



For Tasman

INFRASTRUCTURE STRATEGY 2018 – 2048

DRAFT FOR CONSULTATION

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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 Council's water supplies, stormwater, wastewater, rivers and flood control, and transportation activities.

WHAT IS INFRASTRUCTURE?

Infrastructure is the physical assets that Council provides and owns in order to undertake these services. Council has other infrastructure that supports community services such as libraries, parks and reserves, pools and halls. These are not covered by this Strategy.

Infrastructure provides the foundation on which the Tasman District is built. It is essential to health, safety, and for the transport of both people and freight. It enables businesses and communities to flourish, and failure to maintain and invest in infrastructure would inhibit the economic performance, health and prosperity of Tasman.

WHY HAVE AN INFRASTRUCTURE STRATEGY?

Council is responsible for managing \$1.1 billion worth of infrastructure. Maintaining and renewing these assets, as well as managing and meeting the communities changing needs for infrastructure, account for most of Council's spending.

The purpose of this Strategy is to 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.

However, there is tension in the process when Council assesses how and when to address these key issues. Often, what Council would like to do differs from what is practical and affordable, especially in regards to timing. Council has an inherent desire 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 caps set out in Council's Financial Strategy. By doing this, Council has set out a long-term infrastructure 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?

In 2015, Council made a plan to turn the tide on its growing debt. It did this by introducing new financial caps that capped rate income increases at 3% per year plus an allowance for growth, and net debt at \$200 million through the development of the Long Term Plan 2015-2025. This changed the way that Council had to think about infrastructure planning. There needed to be a clear focus on the 'need to have' and much less focus on the 'nice to have'. The Long Term Plan 2015-2025 focused on maintaining core renewal programmes, making the most of existing assets first, and undertaking upgrades required to meet agreed levels of service rather than investing in increasing levels of service.

Since 2015, Tasman's population has grown significantly more than anticipated, using up a lot of capacity within Council's existing infrastructure in the process. Development in Richmond, Mapua/Ruby Bay, and Motueka has almost exhausted the capacity that Council had assumed would be available to service new developments in the years to come. This means that the timing of upgrades that Council planned in 2015 now need to be advanced, and some new works are required.

In 2015, Council decided to accept some risk when programming renewal of some assets. This was in attempt to maximise the life of those existing assets and to keep within the new financial caps. This included deferral of the Mapua trunk water main replacement, and reducing road resurfacing budgets for three years between 2015 and 2018. Since then, there has been a number of failures on the Mapua trunk water main meaning that it no longer provides the appropriate level of service. Reducing the road resurfacing budget was a good short-term tactic that enabled Council to pay off some extra debt but, as Council anticipated, it is not a sustainable level of investment for the long-term.

Nationally there has been asset failures which has resulted in significant harm to communities. Two notable events were the contamination of the Havelock North drinking water supply, and flooding due to stopbank failure. For Council, this has reinforced the need to ensure its assets are maintained and operated well, and to learn from the mistakes of others. A standout issue for Tasman is the challenge of providing water supplies that meet the requirements of the NZ Drinking Water Standards.

Nationally, there is improved understanding of the likely impact a major rupture of the Alpine Fault will have on infrastructure services. Council will need to do more to adequately prepare to respond to and recover from an event of such magnitude.

WHERE ARE WE GOING?

After considering the key issues facing the District’s infrastructure, Council has identified four key priorities that will guide Council’s effort and investment in planning, developing and maintaining its 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

HOW ARE WE GOING TO GET THERE?

Council plans to spend \$696 million on infrastructure services over the next 10 years, and a total of around \$2.4 billion over the next 30 years. Figure 1 shows how much Council plans to invest in each of the infrastructure activities. The percentage of planned expenditure for each activity is similar for the 10 year and 30 year timeframes. Council invests most in transportation as there is a large core programme of routine maintenance and renewal work.

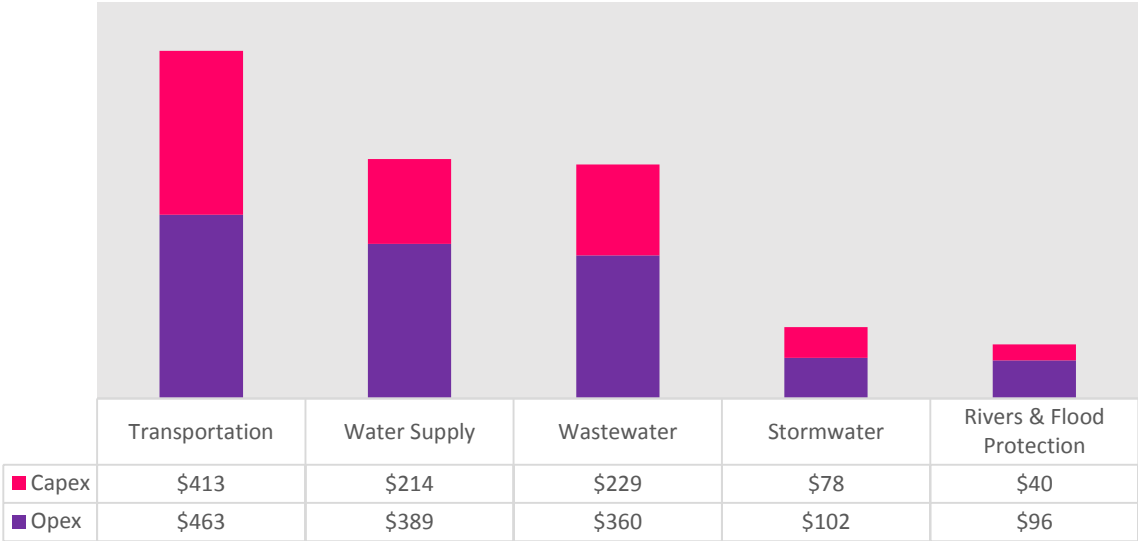
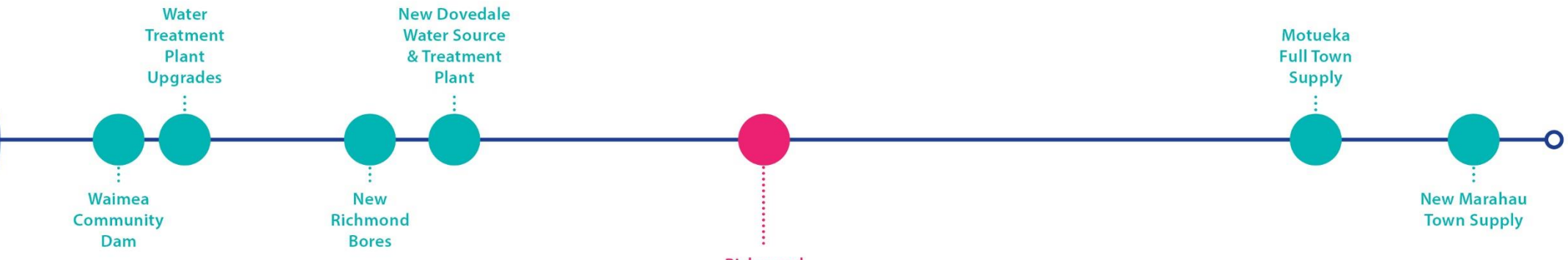


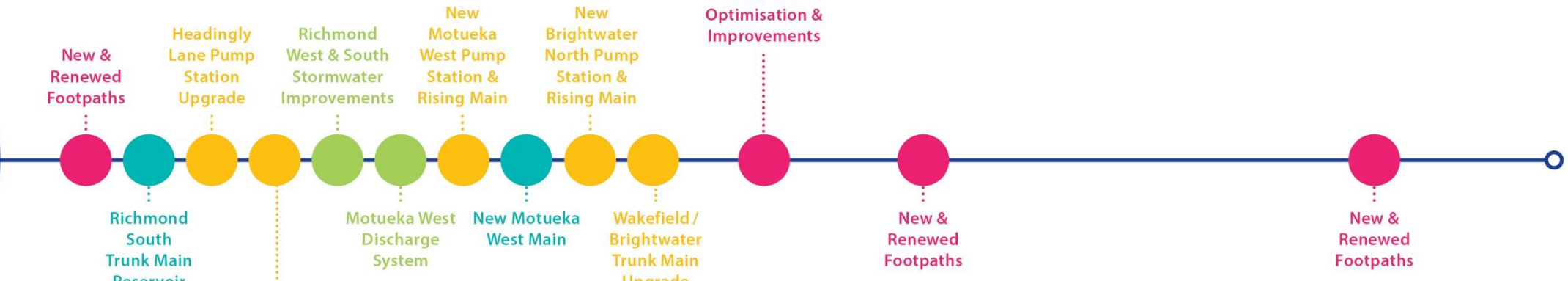
Figure 1: Total Infrastructure Expenditure for 2018 – 2048 (\$ million)

The following page shows the key actions that Council plans to take to achieve the four key infrastructure priorities.

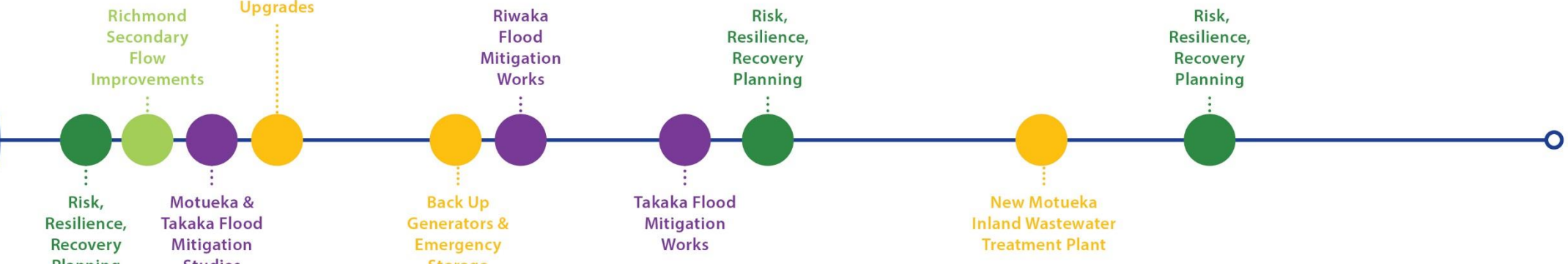
SAFE & SECURE



CHANGING POPULATION



RESILIENT COMMUNITIES



PRUDENT MANAGEMENT



KEY

- WATER
- WASTEWATER
- STORMWATER
- TRANSPORT
- RIVERS
- ALL OF THE ABOVE

INTRODUCTION

PURPOSE

The purpose of this Infrastructure Strategy, as prescribed by the Local Government Act 2002, 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 Council intends to manage the District's infrastructure assets and services, it must consider how:

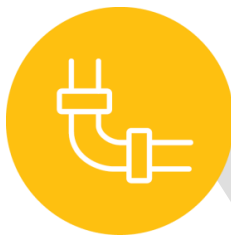
- to respond to growth or decline in demand;
- to manage the renewal or replacement of existing assets over their lifetime;
- planned increases or decreases in levels of service will be allowed for;
- public health and environmental outcomes will be maintained or improved; and
- natural hazard risks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

SCOPE

This Strategy covers the following essential infrastructure:



Water Supply



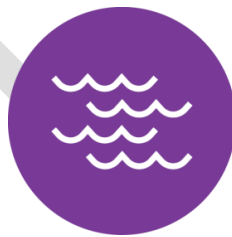
Wastewater



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 the following activities have been excluded at Council's discretion. During future reviews of the Strategy, Council will reconsider the inclusion of these activities.

Solid Waste

Parks and Reserves

Hydrometric Assets

Coastal Assets

Commercial Assets

Community Facilities

Council Property

This Strategy provides direction to Council's infrastructure activity management plans, which can be found on Council's website <http://www.tasman.govt.nz/policy/plans/activity-management-plans/>.

All financial information included in this Strategy includes inflation.

CONTEXT

DISTRICT OVERVIEW

The Tasman District is located in the north-west of the South Island. It covers the area extending from Golden Bay in the north-west to Richmond in the east and Murchison in the south, covering 9,654 square kilometres of land, 817km of coastline, and including 17 settlements/towns.



POPULATION

At 30 June 2017, Statistics New Zealand estimated Tasman District's population to be 51,100. Over the last 10 years, the District has experienced average annual growth of 1.2%. Two thirds of the population live in 17 urban settlements spread throughout the District, and the other third live in the rural areas. The settlements vary in size from approximately 110 people living in St Arnaud to 14,600 people living in Richmond. Figure 2 provides an overview of Tasman's 17 settlements.

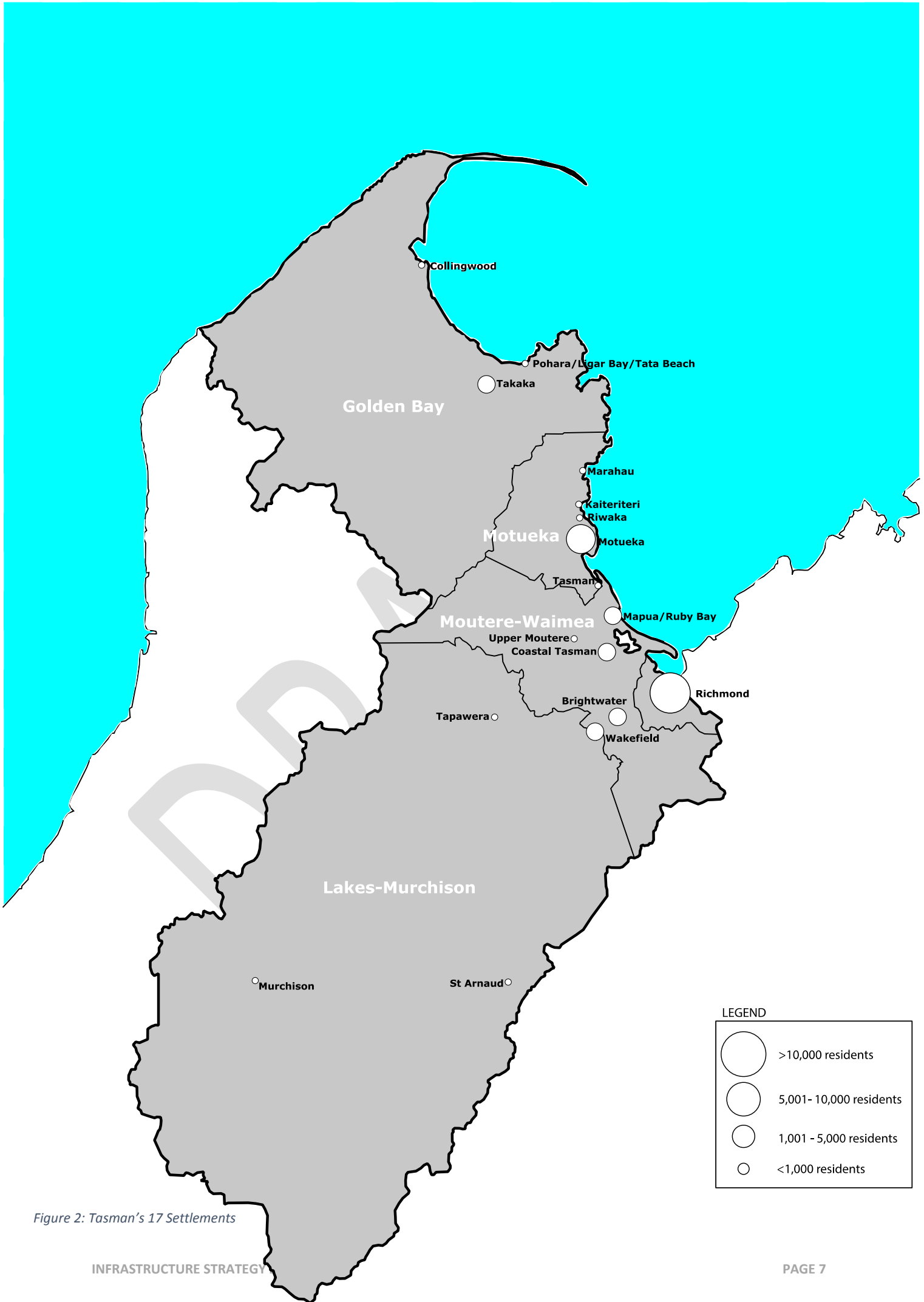


Figure 2: Tasman's 17 Settlements

AGE STRUCTURE

The median age of Tasman residents was estimated to be 46 years at 30 June 2017 and is showing an increasing trend. The age structure of Tasman residents at 30 June 2017 is summarised in Table 1.

Table 1: Tasman's Age Structure

AGE GROUP	POPULATION	PERCENT
0 – 14 years	9,400	18
15 – 39 years	12,200	24
40 – 64 years	18,800	37
65+ years	10,700	21

DWELLINGS

Tasman's latest dwelling count was completed as part of Census 2013. At that time, Tasman had approximately 21,700 dwellings.

ECONOMY

The main drivers of the Tasman economy continue to be horticulture, forestry, fishing/seafood, agriculture and tourism. There are many manufacturing and processing plants associated with these industries, for example the Nelson Pine Industries plant in Richmond, and dairy factories in Takaka and Brightwater. These industries rely on the road network to transport their products through Richmond and onto Port Nelson.

CLIMATE SUMMARY

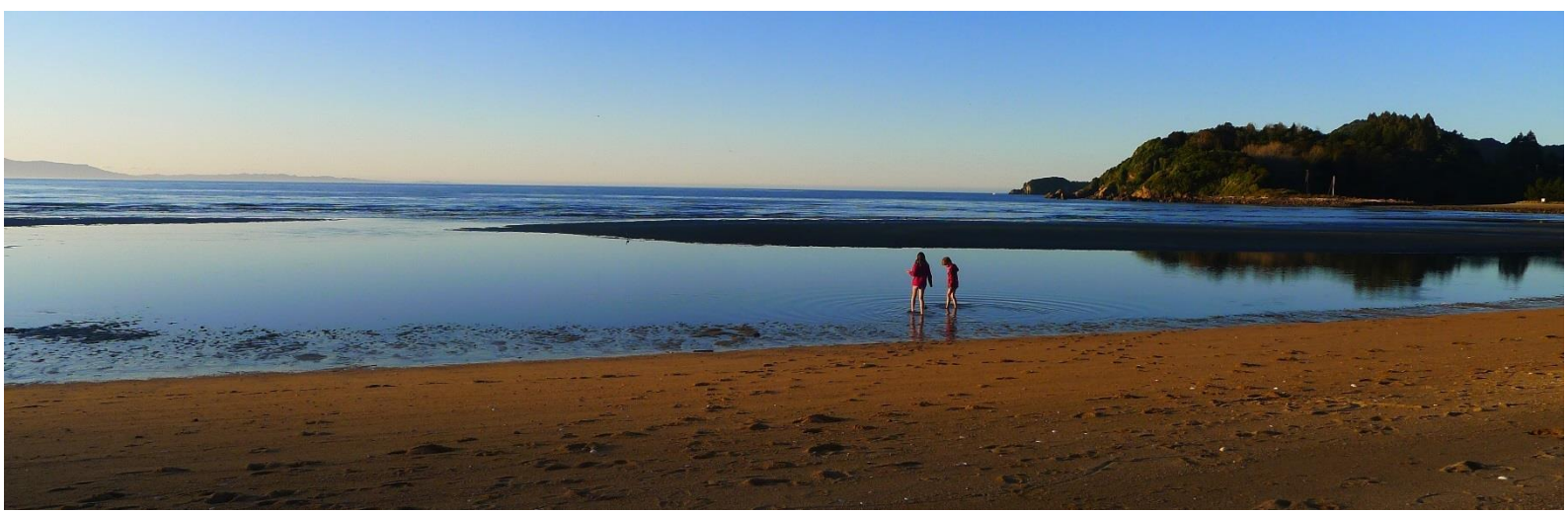
Across Tasman District the winds are generally light except for parts around Farewell Spit where the wind is often strong. Rainfall is fairly evenly distributed across the year, although February and March are typically the driest months of the year and the wettest months are typically in winter or spring. Parts of Tasman's mountains receive in excess of 6000 mm of rainfall per year. In contrast, the Waimea Basin is the driest area of the District as it is sheltered from rain-bearing weather systems arriving to New Zealand from the west and south. Here, rainfall totals are approximately 1000 millimetres per year. Dry spells of more than two weeks are quite common, particularly in eastern and inland locations. In Tasman, temperatures are mild compared with most parts of the country due to the District's 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 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:

- 18 water supply schemes including 15 water treatment plants, 21 pump stations, and 756 kilometres (km) of reticulation;
- 9 wastewater schemes including 8 wastewater treatment plants, 78 pump stations, and 360 km of reticulation;
- 187 km of piped stormwater network and 29 km of maintained streams
- 1,741 km of roads, 282 km of footpaths and cycleways, and 483 bridges
- 285 km of river spread across six main river catchments; Waimea including 19.5 km of stopbanks, Motueka including 31.2 km of stopbanks, Takaka, Riwaka 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, Council also prepares a Financial Strategy which sets out the rate increase and net debt level caps for the next 30 years. Infrastructure expenditure forms a large proportion of Council’s spending being 40% of operational expenditure and 82% of capital expenditure over the next 10 years. The two strategies are closely linked to ensure the right balance is struck between providing the agreed levels of service for infrastructure assets within the agreed financial caps. Often these financial caps will influence how Council manages and develops existing and new assets. This is especially so for the next 10 years.

Over the next 10 years, forecast rate income increases and net debt levels are projected to be near Council’s caps. Council has had to work hard to prioritise and plan a work programme which addresses the key issues outlined in this Strategy while staying within these caps. Given Council’s net debt is projected to peak at \$199m in Year 2021/22 there is very little scope to add further work programmes in the next five years.

LINKAGES

There are multiple factors that influence how Council should plan and manage its assets. These factors can be grouped into three broad categories which are described below in Figure 3.

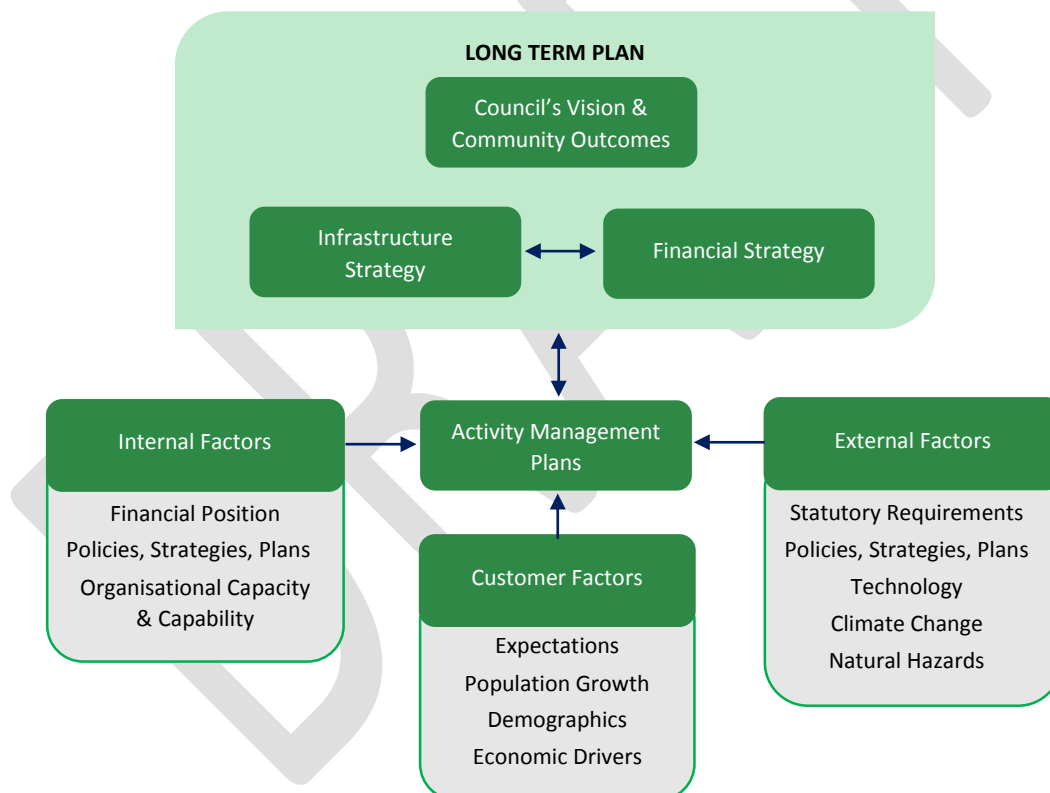


Figure 3: Strategic Linkages and Factors Affecting Infrastructure Planning

KEY INFRASTRUCTURE ISSUES AND PRIORITIES

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 for the District and one of the leading reasons why Tasman is a desirable place to live. This is proven by Tasman’s growing population. In recent years Tasman has experienced a high rate of population growth. Figure 4 below shows the rate of actual population growth as well as a range of projections for population growth into the future.

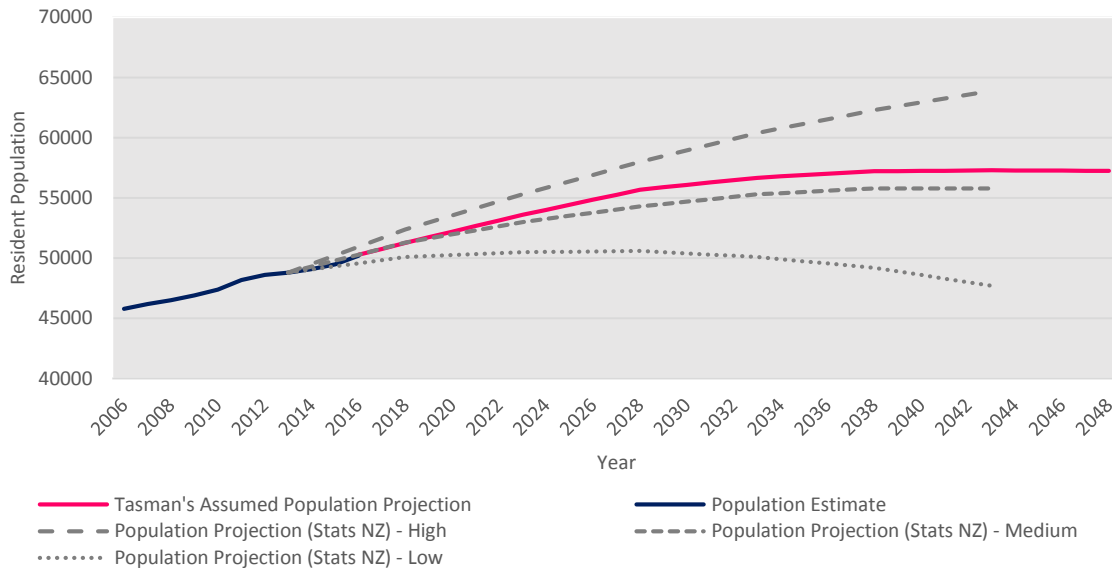


Figure 4: Tasman’s Population Projections



The actual population growth of each settlement varies across the District with the highest growth observed in Richmond followed by Motueka. After careful consideration of recent actual growth and future projections Council has determined that it will plan for high population growth for the first ten years followed by medium thereafter for Richmond, Brightwater, Wakefield, Motueka and Mapua / Ruby Bay. Council is planning for medium population growth for the next 30 years for all other settlements and rural areas. Figure 4 also shows the population projection for the District that Council has adopted for its planning purposes. This shows that Tasman’s population is expected to grow by 4,400 residents over the next 10 years, to reach 55,690.

A high proportion of the population growth is occurring as a result of people moving to Tasman. The 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. Generally, the number of people living in each home is decreasing and our population is ageing. Tasman’s projected age structure is shown below in Figure 5.

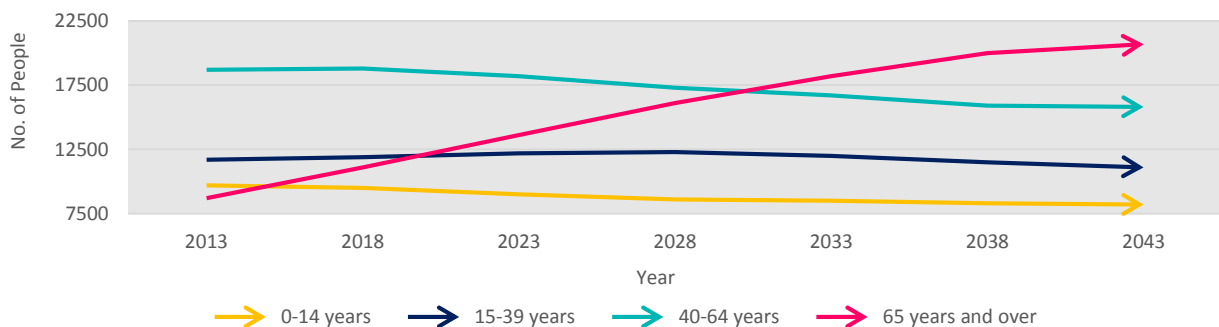


Figure 5: Tasman’s Population Projections by Age Group

In 2013, the percentage of Tasman's population aged over 65 years was 18%, compared with the national average of 15%. Within 30 years, the percentage of Tasman's population aged over 65 year is projected to be 37%, compared with the national average of 23%. This indicates that Tasman's age structure is approximately 25 years ahead of national trends. It is likely that Tasman will need to be a leader of change in providing for an ageing population. Council needs 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.



Using the above information Council has determined that Tasman will need to supply approximately 2,955 new dwellings within the next ten years, and a further 3,040 between 2028 and 2048. Council will need to provide most of these new dwellings with water, wastewater and stormwater, and all will create an increasing load on Tasman's transportation network.

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 occupants per household. That means that if no new people arrive in Tasman there is likely to still be some demand for more houses.

In 2015, Council planned for medium population growth. Since then actual growth has surpassed what Council had assumed, using up considerable amounts of available infrastructure capacity. The combination of this and the projected population increases and demographic change present a significant challenge to Council as to how they provide infrastructure to service new dwellings. Particular settlements of concern are Richmond, Mapua/Ruby Bay and Motueka.

In 2016, the Government released the National Policy Statement on Urban Development Capacity (NPS-UDC). The NPS-UDC directs local authorities to provide sufficient development capacity in their resource management plans, supported by infrastructure, to meet demand for housing and business space. The NPS-UDC classifies Richmond and Nelson as one urban area and assumes that the area will experience medium population growth. For Richmond and Nelson, the NPS-UDC requires both Councils to ensure sufficient, feasible development capacity is available and to provide an additional margin of feasible development capacity over and above projected demand of at least 20% in the short and medium term, and 15% in the long term. The release of the NPS-UDC has reinforced to Council the need to plan and provide infrastructure to enable the population growth.

NATURAL HAZARDS

Tasman District comprises a diverse landscape ranging from flat coastal low lands 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 tsunamis.

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



FLOODING AND LAND INSTABILITY

At times, Tasman District experiences a diverse range of extreme weather. Recently, major damage to property and infrastructure has occurred because of these extreme weather events, and this has come at a significant cost to Council, households and businesses. Recent examples include Aorere River flooding, and extreme rainfall in Golden Bay and Richmond resulting in extensive surface water flooding 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. Recent events, like those that occurred between 2010 and 2013, place the spotlight on the performance of these assets and the community's level of service expectations often increase following an event.

The Ministry for Environment's climate change advice suggests that rainfall patterns are likely to change long term. Increases in rainfall are expected in winter for the entire District but are likely to be more pronounced in the southern and western parts. The nature of rain events are also expected to increase in intensity meaning an increased amount of rain over a shorter period of time.

With the changing rainfall patterns, Tasman District is also expected to experience longer periods of no rainfall increasing the time in which drought conditions will be present. This is likely to be particularly in the eastern part of the District, as was experienced during December 2017. 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.

EARTHQUAKES AND TSUNAMI

Fortunately, Tasman District has not experienced major disruption from earthquakes in recent times. However, the risk of major fault rupture is present. The Alpine Fault has a high probability (estimated at 30% to 50%) of rupturing in the next 50 years. 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 some assets. The Regional Civil Defence Emergency Management Group has ranked rupture of either the Waimea/Flaxmore fault or the Alpine fault as the highest risk and priority for the Nelson-Tasman region.



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.

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 Regional 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 a lower 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

Seven of Tasman's settlements are located in coastal areas, representing approximately 11,500 people. These are Collingwood, Kaiteriteri, Mapua/Ruby Bay, Motueka, Pohara/Ligar Bay/Tata Beach, Riwaka, and Tasman.

There is also widespread development in rural areas along our coastline that is exposed to the risk of coastal erosion and inundation.

Tasman residents have experienced the impact of coastal erosion and inundation both within private property and public areas. Where Council's assets are located in close proximity to the coast, these have also been affected by erosion, most noticeably the erosion of roads and pathways.

Climate change advice from the Ministry for Environment suggests that Council should plan for sea level rise of at least 0.8m by 2090 based on the average 1980 – 1999 levels. As this occurs, new areas of Tasman's coast will be exposed to wave action generating further erosion, as well as increasing the risk of inundation from storm surges. Council expects increasing rates of erosion and associated repair costs. Council will also need to consider improved protection of assets, or potentially relocating further away from the coast.

PUBLIC AND ENVIRONMENTAL HEALTH RISKS

Council builds and operates infrastructure to provide essential services to and improve the well-being of its communities. Sometimes if these assets are managed incorrectly it can have a negative impact on public health or the environment.

In other parts of New Zealand there has been asset failure which has resulted in significant harm to communities. Examples include sickness due to contaminated drinking water supplies, and flooding due to stopbank failure. For Council, this has reinforced the need to ensure its assets are 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, out of 17 water supply schemes that Council maintains, only three 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, Council must also protect the health of the environment. Sometimes there are negative effects on the environment that are created inadvertently by 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 Council to ensure our natural environment is protected.

AGEING INFRASTRUCTURE

Throughout Tasman District, Council is responsible for \$1.1 billion worth of infrastructure assets. These assets have a finite period in which they will operate suitably; known 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 seal up to 100 years for bridges and pipes. A lot of Tasman’s infrastructure was built between the mid-1900s and the 1980s. To date, this has meant that Council has largely had to renew assets with relatively short useful lives and that most of the longer life assets are yet to be renewed.

Figure 6 to Figure 9 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 which 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.

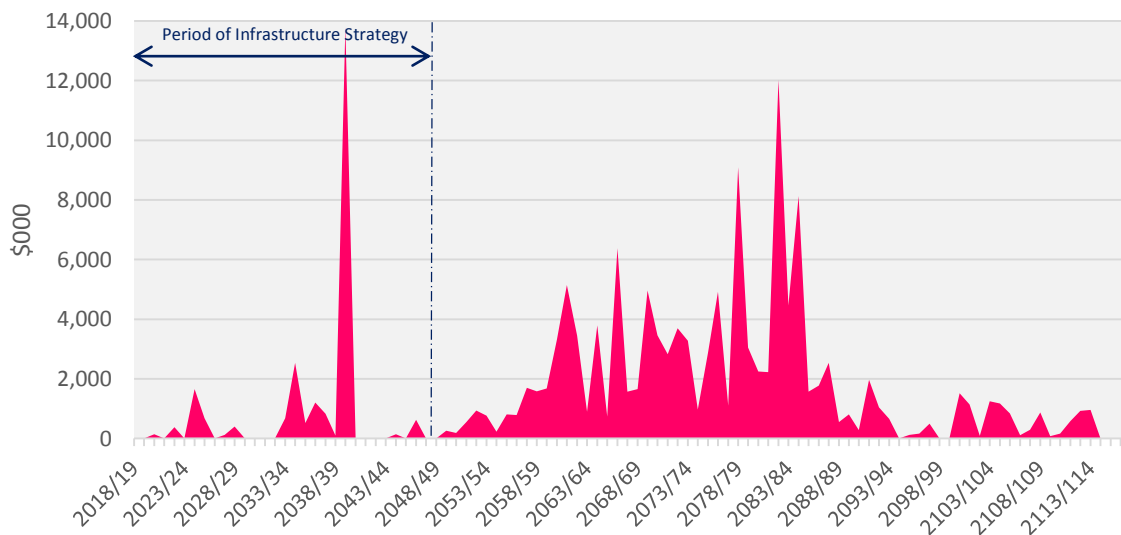


Figure 6: 100 Year Bridge Renewal Profile – Uninflated as at 1 April 2017

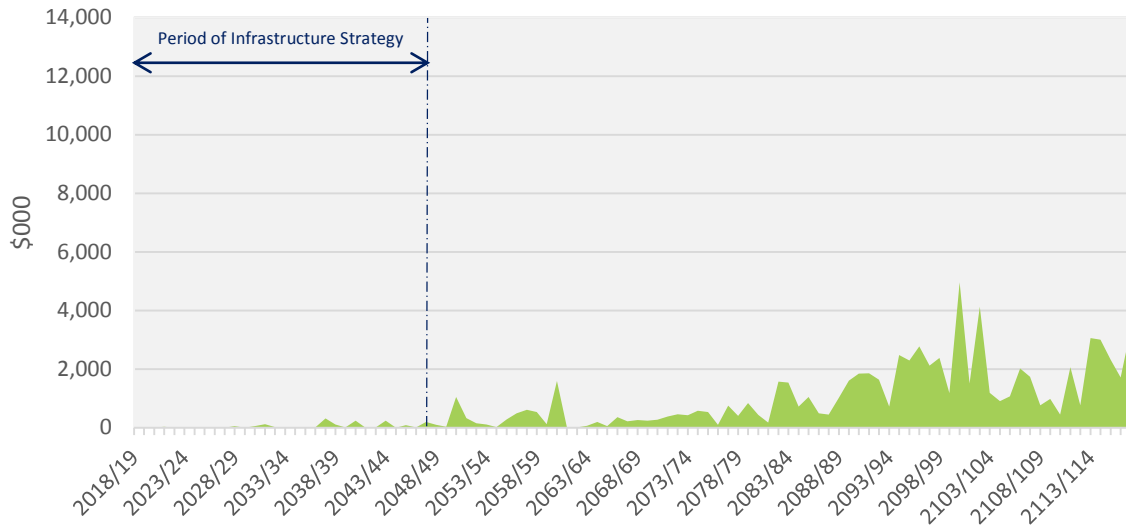


Figure 7: 100 Year Stormwater Pipe Renewal Profile – Uninflated as at 1 April 2017

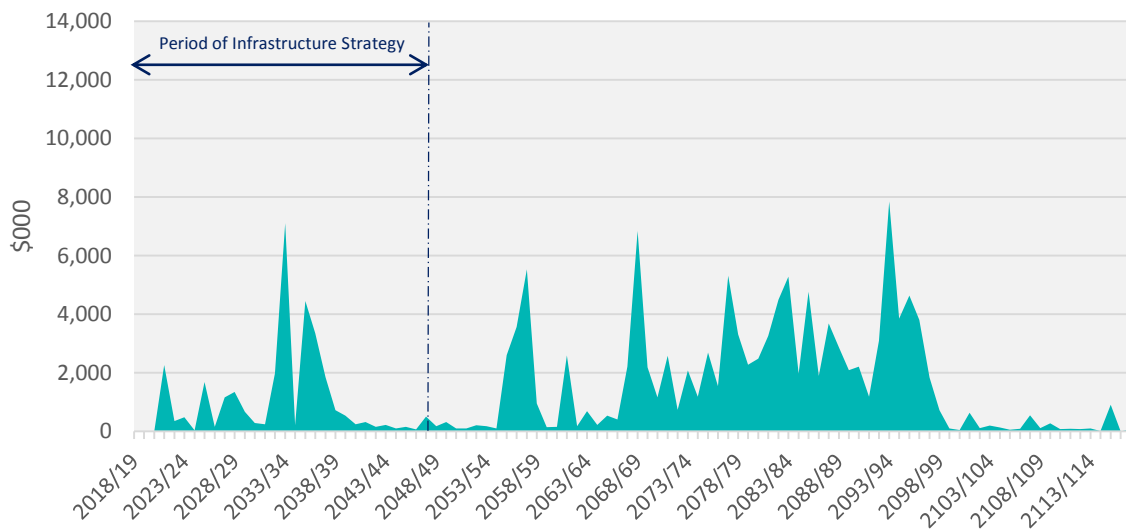


Figure 8: 100 Year Water Pipe Renewal Profile – Uninflated as at 1 April 2017

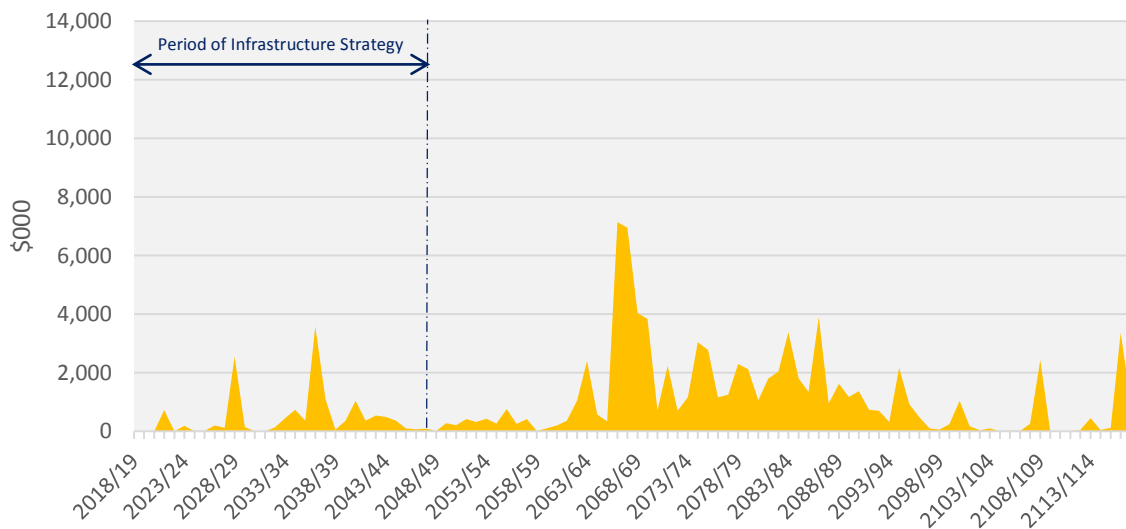


Figure 9: 100 Year Wastewater Pipe Renewal Profile – Uninflated as at 1 April 2017

OUR INFRASTRUCTURE PRIORITIES

Council has identified four key priorities to help guide Council's efforts and investment in planning, developing and maintaining its assets in the short, medium and long term. These priorities are listed below in no particular order.

1

Providing safe and secure infrastructure services

Providing safe and secure infrastructure services is paramount to Council. Council aims to provide public water supplies that are safe to drink, a transport network where people feel they can move about 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. Council aims to provide security in the services that it delivers and avoid significant disruptions. For example, water takes for public water supplies should be enduring and have a low risk of becoming unavailable.

2

Providing infrastructure services that meet the needs of our changing population

Council will continue to enable growth through the development of trunk and main infrastructure as it has done in the past. However, as Tasman grows and changes, 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 the infrastructure networks at the same time as presenting opportunities to optimise the use of existing assets through smarter operational procedures. Council expects the most significant change to be less reliance on individual self-drive motor vehicles in the future and more demand for alternative travel options.

3

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. Council will need to work together with other organisations such as the Regional Civil Defence Emergency Management Group and residents to effectively build resilience and plan for recovery.

4

Prudent management of our existing assets and environment

Council cannot lose sight of the importance of maintaining its existing assets or the need to continue to protect Tasman's natural environment. If Council does 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, Council aims 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 Council would not be getting the best value it could from assets by prematurely replacing them, again increasing whole-of-life costs.



KEY ASSUMPTIONS AND UNCERTAINTIES

There are factors outside of Council's control that can change, impacting on our ability to do what is 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



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

If growth is slower than assumed, Council may be able to defer some infrastructure upgrades associated with providing increased capacity. Where infrastructure has already been installed to provide for future growth it may take Council 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, Council may need to advance planned upgrades or consider unplanned infrastructure to provide additional capacity sooner. In order to do this Council may need to reprioritise other works to ensure it maintains 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 is paid off quicker.

WATER AVAILABILITY

Council cannot be certain what the actual climatic conditions of the future will be, nor the demand for community water supplies, but has assumed both will increase. Council has instigated a process to secure an augmented water source in the Waimea Basin to address the risks associated with drought, increasing demand, and existing over subscription of the aquifers. Council's preferred solution is the construction of the Waimea Community Dam. In preparing this Strategy, Council has assumed that the dam will be built as planned. If this is not the case, Council will need to implement an alternative urban water augmentation solution or demand management measures to address the risk and demand. Without the dam, there will be greenfield growth areas in Brightwater, Richmond and Mapua that Council will not be able supply water to. In a 'no dam' scenario, there will be associated infrastructure planned for these areas that will no longer be necessary, or the timing may be delayed.



STATUTORY CHANGES



Central government often enacts new statutory requirements that affects Council and the way it must manage its assets. When planning, Council cannot be certain when these changes will take place or of the scope of change that will be made until it is confirmed by Central Government. Council is aware that change is proposed for the Government Policy Statement on Land Transport, and that there is potential changes likely to be made to the Drinking Water Standards New Zealand. When preparing this Strategy, Council has had to work to the current versions of both of these documents. If changes are significant, Council may need to review the scope and timing of some of the transportation programme, and the water treatment plant upgrades.

HOW WE MANAGE OUR INFRASTRUCTURE ASSETS

This section outlines how Council plans to account for the growth that is occurring across Tasman, the on-going need to renew assets, and opportunities to improve levels of service, public health, the natural environment, and resilience.

SUPPORTING GROWTH

Council has 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. Richmond, Motueka and Mapua/Ruby Bay are priorities for investment as most of the capacity of the existing infrastructure in these areas has been taken up already. Key growth areas within these settlements include Richmond West, Richmond South, Motueka West and Mapua. Figure 10 shows the total planned investment in growth infrastructure for the next 30 years.

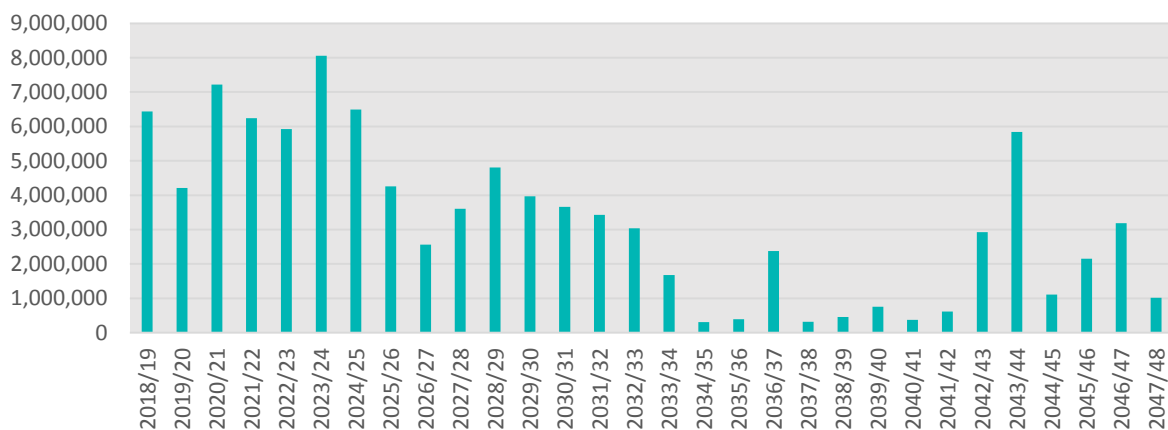


Figure 10: Total Growth Expenditure for Infrastructure for the next 30 Years

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

INVESTING IN ASSET RENEWAL

Council has generally planned 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. Exceptions have been made where assets have notably performed poorly and these have specifically been programmed for early replacement. For roads, Council uses age, condition and demand data to predict an optimised programme of renewal. Following the premature failure of the Mapua water trunk main, Council plans to be more risk adverse when planning renewals where there is an emerging trend in asset failure. Figure 11 shows the total planned investment in renewal of infrastructure assets for the next 30 years.

As highlighted earlier in this Strategy, Council’s infrastructure renewal profile is projected to significantly increase beyond the period of this Strategy. This will likely present a funding challenge to Council in approximately 50 years’ time.

Council has 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 Council’s immediate asset renewal needs. This means that there is an excess of depreciation funding that can be used to manage Council’s cash position as a whole, helping to reduce debt. In the long term, Council expects that asset renewal needs will exceed the funding that Council collects for depreciation. When this occurs, it is likely that Council will need to fund asset renewals through a mix of depreciation funds and borrowing.

Council plans to undertake more mature renewal planning over the next six years to better understand this issue and consider the associated potential effects on Council’s future borrowing requirements.

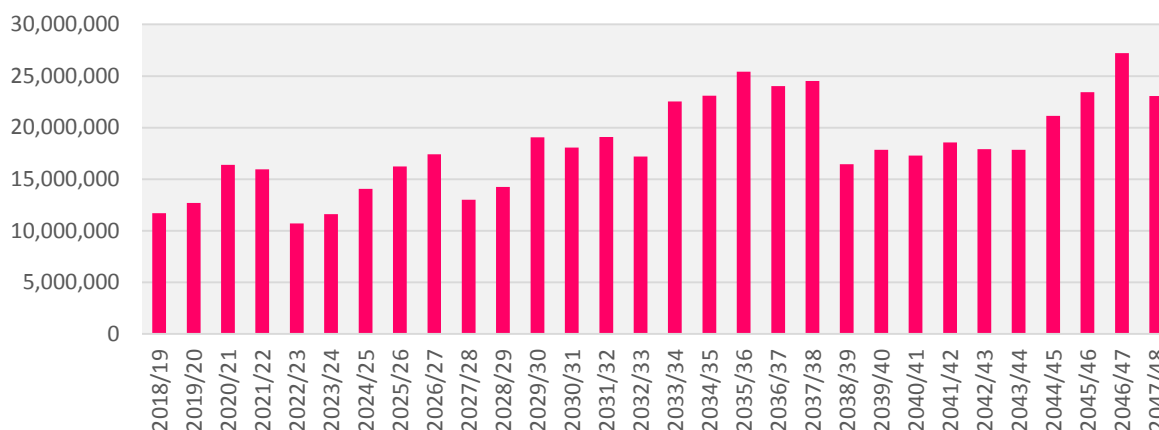


Figure 11: Total Renewal Expenditure for Infrastructure for the next 30 Years

MANAGING LEVELS OF SERVICE

Levels of service are what Council has agreed to deliver to the community. They are attributes that describe the service from the customer’s perspective. Levels of service are set through Council’s Long Term Plan, sometimes in response to community desire, and sometimes in response to statutory requirements. Due to Council’s financial position, there is little scope for Council to significantly improve levels of service over the next five to 10 years. Council has had to focus investment on meeting levels of service, and making improvements due to statutory requirements. Where relatively low cost opportunities are available to improve customers experiences, Council has planned to do these. This includes increasing investment in unsealed road maintenance.

The following table summarises where Council has planned to improve levels of service. A full list of Council’s agreed levels of service can be found in the activity management plans. Figure 12 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.
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 as a mode of transport	Invest in improved cycling facilities.
	Increase the number of people using public transport	Invest in expanded public transport services.

ACTIVITY	TYPE OF CHANGE	DESCRIPTION
Rivers & Flood Control	Increasing the amount of native riparian planting	Invest in new and existing native riparian planting.

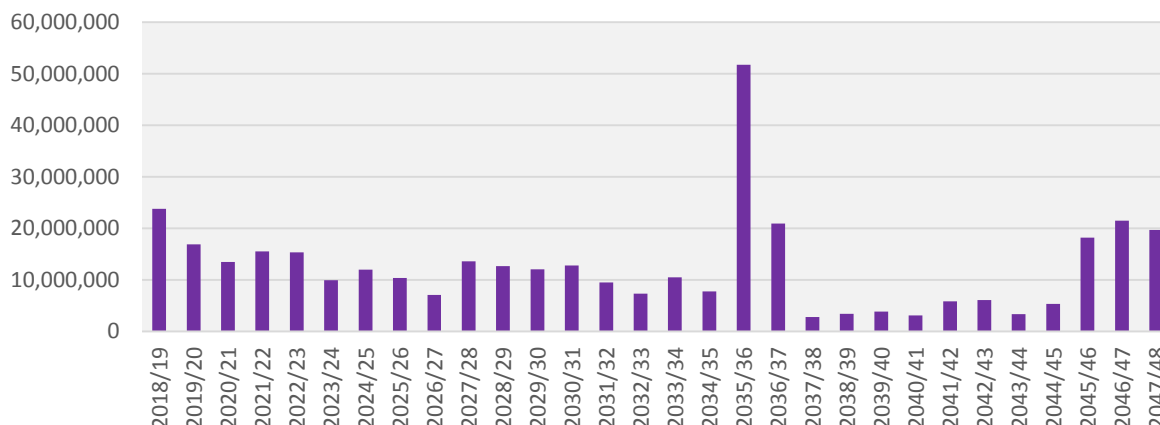


Figure 12: Total Level of Service Expenditure for Infrastructure for the next 30 Years

MAINTAINING PUBLIC AND ENVIRONMENTAL HEALTH

Through the provision of infrastructure, Council has an influence on public and environmental health. Table 3 summarises key aspects.

In this Strategy, Council has changed its approach to public and environmental health in the following areas.

- Water Supply – Council has focused on complying with the NZ Drinking Water Standards to ensure that the water provided to communities is safe to drink sooner than previously planned.
- Wastewater – Council has prioritised investment to areas in Mapua and Pohara where overflows have been a problem.
- Stormwater – Council has implemented an integrated approach to catchment management planning which looks at catchments in a holistic manner and considers multiple factors when identifying improvements. The main factors include flooding, amenity and the environment.
- Transportation – Council has focused more on safe and accessible transportation networks that are fit for purpose, and has provided more budget to increase the frequency of road sweeping in areas with typically high contaminants.

Table 3: Measures Used to Maintain Public and Environmental Health

ACTIVITY	PUBLIC HEALTH	ENVIRONMENTAL HEALTH	RELEVANT STATUTES / REGULATIONS
Water	Council aims to provide a safe and reliable supply of drinking water to residents and businesses.	Council aims to always comply with the conditions of its water take consents so that water is not over extracted from aquifers or streams.	Resource Management Act Health Act Local Government Act
Wastewater	Council collects wastewater from properties and adequately treats it before discharging back to the environment.	Council collects wastewater from properties and adequately treats 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

ACTIVITY	PUBLIC HEALTH	ENVIRONMENTAL HEALTH	RELEVANT STATUTES / REGULATIONS
Stormwater	Council aims to collect and discharge rain water in a way that minimises disruption to normal community activities and risk to life.	Council aims to minimise the level of contaminants in stormwater discharges, and manages 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	Council provides a range of transport options that connects communities and enables access to health care and recreation	Council has a regular road sweeping and sump cleaning regime to prevent contaminants from being washed off the road and into the natural environment.	Resource Management Act Land Transport Management Act
Rivers & Flood Control	Council manages stopbanks to maintain flood protection for residents and businesses	Council manages gravel aggregation and river planting in a manner that protects the natural features and life within the river systems.	Resource Management Act

MANAGING RISKS AND IMPROVING RESILIENCE

Tasman's communities are faced by the ongoing presence of risks from natural hazards and Council needs to ensure that it provides infrastructure that is resilient and that it is prepared financially to respond to and recover from damaging events.

Through this Strategy, Council has placed more emphasis on natural hazard planning and the need to build resilient infrastructure services that can cope during times of major disruption or that can be restored quickly. Council has budgeted to undertake some minor infrastructure improvements which will help build resilience, including the provision of backup power generators and additional storage capacity. 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, Council does not have enough information to adequately plan a full suite of resilience upgrades for the medium and long term horizon.

During 2018 and 2019, Council's has planned to undertake more robust risk, resilience and recovery planning in order to provide better information on network resilience needs. Once this work is complete, it is likely that Council will need to add further infrastructure projects and budget to its work programme in order to continue to improve network resilience.

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

- Annual emergency funding;
- An established Emergency Fund that Council aims to maintain to a value of \$12.8 million;
- Ability to reprioritise Council's capital programme;
- Insurance cover of 40% of the costs of a catastrophic disaster event, up to \$125m;
- Central Government support of up to 60% through the Local Authority Protection Programme;
- NZ Transport Agency subsidy of at least 51% for subsidies transportation asset reinstatement.

CRITICAL ASSETS AND LIFELINES

“First things first – know what is most important”

Knowing what’s most important is fundamental to managing risk well. By knowing this, Council can invest where it is needed most and it can 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 knowing Tasman’s 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
- Detention dams

During 2016, Council in partnership with Nelson City Council, the Regional Civil Defence Emergency Management Group and other utility providers, prepared the Nelson Tasman Lifelines Report. This report summarises all lifelines within Nelson and Tasman and covers the activities included in this Strategy. Within the report there were a number of actions identified to improve the Region’s infrastructure resilience. Improvements relevant to Council’s infrastructure include:

Water

- Review need for additional storage
- Review hazards at all treatment and pumping station sites
- Complete introduction of digital SCADA network
- Review water reticulation under the Mapua estuary

Wastewater

- Upgrading pump stations to provide additional storage capacity
- Reduce inflow and infiltration flows within the reticulation
- Reticulation renewals programme
- Review hazards at all treatment and pumping station sites
- Complete implementation of digital SCADA network
- Review wastewater reticulation under the Mapua estuary

All of the above improvements have been considered by Council when preparing its activity management plans and the work programme contained in them. Over the next three years, as part of the risk, resilience and recovery planning work Council will focus on the planning and management of its critical assets and lifelines to ensure that the appropriate level of effort is being made to manage, maintain and renew them. This will extend to ensuring that Council has adequate asset data to enable robust decisions to be made regarding the management of those assets.

LONG TERM FINANCIAL ESTIMATES

Council is taking a prudent financial approach to managing its infrastructure, with moderate overall cost increases and a steady capital programme. This section provides a summary of the total investment Council is planning to make in infrastructure over the next 30 years.

TOTAL OPERATING EXPENDITURE

The annual operating costs for Council’s infrastructure are forecast to rise from around \$32 million in 2018, to \$42 million in 2028, and \$66 million by 2048. This results in an annual increase of around 2.7% on average in the first 10 years, and 3.4% over the 30 years. These increases are primarily caused by increases in direct costs, increased loan servicing costs, and inflation.

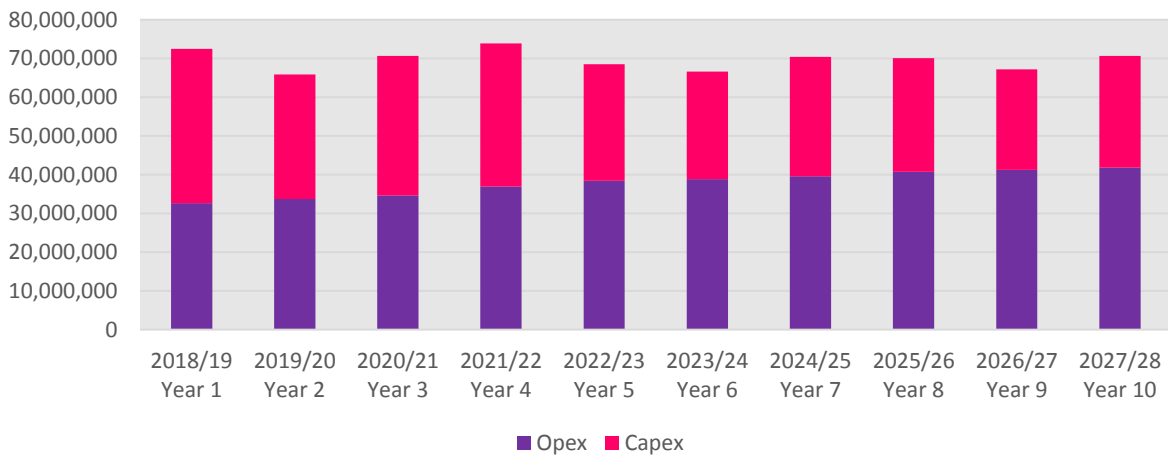


Figure 13: Year 1 to 10 Infrastructure Annual Operating Costs

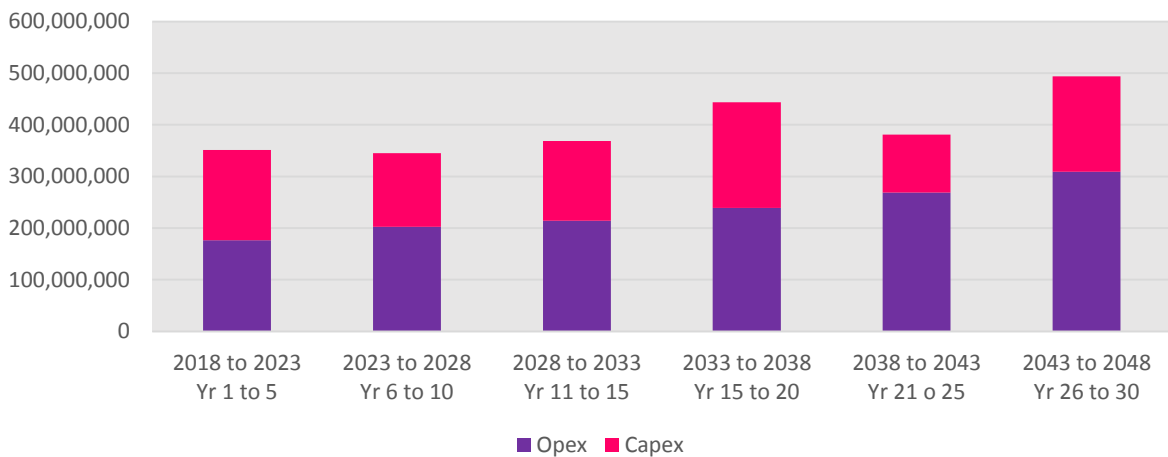


Figure 14: Year 1 to 30 Infrastructure 5-Yearly Operating Costs

TOTAL CAPITAL EXPENDITURE

Council has planned capital expenditure of \$318 million in the next 10 years, and around \$1 billion over the next 30 years. In the first 10 years, 37% of the investment is for level of service improvements, 53% for renewals, and 10% for growth.

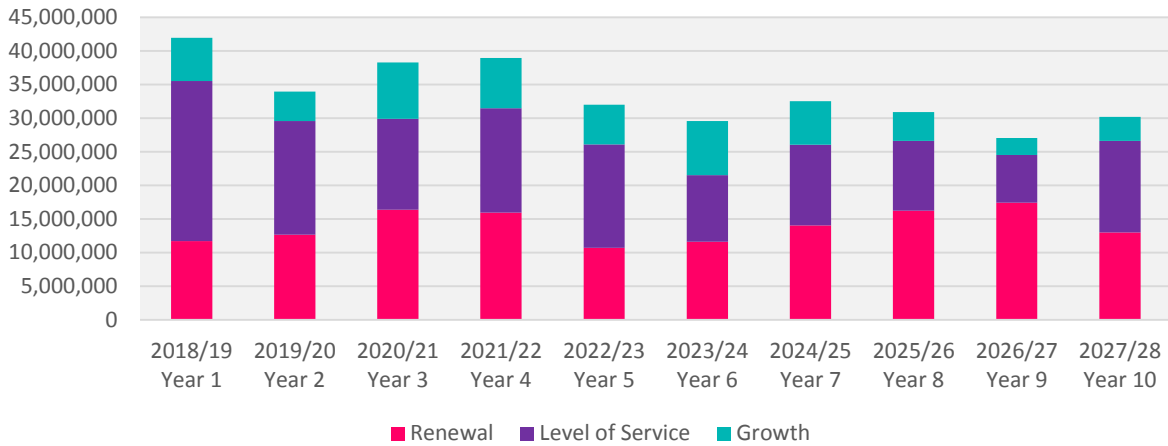


Figure 15: Year 1 to 10 Infrastructure Annual Capital Expenditure

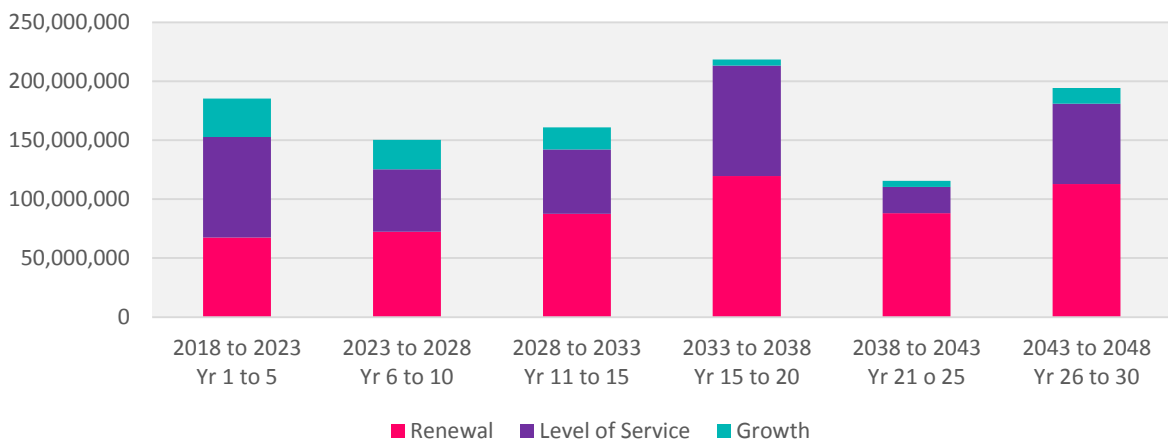


Figure 16: Year 1 to 30 Infrastructure 5-Yearly Capital Expenditure

ACTIVITY SUMMARIES

The following graphs show the split of Council’s operating and capital expenditure for infrastructure. For the next 10 years, Council needs to invest most in water supply due to water treatment plant upgrades. 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 Council’s respective activity management plans.

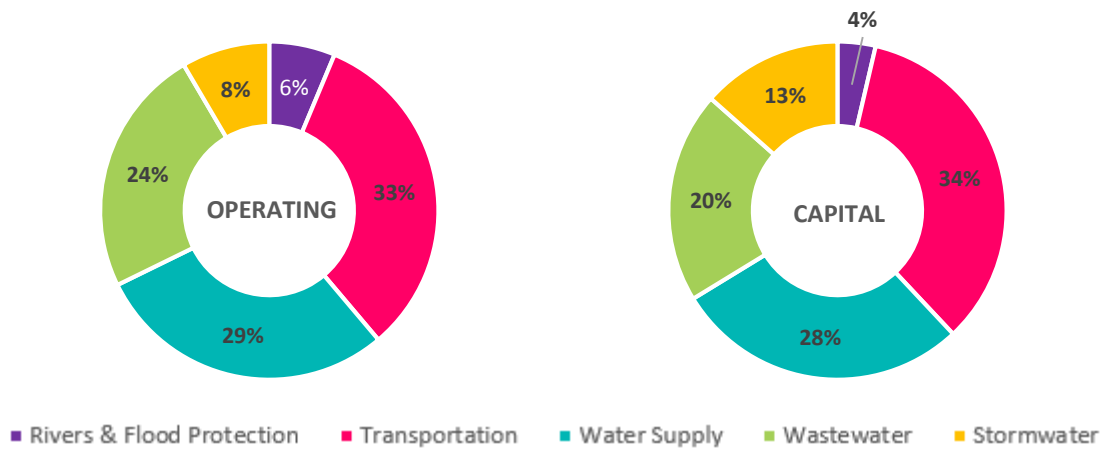
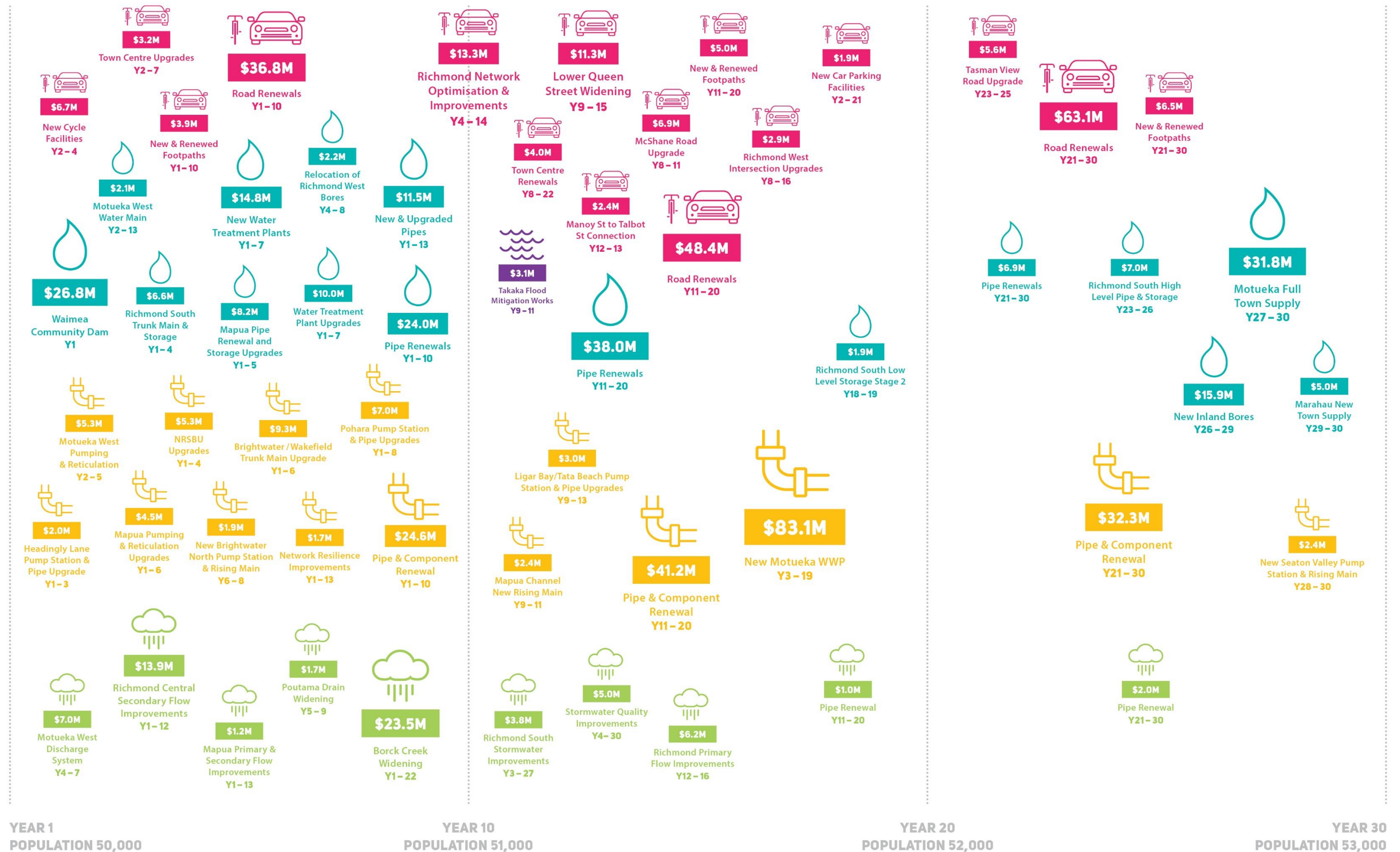


Figure 17: Year 1 to 10 Split of Operating and Capital Expenditure

TIMELINE OF KEY INFRASTRUCTURE PROJECTS

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



WATER SUPPLY



Council provides potable water to properties and businesses within 18 water supply areas across Tasman District. For most urban areas the water supply network also provides adequate pressure to meet firefighting requirements. Over the next 10 years, Council plans to spend 29% of its total infrastructure budget on the water supply activity.

ASSET OVERVIEW

The assets that make up Council’s water supply infrastructure are summarised in Table 4.

Historically, Council’s asset registers have been set up to record reticulation asset inventory data, which it does well. Asset data for water treatment plants is less reliable due to database constraints. Council plans to improve this during 2018.

Table 4: Water Supply Asset Summary

DESCRIPTION	REPLACEMENT VALUE	DATA RELIABILITY
15 water treatment plants	\$6.5m	Poor
21 pump stations	\$16.4m	Good
756km reticulation	\$118.8m	Good
4,548 valves	\$3.3m	Good
1,437 hydrants	\$3.3m	Good
117 backflow prevention devices	\$0.3m	Good
61 reservoirs	\$21.5m	Good
11,199 water meters	\$5.2m	Good
1,522 rural restrictors	\$0.4m	Good
32 bores	\$0.9m	Good

Note: Replacement Valuation as at 1 April 2017

LEVELS OF SERVICE

Council aims to provide the following levels of service for the water supply activity.

“Our water is safe to drink”

“Our use of the water resource is efficient”

“Our water takes are sustainable”

“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”

“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 for Council. Council has planned to invest significantly in improving water treatment commencing in 2018 through to 2025. This investment will lift Council’s performance against its agreed levels of service within the next few years.

Council plans to invest in proactive water leak detection in order to meet agreed levels of service.

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 water supply 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.

IMPROVING SAFETY OF WATER SUPPLIES

Council is required by the Health (Drinking Water) Amendment Act 2007 to provide safe water supplies that comply with the NZ Drinking Water Standards (Standards). Of the 18 supplies that Council operates, only one fully meet the requirements of the Standards. The main reason for non-compliance is a lack of protozoa treatment. Complying with the Standards is not a new issue for Council but one that has increased in priority following recent water contamination issues at Havelock North and the subsequent inquiry.

Table 5 summarises the options that Council has considered in order to improve the safety of its 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 Standards	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.	✓	\$27m	2018 - 2025
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 a breach our financial caps and put pressure on delivery of work.	✗	\$27m	2018 - 2021
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 Council's financial and delivery resources will be reduced but Council may fall further out of line with the Health Act.	✗	\$27m	2018 - 2027

The Health (Drinking Water) Amendment Act requires Council to take all practicable steps to ensure that the drinking water it supplies complies with the drinking-water standards. Consequently, Council has not considered an option that involves maintaining the status quo. Council considers it impractical to speed up the delivery of the upgrades due to the strain on resources it would create.

ENHANCING WATER SUPPLY CAPACITY AND SECURITY

For Council to provide a consistent water supply to households and businesses it is important that we have access to secure water sources that provide an adequate quantity and quality of water throughout the year. Council has already discussed with the community the lack of a secure water source for the Waimea Basin and the risk this presents to those users during summer. To improve security and long term capacity, Council has identified the Waimea Community Dam as the most suitable and preferred option.

As well as the Waimea Basin, Council has concerns about the security of the Dovedale water scheme source. Factors such as changes in private land use and changing weather patterns present a risk to the availability of this source.

Table 6 summarises the options that Council has 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
Waimea Basin Water Capacity and Security				
Invest in the construction and operation of the Waimea Community Dam	Users of the Richmond scheme will be provided with security of water supply during times of dry weather. The dam is to be designed for a one in 60 year drought and will augment the flows in the river and replenish the aquifers from which the water is abstracted. As this scheme is a proposed joint venture with irrigators and Nelson City Council (NCC), the proposed capital costs to the Tasman ratepayers is \$26.8m plus operating costs of \$715,000/year.	✓	\$26.8m is Council's share with \$9.58m attributed to extractor user charges (Urban Water Club)	2019 - 2022
Invest in an alternative water augmentation	A number of alternatives to the Dam have been investigated including riverside storage, the Motueka Aquifer, a dam on the Roding River, and utilising NCC's water supply. The estimated cost to the ratepayer is significantly higher than the proposed dam and the alternatives do not help with irrigation needs or augmentation of flows in the Waimea River. The alternative options do not offer the same long term security that would be provided by the dam.	✗	The cost of each alternative varies starting from \$95m for all options except NCC's supply which is estimated at \$12-15m for current water needs at step 3 rationing	Not planned, refer to Council's Statement of Proposal for the Waimea Community Dam – October 2017 for more detail.
Relocate Richmond water supply bores further inland	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.	✓	\$2.2m	2021 - 2026
Maintain the status quo	Without an augmented residential and industrial water supply, there will be significant restrictions during most summers. The lack of water supply and security will also limit additional new growth in the Richmond, Brightwater and Mapua settlements.	✗	Unknown	Not planned

Council extracts water from the Waimea Basin aquifers to supply the residential and industrial water needs for Brightwater, Mapua/Ruby Bay, Redwoods Valley, Richmond and Nelson South. Water sources within the Waimea basin are currently over allocated. With this, and the predicted changing climates and extreme weather patterns, dry weather has the potential to significantly impact or disrupt this supply. By building a new dam which will augment the Waimea River and groundwater aquifers, Council will be able to provide customers with continued water supply and security, and cater for increasing growth.

Council has recently undertaken extensive consultation on the funding and governance arrangements for the Dam, and this Strategy assumes that the Dam will proceed largely in the form and with the timing indicated in Statement of Proposal published in October 2017 with the following exceptions:

- Properties connected to the Redwood Valley Water scheme will receive the same water supply security benefits as the Urban Water Club, therefore the costs of funding the Redwood Valley water that scheme will now include a contribution to the extractive users costs; and
- The Zone of Benefit is extended to include some Mount Heslington and River Terrace Road properties excluded previously in error.

It also assumes that Council's costs for the Dam and the methods of funding these will be as indicated in the proposal.

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Dovedale Water Source Security				
Install a new water treatment plant and take from a groundwater source	The community will be provided with a much more secure source with vastly improved water quality. The requirement to boil water prior to consumption will be removed. The cost to supply water will increase requiring an increase in water rates.	✓	\$3.6m	2018 - 2025
Upgrade existing treatment plant	An upgrade of the treatment plant will improve the water quality enabling Council to remove the boil water notice. It will not improve source security. The risk of the water source drying up remains and customers connected to the Dovedale stream may experience sustained water outages.	✗	Approx. \$2.5 to \$3.5m	Not planned
Maintain the status quo	The boil water notice would remain in place along with the risk of the source drying up during extended periods of dry weather. Customers connected to the Dovedale stream may experience associated water outages.	✗	N/A	Not planned
<p>The Dovedale scheme currently takes water from a stream prior to dosing it with chlorine. As well as having a vulnerable source, the quality of the water is very poor and the scheme has a permanent boil water notice and disinfection. External factors such as forestry harvesting and dry weather have potential to significantly impact or disrupt this supply. By building a new treatment plant incorporating a new groundwater source, Council will be able to provide customers with increased water quality and security.</p>				

SUPPLYING OUR GROWING COMMUNITIES

Council expects that over the next 10 years Tasman's population will grow by approximately 4,400 residents. To accommodate this growth new houses will need to be built, most of which will need to be supplied with water. Council can supply some of this new demand through existing infrastructure where capacity is available. New areas of development such as Richmond West, Richmond South and Motueka West will require completely new infrastructure in order to deliver water to the area. For Mapua, the existing infrastructure will require upgrading to provide additional capacity.

Table 7 summarises the options that Council has 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 in Richmond and Motueka to service new areas of growth	Council will be able to provide new homes and businesses with the water they need. This will come at a cost that will mainly be funded by development contributions.	✓	\$9m	2018 - 2031
Upgrade existing trunk main and storage infrastructure for Mapua/Ruby Bay	Council will be able to 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 contribution charges and rates.	✓	\$8.2m	2018 - 2023

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Maintain the status quo	Council 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.	✘	N/A	Not planned

Enabling Tasman’s communities to grow is a priority for Council. To do this, Council has determined that it must provide essential infrastructure, including water, and has planned to do this in Richmond and Motueka, as well as upgrading infrastructure in Mapua/Ruby Bay. The timing of these upgrades is based on the population projections set out earlier in this document. Undertaking this work will help Council meet the requirements of the National Policy Statement – Urban Development Capacity.

WATER LOSS

The percentage of water loss from Council’s water supply networks is too high. Five of the urban water schemes currently do not achieve their performance targets. At any given time, there will be losses occurring in some part of Tasman’s network. How much leakage occurs on any scheme can vary significantly depending on a number of factors including operating pressures, pipe age, pipe material, and installation conditions.

Water loss is grouped into two types; apparent losses (result in lost revenue through meter inaccuracies, illegal use or theft, use for firefighting), and real losses (reticulation leakage and overflows at reservoirs). Council is focused on managing real water loss as it accounts for the majority of total water loss.

Table 8 summarises the options that Council has considered in order to reduce real water loss.

Table 8: Principal Options to Reduce Real Water Loss

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Proactive leak detection	Faults are identified and repaired in a proactive manner preventing further water loss.	✔	\$155k / yr	On-going from 2018
On-going pipe renewal	Pipes are progressively upgraded reducing the risk of failures and associated water losses.	✔	\$27m \$36m \$6.6m	2018 - 2027 2028 - 2037 2038 - 2047
Maintain the status quo	Water loss will be identified in a reactive way meaning that preventable water loss will continue to occur until its existence is noticeable.	✘	Unknown	N/A

Council is committed to taking a proactive approach to network water loss and have increased the budget for Demand, Flow & Leak Management to \$155k per annum. This budget 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.

INDICATIVE EXPENDITURE ESTIMATES

OPERATING

Operational costs for the water supply activity are forecast to increase by an average of 3.9% per year for the first 10 years, and an average of 3.4% per year over 30 years. The most notable increases within the next 10 years, occur between Year 1 and Year 4. During this time, direct operating costs are increasing due to the inclusion of the Waimea Community Dam. Council has budgeted for the Dam to be fully operational by Year 4. 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.

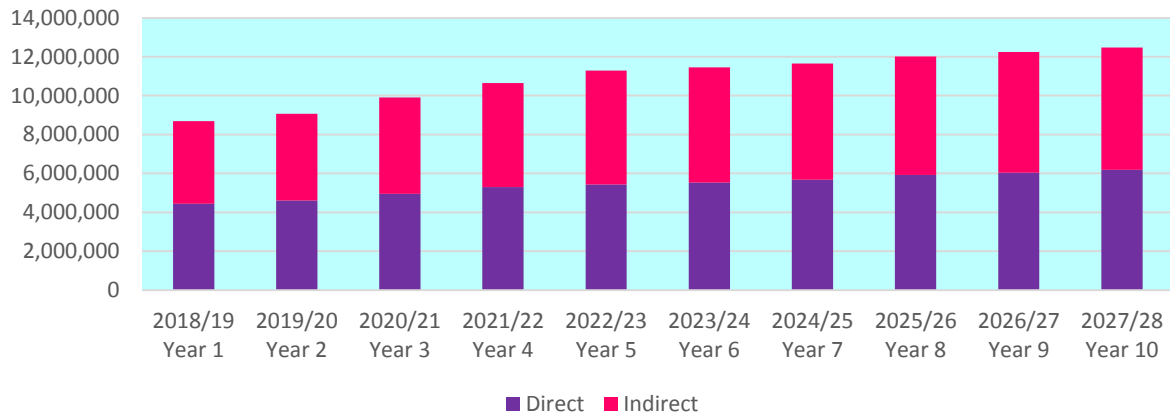


Figure 18: Annual Operating Expenditure for Year 1-10 for Water Supply

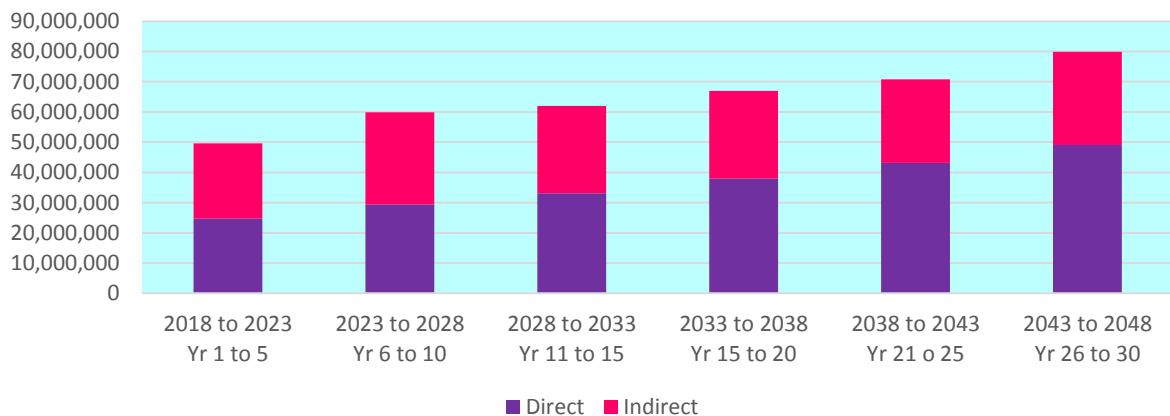


Figure 19: 5 Yearly Operating Expenditure for Year 1-30 for Water Supply

CAPITAL

Council plans to spend \$94 million on capital improvements over the next 10 years. Of this 15% is attributed to growth, 49% for level of service improvements, and 36% for asset renewal.

Council will invest most in level of service improvements for the first four years. This is due to the planned water treatment plant upgrades which are required to meet the NZ Drinking Water Standards.

Council anticipates that the majority of investment being made to enable growth will be required within the first four years. After this, there should be sufficient capacity within the majority of the water supply network to enable growth for the next 20 years. Beyond the next 20 years, it is likely that additional infrastructure will be required to enable growth in the elevated areas of Richmond South. Accordingly, Council has planned to install high level reticulation and storage in Richmond South between 2040 and 2044.

Long term, capital expenditure notably increases in the Year 26 to Year 30 timeframe. This is due to the installation of the Motueka and Marahau new town supplies.

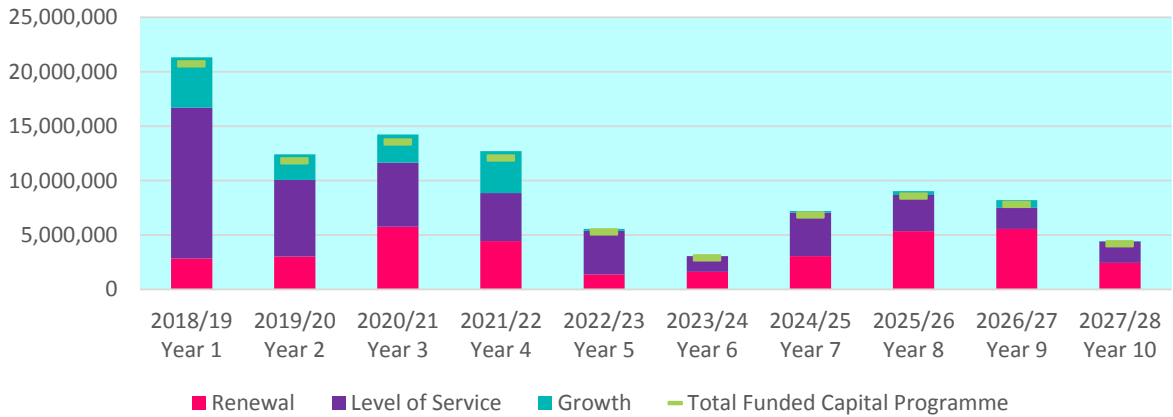


Figure 20: Annual Capital Expenditure for Year 1-10 for Water Supply

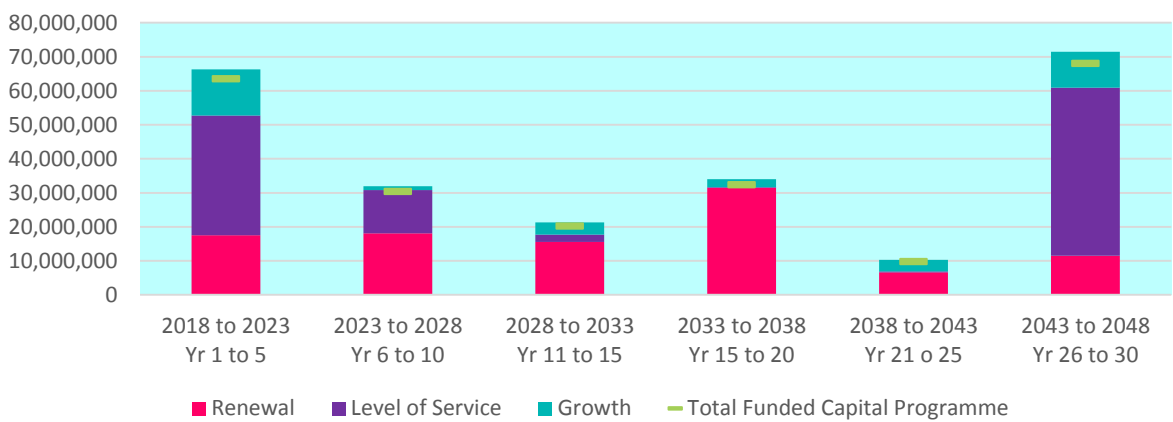


Figure 21: 5 Yearly Capital Expenditure for Year 1-30 for Water Supply

ASSET RENEWAL PROFILE

For the first 10 years, Council’s investment in renewals tracks slightly below depreciation. At Year 21, Council’s investment in renewal starts to fall behind depreciation more significantly. This divergence is due primarily to the long useful life and age profile of Council’s current assets. As shown earlier in Figure 8, most of Council’s water assets are not due for replacement within the next 30 years. The significant investment programme in new assets Council has planned also contributes to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but, like the bulk of Council’s current water assets, most don’t need replacing within the next 30 years. While not shown here, Council has 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

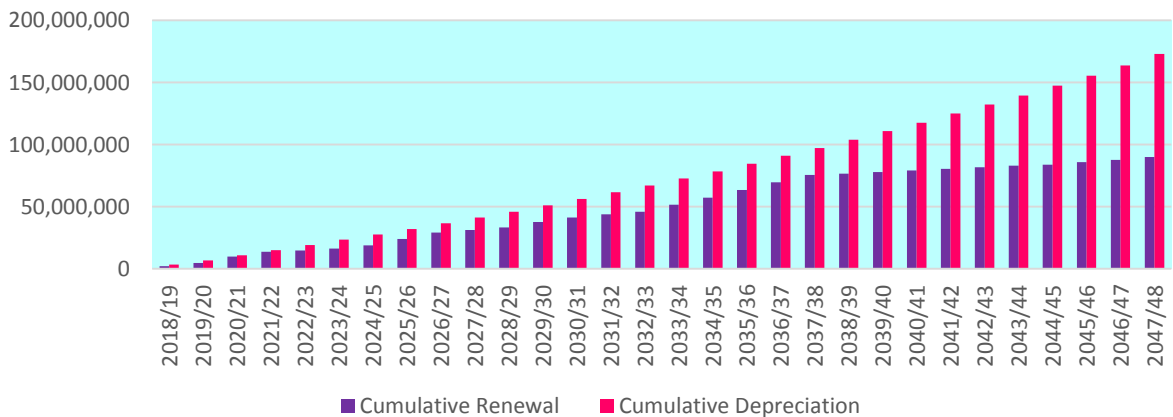


Figure 22: Capital Expenditure and Depreciation for Water Supply

ASSUMPTIONS AND UNCERTAINTIES

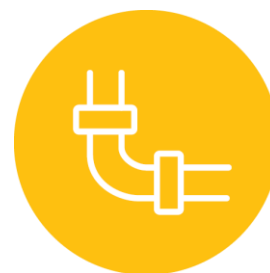
In addition to the key assumptions identified earlier in this Strategy, Council has identified the following uncertainties and key assumptions that are specific to the water supply activity.

- Central Government is currently considering a Bill which if passed would provide power to District Health Boards to make decisions and give directions about the fluoridation of local government drinking water supplies in their areas. It is unclear whether the Bill will be successful and what the actual implications for Council will be. For this Strategy, Council has assumed that its drinking water supplies will not be fluoridated. If the Bill is passed and the Nelson Marlborough District Health Board instructs Council to fluoridate its supplies, it will create additional capital and operating costs.
- An inquiry into the Havelock North drinking water contamination incident has been undertaken by the Government. Recommendations have been released but uncertainty remains about which of these recommendations will be made mandatory. One recommendation relates to water from previously 'secure sources' and continuous chlorination. Council has planned to incorporate emergency chlorination in its water treatment plant upgrades. It has not planned for permanent chlorination. If Government requires continuous chlorination of all drinking water supplies, it is estimated this would require additional capital expenditure of approximately \$1 million to apply this to all of Council's urban water schemes and an increase in operating expenditure of approximately \$50,000 per annum.

DRAFT



WASTEWATER



This activity provides and manages wastewater collection, treatment and disposal facilities for ratepayers connected to Council’s 12 wastewater networks. These networks convey wastewater to eight treatment plants, seven of which are owned and managed by Council. Over the next 10 years Council plans to spend 22% of its total infrastructure budget on the wastewater activity.

ASSET OVERVIEW

The assets that make up Council’s wastewater infrastructure are summarised in Table 9.

Historically, Council’s asset registers have been set up to record reticulation asset data, which it does well. Asset data for wastewater treatment plants is less reliable due to database constraints. Council plans to improve this during 2018.

Table 9: Wastewater Asset Summary

DESCRIPTION	REPLACEMENT VALUE	DATA RELIABILITY
8 wastewater treatment plants including 50% share of Bell’s Island treatment plant	\$57.1m	Poor
78 pump stations	\$18.4m	Good
3,689 manholes	\$17.3m	Good
360km reticulation	\$91.9m	Good
14,041 wastewater connections	\$19.9m	Good
Other assets	\$5.6m	Good

Note: Replacement Valuation as at 1 April 2017

LEVELS OF SERVICE

Council aims to provide the following levels of service for the wastewater activity.

“Our wastewater systems do not adversely affect the receiving environment.”

“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.”

“Our wastewater activities are managed at a level that satisfies the community.”

“Our wastewater systems are designed, operated and managed to be resilient.”

Through this Strategy Council is investing to lift its performance in preventing overflows so that they do not continue to adversely affect the environment. Major pump station and rising main upgrades are planned in Mapua and Pohara to help mitigate overflows in these areas. Council plans to mitigate overflows from the Richmond scheme through addressing inflow and infiltration.

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 wastewater 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. Often, implementing the preferred option for one issue is 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 broken pipes and defective joints, as well as cracked manholes.

Inflow and infiltration is a significant issue in some settlements because 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 Council has 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.	✓	\$29m	2018 - 2048
Identify and rectify illegal stormwater connections to the wastewater network.	Council will identify illegal private connections and take actions to have these rectified. The cost of identifying the work will be funded through the wastewater rate but the cost of rectifying issues will be the responsibility of the private party involved.	✓	\$127k / yr	On-going from 2018
On-going inflow and infiltration investigations	This work will enable Council to collect more condition and performance data, and identify specific areas that suffer from inflow and infiltration. This data will enable Council to make better decisions on balancing maintenance and renewal spending.	✓	\$168k / yr	On-going from 2018
Maintain the status quo.	Inflow and infiltration issues will continue to occur meaning that Council is funding unnecessary operating costs and overflows at known problem areas are likely to continue.	✗	N/A	Not planned
Council does not considers it 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 Council to optimise renewal of its pipes and invest in where it is needed most.				

IMPROVING NETWORK RESILIENCE

Some pump stations within Council's wastewater network 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 Council needs 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. For these reasons, Council considers that the wastewater networks lack resilience. Currently, Council does not meet the agreed level of service for pump station storage or standby electrical generation.

Table 11 summarises the options that Council has considered in order to improve network resilience.

Table 11: Principal Options to Improve Network Resilience

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Provide mobile backup generators	Council 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.	✓	\$370k	2020 - 2031
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.	✓	\$1.4m	2018 - 2023
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

Council has determined that its wastewater networks need to be more resilient. Currently, Council relies on its 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. Council needs to invest in improve storage and backup generators to meet agreed levels of service and protect public and environmental health.

MITIGATING OVERFLOWS

Overflows occur when untreated wastewater escapes from the network into the environment, presenting a risk to public and environmental health. 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. Council has already identified inflow and infiltration, and the lack of storage capacity and backup power as causes for overflows. In addressing this key issue, Council has considered how best to address the undersized parts of the network which have experienced overflows.

Table 12 summarises the additional options that Council has 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 the Pohara wastewater network	Council 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.	✓	\$10m	2018 - 2031

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Pump station upgrades throughout the Mapua wastewater network	Council 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.	✓	\$1.7m	2018 - 2024
Maintain status quo	The community will need to accept that the risk of overflows remains. Council may receive enforcement action due to not addressing preventable overflows. Council 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
Council must act to mitigate the risk of overflows in order to meet agreed levels of service.				

SUPPLYING OUR GROWING COMMUNITIES

Council expects that over the next 10 years Tasman's population will grow by approximately 4,400 residents. To accommodate this growth new houses will need to be built, most of which will need to be supplied with wastewater. Council can supply some of this new demand through existing infrastructure where capacity is available. Where capacity is not available, or if the infrastructure does not exist, Council will need to provide upgraded or new infrastructure to enable growth.

Table 13 summarises the options that Council has 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: <ul style="list-style-type: none"> Brightwater North Mapua Motueka West 	Council 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.	✓	<ul style="list-style-type: none"> \$1.6m \$2.7m \$3.9m 	<ul style="list-style-type: none"> 2023 - 2026 2018 - 2023 2019 - 2023
Upgrade existing pump stations and rising mains in: <ul style="list-style-type: none"> Motueka Richmond West Brightwater / Wakefield trunk main 	Council 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.	✓	<ul style="list-style-type: none"> \$1.0m \$2.0m \$9.3m 	<ul style="list-style-type: none"> 2019 - 2021 2018 - 2021 2018 - 2024

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Maintain the status quo	Council 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 Tasman’s communities to grow is a priority for Council. To enable this, Council has determined that it must provide essential infrastructure, including wastewater, and has planned to do this in Brightwater, Mapua/Ruby Bay, Motueka and Richmond. The timing of these upgrades is based on the population projections set out earlier in this document. Undertaking this work will help Council meet the requirements of the National Policy Statement – Urban Development Capacity.

INDICATIVE EXPENDITURE ESTIMATES

OPERATING

Operational costs for the wastewater activity are forecast to increase by around 3% per year for the first 10 years, and 4% per year over 30 years. Within the first 10 years, the most notable increase in direct costs occurs between Year 3 and Year 4. This is due to an increase in the Council’s share of operational costs from the Nelson Regional Sewerage Business Unit. 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.

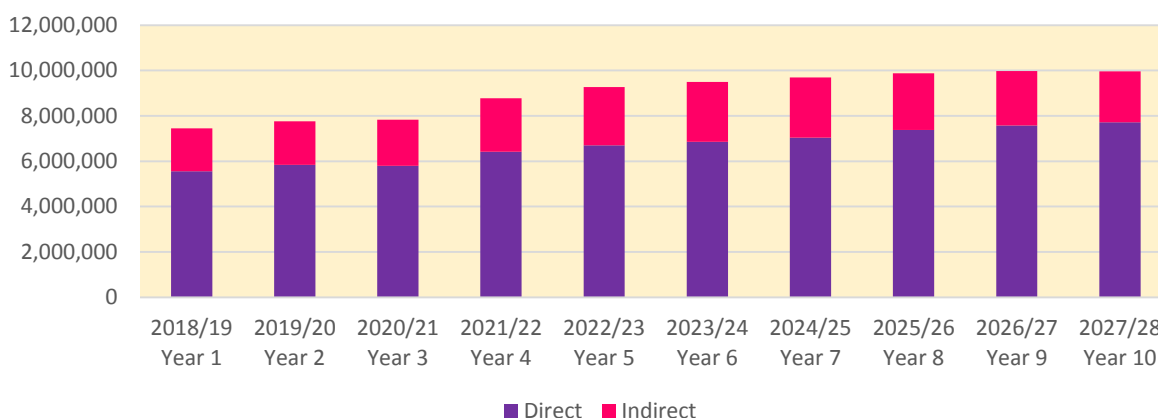


Figure 23: Annual Operating Expenditure for Year 1-10 for Wastewater

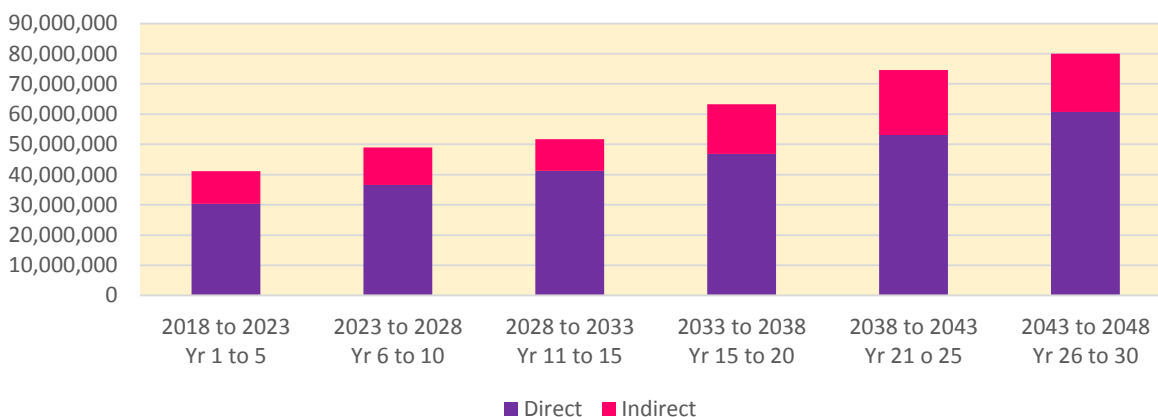


Figure 24: 5 Yearly Operating Expenditure for Year 1-30 for Wastewater

CAPITAL

Council plans to spend around \$64 million on capital improvements over the next 10 years. Of this 30% is attributed to growth, 30% for level of service improvements, and 40% for asset renewal. Council anticipates that the majority of investment being made to enable growth will be required within the first 10 years. After this, negligible costs will be attributable to growth. Beyond 10 years, Council has planned to make a major investment in a new inland wastewater treatment plant in Motueka, this occurs between Year 15 and Year 20 and accounts for the notable increase in forecast capital expenditure.

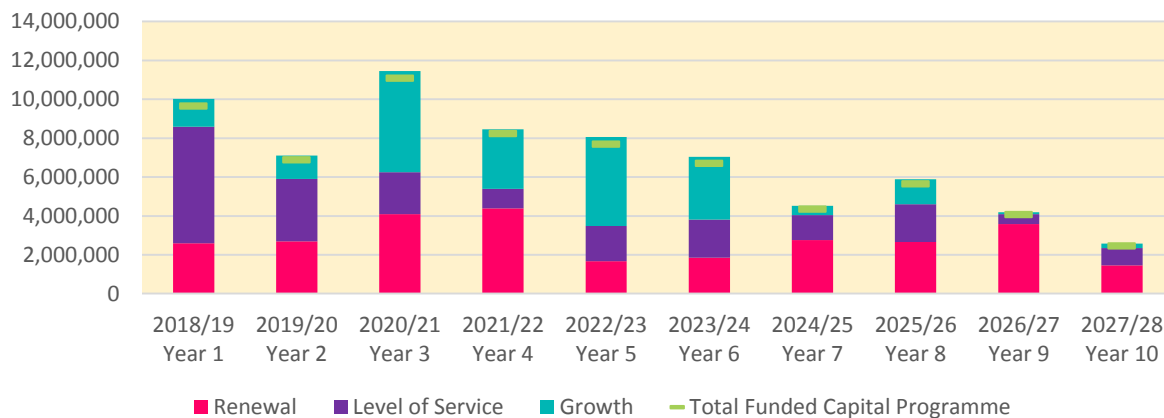


Figure 25: Annual Capital Expenditure for Year 1-10 for Wastewater

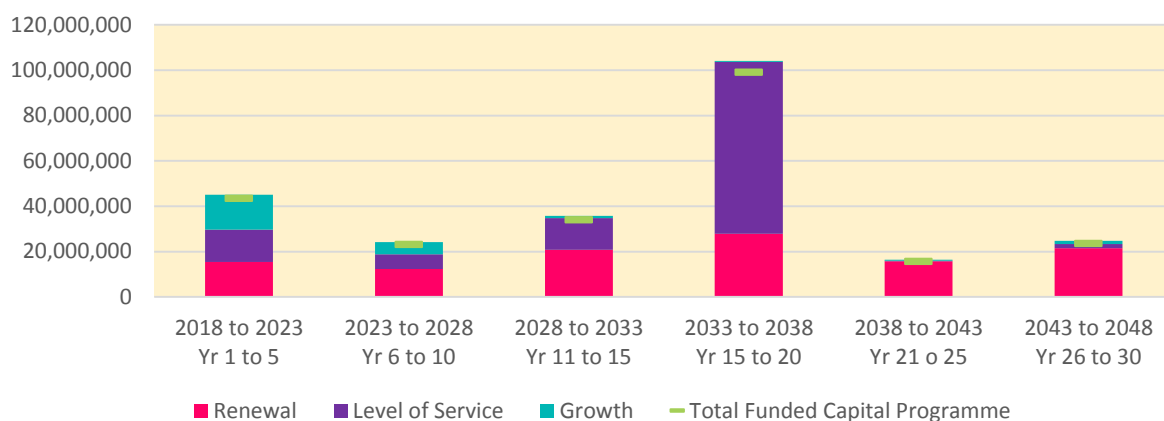


Figure 26: 5 Yearly Capital Expenditure for Year 1-30 for Wastewater

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 Council's current assets. As shown earlier in Figure 9, most of Council's wastewater assets are not due for replacement within the next 30 years. The significant investment programme in new assets Council has planned also contributes to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but, like the bulk of Council's current wastewater assets, most don't need replacing within the next 30 years. While not shown here, Council has 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.

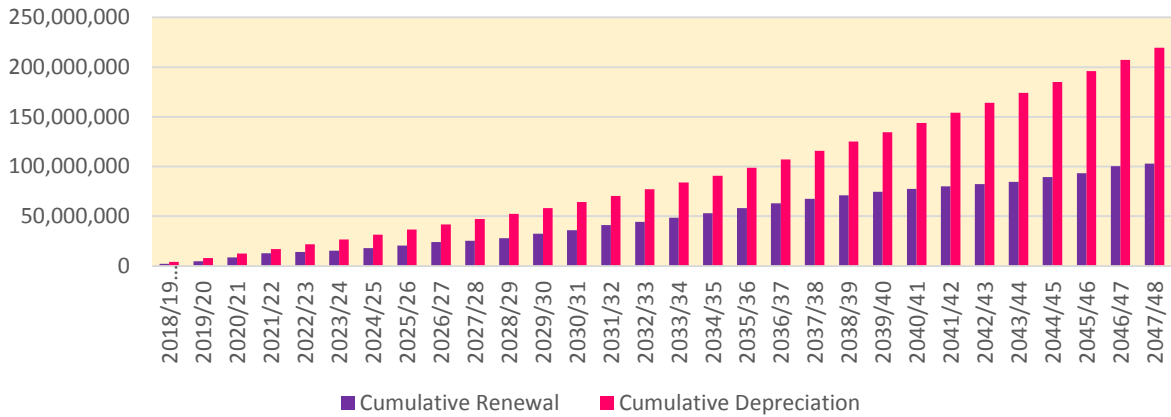


Figure 27: Capital Expenditure and Depreciation for Wastewater

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 wastewater activity.

- Currently, there are high levels of inflow and infiltration within the Motueka wastewater network taking up capacity that could otherwise be used by new connections. Council has assumed that this inflow and infiltration will be addressed by on-going pipe renewals and targeted inflow and infiltration repairs. Council expects 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 growth to exceed the rate of inflow and infiltration reductions. If this is the case, Council will need to programme additional pipe upgrades to enable growth, or potentially limit the rate and location of new connections.
- Council has prepared the wastewater programme of works based on the information that was available at the time. Over the next few years, Council has planned to undertake long term strategic studies 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 operating and capital requirements.



STORMWATER



The stormwater activity encompasses the provision of stormwater collection, reticulation, and discharge systems in Tasman District. Council manages its stormwater activities under 15 Urban Drainage Areas (UDAs) and one General District Area. The General District Area covers the entire District outside the UDAs. Over the next 10 years Council plans to spend 11% of its 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
13,148 property connections	\$12.9m	Good
187 km piped stormwater network	\$113m	Good
29 km of maintained open drains and streams	\$5.4m	Good
2,467 manholes	\$12.4m	Good
928 sumps	\$1.9m	Good
10 detention dams	\$1.1m	Good
Other assets e.g. culverts, inlets and outlets	\$8.3m	Good

Note: Replacement Valuation as at 1 April 2017

LEVELS OF SERVICE

Council aims to provide the following levels of service for the stormwater activity.

“We have measures in place to respond to and reduce flood damage from stormwater to property and risk to the community”

“We have strategies in place to manage our stormwater systems efficiently to ensure that our community receives best value for money”

“Our stormwater activities are managed at a level which satisfies the community”

Our stormwater systems do not adversely affect or degrade the receiving environment

Council has planned investments to improve the capacity of our primary and secondary networks as well as stormwater treatment to protect the receiving environment. In the short term, Council plans to develop stormwater models and catchment management plans for all Urban Drainage Areas. Through these strategic plans Council will develop a better understanding of the current and future performance of its 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. Often, implementing the preferred option for one issue is 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, Council will 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. Council has planned to develop a full suite of urban catchment management plans by 2023, starting with priority areas – Richmond and Motueka. These will be used to inform future versions of this Strategy and Council’s activity management plan for stormwater.

SUPPLYING OUR GROWING COMMUNITIES

Council expects that over the next 10 years Tasman’s population will grow by approximately 4,400 residents. To accommodate this growth new houses will need to be built. As new houses are built, the nature of surface water runoff changes due to permeable areas of ground becoming hard surfaces such as houses and carpark areas. This increases the volume of stormwater that Council needs to collect and discharge. Council can meet this increased demand through existing infrastructure where capacity is available. Where capacity is not available, or if the infrastructure does not exist, Council will need to provide upgraded or new infrastructure to enable development to continue.

Table 15 summarises the options that Council has 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 and streams Key projects include Borck Creek Widening, Motueka West Discharge System	Council will be able to 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.	✓	\$38m	2018 - 2048
Manage demand from the source through the Tasman Resource Management Plan rules	Developers will partially mitigate the impact of their developments on the stormwater system before it enters Council’s network. Council’s stormwater network can be sized accordingly.	✓	N/A	Status quo
Prevent development from occurring	Council will not be able to provide for some new homes and businesses. This will restrict the amount of growth that can occur, particularly in Richmond and Motueka.	✗	N/A	Not planned
Enabling Tasman’s communities to grow is a priority for Council. To enable this, Council has determined that it must provide essential infrastructure, including stormwater, and has planned to do this in Brightwater, Mapua/Ruby Bay, Motueka and Richmond. Undertaking this work will help Council meet the requirements of the National Policy Statement – Urban Development Capacity.				

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 Council to eliminate all flooding so it has to set appropriate intervention levels. For Council, the design standard for the primary flow network is 10% annual exceedance probability, and the secondary flow network is 1% annual exceedance probability. Generally, Council plans to intervene when habitable floors are at risk of being flooded.

Table 16 summarises the options that Council has 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 Key projects include Washbourn Bypass Pipeline, Poutama Drain Widening, Gibbs Road Stormwater Diversion and Ned's Creek Improvements	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.	✓	\$28m	2018 - 2048
Protecting secondary flow paths	Council 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.	✓	\$4.8m	2022 - 2048
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 properties is a priority for Council. Through the agreed stormwater levels of service, Council aims to prevent habitable floors from being flooded. Council considers it 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 line 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. Council controls these types of effects through implementation of Council's Engineering Standards and the Tasman Resource Management Plan (TRMP). For this reason, infrastructure interventions have not been considered below.

Table 17 summarises the options that Council has 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 stormwater network.	✓	N/A – private cost	Status quo
Construct treatment wetlands	Wetlands located in strategic areas will help remove contaminants from the stormwater runoff prior to discharging into the receiving environment.	✓	\$1.6m	2026 - 2037
Installation of stormwater treatment devices	Stormwater runoff can be treated at key locations which generate high levels of contaminants e.g. busy road intersections.	✓	\$2.0m	2021 - 2048
Interventions to improve water quality and stream health Lake Killarney in Takaka	Stormwater runoff will be adequately managed adjacent to Lake Killarney.	✓	\$1.3m	2025 - 2029
The National Policy Statement for Freshwater Management requires Council to maintain or improve the overall quality of freshwater. This means that Council needs 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 be:

- 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;
- 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 Council's 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.

Council has not planned to specifically respond to climate change in isolation from the other issues discussed above. Instead, Council plans to consider and address the effects of climate change when delivering the preferred options. 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 around 1% per year over 30 years. Direct operational costs are fairly static for the duration of the 30 years. Indirect costs fluctuate over the next 30 years due to varying 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.

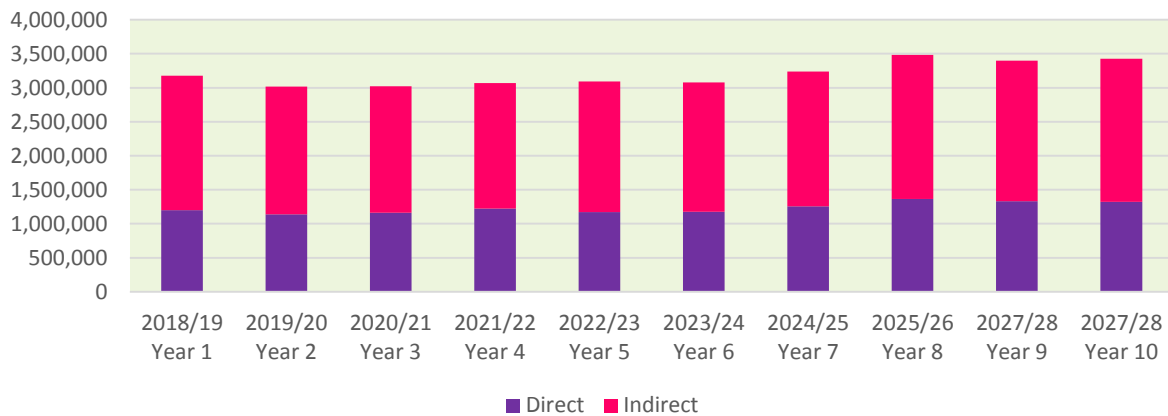


Figure 28: Annual Operating Expenditure for Year 1-10 for Stormwater

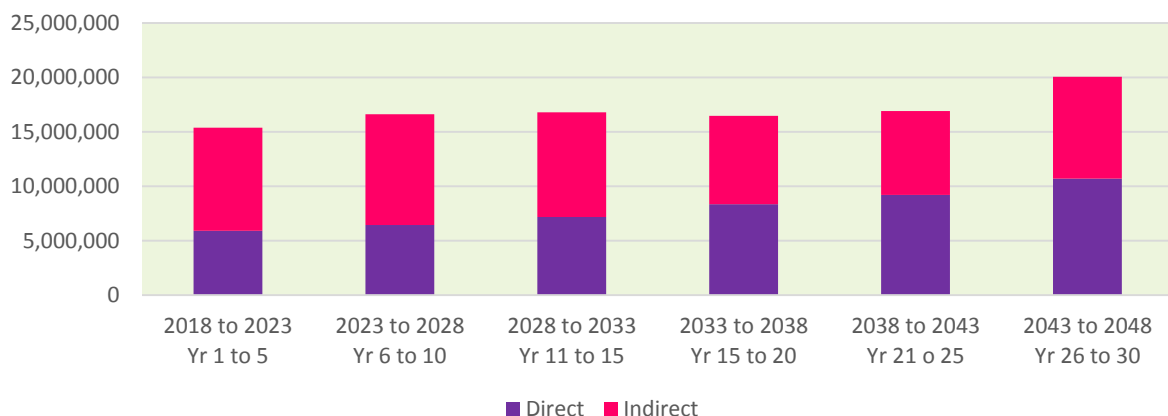


Figure 29: 5 Yearly Operating Expenditure for Year 1-30 for Stormwater

CAPITAL

Council has planned to spend around \$45 million on capital improvements over the next 10 years. Of this 31% is attributed to growth, 64% for level of service improvements, and 5% for asset renewal. Council has a clear focus on reducing the impact of flooding on residents which accounts for the majority spend on levels of service. Council's 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 3 years, Council has planned to undertake stormwater improvements that provide clear benefits to residents without causing issues to other parts of the network, and to complete catchment management planning to confirm the scope of works planned beyond Year 3. There is a clear increase in capital expenditure during Year 4 to Year 7. This is due to the construction of the Washbourn by-pass pipeline and the Motueka West discharge system. There is also a notable increase in Year 10. This is due to the need to acquire land prior to property designations expiring.

Beyond Year 15, capital expenditure drops off significantly. Council expects to identify the need for further works through the catchment management plan process that have not been included in this Strategy. It is likely that these works will be added to the programme after completion of the catchment management plans.

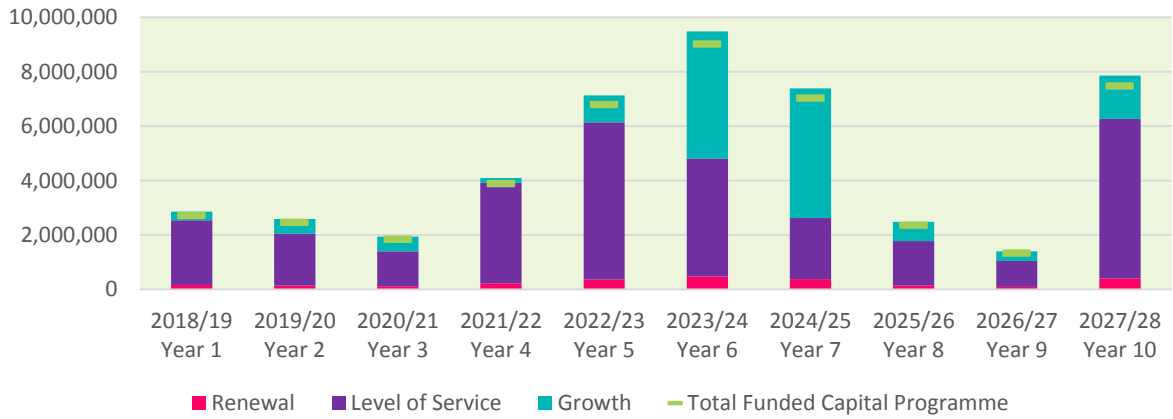


Figure 30: Annual Capital Expenditure for Year 1-10 for Stormwater

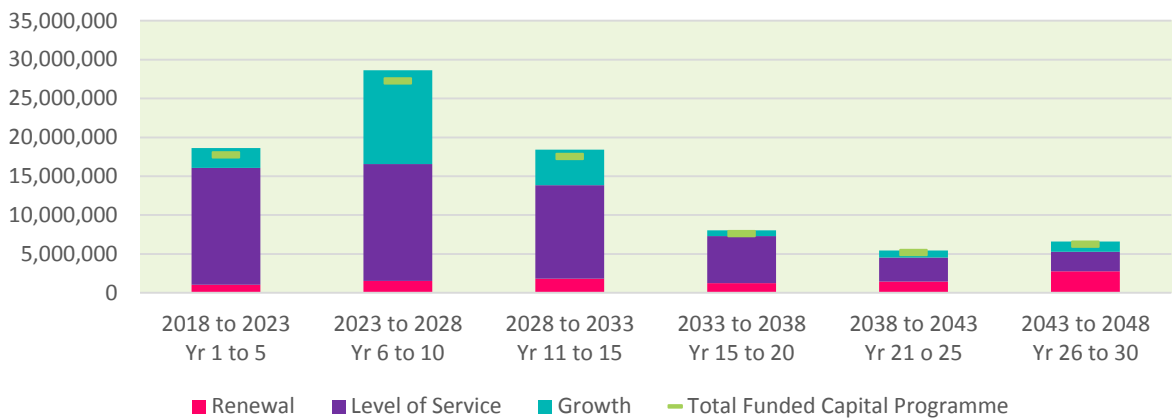


Figure 31: 5 Yearly Capital Expenditure for Year 1-30 for Stormwater

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 Council’s current assets. As shown earlier in Figure 7, most of Council’s stormwater assets are not due for replacement within the next 30 years. The significant investment programme in new assets Council has planned also contributes to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but, like the bulk of Council’s current stormwater assets, most don’t need replacing within the next 30 years. While not shown here, Council has 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.

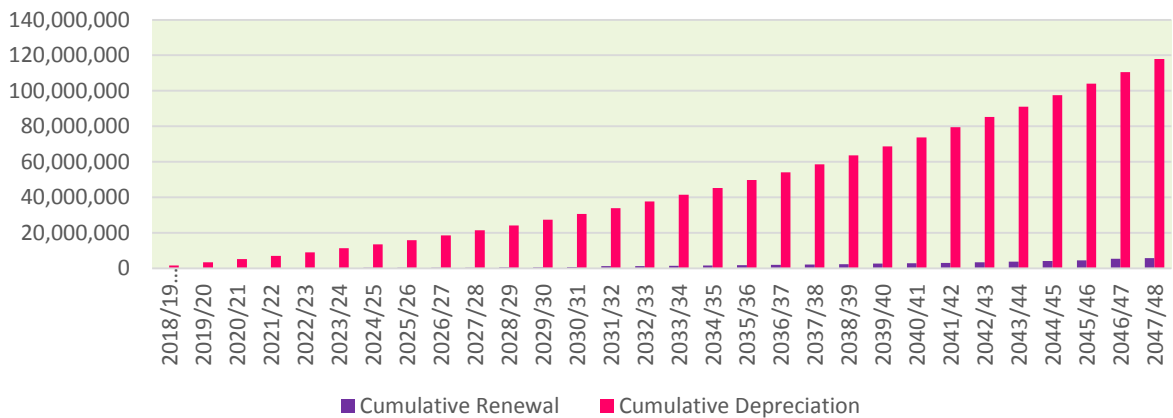


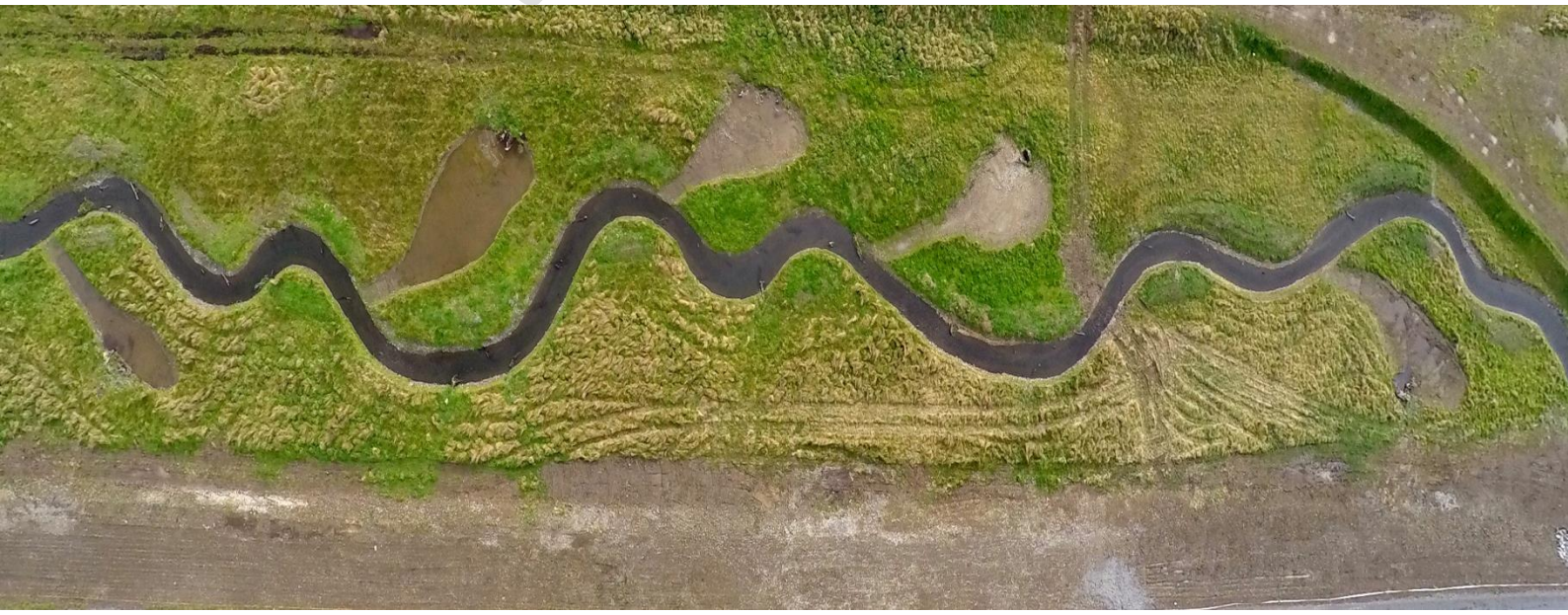
Figure 32: Capital Expenditure and Depreciation for Stormwater

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.

- Extreme rainfall events and associated flood impacts can happen at any time and their occurrence may differ from what can be expected based on historic trends and projections. Council develops stormwater management strategies, plans and designs for events that have a 1% and 10% probability of occurring in any one year. When large events happen, it is likely to trigger higher expectations from the 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 in this Strategy.
- Council has planned to undertake stormwater modelling 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 Council on what could happen, not what will happen. Council considers model prediction together with local knowledge and monitoring data to select most likely scenarios. If the conclusions are incorrect, Council may need to reconsider the scope of projects included in its stormwater programme.
- Council has prepared the stormwater programme of works based on the information that was available at the time. Over the next few years, Council plans to undertake more modelling and prepare catchment management plans. This will provide new and up-to-date information. It is likely that this information will highlight the need for additional intervention by Council, and the need to programme further improvements requiring additional funding.

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TRANSPORTATION



Council provides 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 Council plans to spend 33% of its total infrastructure budget on the water supply activity.

ASSET OVERVIEW

The assets that make up Council's transportation infrastructure are summarised in Table 18.

Council considers that the asset inventory data for bridges, Tasman's Great Taste Trail, carpark areas, street lights and traffic facilities are of poor reliability. This is because a significant portion of the data is estimated. This is not a significant concern for Council as almost all of these assets are above ground and can easily be inspected. Council has good condition data for most of these assets and an ongoing inspection regime. 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
1,741 km of roads including 967 km of sealed roads and 784 km of unsealed roads	\$522m	Good
494 bridges including footbridges	\$152m	Poor to Good
285 km of footpaths, 276 km walkways and 9 km cycleways	\$35m	Good
138 km of Tasman's Great Taste Trail	\$7.2m	Poor
22 off street carpark areas	\$4.4m	Poor
10,157 culverts with a total length of 99 km	\$72m	Good
2,428 sumps and catchpits	\$4.9m	Good
2,198 Streetlights	\$8.5m	Poor
Other assets including signs, retaining walls and traffic facilities	\$17.5m	Poor to Good

Note: Replacement Valuation as at 1 April 2017

LEVELS OF SERVICE

Council aims to provide the following levels of service for the transportation activity.

"Our transportation network is becoming safer for its users."

"We proactively maintain roads in high risk areas to minimise unplanned road closures."

"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."

"Our transportation network is managed so that changes to normal travel time patterns across the network are communicated effectively."

"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."

Council has incorporated two new transportation performance measures that focus on the use of public transport and strategic cycle routes. By incorporating these measures, Council can more effectively determine how the community is using alternative modes of travel.

Council will continue to construct new footpaths with a target of at least 500m per year. By doing this, access for pedestrians will continue to improve as gaps in the network are closed and new areas connected.

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 transportation 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.

SUPPLYING OUR GROWING COMMUNITIES

Council expects that over the next 10 years Tasman's population will grow by approximately 4,400 residents. All of these people will need to access to different forms of transport in order to travel for work, education, recreation and essential services, this will place increasing demand on Council's transportation network.

Table 19 summarises the options that Council has 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 Council makes 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.	✓	\$25.7m	2019 - 2034
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 Council's financial and delivery resources.	✗	\$25.7m	2018 - 2028
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

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. Council has timed the upgrades so that it makes the best use of existing assets at the same time as managing levels of service within an adequate range. Undertaking this work will help Council meet the requirements of the National Policy Statement – Urban Development Capacity.

CHANGING POPULATION

Tasman's population is ageing well ahead of the national average. Over the next 30 years, the percentage of residents aged over 65 is projected to increase from 18% to 37%. Council needs 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 and less demand for self-drive vehicles.

Council is currently preparing a network operating framework (NOF) for Richmond with the NZ Transport Agency and Nelson City Council. The NOF considers the current and future state of the transportation network and how it should operate to meet the changing needs of the community. Through this process, Council has identified areas of the network that need to be improved or optimised in order to be fit for purpose for the changing community. The NOF considers all forms of transport and how each mode interacts with the other. Types of actions identified by the NOF process include; establishing walking and cycling corridors, road widening, intersection improvements, and creating hubs where different transport modes can interact.

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

Table 20: Principal Options to Provide for a Changing Population

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Public Transport				
Extend the existing Nelson-Richmond route to provide better coverage of Richmond	Bus users within Richmond will have better access to services. Council will be able to determine if the extended services are viable before making a long term commitment.	✓	\$8.3m	2018 - 2028
Extend public transport services to other settlements such as Brightwater, Wakefield and Motueka	Residents in Brightwater, Wakefield and Motueka will have more transport options.	✗	Approx \$450k / yr	Not planned
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.	✗	\$3.6m	Not planned
During 2017, Council undertook a feasibility study to determine what additional bus services may be viable and worth trialing. The study determined that there is likely to be sufficient demand to make an extension to the existing Richmond route viable. The study found that any extension beyond Richmond would require very high bus fares making the service unviable and Council resolved it would not plan for a trial service.				

Pedestrian Facilities				
Construct new footpaths	Council will continue to improve the footpath network by closing gaps, widening footpaths, and building footpaths in new areas. Residents will have improved walking access.	✓	\$9.0m	2018 - 2048
Renew existing footpaths	Council will maintain the existing network in adequate condition. As footpaths become rough and in poor condition they will be replaced.	✓	\$6.3m	2018 - 2048
Do not construct new footpaths	Walking access will not improve. Narrow footpaths and gaps in the network will remain.	✗	Nil	Not planned
Council has set two level of service performance targets for footpaths. These state that Council will construct at least 500m of new footpath a year, and that it will maintain 95% of the footpath network in average condition or better. The preferred options and cost estimates are based on enabling Council to achieve these targets.				

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Network Operating Improvements				
Undertake network optimisation improvements <ul style="list-style-type: none"> Salisbury Road Wensley Road Oxford Street William Street 	Council will progressively provide a transportation network that is integrated, safe and fit for purpose for all users.	✓	\$14.3m	2021 - 2032
Do not undertake network improvements	It is likely that conflict and tension between different types of users will increase. The risk of injury accidents is likely to increase where there is both increasing traffic volumes as well as pedestrians and cyclists.	✗	Nil	Not planned
Council has planned to be responsive to the changing transport needs of the community. By doing this it is enabling the community to be safe, inclusive and meet the needs of current and future users. Undertaking the network improvements is fundamental to Council delivering on its Community Outcomes.				

COMMERCIAL GROWTH

Bigger trucks, more tourists and a thriving economy rely heavily on the road network. The growth in primary industries across the District is causing increased freight traffic which increases wear and tear to Council's roads and creates more conflicts with other road users.

Table 21 summarises the options that Council has considered in order to enable commercial growth.

Table 21: Principal Options to Enable Commercial Growth

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Increase investment in road pavement 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.	✓	\$36m	2018 - 2048
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 \$27m	2018 - 2048
Council has planned to renew its road pavements in an optimised way that takes into account the increased wear and tear from more and heavier vehicles. By doing this, Council 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 the NZ Transport Agency for its subsidised transport programme. The subsidy applies to most operating and maintenance activities and some capital improvements. The subsidy generally does not apply to footpaths and town centre upgrades.

OPERATING

Operational costs for the transportation activity are forecast to increase by around 2% per year for the first 10 years, and 4% per year over 30 years. Direct costs generally increase in line with inflation for the duration of the 30 years. Indirect costs increase with inflation over 30 years, as well as increasing loan interest costs beyond Year 20.

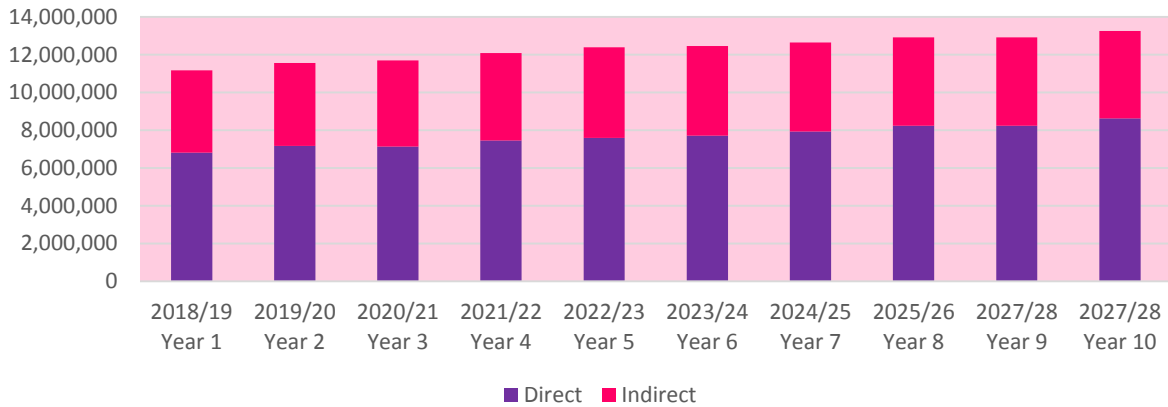


Figure 33: Annual Operating Expenditure for Year 1-10 for Transportation

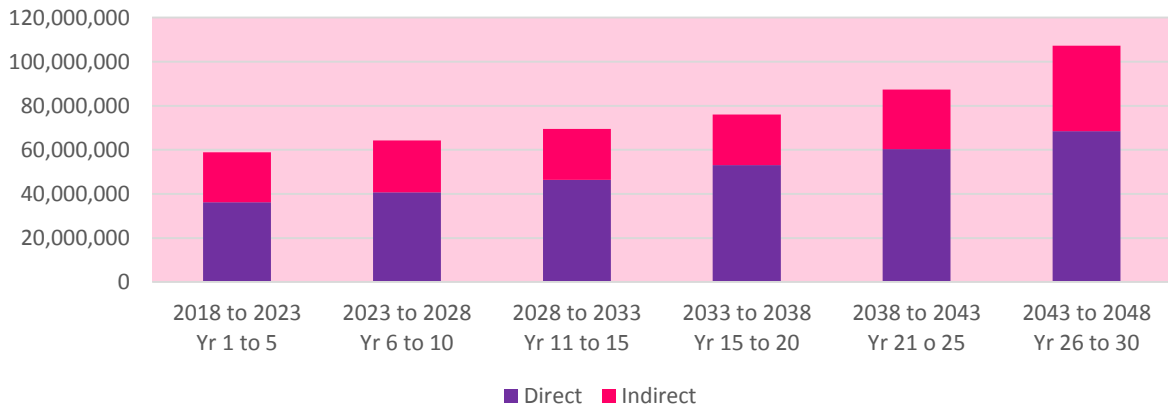


Figure 34: 5 Yearly Operating Expenditure for Year 1-30 for Transportation

CAPITAL

Council plans to spend around \$109 million on capital improvements over the next 10 years. Of this 7% is attributable to growth, 26% for level of service improvements, and 68% for asset renewal. Council’s clear priority for the transportation activity is maintaining the condition of the network.

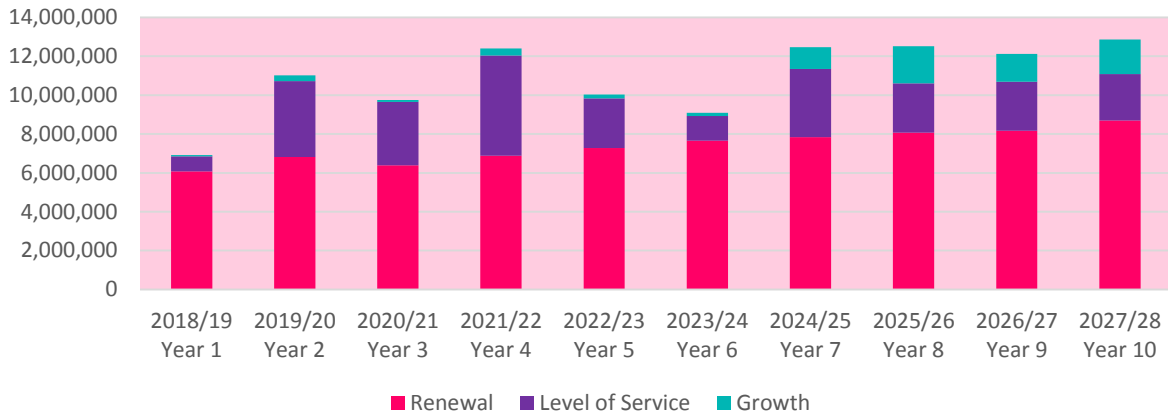


Figure 35 shows that Council’s capital investment is primarily for renewal and that this investment is steady for the next 30 years.

In Year 7 to Year 10, there is a notable increase in growth expenditure. This is due to the need to upgrade parts of the Richmond ring route, roads and intersection in Richmond West, and Bird Lane in Brightwater. Between Year 11 and Year 15 Council has planned to upgrade Lower Queen Street which accounts for a large portion of growth expenditure required over that timeframe. The small amount of growth funding shown outside of these timeframes largely relates to the growth proportion of the new footpath and kerb and channel works that Council has planned to do each year.

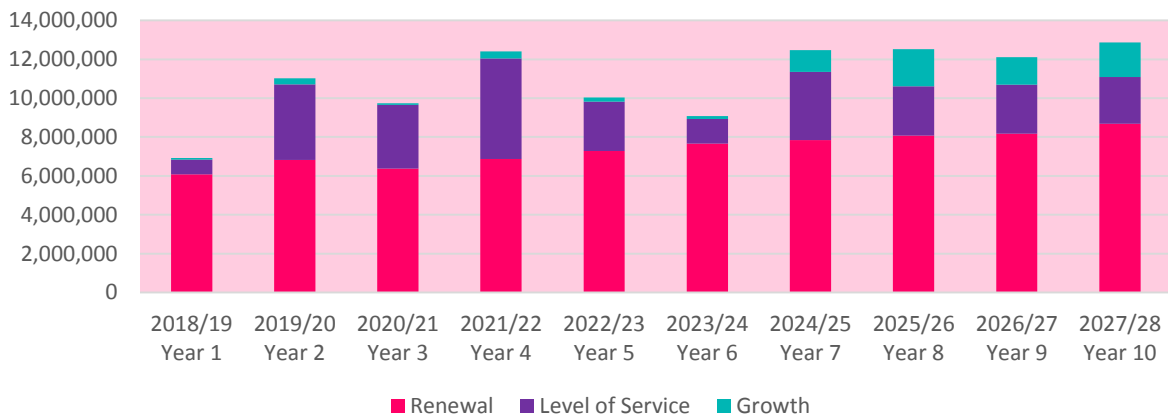


Figure 35: Annual Capital Expenditure for Year 1-10 for Transportation

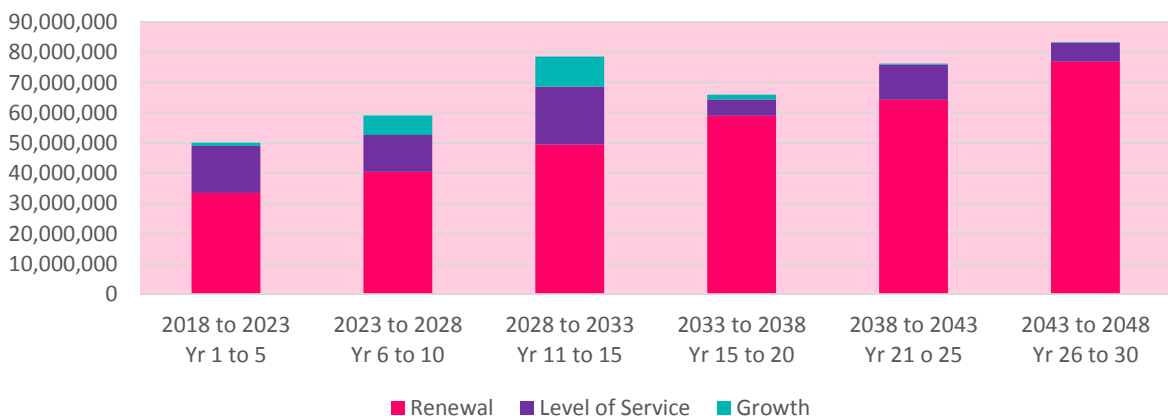


Figure 36: 5 Yearly Capital Expenditure for Year 1-30 for Transportation

ASSET RENEWAL PROFILE

Council has planned a steady base of renewals for the next 30 years. This base is created by the high proportion of transportation assets that have a relatively short useful life, between 10 and 20 years. Bridges are an exception to this as their useful life is typically 100 years and most of Council’s bridge assets are not due for renewal within the next 30 years. There is a significant divergence between renewal investment and depreciation from Year 1, increasing through to Year 30. This divergence is partly due to the age profile of Council’s current bridge assets. As shown earlier in Figure 6, most of Council’s bridges are due for renewal beyond Year 30. Council has 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 depreciation is closed as the bulk of the assets reach the end of their useful life. As well as this, Council uses deterioration modelling to determine optimised renewal investment levels which take into account asset condition and usage which have not been factored into depreciation estimates. Another factor driving this divergence is that the new assets that Council has planned to build over the next 30 years have been incorporated into the depreciation forecasts but not the renewal forecasts.

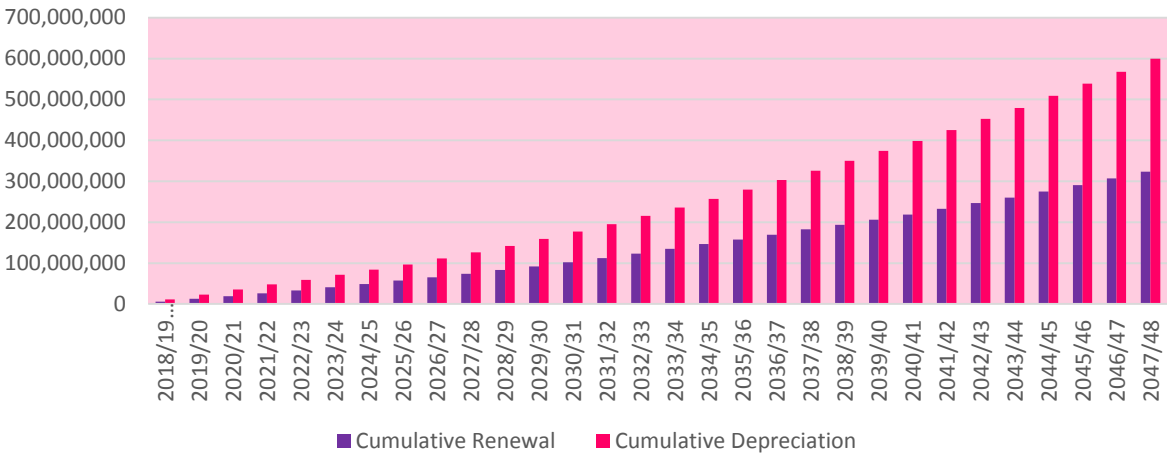


Figure 37: Capital Expenditure and Depreciation for Transportation

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.

- Council cannot predict when and where flood events will occur, or the damage that may be sustained during such a flood. During large events there is a risk that roads can be washed out or blocked by slips and debris. Council has assigned annual budgets to cover clean-up and repair costs which should be sufficient for most events. Council has an emergency fund to cover the costs associated with more significant damage. Council has assumed that if this occurs, that it will have enough funds available to undertake repairs whether it is through accessing budgeted funds or reprioritisation of other maintenance activities.
- The Richmond Network Operating Framework is yet to be completed. The scope and cost estimates of the network improvement projects included in the capital programme have been developed based on the work undertaken to date. Council assumes that once the Framework is complete, that the scope and cost of the individual projects will not materially change and that the planned budgets will be sufficient.
- At the time of preparing this Strategy, Council had not received confirmation that it would receive the full amount of funding applied for from the NZ Transport Agency. Council assumes it will receive the full funding request. If full funding is not granted, Council may need to fully fund a small portion of the programme, or reduce the scope of the programme so that it aligns with the level of funding given.
- The draft Government Policy Statement on Land Transport (GPS) was released in March 2017. The GPS summarised the issues that the Ministry of Transport had prioritised for the next three years. Following election of a new Government, the Minister of Transport has signalled new priorities which will likely change the GPS. The Council’s programme of planned transportation works has been assessed against the issues recently signalled and there is a high level of conformity with Council’s plans and the likely scope of the final GPS. Council has assumed that the finalised GPS will not have a material impact on Council’s ability to receive funding from the NZ Transport Agency.

- Until now, self-drive vehicles have been the predominant form of transport throughout the 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 the future, it is likely that driverless automated vehicles become commonplace. Council assumes that these changes in technology will not significantly impact the way the transportation network functions.

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RIVERS AND FLOOD CONTROL



Council maintains 285km of rivers in order to carry out its statutory role to promote soil conservation and mitigate damage caused by floods and riverbank erosion. By implementing and maintaining quality river control and flood protection schemes, Council improves protection of public spaces and assets as well as private property. Over the next 10 years Council plans to spend 5% of its total infrastructure budget on the rivers and flood control activity.

ASSET OVERVIEW

The assets that make up Council's rivers and flood control infrastructure are summarised in Table 22.

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

Council aims to provide the following levels of service for the rivers and flood control activity.

"Our communities are protected from natural hazard events"

"Our river environments are attractive and enjoyed by our communities"

Council does not plan to increase levels of service for this activity for the duration of this Strategy. Council plans to continue to invest in native riparian planting in order to increase the amount of native plants within the river systems.

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 rivers and flood control 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.

FLOODING OF PRIVATE PROPERTY

Communities that live near rivers are exposed to flood risk. Our communities most at risk include Motueka, Riwaka, and Takaka. 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, Council aims to help protect these communities through its River and Flood Control activity through the provision of erosion protection and stopbanks. However, there is only so much that Council 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.	✓	N/A	Status quo
Increase capacity and strength of the existing stopbanks	The risk of the stopbanks overtopping or collapsing during significant flood events will be reduced. The community will be protected to a higher level.	✗	\$15m - \$20m	Not planned
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
<p>Prior to adopting the Long Term Plan 2015-2025, Council investigated and consulted with the community on the improvement of flood protection for Motueka. At the time, the community and Council decided to accept the flood risk rather than invest in a higher level of protection. This decision stands. Council has planned to revisit this work as part of a wider natural hazards planning process for Motueka during 2018/19. This acknowledges that risks change and the community may feel differently now after observing the impact of recent flood events in other parts of New Zealand.</p>				
Riwaka River				
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.	✓	\$725k	2020 - 2023
Increase height of stopbanks to provide increased flood capacity	<p>Neighboring residents will be provided with a higher level of protection.</p> <p>The cost of this option is relatively high given that the improvements will only impact a small number of houses.</p> <p>Land acquisition is required to increase the footprint of the stopbanks which may result in loss of income for affected land owners.</p>	✗	\$3.5m - \$4.5m	Not planned

PRINCIPAL OPTIONS	IMPLICATIONS	PREFERRED OPTION	COST ESTIMATE	TIMING
Maintain the status quo	The risk of the stopbanks overtopping during significant flood events will remain.	✘	Nil	Not planned

The cost of wide scale stopbank improvements far outweigh the benefits of undertaking the work. Council will work with individuals who are most affected by stopbank breaches to improve their resilience.

Takaka River

Construct new stopbanks	Residents will experience a higher level of flood protection.	✔	\$3.1m	2026 - 2029
Do not construct new stopbanks	The risk of river flooding to the township will remain the same.	✘	Nil	Not planned

The existing bank was installed privately and in a way that does not meet adequate construction standards. The existing bank provides some protection to some residents in Takaka, at the same time as increasing the risk to others. Construction of new stopbanks should reduce flood risks for the majority of residents.

EROSION OF PRIVATE PROPERTY

Tasman has experienced several major storm events since 2010 which have resulted in erosion of private properties adjoining rivers. A large portion of these rivers are 'unclassified' or not maintained by Council. Whilst Council doesn't maintain the river system in these locations, it has made provision to assist land owners to undertake repairs and protection where they are willing to share in the cost of doing so. Council's policy is to contribute up to 50% towards the cost of the works from its 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
Reallocate existing budgets to increase Rivers Z funding	Enable Council to support a greater number of individuals with a neutral impact on overall river rates.	✔	\$400k / year	On-going from 2018/19
Extend the length the maintained river system	Provide a high 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

Council has identified that savings can be made in some aspects of rivers maintenance which will enable Council to allocate more funding to the Rivers Z fund. By doing this, Council is able to assist more people without requiring additional income.

GRAVEL AGGREGATION

The movement of gravel within a river system is part of the natural river process. 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 that Council allows 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.	✓	\$200k every 5 years	2018/19
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

Until recently Council has been extracting gravel based on survey or visual inspection. Without extensive survey data it was unclear how the whole river system was responding to this extraction and whether there was scope for increased removal. By improving river bed surveying it enables Council to maximize gravel extraction without compromising the natural environment.

INDICATIVE EXPENDITURE ESTIMATES

OPERATING

Operational costs for the rivers and flood control activity are forecast to increase by around 3% per year for the first 10 years, and 4% per year over 30 years. Generally, operating expenditure is fairly static with the exception of gravel surveys. Long term increases are primarily due to inflation.

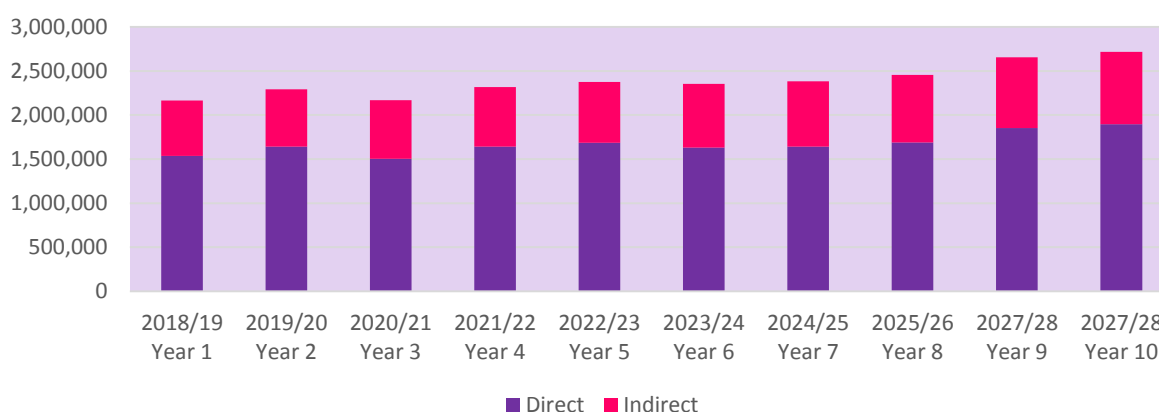


Figure 38: Annual Operating Expenditure for Year 1-10 for Rivers and Flood Control

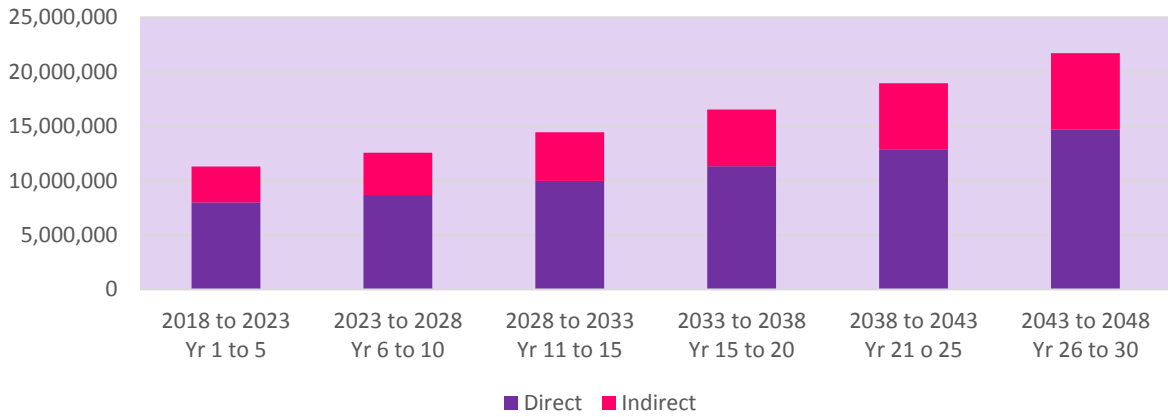


Figure 39: 5 Yearly Operating Expenditure for Year 1-30 for Rivers and Flood Control

CAPITAL

Council has planned to spend around \$11 million on capital improvements over the next 10 years, and \$40 million over the next 30 years. All of which is all attributed to level of service improvements. In Year 10, there is a notable increase in expenditure associated with the construction of the new Takaka stopbanks.

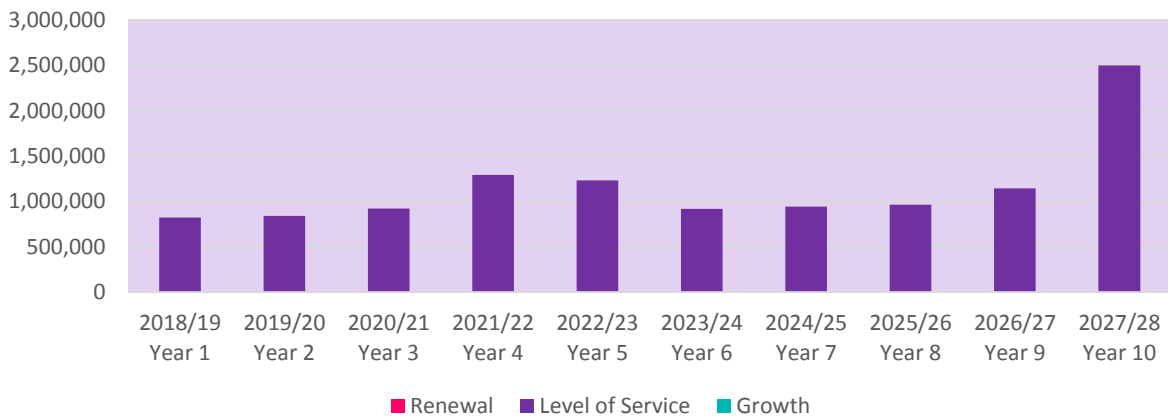


Figure 40: Annual Capital Expenditure for Year 1-10 for Rivers and Flood Control

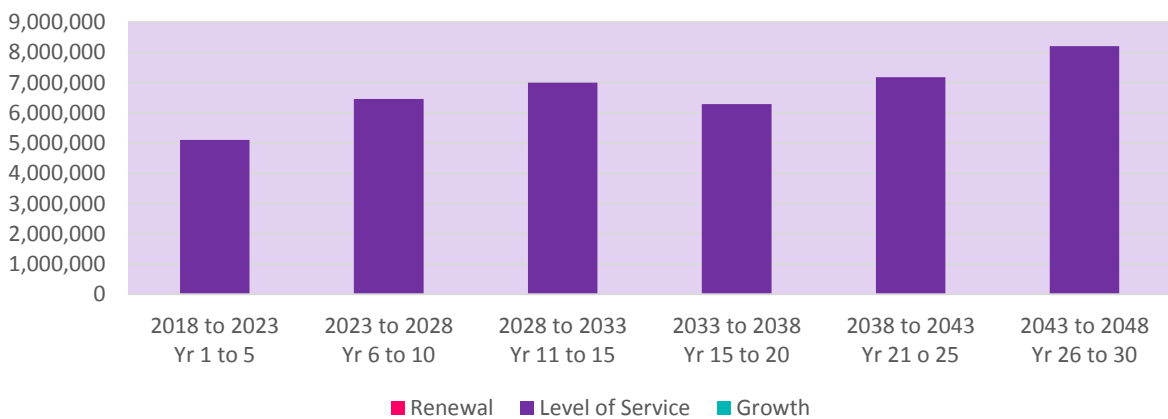


Figure 41: 5 Yearly Capital Expenditure for Year 1-30 for Rivers and Flood Control

ASSET RENEWAL PROFILE

Most of Council's rivers and flood control assets are not depreciated. Council only depreciates tide gates/outfalls, gabion baskets and railway iron structures. The expected useful life of these assets ranges from 30 to 60 years. Council has 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.

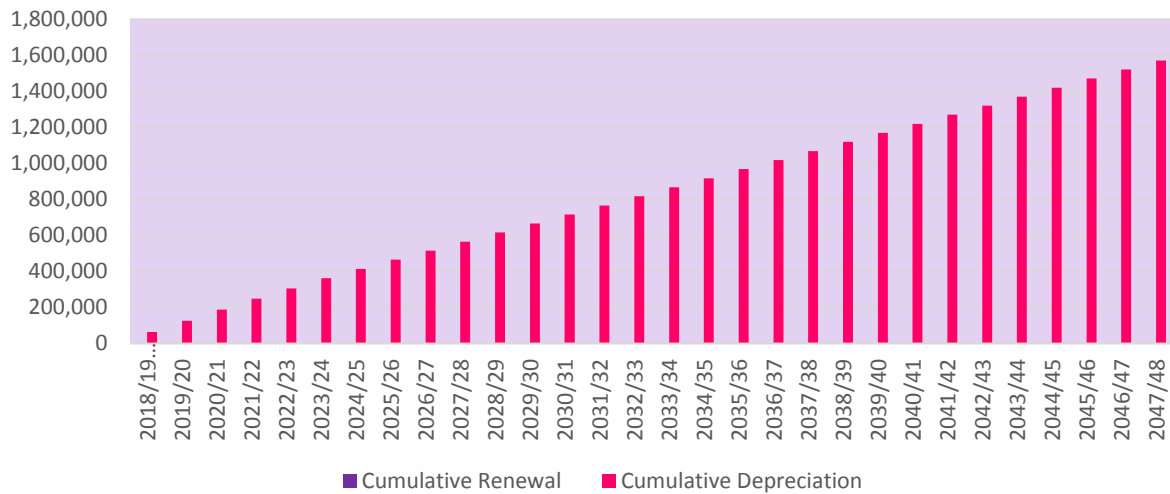


Figure 42: Capital Expenditure and Depreciation for Rivers and Flood Control

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.
- Council cannot predict when and where large flood events will occur, or the damage that may be sustained during such a flood. During a large events there is a risk that rock protection works can shift, new erosion can occur, or stopbanks could be damaged. Council has assumed that if this occurs, that it will have enough funds available to undertake repairs whether it is through reprioritisation of maintenance activities or accessing emergency funding provisions.
- Like with large floods, Council also cannot reliably predict when moderate floods may occur or their impact. Council has 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 Council will be required to spend more than anticipated. If floods are less or more minor than assumed, it is likely that Council we be required to spend less than anticipated.

