

Stormwater Drainage

- *Council responds to flood events, faults and blockages promptly and effectively*
- *Council maintains waterway channels & margins to a high standard*
- *Council manages the stormwater network in a responsible and sustainable manner.*
- *Stormwater network is managed to minimise risk of flooding, damage and disruption*
- *Implement Flood Plain Management Programme works to reduce risk of flooding to property and dwellings during extreme rain events*
- *Waterways are clean and pollution is minimised.*

Approvals

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			Signature	Date of sign-off
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1. What this activity delivers

The stormwater network collects and conveys stormwater during rainfall events. This is designed to work with secondary flow paths which can include roads in larger storm events.







In delivering this service the Council aims to provide a balanced mix of:

- maintenance and renewals to preserve the levels of service;
- managing the risk that is generated from stormwater runoff within the Christchurch urban area, whether conveyed or managed along pipes, roads, facilities or watercourses.
- capital investment to respond to increasing demands for growth (both greenfield and infill); and
- managing stormwater discharge quality and quantity to improve health of water bodies to sustain ecological health and avoid any overwhelming of the stormwater network and the receiving environment.

Council uses a multi-value approach to Stormwater, where the drainage value of the network is considered alongside other values such as ecology, culture, recreation, heritage and landscape. Together these are known as the 'six values' that Council utilises in Stormwater drainage and waterway management.

Council is developing and implementing Stormwater Management Plans (SMPs) across Christchurch City and Banks Peninsula where the Council has stormwater infrastructure. The SMPs aim to maintain and improve the six values for waterways. The SMP technical documents support and define how Council will comply with rules in stormwater discharge consents it has with Environment Canterbury.

This activity includes the following services:

	Council responds to flood events, faults and blockages promptly and effectively – We want to limit the impact of faults with the service on our customers.
	Council maintains waterway channels & margins to a high standard – Appropriate maintenance is a key part of ensuring our waterways remain healthy and an environment people want to interact with.
	Council manages the stormwater network in a responsible and sustainable manner – We need to ensure that our activity is carried out to the best environmental standards
	Stormwater network is managed to minimise risk of flooding, damage and disruption – We need to manage our assets to minimise the negative impacts on customers.
	Implement Flood Plain Management Programme works to Reduce risk of flooding to property and dwellings during extreme rain events – Ensures we work to reduce flooding – focussing on above residential floor flooding - across the city. This is planned for by updating and running catchment models representing existing development (ED) and maximum probable development (MPD) flooding. It is also key that we maintain our control structures, hydrometric equipment and our pump stations, to ensure that the risk of flooding is appropriately mitigated.
	Waterways are clean and pollution is minimised. – we need to ensure that values are restored to our waterways through correcting mistakes of the past and ensuring future works are the best they can be.

The key physical assets used to deliver this activity are:

- The underground stormwater conveyance networks (including approximately 915km of pipes and 20,000 manholes/sumps/inlets/outlets etc.)
- Pump stations and water flow control devices and structures such as valves, wetlands and basins
- Open channels and overland flow path (including 2,429km of natural waterways such as rivers, streams and creeks, 110km of constructed drainage channels using various bank lining materials (timber, rock, concrete), in-channel structures, weirs and retaining walls etc.)
- Treatment devices that are not within the Flood Protection and Control Works activity (i.e. where there is no flood protection component such as silt traps, gross debris traps or proprietary treatments devices such as the cartridge filters) and flow level control devices.
- hydrometric monitoring devices, measuring rainfall along with surface water, sea and groundwater levels.



Example of land drainage

Note: This activity is intrinsically linked to and interdependent with the Flood Protection and Control Works activity

A snapshot of provision and use:

- ✓ **Over 1000km of pipework**
- ✓ **Almost 30,000 nodes (manholes, inlets/outlets etc.)**
- ✓ **We have pipelines made of brick over 140 years old**
- ✓ **Our waterways have a mixture of timber or concrete linings, or are completely natural**
- ✓ **Council operates a vast network of treatment swales, basins and wetlands.**
- ✓ **One of the biggest risks to our waterways is urban encroachment**



A control structure at a facility to provide storage to mitigate flood flows.

Where we came from

The city's first known stormwater drainage was through a sewer discharging into Ihutai-Avon Heathcote Estuary via an outfall at Linwood Avenue. The main stormwater outfall, built between 1871 and 1874, has served the city since. The Christchurch Drainage Board, formed in 1876, decided to keep the city's stormwater and sewage disposal systems separate.

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

Early on, Christchurch had the country's highest rates of water-borne diseases but was later said to have the country's "first comprehensive, effective drainage system" one historian wrote.

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 maintaining existing assets with an aim to reduce the risk of flooding where possible.

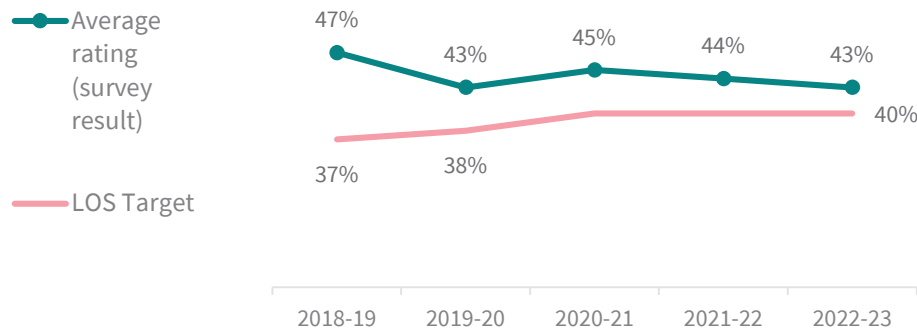
In the LTP2024, some services that had previously been sitting under the Flood Protection and Control Works Activity were re-classified into the Stormwater Drainage activity due to their Levels of Service being primarily for stormwater management purposes.

What our community is saying



43% are on average satisfied with Council's management of the stormwater network.

LOS 14.0.3 Council manages the stormwater network in a responsible and sustainable manner: Resident satisfaction with Council's management of the stormwater network (average rating)



Individual components	2018-19	2019-20	2020-21	2021-22	2022-23
Condition of Waterways	36%	30%	44%	38%	36%
Condition of Waterway Margins	52%	48%	45%	49%	47%
Appearance of Waterway Margins	53%	51%	50%	53%	50%
Stormwater system minimises flood risk	46%	41%	42%	40%	39%

Source: *Residents Survey*

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: “Stormwater upgrade ... making sure when there are huge rains that there is capacity to quickly move that water out of the drains.”







Community outcomes: A green, liveable city.

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>A collaborative confident city 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>We aim to involve our communities with our green assets to change attitudes by:</p> <ul style="list-style-type: none"> Working with community groups to engage with waterways through being part of activities such as community plantings along waterway margins. This is important for improving the connection of people with our waterways.
 <p>A green, liveable city 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>We strive to right past wrongs done and care for the environment by:</p> <ul style="list-style-type: none"> Appropriate stormwater management is a crucial part of keeping waterways healthy which are an important part of a healthy environment for a green, liveable city. Without suitable investment in growth and renewal projects, land use intensification negatively impacts water quality and the ecological health of our natural waterways. For water quality in our waterways, wetlands and estuaries to improve over time good stormwater management such as timely renewals, appropriate maintenance regimes and public education on “where stormwater goes” is required by everyone in the community. Greening of our infrastructure can bring ecosystems right to the residents of our city, making it a much more pleasant place to live The activity includes projects such as planting programmes to mitigate sediment migration from the hillside catchments, as well as provide for carbon sequestration to offset emissions.
 <p>A cultural powerhouse city 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>We strive to include multiple values within our business by:</p> <ul style="list-style-type: none"> 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 treatment facilities (artifacts, storyboards etc.). We also look to carry out meaningful and sincere discussions with mana whenua to better understand cultural values.
 <p>A thriving prosperous city 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>We strive to deliver cost effective solutions to improve the city by:</p> <ul style="list-style-type: none"> A key objective of this activity is to limit the effects of flooding on homes and Council infrastructure and ensure lifeline routes are available during an emergency response. Through improved use of smart technology such as on-going ground water monitoring, Council is better able to inform strategic planning documents with hazard risk information. 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.
<p>*Level of contribution – what this means</p> <p>★★★★ This activity is critical to the Council’s contribution to achieving this community outcome – we measure our impact with specific levels of service</p> <p>★★★ 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</p> <p>★★ This activity supports the Council’s contribution to achieving this community outcome – we measure our impact with specific levels of service if practicable</p> <p>★ This activity may provide incidental support to achieving this community outcome – it’s not cost-effective to measure our impact</p>		


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

Strategic Priorities		Contribution*	How our strategic priorities influence the way we work
	Be an inclusive and equitable city which puts people at the centre of developing our city and district, prioritising wellbeing, accessibility and connection	★★★	<ul style="list-style-type: none"> As a member of the Community Waterways Partnership Charter, Council work with other members to improve waterways, through delivery of education and awareness programmes to get the wider community working together to protect and improve waterways. The more public are willing to interact with the water ways running within their properties and communities, the more likely waterway encroachment trends will start to reverse, and habit protection and enhancement will become normal.
	Champion Christchurch and collaborate to build our role as a leading New Zealand city	★★	<ul style="list-style-type: none"> By using our 6-values approach with drainage design and how Council views its waterways and waterway health, we have historically been able to be a leader in design and management of our drainage infrastructure.
	Build trust and confidence in the Council through meaningful partnerships and communication, listening to and working with residents	★★	<ul style="list-style-type: none"> We regularly partner with community and school groups to work on planting and education programmes to improve the health of our waterways. These exercises allow those groups to tell us what they see as priorities and how we can better work together.
	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.	★★★★	<ul style="list-style-type: none"> The Stormwater Drainage 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 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 pumped solutions, changing flow path directions reducing sub-catchment numbers requiring working with other council activities. We will need to address the potential for increased emissions that this will result in with real emission reduction strategies. To regain a connection with a healthy environment and public well-being, it is essential that Council recognises that there are many unique landscapes needing to be protected, maintain and extended along with its indigenous biodiversity. As communities see and enjoy living with the natural environment across their city, the unique landscapes and indigenous biodiversity will become truly valued.
	Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents	★★★★	<ul style="list-style-type: none"> 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. Operational expenditure is managed through the use of a multi-year maintenance contract. 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.
	Actively balance the needs of today's residents with the needs of future	★★★★	<ul style="list-style-type: none"> Restoring the damage done by historical drainage practices are an on-going part of the activity to ensure we leave things in a better state for future generations.


	generations, with the aim of leaving no one behind		<ul style="list-style-type: none">As discussed above climate adaptation and carbon emission reduction works are required considerations with many of the projects undertaken by the activity.
*Levels of contribution – what this means			
★★★★	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"> • Construction of new infrastructure • Decommissioning or renewal of existing infrastructure • Emissions from biologically enhanced stormwater treatment facilities • Potential waste product of captured pollutants • Electricity usage for activities such as pumping • Maintenance of infrastructure including travel emissions 				
	<p>Stormwater Drainage are taking the following actions to reduce greenhouse gas emissions:</p> <table border="1"> <thead> <tr> <th data-bbox="206 544 1167 576">Operational/embedded greenhouse gas emissions</th><th data-bbox="1167 544 2110 576">Greenhouse gas emissions by users of the Stormwater Drainage activity</th></tr> </thead> <tbody> <tr> <td data-bbox="206 576 1167 865"> <ul style="list-style-type: none"> • Reduce the pollutant load by implementing source treatment and catchment management of pollutants to reduce maintenance costs for removal of accumulated sediment • Reduce our carbon footprint through changes in design, material choice and construction of new assets without compromising stormwater quality or reliability • Prioritise nature based solutions and encourage native plantings in infrastructure design </td><td data-bbox="1167 576 2110 865"> <ul style="list-style-type: none"> • Consider opportunities for stormwater / rainwater detention storage tanks to limit pressure on downstream network during periods of high flow. Co-benefits also include available water reuse. • Education in reduction of point source pollutants such as roofing material choices, brake pad material choices, environmentally friendly paint, etc • Encourage reduced impervious area in developments through alternative options </td></tr> </tbody> </table>	Operational/embedded greenhouse gas emissions	Greenhouse gas emissions by users of the Stormwater Drainage activity	<ul style="list-style-type: none"> • Reduce the pollutant load by implementing source treatment and catchment management of pollutants to reduce maintenance costs for removal of accumulated sediment • Reduce our carbon footprint through changes in design, material choice and construction of new assets without compromising stormwater quality or reliability • Prioritise nature based solutions and encourage native plantings in infrastructure design 	<ul style="list-style-type: none"> • Consider opportunities for stormwater / rainwater detention storage tanks to limit pressure on downstream network during periods of high flow. Co-benefits also include available water reuse. • Education in reduction of point source pollutants such as roofing material choices, brake pad material choices, environmentally friendly paint, etc • Encourage reduced impervious area in developments through alternative options
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We understand and are preparing for the ongoing impact of Climate change

	<p>Key climate risks for the Stormwater Drainage activity includes:</p> <ul style="list-style-type: none"> • Sea Level Rise Related <ul style="list-style-type: none"> ○ Reduced conveyance capacity due to elevated groundwater table ○ Reduction in hydraulic capacity due to higher sea level at outfall ○ Increased flooding extent in coastal areas ○ Increased drainage time of detention / flood management ponds due to increased groundwater table, potentially leading to opportunities for unwanted insect growth • Rainfall and Flooding Related <ul style="list-style-type: none"> ○ Available ground soakage may change in seasons with greater average rainfall, contributing to more surface water runoff, resulting in greater flood flow volumes ○ More intense and frequent storms contribute to increased flood flows ○ More energy usage may be necessary to support pumping operations due to greater flood flows and reduced capacity ○ Higher peak inflows into treatment devices may render them not as effective for different frequency storms ○ Increased contaminant loading due to greater surface water runoff volume and frequency ○ Overland flow paths may change
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- Heat, Drought, Fire Related
 - Increased contaminant and sediment concentrations during periods of low flow
 - Eutrophication of systems may occur which may adversely impact water quality
- Soil Erosion and Landslides Related
 - Increased scour and erosion during flood events due to increased flows
 - Frequent flooding could contribute to land and slope instability
- Other
 - Buildings, homes, and businesses may become inhabitable, unusable, or uninsurable
 - Alterations to river flows may result in changes to flood hazards
 - Damage from flooding could result in large amounts of hazardous waste requiring disposal
 - Flood waters can contain contaminants which can pose human health risks
 - Contaminants in flood waters can also impact social, recreational, and cultural values in surface water bodies and coastal areas
 - Flooding and erosion may lead to restricted road access and isolate affected communities
 - Infrastructure repairs may be required at a greater frequency due to increased number of flood events
- Other impacts on assets and infrastructure (see the [Asset Management Plan](#) for more details).

Options being considered to reduce the risks to the Stormwater Drainage activity and the community posed by those climate risks include:

- Require or incentivise practices such as hydraulic neutrality, minimum floor levels, setbacks from open streams, effects from change in land use in terms of sediment and pollutant loading, and protection of overland flow paths in new developments to enhance how the flood protection and control works respond to differing storm flow patterns and reduced hydraulic capacity and conveyance due to climate change
- Improve water quality through sediment control measures, use of wetlands and nature based design, improving resilience and effectiveness of source control of contaminants and pollutants to counter the effects of increased magnitude and frequency of rainfall, including retrofit water quality mitigation for existing developed areas
- Education surrounding litter, pollutant and contaminant reduction at source to counteract the changes in rainfall intensity and storm frequency due to climate change
- Encourage communal stormwater management approaches and/or on-site stormwater management at source to manage changes in storm frequency and intensity due to climate change
- Reduce dependence on piped infrastructure and instead prioritise nature based solutions, water sensitive urban design, and designated overland flow paths to maximise capacity and minimise conveyance route risks for greater flood flow volumes
- Improve knowledge of network performance by continuing to use and maintain hydraulic models which consider current and future climate-factor scenarios to enable informed decision making
- Managing 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.

We are guardians of our natural environment and taonga

We will be undertaking four pilot projects in the next three years to further support climate change initiatives. These are:

Project 1: Loaded Value Treatment – Conduct Multi-Value Analysis on Stormwater Treatment Methods and Technologies for Consideration in Future Projects



Carry out a multi-value analysis on stormwater treatment methodologies and technologies, which includes climate change emissions and vulnerability considerations. The work extent and outputs would include:

- Development of a total value analysis structure for evaluation of stormwater treatment options including consideration of economic, ecological, cultural, heritage, recreation, carbon footprint, land-uses and space requirements coupled with landscaping, hydraulic and drainage functionality, and others
- Gather environmental product declarations and emissions data on propriety treatment devices from suppliers and compare whole-of-life emissions across the treatment methodologies
- Use output information to support informed decision making for future investment

Project 2: Cleaning Our Roofs – Installation of Stormwater Treatment Devices to Reduce Metal Contaminant Discharge and Monitoring of Effectiveness

Install Storminator treatment devices on XX selected Council owned buildings within the XXX stormwater management zone and evaluate performance. Climate change means that storm event magnitudes and frequencies may change, potentially driving more frequent, more intense rainstorm events. In these events, there is likely to be more sediment and contaminants discharge due to erosion and/or less ground soakage contributing to increased runoff. Treatment devices or methodologies may not render as effective during these higher peak flows. Therefore, investigation into direct treatment of roof runoff could help to counteract the adverse effects of climate change. Some advantages of the project are:

- Opportunity to trial a retrofit solution and evaluate costing, ease of installation, maintenance, water quality improvement, etc.
- The results of this assessment would inform future investment strategies and design requirements. Point source pollution control could be implemented throughout the catchment and on new infrastructure.
- The proposal supports the legal requirements to provide treatment under the stormwater discharge consent.
- Contribution to water quality enhancement.

Project 3: Outfall Rehab, Let It Flow – Undertake Analysis of Stormwater Outfall Blockage and Discharge Potential Risks with Respect to Climate Change Effects and Identify Mitigation Solutions

Carry out an assessment climate change effects contribute to stormwater outlet discharge coupled with an assessment of mitigation solutions. The results of the assessment could inform future decision-making and investment strategies. Climate change effects may have an adverse effect on the ability for the outlet to drain, such as the effects listed below:

- Sea-level rise and/or groundwater rise can reduce the hydraulic gradient of the stormwater system and therefore limits discharge at the outfall.
- Potential increased deposition of material at outfall outlet with the potential to cause blockages due to less frequent minimum flushing velocities achieved due to reduced hydraulic gradient.
- Increased sediment concentration in stormwater flow from the catchment, increasing the potential for deposition at the outfall.

It is noted that mitigation solutions may include:

- Backflow prevention, coupled with consideration of limited outflow on upstream flood levels.
- Assessment of hydraulic gradient (or reduction of).
- Pumping feasibility.
- Investment strategies and consolidation of outlets from multiple sub-catchments.

Project 4: Drying Out Wet Feet – Identification of Properties At-Risk of Above Floor Flooding

Complete an assessment to quantify properties at-risk of flooding above floor level, primarily due to river flooding, coastal inundation, and groundwater rising effects. These results would be used for a variety of reasons including:

- Estimation of potential greenhouse gas emissions due to surface water damage
- Spatial correlation of funded projects with at-risk properties
- Provides tool / interface for consideration in identification of future project or at-risk areas
- Helps to outline appropriate level of service targets (long-term planning)
- Facilitation of collaborative planning with the Coastal Hazards Adaptation team with regard to future investment
- Allow for interaction with the insurance industry regarding assessment of risk to properties and infrastructure – subject to further review following tentative release of Toka Tū Ake EQC new Risk Portal – scheduled for 2023 release.
- Investing in identification of hazards to inform risk reduction and resilience initiatives is one of the most efficient and effective ways to reduce the impact of natural hazard risks on New Zealanders.

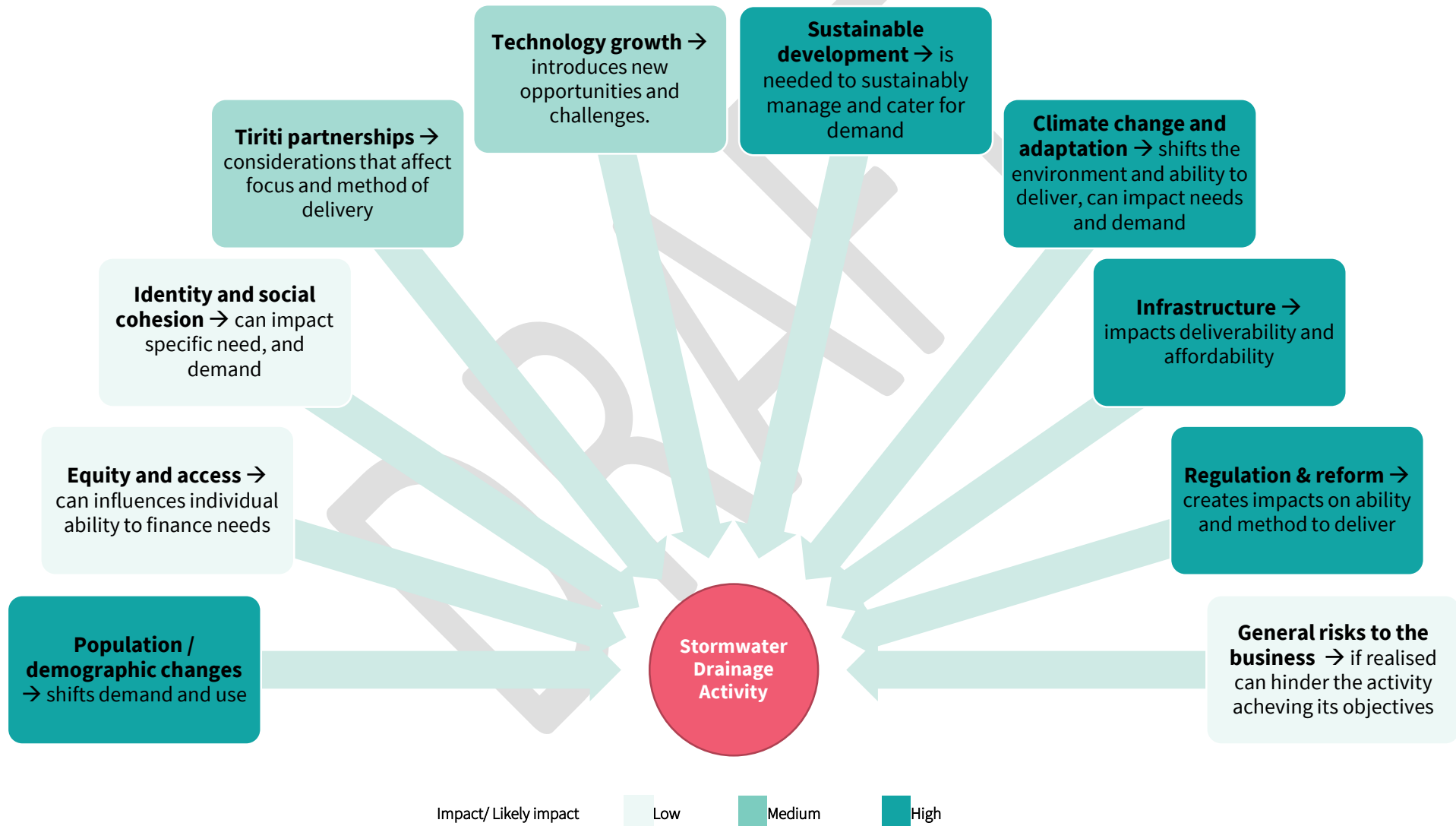
The current level of services set-out already begin to address accountability of the activity functions in relation to climate change vulnerability and greenhouse gas emissions.

- LOS: Council responds to flood events, faults and blockages promptly and effectively
 - This measure of service is reliant on the management of the activity to respond to climate change impacts.
- LOS: Council maintains waterway channels & margins to a high standard
 - A maintained stormwater drainage system is more effective at minimising adverse flooding and therefore contributes to reducing the vulnerability of those being serviced.
 - Design, material choice, fuel and electricity usage for maintenance activities would also be considered in efforts to minimise greenhouse gas emissions.
- LOS: Council manages the stormwater network in a responsible and sustainable manner
 - Management of the stormwater network contributes to benefits in reduction in sediment and pollutant loadings which minimises maintenance efforts.
 - Use of and continual maintenance of hydraulic models incorporating climate factors ensure decisions for current and future works are driven by evidence-based approaches to contribute to responsible management of the system.
 - This service also relates to compliance with discharge consent requirements which takes into account means to limit sediment volume which can have adverse effects on maintenance and greenhouse gas production.
- LOS: Stormwater network is managed to minimise risk of flooding, damage and disruption
 - Prioritising nature based solutions, water sensitive urban design, and allowing for overland flow paths ensures the system can better adapt to future climate change pressures for a sustainable future and minimise damages and disruptions.
- LOS: Reduce risk of flooding to property and dwellings during extreme rain events
 - Achievement of this measure of service is dependent on management of the activity to respond to climate change impacts
- LOS: Implement Flood plain Management Programme works to reduce flooding
 - The implementation of these works to reduce flooding helps to limit greenhouse gas emissions which would likely occur if flood protection is inadequate.
- LOS: Waterways are clean and pollution is minimised
 - Pollution minimisation initiatives are already being actioned in performance targets and contribute to reduction in greenhouse gas emissions

3. How we are planning for future impacts

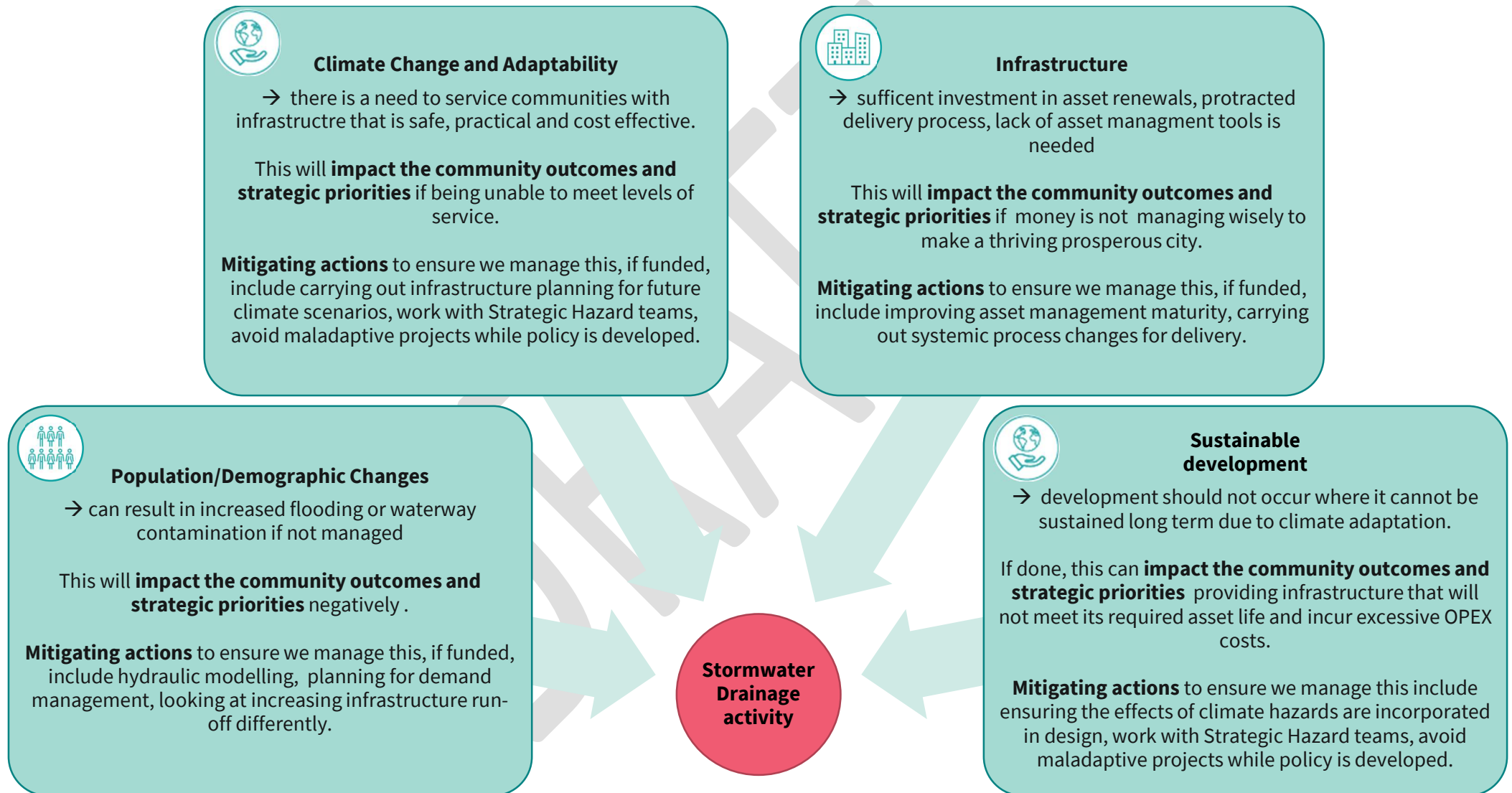
There are various factors influencing current and future demand for Stormwater drainage and the ability to deliver them. These are listed below.

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.









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 & Levels of Service measurements

- ➔ Stormwater Drainage have **11 Community (C) Levels of Service**. (These LOS community facing and will be published in our Statement of Service Provision)
- ➔ This activity also has **13 Management (M) Levels of Service**. (These are LOS that are measured in the organisation to ensure service delivery)

 Council responds to flood events, faults and blockages promptly and effectively		 Council maintains waterway channels & margins to a high standard	
Service contributes to: <ul style="list-style-type: none"> A thriving prosperous city A collaborative confident city <p>This is by generally maintaining the targets of the levels of service promised.</p>	Levels of Service This service has 2 Community and 2 Management LoS. <ul style="list-style-type: none"> Percentage of calls responded to within 2 hours (urban) or 6 hours (rural). Percentage of routine calls responded to within 5 working days. Median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site. Number of complaints received by a territorial authority about the performance of its stormwater system 	Service contributes to: <ul style="list-style-type: none"> A green, liveable city A thriving prosperous city <p>This is by generally maintaining the targets of the levels of service promised.</p>	Levels of Service This service has 1 Community and 3 Management LoS. <ul style="list-style-type: none"> Resident satisfaction with Council's management of the stormwater network. Percentage of all aquatic weed diverted from landfill (mechanical and hand harvested). Minimum length of 500m of bank naturalised per year (based on a single side of the waterway). Ratio of the length of watercourse consented to be physically improved versus physically degraded in each year.
 Council manages the stormwater network in a responsible and sustainable manner.		 Stormwater network is managed to minimise risk of flooding, damage and disruption	
Service contributes to: <ul style="list-style-type: none"> A green, liveable city A thriving prosperous city <p>This is by generally maintaining(?) the targets</p>	Levels of Service This service has 4 Community and 2 Management LoS. <ul style="list-style-type: none"> 4 measures relating to the number of abatement notices, infringement notices, enforcement orders, and successful prosecutions a regarding Council resource consents related to discharges from the stormwater networks per year. 	Service contributes to: <ul style="list-style-type: none"> A green, liveable city A thriving prosperous city <p>This is by generally maintaining the targets of</p>	Levels of Service This service has 3 Community and 2 Management LoS. <ul style="list-style-type: none"> The number of flooding events that occur. For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system). Percentage of total stormwater gravity network pipework length at condition grade 5.

of the levels of service promised.	<ul style="list-style-type: none"> Stormwater Service potential - 10yr rolling historic ratio of renewals to depreciation: The ratio of asset renewals to depreciation per year. Increase Land Drainage Asset Management Maturity towards agreed appropriate level (Advanced 89). 	the levels of service promised.	<ul style="list-style-type: none"> Percentage of stormwater mains with high or very high consequences of failure inspected as scheduled in their lifespan. Percentage of total Stormwater waterway linings at condition Grade 5.
 Implement Flood Plain Management Programme works to reduce risk of flooding to property and dwellings during extreme rain events		 Waterways are clean and pollution is minimised	
Service contributes to: <ul style="list-style-type: none"> A collaborative confident city A thriving prosperous city <p>This is by generally maintaining (?) the targets of the levels of service promised.</p>	Levels of Service This service has 2 Community and 1 Management LoS. <ul style="list-style-type: none"> 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 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. Number of surface water network monitoring sites (flow, level or rainfall) 	Service contributes to: <ul style="list-style-type: none"> A collaborative confident city A green, liveable city A thriving prosperous city <p>This is by generally maintaining (?) the targets of the levels of service promised.</p>	Levels of Service This service has 3 Management LoS. <ul style="list-style-type: none"> 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 Average annual of retrofit stormwater treatment to existing or brownfield development areas Auditing of stormwater systems on industrial premises.

5. How assets will be managed to deliver the services

The Stormwater Drainage portfolio is made up of piped reticulation, waterway linings, open waterway structures, treatment facilities and monitoring equipment. The Asset value of this Activity is approximately \$2,903M

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 waterways and treatment areas are carried out by the Land Drainage

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 “Installation of Stormwater Treatment Devices to Reduce Metal Contaminant Discharge” and “Undertake Analysis of Stormwater Outfall Blockage and Discharge Potential Risks with Respect to Climate Change Effects” (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

operations team. Some of the maintenance activities are carried out by 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 the Stormwater Drainage activity 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). There is a large renewal required for lined drains as well.

The Draft Infrastructure Strategy (IS) contains some key significant issues that affect our ability to manage ratepayer money wisely, 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 of our waterway linings 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.

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 guidance (or funding/resourcing) 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.

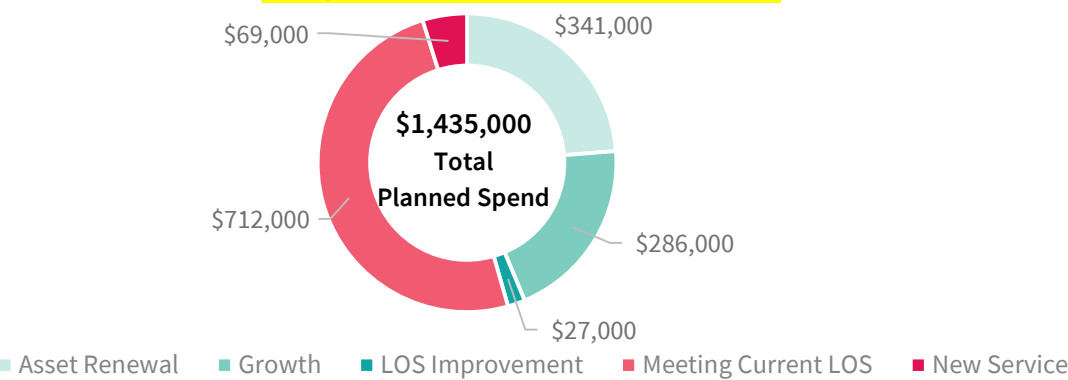
Reducing the capital program would increase the risk profile to Council. The program is developed to meet the level of service targets, avoid the sweating assets that would increase operational costs, and undertaking projects required to meet growth demands.

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. Note projection includes Stormwater Drainage AND Flood Protection and Control funding as the two activities are closely linked. Also note, this programme is based on the capital works programme provided to the National Transition Unit to reflect the unconstrained needs of the 3 Waters business with consideration for deliverability. *Note that Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026.*

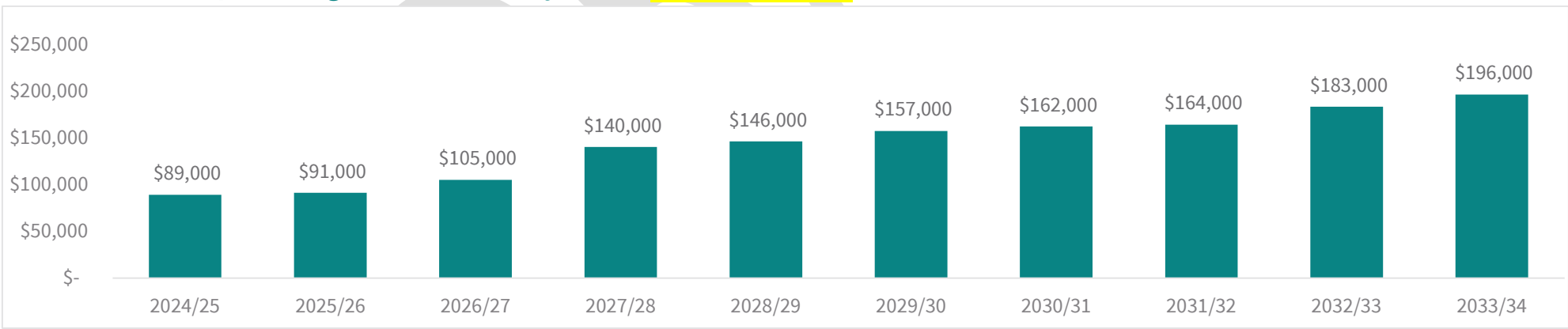
Stormwater Drainage & Flood Protection Capital Programme over 10 years (\$'000)



Planned significant projects and programmes include:

1. Ōtākaro-Avon River Corridor Programme ~\$90 – 180M
2. Waterway lining renewal programme ~\$112M
3. Stormwater reticulation renewal programme ~\$94M
4. Coastal Hazards Adaptation Planning Groundwater Management programme ~\$95M
5. Horners Kruses Basin ~\$45M
6. Addington Brook & Riccarton Drain Filtration Devices ~\$23M

Total Planned Capital Programme summary (\$'000) (To be updated)



See [reference](#) for more detail on the Planned Capital Programme.

7. Financial resources needed

7.1. Resources needed

Indicative budgets are based on the 2023/24 Annual Plan projections for the balance of the current LTP. They are subject to year end capital carry forwards, and further refinement of inflation and other assumptions for the new LTP. **(table to be updated)**

Stormwater Drainage

000's	Annual Plan 2023/24	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
Activity Costs Before Overheads by Service											
Stormwater Drainage	12,990	13,919	14,570	15,180	15,801	16,403	16,992	17,580	1,657	1,657	
	12,990	13,919	14,570	15,180	15,801	16,403	16,992	17,580	1,657	1,657	
Activity Costs by Cost Type											
Direct Operating Costs	2,519	2,468	2,567	2,657	2,748	2,834	2,918	2,998			
Direct Maintenance Costs	9,503	10,288	10,802	11,288	11,783	12,262	12,740	13,221	255	255	
Staff and Contract Personnel Costs	965	1,160	1,199	1,232	1,266	1,303	1,332	1,359	1,401	1,401	
Other Activity Costs	3	3	3	3	3	3	3	3			
Overheads, Indirect and Other Costs	12,283	13,271	14,017	14,426	15,065	15,739	16,097	16,545	6,001	5,944	
Depreciation	27,117	29,009	30,512	32,203	33,712	35,299	36,759	38,059	6,392	6,362	
Debt Servicing and Interest	3,240	4,182	5,093	6,016	6,603	6,936	7,092	7,301	3,001	3,013	
Total Activity Cost	55,629	60,381	64,192	67,826	71,181	74,376	76,941	79,486	17,052	16,975	
Funded By:											
Fees and Charges	16	16	17	17	18	18	19	19			
Grants and Subsidies											
Cost Recoveries	209	217	225	231	237	243	248	253			
Other Revenues											
Total Operational Revenue	224	234	241	248	255	261	267	272			
Net Cost of Service	55,405	60,147	63,951	67,577	70,926	74,115	76,674	79,214	17,052	16,975	
Funding Percentages											
Rates	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Fees and Charges	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Grants and Subsidies	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cost Recoveries	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other Revenues	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Capital Expenditure											
Improved Service Levels	6,232	4,131	4,826	3,707	3,549	4,853	4,990	5,814			
Increased Demand	3,052	2,396	295	58	61	56	55	55			
Renewals & Replacements	22,817	22,831	22,556	21,549	24,874	26,546	24,559	25,390			
Total Activity Capital	32,101	29,359	27,677	25,314	28,485	31,455	29,604	31,259			

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 Stormwater Drainage 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 Library 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
User-Pays <i>the degree to which the Activity can be attributed to individuals or identifiable groups rather than the community as a whole</i>	High	Fund from X
Exacerbator-Pays <i>the degree to which the Activity is required as a result of the action (or inaction) of individuals or identifiable groups</i>	Low	Fund from x
Inter-Generational Equity <i>the degree to which benefits can be attributed to future periods</i>	Low	Fund when
Separate Funding? <i>the degree to which the costs and benefits justify separate funding for the Activity</i>	High	Fund from x

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*
Renewal/replacement	<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>	81%
Service improvement	<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>	16%
Growth	<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>	3%

Outcome: Initial funding for capital

Initial funding source	Proportion of capex funded*
Rates	100%
Borrowing	
Development Contributions	
Grants and Other	

* 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 Policies 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
Social	
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 encroachment and degradation of waterways through development, flooding issues due to development within secondary flow paths and increasing contaminant loadings and quantities of run-off. 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 system (projected increased stormwater volumes in more frequent, more extreme events and decreasing hydraulic gradient).	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 level of service provision 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
Economic	
Cost to Council / ratepayers of operating stormwater drainage network	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	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.

frequent, more extreme events and decreasing hydraulic gradient resulting from climate change and sea level rise.	
Meeting increasing community and regulatory requirements for improved stormwater quality requires ongoing CAPEX and OPEX commitment by Council	Ongoing education and works programme to reduce creation of stormwater contamination at source and reduce contaminant load, necessary to reduce the reliance on infrastructure for contaminant removal through provision of stormwater treatment facilities and devices. Provision of adequate CAPEX and OPEX to meet the regulatory requirements and community levels of service
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
Environmental	
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.
Urban development increases the contaminant load in stormwater discharges	Retrofit treatment of existing urban areas
Cultural	
Without suitable consideration for cultural values with how we renew, plan for, construct and operate our networks, Council will not meet 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.

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, noting that the Three Waters Reform programme is ongoing and that there will be a change to an entity model.

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

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
Council responds to flood events, faults and blockages promptly and effectively										
14.0.1.1	M	Council responds to flood events, faults and blockages promptly and effectively: Percentage of emergency calls responded to within 2 hours (urban) or 6 hours (rural)	2023: TBD 2022: ≥95% 2021: 98.6% 2020: 98.1% 2019: 100%		≥95%	≥95%	≥95%	≥95%	Reported in monthly contract reports from the Contractor.	A thriving prosperous city A collaborative confident city
						<i>Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.</i>				
14.0.1.3	M	Council responds to flood events, faults and blockages promptly and effectively: Percentage of routine calls responded to within 5 working days - TBC	2023: TBD 2022: ≥95% 2021: 93% 2020: 98.1% 2019: 97%		≥95%	≥95%	≥95%	≥95%	Reported in monthly contract reports from the Contractor.	A thriving prosperous city A collaborative confident city
14.0.10	C	Council responds to flood events, faults and blockages promptly and	2023: TBD 2022: Urban: 33 / Rural: Nil 2021: Urban: Nil / Rural: Nil		≤60 mins urban ≤120 mins rural	≤60 mins urban ≤120 mins rural	≤60 mins urban ≤120 mins rural	≤60 mins urban ≤120 mins rural	Reported in monthly contract reports from the Contractor.	A thriving prosperous city A collaborative confident city

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		effectively: Median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site	2020: Urban: Nil / Rural Nil 2019: Urban: Nil / Rural Nil						Both targets must be met for the level of service to be met. <i>Department of Internal Affairs, Stormwater non- financial performance measure number 3</i>	
14.0.11.3	C	Stormwater network is managed to minimise risk of flooding, damage and disruption: Number of complaints received by a territorial authority about the performance of its stormwater system (Expressed per 1000 properties connected to the territorial authority's stormwater system)	2023: TBD 2022: 8.5 2021: 0.5 2020: 6.07 2019: 6.74		< 9 complaints per 1000 properties	< 9 complaints per 1000 properties	< 9 complaints per 1000 properties	< 8 complaints per 1000 properties	Number of requests for service received through the Hybris <i>Department of Internal Affairs, Stormwater non- financial performance measure number 4</i>	A thriving prosperous city A collaborative confident city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
Council maintains waterway channels & margins to a high standard										
14.0.3	C	Council manages the stormwater network in a responsible and sustainable manner: Resident satisfaction with Council's management of the stormwater network	2023: TBD 2022: 44% 2021: 45% 2020: 42.7% 2019: 47%		39%	TBC	TBC	35%	Resident satisfaction surveys	A thriving prosperous city A green, liveable city
14.0.6	M	Council manages the stormwater network in a responsible and sustainable manner: Percentage of all aquatic weed diverted from landfill (mechanical and hand harvested)	2023: TBD 2022: ≥95% 2021: 100% 2020: 100% 2019: 100%		≥95%	≥95%	≥95%	≥95%	Reported in monthly contract reports from the Contractor.	A thriving prosperous city A green, liveable city
14.0.4.1	M	Council maintains waterway channels and margins to a high standard: Minimum length of 500m of bank	2023: TBD 2022: 997m - 199% 2021: 300 2020: 2,327 2019: 1,819		≥95%	≥95%	≥95%	≥95%	GIS and as-built data from CAPEX projects	A thriving prosperous city A green, liveable city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		naturalised per year (based on a single side of the waterway)								
14.0.14	M	Council maintains waterway channels and margins to a high standard: Ratio of the length of watercourse consented to be physically improved versus physically degraded in each year	2023: TBD 2022: 33:1 (enhancement : degradation) New measure with 2021 LTP		≥3	≥3	≥3	≥3	Ratio calculated as (kms improved ÷ kms degraded = 3 or more). GIS and as-built data from CAPEX projects Physically Improved – includes daylighting, naturalisation, artificial lining removal, riparian protection and enhancement) Physically Degraded – includes piping, lining and other structures that contribute negatively to the environment Excludes: water quality aspects	A thriving prosperous city A green, liveable city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
									of watercourse improvement and degradation such as contaminants and temperature change.	
Council manages the stormwater network in a responsible and sustainable manner.										
14.0.2.1	C	Council manages the stormwater network in a responsible and sustainable manner: Number of abatement notices regarding Council resource consents related to discharges from the stormwater networks per year	2023: TBD 2022: 0 2021: 1 2020: 0 2019: 0		0 abatement notices	0 abatement notices	0 abatement notices	0 abatement notices	Reported in resource consent compliance reports to ECan. <i>Department of Internal Affairs, Stormwater non-financial performance measure number 2a</i>	A thriving prosperous city A green, liveable city
14.0.2.4	C	Council manages the stormwater network in a responsible and sustainable manner: Number of infringement	2023: TBD 2022: 0 2021: 1 2020: 0 2019: 0		0 infringement notices	0 infringement notices	0 infringement notices	0 infringement notices	Reported in resource consent compliance reports to ECan. <i>Department of Internal Affairs,</i>	A thriving prosperous city A green, liveable city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		notices regarding Council resource consents related to discharges from the stormwater networks per year							<i>Stormwater non- financial performance measure number 2b</i>	
14.0.2.3	C	Council manages the stormwater network in a responsible and sustainable manner: Number of enforcement orders regarding Council resource consents related to discharges from the stormwater networks per year	2023: TBD 2022: 0 2021: 0 2020: 0 2019: 0		0 enforcement orders	0 enforcement orders	0 enforcement orders	0 enforcement orders	Reported in resource consent compliance reports to ECan. <i>Department of Internal Affairs, Stormwater non- financial performance measure number 2c</i>	A thriving prosperous city A green, liveable city
14.0.2.2	C	Council manages the stormwater network in a responsible and sustainable manner: Number of successful prosecutions regarding Council resource	2023: TBD 2022: 0 2021: 0 2020: 0 2019: 0		0 successful prosecutions	0 successful prosecutions	0 successful prosecutions	0 successful prosecutions	Reported in resource consent compliance reports to ECan. <i>Department of Internal Affairs, Stormwater non- financial performance</i>	A thriving prosperous city A green, liveable city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		consents related to discharges from the stormwater networks per year							<i>measure number 2d</i>	
14.0.15.2	M	Stormwater Service potential - 10yr rolling historic ratio of renewals to depreciation: The ratio of asset renewals to depreciation per year	2023: TBD 2022: 32.3% New Metric with LTP 2021	IPWEA Asset management financial indicator : 100% 2018/19: 66%	91%	TBC	TBC	80%	Historic 10yr average renewals expenditure / Historic 10yr average depreciation	A thriving prosperous city A green, liveable city
14.0.15.3	M	Increase Land Drainage Asset Management Maturity towards agreed appropriate level (Advanced 89)	2023: TBD 2022: 77% New measure with LTP 2021	NZ Treasury Investor Confidence Rating (ICR) Asset Management Maturity Assessment (AMMA) Tool 2020: 77%	≥77%	77%	77%	89%	Conduct assessment on alternate years. Asset Management Maturity assessment (AMMA) to be conducted every two years by an external assessor until appropriate level of maturity target is achieved.	A thriving prosperous city A green, liveable city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
Stormwater network is managed to minimise risk of flooding, damage and disruption										
14.0.11.2	C	Stormwater network is managed to minimise risk of flooding, damage and disruption: The number of flooding events that occur	2023: TBD 2022: 2 flooding events in Dec 2021 and Feb 2022 2021: 0 2020: 0 2019: 0		<2 flooding events	<2 flooding events	<2 flooding events	<2 flooding events	Site inspection reports. Where a flood event is defined as “a result of the capacity of the stormwater network (either primary or secondary flow paths) being exceeded”. <i>DIA stormwater non-financial performance measure number 1a</i>	A thriving prosperous city A green, liveable city
14.0.11.1	C	Stormwater network is managed to minimise risk of flooding, damage and disruption: For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties)	2023: TBD 2022: 0.01 2021: 0 2020: 0 2019: 0		<0.1 habitable floors per 1000 properties	<0.1 habitable floors per 1000 properties	<0.1 habitable floors per 1000 properties	<0.1 habitable floors per 1000 properties	Site inspection reports <i>Department of Internal Affairs, Stormwater non- financial performance measure number 1b</i>	A thriving prosperous city A green, liveable city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		connected to the territorial authority's stormwater system.)								
14.0.11.4	C	Percentage of total stormwater gravity network pipework length at condition grade 5	2023: TBD 2022: 5.45% New measure with LTP 2021	Median Results from Water NZ National Performance Review =10.91%	≤ 7%	≤ 7%	≤ 7%	≤ 10%	Reported from Council Asset Management Systems. Condition deterioration since inspection to be included when assigning a condition grade to a pipe. Lengths of pipe at condition 5 divided by total stormwater pipe length expressed as a percentage.	A thriving prosperous city A green, liveable city
14.0.11.10	M	Percentage of stormwater mains with high or very high consequences of failure inspected as scheduled in their lifespan	2023: TBD 2022: 74.86% New measure with LTP 2021		≥ 80%	TBC	TBC	≥ 80%	Reported from Council Asset Management Systems. Length of pipe inspected divided by total length of pipe. Considering only pipes	A thriving prosperous city A green, liveable city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
									scheduled for inspection in the CCTV inspection programme.	
14.0.15.1	M	Stormwater network is managed to minimise risk of flooding, damage and disruption: Percentage of total Stormwater waterway linings at condition Grade 5.	2023: TBD 2022: Unknown New measure with LTP 2021		≤ 7%	≤ 7%	≤ 7%	≤ 7%	Reported from Council asset management systems. Condition deterioration since inspection to be included when assigning a condition grade to a lining.	A thriving prosperous city A green, liveable city
Implement Flood plain Management Programme works to reduce risk of flooding to property and dwellings during extreme rain events										
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	Properties per annum 2023: TBD 2022: 30 2021: 44 2020: 44 2019: 57		TBC	TBC	TBC	TBC	Flood Models	A collaborative confident city A thriving prosperous city

Note: All Water Services Entities are expected to go live between 1 July 2024 and 1 July 2026. LOS targets may not be applicable beyond year 2 of this plan.

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		in a 2% AEP Design Rainfall Event of duration 2 hours or greater excluding flooding that arises solely from private drainage								
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	2023: TBD 2022: Updated Ōtākaro Avon model was installed and became operative in June 2022 New measure with LTP 2021		Huritini Halswell River			Pūharakeken ui Styx River, Sumner	Flood Models	A collaborative confident city A thriving prosperous city

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
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)	2023: TBD 2022: 11 new sites (84 total) New measure with LTP 2021		+2 sites (77)	TBC	TBC	+2 sites (95)	Contract Reporting and GIS	A collaborative confident city A thriving prosperous city
Waterways are clean and pollution is minimised										
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	2023: TBD 2022: Model will be undertaken during 2023. New measure with LTP 2021		Pass	Pass	Pass	Pass	Annual modelling of reduction of contaminant load in stormwater discharges, and the determination of an annual rolling average reduction for comparison with the trend required to meet the CSNDC requirement for each of the specified years	A collaborative confident city A thriving prosperous city A green, liveable city

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		Network Discharge Consent (CSNDC) for 2023 and 2028, derived through contaminant load reduction modelling of the stormwater treatment facilities which have been installed							of 2023 and 2028.	
14.1.7.5	M	Reduce stormwater contaminants in receiving waterways: Average annual of retrofit stormwater treatment to existing or brownfield development areas	2023: TBD 2022: 314.5 New measure with LTP 2021		≥10Ha per year	≥10Ha per year	≥10Ha per year	≥10Ha per year	5 year rolling average existing residential area retrofitted with stormwater treatment infrastructure	A collaborative confident city A thriving prosperous city A green, liveable city
14.1.7.4	M	Reduce pollution from discharge of industrial contaminants to waterways:	2023: TBD 2022: 18 audits New measure with LTP 2021		≥15 per year	≥15 per year	≥15 per year	≥16 per year	Number of industrial premises audited annually	A collaborative confident city A thriving prosperous city

LOS number	C/ M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Community Outcome
					Year 1 2024/25	Year 2 2025/26	Year 3 2026/27	Year 10 2033/34		
		Auditing of stormwater systems on industrial premises								A green, liveable city

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

Deletions

This Activity has no deleted levels of service.

New

Activity / Level of Service	Change from 2021-31 LTP	Reason/Rationale	Options for Consultation
14.1.6.1 - 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	Level of service is moved from Flood Protection and Control works	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	DIA required level of service, as this is only shifting activities, consultation not required
14.1.6.9 - 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.	Level of service is moved from Flood Protection and Control works Text change from “ <i>required intervals not greater than every 3 years</i> ” to “ <i>required intervals not greater than every 5 years</i> ”.	This lines the modelling update and reporting time frames to match the legal requirement of the CSNDC.	N/A
14.1.6.3 - Manage the risk of flooding to property and dwellings during extreme rain events: Number of surface water network monitoring sites (flow, level or rainfall)	Level of service is moved from Flood Protection and Control works		DIA required level of service, as this is only shifting activities, consultation not required

14.1.7.1 - 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	Level of service is moved to Stormwater & Drainage	This LOS belongs to the Service of Waterways are clean and pollution is minimised, which has been moved to Stormwater & Drainage Activity	Management level of service, consultation not required
14.1.7.5 - Reduce stormwater contaminants in receiving waterways: Average annual of retrofit stormwater treatment to existing or brownfield development areas			Management level of service, consultation not required
14.1.7.4 - Reduce pollution from discharge of industrial contaminants to waterways: Auditing of stormwater systems on industrial premises			Management level of service, consultation not required

Amendments

This Activity has no amended levels of service.

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)		<ul style="list-style-type: none"> Change in population intensity in parts of the network Change in demand density in parts of the network 	<ul style="list-style-type: none"> Capacity issues 	<ul style="list-style-type: none"> Demand management (that reduces the need for new infrastructure) – e.g. enforcing on-site attenuation New infrastructure to increase capacity Upgrade existing infrastructure to increase capacity
Shifts within city (e.g., growing communities, possible future managed retreat)		<ul style="list-style-type: none"> 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. It is as yet uncertain what the quantum and rate of intensification will be across the City. 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 predetermining the results of the Coastal Hazard Adaptation Planning (CHAP) process with communities. 	<ul style="list-style-type: none"> Growth may exceed the capacity of infrastructure at a localised level and can lead to reduced levels of service and criticism of Council. Create uncertainty on performance of existing hydraulic modelling requiring more work to be done to verify solutions proposed in the forward works programme. Unfeasible to service some areas requiring a change to the District Plan, restricting development. 	<ul style="list-style-type: none"> Hydraulic models and Stormwater Management Plans to be reviewed and updated with population growth changes Waiting on Central Government decisions legislation around managed retreat. Then developing and following policy on managed retreat

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"> Increased genuine engagement and collaboration with mana whenua Increased training for staff on how the business affects Māori values. Provision of sincere guidance from Management to staff 	<ul style="list-style-type: none"> Minor (generally) increase cost in projects due to engagement time and cost. Minor cost to look at updating the 3 Waters Strategy Implementation Plan 	<ul style="list-style-type: none"> Review and update the 3W Strategy Implementation Plan with mana whenua. Guidance and leadership from management with a focus on eventual co-governance with 3 Waters Reform.
Te mana o te wai – Freshwater Management	<p>As above, more direction is needed.</p> <p>Staff within the freshwater ecology team have created an Action Plan to implement principles of Te Mana o te wai.</p>	<ul style="list-style-type: none"> Changes required to give effect to Te mana o te wai 	<ul style="list-style-type: none"> Provision of funding required to meet the requirements of the Action Plan Minor (generally) increase cost in projects due to engagement time and cost. 	<ul style="list-style-type: none"> Review and update 3W Strategy Implementation Plan with respect to Te mana o te wai Increased level of engagement and planning on individual project levels Implementation of the recently completed “Healthy Waterbodies Action Plan” – assuming funding is provided.

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 assets and missing opportunities for planning.	<ul style="list-style-type: none"> The attenuation and treatment of runoff is accepted as a cost of new development and is required over an increasing proportion of the city to control the discharge of urban contaminants. Internationally, industry standards and practices for dealing with stormwater have been changing to incorporate more holistic outcomes. There is a transitional shift from the use of traditional engineering methods e.g. pipes and culverts) to the use of Water Sensitive Urban Design (WSUD) and green infrastructure to mimic natural habitat in the urban environment. This shift will provide technology that may provide benefits to water quality outcomes, biodiversity, carbon footprint reduction and even reduce urban heat island effects. Use of smart technologies such as recording ground water levels for provision into hydraulic models or for hazard modelling for District Plan Matters. Also monitoring of treatment devices for both water attenuation and quality for ensuring devices are working as designed. If a network of flow monitoring stations is set up in the network, there 	<ul style="list-style-type: none"> Provision of funding will allow smarter decisions to be made resulting in better outcomes. The use of WSUD devices fits with the community outcome of “A green, liveable city”, forming quality green space areas. 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. 	<ul style="list-style-type: none"> On-going investigation and use of WSUD’s and green infrastructure should be encouraged by both the Planning and Asset teams to role-model these solutions for both public works and private development. Further develop suitable solutions and updates to design guidelines and standards. Provide requested OPEX to 3 Waters Asset Management to enable monitoring programmes to be created. Provide funding for the installation of monitoring equipment in the network.

		<p>will be more reliable data to use for calibration of our hydraulic models.</p> <ul style="list-style-type: none"> • 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. 		
Digital security		<ul style="list-style-type: none"> • More stormwater flow data available and administered by Council • More sophisticated hacking and cyber-attack technology and techniques 	<ul style="list-style-type: none"> • May affect the operation of key structures that control flood retention systems 	<ul style="list-style-type: none"> • Maintain separate operations communication network •

B.4. Resilience and environmental considerations

Climate change & adaptation (high impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Key climate impacts	See Section 2.3 for detailed information.			
Population movement due to managed retreat and adaptation	Unable to make any infrastructure decisions on this issue.	<ul style="list-style-type: none"> • Following government advice, it is expected that suitable guidance will be provided to the business for incorporation in Planning. 	<ul style="list-style-type: none"> • Unable to advise until further work has been undertaken by other teams. 	<ul style="list-style-type: none"> • No plans are currently being progressed.
Increasing numbers of extreme weather events change	See Section 2.3 for detailed information.			

utilisation of physical and digital assets				
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"> The development of guidance/policy is required to give direction to the business units which can then be used to better inform the public. 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. 	<ul style="list-style-type: none"> 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. Additional funding is 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. 	<ul style="list-style-type: none"> The CHAP team has a programme of work to carry out extensive community engagement to plan out adaptive pathways. This process has been very slow to date due to the team being under resourced for the scale of the project.

Sustainable development (high impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Managing GHG emissions (per table above)	See Section 2.3 for detailed information.			
Resilience & risk	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.	<ul style="list-style-type: none"> Increased expectation for resilience to be built into infrastructure solutions. 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. If waterway health continues to deteriorate, NZ's reputation as being "Clean and Green" may be further 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Develop 3 waters risk and resilience framework incorporating wider issues than just climate change resilience.

		<p>compromised affecting tourism and income.</p> <ul style="list-style-type: none"> • Change in the public's perception and desire of public infrastructure from solely economic to environmentally lead is not being visualised by Council. • 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 increased waterway margins and enhancement requiring increases in operational funding. 		
Natural hazards	<p>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.</p>	<ul style="list-style-type: none"> • 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. • 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. 	<ul style="list-style-type: none"> • 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. • 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. 	<ul style="list-style-type: none"> • Current design requires an allowance for increased rainfall amounts based on MfE predications. • Hydraulic models have an allowance for future density based on current District Planning maps for runoff prediction. • Work carried out under the LDRP 97 Multi-Hazard Analysis project continues to provide essential information for informing capital planning and avoiding maladaptive works.

		<p>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.</p> <ul style="list-style-type: none"> • Rainfall and storm patterns involving intensity and frequency may require investment in pipe upgrades or duplication to mitigate flooding in communities. • 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. • 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. 	<ul style="list-style-type: none"> • Accelerated asset deterioration due to site conditions not designed for. • Reduced levels of service due to inability to drain pipework which may be “drowned” in the future reducing available capacity. 	
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Triple bottom line		<ul style="list-style-type: none"> Increased expectation for financial, social and environmental bottom line reporting 	<ul style="list-style-type: none"> 	Continue to incorporate triple bottom line analysis and reporting at a strategic planning level
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B.5. Infrastructure (high impact)

Issue/driver	Present Position	→ Projection	Impact on services	Mitigating plans
Delivering on what we say and looking after what we've got	<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"> 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. 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. The delivery of growth projects is extended due to the currently followed systemic process not being efficient through the design and procurement process. 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. 	<ul style="list-style-type: none"> Reduced ability to carry out well informed asset renewals programme to replace asset base that has reached full depreciation in a timely manner. Growth projects are slow to deliver, risking breach of consent conditions. Increased overall project costs. 	<ul style="list-style-type: none"> Working with Councils procurement teams to change the way we deliver projects to increase capital delivery with selected current Tier 1 contractors. Develop programmes of work to review and inspect assets so we have a better understanding of the condition and performance of our assets. Improvement items have been recommended in the previous 2 AMP's, these items will improve the ability to look after what we've got. Ensure whole-of-life maintenance costs are identified and the required OPEX is factored into future budgets before asset investment decisions are made.
Resilience to impacts of climate change	See Section 2.3 and Appendix B.4			

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"> • 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. • 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. • Council needs to advise 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. 	<ul style="list-style-type: none"> • Disruption to services • Increased costs of meeting regulation • Reliance on OPEX to manage shortfalls in managing assets for timely renewal. 	<ul style="list-style-type: none"> • OPEX funding for an asset improvement programme has been requested for the 3 Waters Asset Management team. • It is hoped that the SAP improvement programme will provide improved processes.

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"> • Organisational change and upheaval with move from Council delivery to new Entity model • Increased regulation and standards • The business has had piecemeal involvement with reform to date with all requests for information being managed by staff not within the 	<ul style="list-style-type: none"> • Unknown affects on the services due to uncertainty on timeframe for reform. • Staff are affected by uncertainty over how reform will affect their jobs. • Uncertainty over future budget availability to continue 	<ul style="list-style-type: none"> • Participate with the National Transition Unit Process • Monitor proposed changes and engage with Council Leadership to prepare submissions

		business. Not all key staff have been involved with NTU meetings at times when they should be.	identified work programmes e.g. OARC. <ul style="list-style-type: none"> Many and varied Service Level Agreements will be needed, but nothing has yet been discussed. 	<ul style="list-style-type: none"> Make provisions for regulation and standards when they are advised
Resource Management reforms		<ul style="list-style-type: none"> Unknown state 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> To be developed
Future for Local government		<ul style="list-style-type: none"> Unknown state 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> To be developed

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B.7. Identified Business Unit Risks

The main risks to the activity have been discussed in Section 3.XX 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	Assessed Risk Level			Controls / Mitigations	Residual Risk Rating
		Impact	Likelihood	Inherent Risk Level		
<ul style="list-style-type: none"> Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents. 	<p>Economic Environment on Capital Programme</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"> Capital programme forecasts will be underdeveloped requiring additional funding. Inability to source key materials/products. Failure to meet levels of service Inability to meet compliance requirements (CSNDC conditions for water quality) 	Moderate	Highly Likely	7	<ul style="list-style-type: none"> Ensure realistic contingency amounts are included in the project/programme estimates. Ensure that suitable escalation calculations are carried out and used. Ensure projects are carried out in a timely fashion to prevent undue escalation during the design phase of the project. 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. 	Medium
<ul style="list-style-type: none"> Manage ratepayers' money wisely, delivering quality core services to 	<p>Three waters reform</p> <p>There is still general uncertainty on the reform process, what staff will be affected, what positions</p>	Moderate	Likely	6	<ul style="list-style-type: none"> More open and transparent information to be provided from staff. Increased involvement of key 3-waters staff with NTU workshops. 	medium

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the whole community and addressing the issues that are important to our residents.	<p>will be required in the new entity and how work flows will be managed in the future.</p> <p>There is a risk of:</p> <ul style="list-style-type: none"> Staff well-being and stress levels as the process continues Disengagement of staff. Loss of institutional knowledge if staff leave. Lack of advice from the National Transition Unit (NTU) to give and surety to staff. Continuation of the current process with lack of key 3-waters staff involvement in meetings/workshops led by NTU may lead to staff feeling disconnected with the reform process. 				<ul style="list-style-type: none"> Allow NTU staff to liaise directly with staff. More staff involvement in the processes of e.g. data provision and high level meetings. 	
<ul style="list-style-type: none"> Be an inclusive and equitable city which puts people at the centre of developing our city and district, 	<p>Staff wellbeing</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> <p>There is a risk of:</p>	Moderate	Highly Likely	7	<ul style="list-style-type: none"> Increased leadership engagement with teams on wellbeing Increased EAP, People and Culture connections Wellbeing activities embedded into day-to-day working culture. Development of unit programme of work to prioritise activities and manage individual workloads. 	Medium

Strategic priorities risk is associated with	Risk Description	Assessed Risk Level			Controls / Mitigations	Residual Risk Rating
		Impact	Likelihood	Inherent Risk Level		
<p>prioritising wellbeing, accessibility and connection.</p> <ul style="list-style-type: none"> • Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents. 	<ul style="list-style-type: none"> • Staff burnout and related health issues • Absenteeism and productivity impacts • Increased recruitment costs if retention impacted 				•	
<ul style="list-style-type: none"> • Be an inclusive and equitable city which puts people at the centre of developing our city and district, prioritising wellbeing, accessibility and connection. • Manage ratepayers' 	<p>Recruitment and retention of skilled staff</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"> • Staff wellbeing negatively impacted by workload changes. 	Moderate	Likely	6	<ul style="list-style-type: none"> • Increased staff wellbeing programmes • Work with staff on personal development opportunities including internal secondments. • Use exit interviews to identify opportunities for improvement. • Development of leadership opportunities and training • Increase remuneration to closer match the private sector. 	Low

Strategic priorities risk is associated with	Risk Description	Assessed Risk Level			Controls / Mitigations	Residual Risk Rating
		Impact	Likelihood	Inherent Risk Level		
<p>money wisely, 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"> Level of service achievement is impacted. Increased cost of external resourcing to achieve schedule requirements 						
<ul style="list-style-type: none"> Manage ratepayers' money wisely, delivering quality core services to the whole community and addressing the issues that are important to our residents. 	<p>Asset Management Policy advice and performance</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"> Clear asset management priorities will not be embedded at the needed operational level to see the required changes. Decision-making is not informed by evidence-based advice. 	Major	Highly Likely	8	<ul style="list-style-type: none"> 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. Use clear and concise language to explain Asset Management principles, objectives, and benefits. Avoid jargon and technical terms that may hinder understanding. Foster a collaborative culture by creating forums, workshops, or focus groups where stakeholders can exchange ideas, share experiences, and contribute to Asset Management discussions. Provide training programs and resources to enhance the knowledge and skills of staff members and elected 	High

Strategic priorities risk is associated with	Risk Description	Assessed Risk Level			Controls / Mitigations	Residual Risk Rating
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	<ul style="list-style-type: none">• The necessary investment into asset management will not occur.• Councils Asset management will not align with national legislation or best practice				members regarding Asset Management principles, processes, and decision-making frameworks	