

Long Term Plan 2024-34 Activity Plan

# Flood Protection and Control Works

- *Major tidal river flooding flood protection and control works are maintained, repaired and renewed to key standards*

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# 1. What this activity delivers

The flood protection and control works activity delivers floodplain and stormwater management plan objectives to reduce the harm from flooding to our community

The activity includes construction of new flood protection infrastructure and management of existing infrastructure including:


- water flow control devices and structures such as stopbanks, dams and tide gates,

Under this activity plan, protection and control works that are required to mitigate the effects from flooding of our tidal waterways, coastal and estuary areas within the Christchurch City Drainage boundary. Note: Banks Peninsula Waterways are administered by Canterbury Regional Council.

Therefore this activity excludes anything that provides flood mitigation against runoff that is generated by rainfall falling on urban “surfaces” such as roads, dwellings, commercial builds, parks etc. that is collected and discharged into our urban waterways within the current Christchurch City Drainage boundary.

**Note: This activity is intrinsically linked to and interdependent with the Stormwater Drainage activity.**

This activity includes the following services:

Service	Contributes to Community Outcomes
 <p><b>Major tidal river flooding flood protection and control works are maintained, repaired and renewed to key standards</b> This is to reduce risk of flooding to property and dwellings during extreme tidal flooding events – focussing on above residential floor flooding - across the city</p>	<ul style="list-style-type: none"> <li>• A green liveable city</li> <li>• A thriving prosperous city</li> </ul>



Stopbanks along a stretch of the Avon River will contain a tide associated with a one in 100-year storm. (<https://www.stuff.co.nz/the-press/news/125656079/avon-river-stopbanks-will-protect-area-from-one-in-100year-tide>)

## A snapshot of provision and use:

- ✓ We operate 12.1 kilometres of stop bank



Previous flooding around the Ōpāwaho Heathcote River

### What our community is saying

**Who our key customers are:** All residents of the City and Banks Peninsula

**Who our key stakeholders are:** All residents of the City and Banks Peninsula

**What residents say:** “Our street has flooded multiple times and there seems to be nothing done to solve it.”

**Community outcomes:** A green, liveable city.

### Where we came from

Christchurch City’s flooding and storm water draining has generally been interdependent and intrinsically linked.

A complex system of drains, both open and piped, have been created to carry stormwater from the city to the Linwood Avenue outfall. Natural streams and creeks have been used, with many becoming boarded drains.

In 1868 Christchurch was flooded by the Waimakariri River. This prompted the construction of flood protection works that started in the 19th century and continued well into the second half of the 20th century.

Christchurch remains vulnerable to surface flooding from large rainfall events, rivers spilling over their banks, and major storm events associated with high tides.

This was exacerbated by the Canterbury earthquakes of 2010 and 2011, substantially altered ground levels in parts of the city and flooding affected Mairehau, Richmond, St Albans and properties along the lower reaches of the Ōpawaho-Heathcote River.

In 2012 the Land Drainage Recovery Programme was established to assess the effects of the earthquakes on the land drainage network and prepare a programme of works to address them.

After a series of floods, a Mayoral Taskforce was set up in 2014 to grapple with this problem in the most vulnerable areas. It prioritised funding for mitigation projects, particularly in the Flockton area and the Heathcote catchment. The Land Drainage Recovery Programme was absorbed back into ‘business as usual’ works at the end of 2019.

Historically, work on Banks Peninsula focused on enclosing hillside streams for safety and land stability, and to improve drainage to the sea from Lake Forsyth to reduce the risk of flooding.







In the LTP2024, some services that had previously been sitting under the Flood Protection and Control Works Activity were re-classified into the Stormwater Drainage activity due to their Levels of Service being primarily for stormwater management purposes.

## 2. Why we deliver this activity

### 2.1. Community Outcomes: How this activity contributes


Community Outcomes	Contribution*	Key contributions to achieving our community outcomes
 <p><b>A collaborative confident city</b> Our residents have the opportunity to actively participate in community and city life, have a strong sense of belonging and identity, and feel safe</p>	★★	<p><b>We aim to involve our communities with our green assets to change attitudes by:</b></p> <ul style="list-style-type: none"> <li>As part of what we do, community groups are able to engage with waterways through being part of activities such as community plantings. This is important for improving the connection of people with our waterways and the restoring the Mauri of water.</li> </ul>
 <p><b>A green, liveable city</b> Our neighbourhoods and communities are accessible and well-connected, supporting our goals to reduce emissions, build climate resilience and protect and regenerate the environment, especially our biodiversity, water bodies and tree canopy</p>	★★★★	<p><b>We strive to provide appropriate measures for climate change adaptation by:</b></p> <ul style="list-style-type: none"> <li>Appropriate flood management is a crucial part of Council providing such measures within our control to ensure all communities with the city are provided with a liveable city. Council is cognisant of the effects of climate change and our adaptation responses need to consider the needs of our customers to provide the best informed solutions.</li> </ul>
 <p><b>A cultural powerhouse city</b> Our diverse communities are supported to understand and protect their heritage, pursue their arts, cultural and sporting interests, and contribute to making our city a creative, cultural and events 'powerhouse'</p>	★★	<p><b>We strive to include multiple values within our business by:</b></p> <ul style="list-style-type: none"> <li>One of the 6-values that Council aspires to include within capital works projects and the way it operates and maintains assets is culture. This can be often seen with the inclusion of items within flood protection facilities (artifacts, storyboards etc.).</li> </ul>
 <p><b>A thriving prosperous city</b> Our city is a great place for people, business and investment where we can all grow our potential, where enterprises are innovative and smart, and where together we raise productivity and reduce emissions</p>	★★	<p><b>We strive to deliver cost effective solutions to improve the city by:</b></p> <ul style="list-style-type: none"> <li>Developing flood mitigation strategies that are provide sufficient confidence to allow the city to grow and be productive.</li> <li>Through careful planning, consultation and prudent financial investment, Council aspires to ensure Christchurch is well prepared for the impacts and consequences of climate change and our obligations to meet emissions targets although no actual work is being funded through this LTP.</li> </ul>
<p><b>*Level of contribution - what this means</b></p>		
★★★★	This activity is critical to the Council's contribution to achieving this community outcome – we measure our impact with specific levels of service	
★★★	This activity strongly supports the Council's contribution to achieving this community outcome – we measure our impact with specific levels of service for some elements	
★★	This activity supports the Council's contribution to achieving this community outcome – we measure our impact with specific levels of service if practicable	
★	This activity may provide incidental support to achieving this community outcome – it's not cost-effective to measure our impact	

## 2.2. Strategic Priorities - How this activity supports progress on our priorities


Strategic Priorities		Contribution*	How our strategic priorities influence the way we work
	<b>Be an inclusive and equitable city which puts people at the centre of developing our city and district, prioritising wellbeing, accessibility and connection</b>	★★	<ul style="list-style-type: none"> <li>The provision of flood protection measures provides an element of safety to the residents that live in areas that are at risk of tidal flooding, both now and in the future. By working with communities in preparing for adaptation, which considers the well-being of our affected communities, it will hopefully provide more connection between Council and residents over the proposed works.</li> </ul>
	<b>Champion Christchurch and collaborate to build our role as a leading New Zealand city</b>	★★	<ul style="list-style-type: none"> <li>By being proactive with climate adaptation as related to sea level increases Council has the ability to be a leading New Zealand city. While council has the passionate and skilled staff to be able to deliver this work, it will require our elected members to commit the require expenditure in new assets (and further OPEX increases) to meet the ideal of our strategic priorities.</li> </ul>
	<b>Build trust and confidence in the Council through meaningful partnerships and communication, listening to and working with residents</b>	★★	<ul style="list-style-type: none"> <li>Though engagement with the community on climate change adaptation, and the proposed adaptation pathways, Council will be able to ensure that the residents concerns are addressed to build trust and confidence what we do.</li> </ul>
	<b>Reduce emissions as a Council and as a city, and invest in adaptation and resilience, leading a city-wide response to climate change while protecting our indigenous biodiversity, water bodies and tree canopy.</b>	★★★★	<ul style="list-style-type: none"> <li>The Flood Protection &amp; Control Structure activity is very aware of the effects of the changing climate on our asset base and the changes that will be required to manage rising ground water levels, rising sea levels, more intense rain events and times of drought. While not undertaken yet , as the business is awaiting further strategic direction, there will need to be greater planning carried out how we will provide for resilience for our infrastructure which may require planning for our approach for providing flood protection. We will need to address the potential for increased emissions that this will result in with real emission reduction strategies. There is no funding available within the LTP to fund any of these works within the business.</li> </ul>
	<b>Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents</b>	★★★	<ul style="list-style-type: none"> <li>We aim to ensure that capital works projects are delivered in the best possible way to minimise expenditure which limits the amount of borrowing Council is required to undertake.</li> <li>Operational expenditure is managed through the use of a multi-year maintenance contract.</li> <li>The balancing act of managing the cost of renewals with increased operational cost is something that staff are mindful of when making financial decisions. We are ratepayers too.</li> </ul>
	<b>Actively balance the needs of today's residents with the needs of future generations, with the aim of leaving no one behind</b>	★★★★	<ul style="list-style-type: none"> <li>The business is well aware of the requirement with providing suitable flood defences that are balanced between a suitable level of protection (which considers best estimates on the future climate scenarios) and the capital costs. This is why it is essential that Council continues essential projects such as the Multi Hazard Assessment works.</li> <li>As discussed above climate adaptation and carbon emission reduction works are required considerations with many of the projects undertaken by the activity although there is no funding available within the LTP to fund any of these works within the business.</li> </ul>
<b>*Levels of contribution - what this means</b>			
★★★★	This activity is critical to achievement of this strategic priority – we measure our impact with actions and levels of service in the Strategic Priorities Action Plan		
★★★	This activity strongly supports achievement of this strategic priority – we measure our impact with actions and levels of service in the Strategic Priorities Action Plan for important elements only		
★★	This activity supports achievement of this strategic priority - we measure our impact with actions and levels of service in the Strategic Priorities Action Plan if practicable		
★	This activity may provide incidental support for the achievement of this strategic priority – it's not cost-effective to measure our impact		

## 2.3. Climate Resilience Goals: How this activity supports climate resilience goals

### Net zero emissions Christchurch

	<p>Key sources of greenhouse gas emissions from this activity includes:</p> <ul style="list-style-type: none"> <li>• Construction of flood protection structures</li> <li>• Maintenance of flood protection assets including travel associated with operation and maintenance activities</li> </ul>	
	<p>Flood Protection and Control Works are taking the following actions to reduce greenhouse gas emissions:</p> <p>Operational/embedded greenhouse gas emissions</p> <ul style="list-style-type: none"> <li>• Reduce our carbon footprint through changes in design, material choice and construction of new assets without compromising level of flood protection</li> </ul>	<p>Greenhouse gas emissions by users of the Flood Protection and Control Works activity</p> <ul style="list-style-type: none"> <li>• Reduce carbon emissions during and following flood events by providing adequate flood defence. Emissions from adverse flood effects may include:             <ul style="list-style-type: none"> <li>○ Use of diesel generators to provide temporary power to properties</li> <li>○ Emergency responses and evacuations</li> <li>○ Road closures leading to large diversions, increasing petrol use</li> <li>○ Repairs to or replacement of flood damaged properties, structures, equipment, etc</li> <li>○ Energy in drying processes (e.g. dehumidifiers, air blowers, etc)</li> <li>○ Waste generation from flood damaged goods</li> </ul> </li> </ul>


### We understand and are preparing for the ongoing impact of Climate change

	<p>Key climate risks for the Flood Protection and Control Works activity includes:</p> <ul style="list-style-type: none"> <li>• Sea Level Rise Related             <ul style="list-style-type: none"> <li>○ Reduced system conveyance and flood management capacity due to either a raised groundwater table or decreased hydraulic gradient due to sea level rise</li> <li>○ Salinity may affect vegetation health, leaving banks at higher potential for erosion</li> <li>○ Increased flooding extent in coastal areas</li> </ul> </li> <li>• Rainfall and Flooding Related             <ul style="list-style-type: none"> <li>○ More intense and frequent storms contribute to increased flood flows</li> <li>○ Rainfall amounts and seasonality changes may contribute to increased runoff volumes due to change in ground soakage capacity</li> <li>○ Overland flow paths may change</li> </ul> </li> <li>• Heat, Drought, Fire Related             <ul style="list-style-type: none"> <li>○ Grass/vegetation die off along stop banks may lead to faster degradation and erosion</li> </ul> </li> <li>• Soil Erosion and Landslides Related             <ul style="list-style-type: none"> <li>○ Changes in seasonality of rainfall could cause effect on soil erosion on surfaces at different stages of vegetation life</li> <li>○ Increased scour and erosion during flood events due to increased flows</li> </ul> </li> <li>• Other             <ul style="list-style-type: none"> <li>○ Buildings, homes, and businesses may become inhabitable, unusable, or uninsurable</li> <li>○ Alterations to river flows may result in changes to flood hazards</li> <li>○ Damage from flooding could result in large amounts of hazardous waste requiring disposal</li> </ul> </li> </ul>
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	<ul style="list-style-type: none"> <li>○ Flood waters can contain contaminants which can pose human health risks</li> <li>○ Contaminants in flood waters can also impact social, recreational, and cultural values in surface water bodies and coastal areas</li> <li>○ Flooding and erosion may lead to restricted road access and isolate affected communities</li> </ul> <ul style="list-style-type: none"> <li>● Other impacts on assets and infrastructure (see the <a href="#">Land Drainage Asset Management Plan</a> for more details).</li> </ul>
	<p>Options that are currently being carried out to reduce the risks to the Flood Protection and Control Works activity and the community posed by those climate risks include:</p> <ul style="list-style-type: none"> <li>● Improve knowledge of flood management system performance by continuing to use and maintain hydraulic models which consider current and future climate-factor scenarios to enable informed decision making</li> <li>● Manage assets collectively to ensure future works maximise collaborative benefits across Council activities. This includes reviewing climate change risks, such as sea level rise extents, and incorporating the results into current and future planning and design works, noting management of climate related risks and reduction in vulnerability will likely include collaboration in multiple Council activity areas such as the Coastal Hazards Adaptation Programme.</li> <li>● When considering replacement or upgrading of existing assets in current and future flood prone areas, consider the lifespan of the new asset and cost over its lifetime. Undertaking a lifespan cost assessment may highlight design options to reduce intergenerational burden.</li> </ul>

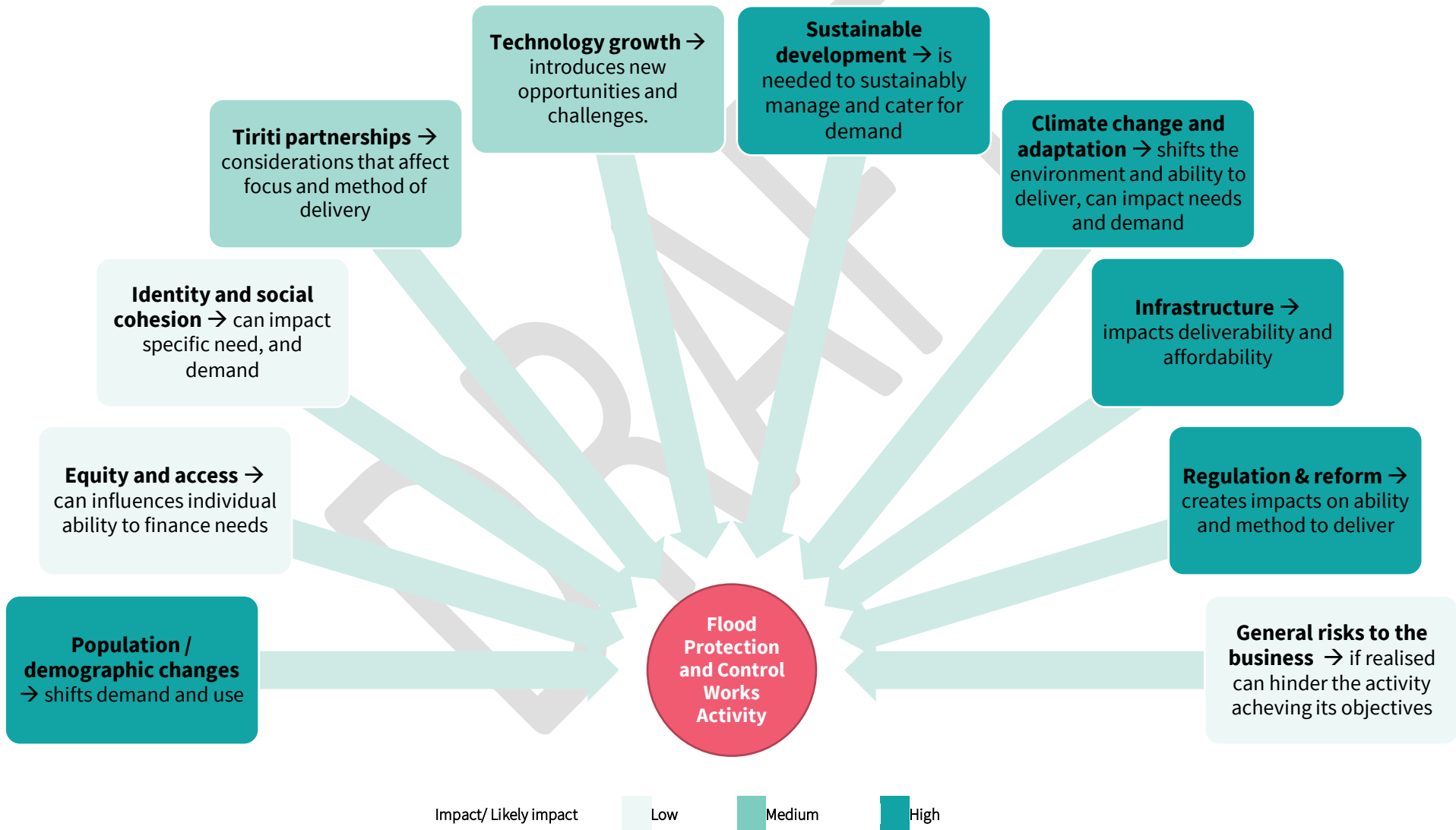
**We are guardians of our natural environment and taonga**

	<p>A pilot project that was proposed to be undertaken to support strengthened resilience to climate change impact initiatives but not provided with any 2024-2034 LTP funding was:</p> <p><u>Project 1: Mapping the Flood – Continued Development of Flood Hazard Models and Utilisation of Outputs for Decision-Making and Planning</u></p> <p>Carryout project to update flood hazard mapping throughout the district for a range of current and future scenarios. Continued upgrade of flood models has the following benefits:</p> <ul style="list-style-type: none"> <li>● Creation of updated district-wide comprehensive, dynamic flood models enable informed decision making based on the latest predictions and estimations</li> <li>● Outputs from the flood model would be able to be incorporated into the climate risk explorer tool developed in the coastal hazard adaptation team and contribute to evidence-based decision making utilising a multi-hazard tool</li> <li>● Enable a cost-effective way of testing and developing flood management designs which take into account the effects to the whole system and account for future climate change impacts such as sea level rise and increased rainfall.</li> <li>● Contribute to the ongoing safety of residents by educating on existing flood risk locations and enabling development of whole of system designs which consider effects upstream and downstream.</li> <li>● Are essential for contributing to the ongoing reduction of flood risk to the city by providing information on flood risk, notably when considering new housing areas or facilities or purchase of a property.</li> </ul> <p>The current level of service (LOS) already begins to address accountability of the activity functions in relation to climate change vulnerability and greenhouse gas emissions as outlined below. This level of service meets the outcome as it is undertaken as “business as usual”. Nothing new is being provided or funded as part of the 2024-2034 LTP.</p> <ul style="list-style-type: none"> <li>● LOS: Major flood protection and control works are maintained, repaired and renewed to key standards <ul style="list-style-type: none"> <li>○ A maintained system is more effective at minimising adverse flooding</li> </ul> </li> </ul>
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# 3. How we are planning for future impacts

There are various factors influencing current and future demand for Flood Protection and Control Works and the ability to deliver them. These are listed below.

## 3.1. Issues impacting current and future activity demand and deliverability



## 3.2. The high impact issues and mitigations planned

The more prominent ones that in particular effect our Community Outcomes or Strategic Priorities are summarised on this page. For further details on issues, including the current status, future projections, likely impact and mitigations please see Appendix B.



### Climate Change and Adaptability

→ there is a need to service communities with infrastructure that is safe, practical and cost effective.

This will **impact the community outcomes and strategic priorities** if being unable to meet levels of service.

**Mitigating actions** to ensure we manage this, if funded, include carrying out infrastructure planning for future climate scenarios, work with Strategic Hazard teams, avoid maladaptive projects while policy is developed.



### Infrastructure

→ sufficient investment in asset renewals, protracted delivery process, lack of asset management tools is needed

This will **impact the community outcomes and strategic priorities** if money is not managing wisely to make a thriving prosperous city.

**Mitigating actions** to ensure we manage this include improving asset management maturity, carrying out systemic process changes for delivery. However, as this is not funded in the LTP, improvements are unlikely



### Population/Demographic Changes

→ can result in increased flooding or waterway contamination if not managed

This will **impact the community outcomes and strategic priorities** negatively.

**Mitigating actions** to ensure we manage this include hydraulic modelling, planning for demand management, looking at increasing infrastructure run-off differently. Additional funding for Planning has not been provided in LTP, so improvements will be limited



### Sustainable development

→ development should not occur where it cannot be sustained long term due to climate adaptation.

If done, this can **impact the community outcomes and strategic priorities** providing infrastructure that will not meet its required asset life and incur excessive OPEX costs.

**Mitigating actions** to ensure we manage this include ensuring the effects of climate hazards are incorporated in design, work with Strategic Hazard teams, avoid maladaptive projects until suitable policy is developed.

### Flood Protection & Control Works activity

## 4. Our levels of service

Council’s Levels of Service (LoS) measures enable us to monitor and report against our outcomes and service performance. See Appendix A: Levels of Service Details for more detail.

### Services & Level of Service Statements, with Measures of Success and future year Targets

Level of Service statement (What we will provide)	Measures of success (What our community can expect)	Performance Targets/Outputs			
		2024/25	2025/26	2026/27	2027 - 34
<b>Major tidal river flooding flood protection and control works are maintained, repaired, and renewed to key standards</b>					
<b>Major tidal river flooding flood protection and control works are maintained, repaired, and renewed to key standards</b>	Stop banks identified as not meeting the original design requirements for condition and/or height are repaired within 9 months (DIA Flood Protection & Control non- financial performance measure number 1) (14.1.3.3)		80%		80% - 100%
	Stormwater attenuation facilities are assessed and compliant with New Zealand Dam Safety Guidelines 2015 (DIA 1) (14.1.8)	25%	50%	75%	100%

## 5. How assets will be managed to deliver the services

The Flood Protection and Control Works portfolio is made up of flood protection structures such as the Woolston Barrage and stop banks. The Asset value of this Activity is approximately \$11M

### Managing our assets

Assets are provided by the activity by 3 key means: asset improvement/growth, renewals and vested assets from development. Development is unplanned and can be difficult to financially manage, especially OPEX funding, as the provision of the timing of delivery is out of council's hands. Improvement and growth works are generally required to meet compliance and regulatory requirements (Comprehensive Stormwater Network Discharge Consent (CSNDC), Freshwater NES) and climate change resilience projects. Renewal projects are required to ensure our asset based is replaced at a time that manages the cost of borrowing CAPEX funds to replace the asset compared to rates raising required for increased OPEX costs.

Given the size of the asset base, there are separate teams that manage the various provision of Assets. the various teams in this activity work well together.

There are three maintenance contracts for the maintenance and operation of the assets, with the main one being the CN4600003932 – “Stormwater and Waterways Maintenance Christchurch”. The funding for the maintenance activities are a mixture of planned works and reactive works. This allows the greatest flexibility for the funding provided and a mixture of works that are required to meet levels of service for amenity and public satisfaction as well as fault resolution.

Not all of the maintenance activities on flood protection and control works are carried out by the Land Drainage operations team. Some of the maintenance activities are carried out by

### Looking forward

The focus for the activity for this LTP period is consistent with other previous LTP's. There is always a focus on how best to prioritise the needs of the community, meeting our legal requirements and ensuring value for money. This LTP also needs to consider the cost implications of the changing economic situation with increasing inflation and cost escalation and finally looking at prioritising climate resilience with the attention that's been needed for some time. These competing priorities create some tension with the available funding that needs to be balanced across the 3 Waters activities and the wider organisation.

With the emphasis on Climate Resilience through the Strategic Priority of “Reduce emissions as a Council and as a city, and invest in adaptation and resilience, leading a city-wide response to climate change while protecting and enhancing our indigenous biodiversity, water bodies and tree canopy”, there have been a number of pilot projects that have been identified and funding requested (CAPEX and OPEX). These projects include initiatives such as “Continued Development of Flood Hazard Models and Utilisation of Outputs for Decision-Making and Planning” and “Identification of Properties at-risk of Above Floor Flooding” (see section 2.3 for further detail). This will have corresponding benefits with the “A green, liveable city” Community Outcome, which, as discussed in Section 2.1 above, is a key outcome for this activity.

There are a number of Council strategy documents that are important to the activity, with one of the key documents being “Te Wai o Tane - Integrated Water Strategy (2019)”. The strategy sets out 4 goals including; the value of water use by the community, the importance of water quality and ecosystem protection and enhancement, an understanding of the effects of climate change and assisting with community adaptation and the sustainable management of water in line with the principle of kaitiakitanga. Unfortunately, while there have been child water strategies prepared by the Water and Wastewater Planning team, this has not been done yet by the Land Drainage and Waterways Planning team due to other competing priorities for similar works (CSNDC work, Freshwater Action Plan, Stormwater Management Plans) and insufficient dedicated resource. The business has not able to make use of the “Otautahi Christchurch Climate Change Strategy (2021)” as there have been insufficient policy or

the Parks operations team. Given the planned water reform, there will either need to be a change in operation, or more detailed Service Level Agreements will be required.

As can be seen in “Section 6: Capital Expenditure and key capital projects”, the main spend for Stormwater Drainage and Flood Protection activities is Growth and Improvement. This is primarily due to the provision of treatment facilities both within and outside of the Ōtākaro Avon River Corridor (and associated land purchase) and flood mitigation projects. There is a large renewal required for lined drains as well.

The Draft Infrastructure Strategy (IS) contains some key significant issues, including “We need to improve our understanding of our infrastructure so we can make the best decisions for our community”. This is an on-going issue that additional resource is needed to make any improvements to data collection or management. There are a number of processes that need to be improved, for example the ability to collect and update condition data to be able to create renewal models with accurate funding projections. Many of these issues are also reflected within the Risk Table of the Strategic Asset Management Activity Plan which is the key team responsible for guiding the organisation with all things asset management.

Additionally, there is a continued need to provide for consequential OPEX related to operating the capital projects currently being built or proposed for the future e.g. new stopbanks. This means that the assets will:

- deteriorate at a much faster rate than designed to,
- may pose a health and safety risk to council staff and the public, and
- will not deliver the benefits that they were built.

Bids for consequential OPEX will be included in future plans

guidance for the activity to work within the framework of goals and programmes in the strategy. Therefore, the emphasis of climate within this LTP is welcomed by the business.

One of the key messages within the Infrastructure Strategy, Financial Strategy and the Mayors Letter of Expectation is ensuring that the capital programme is appropriate and deliverable.

We acknowledge that while past performance is valuable for learning, it is crucial to focus on the changes required to enhance delivery processes and ensure the capital program's deliverability. Three Waters has and continues to make systematic changes to delivery that will enable the delivery of the Capital program. The following are changes being undertaken to improve the efficiency of capital delivery:

- Development of a 3-year delivery program
- Improved scheduling, resourcing and allocation
- Improved program management
- Pipe renewals delivered through a multi-year performance based contract with Tier 1 contractors
- Contingency funds to be held at program level for low risk projects
- Development of a capital works program that is agile and can react to project delays that will invariably occur on a capital works program of this size
- Increased investigations and designs ahead of plan, this will remove the risk of procurement delays impacting the capital program

By recognizing the need for improvement and implementing the necessary changes, we are confident in achieving successful outcomes for the program and it is deliverable. There are sufficient contractor resources in the market, the challenges in supply chain are being overcome through advanced planning, and design resources are available. This is all made possible with a well developed program and schedule, allowing our delivery partners to prepare and allocate resources to support our capital program.

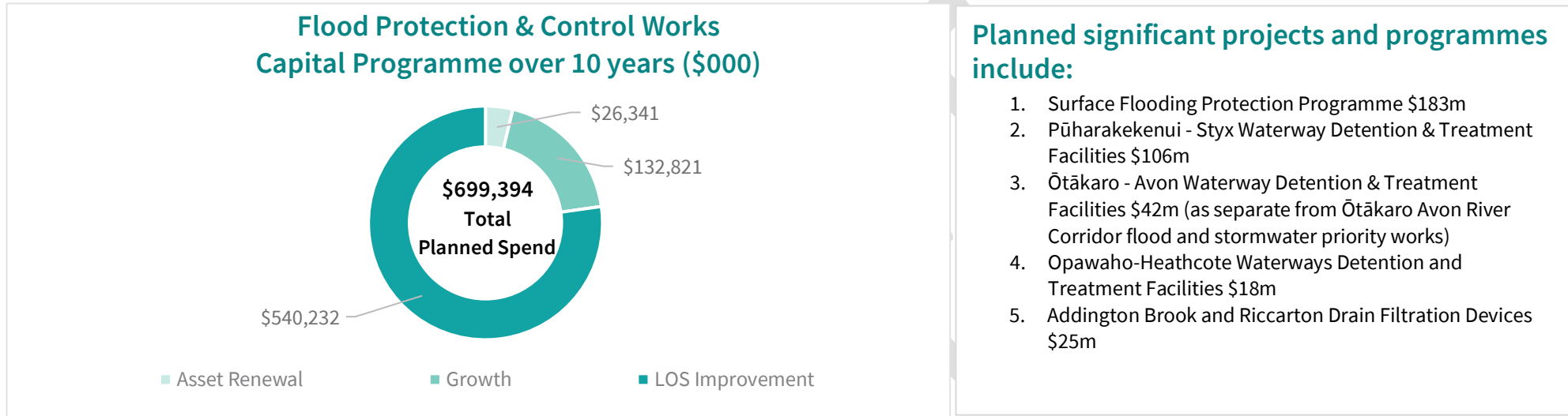
The current capital programme has been designed to balance between deliverability and achieving levels of service. Adjustments have been made not just to the initial 3 years of the LTP, but for the first 10 years of the infrastructure strategy. This has resulted in some redesign and rephasing of some major flood protection works.

As improved asset data allows robust business cases to be developed, additional funding will be requested in future Long Term Plans to fund programmes of work that require increased investment.

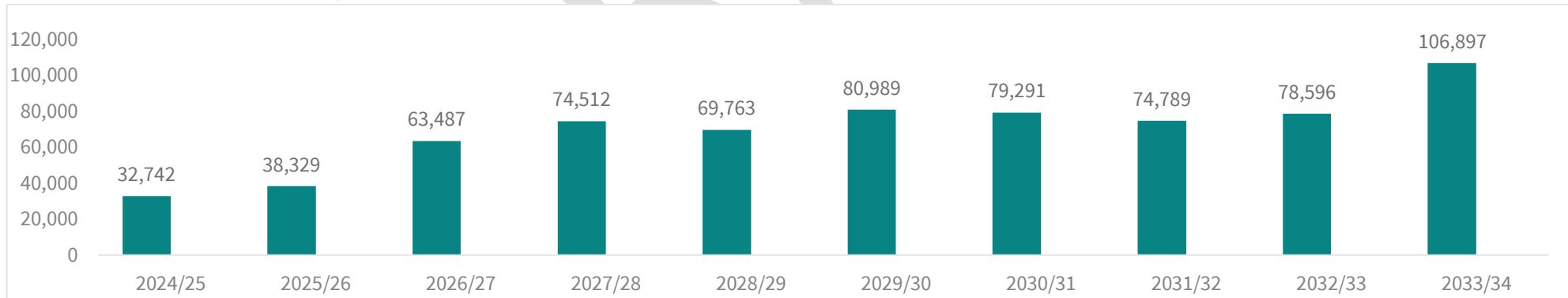
Please refer to the [Land Drainage Asset Management Plan](#) for more information on these assets.

## 6. Capital expenditure and key capital projects

To ensure the continued ability to deliver on our activities and services, and contributing to our community outcomes and strategic priorities, projects have been planned and budgeted for the next 10 years.



### Total Planned Capital Programme summary (\$000) (15 February 2024)



See the [Land Drainage Asset Management Plan](#) for more detail on the Planned Capital Programme.

# 7. Financial resources needed

## 7.1. Resources needed

Financial projections reflect the direction from Council as at the adoption meetings of 14, 21, 27 February 2024.

### Flood Protection and Control Works

000's	LTP 2024/25	LTP 2025/26	LTP 2026/27	LTP 2027/28	LTP 2028/29	LTP 2029/30	LTP 2030/31	LTP 2031/32	LTP 2032/33	LTP 2033/34
<b>Activity Costs Before Overheads by Service</b>										
Flood Protection	5,398	5,801	5,969	6,387	6,587	7,020	7,233	7,380	7,528	7,671
	<b>5,398</b>	<b>5,801</b>	<b>5,969</b>	<b>6,387</b>	<b>6,587</b>	<b>7,020</b>	<b>7,233</b>	<b>7,380</b>	<b>7,528</b>	<b>7,671</b>
<b>Activity Costs by Cost Type</b>										
Direct Operating Costs	34	35	35	36	37	38	39	39	40	41
Direct Maintenance Costs	5,215	5,610	5,773	6,185	6,379	6,807	7,015	7,156	7,299	7,437
Staff and Contract Personnel Costs	149	156	160	165	171	175	179	185	189	192
Other Activity Costs										
Overheads, Indirect and Other Costs	811	892	921	960	998	1,019	1,042	1,082	1,087	1,106
Depreciation	369	587	781	1,010	1,274	1,496	1,719	1,948	2,177	2,440
Debt Servicing and Interest	36	74	113	165	218	260	304	348	382	426
<b>Total Activity Cost</b>	<b>6,615</b>	<b>7,354</b>	<b>7,784</b>	<b>8,522</b>	<b>9,077</b>	<b>9,795</b>	<b>10,298</b>	<b>10,756</b>	<b>11,175</b>	<b>11,643</b>
<b>Funded By:</b>										
Fees and Charges	37	39	39	40	41	42	43	44	45	46
Grants and Subsidies										
Cost Recoveries										
<b>Total Operational Revenue</b>	<b>37</b>	<b>39</b>	<b>39</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>
<b>Net Cost of Service</b>	<b>6,577</b>	<b>7,315</b>	<b>7,745</b>	<b>8,482</b>	<b>9,036</b>	<b>9,753</b>	<b>10,255</b>	<b>10,713</b>	<b>11,130</b>	<b>11,597</b>
<b>Funding Percentages</b>										
Rates	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%
Fees and Charges	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%
Grants and Subsidies	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cost Recoveries	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Capital Expenditure</b>										
Improved Service Levels	17,854	16,903	44,531	52,786	53,632	63,618	66,824	67,854	65,531	90,699
Increased Demand	13,626	21,001	18,227	18,711	13,396	14,205	9,220	3,585	9,684	11,167
Replace Existing Assets	1,262	424	730	3,016	2,734	3,166	3,247	3,350	3,381	5,031
<b>Total Activity Capital</b>	<b>32,742</b>	<b>38,329</b>	<b>63,487</b>	<b>74,512</b>	<b>69,763</b>	<b>80,989</b>	<b>79,291</b>	<b>74,789</b>	<b>78,596</b>	<b>106,897</b>



## 7.2. Funding consideration and outcome

Section 101 Local Government Act 2002 - Funding Consideration. The following tables are based on the financials from the previous page.

Council funds the Flood Protection and Control Works Activity predominately through the general rate. This means that most funding comes from General Rates, mostly on the basis of Property Value.

- **Operating expenditure** is largely funded through general rates as the Activity benefits the community as a whole, and the benefits are received mostly in the same year the expenditure is incurred.
- **Capital expenditure** is largely funded from rates in the year the expenditure occurs as the capital expenditure is mostly on asset renewals.

This funding approach is based on applying the following main funding principles to determine the funding policy.

### Funding principles considered for operating costs

Consideration for funding method	Result	Implication
<b>User-Pays</b> <i>the degree to which the Activity can be attributed to individuals or identifiable groups rather than the community as a whole</i>	High	Funded from fees and charges
<b>Exacerbator-Pays</b> <i>the degree to which the Activity is required as a result of the action (or inaction) of individuals or identifiable groups</i>	Low	Funded from rates
<b>Inter-Generational Equity</b> <i>the degree to which benefits can be attributed to future periods</i>	Low	Funded in the year costs are incurred
<b>Separate Funding?</b> <i>the degree to which the costs and benefits justify separate funding for the Activity</i>	High	Funded from rates

### Outcome: Funding for operating costs

Source	Proportion funded*	Funding Mechanisms
Individual / Group	High	Targeted Rate (High) Fees & Charges (Low)
Community	Low	N/A

### Funding of net capital expenditure

*Net means after specific capital grants/subsidies/funding*

Category of capex	How it is funded initially - Refer also to Financial Strategy	Proportion*
<b>Renewal/replacement</b>	<i>Mix of rates and debt, but mostly rates – because the renewal / replacement programme is continuous. In future years, debt repayment is funded by rates.</i>	Low
<b>Service improvement</b>	<i>Debt – because the benefits of capital expenditure on service improvement are received in future periods. In future years, debt repayment is funded by rates.</i>	Medium
<b>Growth</b>	<i>Development contributions and debt – because the benefits of capital expenditure relating to growth are received in future periods. In future years, debt repayment is funded by a mix of development contributions and rates.</i>	Medium

### Outcome: Initial funding for capital

Initial funding source	Proportion of capex funded*
Rates	Low
Borrowing	High
Development Contributions	Low
Grants and Other	n/a

\* Low = this source provides 0%-25% of the funding for this Activity, Medium = this source provides 25%-75% of the funding for this Activity, High = this source provides 75%-100% of the funding for this Activity

More information on the Council's Finance and Funding Polices can be found in the [Financial Strategy](#) and the [Revenue and Financing Policy](#)

## 8. Possible significant negative impacts on wellbeing



**This activity may have significant negative effects on social, economic, environmental or cultural wellbeing of the local community, now or in the future.**

Negative Effect	Mitigation
<b>Social</b>	
Social, cultural and environmental effects of construction works	Management of construction activities to minimise risk of non-compliance with relevant consent conditions.
Social, cultural and environmental effects of stormwater discharges into waterways	Ongoing education and works programme to reduce contaminant load. Develop and deliver stormwater management plans that consider all six values and set appropriate, measurable performance targets. Monitor stormwater discharges and instigate appropriate remedial actions as may be necessary to address potential non-compliances.
Future risk to levels of service as climate change and sea level rise strain the effectiveness of stormwater and flood management system (projected increased stormwater volumes in more frequent, more extreme events and decreasing hydraulic gradient). Risk to living assets through more frequent, more intense drought, higher temperatures and seasonal shifts.	Investigations to better understand how climate change will affect demand and capacity in order to maximise effectiveness of future investment and adaptation. Engage community in cost vs LOS discussion. Work with town planners and those engaged in community consultation on dynamic adaptive planning to ensure a holistic approach is taken.
Social and economic effects of flooding caused by declining stormwater conveyance and flood storage capacity due to urban infill	Appropriate provisions in the District Plan and the Stormwater Bylaw and increased provision of Council resources for community education, monitoring and enforcement
<b>Economic</b>	
Cost to Council / ratepayers of operating flood management system	Follow documented procedures and industry best practice for cost minimisation. Follow technological developments and implement cost saving initiatives on a continuous improvement basis. Focus process of defining key performance indicators on cost efficiency. Ensure staff are kept updated with technological and operational best practice through attendance at conferences and participation in specialist industry working groups.
Cost to Council/ratepayers of future work needed to upgrade system in order to appropriately manage projected increased volumes of stormwater in more frequent, more extreme events and decreasing hydraulic	Investigations to better understand how climate change will affect demand and capacity in order to maximise effectiveness of future investment and adaptation. Work with town planners and those engaged in community consultation on dynamic adaptive planning to ensure a holistic approach is taken.

gradient resulting from climate change and sea level rise. Risk of eutrophication of wetlands and waterways and devegetation of assets in drought.	
Meeting community and regulatory requirements for management of stormwater quantity, including flooding and the effects on it from climate change, requires ongoing CAPEX and OPEX commitment by Council	Appropriate provisions in the District Plan and the Stormwater Bylaw and increased provision of Council resources for community education, monitoring and enforcement Timely development and implementation of an effective Council Climate Change Adaptation Plan Provision of adequate CAPEX and OPEX to meet the regulatory requirements and community levels of service
<b>Environmental</b>	
Embedded carbon in capital works contribute to council & district greenhouse gas footprint.	Take a whole-of life approach to greenhouse gases. Seek guidance on carbon pricing in order to affordably minimise embedded carbon in capital works. Train staff as necessary.
<b>Cultural</b>	
Without suitable consideration for cultural values with how we renew, plan for, construct and operate our networks, Council will not meet runanga and central government legislation requirements.	By conserving and improving our landscapes and biodiversity which are taonga, mahinga kai will be enhanced through our activities. This can be achieved over time by ensuring that good stormwater management practice is carried out by Council in its planned works and maintenance activities, and by the community in general.

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# Appendices



## A. Appendix A: Levels of Service detail

### A.1. Continuous Improvement Review (S17A) – Recommendations for change

No Continuous Improvement Reviews (S17A) have been identified for this Activity.

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## A.2. Levels of Service: Performance measures in detail

Note: With the proposed repealing of the Water Services Bills and uncertainty over future proposed models, the Levels of Service below may need to be reviewed and updated within the LTP period.

Level of Service statement (What we will provide)	LOS	Measures of success (What our community can expect)	Performance Targets/Outputs				Method of Measurement	Community Outcome	Historic Performance Trends	Benchmarks	C/M
			2024/25	2025/26	2026/27	2027 - 34					
<b>Major tidal river flooding flood protection and control works are maintained, repaired, and renewed to key standards</b>											
<b>Major tidal river flooding flood protection and control works are maintained, repaired, and renewed to key standards</b>	14.1.3.2	Stop bank crest surveys are carried out at required intervals (DIA Flood Protection & Control non- financial performance measure number 1)	Annually	Annually	Annually	Annually	Annual Survey  <i>Department of Internal Affairs, Flood Protection &amp; Control non- financial performance measure number 1</i>	A green, liveable city  A thriving prosperous city	2023: Survey completed 2022: Survey completed 2021: Survey completed 2020: Survey completed 2019: Survey completed		M
	14.1.3.1	Cross sectional surveys of selective waterways are carried out at required intervals (14.1.3.1)	2-5 yearly or as required	2-5 yearly or as required	2-5 yearly or as required	2-5 yearly or as required	5 year survey verification  <i>Department of Internal Affairs, Flood Protection &amp; Control non- financial performance measure number 1</i>	A green, liveable city  A thriving prosperous city	2023: None required 2022: 5 year survey verification completed 2021: None required 2020: Survey completed 2019: Survey completed		M
	14.1.3.3	Stop banks identified as not meeting the original design requirements for condition and/or height are repaired within 9 months (DIA Flood Protection & Control non- financial performance measure number 1)	80%	80%	80%	80% - 100%	Bi-annual survey of critical stop banks.  Target is measured as a proportion of actual stop bank length remediated out of the total non-compliant length of stopbank requiring remediation within the required timescale.  <i>Department of Internal Affairs, Flood Protection &amp; Control non- financial performance measure number 1</i>	A green, liveable city  A thriving prosperous city	2023: 97% 2022: 100% of stopbanks identified as below their original design standard will be repaired within 9 months 2021: 100% 2020: 100% 2019: 100%		C
	14.1.8	Stormwater attenuation facilities are assessed and compliant with New Zealand Dam Safety Guidelines 2015 (DIA 1)	25%	50%	75%	75% - 100%	Ensure that all stormwater retention devices that can hold a volume greater than 20,000m3 of water shall have a NZSOLD Consequence Assessment carried out, and if deemed appropriate a Potential Impact assessment with relevant assessment and safety reports completed with inspections and reviews being undertaken.	A green, liveable city  A thriving prosperous city	2023: 0% 2022: 0% New measure with LTP 2021		C

## A.3. Levels of Service changes from Long-term Plan 2021-31, and why

*Related Levels of Service (now known as Measures of Success and Targets) have been grouped together under Level of Service Statements. This provides a reduced suite of levels of service that are most critical and meaningful, rationalising the overall number to be presented in the LTP and included in future performance reporting to ELT, Council and the community, while ensuring continued transparency of non-financial performance across services. Applying this process has resulted in no material changes to Measures of Success or Targets beyond those changes specifically set out below.*

### Deletions

Activity / Level of Service	Change from 2021-31 LTP	Reason/Rationale	Options for Consultation
<p>14.1.6.2 (M) Manage the risk of flooding to property and dwellings during extreme rain events: Catchment models for the city represent the current network. Target: X% of operational network 300mm diameter or greater is included in model</p>	Level of service is deleted.	This level of service is no longer required as the intent is suitably covered under level of service 14.1.6.9 and is a legal requirement of the Comprehensive Stormwater Network Discharge Consent (CSNDC).	Management measure, no consultation required.
<p>14.1.6.1 (C) Manage the risk of flooding to property and dwellings during extreme rain events: Annual reduction in the modelled number of properties predicted to be at risk of habitable floor level flooding of the primary dwelling in a 2% AEP Design Rainfall Event of duration 2 hours or greater excluding flooding that arises solely from private drainage</p>	Level of service is moved from Flood Protection and Control works to Stormwater & Drainage	This LOS belongs to the Service of Reduce risk of flooding to property and dwellings during extreme rain events, which has been moved to Stormwater & Drainage Activity	Consultation not required: LOS retained in the LTP.
<p>14.1.6.9 (M) Manage the risk of flooding to property and dwellings during extreme rain events: Catchment models are updated and run to represent existing development (ED) and maximum probable development (MPD) flooding; Ōtākaro Avon River and other models at required intervals not greater than every 5 years</p>			

<p>14.1.6.3 (C) Manage the risk of flooding to property and dwellings during extreme rain events: Number of surface water network monitoring sites (flow, level or rainfall)</p>	<p>Level of service is moved from Flood Protection and Control works to Stormwater &amp; Drainage</p>	<p>This LOS references managing risk of flooding to property and dwellings during extreme rain events, a service that has been moved to Stormwater &amp; Drainage Activity</p>	<p>Consultation not required: LOS retained in the LTP.</p>
<p>14.1.7.1 (M) Reduce pollution of waterbodies from discharge of urban contaminants to waterways: Annual rolling average reduction in the discharge of zinc/copper/Total Suspended Solids (TSS) to be equal or greater than that required to meet the reduction set in the Comprehensive Stormwater Network Discharge Consent (CSNDC) for 2023 and 2028, derived through contaminant load reduction modelling of the stormwater treatment facilities which have been installed</p>	<p>Level of service is moved to Stormwater &amp; Drainage</p>	<p>This LOS belongs to the Service of Waterways are clean and pollution is minimised, which has been moved to Stormwater &amp; Drainage Activity</p>	<p>Consultation not required: LOS retained in the LTP.</p>
<p>14.1.7.5 (M) Reduce stormwater contaminants in receiving waterways: Average annual of retrofit stormwater treatment to existing or brownfield development areas</p>			
<p>14.1.7.4 (M) Reduce pollution from discharge of industrial contaminants to waterways: Auditing of stormwater systems on industrial premises</p>			

**New**

**This Activity has no new levels of service.**



## Amendments

Activity / Level of Service	Change from 2021-31 LTP	Reason/Rationale	Options for Consultation
14.1.8 (C) Stormwater attenuation facilities are assessed and compliant with New Zealand Dam Safety Guidelines 2015 (DIA 1)	Targets changed <ul style="list-style-type: none"> <li>• From 0%</li> <li>• To 25% in 2024/25, 50% in 2025/26, 75 in 2026/27 and 100% in year 10.</li> </ul>	On-going funding has been provided through the LTP.	No specific consultation required. Change also noted in the Statement of Service Provision.
14.1.3.2 (C → M) Stop bank crest surveys are carried out at required intervals (DIA Flood Protection & Control non-financial performance measure number 1)	Changed from a Community measure to a Management measure.	This is an operational indicator of success	Consultation not required. LOS now reported to Council/Community. Change also noted in the Statement of Service Provision.
14.1.3.1 (C → M) Cross sectional surveys of selective waterways are carried out at required intervals	Changed from a Community measure to a Management measure.	This is an operational indicator of success	Consultation not required. LOS now reported to Council/Community. Change also noted in the Statement of Service Provision.

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## B. Appendix B: Possible issues impacting the Activity & the mitigations planned

### B.1. Changing customer needs

#### Population / demographic changes (high impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans/actions
Population growth (general and in specific areas)	Population projections are based upon a standard set of demographic assumptions. The Council revises its growth modelling annually based on the best information available at the time.	<ul style="list-style-type: none"> <li>Change in population intensity in parts of the city to areas affect by potential future tidal flooding.</li> <li>Change in demand density in parts of the network</li> </ul>	<ul style="list-style-type: none"> <li>May need to increase size/height or change operation of existing assets to provide the expected level of service.</li> </ul>	<ul style="list-style-type: none"> <li>New infrastructure to increase resilience</li> <li>Upgrade existing infrastructure to increase resilience</li> </ul>
Shifts within city (e.g., growing communities, possible future managed retreat)		<ul style="list-style-type: none"> <li>It is considered that changes will be seen in the number and location of growth as a result of Plan Change 14 (Housing and Business Choice Plan Change) and concurrent spatial planning activities.</li> <li>It is as yet uncertain what the quantum and rate of intensification will be across the City.</li> <li>Unknown extent of possible managed retreat, but some policy, actions and directives are inevitable for coastal areas. Decisions are unable to be made yet that may be seen as</li> </ul>	<ul style="list-style-type: none"> <li>Growth may exceed the capacity of infrastructure at a localised level and can lead to reduced levels of service and criticism of Council.</li> <li>Create uncertainty on performance of existing hydraulic modelling requiring more work to be done to verify solutions proposed in the forward works programme.</li> <li>Unfeasible to service some areas requiring a change to the</li> </ul>	<ul style="list-style-type: none"> <li>Hydraulic models and Stormwater Management Plans to be reviewed and updated with population growth changes</li> <li>Waiting on Central Government decisions legislation around managed retreat. Then developing and following policy on managed retreat</li> </ul>

		predetermining the results of the Coastal Hazard Adaptation Planning (CHAP) process with communities.	District Plan, restricting development.	
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### Equity and access (low impact)

This Activity has identified no equity and access issues impacting the Activity.

### Identity and social cohesion (low impact)

This Activity has identified no identity and social cohesion issues impacting the Activity.

## B.2. Tiriti Partnerships (medium impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Mana whenua cultural awareness	There is a general lack of awareness for many staff on the effects that the business has on the Mauri of water, being of high cultural and spiritual significance to Maori.	<ul style="list-style-type: none"> <li>Increased genuine engagement and collaboration with mana whenua</li> <li>Increased training for staff on how the business affects Māori values.</li> <li>Provision of sincere guidance from Management to staff</li> </ul>	<ul style="list-style-type: none"> <li>Minor (generally) increase cost in projects due to engagement time and cost.</li> <li>Minor cost to look at updating the 3 Waters Strategy Implementation Plan</li> </ul>	<ul style="list-style-type: none"> <li>Review and update the 3W Strategy Implementation Plan with mana whenua.</li> <li>Guidance and leadership from management with a focus on eventual co-governance with 3 Waters Reform.</li> </ul>

## B.3. Technological growth (medium impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Changing technology	CCC was a leader in the adoption of a multi-values approach to the management of stormwater. We are in danger of not moving with the times as much as our peers around the country and relying on old techniques for managing our networks and the ensuing flood response missing opportunities for planning.	<ul style="list-style-type: none"> <li>Using information such as bathymetric data and land settlement data of the coastal and estuary areas, to note physical changes over time, and inform flooding.</li> <li>Use of smart technologies such as recording ground water levels for provision into hydraulic models or for hazard modelling for District Plan Matters.</li> <li>If a network of flow monitoring stations is set up in the network, there will be more reliable data to use for calibration of our hydraulic models.</li> <li>Use of technology for real time reporting of storms as they occur across the city may allow for better deployment of resource to manage the effects of flooding rather than spending time all over the city. This can also feed into hydraulic models to predict areas of flooding before it occurs. By seeing the flooding as it occurs, it will provide verification of hydraulic model outputs.</li> </ul>	<ul style="list-style-type: none"> <li>Provision of funding will allow smarter decisions to be made resulting in better outcomes.</li> <li>Use of smart technology in the network will provide for higher confidence in our hydraulic models, allow for “real-time” predictions and focussed renewal/improvement planning.</li> </ul>	<ul style="list-style-type: none"> <li>Further develop suitable solutions and updates to design guidelines and standards.</li> <li>Provide requested OPEX to 3 Waters Asset Management to enable monitoring programmes to be created.</li> <li>Provide funding for the installation of monitoring equipment in the network, and for the purchase of data to inform coastal hazard understanding.</li> </ul> <p>Some additional OPEX funding has been provided to the planning teams through the 2024-2034 LTP for some of these mitigation plans.</p>
Digital security	Standard IT security processes are relied upon for asset operation and data security.	<ul style="list-style-type: none"> <li>More stormwater flow data available and administered by Council</li> <li>More sophisticated hacking and cyber-attack technology and techniques</li> </ul>	<ul style="list-style-type: none"> <li>May affect the operation of key structures that control flood retention systems</li> </ul>	<ul style="list-style-type: none"> <li>Maintain separate operations communication network</li> </ul>

## B.4. Resilience and environmental considerations

### Climate change & adaptation (high impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Population movement due to managed retreat and adaptation	Unable to make any infrastructure decisions on this issue.	<ul style="list-style-type: none"> <li>Following government advice, it is expected that suitable guidance will be provided to the business for incorporation in Planning.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to advise until further work has been undertaken by other teams.</li> </ul>	<ul style="list-style-type: none"> <li>No plans are currently being progressed.</li> </ul>
Increasing numbers of extreme weather events change utilisation of physical and digital assets	See Section 2.3 for detailed information.			
Increased community expectations of information and engagement	There is currently no advice that can be provided to communities as there is no Council policies that give staff direction on how to adapt infrastructure to climate change.	<ul style="list-style-type: none"> <li>The development of guidance/policy is required to give direction to the business units which can then be used to better inform the public.</li> <li>By installing stopbanks along the Avon River in the OARC corridor, Council is signalling that all upstream catchments are to be protected from flooding, however this doesn't consider changes to e.g. ground water elevation, lack of outlets for drainage networks etc. that may make the areas unserviceable.</li> </ul>	<ul style="list-style-type: none"> <li>There would be an increase in workload of a specialist nature. This would require additional staff, or more reliance on information from other teams within Council.</li> <li>Additional focus required for the Land Drainage Planning teams to look at the "bigger picture" effects of climate change adaptation. This may mitigate maladaptive investment within the OARC area.</li> </ul>	<p>The CHAP team has a programme of work to carry out extensive community engagement to plan out adaptive pathways. 3 Waters support the extra resourcing required for this work. This process has been very slow to date due to the team being under resourced for the scale of the project. It appears that at best the CHAP team will only increase resources to be able to consult with 2 communities at one time, meaning the adaptive pathways for the city will not be complete for at least 2 LTP periods.</p> <p>3-waters has supported the CHAP team's bid for additional funding to be able to plan for the climate change resilience and adaptability.</p>

## Sustainable development (high impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Managing GHG emissions (per table above)	<p>See Section 2.3 for detailed information.</p> <p>Update – No additional OPEX funding has been provided to the planning teams through the 2024-2034 LTP for any of these mitigation plans. Therefore, comparative assessment of greenhouse gas emissions cannot be completed and therefore used to inform future investment decisions towards reducing the carbon footprint of Council and Christchurch District</p>			
Resilience & risk	<p>Staff generally consider resilience and risk on an individual project basis. There is no policy giving guidance to the business for managing resilience and risk to the asset base.</p>	<ul style="list-style-type: none"> <li>• Increased expectation for resilience to be built into infrastructure solutions.</li> <li>• Being an isolated island nation, we are exposed to the cost of materials. Any trade embargos/wars may affect the costs for replacing assets beyond budget forecasts, or preventing renewals resulting in lower levels of service.</li> <li>• If waterway health continues to deteriorate, NZ’s reputation as being “Clean and Green” may be further compromised affecting tourism and income.</li> <li>• Change in the public’s perception and desire of public infrastructure from solely economic to environmentally lead is not being visualised by Council.</li> <li>• To offset potential intensified housing areas to service a community need, an increase in greenspaces could be provided with enhanced waterways as a public meeting point for families and communities. This would involve the daylighting of assets where possible, property purchase for</li> </ul>	<ul style="list-style-type: none"> <li>• The way that providing services is considered i.e. solely focussed on the “engineering solution” needs to consider environmental changes and effects on public perceptions and well-being.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop 3 waters risk and resilience framework incorporating wider issues than just climate change resilience.</li> </ul> <p>Some additional OPEX funding has been provided to the planning teams through the 2024-2034 LTP for any mitigation plans.</p>

		increased waterway margins and enhancement requiring increases in operational funding.		
Natural hazards	Staff generally consider natural hazards on an individual project basis. There is no policy giving guidance to the business for managing resilience and risk to the asset base.	<ul style="list-style-type: none"> <li>Sea level rise will expose infrastructure in low lying coastal communities, causing damage. The existing sea outfalls will be unable to discharge storm flows increasing the chances of flooding. This can result in water backing up a long way inland so that flooding may also affect communities that are further from the coast. Recent studies have identified that we can already expect higher storm tides than previously thought.</li> <li>Shallow, saline groundwater will rise closer to the surface in coastal areas, which will inhibit soakage to ground, leaving more runoff to be handled by the flood management assets. Shallow groundwater will also cause increased infiltration of the stormwater network, reducing its capacity. The increase in ground water levels, particularly saline water may lower the expected life of pipework and structures meaning asset renewal rates are accelerated causing funding problems. In some areas, groundwater will rise to the ground surface resulting in long-term standing water. This may be further exacerbated by ongoing subsidence identified along the Christchurch coast by an Otago University study.</li> </ul>	<ul style="list-style-type: none"> <li>Investment in larger capital works such as combined catchment pump stations maybe required, seawalls and stop banks constructed. Retreat from vulnerable areas may be required.</li> <li>Provision of services in areas of high groundwater may not be feasible as Council will need to pump ground water to maintain a level of service. This level of planning – or even considering this as an option – has not been undertaken.</li> <li>Accelerated asset deterioration due to site conditions not designed for.</li> <li>Reduced levels of service due to inability to drain pipework which may be “drowned” in the future reducing available capacity.</li> </ul>	<ul style="list-style-type: none"> <li>Current design requires an allowance for increased rainfall amounts based on MfE predications.</li> <li>Hydraulic models have an allowance for future density based on current District Planning maps for runoff prediction.</li> <li>Work carried out under the LDRP 97 Multi-Hazard Analysis project continues to provide essential information for informing capital planning and avoiding maladaptive works.</li> </ul> <p>Some additional OPEX funding has been provided to the planning teams through the 2024-2034 LTP to investigate future requirements to avoid maladaptation or to inform how best to manage the natural hazards relating to climate change.</p>

		<ul style="list-style-type: none"> <li>• Rainfall and storm patterns involving intensity and frequency may require investment in pipe upgrades or duplication to mitigate flooding in communities.</li> <li>• Periods of drought may also occur putting stress on the health of the waterways and ecology. A process of base flow supplementation from underground wells may be required to prevent the loss of habitat or aquatic/avian species.</li> <li>• In coastal areas and lower reaches of rivers, stopbanks that are designed to be wet only during high rainfall events may be permanently wet due to rising sea level. This may accelerate deterioration of some assets.</li> </ul>		
Triple bottom line		<ul style="list-style-type: none"> <li>• Increased expectation for financial, social and environmental bottom line reporting</li> </ul>		<p>Continue to incorporate triple bottom line analysis and reporting at a strategic planning level.</p> <p>(Note - this is not an issue that has been added to the activity by the 3 Waters business.)</p>



## B.5. Infrastructure (high impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
<p>Delivering on what we say and looking after what we've got</p>	<p>Currently underinvesting in renewals, we “sweat” our assets. Delivery is too slow to meet the requirements of the work that is needed for meeting the needs of both growth/improvement projects and renewal projects.</p> <p>We do not invest enough in asset management to improve our data, how we plan for renewals, and how we collect and use information.</p>	<ul style="list-style-type: none"> <li>• The continual underinvestment in renewals will lead to an asset base that is continually being “sweated” relying on an increased OPEX through reactive maintenance repairs.</li> <li>• There is no current method within the corporate data and financial structure to be able to track the effects of delaying capital spend on OPEX costs meaning that decisions on optimising CAPEX vs OPEX costs for renewals is unable to be carried out.</li> <li>• The delivery of growth projects is extended due to the currently followed systemic process not being efficient through the design and procurement process.</li> <li>• There is an unquantifiable risk to public/private infrastructure due to failure of lined drains which do not have a current process for renewal forecasting beyond what the operations team report.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced ability to carry out well informed asset renewals programme to replace asset base that has reached full depreciation in a timely manner.</li> <li>• Growth projects are slow to deliver, risking breach of consent conditions.</li> <li>• Increased overall project costs.</li> </ul>	<ul style="list-style-type: none"> <li>• Working with Councils procurement teams to change the way we deliver projects to increase capital delivery with selected current Tier 1 contractors.</li> <li>• Develop programmes of work to review and inspect assets so we have a better understanding of the condition and performance of our assets.</li> <li>• Improvement items have been recommended in previous AMP’s for consideration, these items will improve the ability to look after what we’ve got.</li> <li>• Ensure whole-of-life maintenance costs are identified and the required OPEX is factored into future budgets before asset investment decisions are made.</li> </ul> <p>Some additional OPEX funding has been provided to the planning teams through the 2024-2034 LTP to allow any asset management improvement plan items to be carried out to better manage the asset base smarter or more cost effectively.</p>

Resilience to impacts of climate change	<p>See Section 2.3 and Appendix B.4</p> <p>No additional OPEX funding in the 2024-2034 LTP to address any climate change challenges, other than embedding it within our planning processes. Any additional work in this space will need to be managed through existing budgets and reprioritising current commitments.</p>			
Planning and investing for growth	See Appendix B.1			
Understanding and maintaining the condition of our infrastructure	<p>There has not been any emphasis on improving asset management processes over recent years, particularly in Land Drainage.</p> <p>While we have reasonable confidence in asset data held in SAP the lack of asset management systems within SAP mean we don't make best use of data.</p>	<ul style="list-style-type: none"> <li>• There has not been an increase in the way that asset management has been improved in Land Drainage. Any improvements to asset management maturity over recent years has been due to changes in framework and policy improvements, not how data is used or processes for the use of data.</li> <li>• It is hoped that that the Strategic Asset Management team will be mandated with the requirement to improve asset management maturity to an appropriate level, which will include providing guidance and support to 3 Waters.</li> <li>• Council needs to advice on the level of asset management maturity that it is willing to fund. From this point, advice on the risks and likely OPEX costs can be better provided to elected officials.</li> </ul>	<ul style="list-style-type: none"> <li>• Disruption to services</li> <li>• Increased costs of meeting regulation</li> <li>• Reliance on OPEX to manage shortfalls in managing assets for timely renewal.</li> </ul>	<ul style="list-style-type: none"> <li>• OPEX funding for an asset improvement programme has been requested for the 3 Waters Asset Management team.</li> <li>• It is hoped that the SAP improvement programme will provide improved processes.</li> </ul> <p>Some additional OPEX funding has been provided to the planning teams through the 2024-2034 LTP to allow for better asset management practices.</p>

## B.6. Regulations & reform (medium impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Three Waters reform	Recent changes to the legislation has slowed down the timeframe for reform, with some question if there is a change in central government.	<ul style="list-style-type: none"> <li>Organisational change and upheaval with move from Council delivery to new Entity model</li> <li>Increased regulation and standards</li> <li>The business has had piecemeal involvement with reform to date with all requests for information being managed by staff not within the business. Not all key staff have been involved with NTU meetings at times when they should be.</li> </ul>	<ul style="list-style-type: none"> <li>Unknown effects on the services due to uncertainty on timeframe for reform.</li> <li>Staff are affected by uncertainty over how reform will affect their jobs.</li> <li>Uncertainty over future budget availability to continue identified work programmes e.g. OARC.</li> <li>Many and varied Service Level Agreements will be needed, but nothing has yet been discussed.</li> </ul>	<ul style="list-style-type: none"> <li>Participate with the National Transition Unit Process</li> <li>Monitor proposed changes and engage with Council Leadership to prepare submissions.</li> <li>Make provisions for regulation and standards when they are advised.</li> </ul> <p>Update – with the change of government, Three Waters reform has been stopped. It is unclear what this means for council and how 3-waters infrastructure will be managed in the future.</p>
Resource Management reforms	Multiple pieces of legislation were proposed and being developed by the government that affect the 3-waters business, particularly the National Environmental Standards.	<ul style="list-style-type: none"> <li>Increased regulation and standards</li> </ul>	<ul style="list-style-type: none"> <li>Unknown impacts until the legislation is put into effect and various teams have had a chance to review and comment.</li> </ul>	<ul style="list-style-type: none"> <li>With the change of government, reform has been stopped. It is unclear what this means for council and how 3-waters infrastructure will be managed in the future to meet any required environmental standards.</li> </ul>

## B.7. Identified Business Unit Risks

The main risks to the activity have been discussed in Section 3.2.3 of the Land Drainage Asset Management Plan.

Below are some risks that are more general and affect the 3-Waters Business. Risks are recorded and periodically reported to the Executive Leadership Team and the Audit and Risk Management Committee.

Strategic priorities risk is associated with	Risk Description	Impact	Likelihood	Inherent Risk Rating	Controls / Mitigations	Residual Risk Rating
<ul style="list-style-type: none"> <li>Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents.</li> </ul>	<p><b>Economic Environment on Capital Programme</b></p> <p>There have been significant financial increases affecting Council due to changes in the current economic environment that started with the onset of the Covid-19 Pandemic.</p> <p>There is a risk of:</p> <ul style="list-style-type: none"> <li>Capital programme forecasts will be underdeveloped requiring additional funding.</li> <li>Inability to source key materials/products.</li> <li>Failure to meet levels of service</li> <li>Inability to meet compliance requirements (CSNDC conditions for water quality)</li> </ul>	Moderate	Highly Likely	High	<ul style="list-style-type: none"> <li>Ensure realistic contingency amounts are included in the project/programme estimates.</li> <li>Ensure that suitable escalation calculations are carried out and used.</li> <li>Ensure projects are carried out in a timely fashion to prevent undue escalation during the design phase of the project.</li> <li>Consider having a stand-alone “escalation” budget that can be called upon to top up projects if needed over the financial year and returned to the general Council funds if not required.</li> </ul>	Medium
<ul style="list-style-type: none"> <li>Manage ratepayers' money wisely, delivering</li> </ul>	<p><b>Three waters reform</b></p> <p>Give the change to a new coalition government There is</p>	Moderate	Likely	Medium	<ul style="list-style-type: none"> <li>More open and transparent information to be provided from internal CCC staff involved with decision making on the reform process.</li> </ul>	Medium

Strategic priorities risk is associated with	Risk Description	Impact	Likelihood	Inherent Risk Rating	Controls / Mitigations	Residual Risk Rating
<p>quality core services to the whole community and addressing the issues that are important to our residents.</p>	<p>considerable uncertainty on the reform process, what changes may be required, how the reform process will progress – if at all - what staff will be affected, and how work flows will be managed in the future.</p> <p>There is a risk of:</p> <ul style="list-style-type: none"> <li>• Staff well-being and stress levels as the process continues.</li> <li>• Disengagement of staff.</li> <li>• Loss of institutional knowledge if staff leave.</li> <li>• Lack of advice from the National Transition Unit (NTU) to give any surety to staff.</li> <li>• Disillusionment with the current way that 3-waters is being underfunded and resourced within council may cause staff to leave for the private market.</li> </ul>					
<ul style="list-style-type: none"> <li>• Be an inclusive and equitable city which puts people at the centre of developing our city and</li> </ul>	<p><b>Staff wellbeing</b></p> <p>If the level of organisational demands continues to be highly ambiguous and reactive, then staff will feel pressured and have unreasonable workloads.</p>	Moderate	Highly Likely	High	<ul style="list-style-type: none"> <li>• Increased leadership engagement with teams on wellbeing</li> <li>• Increased EAP, People and Culture connections</li> <li>• Wellbeing activities embedded into day-to-day working culture.</li> </ul>	Medium

Strategic priorities risk is associated with	Risk Description	Impact	Likelihood	Inherent Risk Rating	Controls / Mitigations	Residual Risk Rating
<p>district, prioritising wellbeing, accessibility and connection.</p> <ul style="list-style-type: none"> <li>• Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents.</li> </ul>	<p>There is a risk of:</p> <ul style="list-style-type: none"> <li>• Staff burnout and related health issues</li> <li>• Absenteeism and productivity impacts</li> <li>• Increased recruitment costs if retention impacted</li> </ul>				<ul style="list-style-type: none"> <li>• Development of unit programme of work to prioritise activities and manage individual workloads.</li> </ul>	
<ul style="list-style-type: none"> <li>• Be an inclusive and equitable city which puts people at the centre of developing our city and district, prioritising wellbeing, accessibility and connection.</li> <li>• Manage ratepayers' money wisely,</li> </ul>	<p><b>Recruitment and retention of skilled staff</b></p> <p>If Council and the activity have a high level of staff turnover, then there is less skilled and experienced staff to deliver the activities.</p> <p>There is a risk of:</p> <ul style="list-style-type: none"> <li>• Staff wellbeing negatively impacted by workload changes.</li> </ul>	Moderate	Likely	Medium	<ul style="list-style-type: none"> <li>• Increased staff wellbeing programmes</li> <li>• Work with staff on personal development opportunities including internal secondments.</li> <li>• Use exit interviews to identify opportunities for improvement.</li> <li>• Development of leadership opportunities and training</li> <li>• Increase remuneration to closer match the private sector.</li> </ul>	Low

Strategic priorities risk is associated with	Risk Description	Impact	Likelihood	Inherent Risk Rating	Controls / Mitigations	Residual Risk Rating
<p>delivering quality core services to the whole community and addressing the issues that are important to our residents.</p>	<ul style="list-style-type: none"> <li>Level of service achievement is impacted.</li> <li>Increased cost of external resourcing to achieve schedule requirements</li> </ul>					
<ul style="list-style-type: none"> <li><b>Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents.</b></li> </ul>	<p><b>Asset Management Policy advice and performance</b></p> <p>If Asset Management advice is not understood and taken into consideration across the organisation, then Elected Members and Community expectations of Council Assets will not be met.</p> <p>There is a risk of;</p> <ul style="list-style-type: none"> <li>Clear asset management priorities will not be embedded at the needed operational level to see the required changes.</li> <li>Decision-making is not informed by evidence-based advice.</li> <li>The necessary investment into asset management will not occur.</li> </ul>	Major	Highly Likely	High	<ul style="list-style-type: none"> <li>Develop a comprehensive communication plan to ensure that Asset Management advice is effectively communicated to all relevant stakeholders, including elected members, staff, and the community.</li> <li>Use clear and concise language to explain Asset Management principles, objectives, and benefits. Avoid jargon and technical terms that may hinder understanding.</li> <li>Foster a collaborative culture by creating forums, workshops, or focus groups where stakeholders can exchange ideas, share experiences, and contribute to Asset Management discussions.</li> <li>Provide training programs and resources to enhance the knowledge and skills of staff members and elected members regarding Asset Management principles, processes, and decision-making frameworks</li> </ul>	High

Strategic priorities risk is associated with	Risk Description	Impact	Likelihood	Inherent Risk Rating	Controls / Mitigations	Residual Risk Rating
	<ul style="list-style-type: none"> <li>Councils Asset management will not align with national legislation or best practice</li> </ul>				<p>Some additional OPEX funding has been provided to the 3-waters Asset Management teams through the 2024-2034 LTP to investigate asset management improvement items. However, no changes to this risk are likely over the LTP period.</p>	

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