Framework
- resealing about 7% of our roads each year for the next 30 years to ensure assets renewed sustainably.

6.5 Funding implications

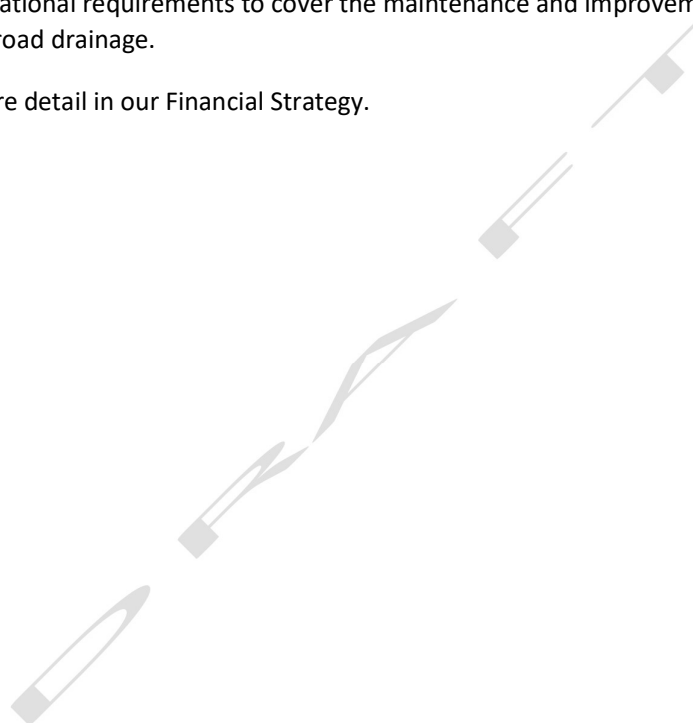
There are funding implications from significant capital expenditure in this first ten years to meet the:

- Higher environmental standards
- Upgrading the Rotorua Wastewater Treatment Plant
- Ensure our land transport network is preserved
- Investment in stormwater capability to facilitate development and population growth
- To ensure our networks are resilient.

The largest change since the 2018 Infrastructure Strategy is the greater investment in the transport network (opex and capex), and the Rotorua Wastewater Treatment Plant upgrade. The impacts of these investment are:

- Increase in annual depreciation for the wastewater treatment plant once upgraded
- Outsourcing of the operational management and day to day risk for the wastewater services
- Increased operational requirements to cover the maintenance and improvements in pavement condition and road drainage.

This is discussed in more detail in our Financial Strategy.



7.0 Assumptions and Uncertainty

7.1 Uncertainty and implications

In developing this strategy, we have identified a few things that we do not know. This uncertainty has a flow on effect on the identification of issues, options for dealing with issues, and how we can best respond.

The identified areas of uncertainty are:

- Legislative changes, National Policy Statements and National Environmental standards that may require significant changes to the way we plan, manage and fund the infrastructure.
- The impact of the Government's Three Waters Reform Programme and how water services will be delivered.
- The current water take consents for the Eastern, Central and Hamurana Kaharoa areas may not be renewed at the current abstraction limits in terms of quantity. This may require new source /s to be developed with associated capital cost implications.
- Future stormwater consent conditions may require us to be more proactive in stormwater quality management than current practices.
- The conditions and cost implications of the future resource consents for the Rotorua Wastewater Treatment Plant are uncertain.
- The effect of climate change on RLC's infrastructure. As Council develops its understanding of the impact from climate change, the long-term response will need to be adapted for how to manage those effects on the infrastructure.
- Further work is required to understand what years 11-30 look like across the infrastructure classes as at the moment there are gaps in information which do not enable to RLC give certainty of what the future is expected to look like. We intend to gather evidence particularly the condition of our critical assets in the next three to ten years. This will help us develop robust and risk based renewal programmes.
- There are various levels of reliability of information across its infrastructure activities. Gaps have been identified (refer to the following section).

7.2 Reliability of information

RLC has made some improvements in data collection and quality in relation to its assets since the 2018 Infrastructure Strategy. However, there are still varying levels of reliability across the activities covered in this strategy. There is limited information to give certainty to what years 11-30 of the strategy looks like. RLC is actively looking to fill the gaps to inform the 2024 strategy.

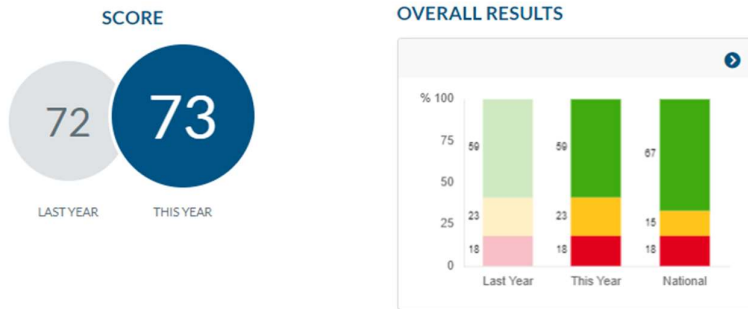
Other gaps have been identified in the following areas:

- The extent of the effects of climate change on roading and three waters, the impact on infrastructure and how it will be funded.
- The condition of the three water assets.

The data for three waters assets are recorded in Council's asset management system for most asset classes. The data confidence of the three waters asset data has been classified as reliable for inventory completeness and age, and uncertain for condition (in accordance with the International Infrastructure Management Manual).

The data accuracy, completeness and timeliness of land transport assets were independently assessed for the 2019/20 year (by the Road Efficiency Group). RLC have scored an annual score of 73/100, a slight improvement on 2018/19 (72/100) as shown below. RLC is just below the national average score of 78. An item in the Improvement Programme will address the low scoring issues.

Figure 27 Data quality results for 2019/20



Source: ONRC Reporting Tool October 2020

7.3 Key planning assumptions

This strategy is based on the following assumptions:

Table 20 Significant assumptions

Significant assumption	Level of uncertainty	Impacts	Mitigation
Vision 2030: That our Vision 2030 will apply for the duration of this 30-year strategy.	Low	The various planning documents will need to be reviewed and realigned with any new vision.	Any significant changes will likely occur with the Long Term Plan three yearly cycle so adequate time to make changes.
District population - Our District population is projected to continue growing, reaching approximately 90,800 by 2051 (based on the baseline scenario).	Medium	Population growth is significantly higher than forecast in a localised area, putting pressure on infrastructure. Or population significantly declines resulting in under-utilisation of infrastructure.	RLC will continue to monitor population change in the District. RLC will continue to monitor and update as things change at District level and regionally. Generally, small changes in population can be managed within the existing level of service.
Lakes co-management - We will continue with our partner organisations Te Arawa Lakes Trust and Bay of Plenty Regional Council to ensure the integrated management of our lakes.	Medium	Rotorua Te Arawa Lakes are important for our District and co-management is vital for holistic and long term approach.	RLC will continue to foster the partnership as there are significant long term benefits to the District, regionally and nationally.
Waka Kotahi funding assistance - Waka Kotahi will continue to provide us with subsidised funding for the land transport network over the next 30 years at current levels.	Low	There is risk that sufficient funds will not be available to pay for planned capital projects.	This is an established and mature process and plenty of opportunities to negotiate.
Levels of service - Levels of service are defined in the Activity / Asset Management Plans for each activity, to meet legislative requirements and agreed to / accepted by the communities. Given financial pressures and the challenges faced by RLC, there is no intention to alter them.	Low	Significantly enhanced service levels are demanded by the community or imposed by the government. This will lead to additional cost and / or resourcing requirements.	RLC regularly monitors existing service provision within its operation on a day to day basis. Minor changes may be made to service levels where budget, contracts and resources allow. Major changes in service levels will be confirmed with the community through the Long Term Plan process.

Significant assumption	Level of uncertainty	Impacts	Mitigation
Delivering the customer outcomes - Activity / Asset Management Plans will test the affordability of delivering the customer outcomes.	Low	Any significant customer outcomes is generally shared in national industry forum such as REG as common across local government.	The asset management planning process is relatively mature and is the acceptable industry mechanism for testing service levels, risk and financial forecasts with the community.
Asset lives - RLC will maximise the useful and economic lives of our assets.	Medium	This will impact on the timing of replacements and the amount of rates collected for funding depreciations.	Continue to analyse the useful lives of the major asset classes as new information becomes available, with focus on the critical assets.
Risk management practices - Council will use risk management practices to maximise assets and the management of risk of a critical asset failing.	Medium	Large number of customers and critical facilities such as schools and hospitals may experience unacceptable outages.	Continue to monitor the performance of critical assets with targeted maintenance and renewal strategies.
Three waters reform - Legislation with the three waters reform will have a significant impact on these activities and at a rapid pace.	High	The three waters reform will impact service delivery.	RLC will keep up to date with the Government's proposed water reform programme and evaluate options as information becomes available.
Climate change - Climate change will affect our District over the medium to long term in line with projections provided by the Ministry for the Environment.	Medium	The effects of climate change are more severe than expected, resulting in additional costs to mitigate impacts and increasing damage to Council infrastructure.	Council activities will build appropriate mitigation responses into infrastructure development. RLC will implement its Climate Action Plan including the impacts on infrastructure assets.
Abstraction limits - The current water supply consents for the Eastern, Central and Hamurana Kaharoa areas will be renewed without any reduction from the current abstraction limits, and all those consents expiring in the next ten years.	High	Alternative supplies and / or storage many need to be investigated if consent not rolled over.	Continue with water loss management programmes to reduce demand to demonstrate to the Regional Council using water wisely.
Universal water metering - Universal water metering will not be adopted unless supported by strong business case.	Medium	This may be a requirement by Regional Council for new resource consents. It may also be a future requirement for securing any external funding.	Continue with implementing existing metering policy consistently coupled with education programme on water conservation.
Resource consents - There will be increased costs for the acquisition, implementation, compliance and monitoring of resource consents.	Medium	Additional resources may be required to meet increasing compliance requirements. This will result in additional operational costs for the activity.	Monitoring of compliance with existing resource consent conditions will provide a compliance for future processes. Work collaboratively with the Regional Council and Taumata Arowai on pragmatic monitoring programmes.
Wastewater investment - There will need to be significant expenditure in the long term to meet resource consent	High	The investment requirements may be unaffordable for our community and may not provide good environmental outcomes.	Work with our long term partner on cost effective options to manage the asset risks.

Significant assumption	Level of uncertainty	Impacts	Mitigation
requirements for wastewater discharges.			
Lake Rotorua nutrient management - We will work towards offsetting the increasing level of nitrogen in the urban discharge through nitrogen discharge allocations.	High	The total load of nitrogen to the lake increases. The Regional Council enforces Plan Change 10 with RLC for its actions from the Rotorua Treatment Plant.	Continue to investigate charging an environmental fee (or a transfer of nitrogen in lieu of payment) that will be used to offset the increasing load of nitrogen in the treatment plant discharge as the population and community grow.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion.

As the world's population grows, the demand for food and other resources will increase. This will put pressure on the environment and on the world's food supply.

One way to meet this demand is to increase the amount of food that is produced. This can be done by using more land for agriculture, or by using more resources on the land that is already being used.

Another way to meet this demand is to reduce the amount of food that is wasted. This can be done by improving the way that food is stored and distributed, or by changing the way that people eat.

There are many ways to meet the world's growing demand for food and other resources. It is important that we find ways to do this that do not harm the environment or the people who are most vulnerable to the effects of climate change.

One of the most important ways to do this is to reduce the amount of greenhouse gases that are emitted. This can be done by using less energy, or by using energy that is produced from renewable sources.

Another important way to do this is to protect the environment. This can be done by preserving forests, wetlands, and other natural resources, and by reducing the amount of pollution that is released into the environment.

There are many other ways to meet the world's growing demand for food and other resources. It is important that we find ways to do this that do not harm the environment or the people who are most vulnerable to the effects of climate change.

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