DRAFT
INFRASTRUCTURE STRATEGY
2021–2051

Ka tupu te purapura ka ora to Aorere

Planting the seeds for Tasman's future

tasman district council | Te Kaunihera o te tai o Aorere

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Executive Summary

Summary of Council's strategic direction for its infrastructure services

Strategic Direction

Provides context, an outline of the key infrastructure issues, and a summary of how Council intends to manage its assets

Activity Summaries

Overview of each infrastructure activity including options to address key issues and long term budget requirements

EXECUTIVE SUMMARY

This Infrastructure Strategy (Strategy) covers the provision of Tasman District Council's water supply, stormwater, wastewater, rivers and flood control, and transportation activities.

WHAT IS INFRASTRUCTURE?

Infrastructure is the physical assets that we own and maintain to allow Tasman residents to:

- have access to safe drinking water
- have wastewater collected from their homes and businesses, treated and safely discharged back into the environment
- have rainfall collected and conveyed away from their roads and properties to prevent flooding
- travel safely throughout the District using their preferred form of transport, and
- live alongside rivers while benefiting from flood risk mitigation measures.

Infrastructure is the essential foundation that sustains us and enables Tasman to grow. It is essential to health, safety, and for the transport of both people and freight. It enables businesses and communities to flourish. Failure to maintain and invest in infrastructure would inhibit the economic performance, health and prosperity of Tasman.

We own and maintain other infrastructure to that listed above that supports community services such as libraries, parks and reserves, pools and halls. These are not covered by this Strategy.

WHY HAVE AN INFRASTRUCTURE STRATEGY?

We manage $1.3 billion worth of infrastructure on behalf of our community. Maintaining and renewing these assets, as well as managing and meeting the communities' needs, account for most of our spending.

The purpose of this Strategy is to show how we will care for our assets and investments so that they reach their potential. In this Strategy, we identify key issues relevant to the provision of infrastructure, the key options for addressing those issues, and the subsequent financial implications for the next 30 years.

There is tension in the process when we assess how and when to address these key issues. Often, what we would like to do differs from what is practical and affordable, especially in regards to timing. We would like to address issues quickly for the community, but often there are constraints that mean this cannot always be the case. This Strategy acknowledges the tension between prudent provision of infrastructure and the need to stay within the financial limits set out in our Financial Strategy. By doing this, we have set out a long-term Strategy that is realistic, prudent and achievable, and outlines the infrastructure services that will be provided over the next 30 years.

WHERE ARE WE AT NOW?

Tasman is experiencing significant population growth and demand for housing. In recent years, actual population growth surpassed what we had estimated would occur. This resulted in more homes being built, taking up infrastructure capacity far sooner than we had anticipated. Our future population projections suggest this period of growth will continue for many years yet. This growth is occurring in all of our key settlements meaning that a number of our networks are under strain and require capacity upgrades. We have planned upgrades in Motueka, Richmond, Māpua, Brightwater and Wakefield to provide capacity for future homes that will need to connect to our networks.

We have made progress on our water treatment plant upgrades by commencing work on the Motueka, Māpua, Brightwater and Wakefield plants. The other remaining non-compliant plants are scheduled for upgrade by 2026. This work is required in order for us to supply safe drinking water from all of our schemes and meet the NZ Drinking Water Standards.

We have also commenced construction on the Waimea Community Dam (the Dam). Completion of the Dam is a key strategic step for our District, enabling us to have access to enough water to supply the estimated number of people we expect to connect to the Richmond, Māpua, Brightwater, Eighty Eight Valley, Redwood Valley, and Wakefield schemes.

We have seen a noticeable increase in traffic congestion on State Highway 6 through Richmond. This is of concern to us as it highlights the unfavourable impact increased traffic numbers will have on this section of highway without further interventions. We have also seen the significant impact a crash or road closure within the Appleby section of State Highway 60 or Lower Queen Street has on the network. This part of the network does not have the resilience to cope with the consequential changes in traffic flows after crashes; often bringing parts of the network to near gridlock.

As a way of stimulating our local economy and addressing priority issues, central government have granted us significant funding. This funding has allowed us to speed up delivery of some priority water and wastewater projects, and commence work on improving parts of the Motueka River stopbanks.

WHERE ARE WE GOING?

We have identified four key priorities that will guide our efforts and investment in planning, developing and maintaining our infrastructure in the short, medium and long term.

1. Providing safe and secure infrastructure services
2. Providing infrastructure services that meet the needs of our changing population
3. Planning, developing and maintaining resilient communities
4. Prudent management of our existing assets and environment

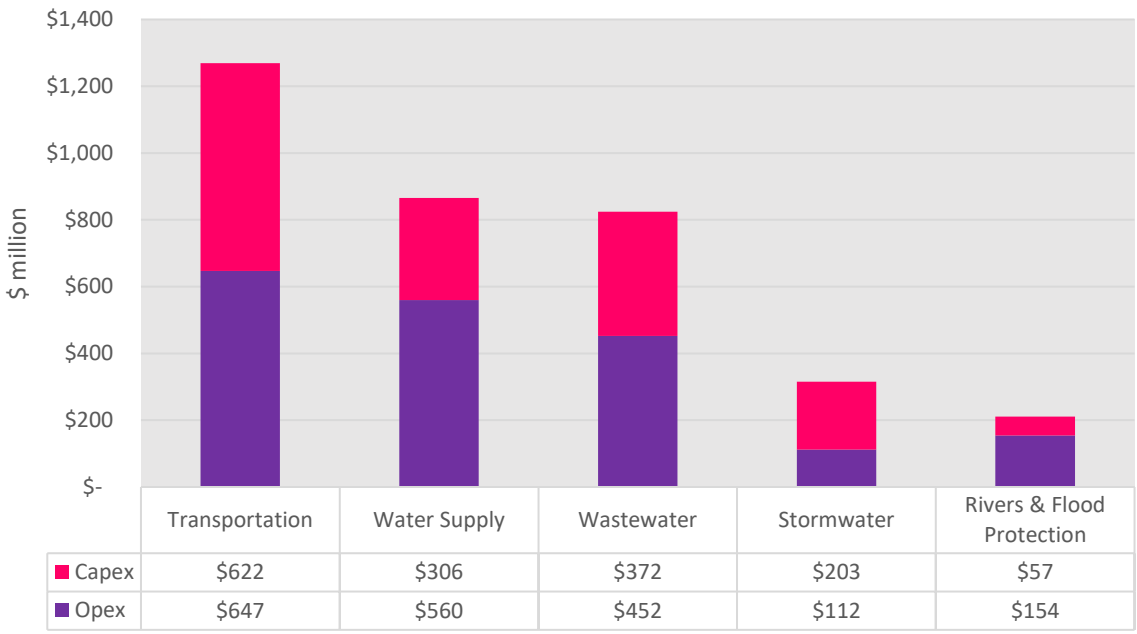
The following page shows the key actions that we plan to take to address these priorities.

HOW ARE WE GOING TO GET THERE?

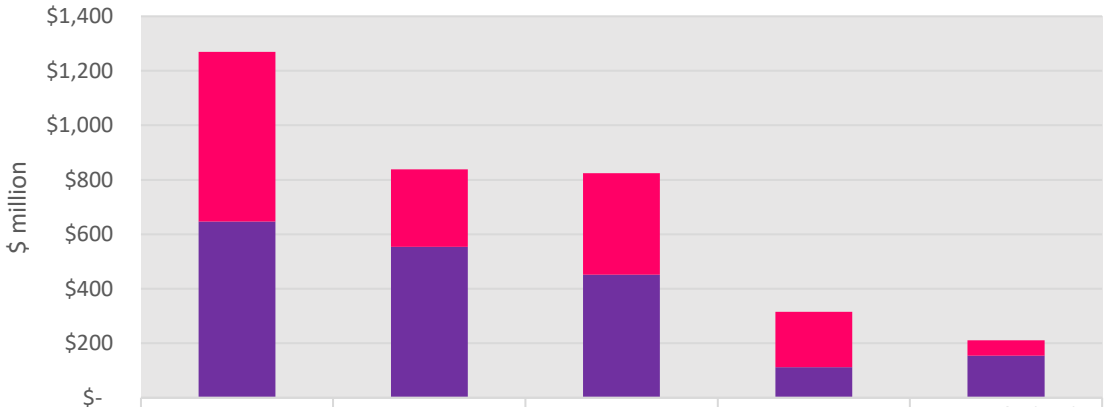
We plan to spend $993~~969~~ million on infrastructure services over the next 10 years, and a total of around $3.5~~4~~ billion over the next 30 years. Figure 1 shows how much we plan to invest in each of the infrastructure activities. The percentage of planned expenditure by each activity is similar for the 10-~~-~~year and 30-~~-~~year timeframes. We intend to invest most in transportation, where a large core programme of routine maintenance and renewal work required to maintain the network in good condition.

We have split this graph into capex and opex:

- Capex – Capital expenditure that results in either the creation of a new asset; an increase in the total useful life or capacity provided by an existing asset (i.e. improves an existing asset); or replaces an existing asset.
- Opex – Operating expenditure is all expenditure that does not meet the criteria for capital. Opex usually covers the day to day maintenance and operating needs of a service.



	Transportation	Water Supply	Wastewater	Stormwater	Rivers & Flood Protection
Capex	$622	$306	$372	$203	$57
Opex	$647	$560	$452	$112	$154



	Transportation	Water Supply	Wastewater	Stormwater	Rivers & Flood Protection
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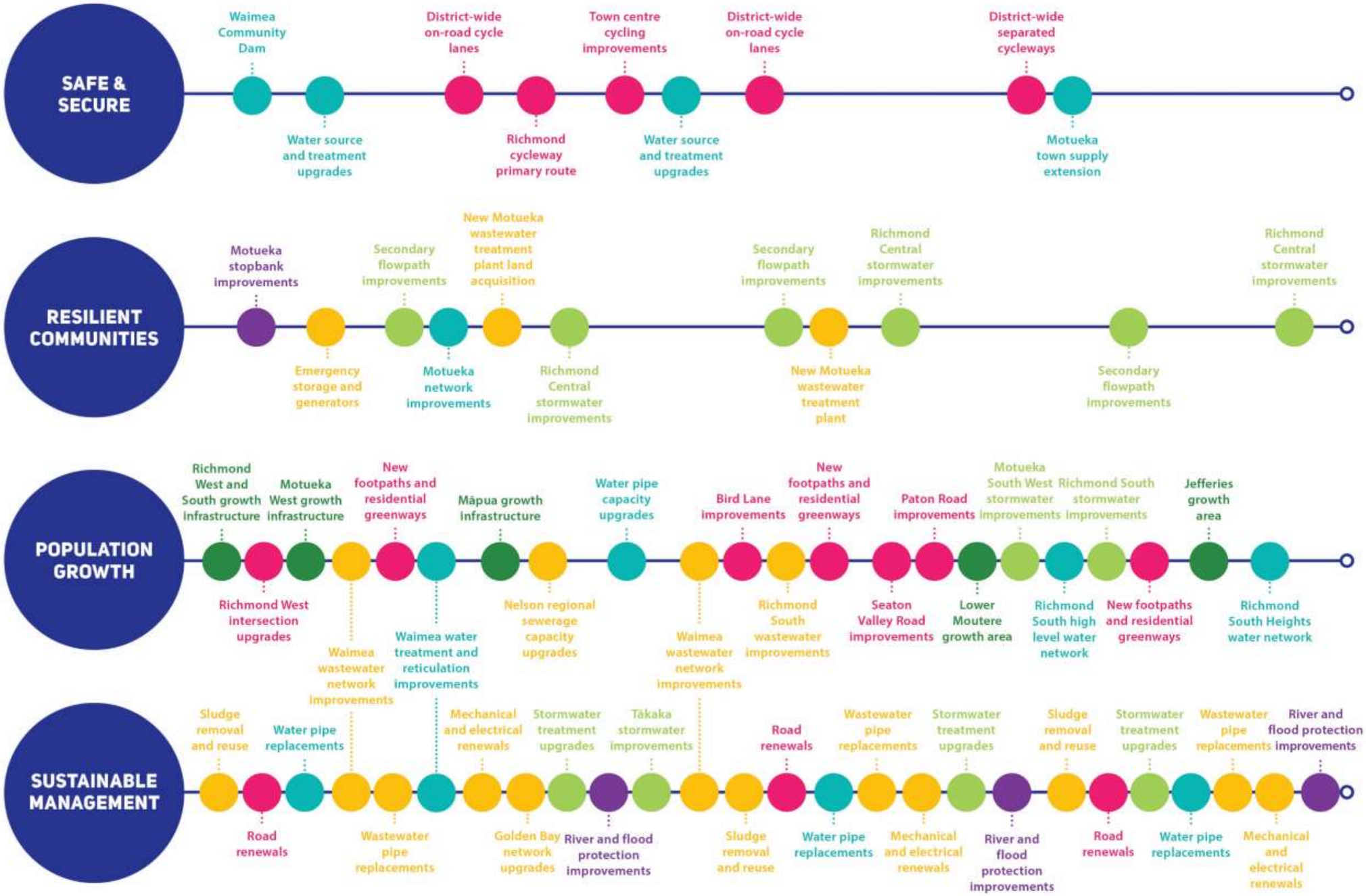
Opex	$647	$554	$452	$112	$154

Figure 1: Total Infrastructure Expenditure for 2021 – 2051

WHAT WE PLAN TO DO OVER THE NEXT 30 YEARS



INTRODUCTION

PURPOSE

The purpose of this Infrastructure Strategy is to identify the significant infrastructure issues for Tasman over the next 30 years, and to identify the principal options for managing those issues and the implications of those options.

When setting out how we intend to manage the District's infrastructure assets and services, the strategy must also consider how:

- to respond to growth or decline in demand
- to manage the renewal or replacement of existing assets over their lifetime
- planned increases or decreases in levels of service will be allowed for
- public health and environmental outcomes will be maintained or improved, and
- natural hazard risks will be addressed in terms of infrastructure resilience and financial planning.

SCOPE

This Strategy covers the following essential infrastructure:

Water Supply | **Wastewater** | **Stormwater** | **Transportation** | **Rivers & Flood Control**

This Strategy has a 30 year planning horizon and will be reviewed every three years.

For this update of the Strategy, we have not included the following activities. We will consider the inclusion of these assets during future reviews of the Strategy.

Waste Management & Minimisation	Coastal Assets	Community Facilities
Parks and Reserves	Commercial Assets	Council Property
Hydrometric Assets		

This Strategy provides direction to our infrastructure activity management plans. All of our activity management plans can be found on our website ~~http://www.tasman.govt.nz/policy/plans/activity-management-plans~~www.tasman.govt.nz/link/activity-management-plans~~/~~.

All financial information included in this Strategy includes inflation unless otherwise stated, and excludes GST.

CONTEXT

DISTRICT OVERVIEW

The Tasman District is located in the north-west of the South Island, within Te Tauihu o Te Waka a Māui/Top of the South. It covers the area extending from Golden Bay in the north-west to Richmond in the east and Murchison in the south, covering 9,635 square kilometres (km) of land, 817 km of coastline, and including 15 settlements/towns.

POPULATION

In 2020, Stats NZ estimated Tasman District's population to be 56,400. Approximately two thirds of the population live in 15 settlement areas spread throughout the District, and the other third live in rural areas. The settlements vary in size from approximately 110 people living in St Arnaud to 15,400 people living in Richmond.

MAP OF TASMAN DISTRICT

AGE STRUCTURE

Stats NZ estimated the median age of Tasman's residents to be 46.6 years at 30 June 2020. At the same time, the national median age was estimated to be 37.4 years.

DWELLINGS

Tasman's latest dwelling count was completed by Stats NZ as part of Census 2018. At that time, Tasman had approximately 23,140 dwellings.

ECONOMY

The main drivers of Tasman's economy are horticulture, forestry, fishing/seafood, agriculture and tourism. There are many manufacturing and processing plants associated with these industries (e.g. the Nelson Pine Industries plant in Richmond and dairy factories in Takaka and Brightwater). These industries rely on the road network to transport raw materials to their factories and their products through Richmond and on to Port Nelson.

Covid-19 has had an impact on our economy. We discuss this further under the Key Assumptions section of this Strategy.

CLIMATE SUMMARY

Across Tasman, the winds are generally light except near Farewell Spit where the wind is often strong. Rainfall is fairly evenly distributed across the year, although February and March are typically the driest months of the year and the wettest months are typically in winter or spring. Some mountain areas receive in excess of 6000 millimetres (mm) of rainfall per year. In contrast, the Waimea Basin is the driest area of Tasman as it is sheltered from rain-bearing weather systems arriving to New Zealand from the west and south. Here, rainfall totals are approximately 1000 mm per year. Dry spells of more than two weeks are quite common, particularly in eastern and inland locations. Tasman's temperatures are mild compared with most parts of the country, due to close proximity to the sea. This causes a relative lack of extreme high and extreme low temperatures. Temperatures exceeding 30° Celsius are rare in coastal areas. Frosts are quite common in the cooler months but they occur less frequently than in most other South Island locations. Tasman is renowned for receiving a great deal of sunshine, with average annual sunshine hours (approximately 2,400 hours) among the highest recorded in New Zealand.

The impacts of climate change are discussed later in this Strategy.

INFRASTRUCTURE

The District is served by:

- 20 water supply schemes, including 15 water treatment plants, 28 pump stations and 756 km of reticulation
- 8 wastewater schemes, including 8 wastewater treatment plants, 78 pump stations and 366 km of reticulation
- 204 km of piped stormwater network and 30 km of maintained streams
- 1,920 km of roads, 450 km of footpaths, walkways and cycleways, and 538 bridges
- 285 km of major rivers spread across six main river catchments: Waimea (including 19.5 km of stopbanks), Motueka (including 31.2 km of stopbanks), Takaka, Riuwaka (including 8.25 km of stopbanks), Aorere, and Buller.

LINKS WITH OTHER DOCUMENTS

FINANCIAL STRATEGY

"Providing the right balance between levels of service and cost."

Alongside this Strategy, we also prepare a Financial Strategy. Our Financial Strategy outlines our financial vision for the next 10 years and the impacts on rates, debt, levels of service and investments. It guides our future funding decisions and, along with this Strategy, informs the capital and operational spending for the Long Term Plan 2021-2031.

Infrastructure expenditure forms a large proportion of our spending, being 38% of operational expenditure and 79% of capital expenditure over the next 10 years. Consequently, the Infrastructure Strategy and Financial Strategy are closely linked ensuring the right balance is struck between providing the agreed levels of service within the agreed financial limits.

Over the next 10 years, forecast rate income increases and debt levels are projected to be very near our self-imposed financial limits. We have had to work hard to prepare and prioritise a work programme that addresses the most pressing key issues while staying within these financial limits. This means there is very little scope to add further work to the programme within the next five years.

LINKAGES

Multiple factors influence how Council plans and manages its assets. These factors can be grouped into three broad categories, described in Figure 2 below.

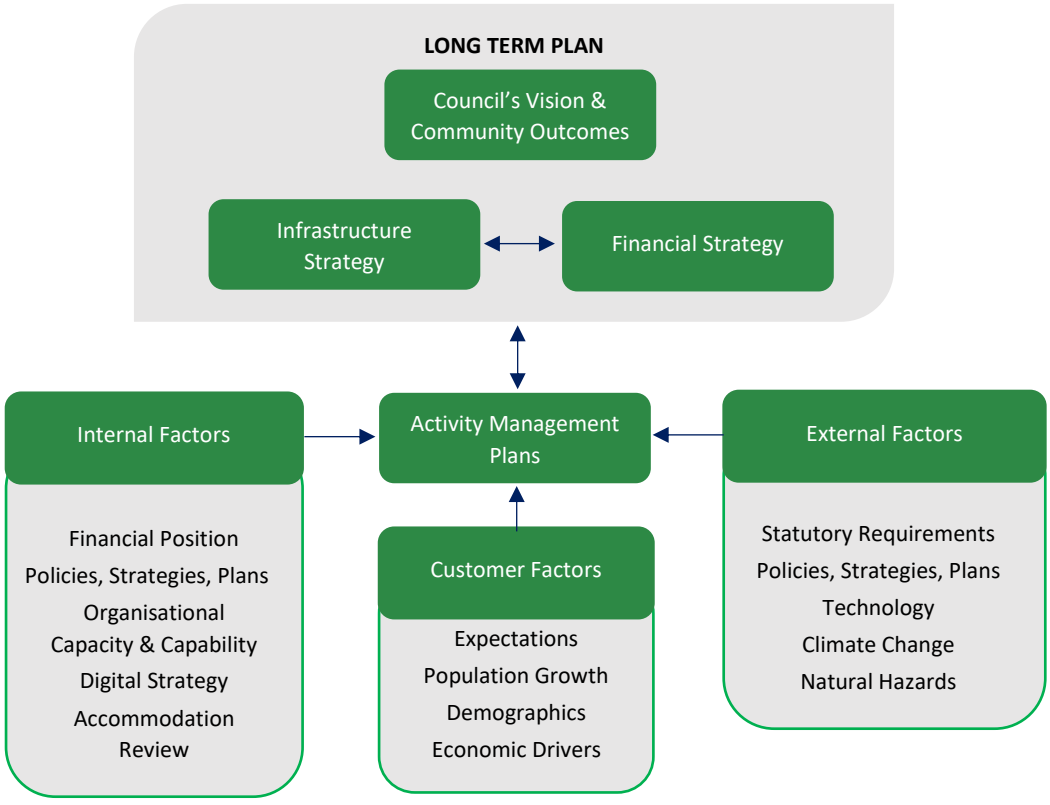


Figure 2: Strategic Linkages and Factors Affecting Infrastructure Planning

KEY INFRASTRUCTURE ISSUES AND PRIORITIES

POPULATION GROWTH CREATING DEMAND FOR INFRASTRUCTURE

POPULATION GROWTH AND DEMOGRAPHICS

Tasman is one of New Zealand's sunbelt regions and is generally noted for its mild winters, frequent sunny skies, and growing economic opportunities. This is a key drawcard and one of the leading reasons why Tasman is a desirable place to live.

We develop a Growth Model to inform our plans to provide for growth with sufficient infrastructure and zoned land in the right location at the right time. From this we are able to estimate population growth and demand for new homes and businesses. The outcomes of our growth modelling are discussed below, further information can be found in our growth model summary document – Tasman Growth Projections 2021 – 2051.

Figure 3 below shows the rate of estimated population growth as well as a range of projections for population growth into the future. It shows that Tasman's resident population has continuously grown since 2003, with a noticeable increase in the rate of growth since 2013.

We expect the overall population of Tasman to increase by 7,700 residents between 2021 and 2031, to reach 64,300 based on the medium projection scenario. We expect ongoing population growth in Tasman over the next 30 years but the rate of growth will slow over time. Under the medium scenario, the Motueka, Moutere-Waimea and Richmond Wards are projected to experience the greatest growth in population.

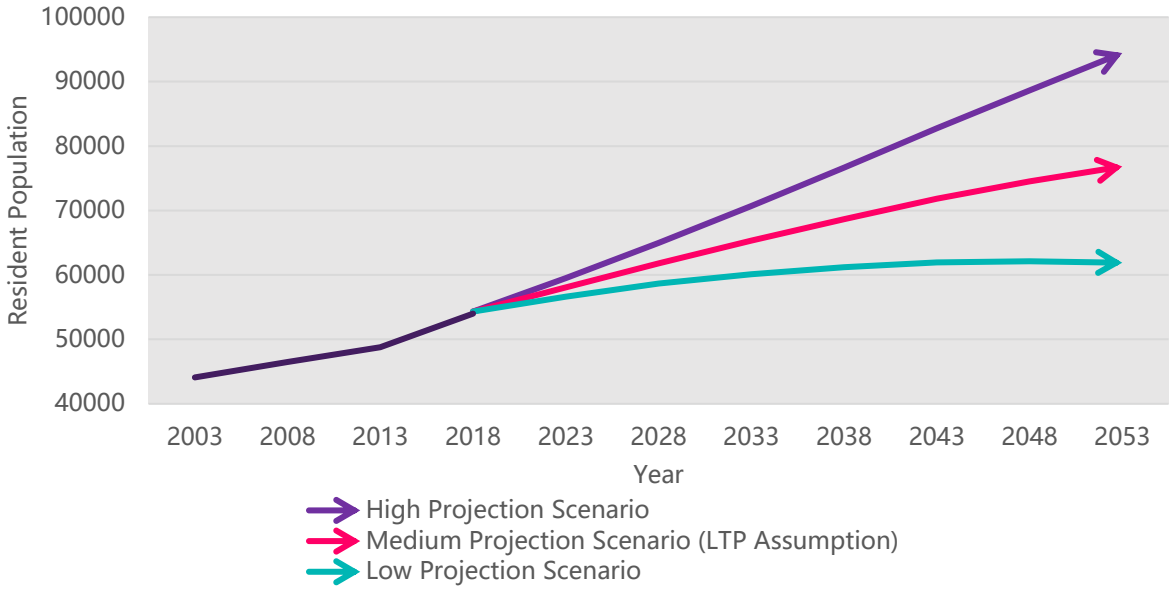


Figure 3: Tasman District's Population Estimates and Projections

A high proportion of the population growth is occurring as a result of people moving to Tasman. Our growth projections indicate that many of these people are older and are choosing to live in larger settlements with easier access to services. This means the composition of Tasman's households is changing, with an increase in one or two person households. Tasman's projected age structure is shown in Figure 4.

In 2020, the percentage of Tasman's population aged over 65 years was 22%. Within 30 years, we estimate the percentage of Tasman's population aged over 65 years to be 34%. The median national population percentage for people aged over 65 years was 16% in 2020, and is projected to increase to 24% by 2053. This indicates that Tasman's age structure is changing ahead of national trends. It is likely that Tasman will need to be a leader of change in providing for an ageing population. We need to consider and plan for a larger portion of the population that is likely to be on a fixed income and may experience personal mobility challenges. This is likely to cause an increased demand for high quality pedestrian facilities and alternative modes of transport.

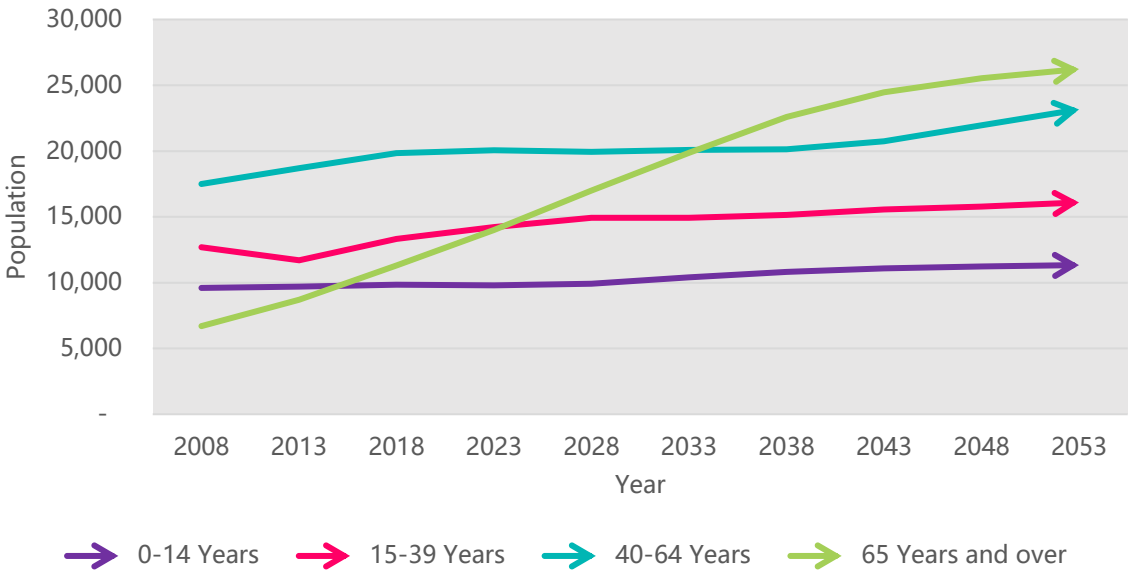


Figure 4: Tasman District's Population Projections by Age Group

DEMAND FOR NEW INFRASTRUCTURE

More people means more homes. Tasman residents are experiencing a housing shortage. More people want to live and work in Tasman and the demand for homes exceeds the available supply.

Tasman is the second least affordable region in the country (behind Auckland) taking into account the cost of borrowing, as well as house price and wage levels (Massey Home Affordability Index).

Most homes built in Tasman connect to our infrastructure services – water supply, wastewater, stormwater and the road network. Using our population projections, along with household size, we forecast that Tasman will require approximately 4,300 new homes within the next 10 years, and a further 7,500 between 2031 and 2051.

The ongoing construction of new homes creates the need for us to construct new, or upgrade existing, infrastructure.

It is important to note that even if no new people shift to Tasman, the structure of our existing population is ageing. This is driving a reduction in the number of residents per household. That means that if no new people arrive in Tasman there is likely to still be some demand for more houses.

Since 2015, the actual growth has surpassed what we had expected, using up considerable amounts of available infrastructure capacity. The combination of this and the projected population increases and demographic change create the need for significant investment in growth infrastructure. Table 1 below summarises the estimated number of new homes required within Tasman in the next 30 years.

Table 1: Projected New Homes in Tasman

SETTLEMENT	YEARS 1 TO 10		YEARS 11 TO 30	
	Estimated Demand	Estimated Supply	Estimated Demand	Estimated Supply
Richmond	1,170	1,781	2,345	2,339
Motueka	744	449	1,576	580
Brightwater / Wakefield	384	373	686	688
Māpua / Ruby Bay	314	317	628	628

SETTLEMENT	YEARS 1 TO 10		YEARS 11 TO 30	
	Estimated Demand	Estimated Supply	Estimated Demand	Estimated Supply
Moutere	569	569	1,130	2,130
Other	1,016	855	1,195	1,164
Total	**4,197**	**4,344**	**7,560**	**7,529**

Overall, we have planned to meet demand across the District. However, we anticipate there is unlikely to be enough supply in Brightwater and Motueka within the next 10 years.

In Brightwater, this is due to infrastructure constraints. These constraints will be lifted once the Waimea Dam enables a sufficient water supply and wastewater improvements are complete.

In Motueka, development is constrained by a combination of infrastructure servicing and zoning. We are planning sufficient infrastructure servicing in Years 1 to 20 to enable development of all the residential land in Motueka, especially the western side of High Street. However, development in the other parts of Motueka will remain limited, due to natural hazard risks in the east and a preference to avoid expansion into productive land on the outskirts of Motueka. To address the long-term undersupply of residential land in Motueka, we are planning for the development of a significant area of land in Lower Moutere.

To offset the undersupply in Brightwater and Motueka, we have assumed a higher rate of development in Richmond in the short to medium term.

The National Policy Statement on Urban Development (NPS-UD) also requires councils to provide an additional margin of feasible development capacity in urban areas. This additional margin is 20% above the projected demand for the next 10 years, and 15% above the demand projected for the following 20 years. Under the NPS-UD, Nelson and Tasman is a combined urban area. The two Councils have agreed that the urban environment for Nelson and Tasman comprises Richmond (including Hope), Brightwater, Wakefield, Māpua and Motueka – in Tasman, and in Nelson: the city itself and all suburbs, extending to Hira and Cable Bay. Our assessment of the development capacity in the urban environment of Tasman indicates that we will meet the NPS-UD's requirement for the additional margin of feasible development capacity and our Future Development Strategy.

NATURAL HAZARDS AND CLIMATE CHANGE

Tasman District comprises a diverse landscape ranging from flat coastal lowlands and intensively used (predominantly horticulture) alluvial flood plains, to large, sparsely populated, steep mountainous areas. The District has several major rivers traversing it, including the Aorere, Buller, Motueka and Takaka rivers that pass close by townships. The geology is relatively complex and varied with numerous active fault systems. These include the Waimea Flaxmore fault system, that runs through urban areas of Richmond, and the Alpine/Wairau Fault that passes through the Nelson Lakes area at the south of the Region.

Tasman District is susceptible to a wide range of hazards, and has over time felt the impact of natural hazards such as earthquakes, landslides, floods and coastal inundation. Many hazards originate from within the District, but there is also potential for the area to be affected by hazards generated from outside the District's boundaries, or hazards that affect multiple regions, for example, an Alpine Fault earthquake or tsunami.

For the purposes of this Strategy, these risks have been categorised into three broad areas:

- flooding and land instability
- earthquakes and tsunami
- coastal erosion and inundation.

We also assume that the effects of climate change will cause a change in the intensity and frequency of flooding, coastal erosion and inundation. We discuss the nature of these changes within the following sections.

FLOODING AND LAND INSTABILITY

Extreme weather events in Tasman District have increased in frequency in recent years Major damage to property and infrastructure has occurred as a result of these extreme weather events. This has come at a significant cost to Council and the community. Ex-cyclone Gita is an example of how extreme rainfall can result in extensive surface water flooding, debris flows and landslides.

The performance of Council's flood control and stormwater assets during rainfall events can have an impact on the amount of damage sustained by both public and private property. Major events, like Ex-Cyclone Gita, place the spotlight on the performance of these assets and the community's level of service expectations often increase following such an event.

The Ministry for Environment's climate change advice suggests that rainfall patterns are likely to continue to change going forward. We expect there will be more frequent, more intense river flooding and direct rainfall flash flooding of communities and businesses, with knock-on consequences to people and the economy.

With the changing rainfall patterns, we also expect to experience longer periods of no rainfall - increasing the time in which drought conditions will be present. We expect this to be more so in the eastern part of the District, as was experienced during December 2017 and January/February 2020. Increasing periods of drought will place increasing pressure on Council's water sources, meaning that Council can expect to see greater rationing and have difficulty supplying the growing population, particularly in the Waimea Basin until the Waimea Community Dam is operational. Drought and/or fire can also lead to loss of vegetation on hills, which increases the risk of landslides and rapid erosion of soils by intense rainfall and strong winds.

EARTHQUAKES AND TSUNAMI

Tasman lies within a seismically active zone, with both the Alpine Fault and Waimea Flaxmore Fault System traversing through the south-eastern part of Tasman. The Alpine Fault is the most active, with evidence of repeated movement (rupture) occurring over the last 8000 years.

Earthquakes happen with little or no warning. The Kaikōura earthquake demonstrated how communities can be immediately isolated and the challenges of reinstating access and services to those communities. In the event of a major rupture, it is reasonable to expect the Nelson-Tasman region to be isolated from other parts of New Zealand for an extended period of time, potentially many months.

Fortunately, Tasman District has not experienced major disruption from earthquakes in recent times. However, the risk of a major fault rupture is present. The last rupture of the Alpine Fault is estimated to have occurred in 1717. The probability of the Alpine Fault rupturing again within the next 50 years is in the order of 30%. The rupture may produce one of the biggest earthquakes since European settlement of New Zealand, and it will have a major impact on the lives of many people as well as catastrophic consequences for infrastructure. The Nelson Tasman Civil Defence Emergency Management Group has ranked rupture of the Alpine fault as the highest risk and priority for the Nelson-Tasman region.

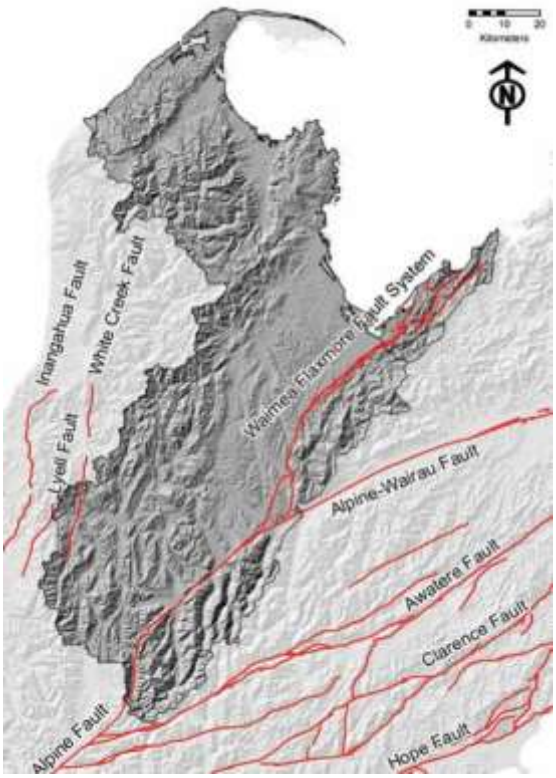


Figure 5: Active Faults In or Near the Nelson-Tasman Region

An offshore fault rupture or land movement can generate a tsunami as well as ground shaking. There are three distinct types of tsunami: distant, regional and local. A local tsunami is likely to arrive with little to no warning following an earthquake. The Nelson Tasman Civil Defence Emergency Management Group has identified this as high risk and priority for the Nelson-Tasman Region, whereas both regional and distant tsunami are considered to be moderate risk and priority. As seen in other parts of the world, tsunamis can have devastating effects on above ground public and private infrastructure. In the event of a local tsunami there is likely to be extensive damage to Council's roads, pump stations and treatment plants that are in low-lying areas near the coast.

COASTAL EROSION AND INUNDATION

We have recently experienced the effects of extreme coastal erosion and inundation to some parts of Tasman District. During Ex-Cyclone Fehi, extreme coastal flooding occurred, with some residents and private properties suffering extreme erosion and inundation. The worst hit areas were Ruby Bay and Riwaka. Coastal erosion also damaged roads and pathways adjacent to the coast. The Nelson Tasman Civil Defence Emergency Management Group has rated coastal inundation and erosion as a moderate risk and priority.

Climate change advice from the Ministry for Environment estimates that sea levels could rise by 1.9m by 2150 (based on the average 1986 – 2005 levels). We are likely to experience the following effects as sea levels rise:

- more frequent, more severe coastal flooding of coastal communities, infrastructure and businesses and knock-on consequences for health, wellbeing and economy
- saltwater incursion into freshwater habitats and waterbodies
- coastal erosion can result in loss of road access to isolated coastal communities
- there could be changes in the cost and availability of insurance, and
- there may be migration of people inland from coastal and low-lying communities.

We have prepared a coastal risk assessment, which helps us to understand Tasman Bay and Golden Bay's vulnerability to coastal storm inundation and sea level rise taking into account different sea level rise scenarios. The assessment identifies assets, property, infrastructure and facilities (known as 'elements at risk') that may be vulnerable, using readily available datasets. From this work, we estimate 8,400 people are located in low-lying coastal areas that are vulnerable to coastal storm inundation and sea level rise. Approximately 5,000 of those people are located in the Motueka – Riwaka coastal area, followed by 1,000 people in the Māpua – Ruby Bay coastal area. Motueka is the largest town that will be affected by coastal storm inundation and sea level rise. The cost to repair damage, or to replace or relocate over the longer term will be significant. Infrastructure in low lying areas, such as pipes, pump stations, treatment plants, roads and footpaths could be vulnerable to coastal erosion and inundation.

More information on coastal management can be found on our webpage Coastal Management – Responding to Climate Change.

PUBLIC AND ENVIRONMENTAL HEALTH RISKS

We build and operate infrastructure to provide essential services and to improve the well-being of Tasman's communities. Sometimes, if these assets are inappropriately managed, it can have a negative impact on public health or the environment.

In other parts of New Zealand asset failure has resulted in significant harm to communities. Examples include sickness due to contaminated drinking water supplies and flooding due to stopbank failure. This has reinforced the need to ensure our infrastructure is well maintained and operated, and to learn from the mistakes of others. A standout issue for Tasman is the challenge of providing water supplies that meet the NZ Drinking Water Standards. Currently two of the water supply schemes that Council maintains fully comply with the requirements of the NZ Drinking Water Standards. To achieve full compliance, Council's water treatment plants will need upgrading.

As well as looking after the health of Tasman's residents, we must also protect the health of the environment. Sometimes there are negative effects on the environment that were created inadvertently through the provision of infrastructure. This can include wastewater overflows and contaminated stormwater. The Resource Management Act and National Policy Statement – Freshwater Management place obligations on councils to ensure natural environments are protected.

AGEING INFRASTRUCTURE

We are responsible for managing $1.3 billion worth of infrastructure assets. These assets have a finite period in which they will operate suitably. We refer to this as an asset's 'useful life'. Once the useful life of an asset is reached, the asset will usually require renewal or replacement. The useful life of assets varies significantly, from 10 years for signs or road chip seals, up to 100 years for bridges and pipes. Much of Tasman's infrastructure was built between circa 1950s and the 1980s. To date, this has meant that Council has largely had to renew assets with relatively short useful lives. Most of the longer life assets are yet to be renewed.

Figure 6~~Figure 6~~ to Figure 8 show the long-term renewal investment required based on the expected asset life for Council's bridges and pipes. Council needs to be very mindful of these types of assets when forecasting future renewal needs because they will generate the most change in the demand for renewal investment. However, this is most relevant beyond the period of this Strategy. For the period of the Strategy, Council expects the renewal of short life assets to continue much the same as recent times, effectively creating a stable baseline for renewal investment that bridges and pipes will add to in the future. Council needs to plan well ahead of time in order to manage and fund this big step up in renewal activity.

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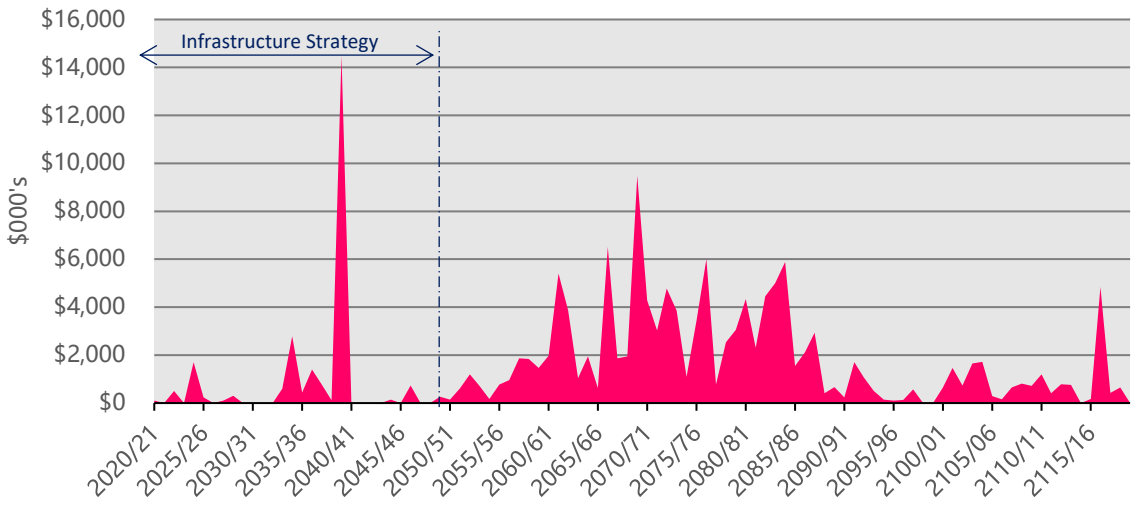


Figure 6: 100 Year Bridge Renewal Profile – Uninflated as at 30 June 2020

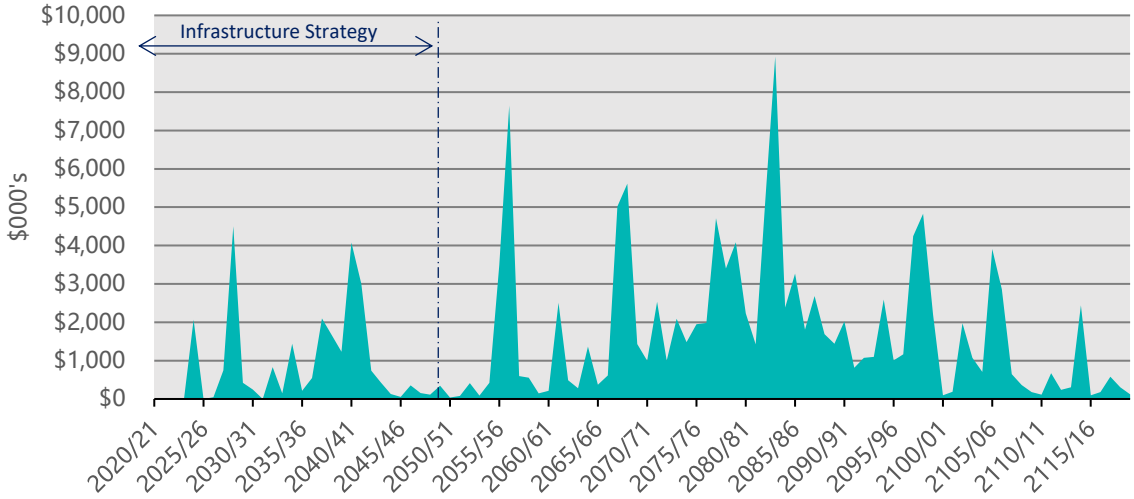


Figure 7: 100 Year Water Pipe Renewal Profile – Uninflated as at 30 June 2020

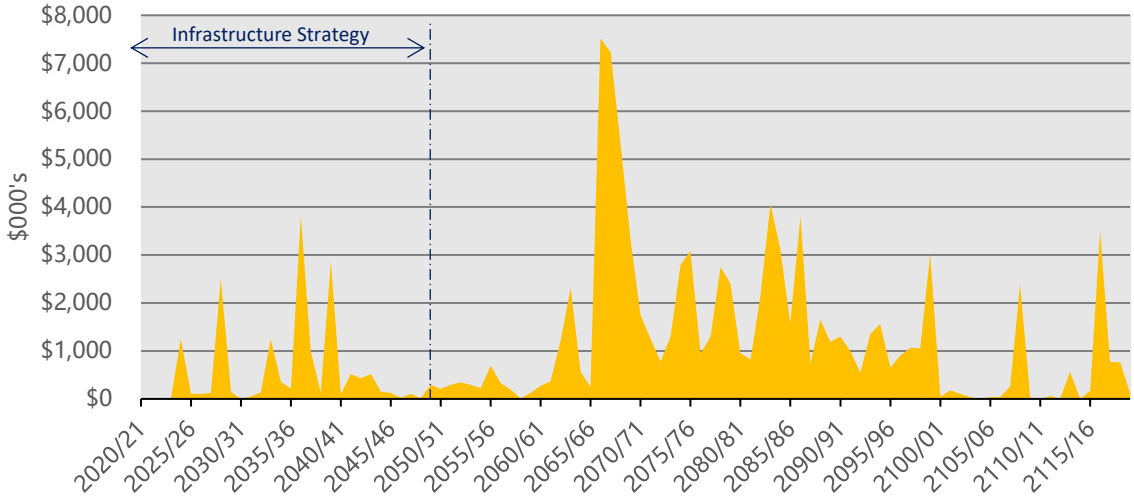
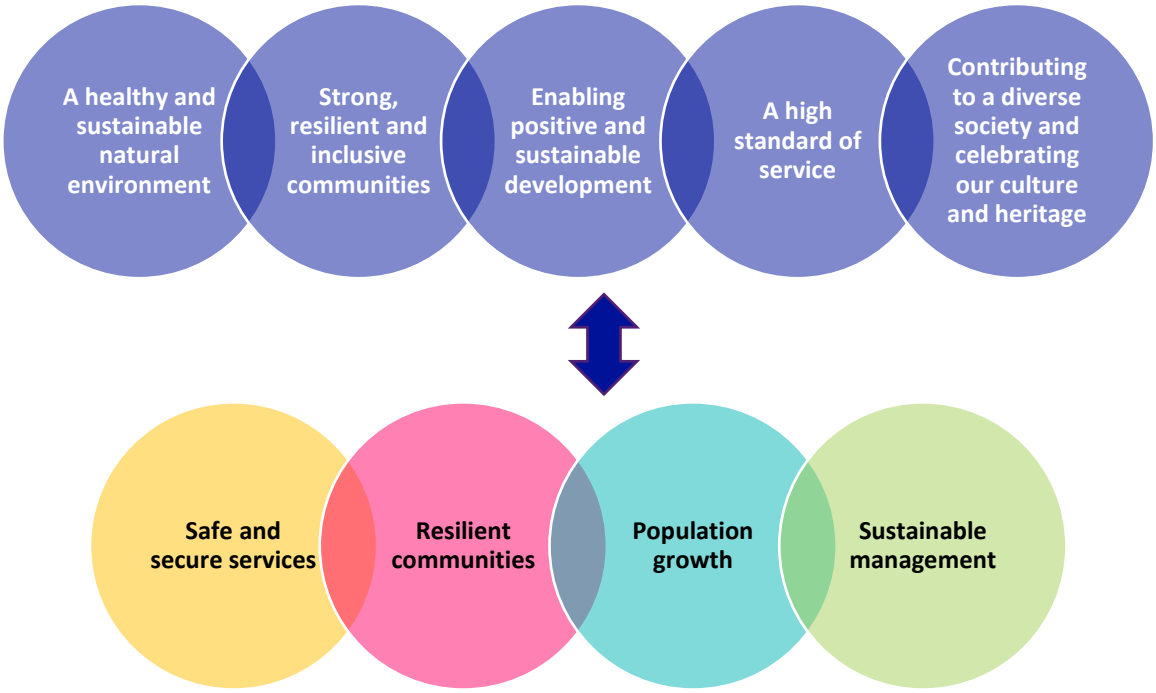


Figure 8: 100 Year Wastewater Pipe Renewal Profile – Uninflated as at 30 June 2020

Figure 9: 100 Year Stormwater Pipe Renewal Profile – Uninflated as at 30 June 2020

OUR INFRASTRUCTURE PRIORITIES



The above diagram sets out our Strategic Priorities and our Infrastructure Priorities. Each of the Infrastructure Priorities are discussed below.

PROVIDING SAFE AND SECURE INFRASTRUCTURE SERVICES

Providing safe and secure infrastructure services is paramount. We plan to provide public water supplies that are safe to drink, a transport network where people feel they can move safely, and public assets that are safe to use. Not only do our infrastructure services need to be safe and available now, they need to be secure into the future. We plan to provide secure services and avoid significant disruptions. For example, water takes for public water supplies should be enduring and have a low risk of being unavailable.

PROVIDING INFRASTRUCTURE SERVICES THAT ENABLE OUR COMMUNITY TO GROW

We will continue to enable growth through the development of trunk and main infrastructure. As Tasman grows, we expect the density of our urban populations to increase and there to be significant advancements in technology. This will place a changing demand on our infrastructure networks, at the same time as presenting opportunities to optimise the use of existing assets through smarter operational procedures.

PLANNING, DEVELOPING AND MAINTAINING RESILIENT COMMUNITIES

Infrastructure resilience is the ability to reduce the magnitude and/or duration of disruptive events. The effectiveness of resilient infrastructure depends upon its ability to anticipate, absorb, adapt to and/or rapidly recover from a potentially disruptive event. For Tasman's communities to cope well with change and disruption, they must be resilient.

Resilience will not be achieved through the actions of Council alone. We will need to work together with other organisations such as the Nelson Tasman Civil Defence Emergency Management Group, iwi and residents to effectively build resilience and plan for recovery.

SUSTAINABLE MANAGEMENT OF OUR EXISTING ASSETS AND ENVIRONMENT

We cannot lose sight of the importance of maintaining our existing assets or the need to continue to protect Tasman's natural environment. If we do not put the right level of effort into looking after what we have now it can have a significant impact on what future generations experience and need to pay for. With built assets, we plan to invest in renewal and maintenance at an optimised level. Too little investment in renewals could see more and more assets becoming run-down, costing more to maintain and increasing whole-of-life costs. Too much investment in renewal and we would not achieve the best value we could from assets by prematurely replacing them, again increasing whole-of-life costs.

KEY ASSUMPTIONS AND UNCERTAINTIES

There are factors outside of our control that can change, affecting our ability to do what we have planned. Sometimes the impact can be significant. There is always uncertainty in any planning process, but the key to good quality planning is to make clear assumptions to help address this uncertainty. In this section, we have set out the key assumptions and uncertainties that relate to the provision and management of infrastructure.

GROWTH

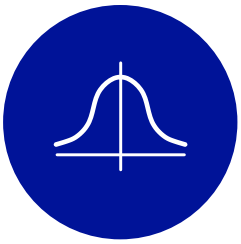
We cannot be certain what the actual rate of population and business growth will be. There are local, national and international factors that affect the actual rate of growth, either speeding it up or slowing it down. Some of these factors include employment opportunities and immigration policies. For planning purposes we have assumed that population growth will be medium, as set out earlier in this Strategy.

If growth is slower than assumed, we may be able to defer some infrastructure upgrades associated with providing increased capacity. Where upgraded infrastructure is already in place to provide for future growth it may take longer to pay off the debt associated with the works. This is because development contribution income will also slow. The increased financing costs associated with this will be incorporated into future development contribution charges.

If growth occurs faster than assumed, we may need to advance planned upgrades or consider unplanned infrastructure to provide additional capacity sooner. We may need to reprioritise other works to ensure we maintain a programme of work that is affordable within existing financial caps and also deliverable. If this occurs, development contribution income is also likely to increase, meaning that debt associated with growth will be repaid more quickly.

EXPECTED LIFE OF ASSETS

We cannot be certain how long each individual asset will last. Even if assets are made from the same material, it is unlikely that they will age and perform the same as each other. Factors such as installation methodology, operating conditions, wear and tear, and manufacturing defects will affect how long each individual asset will actually last before needing replacement. To address this uncertainty, we assign an average expected life for types of assets to assist with renewal planning.



We generally use average asset life expectancy to estimate future renewal requirements. Actual asset condition and performance has only been incorporated for assets that have shown clear signs of premature failure. For transportation assets, we use a mix of average asset life expectancy, asset condition and performance.

Our infrastructure asset data reliability is generally B grade. This means that the data used to determine our renewal forecasts has an uncertainty of approximately 15% and that renewal needs in any year could vary to this extent. Some assets will fail before reaching the end of their expected useful life, and some will last longer. We have assumed that we will be able to manage this variance within our proposed budgets by annually prioritising renewals.

STATUTORY CHANGES AND THREE WATERS REFORMS

Central government often enacts new statutory requirements that affect councils and the delivery of their services. We cannot be certain when these changes will take place or of the scope of changes until they are confirmed by central government.

We expect the proposed Three Waters Reforms to have a significant impact on the way in which we deliver services. However, central government has not fully developed its proposal and we are uncertain of how it will take shape. We have assumed that challenges such as asset renewal, resilience, meeting service standards and meeting growth needs will exist and be important for any entity that is responsible for delivery of the Three Waters services. We expect more clarity on the reforms in late 2021. In the meantime, we have assumed that we will continue to own and provide Three Waters services within Tasman District.

SCOPE RISK AND PROGRAMME DELIVERY

When developing this Strategy and the associated work programmes, we needed to estimate how much to budget for each project. Often, we cannot be certain what the actual costs or scope of projects will be because the design is yet to be completed. We typically have more confidence in the cost and scope of projects that we have planned within the first three years. After this, our estimates are usually based on simple concept designs.

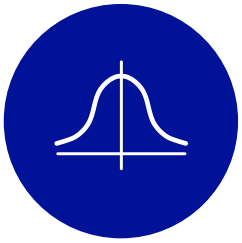
An added level of uncertainty is the impact that Covid-19 has had on the global trade market. It may affect our local contractors and suppliers and their ability to secure plant and materials for our projects. We have assumed this may create minor project delays, but that necessary plant and materials will still be available.

To address these uncertainties, we have incorporated funding of scope risk into capital project budgets. The amount of scope risk included varies from 10% to 40% of the project estimate, depending on the expected complexity of the project. Based on history, it is unlikely that all individual projects will need the full amount of allocated scope risk funding, in reality there will be some under and over spending.

It is also unrealistic to assume that we will deliver all of our projects on time. There are often delays associated with land access and consenting and other unforeseen issues that prevent us achieving on time delivery for some projects.

For the water, wastewater, stormwater and rivers activities, we have made an overall downward adjustment to the total capital programme of 10% per year. This adjustment accounts for uncertainties in scope risk and programme delivery. By including this adjustment, we avoid over-funding the activities. Where we have applied the 10% adjustment, we refer to this adjusted budget as the Total Funded Capital Programme.

IMPACT OF COVID-19



The Covid-19 pandemic has affected all our lives in 2020 and 2021. We are seeing far fewer overseas migrants and workers coming into Tasman. This is a particular concern for some of our horticultural businesses that rely on seasonal labour for harvest, and our tourism sector.

The Nelson/Tasman economy bounced back strongly after the Level 3 and 4 restrictions, with the Nelson/Tasman economy tracking better than the rest of the country. Nelson/Tasman's September 2020 quarter GDP was at a higher level than in 2019, although the year to date level is down 1.2%. It remains a mixed recovery and some in our community are still being impacted.

It is important that we continue to invest in the District and provide services. This spending helps to fuel the economy and acts as a buffer against increasing unemployment. We have taken advantage of additional Government funding opportunities to boost jobs and undertake projects that contribute to Thriving and Resilient Tasman Communities.

Covid-19 presents added uncertainty in our planning process. The most notable for infrastructure is its impact on population growth. We have not changed our population assumptions in response to Covid-19. The current housing market and economy are good indicators that our assumptions are appropriate. If Covid-19 does have an impact on population growth, the scenarios discussed above under growth will be applicable.

HOW WE WILL MANAGE OUR INFRASTRUCTURE ASSETS

This section outlines how we plan to enable the development of new homes and businesses across Tasman, the on-going need to renew assets, and opportunities to improve levels of service, public health, the natural environment and resilience.

ENABLING GROWTH

Infrastructure is essential for growing communities. We estimate that there will be 11,900 new homes built in Tasman within the next 30 years. Approximately 60% of those homes will connect to Council's infrastructure. They will need water supply, wastewater collection and disposal, and they will generate more stormwater runoff and traffic movements. This demand adds pressure to our existing infrastructure networks and systems. Within some parts of our networks, there is capacity for new homes to connect. In others, the network is full and new or enlarged infrastructure assets are required. We use population projections, housing and subdivision trends, and asset and network information to determine where and when infrastructure upgrades are required.

The majority of our growth is occurring in greenfield or undeveloped areas. This usually requires new infrastructure in order to extend our networks into those areas. The recent demand for new homes, coupled with land supply and infrastructure constraints, is contributing to increasing house prices. Housing is fundamental to the well-being of Tasman's communities and we have prioritised investing in growth infrastructure to help ease the strain in the housing market.

For the past three years, Tasman has experienced rapid growth, particularly in Richmond. We have commenced a series of upgrades in Richmond and Māpua to enable subdivision development to proceed. In Motueka, Brightwater, and Wakefield some subdivision has proceeded using up most of the available capacity. In those areas, upgrades are now required in order to enable further development.

We plan to enable growth within Tasman by investing $317~~316~~ million in growth related infrastructure upgrades over the next 30

We have planned to only provide trunk and main infrastructure for growth areas where more than one development is served. The programme of work that supports this Strategy has been prepared to support growth across the District for the next 30 years. Figure 11 shows the key areas and timing for the infrastructure upgrades we have planned to enable growth. Figure 10 shows the total planned investment in growth infrastructure for the next 30 years.

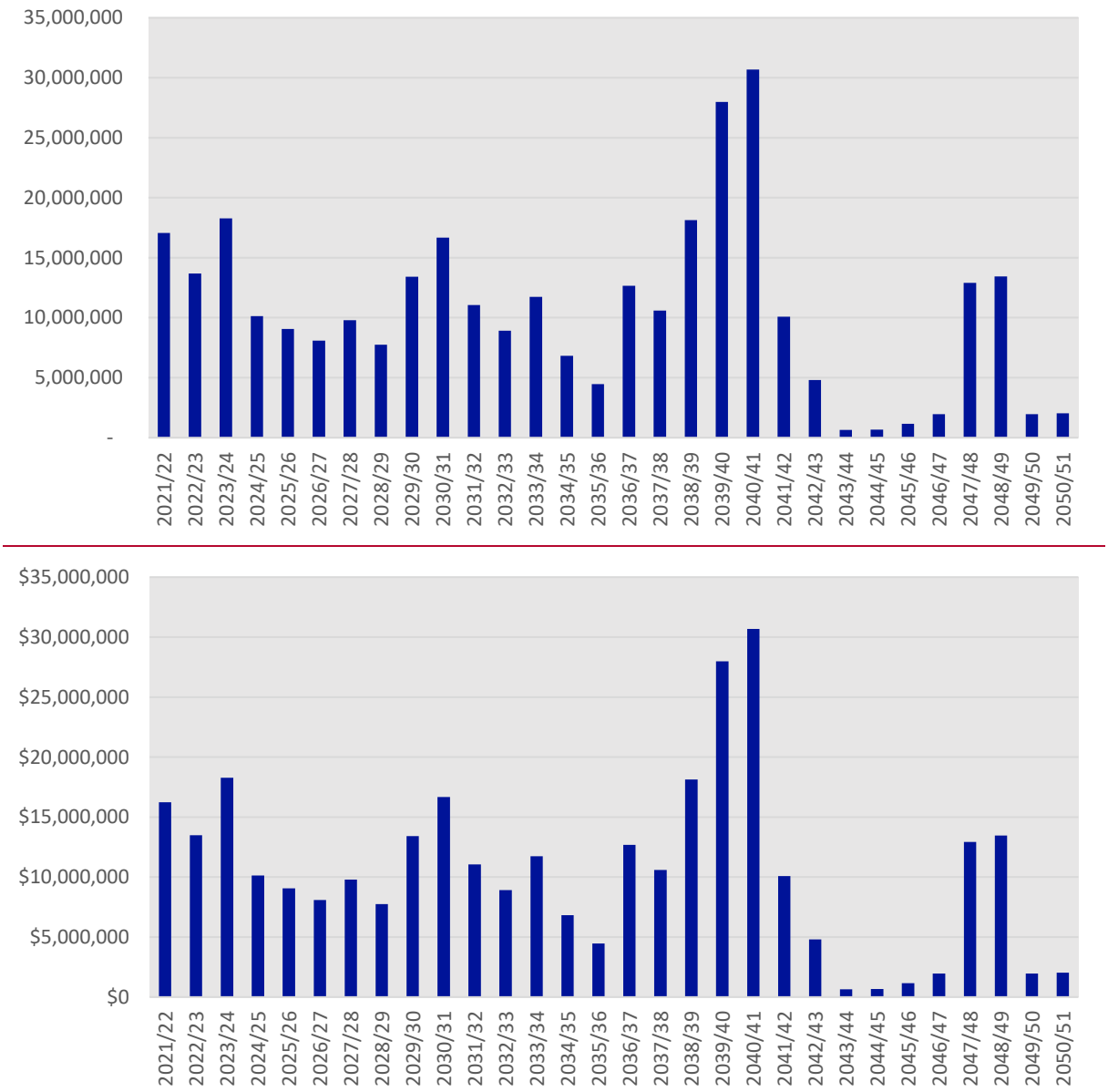


Figure 10: Total Growth Expenditure for Infrastructure for the next 30 Years

We will use development contributions to fund the growth costs shown in Figure 10. For more funding information, refer to our Development and Financial Contributions Policy and Revenue and Financing Policy.

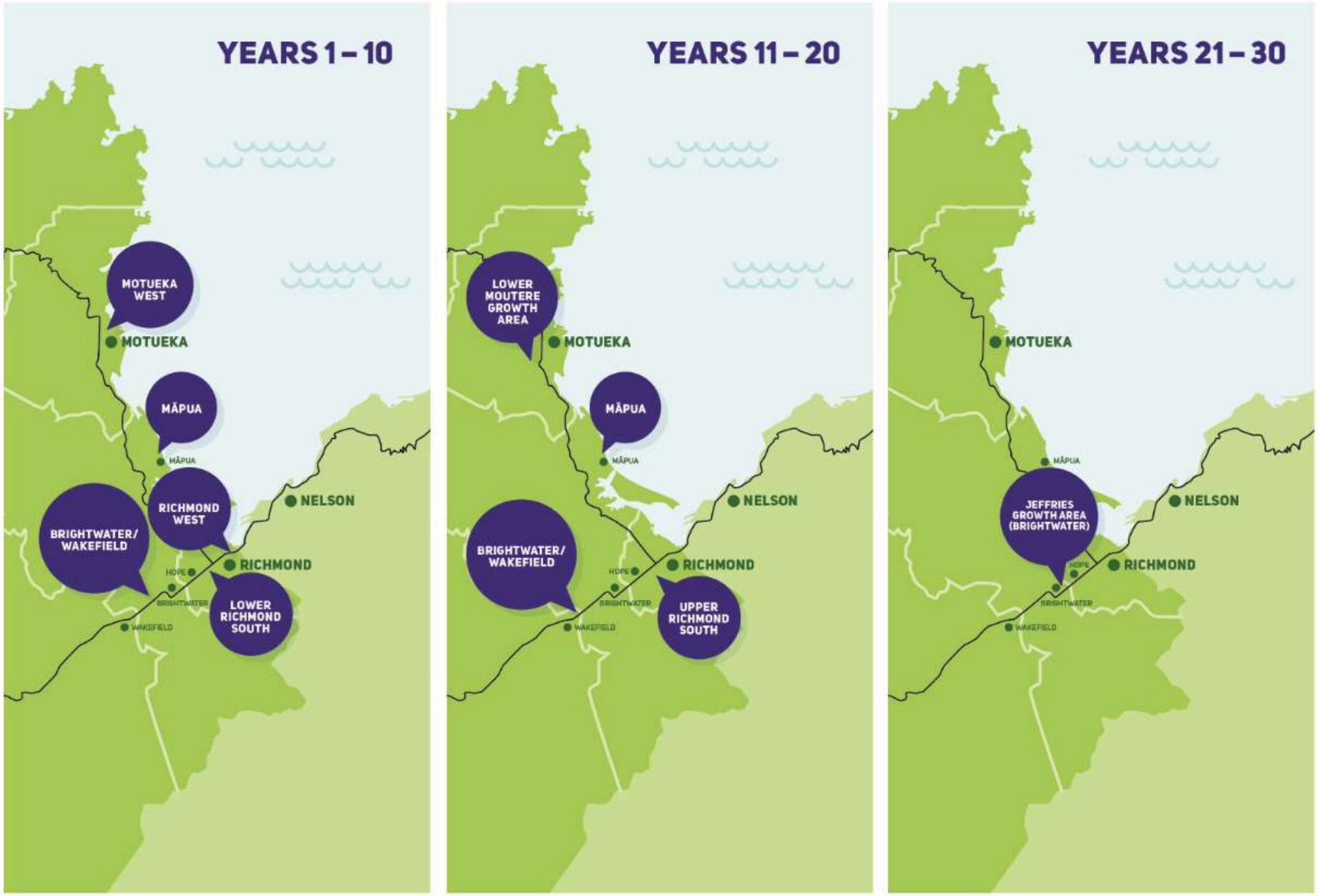


Figure 11: Timing of Key Growth Areas requiring Infrastructure Upgrades

INVESTING IN ASSET RENEWAL

We generally plan the rate of renewal investment for water, wastewater, stormwater, and rivers and flood protection assets based mainly on the age of the assets and their expected useful life. We have made exceptions where assets have performed poorly and these have specifically been programmed for early replacement. For water supply pipes, we have estimated the expected useful life for different pipe materials using pipe failure trends from across our own network. For roads, we use age, condition and demand data to predict an optimised programme of renewal. Figure 12 shows the total planned investment in renewal of infrastructure assets for the next 30 years. As highlighted earlier in this Strategy, our infrastructure renewal need is projected to significantly increase beyond the period of this Strategy. This will likely present a funding challenge in approximately 50 years' time.

We have planned to progressively fully fund depreciation (i.e. the wearing out of assets as it occurs) through rates and other income streams by 2025. Over the next 30 years, funding of depreciation generally exceeds our immediate asset renewal needs. This means that there is an excess of depreciation funding that we can use to manage our cash position as a whole, helping to reduce debt. In the long term, we expect that asset renewal needs will exceed the funding that we collect for depreciation. When this occurs, it is likely that we will need to fund asset renewals through a mix of depreciation funds and borrowing.

We plan to undertake more mature renewal planning over the next three years to better understand this issue and consider the associated potential effects on our future borrowing requirements.

We plan to renew $~~743~~ 654 million worth of assets over the next 30 years in order to maintain the overall condition of our infrastructure networks

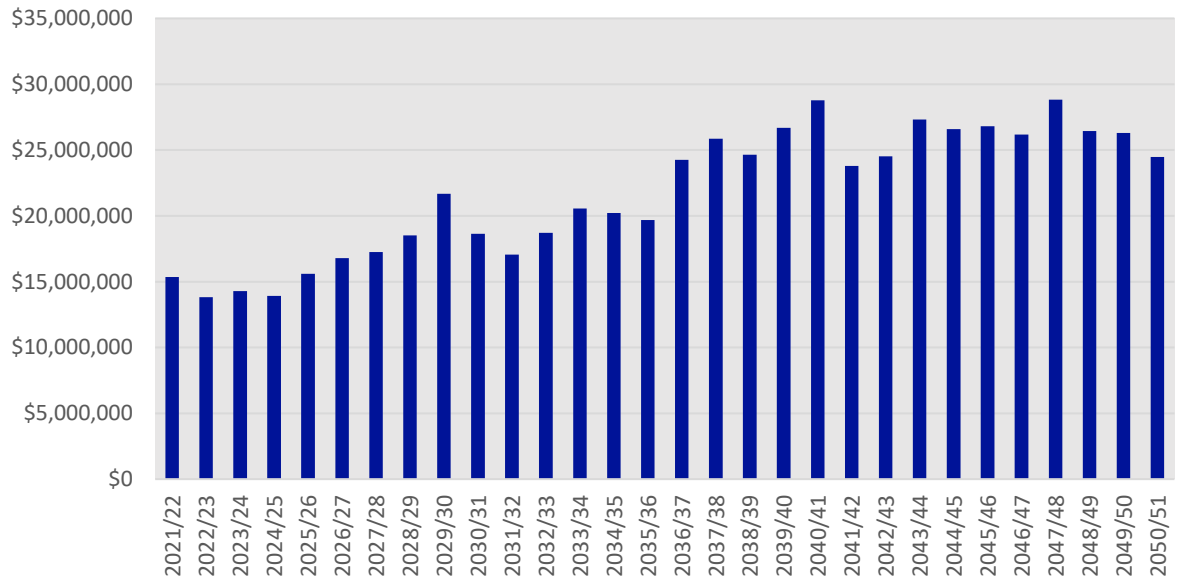


Figure 12: Total Renewal Expenditure for Infrastructure for the next 30 Years

MANAGING LEVELS OF SERVICE

Levels of service are what we have agreed to deliver to, and on behalf of the community. They are attributes that describe the service from the customer's perspective.

Levels of service are set through our Long Term Plan, sometimes in response to community desire, and sometimes in response to statutory requirements.

Due to our self-imposed financial limits, there is little scope for us to significantly increase level of service targets over the next 10 years. We have had to focus investment on meeting existing level of service targets and making improvements due to statutory requirements.

The following table summarises where we have planned works in order to achieve agreed level of service targets. A full list of our agreed levels of service are in our Long Term Plan, and some additional technical measures are included in our activity management plans. Figure 13 shows the total planned investment in level of service improvements for the next 30 years.

Table 2: Proposed Level of Service Changes

ACTIVITY	TYPE OF CHANGE	DESCRIPTION
Water	Improve compliance with NZ's Drinking Water Standards	Invest in meeting the requirements of the Drinking Water Standard New Zealand.
	Reduce water loss from the network	Invest in proactive leak detection and repairs, and on-going pipe renewal.
	Complete the investment in the Waimea Community Dam	Provide for water security for urban and rural water users.
Wastewater	Reduce incidences of wastewater overflows into waterways	Invest in pipe and pump station upgrades.
	Improve network resilience	Invest in additional storage or standby electrical generation.
Stormwater	Maintain focus on mitigating flooding of habitable floors	Prioritise investment in network upgrades that mitigate flooding of habitable floors rather than nuisance surface water flooding.
Transportation	Increase the number of people using cycling and walking as a mode of transport	Invest in improved cycling facilities.
	Increase the number of people using public transport	Invest in expanded public transport services.
	Increase the length of sealed road resurfacing	Increase investment in routine road resurfacing.
Rivers & Flood Control	Restore the agreed level of service of the Motueka River stopbanks	Invest in reconstruction and strengthening of priority areas of stopbank.

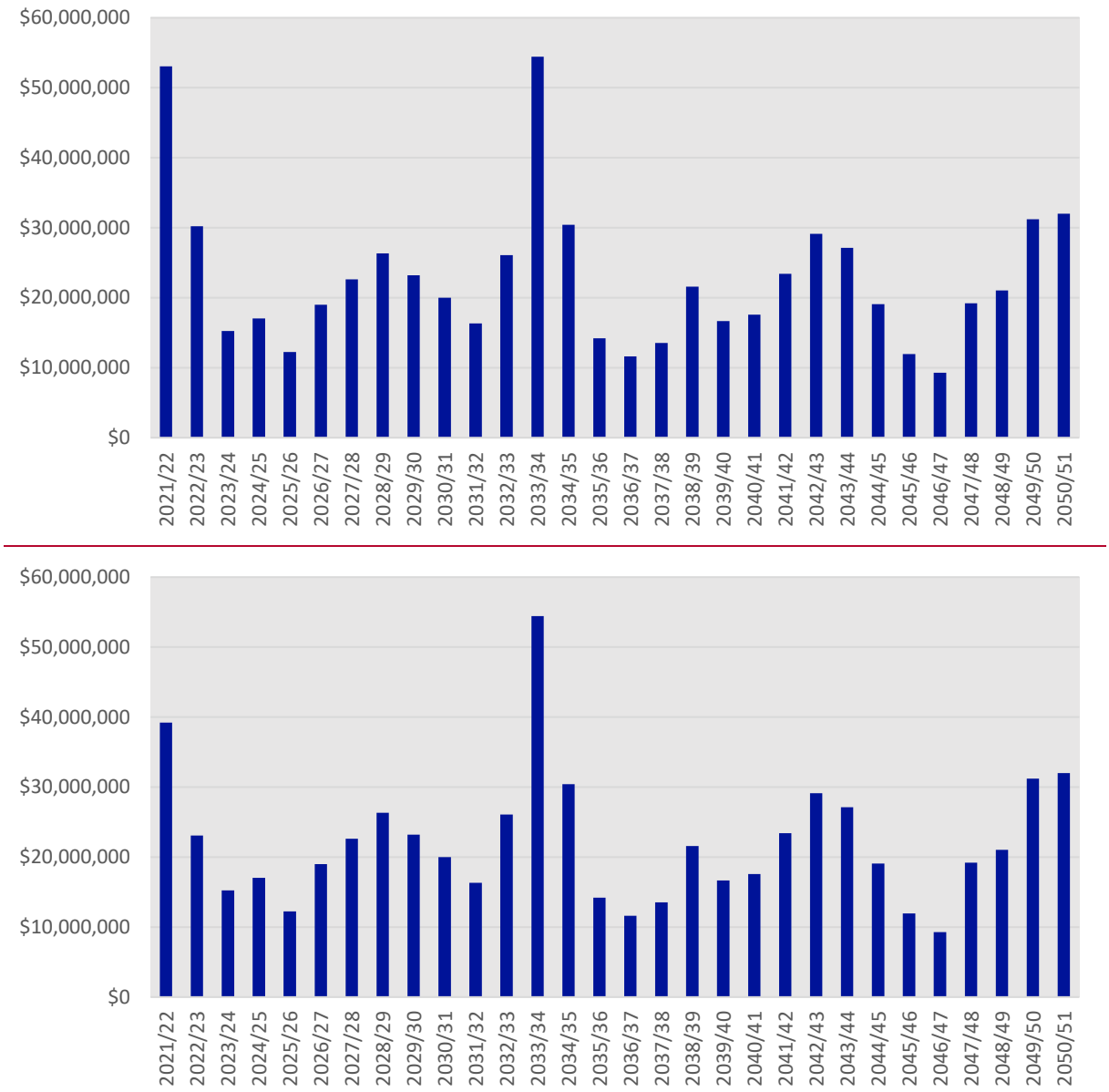


Figure 13: Total Level of Service Expenditure for Infrastructure for the next 30 Years

MAINTAINING PUBLIC AND ENVIRONMENTAL HEALTH

Through the provision of infrastructure, we have influence and effect on public and environmental health. Table 3 summarises key ways in which we protect public and environmental health.

A key development since the development of the last version of this Strategy is the updated National Policy Statement for Freshwater Management (NPS-FM) and the concept of Te Mana o te Wai. The Government has signalled through the NPS-FM and new Taumata Arowai legislation to uphold the principles of the Treaty of Waitangi.

- The NPS-FM provides local authorities with new direction on how to manage water resources. Central to this direction is the concept of Te Mana o te Wai. Te Mana o te Wai refers to the vital importance of water and recognises that protecting the health of water protects the health and wellbeing of the wider environment and the community.
- The new Taumata Arowai legislation also requires authorities to give effect to te Mana o te Wai. The new regulatory body has a Māori advisory Board to provide support and guidance on this matter.

Throughout 2021, we will engage with iwi of Te Tauihu o Te Waka a Māui and Ngāi Tahu to determine how we give effect to Te Mana o te Wai.

Table 3: Measures Used to Maintain Public and Environmental Health

ACTIVITY	PUBLIC HEALTH	ENVIRONMENTAL HEALTH	RELEVANT STATUTES / REGULATIONS
Water	We aim to provide a safe and reliable supply of drinking water to residents and businesses.	We aim to always comply with the conditions of our water take consents so that water is not over extracted from aquifers or streams.	Resource Management Act Health Act Local Government Act Drinking Water Standards for New Zealand
Wastewater	We collect wastewater from properties and adequately treat it before discharging back to the environment.	We collect wastewater from properties and adequately treat it before discharging back to the environment. Wastewater is collected and transferred in a manner that minimises odours and overflows.	Resource Management Act Local Government Act
Stormwater	We aim to collect and discharge rainwater in a way that minimises disruption to normal community activities and risk to life.	We aim to minimise the level of contaminants in stormwater discharges, and manage natural streams in a manner that protects the natural habitat within the stream.	National Policy Statement – Freshwater Management Local Government Act Resource Management Act
Transportation	We provide a range of transport options that can in themselves improve health, and also connect communities and enable access to health care and recreation.	We regularly undertake road sweeping and sump cleaning to prevent contaminants from being washed off the road and into the natural environment.	Resource Management Act Land Transport Management Act
Rivers & Flood Control	We manage stopbanks to maintain flood protection for residents and businesses	We manage gravel aggregation and river planting in a manner that protects the natural features and life within the river systems.	Resource Management Act Soil Conservation and Rivers Control Act

MANAGING RISKS AND IMPROVING RESILIENCE

Tasman's communities face the ongoing presence of risks from natural hazards and we need to ensure that we provide infrastructure that is resilient and that we are prepared financially to respond to in order to recover from damaging events.

Over time, we will build more resilient infrastructure services that can cope during times of major disruption or that can be restored quickly. Planned improvements include the provision of backup power generators and additional storage capacity, water reservoir construction, and relocation of the Motueka wastewater treatment plant. These improvements will be the start of a wider programme of work that will be necessary in order to improve resilience to an adequate level. Currently, we don't have enough information to adequately plan a full suite of resilience upgrades for the medium and long term horizon. Our knowledge of the impact of climate change and the impact on infrastructure is developing. We will use this knowledge to inform discussions with Tasman communities on how we will together adapt to climate change.

As well as ensuring our assets are resilient, we have a range of financial provisions to assist with response to and recovery from major damaging events. These include:

- annual emergency funding from Year 5 onwards
- an established Emergency Fund that Council aims to bring up to a value of $16.5 million by 2030/2031
- ability to reprioritise our capital programme
- insurance cover of 40% of the costs of a catastrophic disaster event, up to $125m
- central government support of up to 60% for essential infrastructure, and

- Waka Kotahi / NZ Transport Agency subsidy of at least 51% for subsidies for transportation asset reinstatement.

CRITICAL ASSETS AND LIFELINES

Knowing what is most important is fundamental to managing risk well. By knowing this, we can invest where it is needed most and tailor this investment at the right level. This will avoid over investing in assets that have little consequence of failure, and will ensure assets that have a high consequence of failure are well managed and maintained. For infrastructure, this is critical assets and lifelines. These typically include arterial road links (including bridges), water and wastewater treatment plants, trunk mains, main pump stations, key water reservoirs, stopbanks and detention dams.

During 2016, in partnership with Nelson City Council, the Nelson Tasman Civil Defence Emergency Management Group and other utility providers, we prepared the Nelson Tasman Lifelines Report. This report summarises all lifelines within Nelson and Tasman. A number of actions identified in the report aim to improve the Region's infrastructure resilience.

We also recently developed an asset criticality assessment framework for water supply, wastewater and stormwater. The framework is defined by:

- a 'Criticality Score' from 1 (very low criticality asset) to 5 (very high criticality asset)
- a set of 'Criteria' against which each asset will be assessed and assigned a Criticality Score (see 1 above), and
- a set of straightforward, logical rules, measures and proxies under each criteria that can be assessed for each asset and enable a Criticality Score to be assigned in a spatial (i.e. GIS) context.

For each asset, the criticality has been assessed against the following five criteria:

- number of people that would be effected if the asset failed
- asset failure would prevent/impair use of a critical facility
- ease of access/complexity of repair
- asset failure has potential for environmental/health/cultural impacts, and
- asset failure has potential to initiate cascading failures and/or the asset has interdependencies with other assets.

Based on the above, asset criticality has been assessed for all assets across the District and mapped spatially in a GIS viewer. The vulnerability of critical assets to natural hazards has been identified through the overlay of natural hazards information such as coastal inundation and sea level rise, stormwater and river flooding, fault lines, tsunami risk and liquefiable soils.

The asset criticality framework will help to ensure that the appropriate level of effort is made to manage, maintain and renew them, and will extend to ensure that we have adequate asset data to enable robust decisions to be made regarding the management of those assets.

LONG TERM FINANCIAL ESTIMATES

We have planned for a prudent financial approach to managing our infrastructure, with moderate overall cost increases and a steady capital programme. This section provides a summary of the total investment we have planned to make in infrastructure over the next 30 years.

TOTAL OPERATING EXPENDITURE

We have split operating expenditure into two categories:

- direct expenditure – includes maintenance and operating costs paid to our contractors and suppliers, and professional service fees, and
- indirect expenditure – includes financing costs, depreciation, and overheads such as staff salaries.

The annual operating costs for infrastructure are forecast to rise from around $39 million in 2021, to $59 million in 2031, and $94 million by 2051. This results in an annual increase of around 5.1% on average in the first 10 years and 4.7% over the 30 years. These increases are primarily caused by increases in direct costs (partly driven by increased infrastructure needed to accommodate growth), increased loan servicing costs, and inflation.

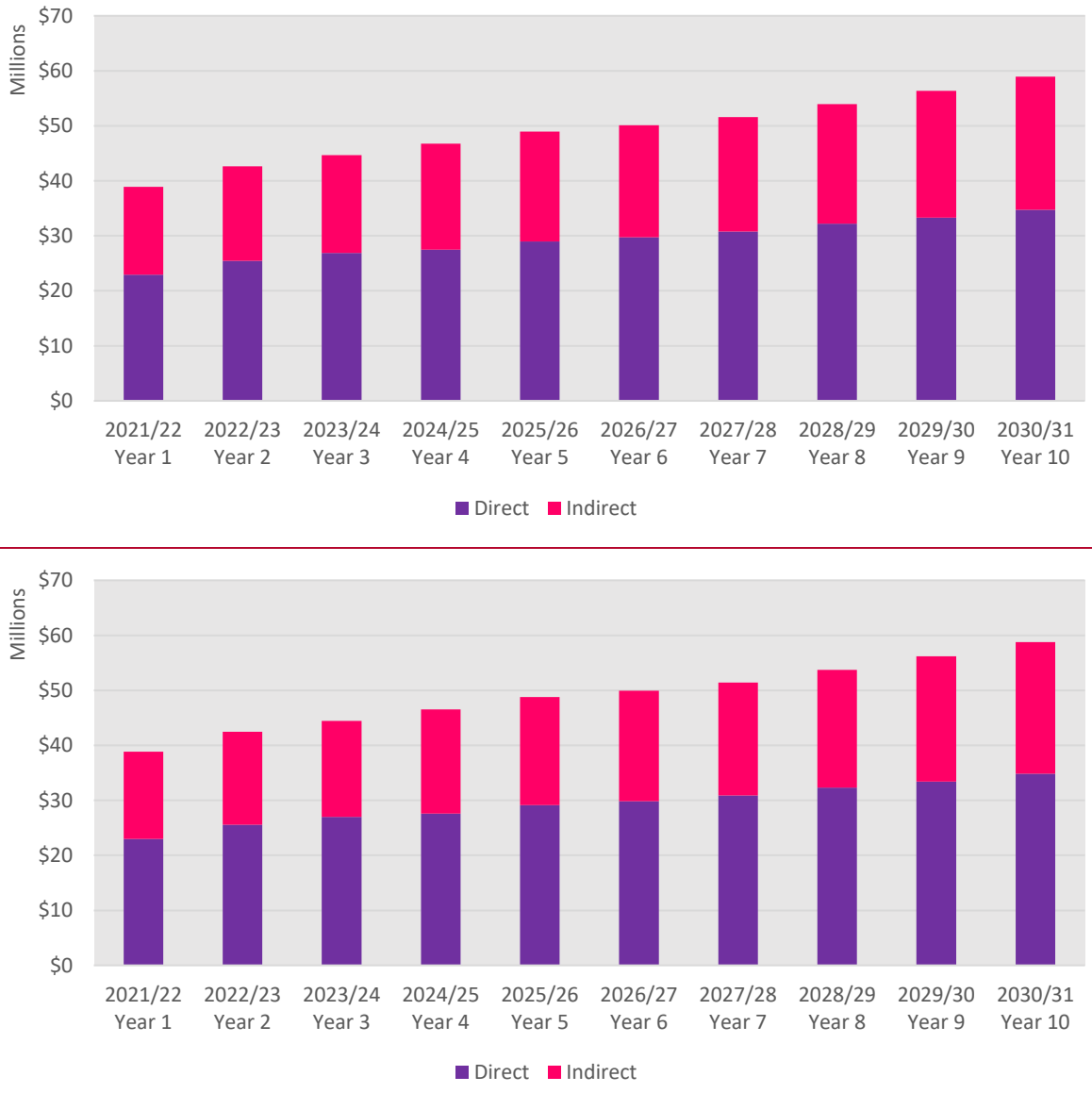


Figure 14: Year 1 to 10 Infrastructure Annual Operating Costs

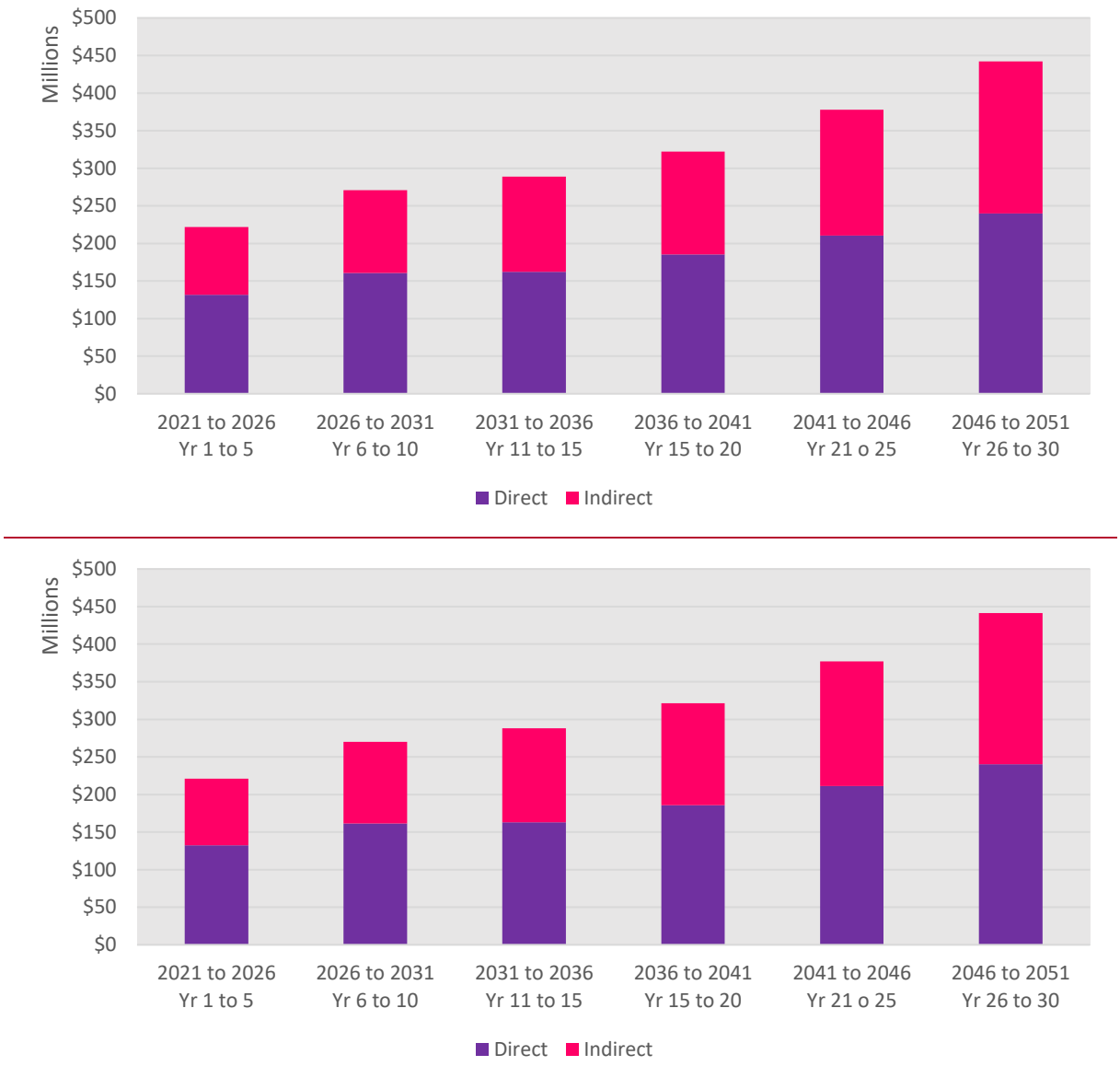


Figure 15: Year 1 to 30 Infrastructure 5-Yearly Operating Costs

TOTAL CAPITAL EXPENDITURE

We have planned to fund $~~480~~ 502 million of capital expenditure over the next 10 years and around $1.~~5~~ 6 billion over the next 30 years. In the first 10 years, ~~43~~45% of the investment is for level of service improvements, ~~33~~31% for renewals and ~~24~~23% for growth.

The Total Funded Capital Programme shown below includes the 10% scope risk and programme delivery adjustment discussed earlier in this Strategy.

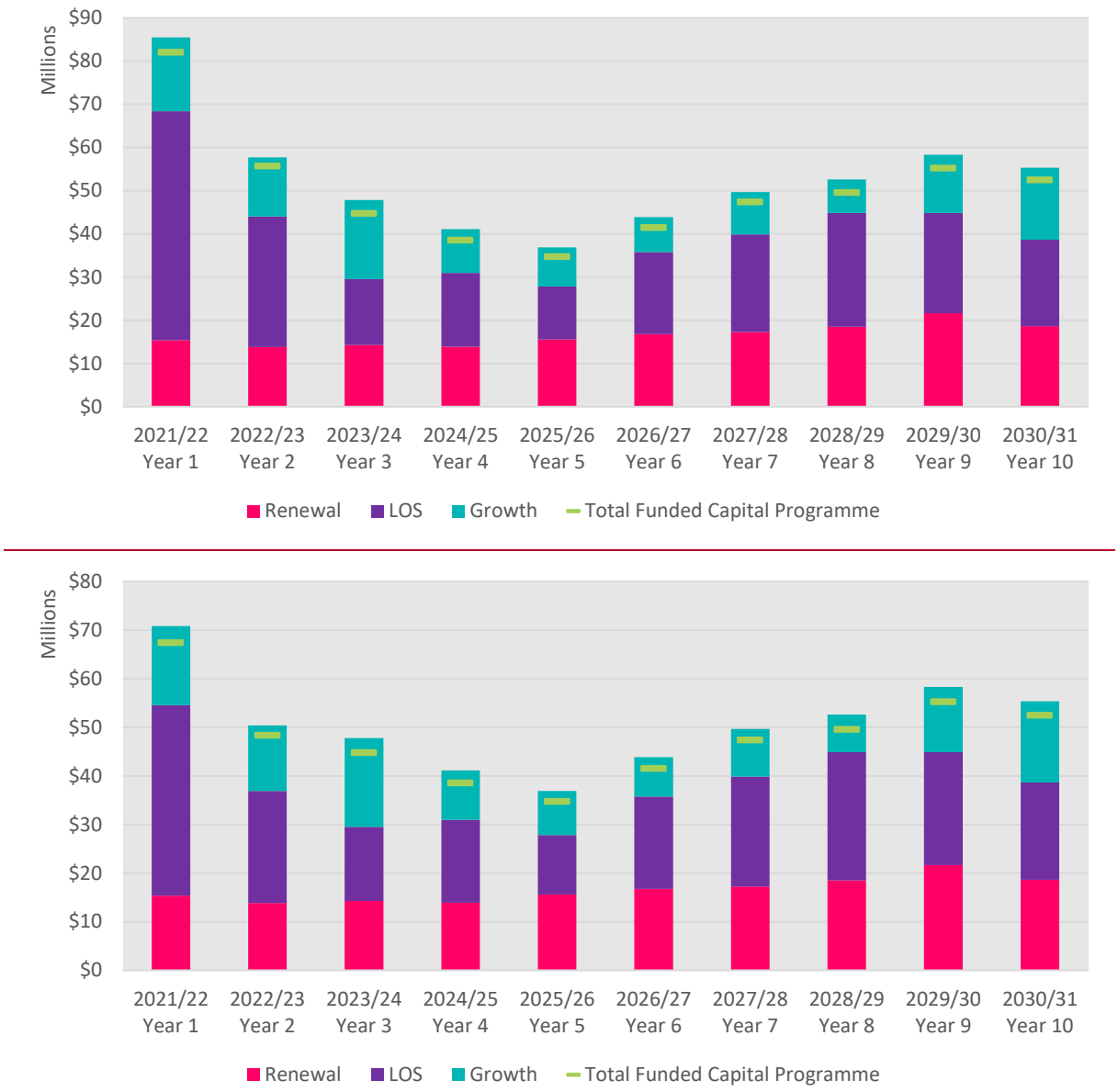


Figure 16: Year 1 to 10 Infrastructure Annual Capital Expenditure

Figure 17: Year 1 to 30 Infrastructure 5-Yearly Capital Expenditure

ACTIVITY SUMMARIES

The following graphs show the split between operating and capital expenditure for infrastructure. For the next 10 years, we need to invest most in transportation as there is a high base programme of routine maintenance and renewal works. A breakdown of the financials for each activity is provided in the following activity summaries. The full list of the operating and capital budgets for each activity is included in our respective activity management plans.

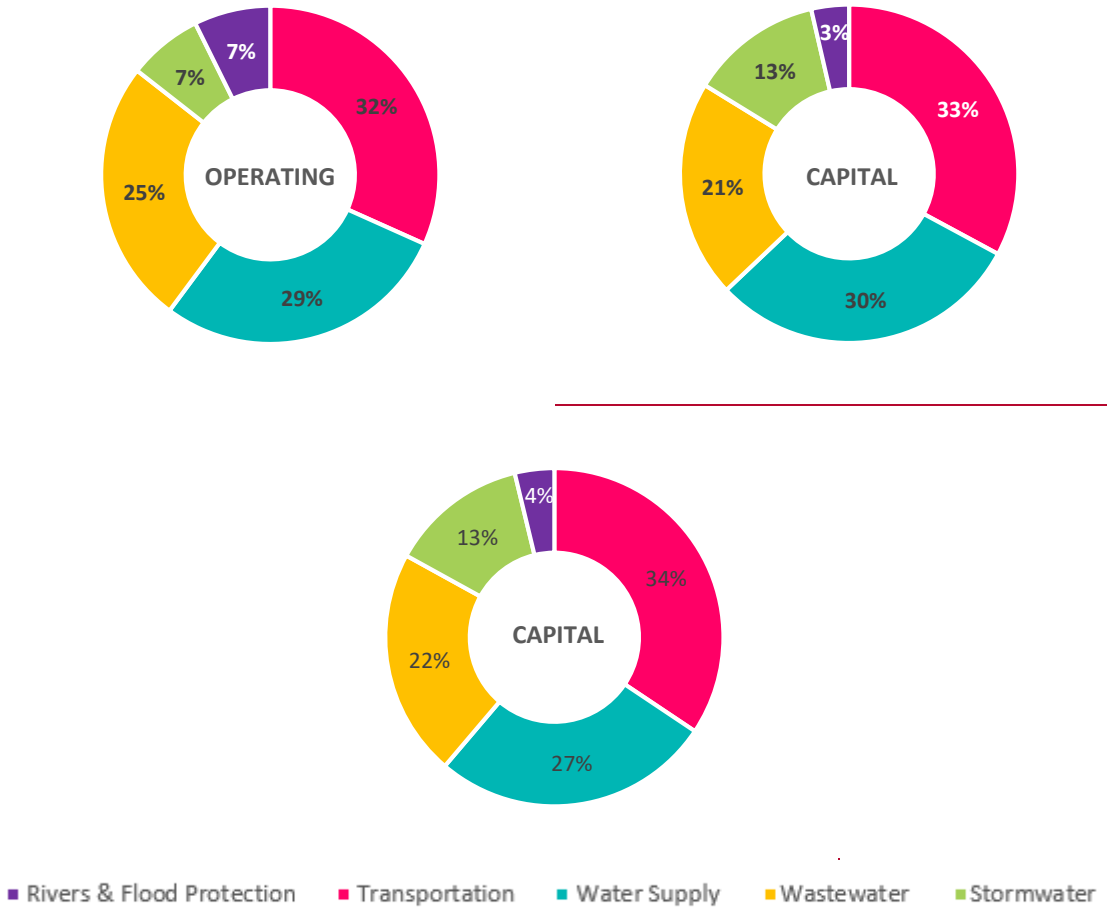


Figure 18: Year 1 to 10 Split of Operating and Capital Expenditure

WATER SUPPLY

We aim to provide secure water supply systems that deliver safe water to Tasman communities. We own and operate 20 water supplies across Tasman District. For most urban areas, the water supply network also provides adequate pressure to meet firefighting requirements. Over the next 10 years, we plan to spend ~~28~~29% of our total infrastructure budget on the water supply activity.

ASSET OVERVIEW

The assets that make up our water supply infrastructure are summarised in Table 4.

Table 4: Water Supply Asset Summary

DESCRIPTION	REPLACEMENT VALUE	DATA RELIABILITY
15 water treatment plants	$13.9m	Good
28 pump stations	$4.7m	Good
756 km reticulation	$121m	Good
4,251 valves	$7.2m	Good
1,546 hydrants	$4.0m	Good
332 backflow prevention devices	$0.3m	Good
61 reservoirs	$20.9m	Good
12,096 water meters	$6.7m	Good
1,590 rural restrictors	$0.4m	Good
32 bores	$4.9m	Good

Note: Replacement Valuation as at 1 June 2020

LEVELS OF SERVICE

"Our water supply systems are built, operated and maintained so that failures can be managed and responded to quickly"		*"Our water supply systems provide fire protection to a level that is consistent with the national standard"*
"Our water is safe to drink"	*"Our water takes are sustainable"*	*"Our water supply activities are managed at a level that the community is satisfied with"*

As explained earlier in this Strategy, providing safe and secure infrastructure services is a priority. We have planned to invest significantly in improving water treatment. We started water treatment plant upgrades in 2018 and plan to continue through to 2028. This investment will lift our performance against our agreed levels of service.

RESPONDING TO OUR INFRASTRUCTURE PRIORITIES

Further to the overarching infrastructure key issues identified earlier in this Strategy, we have also identified key issues specific to the water supply activity that are described below. Each of these issues relate back to our infrastructure priorities. For each issue, the significant decisions we need to make are outlined, along with the principal options for addressing the issue, estimated costs and timing.

IMPROVING SAFETY OF WATER SUPPLIES

We are required by the Health Act to provide safe water supplies that comply with the NZ Drinking Water Standards (NZDWS). At present, only two fully meet the requirements of the NZDWS. The main reason for non-compliance is a lack of protozoa treatment. Complying with the NZDWS is not a new issue but one that has increased in priority.

Table 5 summarises the options that we have considered in order to improve the safety of our water supplies.

Table 5: Principal Options to Improve Safety of Water Supplies

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Upgrade or install water treatment plants that provide the level of treatment required by the NZDWS	The risk of water contamination will be reduced and communities will have increased confidence that their water is safe to drink. However, providing higher quality water will come at a higher cost, resulting in rates increases.	✓	$10.7m	2021 - 2026
Undertake required upgrades over a shorter period of time	The risk of water contamination will be reduced quicker than planned. However, compressing the timeframe will cause debt to increase more sharply and breach our financial caps. It may also contribute to an undeliverable work programme for our resources and the construction market.	✖	$10.7m	2021 - 2024
Undertake required upgrades over a longer period of time	The longer the time taken to upgrade, the longer the risk of drinking water contamination will persist. The strain on our financial and delivery resources will be reduced but we may fall further out of line with the Health Act.	✖	$10.7m	2021 - 2030
Connect Eighty-Eight Valley water scheme to the Wakefield / Brightwater scheme	Homes on the Eighty-Eight Valley scheme will be supplied with higher quality water from the Wakefield / Brightwater schemes. Some users on the Eighty-Eight Valley scheme will now be connected via an extension from an urban supply. This would usually require those users to pay restricted supply rates. If a connection is made to the Wakefield/Brightwater schemes the cost of the upgrade could be shared amongst the Urban Water Club users. Some farms on the Eighty-Eight Valley scheme may stay connected to the original source due their needs being primarily for stock drinking water. A full upgrade of the Eighty-Eight Valley source and treatment plant will not be required. Avoiding a situation that was likely to be unaffordable for those currently connected to the Eighty-Eight Valley scheme. This option and rating implications are yet to be consulted on. Any change to rating would not occur within prior to the development of our Long Term Plan 2024 – 2034.	✓	$3.5m	2021 - 2025

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Upgrade the existing Eighty-Eight Valley treatment plant and do not connect the Eighty Eight Valley scheme to Wakefield.	The Eighty-Eight Valley water source is a surface water take from a stream. This type of source is higher risk than ground water bores. This requires a higher level of treatment effort making the treatment plant upgrade cost prohibitive for the existing users. The costs of the upgrade will be borne by only the Eighty-Eight Valley users.	✘	$2.5m	2021 - 2025
Implement permanent residual disinfection on all schemes through chlorination	Most of our water supplies are already chlorinated. In August 2020, we proposed via public consultation to permanently chlorinate all schemes. Our decision on whether to proceed with this proposal was pending at the time of preparing this draft Strategy. Further information on this proposal can be found at https://www.tasman.govt.nz/my-council/public-consultation/past-consultations/water-safety-consultation/.	?	Approx. $20,000 per year	Undecided
The Health Act requires us to take all practicable steps to ensure that the drinking water we supply complies with the NZDWS. Consequently, we have not considered an option that involves maintaining the status quo. We consider it is impractical to speed up the delivery of the upgrades due to the strain on resources it would create. We have planned to complete all upgrades within the Government's indicated deadlines. These deadlines are yet to be enacted, however we consider it prudent to plan to meet them. We are required to upgrade the Eighty-Eight Valley water treatment plant in order to meet the NZDWS. Connecting the Eighty Eight Valley scheme to the Wakefield/Brightwater schemes will enable us to supply water that meets the NZDWS, without the need to upgrade the Eighty-Eight Valley treatment plant. We do not have the option to do nothing due the requirement to meet the NZDWS.				

ENHANCING WATER SUPPLY CAPACITY AND RESILIENCE

In order to provide a consistent and resilient water supply to households and businesses we need:

- access to secure water sources that provide an adequate quantity and quality of water throughout the year, and
- reticulation networks of suitable configuration and size to move water across the network at appropriate pressure and flow for users.

We have split enhancing water supply capacity and resilience into three sub-categories:

- water source improvements
- network capacity upgrades, and
- new or extended schemes.

New or extended schemes have been included here as they increase coverage and add supply capacity, allowing existing homes and businesses to connect to a scheme. These options have not been included under growth, as the need is not created by the development of new homes and businesses.

Table 6 summarises the options we have considered in order to enhance water supply capacity and security.

Table 6: Principal Options to Enhance Water Supply Capacity and Security

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Water Source Improvements				
Construct a supplementary water source for the Wai-iti Dam	A supplementary water source will allow us to collect more water in the winter in preparation for dry summers. The ability to collect from two sources will increase resilience of the scheme as we have an increased ability to fill the Dam.	✓	$1.1m	2026 - 2028
Relocation of Richmond bores	The bores will be relocated to a more secure location further inland. The risk of salt water intrusion into the bores, and surface flooding of the bore heads will be reduced.	✓	$3.4m	Land acquisition: 2021 – 2023 Construction: 2030 - 2033
Network Capacity Upgrades				
District wide pipe capacity improvements	Increasing pipe capacity at strategic locations within the network allows us to supply more water and to transfer water between different parts of the network. This adds resilience to the scheme as well as providing capacity for growth. In some locations, increasing the pipe size enables us to meet the agreed firefighting level of service.	✓	$11.9m	2021 - 2028
Waimea water network capacity upgrades between Hope, Brightwater and Wakefield - including the construction of a new bores and treatment plant near Brightwater.	Increased capacity will allow the transfer of water between different townships, allowing us to better balance supply and demand. This adds resilience, as water can be extracted from multiple sources and distributed. These improvements will provide additional capacity for growth and the ability to supply the Eighty Eight Valley scheme. Construction of the new bores and treatment plant will allow extraction of a greater volume of higher quality water and water security.	✓	$34.4m*	2023 - 2031
Motueka network improvements - including construction of link mains	Construction of new link mains will create loops and add resilience to the scheme. If there is a break in a part of the network, a ring main will allow us to supply water from the other side of the break.	✓	$3.4m	2021 - 2030
Maintain the status quo	The network constraints will remain as they are, and potentially worsen as growth occurs. The opportunity to improve resilience will be missed.	✗	Nil	Not planned

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Implementing the above preferred options will help us deliver on the following levels of service: • Our water supply systems provide fire protection to a level that is consistent with the national standard. • Our water supply systems are built, operated and maintained so that failures can be managed and responded to quickly. Projects that increase capacity within the network often provide multiple benefits (e.g. improved resilience and capacity for future growth). All of the preferred options above improve resilience and enable growth. **The Waimea water network capacity upgrades project is a key project required specifically to address both the need to increase network capacity and supply growth.*				
New or Extended Schemes				
Extend the reticulation within Motueka to provide the whole township with access to treated and reticulated water.	The majority of people in Motueka will have access to safe drinking water, removing their reliance on their private bores. Decommissioning redundant bores will reduce the number of entry points into the aquifer, reducing the risk of source contamination. The Motueka scheme is a standalone scheme and not part of the Urban Water Club. Ratepayers connected to the Motueka scheme will bear the full cost of the works under the current funding mechanism. Some people with private water supplies may not wish to abandon their supplies. The scope, timing, and funding options for this work will be subject to public consultation.	✓	$30.3m	2038 - 2044
In Motueka, the community is currently satisfied with the coverage of the existing reticulation network and their reliance on private bores. There is currently a very low appetite for this upgrade. We anticipate that this upgrade will be required in the future due to the size of the Motueka township and changing water supply regulations. As such, we have indicatively planned this within the next 30 years.				

SUPPLYING OUR GROWING COMMUNITIES

We expect that over the next 10 years Tasman's population will grow by approximately 7,700 residents. To accommodate this growth new homes need to be built, most of which will need to be supplied with water. We can supply some of this new demand through existing infrastructure where capacity is available. New areas of development such as Richmond South, Motueka West and Lower Moutere will require completely new infrastructure in order to deliver water to the area. For Māpua, Brightwater and Wakefield, the existing infrastructure will require upgrading to provide additional capacity.

Table 7 summarises the options that we have considered in order to provide for growth.

Table 7: Principal Options to Provide Water Supply to Areas of Growth

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Construct new infrastructure to service new areas of growth in: • Richmond South • Motueka West • Lower Moutere • Jefferies Growth Area (Brightwater)	We will be able to provide new homes and businesses with the water they need. This will come at a cost that will largely be funded by development contributions.	✓	Richmond South: $9.8m $8.5m $3.9m $3.0m Motueka West: $1.0m $1.2m Lower Moutere: $32m Jefferies Road: $13.2m	 2021 - 2030 2033 - 2038 2041 - 2043 2046 - 2049 2021 - 2022 2029 - 2031 2034 - 2041 2045 - 2049
Upgrade existing infrastructure to service growth in: • Māpua Brightwater • Wakefield	We will provide new homes and businesses with the water they need, as well as improving the reliability of the supply for existing customers. This will come at a cost that will need to be recovered through a mix of development contributions and rates.	✓	Māpua: $2.1m Brightwater & Wakefield: $34.4m*	 2021 - 2022 2023 - 2031
Maintain the status quo	We will not be able to provide new homes and businesses with water requiring them to find alternatives if possible. This is likely to restrict where and when growth can occur and have an unfavorable impact on the housing market.	✘	N/A	Not planned
Enabling construction of new subdivisions will provide homes for our growing population. This is a priority for us. To do this, we have determined that we must provide essential infrastructure. We have planned to implement the above options so that our supply of increased water network capacity meets the demand created by new homes as they are built. The timing of these upgrades is based on the population projections set out earlier in this Strategy. Implementing these options will help us meet the requirements of the National Policy Statement – Urban Development 2020. **The Waimea water network capacity upgrades project is a key project required specifically to address both the need to increase network capacity and supply growth.*				

NETWORK INTEGRITY

To maintain the integrity of our networks we must replace assets before or as their performance fades. To ensure we act prudently and intervene at the right time, we monitor the condition and performance of the network and replace assets as required. We do not treat all assets the same, some are more critical than others. For critical assets, our tolerance of failure is lower and we are likely to replace these assets earlier than non-critical assets in similar condition.

Table 8 summarises the options that we have considered in order to maintain network integrity.

Table 8: Principal Options to Maintain Network Integrity

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Proactive leak detection	Faults are identified and repaired in a proactive manner preventing further water loss. Sections of pipe that require maintenance or renewal are identified and prioritised.	✓	$7.3m total for 30 years	On-going
On-going pipe renewal	Pipes are progressively upgraded, reducing the risk of failures and associated service disruptions and water loss.	✓	$15.2m $21.7m $12.1m	2021 - 2030 2031 - 2040 2041 – 2050
Our budget for Demand, Flow and Leak Management will fund leak detection surveys, day/night flow monitoring and other network modelling. Information collected through this work will be incorporated into future pipe renewal planning and prioritisation. This allows us to optimise our renewal investment, meaning that we replace assets at the most appropriate time. As we need to ensure we can provide water to our current and future users, it is not an option to not maintain the integrity of our networks. We must implement the above options.				

INDICATIVE EXPENDITURE ESTIMATES

OPERATING

Operational costs for the water supply activity are forecast to increase by an average of ~~5.4~~5.5% per year for the first 10 years, and an average of 5.2% per year over 30 years. The most notable increases within the next 10 years occur between Year 1 and Year 2. At this time, direct operating costs are increasing due to the expected completion and operation of the Waimea Community Dam. Indirect costs increase primarily due to increasing loan interest costs associated with the capital programme for this activity. On top of this, both direct and indirect expenditure gradually increase due to inflation.

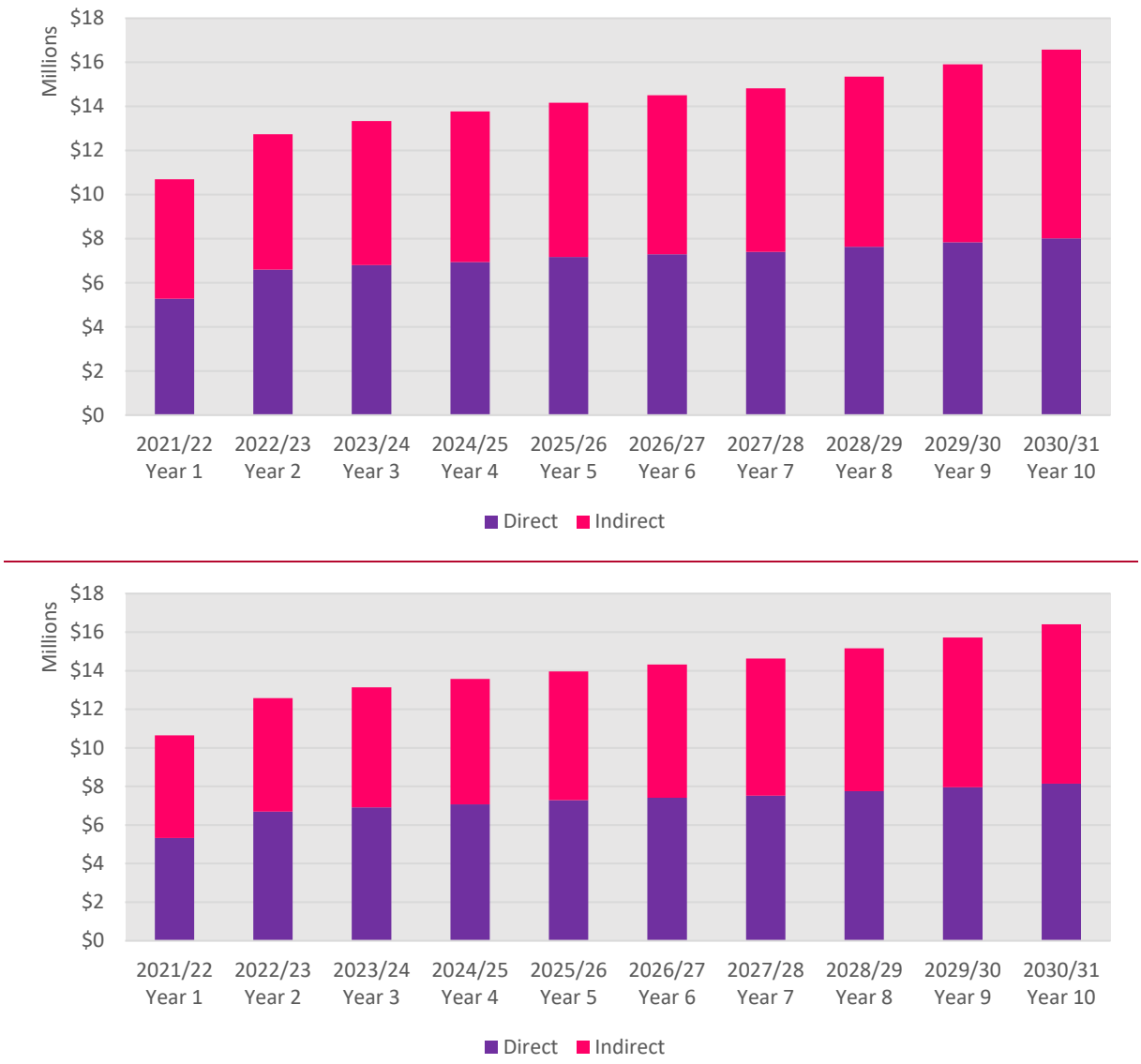


Figure 19: Annual Operating Expenditure for Year 1-10 for Water Supply

Figure 20: Five Yearly Operating Expenditure for Year 1-30 for Water Supply

CAPITAL

We plan to spend $~~128~~ 150 million on capital improvements over the next 10 years. Of this, ~~25~~22% is attributable to growth, ~~52~~58% for level of service improvements, and ~~23~~20% for asset renewal. We will invest most in level of service improvements for the first two years. This is due to the planned water treatment plant upgrades that are required to meet the NZ Drinking Water Standards.

Over the next 30 years, the total funded capital programme is $~~284~~ 306 million.

The Total Funded Capital Programme shown below includes the 10% scope risk and programme delivery adjustment discussed earlier in this Strategy.

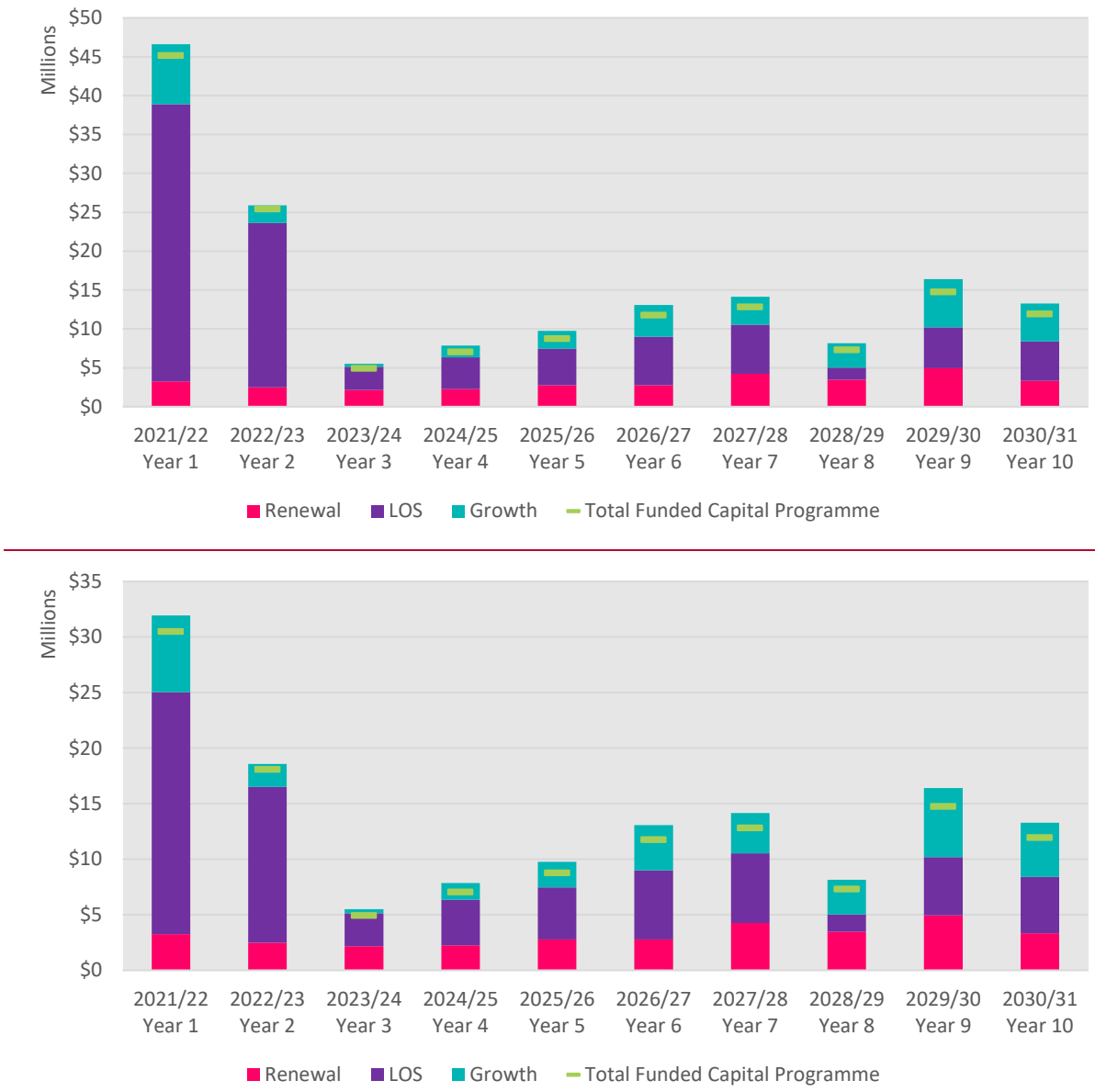


Figure 21: Annual Capital Expenditure for Year 1-10 for Water Supply

Figure 22: Five Yearly Capital Expenditure for Year 1-30 for Water Supply

ASSET RENEWAL PROFILE

For the first 10 years, our investment in renewals tracks slightly below depreciation. At about Year 11, our investment in renewals starts to fall behind deprecation more significantly. This divergence is due primarily to the long useful life and age profile of our current assets. As shown earlier in Figure 7, most of our water assets are not due for replacement within the next 30 years. As we construct new assets, the costs contribute to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but most will not need replacing within the next 30 years. While not shown here, we have compared the likely renewal requirements for 100 years with depreciation over the same time. This assessment shows that the gap closes in the long-run.

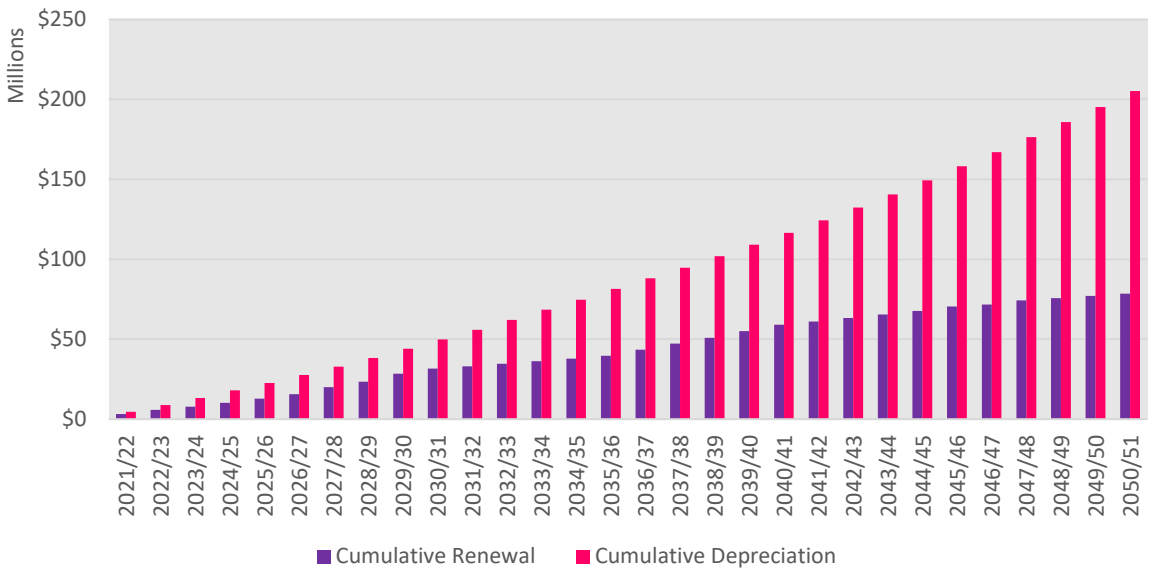


Figure 23: Capital Expenditure and Depreciation for Water Supply

ASSUMPTIONS AND UNCERTAINTIES

In addition to the key assumptions identified earlier in this Strategy, we have identified the following uncertainties and key assumptions that are specific to the water supply activity.

- As part of the Three Waters Review, the Government is considering reform of the current water service delivery models from Council-owned authorities, into larger scale multi-regional model providers. The nature of service delivery upon implementation of the reforms is uncertain. For the development of this Strategy, we have assumed no change in service delivery model for the water supply activity.
- Alongside Nelson City Council and Marlborough District Council, we have signed a Memorandum of Understanding (MoU) with the Government that requires participation and ongoing dialogue, ensuring a regional perspective is included in Three Waters Reform. By signing the MoU, we received an initial $9.78 million funding package to improve our three waters infrastructure. It is uncertain whether there will be further funding from the Government under this initiative.
- The government has completed the inquiry into the Havelock North drinking water contamination incident. One recommendation led to the Drinking Water Standards New Zealand (DWSNZ) amendment. Uncertainty remains about whether network residual disinfection will become mandatory in the future. We are planning to incorporate the ability to apply chlorination treatment in new and upgraded water treatment plants. We are also considering whether to apply residual disinfection using chlorine in our remaining water supplies. We expect to make a decision on this in early 2021 and we will reflect the outcome of that decision in the final version of this Strategy.
- We cannot be certain about the quantity of water that industrial users will require. We have assumed that future use by existing industries will be in line with historic use. We have not planned for additional wet industries. If consumption of water is significantly different to what we have assumed, it may have an impact on our budgets.
- Central government is considering a Bill, which would give power to District Health Boards to make decisions and give direction about the fluoridation of local government drinking water supplies. It is unclear whether the Bill will be successful and what the actual implications for us would be. For this Strategy, we have assumed that our drinking water supplies will not be fluoridated. If the Bill is passed, and the Nelson Marlborough District Health Board instructs us to fluoridate our supplies, it will create additional capital and operating costs.

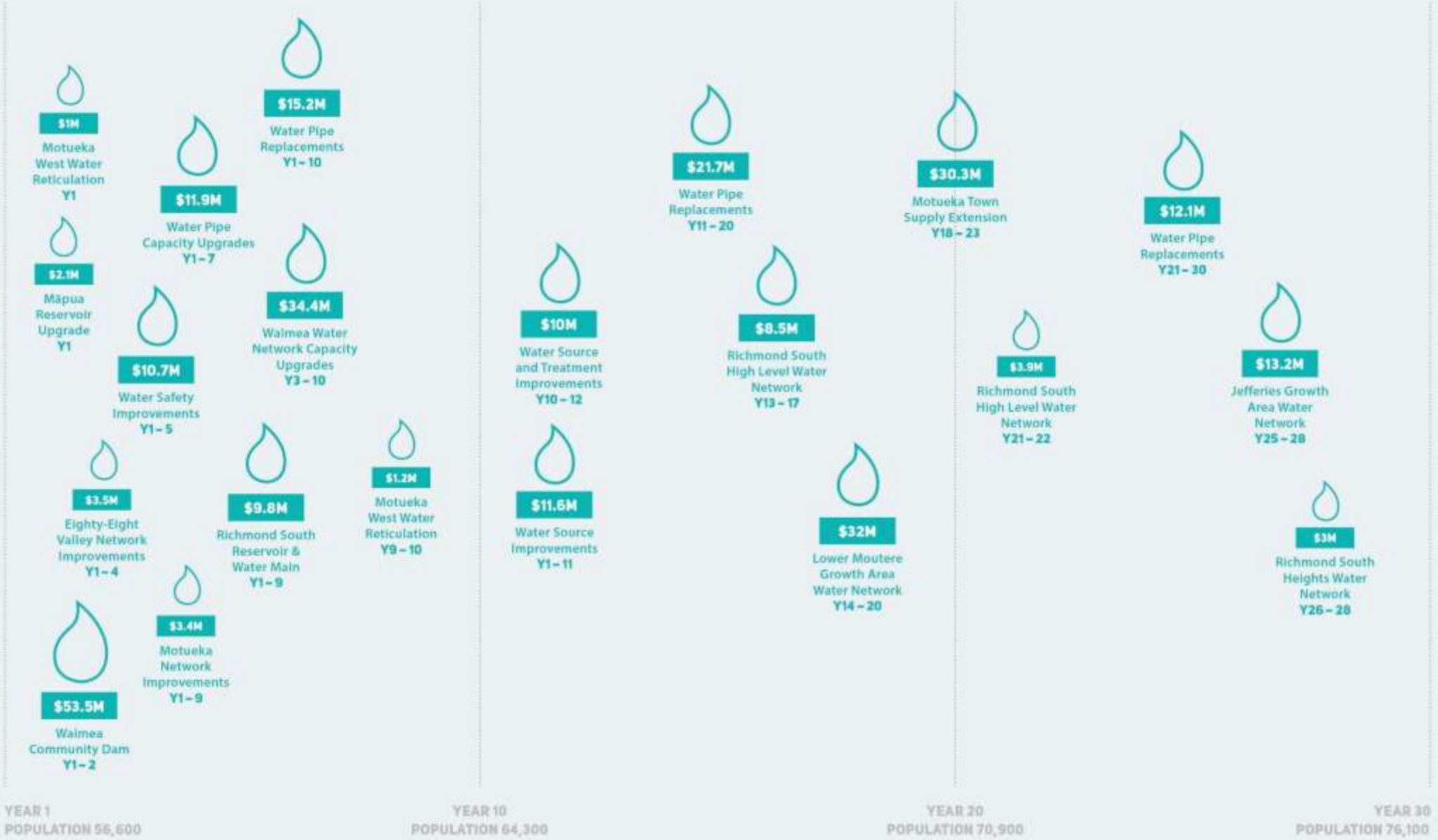
FURTHER INFORMATION

Further information on the Water Supply activity can be found in the Water Supply Activity Management Plan. Key capital projects and programmes of work are summarised in the following timeline. You can find the full list of the proposed budgets, projects, and timing in Appendix A and B of the activity management plan.

~~www.tasman.govt.nz/link/watersupplyactivitymanagementplan2021-2051~~www.tasman.govt.nz/link/activity-management-plans

TIMELINE OF KEY INFRASTRUCTURE PROJECTS – WATER SUPPLY

This timeline shows some of the major capital works planned for the next 30 years.



WASTEWATER

We aim to provide cost-effective and sustainable wastewater systems to protect public health while meeting environmental standards. We operate eight wastewater networks. These networks convey wastewater to eight treatment plants, seven of which we own and manage. Over the next 10 years, we plan to spend 24% of our total infrastructure budget on the wastewater activity.

ASSET OVERVIEW

The assets that make up our wastewater infrastructure are summarised in Table 9.

The largest treatment plant at Bell Island is owned by both Nelson and Tasman Councils on a 50:50 share basis. The Bell Island treatment plant is managed by the Nelson Regional Sewerage Business Unit (NRSBU).

Table 9: Wastewater Asset Summary

DESCRIPTION	REPLACEMENT VALUE	DATA RELIABILITY
8 wastewater treatment plants	$13.6m	Good
50% of NRSBU including Bell Island	$47.8m	Good
78 pump stations	$43.9m	Good
3,899 manholes	$25.9m	Good
366 km reticulation	$110.8m	Good
14,081 wastewater connections	$27.6m	Good
Other assets	$23.2m	Good

Note: Replacement Valuation as at 1 June 2020

LEVELS OF SERVICE

"Our wastewater systems do not adversely affect the receiving environment."	*"Our wastewater activities are managed at a level that satisfies the community."*	*"Our wastewater systems reliably take out wastewater with a minimum of odours, overflows or disturbance to the public."*	*"Our wastewater systems are built, operated and maintained so that failures can be managed and responded to quickly."*

We will invest in increasing network capacity to assist in preventing overflows so that they do not adversely affect the environment. Major pump station and rising main upgrades will help mitigate overflows. These upgrades should improve our performance against our agreed level of service.

RESPONDING TO OUR INFRASTRUCTURE PRIORITIES

Further to the overarching infrastructure key issues identified earlier in this Strategy, we have also identified key issues specific to the wastewater activity that are summarised below. Each of these issues relate back to our infrastructure priorities. For each issue, the significant decisions we are planning to make are outlined, along with the principal options for addressing the issue, estimated costs, and timing.

There is a close relationship between each of the issues. Implementing the preferred option for one issue is often likely to help address the other issues to varying degrees. To avoid duplication, options have been discussed under the issue that they address most.

REDUCING INFLOW AND INFILTRATION

Infiltration is the unintentional entry of ground water into the wastewater network and inflow occurs when rainwater enters the network. Common points of entry typically include gully traps, broken pipes and defective joints, as well as cracked manholes.

Inflow and infiltration is a significant issue in parts of our networks. It consumes useable network capacity causing the overloading of pipe networks and wastewater treatment plants during very heavy rainfall events. In turn, this restricts residential and commercial growth because it uses up available network capacity.

Inflow and infiltration in the network creates the need to pump, convey and treat the extra water and means additional and unnecessary costs. Excessive levels may also dilute wastewater and cause treatment plant performance to deteriorate. Inflow and infiltration can also contribute to overflows.

Table 10 summarises the options that we have considered in order to address inflow and infiltration.

Table 10: Principal Options to Address Inflow and Infiltration

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
On-going programme of pipe renewal to replace broken and cracked pipes.	Inflow and infiltration issues will be addressed over time as the network is renewed. This is a long term strategy meaning that all issues will not be addressed immediately.	✓	$5.2m $15.8m $6.4m	2021 – 2030 2031 – 2040 2041 - 2050
On-going inflow and infiltration investigations, Closed circuit television (CCTV) investigations, pipe survey and network modelling	This work will enable us to collect more condition and performance data, and identify specific areas that suffer from inflow and infiltration. This data will enable us to make better decisions on balancing maintenance and renewal spending.	✓	$14.5m total over 30 years	On-going
Rectify illegal stormwater connections to the wastewater network.	We will identify illegal private connections as part of our investigations and survey above. The cost of rectifying illegal connections will be the responsibility of the private party involved.	✓	Nil	On-going
Require low pressure pump systems in new developments	In areas where there is a high ground water table low pressure pump systems will prevent the ingress of water.	✓	Developer cost. Not a Council cost.	On-going
Maintain the status quo.	Inflow and infiltration issues will continue to occur meaning that we fund unnecessary operating costs and overflows at known problem areas are likely to continue.	✘	N/A	Not planned
It is not appropriate to take no action to address inflow and infiltration. As wastewater pipes reach the end of their useful life, they must be renewed. By undertaking the inflow and infiltration investigation and collecting more asset data, it will enable us to optimise renewal of our pipes and invest in where it is needed most.				

IMPROVING RESILIENCE

Some pump stations within our wastewater networks have limited storage. This means at times of high flows due to wet weather, or during power outages, the network can only manage for a short period of time before we need to manage the overflow risk. As inclement weather can bring both wind and rain, there are instances when high flows and power outages occur at the same time.

In Motueka, the wastewater treatment plant is located adjacent to the coast. The plant will be at increasing risk of coastal erosion and flooding due to the effects of climate change. The current resource consent for the plant expires in 2035 and requires us to investigate and identify alternative future sites for the plant.

Table 11 summarises the options that we have considered in order to improve network resilience.

Table 11: Principal Options to Improve Network Resilience

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Network Resilience				
Provide mobile backup generators	We will be able to provide power to key pump stations during power outages enabling the network to continue operating. The network will be more resilient and less prone to outages.	✓	$330,000	2025 - 2034
Increase storage capacity	The network will be able to handle higher flows or longer periods of outages. The network will be more resilient and less prone to overflows.	✓	$2.9m	2021 - 2031
Maintain status quo	The network will continue to be vulnerable during periods of heavy rain or extended power outages. The risk of overflows will remain as is.	✗	N/A	Not planned
In 2020, we commenced our programme to install emergency storage tanks at strategic places across the network. Without the additional storage, we rely on our maintenance contractors intervening at the right time and being able to remove and transport wastewater away from the pump stations to manage high-level pump station alarms. This is relatively high risk, if the rate of flow exceeds the capacity of the tanker trucks, if the warning time is not sufficient, or if too many pump stations are at risk, overflows are likely. We need to invest in improved storage and backup generators to meet our agreed levels of service and protect public and environmental health.				
Motueka Wastewater Treatment Plant				
Relocate the treatment plant inland	A new plant will be in a locality that is exposed to less risks than the existing site. The new site could also be positioned to provide better connectivity to future growth areas.	✓	$7.4m $73.8m	2028 – 2029 2031 - 2035
Relocate the treatment plant earlier	The risk of coastal erosion and flooding will be mitigated sooner. The useful life of the existing plant will not be fully utilised meaning we will not fully benefit from recent upgrades and expansion.	✗	$7.4m $73.8m	Not planned

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Maintain status quo	The plant will face increasing risks associated with coastal erosion and flooding. The existing consent indicates that the future of the plant does not sit at the current location. Along with this, local iwi and other interested parties wish to see the plant relocated away from the coast. It is therefore unlikely we would be granted a long term consent after the expiry of the current consent.	✖	Nil	Not planned
We are yet to identify a preferred site for the treatment plant and therefore the above cost estimates are indicative only. In 2019, we commenced investigation into alternative sites for the wastewater treatment plant. Potential sites are considered by the working group, which includes representatives from Council, the Nelson Marlborough District Health Board, iwi, and Fish and Game.				

MITIGATING OVERFLOWS

Overflows occur when untreated wastewater escapes from the network into the environment, presenting a risk to public and environmental health. They are also generally offensive to people, especially Māori as it is in conflict with the Te Ao Māori worldview. Overflows can be caused by wet weather due to stormwater inflows which overload the system, or they can occur due to blockages, breaks, power outages, or lack of network capacity. We have already identified inflow and infiltration, and the lack of storage capacity and backup power as causes for overflows. In addressing this key issue, we have considered how best to address the undersized parts of the network which have experienced overflows.

Table 12 summarises the additional options that we have considered in order to reduce the risk of overflows through network capacity improvements.

Table 12: Principal Options to Mitigate Overflows

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Pump station and rising main upgrades throughout: • Golden Bay Network • Māpua Network • Waimea Network* • NRSBU Network	We will be able to provide assets of adequate capacity for the current and future population. The risk of overflows should reduce and the community should experience a higher level of service.	✓	Golden Bay $5.1m Māpua $10.8m Waimea $40.4m NRSBU $82.4m	2021 – 2027 2022 – 2048 2021 – 2037 2021 - 2051
Maintain status quo	The community will need to accept that the risk of overflows remains. We may receive enforcement action due to not addressing preventable overflows. We would need to decline any new requests to connect to the network in problem areas as additional demand will only make the existing situation worse.	✖	N/A	Not planned

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
We must act to mitigate the risk of overflows in order to meet our agreed levels of service and protect the environment. **The Waimea wastewater network capacity upgrades project is a key project required specifically to address both the need to mitigate the risk of overflows and supply growth.*				

SUPPLYING OUR GROWING COMMUNITIES

We expect that over the next 10 years Tasman's population will grow by approximately 7,700 residents. To accommodate this growth new homes need to be built, most of which will need to be supplied with wastewater collection. We can supply some of this new demand through existing infrastructure where capacity is available. New areas of development such as Richmond South, Motueka West and Lower Moutere will require completely new infrastructure in order to collect wastewater from the area. For Brightwater and Wakefield, the existing infrastructure will require upgrading to provide additional capacity.

Table 13 summarises the options that we have considered in order to provide for growth.

Table 13: Principal Options to Enable Community Growth

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Construct new pump stations and rising mains in: • Richmond South • Motueka West • Lower Moutere • Jefferies Growth Area (Brightwater)	We will be able to provide new homes and businesses with wastewater services. This will come at a cost that will need to be recovered through a mix of development contribution charges and rates.	✓	Richmond South: $19.2m Motueka West: $6.0m Lower Moutere: $14.2m Jefferies: $9.0m	2021 – 2042 2021 - 2024 2037 – 2041 2045 - 2049
Upgrade existing pump stations and rising mains in: • Māpua • Brightwater • Wakefield	We will be able to provide new homes and businesses with wastewater services. This will come at a cost that will need to be recovered through a mix of development contribution charges and rates.	✓	Māpua : $10.8m Brightwater & Wakefield: $40.4m*	2022 - 2048 2021 – 2037
Enable low pressure pump systems in infill developments	Low pressure pump systems enable us to better manage existing capacity within our networks. They can pump outside of peak times, and storing wastewater for limited time periods. This means infill development can be enabled without triggering immediate upgrade of main pipes.	✓	$350,000 total over 10 years to contribute to installation of low pressure pump systems in strategic infill areas.	2021 - 2031

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Maintain the status quo	We will not be able to provide new homes and businesses with wastewater requiring them to find alternatives if possible. This is likely to restrict where and when growth can occur.	✘	N/A	Not planned

Enabling construction of new subdivisions will provide homes for our growing population. This is a priority for us. To do this, we have determined that we must provide essential infrastructure. We have planned to implement the above options so that our wastewater network capacity meets the demand created by new homes as they are built. The timing of these upgrades is based on the population projections set out earlier in this Strategy. Implementing these options will help us meet the requirements of the National Policy Statement – Urban Development.

**The Waimea wastewater network capacity upgrades project is a key project required specifically to address both the need to mitigate the risk of overflows and supply growth.*

INDICATIVE EXPENDITURE ESTIMATES

OPERATING

Operational costs for the wastewater activity are forecast to increase by an average of 6.7% per year for the first 10 years, and 3.9% per year over 30 years. Within the first 10 years, the most notable increases occur in direct costs. This is due to an increase in our share of operational costs from the NRSBU. Indirect costs increase primarily due to increasing loan interest costs associated with the capital programme for this activity. On top of this, both direct and indirect expenditure gradually increase due to inflation.

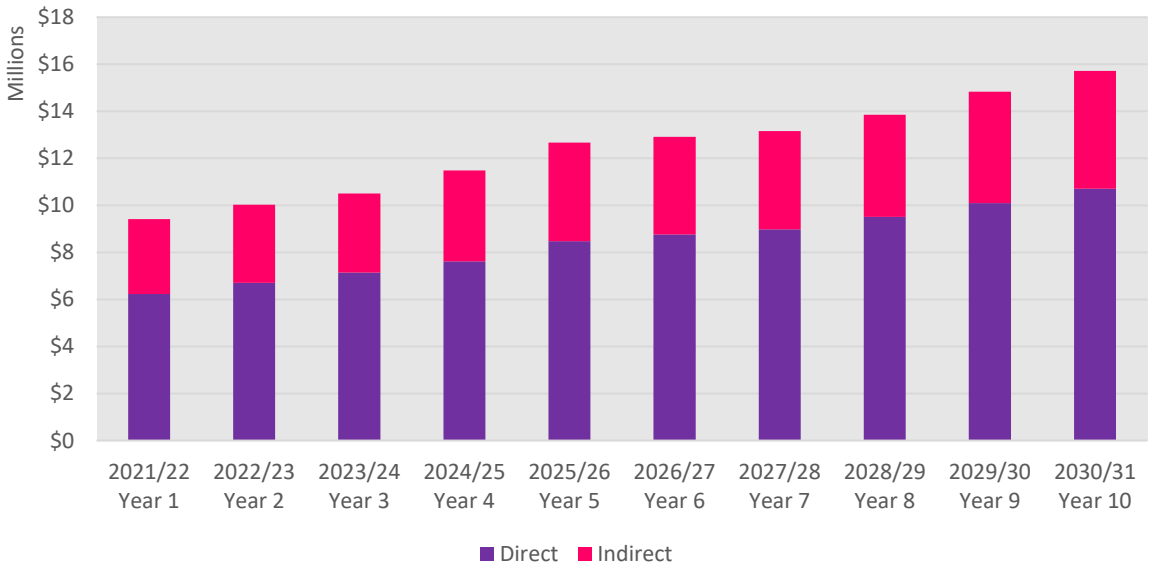


Figure 24: Annual Operating Expenditure for Year 1-10 for Wastewater

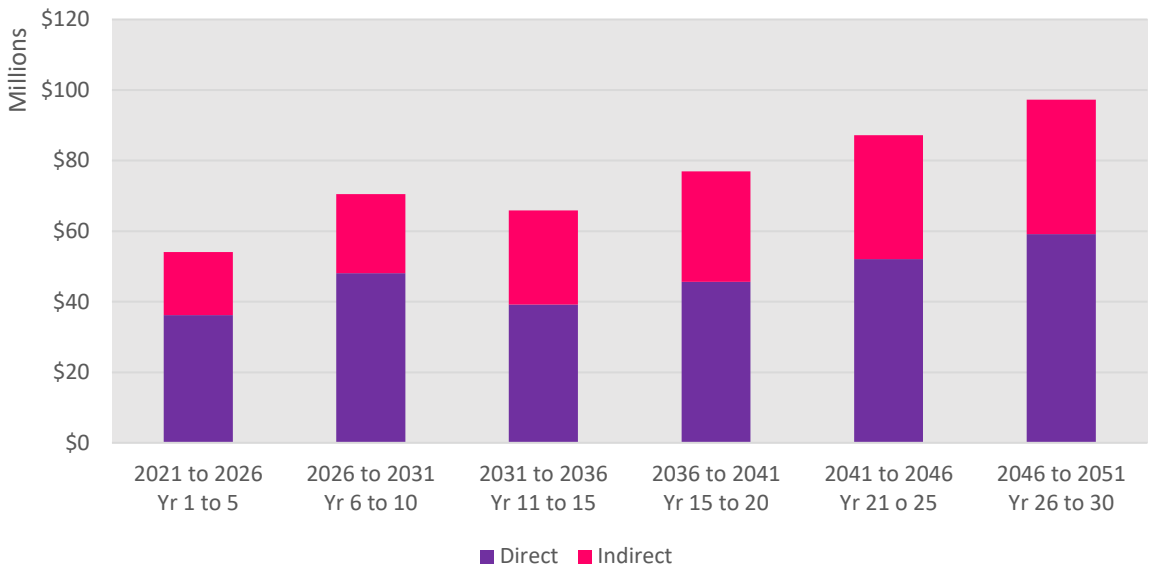


Figure 25: Five Yearly Operating Expenditure for Year 1-30 for Wastewater

CAPITAL

We plan to spend around $104 million on capital improvements over the next 10 years. Of this, 26% is attributable to growth, 45% for level of service improvements and 29% for asset renewal. There is a notable increase in level of service expenditure between Year 11 and 15. This is associated with the construction of the new Motueka wastewater treatment plant.

Over the next 30 years, the total funded capital programme is $372 million.

The Total Funded Capital Programme shown below includes the 10% scope risk and programme delivery adjustment discussed earlier in this Strategy.

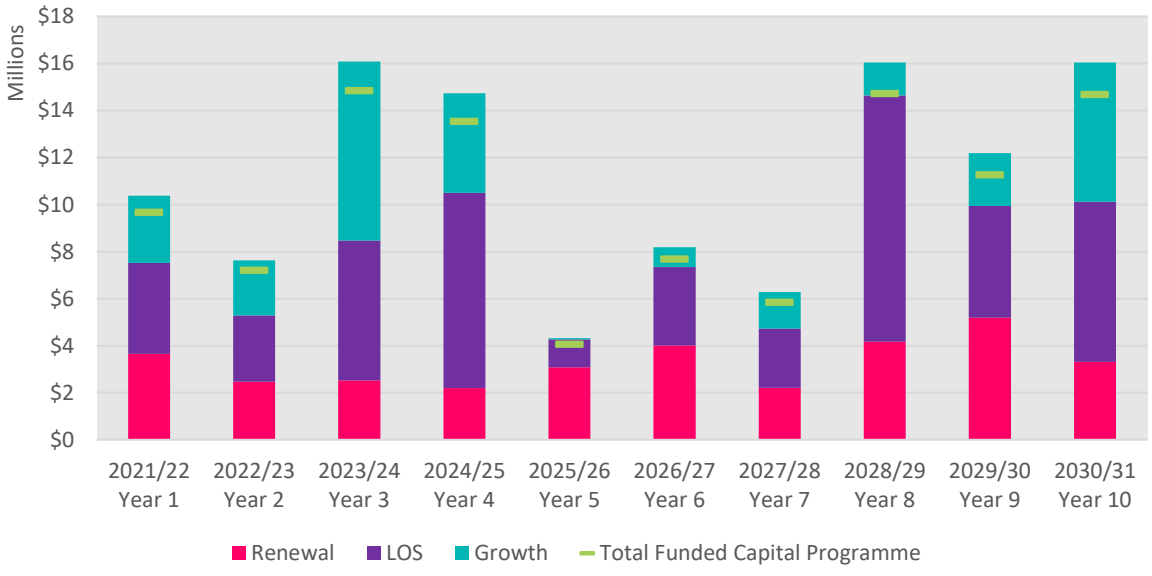


Figure 26: Annual Capital Expenditure for Year 1-10 for Wastewater

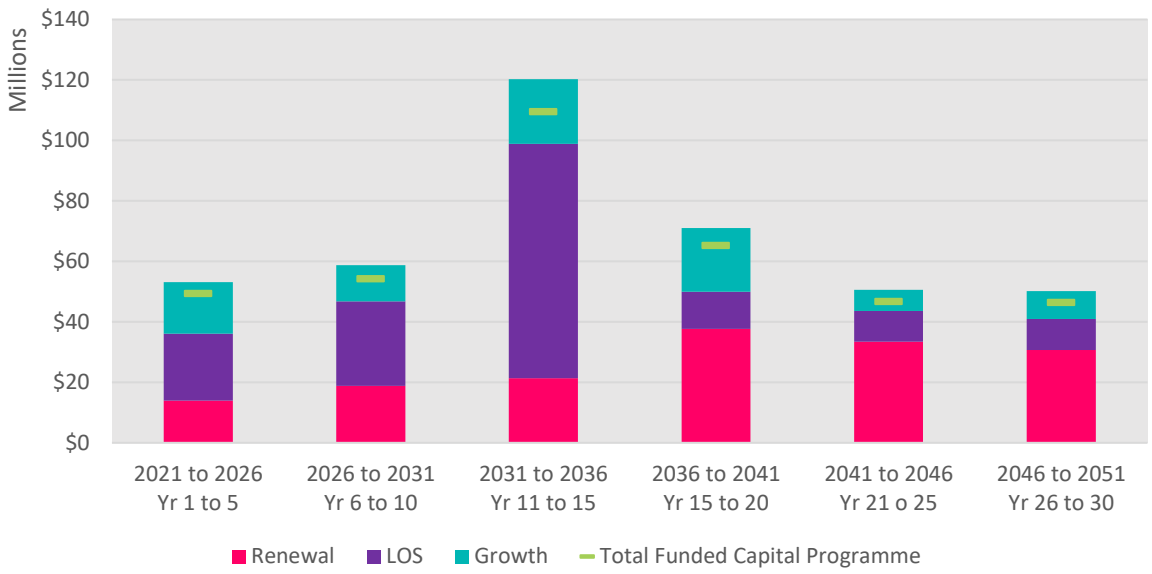


Figure 27: Five Yearly Capital Expenditure for Year 1-30 for Wastewater

ASSET RENEWAL PROFILE

There is a notable difference between planned renewals and forecast depreciation over 30 years. This divergence is mainly due to the long useful life and age profile of our current assets. As shown earlier in Figure 8, most of our wastewater assets are not due for replacement within the next 30 years. As we construct new assets, it will also contribute to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but most don't need replacing within the next 30 years. While not shown here, we have compared the likely renewal requirements for 100 years with depreciation over the same time. This assessment shows that the gap closes in the long-run.

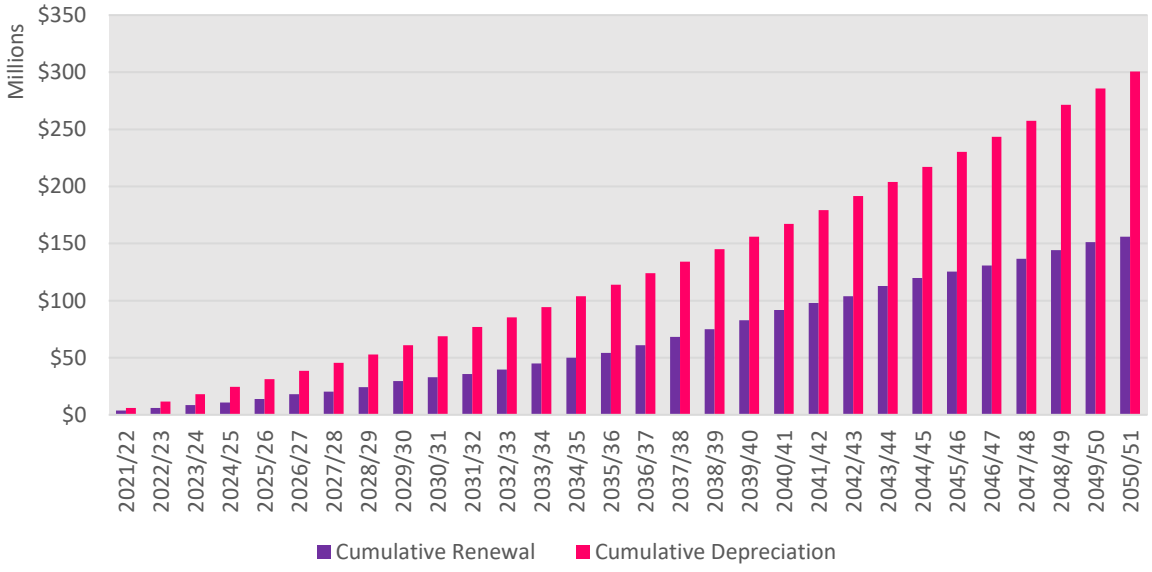


Figure 28: Capital Expenditure and Depreciation for Wastewater

ASSUMPTIONS AND UNCERTAINTIES

In addition to the key assumptions identified earlier in this Strategy, we have identified the following uncertainties and key assumptions that are specific to the wastewater activity.

- As part of the Three Waters Review, the Government is considering reform of the current water service delivery models from council-owned authorities into larger scale multi-regional model providers. How services may be delivered is uncertain. For the development of this LTP, we have assumed no change in service delivery model for our wastewater activity.
- Currently, there are high levels of groundwater and stormwater entering the Motueka wastewater network. This takes up capacity that could otherwise be used by new connections. We have assumed that this issue will be addressed by continued pipe renewals and targeted repairs. We expect that this work will reduce demand enough to be able to provide capacity to support the level of growth predicted for Motueka (excluding Motueka West). It is possible for the works to achieve insufficient capacity, or for the rate of population growth to exceed the rate of repair in this area. If this is the case, we will need to programme additional pipe upgrades to enable growth, or potentially limit the rate and location of new connections.
- We have prepared the wastewater programme based on the information that was available at the time. We have commenced strategic studies and modelling for Motueka and the Waimea networks. This will provide new and up-to-date information that is likely to identify alternative options for the way the schemes could operate, and the associated budget requirements. Initial outcomes of the Waimea network investigations have been incorporated in the recommend upgrade option for the Waimea wastewater network.
- We are uncertain about NRSBU charges because the operational costs are based on the use of individual subscribers and this can be variable. Our budgets are based on historic usage. If usage is different to what was assumed, costs may increase or decrease.
- We increased trade waste charges in July 2018 and 2019. There is some uncertainty about associated income in the future. We assume trade waste volumes and income will be in line with historic usage and budgets.
- We are responsible for maintaining new low-pressure household pumping units (where a complete catchment is set up with pressure pumps). Maintenance largely depends on where and how fast growth occurs. We have assumed maintenance budgets based on growth occurring as per our growth model. If the rate and location of growth changes, we may need to amend maintenance budgets.

FURTHER INFORMATION

Further information on the Wastewater activity can be found in the Wastewater Activity Management Plan. Key capital projects and programmes of work are summarised in the following timeline. You can find the full list of the proposed budgets, projects, and timing in Appendix A and B of the activity management plan.

~~www.tasman.govt.nz/link/wastewateractivitymanagementplan2021-2051~~www.tasman.govt.nz/link/activity-management-plans

TIMELINE OF KEY INFRASTRUCTURE PROJECTS – WASTEWATER

This timeline shows some of the major capital works planned for the next 30 years.

STORMWATER

We aim to provide cost-effective and sustainable stormwater systems that reduce flooding and meet environmental standards. In urban townships, our stormwater systems collect rain water from neighbourhoods, road surfaces, carparks and public spaces through sumps and collection points. Pipes and open drains take the water away, back to its natural destination, which may be land soakage, streams and/or the coast. Over the next 10 years, we plan to spend 10% of our total infrastructure budget on the stormwater activity.

ASSET OVERVIEW

The assets that make up Council's stormwater infrastructure are summarised in Table 14.

Table 14: Stormwater Asset Summary

DESCRIPTION	REPLACEMENT VALUE	DATA RELIABILITY
14,900 property connections	$13.0m	Good
204 km piped stormwater network	$130.9m	Good
30 km of maintained open drains and streams	$5.5m	Good
2,472 manholes	$20.7m	Good
742 sumps	$2.8m	Good
10 detention dams	$1.3m	Good
Other assets e.g. culverts, inlets and outlets	$17.9m	Good

Note: Replacement Valuation as at 1 June 2020

LEVELS OF SERVICE

"We have measures in place to respond to and reduce flood damage from stormwater to property and risk to the community"	*"Our stormwater systems do not adversely affect or degrade the receiving environment"*	*"Our stormwater activities are managed at a level which satisfies the community"*

We plan to invest in improving the capacity of our primary and secondary networks, as well as stormwater treatment to protect the receiving environment. In the short term, we plan to continue development of stormwater models and catchment management plans for all Urban Drainage Areas. Through these strategic plans, we will develop a better understanding of the current and future performance of all of our networks against the agreed levels of service, identify gaps in performance, and programme works to address these gaps.

RESPONDING TO OUR INFRASTRUCTURE PRIORITIES

Further to the overarching infrastructure key issues identified earlier in this Strategy, Council has also identified key issues specific to the stormwater activity that are summarised below. Each of these issues relate back to Council's infrastructure priorities. For each issue, the significant decisions Council is planning to make are outlined, along with the principal options for addressing the issue, estimated costs and timing.

There is a close relationship between each of the issues. Implementing the preferred option for one issue is often likely to help address the other issues to varying degrees. To help simplify the discussion, options have been allocated to the primary reason they have been considered.

In addition to this Strategy we also prepare catchment management plans. Integrated urban catchment management planning is an efficient way of co-ordinating efforts to address multiple stormwater issues (i.e. flood management, freshwater management, aquatic habitat management and amenity values within urban stormwater catchments). We have planned to develop a full suite of urban catchment management plans by 2027. We have completed the first catchment management plan for Richmond, and are in the process of developing the catchment management plan for Motueka. These will be used to inform future versions of this Strategy and our activity management plan for stormwater.

SUPPLYING OUR GROWING COMMUNITIES

We expect that over the next 10 years Tasman's population will grow by approximately 7,700 residents. To accommodate this growth new homes need to be built, most of which will cause changes to the nature of surface water runoff due to permeable areas of ground becoming hard surfaces such as houses and carpark areas. This increases the volume of stormwater that we need to collect and discharge. We can meet this increased demand through existing infrastructure where capacity is available. Where capacity is not available, or if the infrastructure does not exist, we will need to provide upgraded or new infrastructure to enable development to continue. In infill development areas where capacity is limited development can be enabled through on-site detention.

Table 15 summarises the options that we have considered in order to enable growth.

Table 15: Principal Options to Enable Community Growth

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Increase the capacity of the receiving pipes, detention basins, and streams in: • Richmond West • Richmond South • Māpua	We will enable development of new homes and businesses and mitigate the effects of this development on the environment. This will come at a cost that will need to be recovered through a mix of development contribution charges and rates. This work will also reduce the risk of flooding for existing residents.	✓	Richmond West: $12.9m Richmond South: $32.2m Māpua: $4.0m	2021 – 2029 2021 – 2028 2024 - 2034
Contribute to the construction of new stormwater networks in new growth areas: • Motueka West • Motueka South West • Jefferies Growth Area (Brightwater)	We will enable development of new homes and businesses and mitigate the effects of this development on the environment. This will come at a cost that will largely be recovered through development contribution charges.	✓	Motueka West: $5.9m Motueka South West: $26.5m Jefferies: $3.5m	2021 - 2024 2035 – 2041 2041 - 2043
Manage demand from the source through the Tasman Resource Management Plan rules	Using on-site detention developers can partially mitigate the impact of their developments on the stormwater system before it enters our network. Our stormwater network can then be sized accordingly.	✓	N/A	Status quo
Prevent development from occurring	We will not be able to provide for some new homes and businesses. This is will restrict the amount of growth that can occur, particularly in Richmond and Motueka.	✗	N/A	Not planned

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Enabling construction of new subdivisions will provide homes for our growing population. This is a priority for us. To do this, we have determined that we must provide essential infrastructure. We have planned to implement the above options so that our stormwater network capacity meets the demand created by new homes as they are built. The timing of these upgrades is based on the population projections set out earlier in this Strategy. Implementing these options will help us meet the requirements of the National Policy Statement – Urban Development and our Future Development Strategy.				

MITIGATING FLOOD RISKS

Some of Tasman's stormwater pipes and streams are too small to cope with the intense rainfall events experienced over the past few years and do not meet current design standards. During intense rainfall events, there tends to be nuisance surface water flooding and sometimes people's homes and businesses are flooded. It is impossible for us to eliminate all flooding so we have to set appropriate intervention levels.

Flood events and design capacity are often referred to as Annual Exceedance Probability (AEP) e.g. a 1% AEP flood event has a 1% chance of occurring in anyone year. This is sometimes referred to as a 100-year event. The design standard for the primary flow network is 10% AEP and the secondary flow network is 1% AEP. Generally, we plan to intervene when habitable floors are at risk of being flooded.

Table 16 summarises the options that we have considered in order to mitigate surface water flood risks.

Table 16: Principal Options to Mitigate Surface Water Flood Risks

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Increase the capacity of the receiving pipes and streams	The stormwater network will be upgraded over time to provide the agreed levels of service. This will reduce the risk of homes and business being flooded by stormwater runoff.	✓	$37.6m	2025 - 2046
Protecting secondary flow paths	We will manage secondary flow paths in a proactive manner so that they are available when the primary network is overwhelmed. Residents will understand the function and importance of secondary flow paths.	✓	$10.8m	2021 - 2051
Maintain status quo	Known areas of flooding will not be addressed and residents will continue to be exposed to flood risks.	✗	N/A	Not planned
Protecting people and their homes is a priority. Through the agreed stormwater levels of service, we aim to prevent habitable floors from being flooded. It is inappropriate to maintain the status quo as this would not address known issues.				

EFFECTS ON THE ENVIRONMENT

It has long been recognised that stormwater runoff is a predominant contributor to water quality and stream and coastal ecosystem health. The potential adverse effects associated with stormwater discharges can be divided into 'quality' and 'quantity' effects.

The 'quality' effects stem from the fact that urban land uses such as roads, carparks, industrial zones and certain building materials generate contaminants that are picked up by stormwater runoff. They then accumulate in fresh water and marine water receiving environments where they have an adverse effect on ecosystems. The main contaminants of concern are sediments, heavy metals and hydrocarbons. Urban runoff and concrete or rock lined stormwater channels may also lead to increased water temperature which has a detrimental effect on stream life.

The 'quantity' effects stem from the fact that urbanisation leads to increased areas of impervious surface which in turn leads to a decrease in groundwater recharge and increased stormwater runoff. The effect of reduced groundwater recharge leads to reduced base flows in streams especially during dry periods. On the other hand, the increased runoff leads to higher flow velocities that can cause scour and streambank erosion. We control these types of effects through implementation of the joint Nelson Tasman Land Development Manual and the Tasman Resource Management Plan (TRMP). For this reason, infrastructure interventions have not been considered below.

Table 17 summarises the options that we have considered in order to mitigate the effects of stormwater on the environment.

Table 17: Principal Options to Manage the Effects of Stormwater on the Environment

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Implement demand management measures at the source through TRMP rules	Demand management measures implemented at the source reduce the impact on the receiving environment and requires less intervention by Council within the remainder of the public stormwater network.	✓	N/A – private cost	Status quo
Installation of stormwater treatment devices and construction of treatment wetlands	Stormwater runoff can be treated at key locations which generate high levels of contaminants, e.g. busy road intersections. Wetlands located in strategic areas will help remove contaminants from the stormwater runoff prior to discharging into the receiving environment.	✓	$4.0m	2022 - 2051
Interventions to improve water quality and stream health at Lake Killarney in Takaka	Stormwater runoff will be adequately managed before entering Lake Killarney.	✓	$2.0m	2027 - 2029
The National Policy Statement for Freshwater Management requires us to maintain or improve the overall quality of freshwater. We need to ensure that the effects of development on the environment are mitigated.				

CLIMATE CHANGE

NIWA has predicted the anticipated effects from climate change in Tasman District to include:

- an increase in seasonal mean temperature and high temperature extremes
- an increase in rainfall in winter for the entire District and varying increases of rainfall in other seasons in different areas
- increased rainfall intensity
- rising sea levels, increased wave height and storm surges, and
- floods, landslides, droughts and storm surges are likely to become more frequent and intense.

These effects of climate change will put further strain on the already limited capacity of our stormwater networks. Discharging stormwater from coastal communities will become increasingly difficult during high tides and will result in more frequent flooding. In other areas, the increase in rainfall will lead to stormwater networks reaching their capacity sooner and the need to better manage overland flowpaths to avoid flooding of properties.

We have not planned to specifically respond to climate change in isolation from the other issues discussed above. Instead, we will consider and address the effects of climate change when upgrading, replacing or extending our networks. Climate change factors will be incorporated into project designs to ensure infrastructure is future-proofed.

INDICATIVE EXPENDITURE ESTIMATES

OPERATING

Operational costs for the stormwater activity are forecast to increase by an average of 3.6% per year over the next 30 years. Direct operational costs are almost static for the duration of the 30 years, with increases largely due to inflation. Indirect costs increase on average 5.2% per year over the next 30 years, largely due to varying loan interest costs and depreciation associated with the capital programme for this activity.

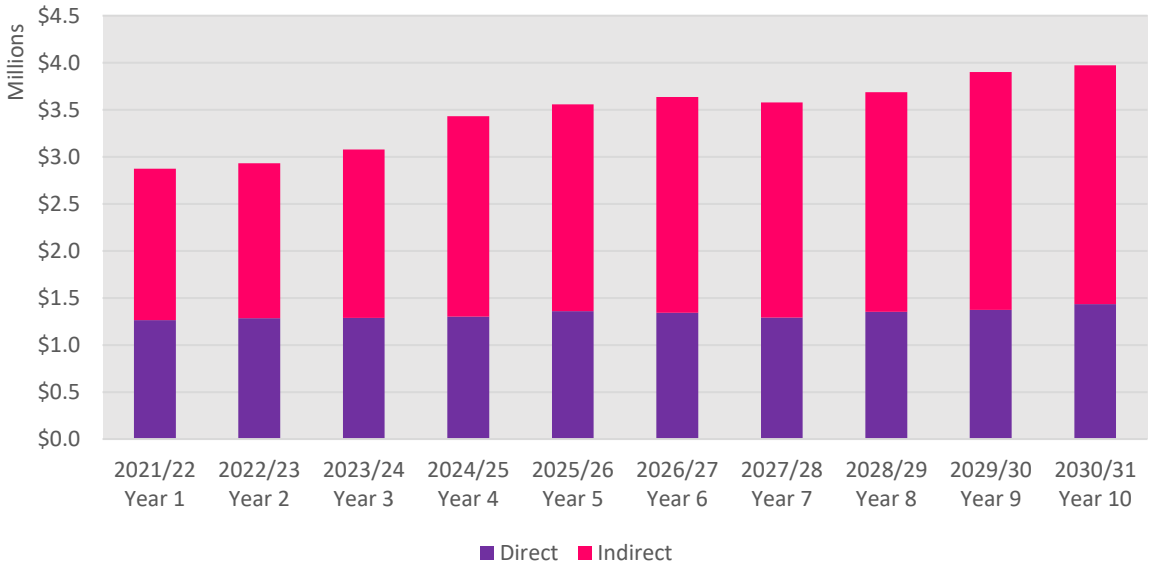


Figure 29: Annual Operating Expenditure for Year 1-10 for Stormwater

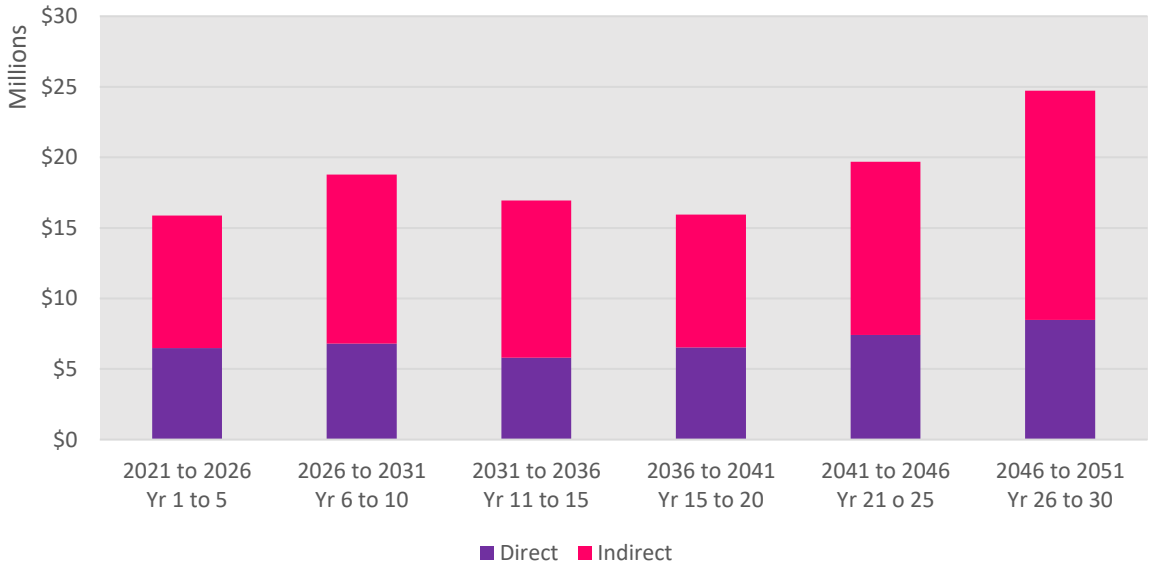


Figure 30: Five Yearly Operating Expenditure for Year 1-30 for Stormwater

CAPITAL

We plan to spend around $63 million on capital improvements over the next 10 years. Of this, 54% is attributable to growth, 45% for level of service improvements and 1% for asset renewal. Our stormwater assets are long life and are relatively young. This means that there is almost no asset renewal requirements over the next 30 years.

For the first 10 years, we have planned to undertake stormwater improvements with a focus on increasing capacity to cater for growth. After that, the focus shifts to improving levels of service. There is a notable increase in level of service expenditure between Year 26 and 30. This is caused by a large project aiming to reduce the risk of stormwater flooding in Motueka.

We will identify the need for further works through the catchment management plan process. It is likely that these works will be added to the programme after completion of the catchment management plans.

Over the next 30 years, the total funded capital programme is $203 million.

The Total Funded Capital Programme shown below includes the 10% scope risk and programme delivery adjustment discussed earlier in this Strategy.

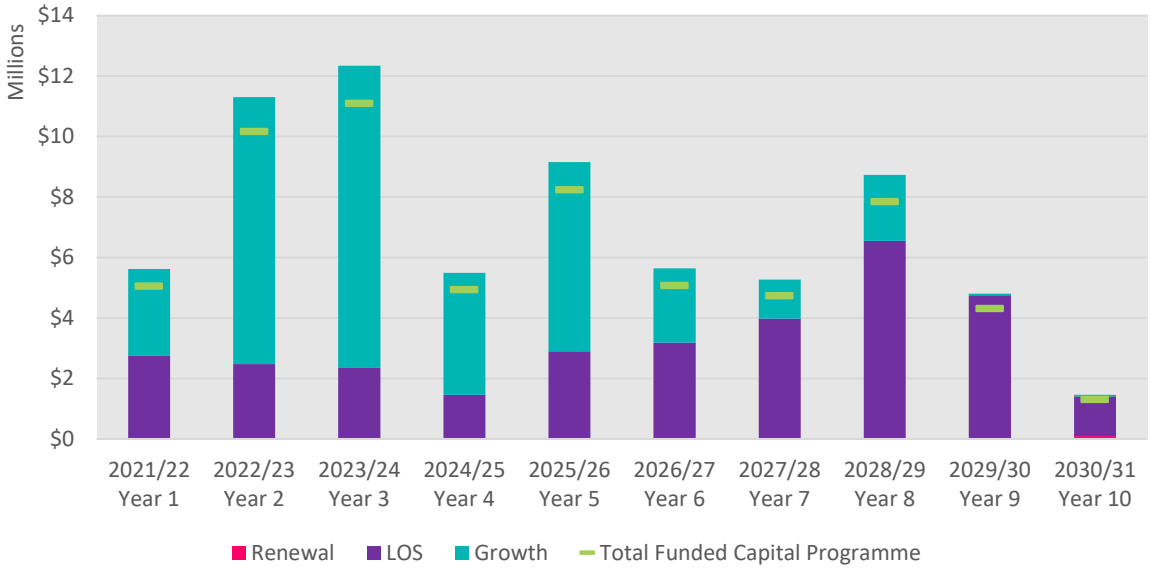


Figure 31: Annual Capital Expenditure for Year 1-10 for Stormwater

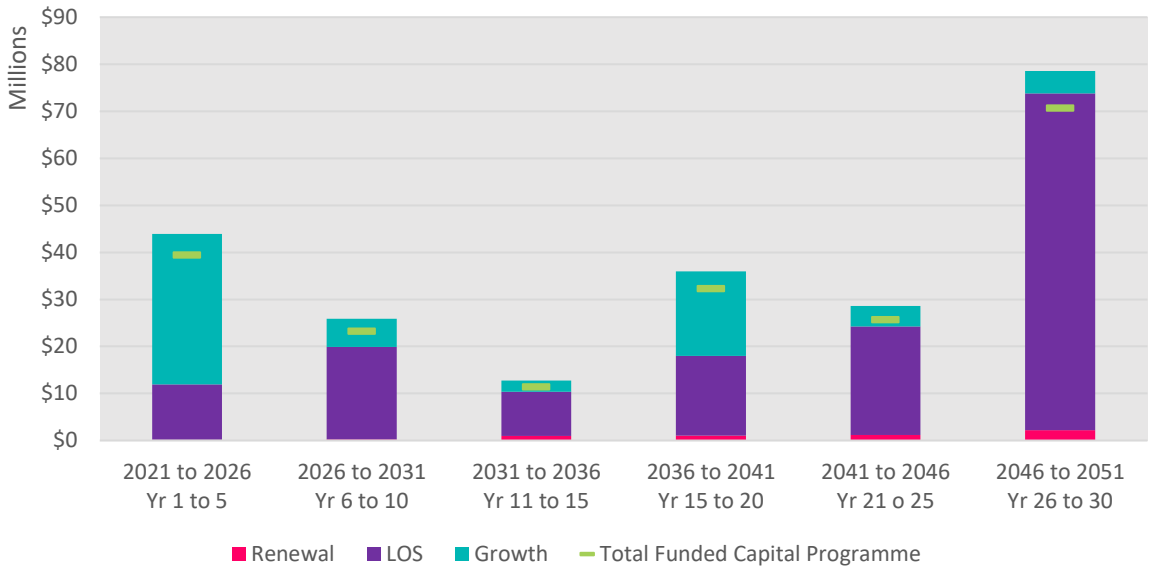


Figure 32: Five Yearly Capital Expenditure for Year 1-30 for Stormwater

ASSET RENEWAL PROFILE

There is a significant difference between planned renewals and forecast depreciation over 30 years. This divergence is due primarily to the long useful life and age profile of our current assets. As shown earlier in Figure 9, most of our stormwater assets are not due for replacement within the next 30 years. As we construct new assets, it will also contribute to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but most don't need replacing within the next 30 years. While not shown here, we have compared the likely renewal requirements for 100 years with depreciation over the same time. This assessment shows that the gap closes in the long-run.

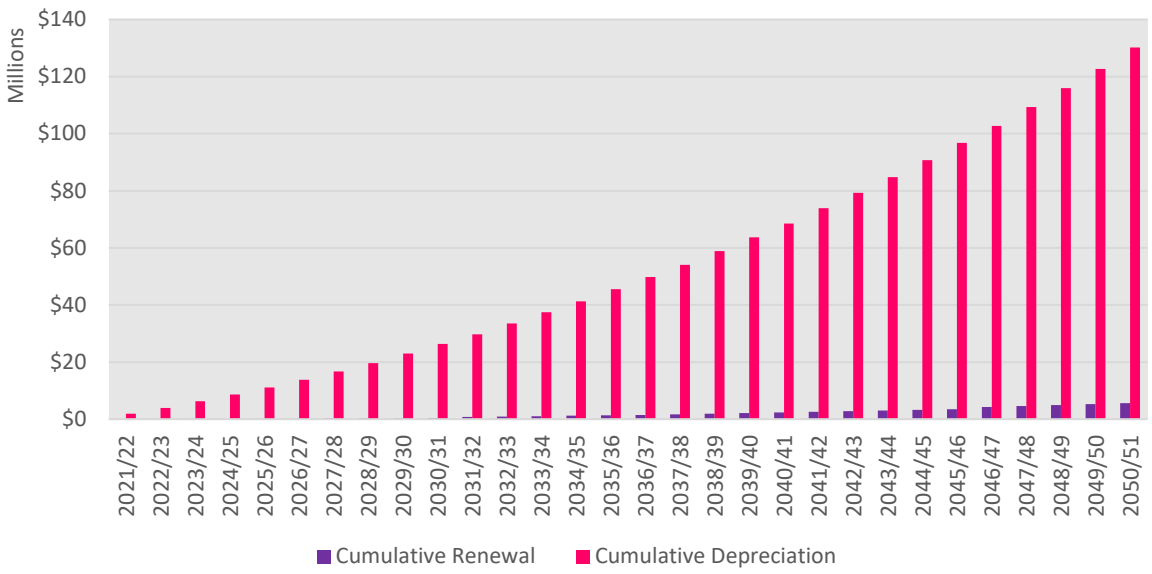


Figure 33: Capital Expenditure and Depreciation for Stormwater

ASSUMPTIONS AND UNCERTAINTIES

In addition to the key assumptions identified earlier in this Strategy, Council has identified the following uncertainties and key assumptions that are specific to the stormwater activity.

- We plan to continue developing and analysing stormwater models to gain a better understanding of the flood risks in the District. Stormwater models aim to simulate potential real-life flood scenarios. The model predictions provide an indication to us about what could happen, not what will happen. We consider model predications together with local knowledge and monitoring data to select most likely scenarios. If the conclusions are incorrect, we may need to reconsider the scope of projects included in its stormwater programme.
- Extreme rainfall events and associated flood impacts can happen at any time and their occurrence may differ from what we expect. We develop stormwater management strategies, plans and designs for events that have a 1% - 10% probability of occurring in any one year. When large events happen more frequently, this may trigger higher expectations from our community to provide a higher level of service. This requires more funding than has been budgeted for.
- We have prepared the stormwater programme based on information that was available at the time. Over the next few years, we plan to do more modelling and prepare catchment management plans. This will provide new and up-to-date information. This information will likely highlight the need for additional intervention, and we may need to plan further improvements and additional funding.
- Timing of growth-related projects is based on current assumptions within our growth model. The actual rate of development in our District will determine when projects and upgrades are required to meet demand. The uncertainty around timing of growth-related projects is a risk, especially for development in Richmond West and South, Motueka West, and Māpua.

FURTHER INFORMATION

Further information on the Stormwater activity can be found in the Stormwater Activity Management Plan. Key capital projects and programmes of work are summarised in the following timeline. You can find the full list of the proposed budgets, projects, and timing in Appendix A and B of the activity management plan.

~~www.tasman.govt.nz/link/stormwateractivitymanagementplan2021-2051~~www.tasman.govt.nz/link/activity-management-plans

TIMELINE OF KEY INFRASTRUCTURE PROJECTS – STORMWATER

This timeline shows some of the major capital works planned for the next 30 years.

TRANSPORTATION

We provide roads, footpaths, cycleways, carparks, public transport and associated infrastructure in order to enable safe and efficient movement of people and goods throughout the District. Over the next 10 years, we have planned to spend 33% of our total infrastructure budget on the transportation activity.

ASSET OVERVIEW

The assets that make up our transportation networks are summarised in Table 18.

The asset inventory data for traffic facilities, traffic signs and retaining walls are of variable reliability. This is because some of the data is estimated. This is not a significant concern for us as almost all of these assets are above ground and can easily be inspected. Inventory data for these assets will improve over time as they are replaced and new information is collected.

Table 18: Transportation Asset Summary

DESCRIPTION	REPLACEMENT VALUE	DATA RELIABILITY
1,751 km of roads including 968 km of sealed roads and 952 km of unsealed roads	$482m	Good
538 bridges including footbridges	$154m	Good
293 km of footpaths and 19 km of walkways	$45m	Good
140 km of Tasman's Great Taste Trail	$14.8m	Good
26 off street carpark areas	$1.9m	Good
10,381 culverts with a total length of 102 km	$124m	Good
4,067 sumps and catch pits	$20.9m	Good
1,690 km of surface water channels	$37.3m	Good
3,198 streetlights	$8.5m	Good
Other assets including signs, retaining walls and traffic facilities	$17.8m	Poor to Good

Note: Replacement Valuation as at 30 June 2020

LEVELS OF SERVICE

"Our transportation network is becoming safer for its users."	*"Our transportation network enables the community to choose from various modes of travel."*
"Our transportation network is maintained cost effectively and whole of life costs are optimised."	*"The travel quality and aesthetics of our transportation network is managed at a level appropriate to the importance of the road and satisfies the community's expectations."*

We have incorporated a new performance measure that measures resident's perception of safety for the different modes of of transport. Knowing how safe people feel when they chose to drive, ride or walk is an important factor in understanding our transport networks and how people interact with them and use them.

We have changed the targets for the number of people cycling and using public transport to be an increase in the number of people per capita per year. Our aim is to see more people choosing to cycle or use public transport instead of relying on traditional car transport.

We have also budgeted to increase the amount of road resurfacing we undertake in order to minimise whole of life costs across the network.

RESPONDING TO OUR INFRASTRUCTURE PRIORITIES

Further to the overarching infrastructure key issues identified earlier in this Strategy, we have also identified key issues specific to the transportation activity that are summarised below. Each of these issues relate back to our infrastructure priorities. For each issue, the significant decisions we plan to make are outlined, along with the principal options for addressing the issue, estimated costs and timing.

There is a close relationship between each of the issues. Implementing the preferred option for one issue is often likely to help address the other issues to varying degrees. As an example, active and public transport are also used to address growing communities and, likewise, road upgrades incorporate walking, cycling and public transport facilities. To help simplify the discussion, options have been allocated to the primary reason they have been considered.

SUPPLYING OUR GROWING COMMUNITIES AND TRAFFIC CAPACITY

We expect that over the next 10 years Tasman's population will grow by approximately 7,700 residents. All of these people will need access to different forms of transport in order to travel for work, education, recreation and essential services. This access will place increasing demand on our transportation network.

We have recently completed a Network Operating Framework (NOF) for Richmond with the Waka Kotahi (NZ Transport Agency) and Nelson City Council, and are now developing a programme business case. The NOF and programme business case consider the current and future state of the transportation network and how it should operate to meet the needs of the community. Through this process, we have identified areas of the network that need to be improved or optimised in order to be fit for purpose. A key area of concern is State Highway 6 between the Richmond Aquatic Centre and Three Brothers Corner. We do not own or operate the state highways, but they have a significant impact on the function and performance of our local road network that relies on state highways for connectivity. Waka Kotahi is responsible for state highways and it is important that we work closely with it to address issues that affect Tasman residents.

Table 19 summarises the options that we have considered in order to provide for growth.

Table 19: Principal Options to Enable Community Growth

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Upgrade road carriageways and intersections to meet increasing road user needs	The network will be fit for current and future users. The timing of upgrades will be such that we make the most of existing infrastructure and it is not prematurely replaced. This will come at a cost that will mainly be funded by development contributions.	✓	$61.4m	2021 - 2040
Undertake the upgrades over a shorter period of time within the next 10 years	Existing users will experience a higher level of service as the road carriageways will be upgraded ahead of the expected traffic growth. Compressing the timeframe will put substantial pressure on both our financial and delivery resources.	✗	$61.4m	Not planned

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Do not undertake upgrades	The level of service will slowly decline for all road users. It is likely that traffic delays will increase. Intersections will be insufficient for future traffic volumes and the crash risk in these locations is likely to increase.	✖	Nil	Not planned
Work proactively with Waka Kotahi to identify options to address traffic congestion on State Highway 6	Working collectively we can plan a co-ordinated and 'one network' approach to improvements that improve the performance of the road network and future proof it for increasing traffic volumes.	✓	Nil	Ongoing
Transportation networks are able to absorb traffic growth without immediately requiring upgrades to maintain levels of service. There will be a point in which traffic delays become unacceptable or crash risks are deemed to be too high. We have timed the upgrades to make the best use of existing assets at the same time as managing levels of service within an adequate range. Undertaking this work will help us meet the requirements of the National Policy Statement – Urban Development. Tasman residents view the road network as one, regardless of whether it is state highway or a local road. It is important that we work closely with Waka Kotahi to identify solutions and address issues so that we avoid unfavourable outcomes when working independently.				

ENABLING ACTIVE AND PUBLIC TRANSPORT

We want to enable more people to choose to walk, cycle and/or use public transport as a form of transport. Providing high quality and safe footpath and cycleway networks, along with a reliable public transport service, will encourage more people to change their travel habits.

If more people choose alternatives to traditional car transport it will have a positive impact on community and environmental health, and contribute to easing or preventing further traffic congestion.

Table 20 summarises the options that we have considered in order to provide for a changing population.

Table 20: Principal Options to Enable Active and Public Transport

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Public Transport				
Extend the existing Nelson-Richmond route to provide better frequency and coverage of Richmond including construction of a new off street bus terminus • New routes added in 2023 • Extended service timetable in 2026 • Increased bus frequency in 2029	Bus users within Richmond will have better access to services making it a more viable commuting option for some people.	✓	Terminus $1.7m Bus Services: $34.3m total over 30 years	2026 - 2028 Ongoing

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Extend public transport services to Wakefield and Motueka • New bus service morning and evening weekdays from 2023 • Increased to all day service weekdays from 2027 • Increased to full week service from 2030	Residents in Brightwater, Wakefield and Motueka will have more transport options.	✓	$17.4m total over 30 years	Ongoing
Maintain the status quo	The service will remain in place. New users may be discouraged from using the service as the route coverage is inadequate for them.	✗	$170,000 per year uninflated	Not planned
In addition to the above, in August 2020 we also introduced a bus service that provides connection within Richmond and a link with the routes that travel into Nelson. This service was procured through Nelson City Council's existing bus services contract to ensure that there would be a seamless connection for users. In July 2019, a not for profit community trust started running a public transport service between Wakefield and Richmond. This initially started as one service one day a week, but is growing and now provides two services per week with additional services under development. The trust also has a service for Māpua residents. Another trust runs a service within and from Golden Bay to Nelson for medical appointments.				
Pedestrian Facilities				
Construct new footpaths	We will continue to improve the footpath network by closing gaps, widening footpaths, and building footpaths in new areas. Residents will have improved walking access.	✓	$26.1m	2021 – 2051
Renew existing footpaths	We will maintain the existing network in adequate condition. As footpaths become rough and in poor condition they will be replaced.	✓	$11.7m	2021 - 2051
Do not construct new footpaths, or renew existing footpaths	Walking access will not improve. Narrow footpaths and gaps in the network will remain. The condition of footpaths across the network will deteriorate, creating tripping hazards and affecting safety.	✗	Nil	Not planned
Our level of service relating to footpaths states that we will maintain 95% of the footpath network in average condition or better. The preferred options and cost estimates are based on enabling us to achieve this target.				

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Cycleway Networks				
Install low intervention, buffered, on-road cycle lanes	Safer cycling routes will exist on strategic routes, encouraging more people to choose cycling as a form of transport.	✓	$7.4m	2021 - 2039
Construct protected, separated cycle lanes	Primary cycle routes will be formed with a much higher level of safety, encouraging more people with wider ranging cycling ability to choose cycling as a form of transport.	✓	$14.8m	2024 - 2030
Shared roads within town centre areas	Safer cycling routes will exist on strategic routes within town centres, encouraging more people to choose cycling as a form of transport. An associated benefit will be an offset in the demand for car parking.	✓	$6.2m	2025 - 2031
Do not extend the cycle way network	Cycling facilities will not improve. New user may be discouraged from cycling if the view the network as unsafe or unsuitable.	✗	Nil	Not planned
The cycle network will be rolled out in stages. Initially, cycle lanes will be created by demarcating a section of the existing road using painted lines. This will allow faster delivery of cycleways around the District. These painted cycle lanes will be upgraded using barriers to separate vehicle lanes from cycle lanes. Cycle routes that pass through town centre areas will become shared zones which slow the traffic speeds to make it safer and easier for cyclists.				

NETWORK INTEGRITY

The road network in Tasman is generally maintained to a good condition. A key aspect of our maintenance regime is keeping the waterproof seal in good condition, in order to keep the pavement dry. Doing this limits degradation associated with water ingress. We have many relatively weak pavements, making this approach crucial to their longevity.

Over the period from 2013/2014 to 2019/2020, we made savings in our road renewal programme to help enable us to remain within our set debt limits in the short term. The road renewal programme was reduced accordingly, on the basis that this was only a short-term tactic and the programme would need to be returned to at least the previous levels. This reduction in renewals has happened at a time when commercial vehicles were getting heavier through the introduction of High Productivity Motor Vehicles (HPMV) and commercial vehicle numbers were significantly growing. Additionally, the drainage network was deteriorating faster than originally anticipated.

Table 21 summarises the options that we have considered in order to maintain network integrity and condition.

Table 21: Principal Options to Maintain Network Integrity

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Increase investment in road surfacing, pavement and drainage renewal	The road network should remain in a similar condition to as it is now. Future users are likely to experience the same level of service as current users.	✓	$268m	2021 - 2051

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Maintain existing investment levels	The condition of the road network is likely to deteriorate in the long term. Future users are likely to be impacted and maintenance costs are likely to increase.	✖	Approx. $190m	2021 - 2051
We have planned to renew our road pavements in an optimised way that takes into account the increased wear and tear from more and heavier vehicles. By doing this, we will ensure that current and future users experience similar levels of service.				

INDICATIVE EXPENDITURE ESTIMATES

The following graphs summarise the total cost of the transportation activity. The true cost to Council will be less than this, as Council receives 51% subsidy from Waka Kotahi for its subsidised transport programme. The subsidy applies to most operating and maintenance activities and some capital improvements.

OPERATING

Operational costs for the transportation activity are forecast to increase by around 4.0% per year for the first 10 years, and 5.0% per year over 30 years.

For the first three years, there are increases in the direct costs associated with sealed pavement maintenance and public transport. After that, there are increases in the public transport budgets in Year 7 and Year 9 associated with planned improvements to bus services.

Within the first 10 years, indirect costs increase more significantly due to loan interest and depreciation costs associated with changes in the capital programme for this activity. These increases are less notable in the following 20 years.

Both direct and indirect costs increase due to inflation across the 30 years.

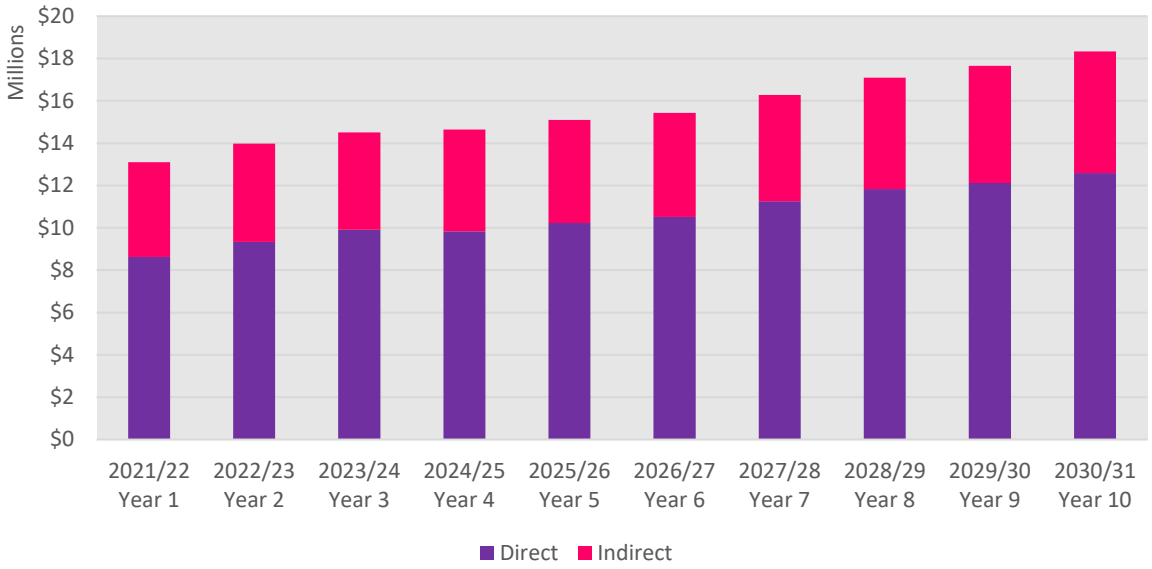


Figure 34: Annual Operating Expenditure for Year 1-10 for Transportation

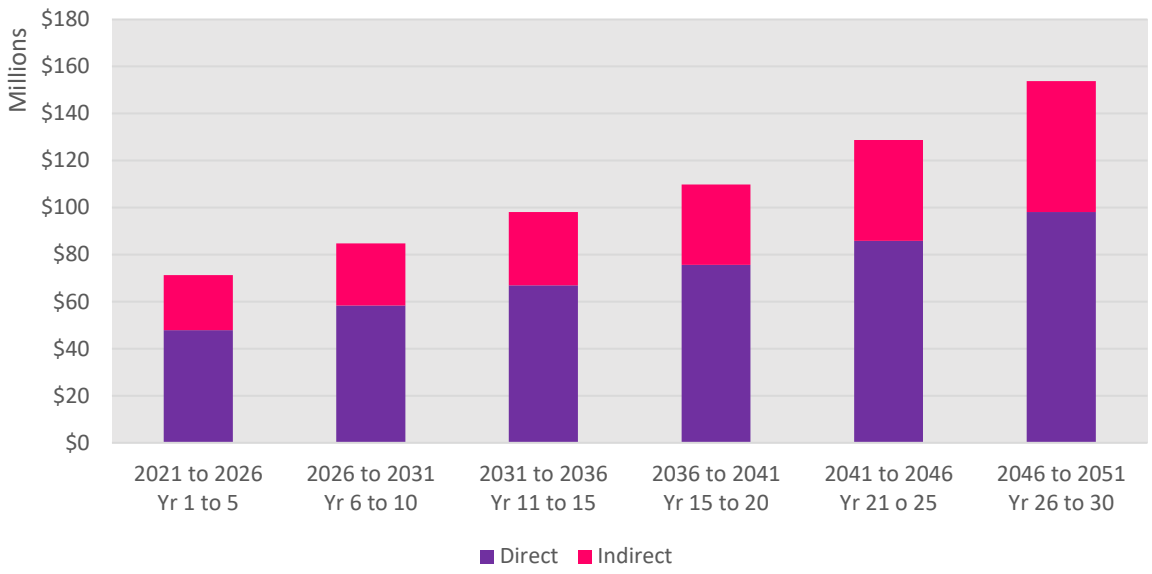


Figure 35: Five Yearly Operating Expenditure for Year 1-30 for Transportation

CAPITAL

We plan to spend around $164 million on capital improvements over the next 10 years. Of this, 13% is attributable to growth, 26% for level of service improvements and 61% for asset renewal. Our clear priority for the transportation activity is to maintain the road network in a good condition, which requires a steady investment in road renewal.

Figure 36~~Figure 36~~ shows that our capital investment is primarily for renewal and that this investment is steady for the next 30 years, only increasing due to inflation.

In Years 7 to 10, there is a notable increase in growth and level of service expenditure. The level of service increase is due to an increase in investment in active transport projects. The growth increase is due to a number of planned intersection and road upgrades in Richmond West.

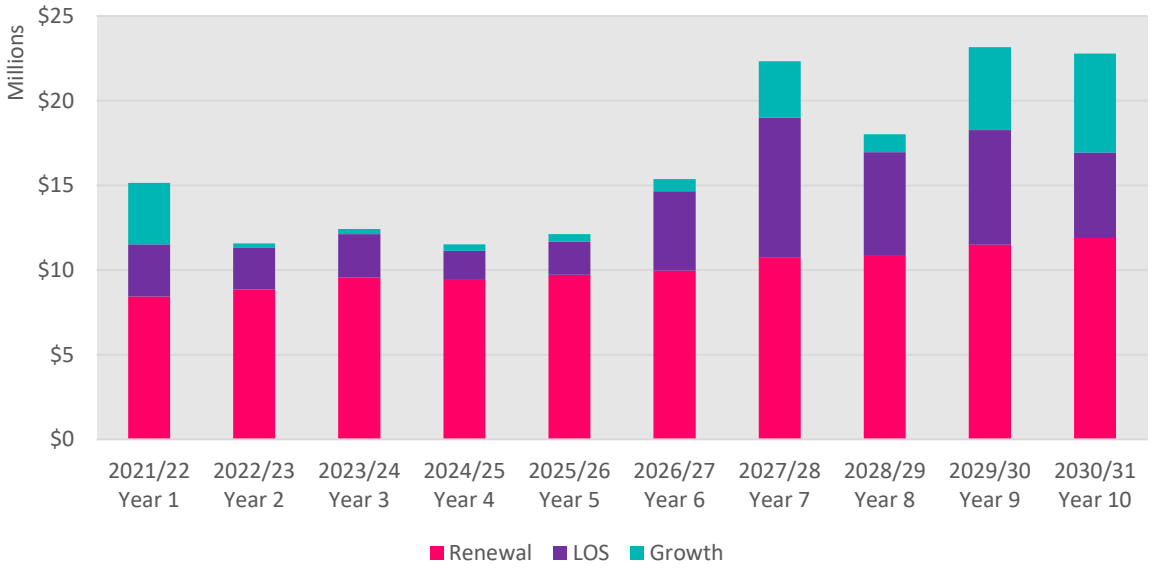


Figure 36: Annual Capital Expenditure for Year 1-10 for Transportation

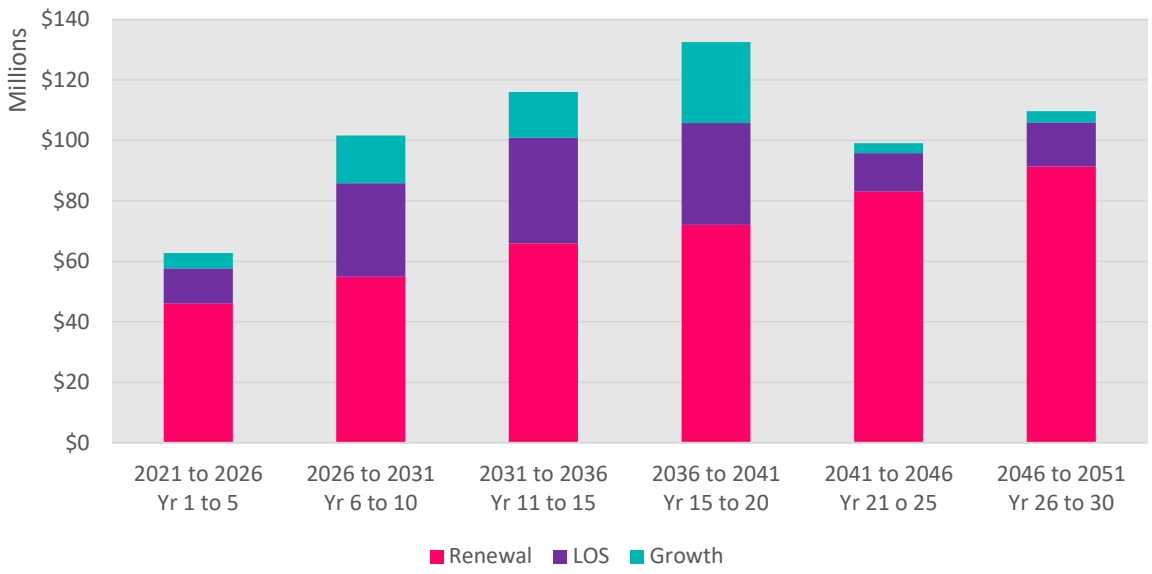


Figure 37: Five Yearly Capital Expenditure for Year 1-30 for Transportation

ASSET RENEWAL PROFILE

We have planned a steady base of renewals for the next 30 years. Our base programme includes a high proportion of assets that have relatively short useful lives, between 10 and 20 years. Bridges are an exception to this as their useful life is typically 100 years and most of our bridge assets are not due for renewal within the next 30 years.

There is divergence between renewal investment and depreciation from Year 1, increasing through to Year 30. This divergence is partly due to the age profile of our current bridge assets. As shown earlier in Figure 6~~Figure 6~~, most of our bridges are due for renewal beyond Year 30. We have undertaken a simple exercise to compare indicative renewal requirements for 100 years with depreciation over the same time. This exercise showed that the gap between renewal and deprecation closes as the bulk of the assets reach the end of their useful life. We also use deterioration modelling to determine optimised renewal investment levels. Our modelling takes into account asset condition and traffic volumes as well, neither of which are incorporated in our depreciation estimates.

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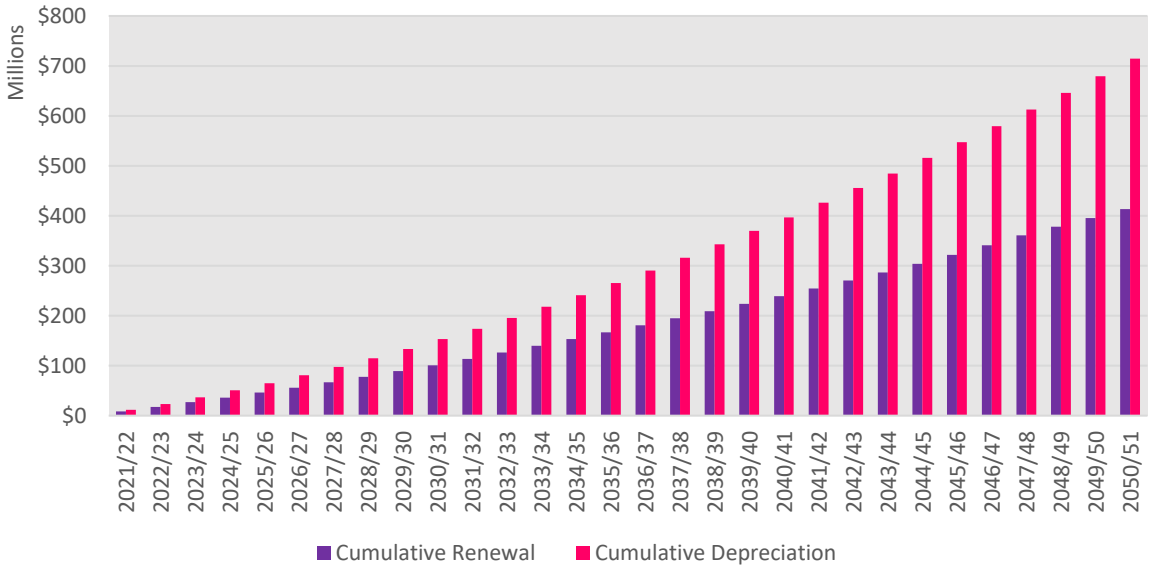

Figure 38: Capital Expenditure and Depreciation for Transportation

ASSUMPTIONS AND UNCERTAINTIES

In addition to the key assumptions identified earlier in this Strategy, Council has identified the following uncertainties and key assumptions that are specific to the transportation activity.

- We cannot predict when and where flood or coastal inundation/erosion events will occur, or the damage that may be sustained during these events. During large events, there is a risk that roads can be washed out or blocked by slips and debris. We have annual budgets for clean-up and repair which should be sufficient for most events. We also have an emergency fund to cover the costs associated with more significant damage. We have assumed that if these events occur, that there will be enough funds available to undertake repairs, whether it is through accessing budgeted funds, reprioritisation of other maintenance activities, or increasing borrowing.
- As at January 2021, we had not received confirmation that we would receive the full amount of funding applied for from the Waka Kotahi. We assume we will receive the full funding request. If full funding is not granted, we may need to fully fund a small portion of the programme from rates, or reduce the scope of the programme so that it aligns with the level of funding given.
- Until now, self-drive vehicles have been the main form of transport throughout our District. In recent years, significant investment has been made in new technologies that have potential to change how vehicles operate, and the demands that they may place on the road network. In future, it is likely that driverless automated vehicles become commonplace. We assume that these changes in technology will not significantly impact the way the transportation network functions within the period of this Strategy.

FURTHER INFORMATION

Further information on the Transportation activity can be found in the Transportation Activity Management Plan. Key capital projects and programmes of work are summarised in the following timeline. You can find the full list of the proposed budgets, projects, and timing in Appendix A and B of the activity management plan.

~~www.tasman.govt.nz/link/transportationactivitymanagementplan2021-2051~~www.tasman.govt.nz/link/activity-management-plans

TIMELINE OF KEY INFRASTRUCTURE PROJECTS – TRANSPORTATION

This timeline shows some of the major capital works planned for the next 30 years.

RIVERS

We maintain 285 km of major rivers in order to carry out our statutory role of promoting soil conservation and mitigating damage caused by floods and riverbank erosion. By implementing and maintaining quality river control and flood protection schemes, we improve protection of public spaces and assets as well as private property. Over the next 10 years, we plan to spend 6% of our total infrastructure budget on the rivers and flood control activity.

ASSET OVERVIEW

The assets that make up our rivers infrastructure are summarised in Table 22. We did not undertake an asset revaluation in 2020. It will be undertaken in 2021 instead.

Table 22: Rivers and Flood Control Asset Summary

ACTIVITY SCHEMES	ASSET DESCRIPTION	REPLACEMENT VALUE	DATA RELIABILITY
Waimea catchment	63 km of maintained river system, including rock protection and 19.5 km of stopbanks	$52.5 million	Good
Upper Motueka catchment	63 km of maintained river system, including rock protection		
Lower Motueka catchment	67 km of maintained river system including rock protection and 39.45 km of stopbanks		
Aorere catchment	18 km of maintained river system, including rock protection		
Takaka catchment	39 km of maintained river system, including rock protection		
District wide	Tidal outfalls or gates, gabion baskets, plantings	$10.5 million	Good

Note: Replacement Valuation as at 1 April 2017

LEVELS OF SERVICE

"Our structures are managed to reduce the impact of flooding now and in the future"	*"Our river environments are healthy ecosystems that are attractive and enjoyed by our communities"*

We do not plan to increase levels of service for this activity for the duration of this Strategy. We have planned to undertake work on the Motueka River stopbanks to improve sections of the banks so that they will perform to our agreed levels of service.

RESPONDING TO OUR INFRASTRUCTURE PRIORITIES

Further to the overarching infrastructure key issues identified earlier in this Strategy, we have also identified key issues specific to the rivers and flood control activity that are summarised below. Each of these issues relate back to our infrastructure priorities. For each issue, the significant decisions we are planning to make are outlined, along with the principal options for addressing the issue, estimated costs and timing.

FLOODING OF PRIVATE PROPERTY

Communities that live near rivers are exposed to flood risk. The communities most at risk include Motueka and Riwaka. This risk is not new, but with changing weather patterns the risk is changing. More intensive and frequent rainfall is likely to bring with it increased river flooding. To varying levels, we aim to help protect these communities through our River and Flood Control activity through the provision of erosion protection and stopbanks. However, there is only so much that we can do from a practical perspective. It is impossible to remove the risk entirely and therefore individual property owners also need to be aware of and take measures to reduce the impact of any flood risk they may face.

Table 23 summarises the options that Council has considered in order to improve the mitigation of river flood risks.

Table 23: Principal Options to Address Flooding of Private Property

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Motueka River				
Do not undertake improvements	The risk of the stopbanks overtopping or collapsing during significant flood events will remain the same.	✘	Nil	Status quo
Increase capacity and strength of sections of the stopbanks that do not meet agreed levels of service	The risk of the stopbanks overtopping or collapsing during significant flood events will be reduced. The community will be protected to a higher level.	✓	$10m	2020 – 2022
Implement other flood mitigation measures e.g. spillways, secondary stopbanks	The existing stopbanks will remain in place and the likelihood of the stopbanks overtopping or collapsing will remain. The consequence of the breach could be mitigated to provide a higher level of protection to the community.	✘	$3m - $20m	Not planned
Prepare a river flooding emergency response plan.	Civil Defence teams and emergency responders will have a well-informed plan should an extreme event occur. Residents will be better informed and understand the risks they are exposed to.	✓	N/A	Underway
We recently undertook stopbank investigations to understand the strength and capacity of the stopbanks. We identified some sections where the level was lower than our agreed level of service, or where the strength of the banks was not sufficient. We applied to the Provincial Development Unit's Covid-19 Response and Recovery Fund to enable us to undertake work to repair or improve the high risk sections of bank. We were successful with our application and granted $7.5 million towards the $10 million project.				
Riuwaka River				
Do not undertake improvements	The risk of the stopbanks overtopping during significant flood events will remain.	✓	Nil	Status quo
Assist affected properties to improve individual flood resilience	The consequence of stopbank breaches will be reduced for those residents who have been most affected by historic breaches.	✘	Not feasible	Not planned

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Increase height of stopbanks to provide increased flood capacity	Neighbouring residents will be provided with a higher level of protection. Land acquisition is required to increase the footprint of the stopbanks which may result in loss of income for affected land owners.	✘	Not feasible	Not planned
Prepare a river flooding emergency response plan.	Civil Defence teams and emergency responders will have a well-informed plan should an extreme event occur. Residents will be better informed and understand the risks they are exposed to.	✓	N/A	Underway
We recently undertook flood investigations and simulated flood modelling to better understand the flood risks from the Riuwaka River on neighbouring properties. The modelling showed that extensive construction of new stopbanks would be required in order to reduce flood risks, requiring extensive land purchase. The nature of the local geography and streams makes them very difficult to contain. We determined that wide scale stopbank improvements are unfeasible and the cost would far outweigh the benefits of undertaking the work.				

EROSION OF PRIVATE PROPERTY

Tasman has experienced several major storm events since 2010 that have resulted in erosion of private properties adjoining rivers. A large portion of these rivers are 'unclassified' or not maintained by Council. Whilst we don't maintain the river system in these locations, we have made provision to assist land owners to undertake repairs and protection where they are willing to share in the cost of doing so. Our policy is to contribute up to 50% towards the cost of the works from our Rivers Z fund. In recent years, this fund has been oversubscribed.

Table 24 summarises the options that Council has considered in order to address erosion of private property.

Table 24: Principal Options to Erosion of Private Property

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Gradual increase in Rivers Z funding	Enable support of a greater number of individuals with a neutral impact on overall river rates.	✓	$22.6m total for 30 years	On-going
Extend the length of the maintained river system	Provide a higher level of service to some customers, but will require a significantly greater rates take.	✘	Unknown	Not planned
Maintain the status quo	Rivers Z likely to remain oversubscribed meaning some individuals will miss out. No impact on rates.	✘	N/A	Not planned
We generally allocate River Z funds on the basis of a 50% subsidy to landowners. Apart from increasing the Rivers Z funding, we may also choose to allocate River Z funds differently in the future by requiring a larger contribution from landowners. By doing this, we may be able to assist more people without requiring additional income.				

HOLISTIC RIVER MANAGMENT

The movement of gravel within a river system and changes to the active channel is part of natural river processes. Most of the time it is of no consequence, but sometimes gravel build-up can cause issues by reducing the capacity of river channels or concentrating flows to cause increased erosion. It is important to allow some natural movement of gravel within the river system to protect the natural environment, but this needs to be balanced against appropriate flood mitigation measures and impacts on local aquifers. Table 25 summarises the options that Council has considered in order to improve the mitigation of river flood risks.

Table 25: Principal Options to Address Gravel Aggregation

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Survey, manage and extract gravel within an appropriate envelope, so that extraction is only undertaken in suitable locations	Requires additional funding to cover on-going survey and management costs. Potentially increase gravel extraction volumes by private parties, which should also increase income for Council.	✓	$3.5m total over 30 years	Ongoing
Develop holistic river management plans	Development of river management plans will help us meet strategic long-term goals for multiple issues and river values. These plans will be based on an integrated approach between Council, iwi, community and stakeholder groups.	✓	$1.5m total over 30 years	Commence in 2021, then ongoing
Uncontrolled extraction of gravel	This option prioritises the built environment and commercial gain over protecting the environment. Potentially increase gravel extraction volumes, which should also increase income.	✗	N/A	Not planned
Maintain the status quo	Continue to extract gravel but in a conservative manner.	✗	N/A	Not planned
The development of river management plans supports a holistic and pro-active approach to river management. This will take into account our obligations under the Soil Conservation and River Control Act as well as our wider responsibility to manage environmental effects and improve environmental outcomes.				

INDICATIVE EXPENDITURE ESTIMATES

OPERATING

Operational costs for the rivers and flood control activity are forecast to increase by around 5.4% per year for the first 10 years and 5.9% per year over 30 years. Within the next 10 years, direct operating expenditure increases by an average of 3% per year. The biggest increase occurs in Year 3, which is caused by the increase in River Z budgets.

Indirect expenditure increases by an average of 8% per year. This is largely driven by increases in loan interest costs associated with the capital programme for this activity.

Both direct and indirect costs increase due to inflation across the 30 years.

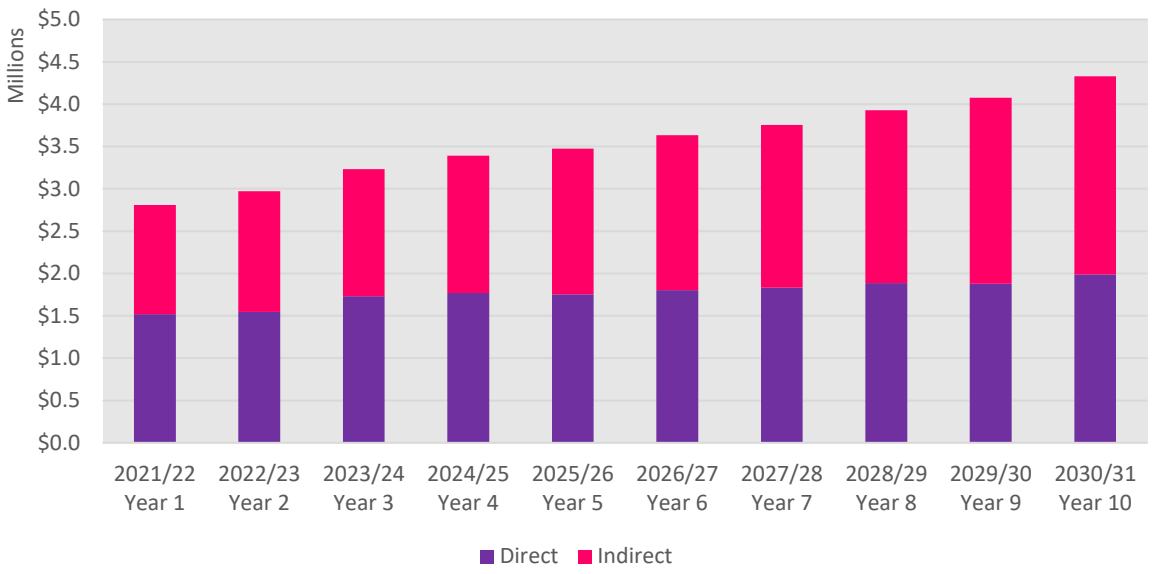

Figure 39: Annual Operating Expenditure for Year 1-10 for Rivers and Flood Control

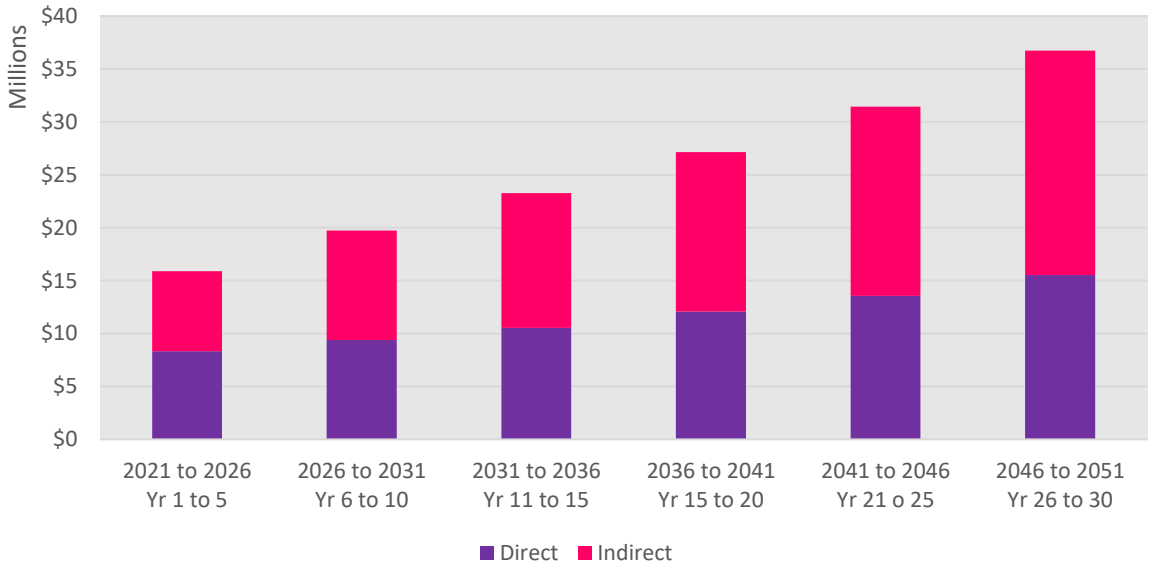

Figure 40: Five Yearly Operating Expenditure for Year 1-30 for Rivers and Flood Control

CAPITAL

We have planned to spend around $18 million on capital improvements over the next 10 years and around $57 million over the next 30 years. Of this, 100% is attributable to level of service improvements. The capital programme is static for the 30 years, only increasing due to inflation, with the exception of Year 1. In Year 1, we plan to complete the upgrade of parts of the Motueka River stopbanks.

The Total Funded Capital Programme shown below includes the 10% scope risk and programme delivery adjustment discussed earlier in this Strategy.

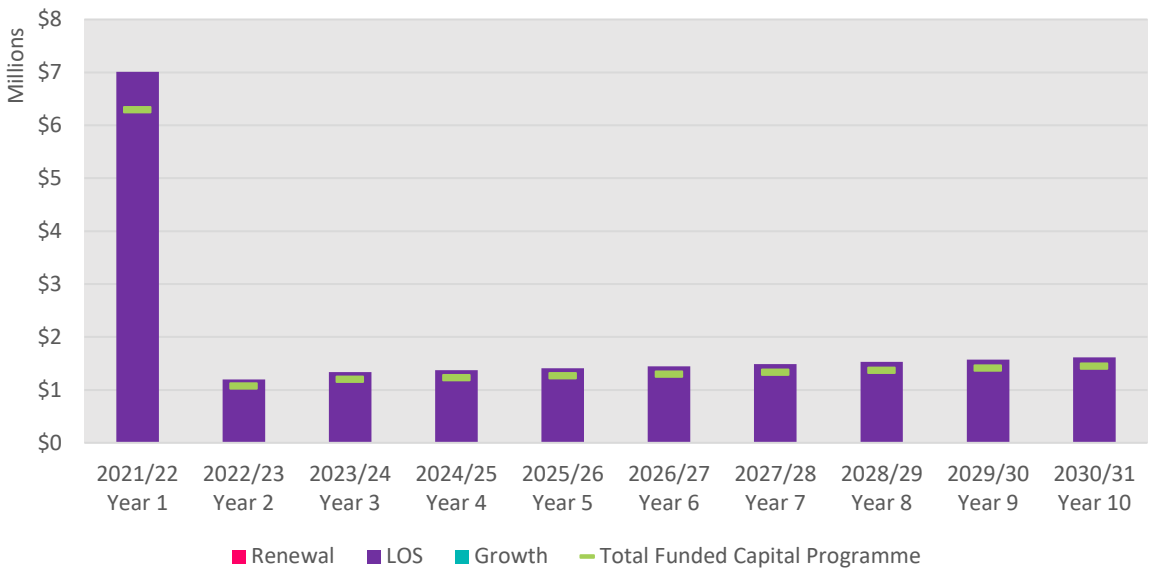

Figure 41: Annual Capital Expenditure for Year 1-10 for Rivers and Flood Control

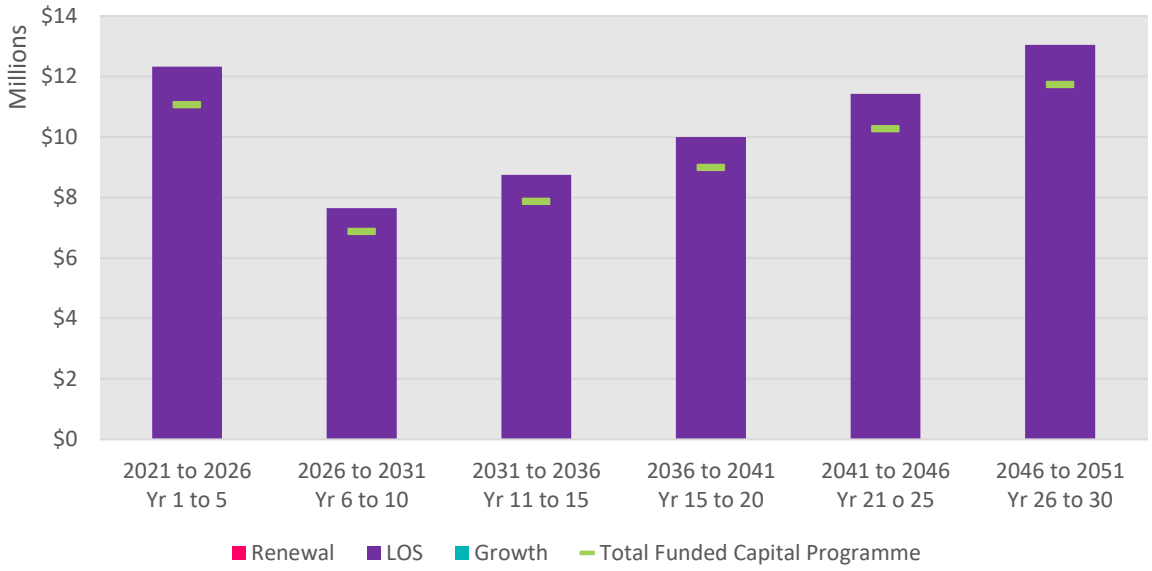

Figure 42: Five Yearly Capital Expenditure for Year 1-30 for Rivers and Flood Control

ASSET RENEWAL PROFILE

Most of our rivers and flood control assets are not depreciated. We only depreciate tide gates/outfalls, gabion baskets and railway iron structures. The expected useful life of these assets ranges from 30 to 60 years. We have not planned to undertake renewal of any of these assets within the next 30 years. This is the cause of the divergence between renewal investment and depreciation.

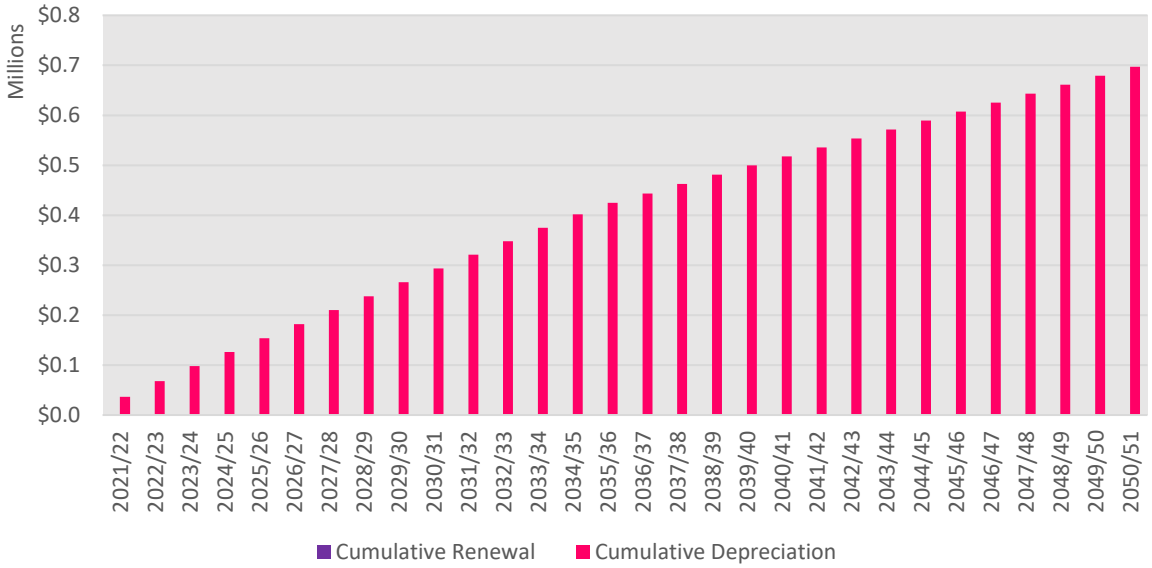

Figure 43: Capital Expenditure and Depreciation for Rivers and Flood Control

ASSUMPTIONS AND UNCERTAINTIES

In addition to the key assumptions identified earlier in this Strategy, Council has identified the following uncertainties and key assumptions that are specific to the rivers and flood control activity.

- Access to Rivers Z funding is largely by 50/50 share between private land owners and Council. If there is a drop in demand from landowners needing assistance, or there is an unwillingness to pay, this fund may be underspent.
- We cannot predict when and where large flood events will occur, or the damage that may be sustained during such a flood. During a large event, there is a risk that rock protection works can shift, new erosion can occur, or stopbanks could be damaged. We have assumed that if this occurs, we will have enough funds available to undertake repairs - whether it is through reprioritisation of maintenance activities or accessing emergency funding provisions.
- Extreme rainfall events and associated flood impacts can happen at any time. The occurrence of these events may differ from what we expect based on statistics. When large events happen more frequently, this may trigger higher expectations from our community to provide a higher level of service. Providing a higher level of service will come at a higher cost and require more funding than has been budgeted for.
- As with large floods, we also cannot reliably predict when moderate floods will occur or their impact. We have used historic trends to determine maintenance funding levels for the future and has assumed that these levels will be sufficient. If more floods occur than assumed, it is likely that we will be required to spend more than planned. If floods are less or more minor than assumed, it is likely that we will be required to spend less than planned.

FURTHER INFORMATION

Further information on the Rivers activity can be found in the Rivers Activity Management Plan. Key capital projects and programmes of work are summarised in the following timeline. You can find the full list of the proposed budgets, projects, and timing in Appendix A and B of the activity management plan.

~~www.tasman.govt.nz/link/riversactivitymanagementplan2021-2051~~www.tasman.govt.nz/link/activity-management-plans


TIMELINE OF KEY INFRASTRUCTURE PROJECTS – RIVERS
This timeline shows some of the major capital works planned for the next 30 years.
$6M
Motueka Stopbank Improvements Y1
$14M
Rivers X & Y Improvements Y1 – 10
$18.7M
Rivers X & Y Improvements Y11 – 20
$24.5M
Rivers X & Y Improvements Y21 – 30
YEAR 1
POPULATION 56,600
YEAR 10
POPULATION 64,300
YEAR 20
POPULATION 70,900
YEAR 30
POPULATION 76,100