BAY OF PLENTY REGIONAL COUNCIL
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Rivers and Drainage Asset Management Plan 2024-2074

EXECUTIVE SUMMARY

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About this document

This document summarises Bay of Plenty Regional Council's (Council) Rivers and Drainage Asset Management Plan (AMP) for 2024-2074.

This AMP outlines the 50-year 'life cycle' of a specific Council activity, in most cases a mix of capital, operations and maintenance, and how it's managed to meet legislative requirements and agreed levels of service to a community.

AMPs inform Council's Long Term Plan (LTP), a 10-year plan that is reviewed every three years with the community and updated annually. The annual budget expression of the LTP, or Annual Plan, outlines what activities will be delivered over the period 1 July – 30 June and how they will be funded, for example through rates or borrowings.

This summary highlights how Council's rivers and drainage assets, such as stopbanks, floodgates, floodways and spillways (totalling $438M), across the region's four main rivers schemes and one drainage scheme, are effectively and efficiently managed.

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The asset management story

The story of efficient and effective asset management is an ongoing one, continually revised to align with the expectations and needs of our communities.

Integration is at the core of this approach, ensuring that the Asset Management Plan (AMP) takes a long-term perspective that balances the Council's legislative obligations with the services it provides, while considering the ratepayers' ability to pay (affordability). This is achieved through an ongoing process of review (conducted every three years in conjunction with the Long Term Plan), implementation (via the Annual Plan), monitoring (external audit), and public reporting (through the Annual Report).

This process is detailed in the following sections:

- **Council's strategic direction and community outcomes**
- **Asset and activity overview**
- **Levels of service**
- **Future demand**
- **Capital planning**
- **Operational and maintenance planning**
- **Financial planning**
- **Risk management**
- **Audit and continuous improvement**

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Council's strategic direction and community outcomes

Tō mātou aronga rautaki
Our strategic direction

Te pae tawhiti
Ka eke panuku, ka eke ngātahi Te Moana a Toi
– mō te taiao, mō ngā tāngata

Our vision
Bay of Plenty Thriving Together - mō te taiao, mō ngā tāngata

Te whāinga
E tū ai, e wana ai te rohe o Te Moana a Toi, he manawaroa,
he ora, he mauri tū roa

Our mission
To create and enhance a resilient, healthy and sustainable
Bay of Plenty region

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Huanga hapori 1

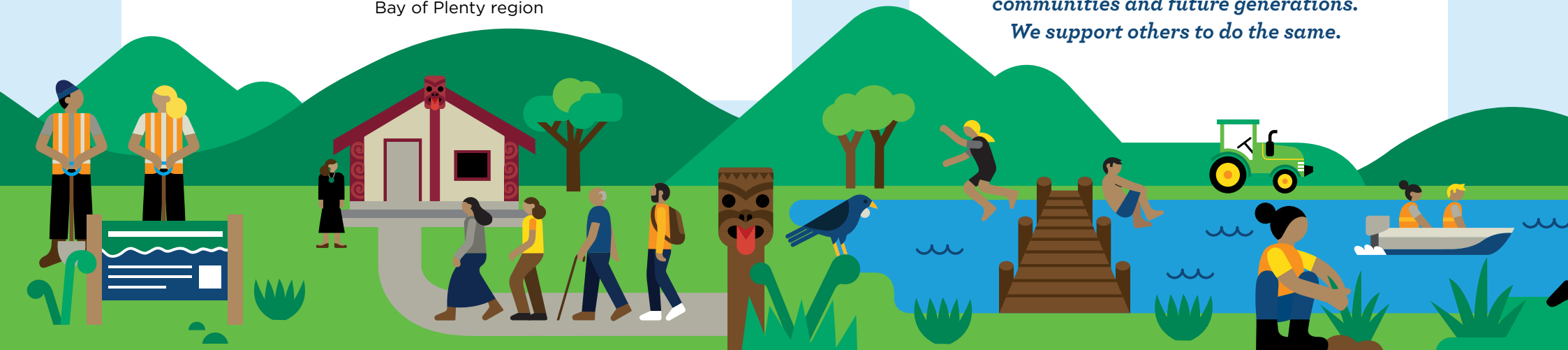
He taiao ora

Ka whakaū, ka whakawana mātou i te taiao kikokiko me ngā pūnaha rauropi māori mō ō mātou hapori me ngā whakatupuranga o āpōpō. Ka tautoko hoki mātou i ētahi atu ki te mahi i ēnei mahi.

Community outcome 1

A healthy environment

We maintain and enhance our physical environment and natural ecosystems for our communities and future generations. We support others to do the same.



Huanga hapori 2

He hapori mata-hī awatea

Ka arataki, ka tautoko ā mātou mahi ki Te Moana a Toi te whakapakaritanga o te tū ki ngā mōreareatanga māori, ā, kia pai ai te tahuritanga mauri ora ki te āpōpō puhanga-waro iti.

Community outcome 2

Future ready communities

Our work in the Bay of Plenty guides and supports improved resilience to natural hazards and an equitable and sustainable transition to a low emissions future.

Huanga hapori 3

He hapori tūhono

Ka āwhina mātou ki te hanga hapori tūhonohono, hapori mauri tū roa.

Community outcome 3

Connected communities

We help provide connected and sustainable communities.

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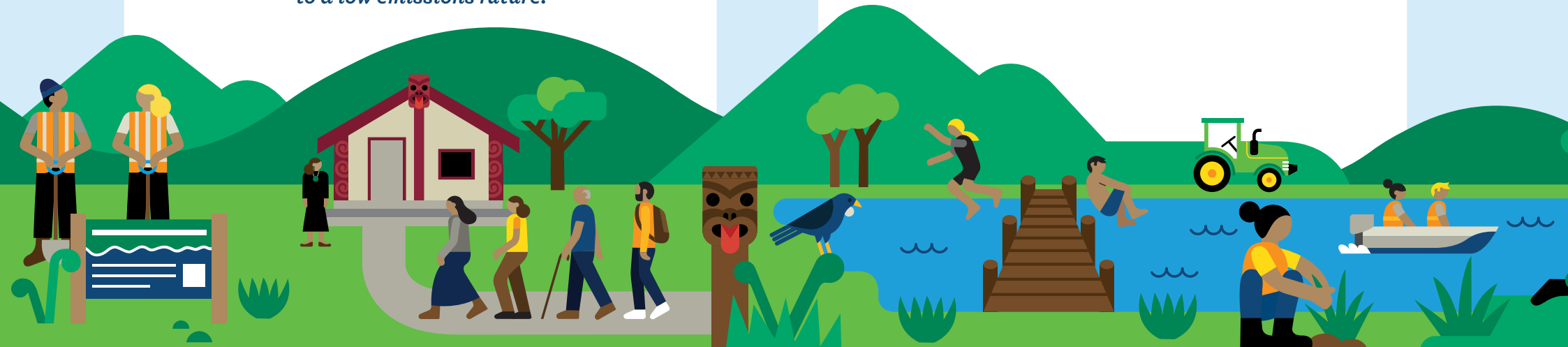

Huanga hapori 4

He whanaketanga mauri tū roa

Ka tautoko, ka manaaki hoki mātou i te whanaketanga mauri tū roa.

Community outcome 4

Sustainable development

We support and advocate for sustainable development.

Huanga hapori 5

Te Ara Poutama

Te mahi tahi ki te tangata whenua me te hapori ki te anamata taurikura me te anamta tautika.

Community outcome 5

The Pursuit of Excellence*

Partnering with tangata whenua and community towards a prosperous and equitable regional future.

*Whilst not a direct translation, 'Pursuit of Excellence' is a close approximation to Te Ara Poutama. Te Ara Poutama has its origins in Te Ao Māori and references the pathway ascended by Tāne to retrieve the three baskets of knowledge that represent humanity's consciousness. From a contemporary perspective, Te Ara Poutama serves to inspire a commitment to innovation, excellence, and continuous improvement.

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How this asset management plan contributes to community outcomes

The LTP outlines community outcomes that relate to work delivered by Council's Rivers and Drainage function. These outcomes are linked with flood protection and drainage work across the region's four main rivers schemes and one drainage scheme.

LTP Community Outcome	Applicable LTP strategic goals	Rivers and Drainage alignment
He taiao ora **A healthy environment** We maintain and enhance our physical environment and natural ecosystems for our communities and future generations. We support others to do the same.	• Enabling te mana o te wai through healthy and improving waterways and their ecosystems. • We use evidence based decision making – all work is informed by the best available science and Mātauranga Māori. • We support communities to nurture our environment.	• We will ensure our maintenance works comply with the Environmental Code of Practice for Rivers and Drainage Maintenance Activities and resource consent conditions for capital works. • Environmental enhancements will be delivered where practicable and agreed with landowners and stakeholders.
He hapori mata-hī awatea **Future ready communities** Our work in the Bay of Plenty guides and supports improved resilience to natural hazards and an equitable and sustainable transition to a low emissions future.	• Communities are aware of and prepared for the impact of natural hazards and climate change. • We will empower communities to make sustainable choices and transition towards a low carbon economy. • We seek to provide nature-based solutions as appropriate to enhance the environment and protect our communities.	• Flood protection and drainage protects public health and property. • We maintain the Flood Warning System and are refreshing Floodplain Management Strategies alongside tangata whenua and our communities. • Room for the River and nature-based solutions, policies, objectives and operations to be developed in collaboration with tangata whenua and stakeholders.
He hapori tūhono **Connected communities** We help provide connected and sustainable communities.	• Communities are connected through an effective transport system, land use and urban design that improves wellbeing, liveability and environmental outcomes. • We foster strong communities through engagement in decisions that are important to them	• Flood defence and drainage assets will continue to enable community wellbeing. • We will engage with our communities and enable participation in decision-making through the function of the River Scheme Advisory Groups, and Annual Plan/Long Term Plan processes.

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LTP Community Outcome	Applicable LTP strategic goals	Rivers and Drainage alignment
He whanaketanga mauri tū roa **Sustainable development** We support and advocate for sustainable development.	• We support development and growth that takes into account the four wellbeings of people and communities, the need to maintain and enhance the quality of the environment, and the reasonably foreseeable needs of future generations. • Regional infrastructure is resilient, efficient and integrated.	• We will deliver a range of work streams (e.g. Flood Protection and Drainage Bylaws, condition and performance assessments, capacity reviews, asset management planning) to ensure flood protection and drainage infrastructure is resilient and integrated. • The Rivers Scheme Sustainability Project will continue to explore, develop, and confirm long-term solutions for scheme sustainability.
Te Ara Poutama **The Pursuit of Excellence** Partnering with tangata whenua and community towards a prosperous and equitable regional future.	• Supporting enhanced Māori participation in operational activities, and progressing new opportunities where they arise within existing operations. • Supporting Māori and community capacity and capability building to empower proactive relationships. • Partner with Māori to enhance delivery and share decision making.	• We will engage and partner with tangata whenua appropriately across the rivers and drainage schemes to support enhanced Māori participation and capability.

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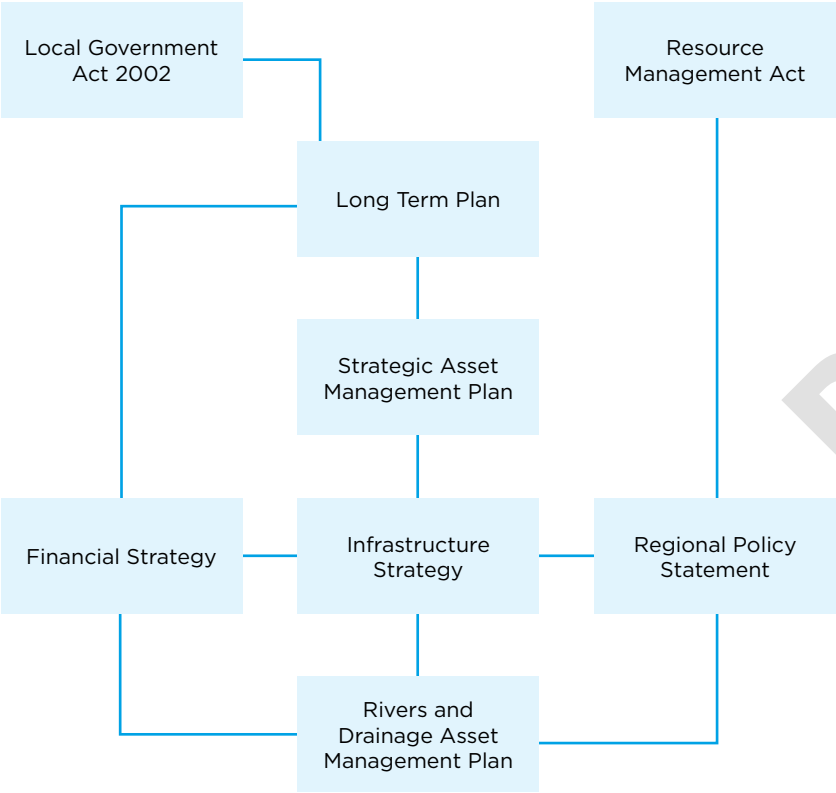
How this plan relates to legislation, council policy, strategies and plans

Council provides flood protection and drainage services through the management of its five major rivers and drainage schemes across the region and the infrastructure assets within these schemes.



To support the delivery of these services, Council is guided by a range of legislation requirements it must comply with.

The primary legislation guiding the development of this AMP is the **Local Government Act (LGA)**. The LGA outlines the responsibilities of councils and the decision-making process for activities carried out on behalf of the community. It requires the Council to plan long-term priorities through the development of a **Long Term Plan (LTP)**. The LGA also requires the implementation of asset management planning for publicly owned assets.

This AMP follows industry best practice under in the International Infrastructure Management Manual (IIMM).

The **LTP** sets out an agreed vision, strategic direction and community outcomes for the council. Public consultation takes place every three years, where budgets and work programmes for the AMP are confirmed.

The LTP contains the **Infrastructure Strategy** and **Financial Strategy**: The former sets out the issues and implications a council faces over the next 30 years and outlines preferred options. The Financial Strategy outlines key financial results council aims to achieve and explains how the council activities will be financially sustainable over the next 10 years.

The **Strategic Asset Management Plan (SAMP)** aligns to the Infrastructure Strategy and Financial Strategy and sets the long-term approach to managing infrastructure assets by linking Council's operational and asset management objectives.

The **Rivers and Drainage Asset Management Plan (AMP)** documents the life cycle activities to be undertaken so assets provide agreed levels of service in a manner which is most cost effective for ratepayers.

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Asset and activity overview

Activity overview

Council is responsible for the provision and management of five major schemes within its regional boundaries. The schemes provide flood protection and drainage for 54,570 targeted ratepayers. More detail on each scheme is available in the main AMP.

Scheme	Catchment area (km²)	Total no. of ratepayers
Kaituna Catchment Control Scheme	1,246	30,538
Rangitāiki Drainage Scheme	290	4,241
Rangitāiki-Tarawera Rivers Scheme	3,995	7,998
Whakatāne-Tauranga Rivers Scheme	1,540	9,330
Waioeka-Otara Rivers Scheme	1,175	2,463
Total	**8,246**	**54,570**

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Bay of Plenty rivers and drainage schemes

Kaituna Catchment Control Scheme

Rangitāiki-Tarawera Rivers Scheme

Rangitāiki Drainage Scheme

Whakatāne-Tauranga Rivers Scheme

Waioeka-Otara Rivers Scheme

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Why we do it

It is a function of Council to provide flood protection and minimise damage to its communities.

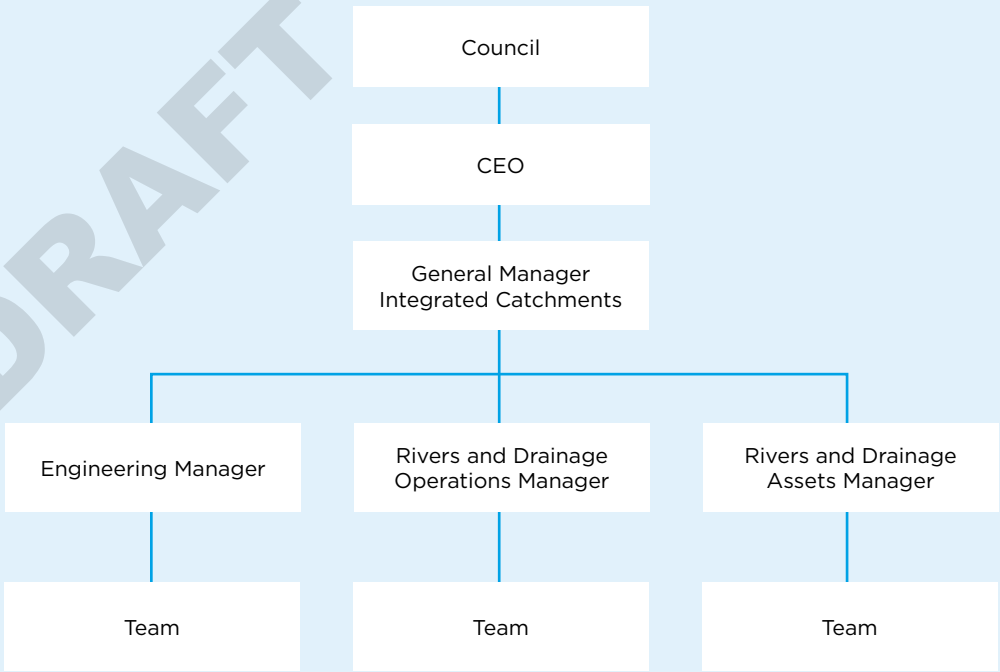
Council has a range of tools and mechanisms it can use through legislation, such as the Soil Conservation and Rivers Control Act 1941, the Local Government Act 2002, the Land Drainage Act 1908, the Rangitāiki Land Drainage Act 1956, and other statutes.

Council meets this responsibility through the management of its rivers and drainage schemes, and the various infrastructure assets within these schemes.

Council's Significance and Engagement Policy lists rivers and drainage schemes as 'strategic assets'. This means that any transfer of ownership of the assets would require a full analysis of options, as well as consideration of community views and preferences as part of Council's decision-making process. These assets play a key role in fulfilling Council's strategic direction and community outcomes, which are outlined in the LTP (see page 7 for details).

How we do it

Rivers and drainage schemes are managed through this organisational structure.



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What we do

Key Activity	Engineering	Operations	Assets	Addressed in AMP section
Capital works and renewal projects	✓	✓		Capital Planning
Ongoing maintenance in accordance with the AMP	✓	✓		Operations & Maintenance Planning
Condition and performance assessments		✓	✓	Assets we own; Operations & Maintenance Planning
Design and investigation projects	✓			Capital Planning
Complying with legislative and regulatory requirements	✓	✓	✓	Strategic Environment
Administering and enforcing Flood Protection and Drainage Bylaws (2020)		✓	✓	Strategic Environment
Reviewing and updating the AMP, in alignment with Council planning cycles			✓	All
Asset management		✓	✓	All

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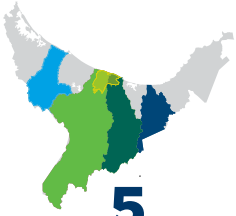
Asset overview

There are five asset groups spanning 31 asset types.

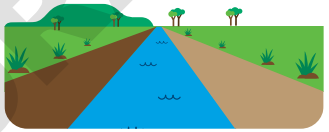


5
major rivers and drainage schemes

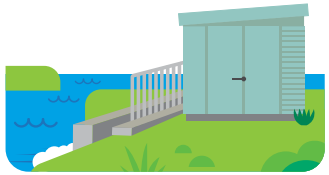
covering
7,920km
of river catchments

Flood and drainage assets are valued at
$438M

500km
of canals and drains



16
pump stations



1.4km
of floodwalls

382km
of stopbanks

968,000
tonnes of rock edge protection

230km
of edge planting

You can find more detail here: boprc.govt.nz/asset-management

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Asset age

Asset age is a key driver in asset replacement or upgrade planning.

Decision making for replacement covers a range of factors, including detailed asset condition and performance information, as well as general observations of field staff. It is not uncommon for assets to be maintained beyond their expected lives if risk of failure is low and condition assessments indicate ongoing confidence in performance.

Stopbanks, waterways and erosion protection asset groups are not presented as they are expected to last in perpetuity. Planned maintenance continually renews these assets, so average asset age and average remaining life data is not as relevant.

The following graphs provide summarised asset age data for different asset types. Where assets are nearing the end of their expected operational life, replacement is provided in the capital programme. **The information provided in the tables below is based on the asset valuation for 2022-23.**

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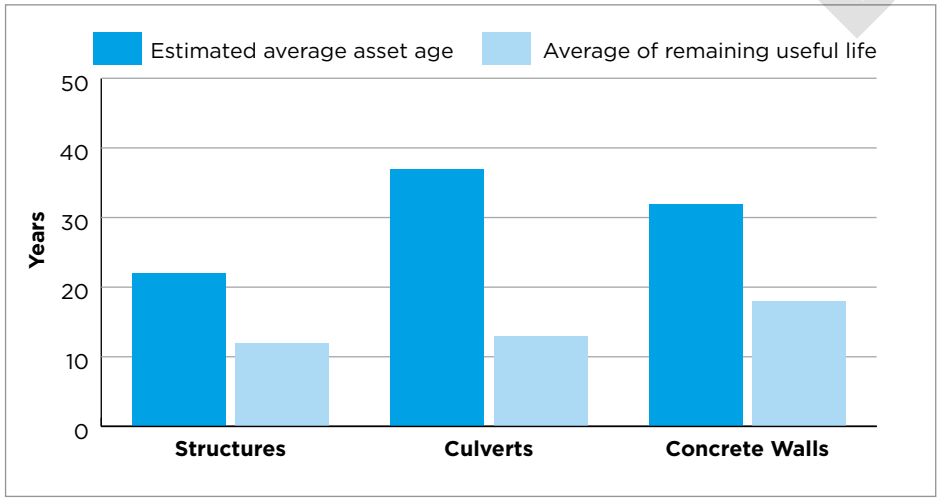

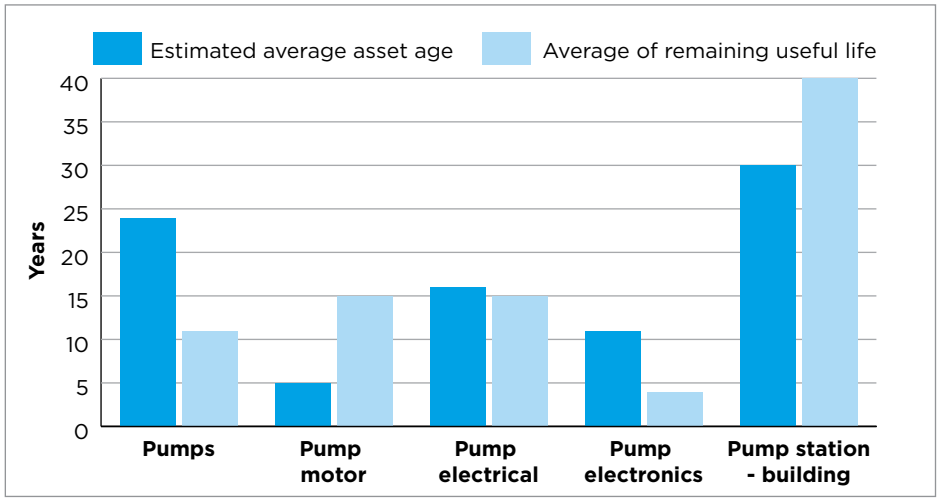

Asset value

The Council revalues its rivers and drainage assets annually. This process is important because it helps the Council make informed decisions. It also reflects changes in the useful life of the assets and depreciation.

Replacement values for 2023 are outlined to the right, noting that these values will change in subsequent years. Detailed information on individual scheme assets can be found in the full AMP.

- **Optimised Replacement Cost** (ORC) is the minimum cost of replacing existing assets with a modern equivalent that offers the same service level. Total ORC for rivers and drainage schemes is $438M. Stopbanks make up 58% of total asset value.
- **Optimised Depreciated Replacement Cost** (ODRC) is the cost of replacing an asset with a modern equivalent, less deductions for physical deterioration, obsolescence and optimisation.
- **Annual Depreciation** (AD) is the standard yearly rate depreciation is charged to a fixed asset. The 'straight-line' method of depreciation is used for all rivers and drainage assets that are depreciated. This results in AD being paid at a consistent rate across the life of the asset. AD is calculated by dividing the ORC of the asset by the expected life of the asset.

Scheme	ORC	ODRC	AD
Whakatāne-Tauranga	$129,986,722	$108,866,080	$499,731
Waioeka-Otara	$71,031,168	$56,051,245	$285,955
Kaituna	$118,325,517	$92,911,170	$751,394
Rangitāiki-Tarawera	$177,771,258	$160,644,483	$527,714
Rangitāiki Drainage	$22,787,340	$19,553,404	$88,963
Total	**$519,902,007**	**$438,026,381**	**$2,153,757**

Asset Group	ORC	ODRC	AD
Stopbank	$327,684,450	$273,400,576	$1,070,597
Structures	$27,350,677	$11,494,654	$534,241
Waterway	$21,186,216	$21,186,216	$-
Erosion Protection	$109,225,245	$109,225,245	$-
Pump Stations	$16,484,567	$7,781,431	$347,351
Other	$17,970,852	$14,938,259	$201,568
Total	**$519,902,007**	**$438,026,381**	**$2,153,757**

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Asset condition and performance

Asset condition is a measure of the physical state of an asset, which is visually assessed by staff and contractors on a regular basis.
The performance of an asset relates to its ability to support the delivery of agreed levels of service.

Understanding condition and performance is integral to risk management processes. By closely monitoring condition and performance, we are better equipped to identify and manage any risks in a timely manner.

Asset condition

Asset condition is one component of asset performance. Condition data collected during inspections provides information for decisions regarding renewal priorities and maintenance programmes. Critical assets are inspected one to three-yearly and non-critical assets are inspected three-yearly.

Asset condition is determined through a visual inspection by staff and contractors, which is recorded and measured using a 1-5 rating system (1 is an asset that is in very good condition and 5 is in very poor condition). Assets in poor to very poor condition are prioritised for renewal. This information, provided in the graph below, is based on the stopbank condition assessments for 2022-23.

1 - Very good	2.45%
2 - Good	71.89%
3 - Moderate	21.02%
4 - Poor	4.65%
5 - Very poor	0.00%

Asset Performance

While condition assessment looks at the physical state of an asset, assessing asset performance is more of a 'whole picture' analysis, incorporating required service levels, asset condition, intrinsic strength, capacity, and potential risks to communities.

When assessing the performance of Council's flood protection schemes, a national Performance Assessment Framework and Code of Practice is used. This national standard provides an overall asset performance score expressed as a risk grading between 1 (Very Low) and 5 (Very High), which is assigned to distinct parts of the river.

Performance assessments were completed on Council's critical flood protection assets in 2022-23. A summary of these results is provided in the main AMP document.

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Levels of service

Our partners and customers

Asset management provides levels of service, for current and future customers, in a cost-effective way, while meeting legislative requirements.

Council has a wide range of customers and partners that play a crucial role in fulfilling its responsibilities under the Rivers and Drainage activity. These include:

Ratepayers

Ratepayers are the key contributors and beneficiaries of the rivers and drainage schemes. Targeted ratepayers directly benefit from efficient land drainage and effective flood protection, which helps to mitigate the risks of flooding and supports land use practices.

Territorial Local Authorities

Council collaborates with local city and district councils to safeguard our communities. Managing natural hazards and supporting essential infrastructure are some of the vital community services where both regional and local councils share responsibilities.

Treaty Partners

The Rivers and Drainage activity is guided by the principles of the Te Tiriti o Waitangi (Treaty of Waitangi). Iwi, hapū, and whānau, who have a deep connection to the region's waterways, play a crucial role in the management of the rivers and drainage schemes.

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Central Government

Council works closely with Central Government agencies such as Kānoa, business unit of the Ministry of Business Innovation & Employment. This ensures a coordinated approach at a regional and national level, and can also provide Central Government funding to support flood protection projects, especially in response to emergencies and climate change adaptation.

Co-governance partnerships

Regional Council has a number of co-governance partnerships in place, in particular:

The Rangitāiki River Forum is the co-governance partnership jointly pursuant to the Ngāti Manawa Claims Settlement Act 2012 and the Ngāti Whare Claims Settlement Act 2012. The Forum was inaugurated in May 2012 and has a statutory role to protect and enhance the mauri (life-giving capacity) of the Rangitāiki River and its tributaries. The Forum partners representatives of Ngāti Whare, Ngāti Manawa, Ngāti Awa, Hineuru, Ngāti Tuwharetoa (Kawerau), Ngati Tuwharetoa (Taupō) and Ngai Tuhoe together with elected members of Bay of Plenty Regional, Taupō District and Whakatāne District councils.

Te Maru o Kaituna River Authority is a co-governance partnership pursuant to the Tapuika Claims Settlement Act 2014. Te Maru o Kaituna River Authority has a statutory mandate to restore, protect and enhance the environmental, cultural and spiritual health and wellbeing of the Kaituna River. It partners representatives from Tapuika, Waitaha, Te Arawa, Ngati Rangiwewehi and Ngāti Whakaue with elected members of Bay of Plenty Regional, Rotorua Lakes, Western Bay of Plenty and Tauranga City councils.

The Whakatōhea Kaitiaki Forum
Following enactment of the Whakatōhea Claims Settlement Bill, the Whakatōhea Kaitiaki Forum will be established. The purpose of the Forum will be to enhance the ability of Whakatōhea to discuss their interests and express views in relation to the rivers and catchments in the Whakatōhea rohe with central and local government agencies. The Forum will also be involved in the design and implementation of work resulting from these co-governance arrangements.

Tarawera Awa Restoration Strategy Group
The Group is a permanent co-governance partnership established under the Ngāti Rangitihi Claims Settlement Act. The Group supports, coordinates and promotes the integrated restoration of the catchment's mauri.

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Levels of service and performance measures

Levels of Service (LoS) incorporate the service element of delivering the Rivers and Drainage activity in conjunction with measurable targets to determine how effectively the activity has been delivered. Performance against service level delivery is reported to the community and Council each year.

Council developed the LoS for the Flood Protection and Control Activity through the LTP and AMP processes. The aim is to provide affordable service levels. This is achieved through community consultation, customer research, and service level reviews. Below are some of the key LoS (brackets indicate which documents they are related to).

Activity Strategic Outcome (LoS)	Customer Performance Measure
Provide flood protection in rivers and drainage scheme areas to agreed design levels.	Zero failures of flood protection and drainage system below design standard. (AMP)
Flood protection and control works are renewed and maintained. If significant erosion is occurring in an area where the river is confined, Council may explore river management options that align to the Room for the River approach (see page 24).	85% of maintenance and flood repairs are completed in accordance with the AMP. (AMP and LTP)
	70% of capital works are completed in accordance with the AMP (or in accordance with approved changes to the work programme). (AMP and LTP)
Community receives timely warning of potential flooding allowing them to take actions to avoid the hazard.	100% of flood warnings are given in accordance with Council's Flood Warning Manual. (LTP and AMP)
Effects on the environment are minimised in operations and capital works.	100% of operations, works and capital works are undertaken according to current legislation and policy, including the Environmental Code of Practice for Rivers and Drainage Maintenance Activities. (AMP)
Decision-making processes are transparent, easily understood and enable participation.	Scheme stakeholders and community are informed through the biannual Rivers Scheme Advisory Group meetings. (AMP)
Response to service requests, complaints and events is timely and appropriate solutions are provided.	Non-urgent complaints and service requests are responded to within five working days 100% of the time. (AMP)
Health and safety risks are minimised.	0% health and safety incidents are attributable to lack of management of rivers and drainage assets. (AMP)

Assets known to not meet design standards are listed in the main AMP and are included in the capital programme for renewal.

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Future demand

Planning for change in growth and demand provides an economically sustainable pathway to meet the needs of the region. The continued provision of rivers and drainage services are essential to helping achieve Council's community outcomes, particularly for healthy and safe communities.

One of the strategic approaches we are using to plan and adapt for future demand is the Rivers Scheme Sustainability Project (RSSP).

Rivers Scheme Sustainability Project

The Rivers Scheme Sustainability Project (RSSP) is considering the long-term sustainability of rivers and drainage schemes.

The current scope of the RSSP work includes:

- Reviewing the current levels of service of flood protection provided by the schemes
- Determining the economic value added by the schemes
- Floodplain management strategy review and development
- Assessing flood risk and the level of community acceptance of different levels of flood risk, as well as their willingness to pay for flood protection which includes the provision of traditional or hard engineering approaches and more environmentally focussed options (such as planting).

Affordability, for both the Council and the community it serves, is fundamental to the longer-term application of the RSSP. For example, the long-term cost of maintaining or fixing a section of riverbank, in a relatively isolated area, may not be appropriate as it will add little benefit in managing the risk of further erosion if the river is too confined.

Managing the impact of climate change and building in long-term community resilience is an all of government issue. Council is aware of work being undertaken by Central Government regarding the long-term sustainability of communities that are prone to flooding, with a particular focus on issues around property rights, insurance and compensation.

Council will continue to work with communities across the region to raise awareness of this work and have a meaningful say on long-term river management approaches and community affordability.

Room for the River is a global approach to river management that allows rivers to gradually reclaim some of their natural flood flow-paths that have been constrained over time.

Council is slowly adopting this approach to determine optimal river management solutions.

Council has started evaluating and implementing Room for the River techniques in some upper river catchments within the Bay of Plenty, to trial the efficiency and effectiveness of this approach.

Room for the River is not a one-size-fits-all solution. This approach ensures that river management decisions are both environmentally sustainable and economically viable in the face of a changing climate, while prioritising affordability for targeted ratepayers.

At a whole-of-catchment scale, the Rivers Scheme Sustainability Project will continue to be Council's key strategic project that explores implementation of Room for the Rivers as part of our adaptation to climate change.

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Capital planning

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Capital expenditure is the building of new assets or upgrading of existing assets. The majority of capital expenditure is focused on replacing or improving existing assets.

Replacement expenditure is work that restores an existing asset to its original service level. The overall LoS objective is to maintain and renew assets considering the following: age and condition profiles, performance and risk, level of ongoing maintenance, economic life of the materials used. Financial, customer and health and safety risks are also considered, as well as the outcomes of capacity reviews and geotechnical investigations.

Council carries out an annual prioritisation of all necessary renewal/improvement work. The priority list is used to assign funds when preparing financial plans. Renewals are reviewed regularly with any deferred work re-prioritised alongside other planned capital work.

Stopbank capacity reviews

A large proportion of Council's capital programme is associated with stopbank capacity reviews and remedial work. Capacity reviews measure the capacity a flood channel has to contain flood water and occur every 10 years in all schemes (apart from the upper Kaituna catchments, which are conducted every 15 years).

Capacity reviews measure changes in stopbank height resulting through settlement and other geomorphic processes. Capacity reviews are a five-year programme (see below a high-level outline) and is part of our committment to continually review the capacity of the flood defence network to account for a changing climate.

Year	Action	Action includes	Resulting action
Y1	Long section and cross section survey (at representative cross sections).	Generate plans of long section and cross section.	Check against benchmarks and design standards. Generate report.
Y2	Level 1 Assessment. Concurrent with modelling and capacity review.	Data gathering and risk assessment (review design standard, capacity, intrinsic strength, condition). Validation and assessment of fish passage.	AMP and GIS update. Risk assessment report (based on Code of Practice).
Y3	Level 2 Assessment.	Geotechnical investigation of high risk sites identified in Level 1 assessment as requiring further inspection.	Review of risk assessment (with more detail). Design of remedial and capital works.
Y4-Y5	Remedial and Capital Works.	Physical works.	Upgraded assets. As-builts. Asset Register/ GIS updated.

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Operational and maintenance planning

The Rivers and Drainage Operations Team is responsible for the delivery of operations and maintenance works across the assets covered in this plan. The Rivers and Drainage Operations Team programmes the delivery and timing of annual maintenance work and manages the operational budgets for schemes.

The purpose of operations and maintenance is to ensure the continued functionality, safety and longevity through the assets' operational lifespan. To achieve this, the right balance between routine, planned and reactive maintenance is required so that assets are managed optimally, in terms of functionality and cost.

Maintenance plans have been developed for each of the schemes operated by Council. These plans outline the maintenance activities that are required.

Preventative maintenance, regular inspection, monitoring and condition assessments all contribute to ensuring service reliability standards are met. Operational and maintenance plans, as well as inspection, condition and performance monitoring frequencies, are presented in the main AMP document.

Additional reactive flood damage repair works are required at times to restore the scheme to acceptable operating levels of service. Maintenance plans are amended to account for work created by flood events – with work being reorganised to align with work prioritisation criteria.

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Financial planning

To undertake a sustainable, long-term approach to asset management, it is essential to prepare long-term financial forecasts. This allows a long-term view of how the assets will be managed, how much this will cost, and when additional funding may be required to meet expected service levels.

Funding

The rivers and drainage schemes are funded through a combination of targeted and general rates, in accordance with the Local Government (Rating) Act 2002.

The targeted rate component includes properties within a scheme that directly benefit from it. This makes up the vast majority of the rate funding. The targeted rate per property is determined based on the property's location within the scheme and the land area within each rating unit.

The general component is value-based, as the benefits of the rivers and drainage schemes extend regionally. The general contribution reflects the economic benefits of the schemes for productive land and protection of public infrastructure, such as roads, and is distributed evenly across the region.

Rivers and drainage capital expenditures, which provide long-term benefits for future generations, is funded through loans, capital grants or reserves. Major flood repair projects are funded through a combination of contributions from ratepayers, Central Government funding and insurance recoveries.

Additional funding sources, such as interest earned on scheme reserves and contributions from external sources, also assist in funding scheme budgets. A more detailed breakdown of this information is available through the Council's Revenue and Financing Policy on the Council's website.

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Risk management

Risk management identifies specific business risks, together with any possible risks associated with the ownership and management of the assets, to the health and safety of employees, contractors and the general public.

Council has developed a Risk Management Framework and Plan. The risk criteria and matrices established as the basis for risk evaluation were developed in accordance with the NZ/AS/ISO 31000:2009 risk management standard.

This framework determines direct and indirect costs associated with these risks, assigns a risk rating and forms a priority-based action plan to address them. Risk ratings enable differentiation between risks that are significant and those of a lesser nature.

Likelihood	Consequence: Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Frequent (5)	5	10	15	20	25
Often (4)	4	8	12	16	20
Likely (3)	3	6	9	12	15
Possible (2)	2	4	6	8	10
Rare (1)	1	2	3	4	5

Risk Score	Risk Level	Risk Action
15-25	Extreme risk	Requires immediate remedial action.
8-14	High risk	Requires remedial planning and action via the AMP.
4-6	Moderate risk	Address via new procedures and/or modification of existing practices and training.
1-3	Low risk	No formal requirement for further action, unless escalation of risk is possible.

Having established the risk level, risks are ranked and then evaluated, by beginning with the highest risks and potential mitigation measures.

The most suitable risk reduction actions are determined by considering options and resources available to the Council. Costs and benefits of these actions are analysed to determine those actions yielding the greatest benefit (risk reduction) for the least cost.

A key risk associated with this activity is the impact of our changing climate, leading to more frequent and intense weather events. Further information on our efforts to mitigate the effect of climate change and other risks can be found in the main AMP document.

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Critical assets

Quantifying consequence of failure is the key element in determining critical flood protection assets.

The consequence criteria that qualifies a Council flood protection asset as 'critical' are assets that:

- Provide direct flood protection to urban environments where large groups of people live in a concentrated manner, i.e. towns, not rural type subdivisions.
- Provide direct flood protection to regionally significant infrastructure.

This criteria identified the following as the most critical assets based on risk to people and important infrastructure.

Asset	Location	Protects
Whakatāne River right bank	Te Tahi Street to rivermouth	Whakatāne Township
Whakatāne River left bank	Te Rahu Canal outlet to rivermouth	The Hub, Keepa Rd area
	The Hub, Gateway Drive, Keepa Road, Whakatāne Board Mill	The Hub, Keepa Rd area
Rangitāiki River stopbanks left and right bank	From substation to downstream of town	Edgecumbe township, Fonterra factory and Transpower substation
Waioeka right bank	Around urban area	Ōpōtiki township
Otara left bank and Mill Stream bank	Around urban area	Ōpōtiki township
Ōkere control gates	Regulates the flow of water from Lake Rotoiti into Kaituna River	Rotorua and surrounding areas and enables downstream flooding management
Ohau Weir	Controls water level fluctuations in Lake Rotorua	Rotorua and surrounding areas
Rotorua stopbanks, floodwalls and Waingaehe Diversion Structure	Around urban area	Urban Rotorua

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Management of critical assets is prioritised over non-critical assets. This is reflected by more frequent monitoring of asset condition and performance for critical assets, as well as the prioritisation of remediation and the development of capital works programmes for our most critical assets. Asset condition and performance information is essential to the overall life cycle management of assets, where decisions relating to the maintenance and renewal of assets are optimised due to the availability of this information.

In 2020, a response plan was adopted that provides guidance for readiness, response and recovery in relation to issues effecting the integrity of critical assets. This provides another important level of risk mitigation for critical assets.

Audit and continuous improvement

Council is committed to implementing robust asset management processes and practices in line with industry best practices. This commitment involves a continuous assessment of the effectiveness of our systems and procedures, and working towards cost-effective improvements.

External reviews of the Council are conducted systematically, with audits being carried out on a consistent, recurring basis. In 2019, KPMG assessed the maturity of Rivers and Drainage AMP. This audit involved a comparison of asset management processes employed across all asset portfolios, including Rivers and Drainage, Coastal Catchments and Regional Parks, Rotorua Lakes, Maritime, and Property, against the relevant aspects of the IIMM and ISO 55001 standards. The KPMG report acknowledged the excellent asset management practices of the Rivers and Drainage department. The next audit is scheduled for 2024.

Efforts to address areas in need of improvement are currently in progress or have been completed, with further planned actions outlined in the improvement action plan.

Reviewing previous performance

Key improvement areas noted in the previous three years are described below.

Condition assessments

Assets covered by the AMP now have a systematic regime for condition assessment, which is consistent with national best practice. This is an improvement in terms of risk management and asset replacement decision making. To add to this, Council's knowledge of the geomorphological characteristics of soils has increased across the schemes but, particularly, in critical asset areas.

Technology One system

Council has implemented this system and it is operational. Staff are competent at a functional level and are familiar with the system. Asset data has been scrutinised and Technology One 'champions' are in development. The asset register, which was previously held solely in spreadsheets, is now maintained through Technology One and links directly with Council's mapping and financial systems. Works orders and maintenance plans are being tested for scheme works (operational and capital) and users are becoming familiar with these systems.

Further functionality will be realised as part of the implementation of the AMP's improvement plan. Improved functionality has the potential to streamline systems and create process efficiencies, saving staff time, improving data accuracy, and providing 'dashboard' type reporting to assist management decisions.

Flood Protection and Drainage Bylaws 2020

Council's management of the risk to flood protection and drainage asset integrity resulting from people's activities has improved. This has been achieved by:

- Increasing specialist staff capacity.
- Improved systems and processes, e.g. public GIS interface for developers to ascertain whether they need Bylaw authority and streamlined application process.
- Increased public communication through the development of short educational videos, improved website material and targeted updates.

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Improvement plan

Council has adopted a strategic management approach to improvement planning, continually developing AMPs, and implementing improvement processes and practices to provide a better service to our customers, managing risk and optimising resource use.

Asset management work has been grouped into key asset management process areas for the purposes of improvement planning.

1. Asset management/information systems
2. Asset data and knowledge processes
3. Operations and maintenance processes
4. Demand analysis and strategic planning processes
5. Asset capital processes
6. Organisational/commercial

Improvement in these areas is critical to achieving sustained performance of the organisation at the lowest life cycle cost. The AMP considers each core asset management process area and determines improvement goals. The improvement goals are then grouped into improvement projects.

Further details can be found within the main AMP document.

Capacity reviews

In recent years Council has completed capacity reviews (see page 26) of all the major rivers schemes, with the exception of the Whakatāne-Tauranga Rivers Scheme (upstream of the Whakatāne township), and some upper Kaituna catchments that are nearing completion. Capacity reviews confirm the current capacity of flood protection networks and identify work required to ensure assets continue to be fit for purpose with climate change induced increases in flood flows. The capital programme identifies the work proposed to ensure assets continue to achieve the required levels of service.

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