30 Year Infrastructure Strategy 2021 – 2051

A Sustainable Future

2021

Mackenzie
DISTRICT COUNCIL

30 Year Infrastructure Strategy 2021 - 2051

REVISION HISTORY

Date Created:	21/5/2021
Review Date:	
Department:	
Responsible Officer:	
Sponsor:	
Approved by:	
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EXECUTIVE SUMMARY

The purpose of the 30-year Infrastructure Strategy (the Strategy) is to identify significant infrastructure challenges for Mackenzie District Council (the Council) over the next 30 years. The Strategy sets out what issues are currently and likely to impact on our core infrastructure assets, our response to those issues and the costs associated with maintaining, operating, renewing, and developing the range of assets Council is responsible for. This includes:

- Water Supply
- Wastewater Disposal
- Stormwater Disposal
- Roads and Footpaths, also referred to more holistically as Transportation.

The Council manages assets to provide services to residents and visitors, and to contribute to our community wellbeing. It is Council's responsibility to do this in a way in which meets our sustainability goals. This means making the best decisions across the four well-beings (cultural, economic, environmental and social) of the community for the long term. Rather than focussing on the infrastructure itself, the outcomes sought are key.

At a high level, Council's priorities align with the community wellbeings:

- A Treasured Environment
- Resilient successful Communities
- Strong and Innovative economy
- Embrace Heritage and Diversity

This moves the discussion from pipes and roads, to how the infrastructure will support the community and enable the future we seek together.

The following three issues are key focus areas for the Council which need to be addressed over the next 30 years.

1. RENEWAL: Renewal and replacement of aging infrastructure

Assets change and the assets wear out. This means replacement or upgrades are necessary.

A fit for purpose transportation network continues to serve an increasing number and variety of users. Replacements and upgrades across the network support transport in Mackenzie evolving for the future, with safety for all users as the priority. Providing better linkages so walking and cycling is encouraged will require both stronger spatial planning and network improvements.

Where there is a conflict between the user's expectations and the infrastructure itself, changes will be required. Examples of this include bridges that are inadequate for heavier vehicles, drainage that cannot cope with storms and cyclists having to share the Alps to Ocean route with forestry trucks.

Community satisfaction with service - along with future planning exercises - will be used to gauge what changes are required. Monitoring tools and resources will also be used to assess the condition and performance of our infrastructure.

2. LEVEL OF SERVICE: Responding to increasing standards and changing priorities

Government priorities and national legislation change with changing governments. This is to increase nationwide standards, improve the overall level of service and respond to increase customer expectation. These changes trigger Councils to either invest in improving the quality of core infrastructure or alternatively risk being non-compliant.

Recently there have been a number of legislative and governmental changes which impact on required level of service for Council owned infrastructure. This includes:

- Changes to the National Policy Statement for Freshwater
- Changes to NZs response to climate change (Zero Carbon vision for 2050)
- Increased focus on delivering sustainable outcomes
- Changes to Land Transport policies and legislation
- Increase in customer expectations regarding the level of service of infrastructure

3. GROWTH: Delivering sustainable infrastructure to a growing population

Prior to the COVID-19 Pandemic the growth within Mackenzie was largely driven by investor confidence in the tourist and holiday destination potential of the Mackenzie Basin. The recent lockdown has slowed this demand in the short term; however, it is expected that the population will continue to increase overtime, with tourist numbers reaching pre-covid numbers by 2023.

This growing population means a growing demand for core infrastructure. Moving forward, the provision of all community assets must be undertaken to ensure a sustainable future. Council's sustainable approach involves investing in appropriate infrastructure which achieves the existing community outcomes without compromising the ability of future generations to meet their own needs.

A growing population in the Mackenzie District impacts key infrastructure in the following ways:

- An increase in vehicles means an increase in potential contaminants such as vehicle emissions, tyres, brake pads, fuels, and lubricants. This impacts on stormwater discharge quality
- An increasing population increases the effluent flows
- An increasing population increases the demand for potable water
- An increase in vehicles means an increase to the demand for parking and safe road crossings in the main townships. Increasing number of vehicles also causes greater wear and tear on local roads and potentially have congestion effects, particularly in town centres.

Core water and transport infrastructure must be planned in order to cater for this demand, particularly during peak tourism periods.

External Factors Influencing Key Infrastructure Decisions

There are a number of moving parts which influence and effect how and when Council respond to the above infrastructure issues. Table 1 below summarises these factors.

Table 1 Externalities

Externality	Impact
Population Growth	As indicated above, a growing population increases the demand for core infrastructure and the ability to maintain a sustainable infrastructure
Climate Change	Increasing temperatures, increasing extreme weather events and rain will put greater pressure on infrastructure and a need to build in greater resilience within any new infrastructure.
Technology	Changing technologies can potentially provide a catalyst for upgraded or new infrastructure. Increasing regulatory standards has meant local governments need to consider innovative technologies and new building processes.
Legislative influences	Central Government's commitment to meet a zero carbon economy by 2050 will require significant changes to the existing infrastructure in Mackenzie District over the next 30 years and also in the way in which new infrastructure is built. The governance of Three Waters infrastructure is currently being reassessed. The increasing regulatory focus on improved environmental and health outcomes means there is a need for local governments to upgrade much of its Three Waters infrastructure.
COVID-19	The closure of international boarders as a result of COVID-19 has led to a drop in international visitors, which in 2018/19 made up approximately 65% of total visitor spend in the Mackenzie Region[1]. This fall in tourism has reduced the demand for short term accommodation. It is expected that visitor numbers will increase back to pre-covid numbers by 2023.

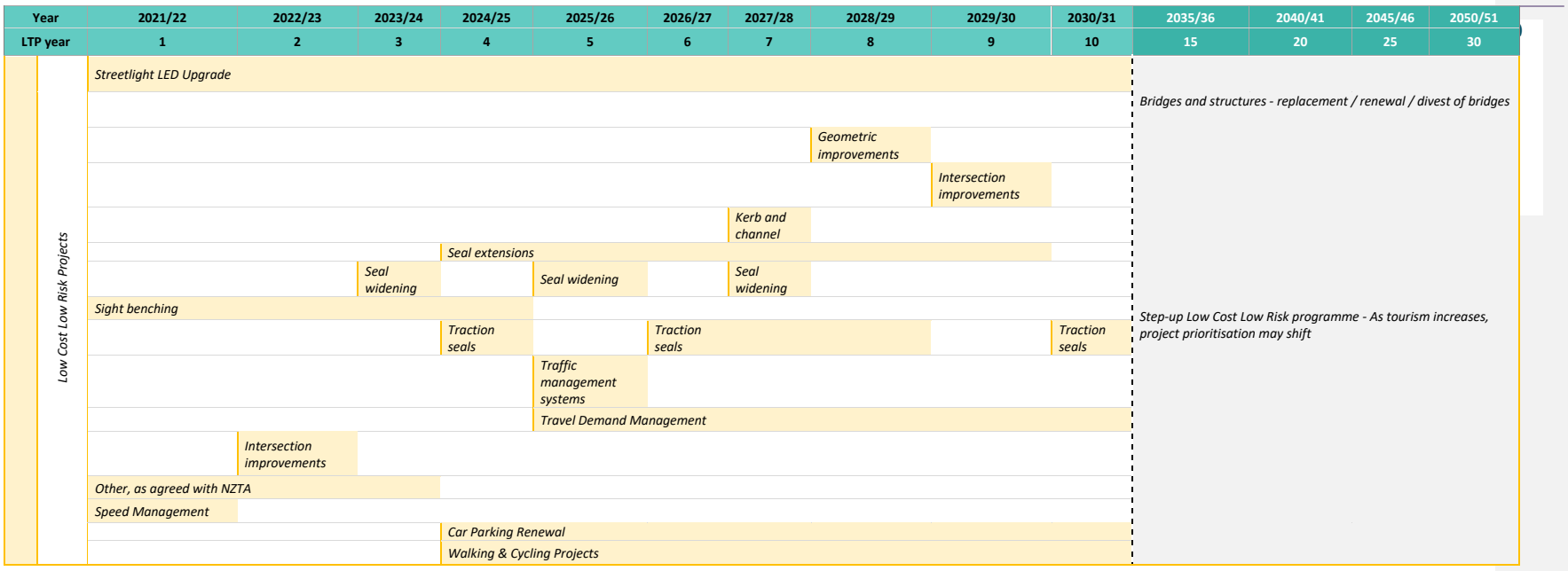
Key strategic infrastructure projects over the next 30 years

The Strategy maps out key capital, renewal and replacement activities which will need to be undertaken over the next 10, 20 and 30 years for each of the core infrastructure categories. Key projects (i.e. projects which exceed $100,000 over the 10 year period) are outlined in the table below:

[1] Source: Mackenzie Region (mbie.govt.nz)

Table 2 Infrastructure Strategy – Summary of Works

	Year	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2035/36	2040/41	2045/46	2050/51
	LTP year	1	2	3	4	5	6	7	8	9	10	15	20	25	30
Water		*New Service Connections*										*Renewal of water take consents (Tekapo, Burkes Pass, Rural WS)*	*Renewal of water take consent for Fairlie*	*Renewal of water take consent for Twizel*	
		Reticulation -renewals													
		New Treatment - Fairlie													
		Water Supply Renewals										*Replacement of assets such as switchboards, pump stations, SCADA and CCTV*			
		Water Metering Trial - Twizel Install													
		Potable Water Supply Remote Properties – installation													
Wastewater		*New Sewer Reticulation*										*Replacement of assets such as switchboards, pump stations, SCADA and CCTV*	*Renewal of discharge consents to land for Fairlie, Tekapo and Burkes Pass*		
		Pump Station Renewal													
		Tekapo Treatment Plant													
		WWTP monitoring equip - design & install													
		Rising Main Mackenzie Park to Twizel WWTP – Design/ Construct													
		Stimulus Package – Programme Delivery													
Stormwater		*Reticulation renewals*										*Council may need to take on additional risk of vested stormwater assts from Tekapo development*	*Renewal of Stormwater discharge consent for Lochinvar and Sealy Street & Twizel River*		*Renewal of Damian discharge consent and SH8, Simpson Lane & Lakeside Dr*
			Reticulation renewals												
Transportation		*Unsealed Road Metalling*										*Continuation of sealed and unsealed renewals.*			
		Sealed Road Resurfacing													
		Drainage Renewal													
		Sealed Road Pavement Rehabilitation													
		Structures Component replacements bridges													
			Structures Component replacements cattle stops			*Structures Component replacements cattle stops*			*Structures Component replacements cattle stops*						
		Bridge & Structures Renewals													
		Traffic Service Renewals													
		Cycle Path Renewal													
		Footpath Renewal													


Year
2021/22
2022/23
2023/24
2024/25
2025/26
2026/27
2027/28
2028/29
2029/30
2030/31
2035/36
2040/41
2045/46
2050/51
LTP year
1
2
3
4
5
6
7
8
9
10
15
20
25
30
Low Cost Low Risk Projects
Streetlight LED Upgrade
Bridges and structures - replacement / renewal / divest of bridges
Geometric improvements
Intersection improvements
Kerb and channel
Seal extensions
Seal widening
Seal widening
Seal widening
Sight benching
Step-up Low Cost Low Risk programme - As tourism increases, project prioritisation may shift
Traction seals
Traction seals
Traction seals
Traffic management systems
Travel Demand Management
Intersection improvements
Other, as agreed with NZTA
Speed Management
Car Parking Renewal
Walking & Cycling Projects

1. INTRODUCTION

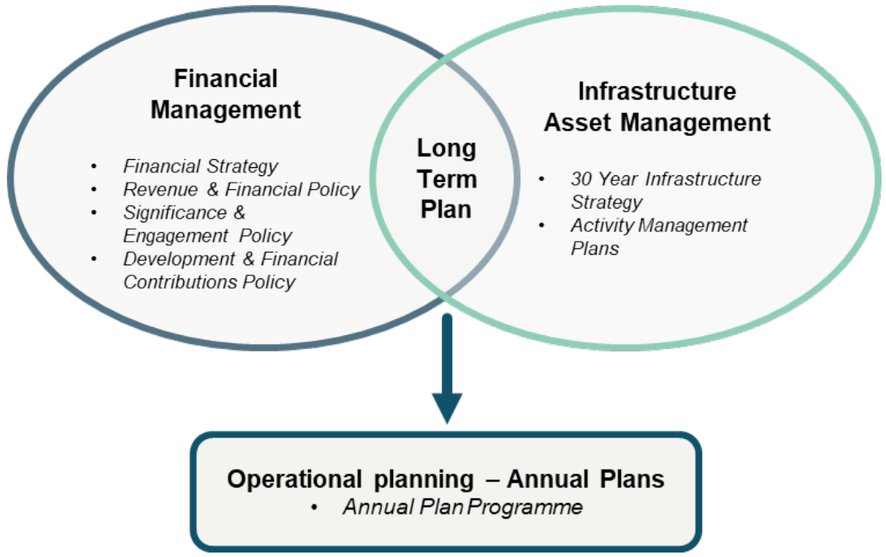
1.1. Strategic Purpose & Outcomes

The purpose of this Strategy is to identify significant infrastructure issues for our district and the options for managing those issues. The strategy covers the areas of:

- Stormwater Disposal
- Wastewater Disposal
- Water Supply
- Transportation

This information forms the backbone of the Activity Management Plans (AMPs) for these activities that then flow into the 2021/22 – 2030/31 LTP (See Figure 1).

Figure 1 Strategic Alignment



The Council manages assets to provide services to residents and visitors, and to contribute to our community wellbeing. It is Council's responsibility to do this in a way in which meets our sustainability goals. This means making the best decisions across the four well-beings of the community for the long term. Rather than focussing on the infrastructure itself, the outcomes sought are key. The Council's overriding goal is:

"***The outcome desired by the community is to have safe, effective and sustainable water, communication, energy and transport systems in place when required, through sound long term planning and funding***".

More specifically, Council's four main priorities align with the four community wellbeings:

- A Treasured Environment (Environment)
- Resilient successful Communities (Community)
- Strong and Innovative economy (Economy)
- Embrace Heritage and Diversity (Culture)

These are further outlined in the figure below.

Figure 2 Our Strategic Vision

1.2. Mackenzie District Core Infrastructure Assets

1.2.1. Waters and Transportation

The core Mackenzie District Infrastructure Assets included in this strategy are tabled below:

Table 3 Mackenzie District Core Infrastructure Assets

Asset	Description	Replacement Value (30 June 2020)	% of Total
WATER	Water extraction, treatment, and distribution	$46.0M	18%
WASTEWATER	Wastewater collection, treatment, and discharge	$34.9M	13%
STORMWATER	Stormwater collection and discharge	$9.8M	4%
TRANSPORTATION	Roads (arterial, collectors, local; curbs and gutters), bridges, footpaths	$170.6M	65%
TOTAL		$261.3 M	100%

1.2.2. Other Activities

Council has opted to continue with the Infrastructure Strategy discussing Three Waters and Transportation activities.

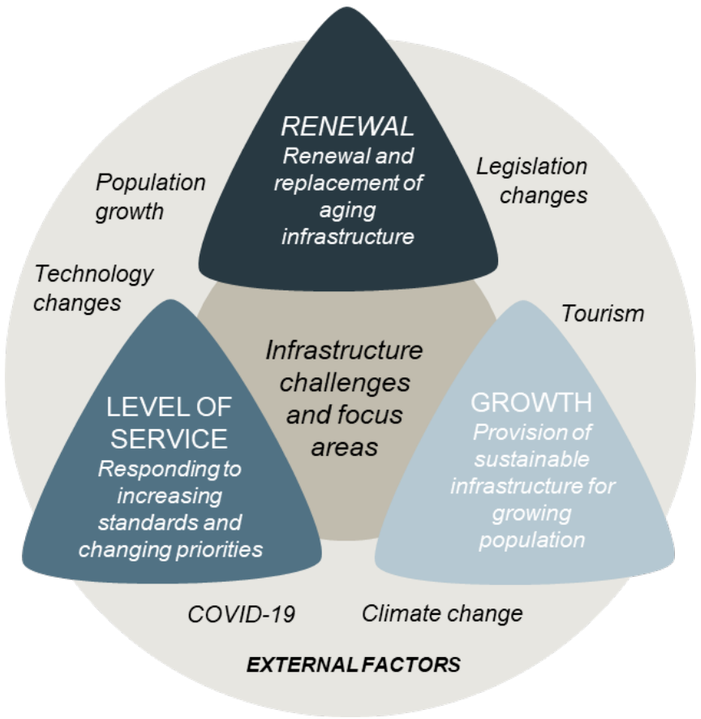
Mackenzie District also recognises waste management and township/community facilities (township amenity areas and recreational facilities, including the district's pools, parks, reserves, libraries, community centres and halls; as well as pensioner housing, cemeteries, medical centres, public and toilets) as important activities. Council has committed to improving the data and management strategies associated with these activities over the next three years.

2. KEY STRATEGIES ISSUES & ACTIONS

The purpose of the Infrastructure Strategy is to identify the infrastructure issues that Council will need to address and set out a 30 year strategy to address those issues in order to best meet the communities needs.

Figure 3 below outlines the key issues along with external factors which influence the development of core infrastructure.

Figure 3 Mackenzie District Infrastructure challenges and focus areas.



Currently there are three main issues which are driving the need for infrastructure improvements across the Mackenzie District: the need to replace and renew aging infrastructure, the need to improve the level of service of existing infrastructure and the need to meet the needs of a growing population.

2.1. Renewal

Renewal and replacement of aging infrastructure

As with all councils across the country, Mackenzie's infrastructure is aging and the district is approaching an important period to ensure that its infrastructure assets continue to meet the needs of the community in

the future. We need to consider if we are going to apply a 'just in time' philosophy to asset renewals or apply pro-active renewal programmes.

Management of ageing infrastructure is closely aligned with the discussion of system resilience above. The key aspect is the recognition of failure mechanisms for our assets, and initiation of a suitable response to minimise cost and disruption to the community. Underground pipe networks represent the greatest risk to the community because of their extent and inaccessibility. Affordability is a key challenge for council in this space and careful planning is needed.

The three key aspects for effectively managing ageing infrastructure are:

- to ensure the organisation has sufficient knowledge of asset status
- that funding is available
- that remedial work (maintenance and renewals) is actioned in a timely manner

The asset management process also needs to identify where investment in upgrading assets will provide the most appropriate service delivery levels in the longer term.

Some data is collected for the transport assets, but it is acknowledged that council can do better. Funds have been put forward for a data analyst to support decision making in this space. Council is investing funds into better understanding its piping network and has embarked on a large AC pipe renewal programme. The 2024/34 LTP will be based on updated data analysis should council still own the asset.

2.2. Changing Level of Service

Responding to increasing standards and changing priorities

Government priorities and national legislation change with changing governments. This is to increase nationwide standards, improve the overall level of service and respond to increase customer expectation. These changes trigger Councils to either invest in improving the quality of core infrastructure or alternatively risk being non-compliant.

Recently there have been a number of legislative and governmental changes and general increases in customer expectations which impact on required level of service for Council owned infrastructure. This includes:

- Changes to the National Policy Statement for Freshwater
- Changes to NZs response to climate change (Zero Carbon vision for 2050)
- Increased focus on delivering sustainable outcomes
- Changes to Land Transport policies and legislation
- Increased in customer expectations regarding the level of service of infrastructure

2.2.1. National Policy Statement for Freshwater Management

The National Policy Statement for Freshwater Management provides direction on how local authorities should carry out their responsibilities under the Resource Management Act 1991 for managing fresh water.

This policy was replaced on 3 September 2020 and requires regional councils to improve water quality and meet targets, giving effect to Te Mana o Te Wai. Te Mana o te Wai refers to the vital importance of water. Any resource consent application must demonstrate how it will ensure that freshwater is managed in a way that prioritises (in this order):

- the health and well-being of water
- the health needs of people
- the ability of people and communities to provide for their social, economic and cultural well-being.

There are now new requirements for regional councils to follow when managing the level of nutrients – such as nitrogen and phosphorus – which can get into waterways. This requires the consideration of cumulative effects.

The National Policy Statement on Fresh Water, which has influenced the Canterbury Land and Water Regional Plan, will require increased standards for all stormwater and wastewater discharges over the life of this Infrastructure Strategy. Both these changes impact on how councils manage its core infrastructure.

2.2.2. Sustainable practices within Three Waters management

There are increasing signals from Central Government that the focus on more holistic approach to Three Waters management including improved management of water resources. Regional Councils are increasing water take/discharge consent conditions to encompass sustainable use of water. Increasing conditions will lead to a need for investment in additional infrastructure.

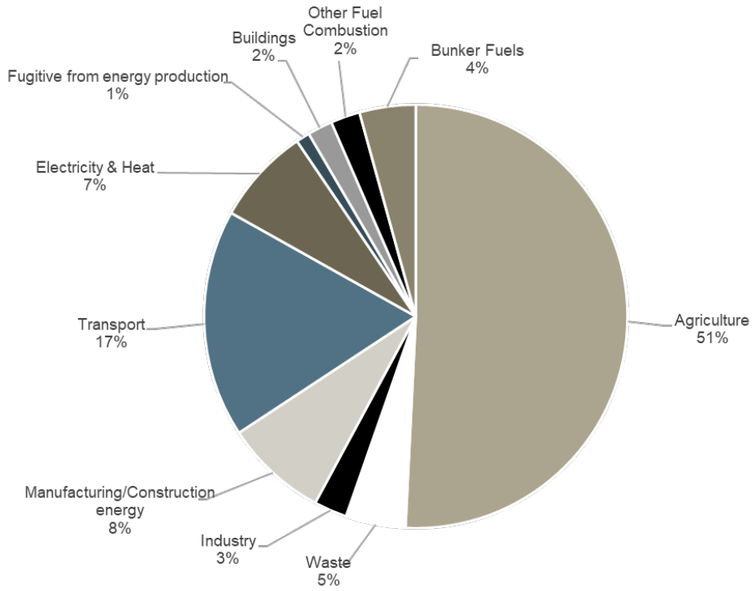
The Havelock North Water incident provided the catalyst for the Three Waters Review which resulted in the establishment of a Water Regulator and a Water Services Act. Regulatory coverage will extend to all water suppliers, except individual household self-suppliers. It will also include a multi-barrier approach to drinking water safety, including mandatory disinfection of water supplies, stronger obligations on water suppliers and local authorities to manage risks to sources of drinking water; and strengthened compliance, monitoring and enforcement of drinking water regulation. Furthermore, Central Government have also signalled through its 'Action for Healthy Waterways' discussion document improved stewardship of wastewater and stormwater services, with Risk Management Plans for wastewater and stormwater networks a likely outcome. This has renewed the focus on the very high standard of care and diligence required to supply drinking water and collect, treat and discharge wastewater and stormwater. A significantly more holistic approach to Three Waters management is dawning.

2.2.3. Zero Carbon Initiative

Since the implementation of the Paris Agreement in 2016, NZ has been working towards its own Climate Change policy changes. In 2019, NZ's Climate Change Response (Zero Carbon) Amendment came into effect. This amendment showed NZ's commitment to a Zero Carbon economy by 2050. More specifically this means by 2050 the "net accounting emissions of greenhouse gases (GHG) in a calendar year, other than biogenic methane, are zero."

This places greater pressure on local councils to plan, renew and develop infrastructure, which is carbon neutral, or is futureproofed so that it can become carbon neutral in the future. Whilst the majority of NZ's carbon emissions is produced by the agricultural sector, buildings, manufacturing and construction, waste, Industry, transport and electricity and heat use are cumulatively responsible for about 40 percent of New Zealand's total carbon emissions (see Figure 4 below) [2].

Figure 4 Carbon emissions contribution by industry for NZ (2016)



The reduction in carbon emissions within some of these industries can be directly influenced by Council's infrastructure management response. For example, the wastewater treatment processes use biological and physio-chemical processes for the removal of contaminants which produce the three primary GHGs (carbon dioxide, methane and nitrous oxide) during the treatment operation and energy generation processes. There are newer technologies which are capable of reducing this production of GHGs and even achieving carbon neutral wastewater treatment processes, however the council currently does not have the necessary scale (or flows) to justify this change in technology, at least within the short to medium term. Growth and additional changes to Three Waters management and governance may make this more achievable in the long term.

Transport is currently the second biggest contributor to carbon emissions in the country. It is important that Council recognises this and seeks to reduce reliance on vehicles, particularly for shorter trips. The

[2] Greenhouse gas emissions by sector, World, 2016 (ourworldindata.org)

Mackenzie District has a very large land area, with one of the largest areas per capita, meaning there is generally a high reliance on private vehicles. However, well maintained footpaths, lighting, pedestrian crossings and bike paths within the town centres, can encourage more people to walk and cycle. This will become particularly important during peak tourism periods.

2.2.4. Transport related policy and legislative changes

Land Transport Management Amendment Act

The introduction of the Land Transport Management Amendment Act (LTMA) saw the establishment of the Waka Kotahi (NZTA) with greater flexibility in determining funding alternatives to Transportation and methods of improving the efficiency of the Transport Sector in New Zealand.

The Act has changed Waka Kotahi's (NZTA's) objective from allocating resources to achieve a "safe and efficient Transportation system" to allocating resources "in a way that contributes to an integrated, safe, responsive and sustainable land transport system."

Specific targets have been set for the whole transport sector which are detailed in two key documents that are part of a raft of changes contained in the LTMA and are to be the driving force behind achieving an affordable, integrated, safe, responsive and sustainable transport system throughout New Zealand. The two documents are:

- New Zealand Transport Strategy 2013 (NZTS)
- Government Policy Statement on Land Transport Funding (GPS 2020)

Under the Act, all land transport programmes (including those prepared by local authorities) must take into account all the NZTS objectives and the purpose of the Act, which includes ensuring funding is allocated in an efficient and effective manner.

GPS for Land Transport 2021

The previous Government's GPS on land transport (2018) prioritised economic growth and productivity, and focused on putting the right infrastructure in place to support high growth urban areas and the regions, improving freight movement, and ensuring that the road network is resilient.

The current GPS shifts the focus of the Government's investment, and prioritises access to transport and safety, supplemented by a focus on the environment and value for money.

Safety is particularly relevant given the Easter road toll was the highest in eight years. The Government's safety priority focuses on creating a safe system, free of deaths and serious injury. This is now part of the "Road to Zero" vision which has been adopted by Waka Kotahi.

This shift in priorities will redirect Council's focus away from delivering economic growth to delivering safer and more sustainable and resilient transport networks.

2.2.5. Customer expectations regarding the level of service of infrastructure

In recent years there has been an increasing awareness on the part of customers with respect to wastewater, water, stormwater and transportation issues. It is anticipated that the following issues will become an increasing priority for Council in determining design and operational standards:

- Water:
  - Increased level of awareness of water quality
  - Increasing demand for better pressure and flow
- Wastewater:
  - Extended areas being desiring to be connected to reticulated wastewater systems
  - Improved response times
- Stormwater:
  - Increased level of protection from rainfall events
  - Improved response times
- Transportation:
  - Improved safety district wide
  - Reduction in the number of loss of control crashes.
  - Slower speed limits in busy areas or where vulnerable users are present.
  - Improved accessibility and amenity on rural roads with future request for seal extensions and traction seals. Less tolerance for dust nuisance.
  - Urban areas little to no acceptance for any unsealed carriageway. Further request for seal extension and seal widening.
  - Demarcation / protection between
  - Increased carriageway and shoulder widths.
  - Improved surface condition of unsealed roads.
  - Improvements in modal shift, active modes, amenity, connectivity and accessibility in urban areas.
  - Further shared space areas.
  - Appropriate facilities and parking provision.
  - Improvements in surfacing selection for amenity.
  - Improvements in urban form.
  - Upgraded Intersection controls, delineation, warning signage traffic calming.
  - Bridge end protection.
  - Destination signage, information and wayfinding for tourists/ visitors to the district.

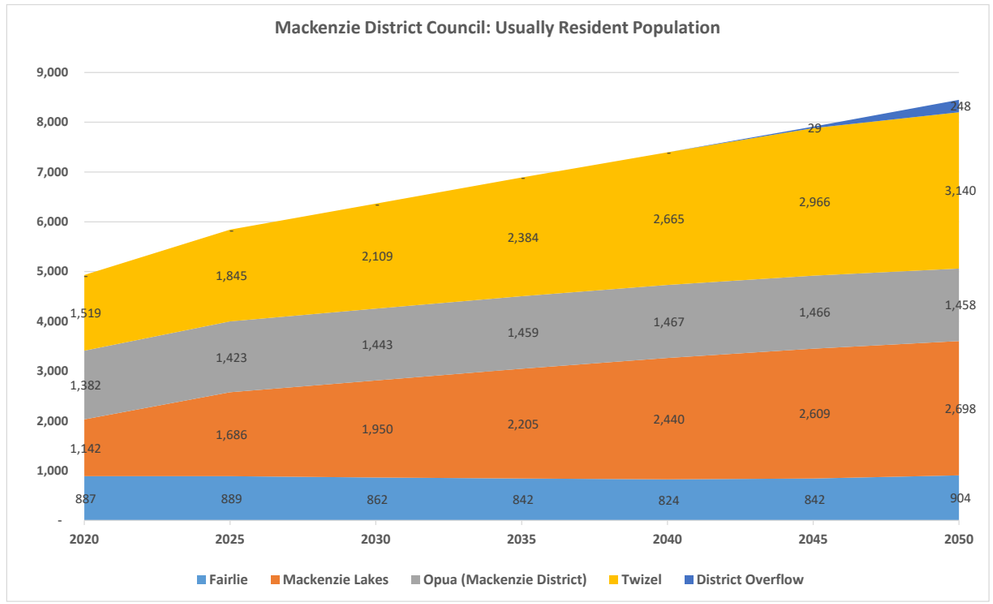
2.3. Growth

Provision of sustainable infrastructure for a growing population

Infrastructure is critically important to ensuring the plan for each town is both sustainable and achievable. An increasing population puts greater pressure on the existing core infrastructure and can compromise the Councils ability to maintain sustainable outcomes. An in depth understanding of the existing infrastructure and its technical ability to support growth is therefore required, as is an appraisal of its current limitations.

MDC's population is predicted to continue to grow in all areas, at differing rates. Fairlie's population is predicted to decline through to 2045. This is due to the age profile of the district and low migration. However, after 2045 a slight increase in population is predicted this is due to Tekapo reaching capacity and 'spilling-over' into Fairlie.

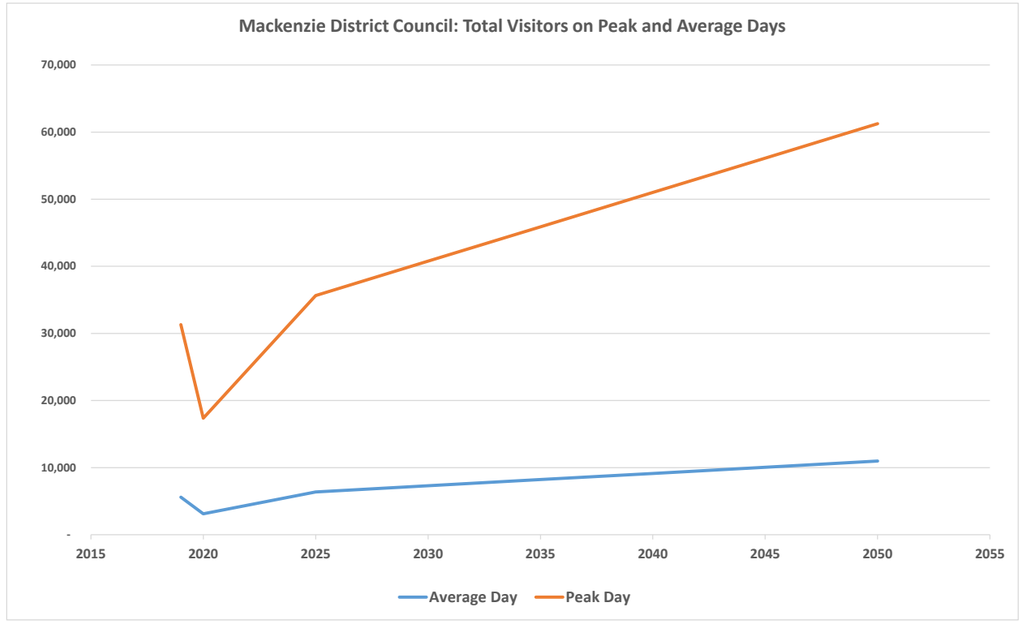
Figure 5 MDC Usually Resident Population



Due to COVID-19 and the closure of New Zealand's borders, the number of international tourists visiting Mackenzie has significantly reduced in the projections from 2020 to 2025.

Based on current assumptions around the reopening of New Zealand's borders and the speed at which tourists are likely to return to New Zealand, the industry is expected to recover by around 2025, as shown in Figure 6.

Figure 6 Mackenzie District – Peak and Average Day Visitors



It is evident that the effects of COVID-19 will have an impact on tourism in the Mackenzie District. This will slow down other areas such as population growth and dwellings.

The projected deceleration in demand over the next few years provides Council an opportunity to reassess existing systems capacity and performance and focus on master planning for service provision.

However, Council is also mindful that COVID-19 also invigorated the domestic tourism market as data indicates that there were almost as many domestic visitors to the Mackenzie area at midday on the Saturday of Queens Birthday as there were on the Saturday of Waitangi weekend pre-COVID-19 lockdown.

The influx of domestic holiday-makers into the district, particularly the Mackenzie Basin impacts key infrastructure in the following ways:

- An increase in vehicles means an increase in potential contaminants such as vehicle emissions, tyres, brake pads, fuels, and lubricants. This impacts on stormwater discharge quality
- An increasing population increases the effluent flows
- An increasing population increases the demand for potable water
- An increase in vehicles means an increase to the demand for parking and safe road crossings in the main townships. An increase in the number of vehicles also increases the wear and tear on local roads and potentially have congestion effects, particularly in town centres.

Additional and unusual demands on the infrastructure networks requires special attention when developing a plan for Council's infrastructure. Table 4 below summarises the impacts of tourism specific growth on the region's infrastructure.

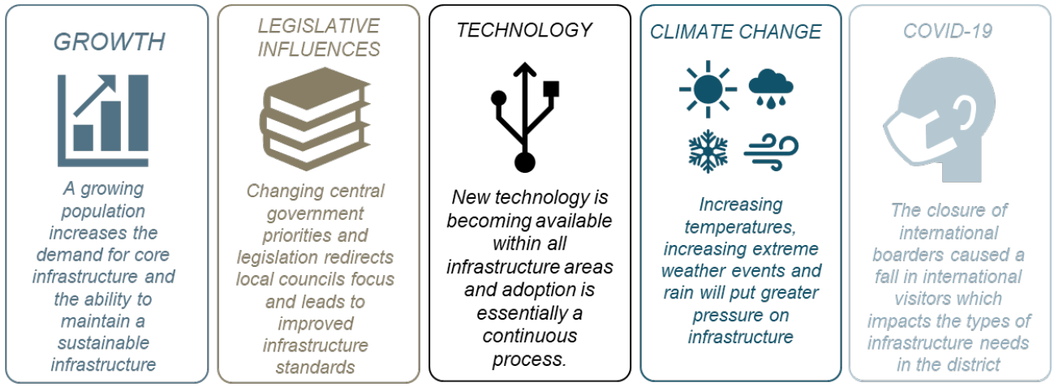
Table 4 Key Tourism Attractions and Associated Impacts for Council on Infrastructure

Fairlie township	Day visitors – parking and safe road crossing
Takapō/Tekapo	Day visitors – parking and safe road crossing
Mt John	Along with the International Dark Sky Reserve – tourists are putting increasing pressure on Godley Peaks Road as people travel to the top of Mt John.
Lake Alexandrina	As with Mt John this is also a popular area for visitors. This road is narrow and unsealed, the challenge is ensuring tourists remain on the correct side of the road, along with the associated wear of the sealed and unsealed pavements.
Haldon Camp	This is on the shore of Lake Benmore and puts high summer traffic numbers on Haldon Road.
Ski Fields	During opening season, traffic on the feeder roads can increase by 1200%.
Alps2Ocean Cycle Trail	This relatively new attraction is starting to put increased demands on Mt Cook Station Road and Hayman Road. It also creates conflict with other road users such as the logging operations. Plans are underway to progressively move this trail off the road carriageway, improving safety and road user experiences for all drivers and cyclists.
Fairlie township	Increase in short term visitors in larger communities, temporarily increases wastewater flows and demand on water supply. An increase in vehicles means an increase in potential contaminants such as vehicle emissions, tyres, brake pads, fuels, and lubricants. This impacts on stormwater discharge quality
Takapō/Tekapo	
Twizel	
Takapō/Tekapo	In Lake Tekapo the disposal system needs to be upgraded. During winter periods ponding issues are experienced. Due to the increase in development and tourists the effluent discharge volumes increase accordingly. This places further strain on existing effluent disposal systems. Investigations indicate that a larger effluent disposal system is required.

The district is changing and there are several workstreams in progress to better understand and plan for this. These includes spatial planning, the District Plans and Te Manahuna Ki Uta 'Destination Mackenzie'. Demand for permanent and holiday housing remains strong, and the forthcoming District Plan will create a platform for changes to the development and subdivision within our landscapes.

3. EXTERNAL FACTORS

There are many external factors that will impact how the Council delivers infrastructure in the future. Although these factors are generally beyond the control of the Council, it is important that we continue to monitor and respond to them to ensure that our infrastructure plans take advantage of new opportunities and remains fit for purpose.



3.1. Growth

The Mackenzie District has experienced significant growth over the past ten years and this is projected to continue in the immediate future. It is significant that building activity and the associated demand for Council infrastructure has increased beyond the level that population growth would indicate. Prior to the COVID-19 Pandemic this dynamic appears to be driven by investor confidence in the tourist and holiday destination potential of the Mackenzie Basin.

Infrastructure demand has been considered using general demand criteria:

- population growth
- dwelling growth
- land development ability

The District Plan Review and Spatial Planning programme will guide the nature of future development. These processes are underway and are not sufficiently advanced to inform this Infrastructure Strategy. This alignment will be progressed, once the planning process is sufficiently advanced to guide strategic responses.

The COVID-19 pandemic has caused a much higher level of uncertainty with projections than would have otherwise been the case[3]. The summarised residential growth pattern is shown in Figure 5 above.

[3] Detailed information can be accessed through Spatial Planning and District Plan Review documents and supporting reports.

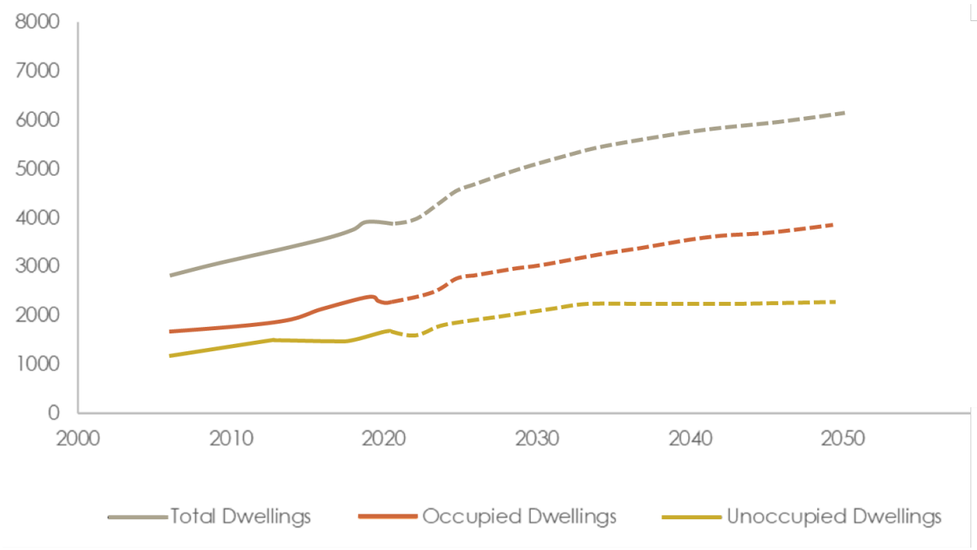
Council also anticipates a growth in household numbers that is consistent with the population growth trajectory. There is a need to consider unoccupied housing stock as this can be a major driver in many areas.

The Mackenzie District is unique in that the district has a significantly high proportion of non-resident ratepayers. This is most noticeable in the townships of Takapō/Tekapo and Twizel. This factor must be considered when viewing trends for building consents within the district, noting that not all dwellings will be used as permanent residences. A consequence of this is a marked change in population of townships (most notably Twizel) during peak times. Fluctuations in population levels throughout the year can pose challenges for activities such as traffic and water management. There is also a growing number of private dwellings being made available as short-term accommodation rentals.

Currently there is adequate water supply and wastewater services to meet peak demand, but this does involve water restrictions. A more sustainable approach to water use is proposed (water meters) to bring overall water consumption down.

Current and projected increases in dwelling numbers are significantly higher than corresponding population changes. The following shows the usually resident proportion of households to unoccupied dwellings.

Figure 7: Mackenzie District Occupied and Unoccupied Dwellings



As noted above (in section 2.3) visitor numbers are a significant factor in infrastructure planning in the Mackenzie District. There are significant differences between the resident population and visitor population numbers. The growth in dwelling numbers outlined above is ultimately sustained by the visitor demand.

Visitor projections are difficult to determine due to the impact of COVID-19. While domestic tourism has remained strong. Council is working with Tourism sector groups and Queenstown Lakes District Council to

develop future scenarios. Currently a return to pre-COVID activity is expected in 2025 as shown below. Overall the impact of COVID-19 must be considered from a wider perspective. The slow down impacts the ability to adjust visitor planning to cater better for when visitors return. This is further discussed in section 3.5 below.

3.1.1. Land use changes and trends

There is a significant amount of interest in the environmental values of the Mackenzie Basin. This has generated a high degree of complexity in relation to environmental planning within the district. A number of the Environment Court decisions associated with Council's Plan Change 13 (PC13) have introduced constraints that may limit the conversion of rural land for residential or other development. These matters are being addressed through the District Plan Review, with a greater level of environmental protection being a clear and measured community priority.

Increasing commercial activity is expected in District townships, in particular Tekapo/Takapō, where town centre redevelopment will be occurring over the next 20 years.

It is expected that modest allocations for industrial and commercial activities can be catered for with the current provision of infrastructure. Residential development for permanent residents and holidaymakers will continue to be the main component of growth.

A number of major land change matters are detailed below:

- **Tenure Review -** Tenure review is a voluntary process that gives pastoral lessees an opportunity to buy some of their leasehold land. The rest of the land returns to Crown ownership, usually for conservation purposes. There are several high-country stations that have undergone tenure review. Historically this has involved part of the station passing into the public estate and being opened for access.

  Potential Impact: As an example, there is a higher expectation from the Department of Conservation (DoC) and other road users that better access be made available with no extra funding from either NZTA or DoC. Staff are working with DoC to try to minimise this effect, so significant allowance has been made for this.

- **Primary Production Intensification -** Council anticipates an increase in primary production as the result of on-farm intensification and irrigation consents being implemented. There is the possibility of further dairy conversions in the Fairlie Basin. There is also a 30-year forestry cutting plan for Mt Cook Station that (if continued by the new owners) will see extensive traffic over fragile unsealed roads every year during that period.

  Potential Impact: An increase in traffic for industrial purposes continues to occur in some of the most remote areas of the District and at the extents of the maintained network. There is increased use of the high-country roads by the NZ Defence Force for training, this involves specialised machinery, with axle loading higher than typical. The council is already struggling to maintain its unsealed roads with the number of heavy vehicles using these roads. Currently the Council is investigating different gravels and maintenance techniques for unsealed roads to improve their resilience. The Council would eventually like to seal some of the higher trafficked roads within the region

- **Large scale accommodation (hotel/resort) -** The hospitality sector is a significant part of the Mackenzie economy. Three consents have been issued for development for large scale accommodation in Takapo/Tekapo. The return of tourists following the COVID-19 Pandemic is expected to determine the time for these developments to proceed.

  Potential Impacts: Currently the council are able to prioritise other infrastructure issues (unrelated to tourism) whilst visitor numbers remain relatively low. However, the Council will start readjusting their priorities once visitor numbers start to increase again. This may lead to more growth related infrastructure projects as visitor numbers start to put greater pressures on the Council's infrastructure.

3.1.2. Development

Future development is challenging to predict as it depends solely on market demands and developer confidence. The table below provides an estimate of the future direction of developments across the Mackenzie District. These projections will be clarified following the completion of the spatial planning project and district Plan review.

Table 5 Future Developments and value of vested assets

Period	Future Development	Vested asset value (inflated)
2018-2021	Tekapo/Takapō: 10 residential lots per year Twizel: 46 lots per year	$6,429,000
2021/22-2024/25	Tekapo/Takapō: 41.6 lots per year Twizel: 65.2 lots per year Fairlie: 3.4 lots per year	$12,066,000
2025/26-2029/30	Tekapo/Takapō: 14.8 lots per year Twizel: 56 lots per year Fairlie: 1.4 lots per year	$11,291,000
2030-2035	Tekapo/Takapō: 0 lots per year Twizel: 58.4 lots per year Fairlie: 2.2 lots per year	

3.1.1. Potential Impacts

The increase in developments across the district will mean the council will need to take on increasing number of vested assets. This means Council will need to plan for the renewal and improvements to level of service, once assets have been vested. This relates mostly to roading assets and stormwater infrastructure and directly influences the future expenses to the Council. Sections 6.2.1, 7.2.1, 8.2.1 and 9.2.1 further explains how future costs were developed for the council's infrastructure projects.

3.2. Legislative Influences

Several of the changing government priorities and changing legislations are outlined in section 2.2 above. However, there are a number of pre-existing legislations which impact the way in which Council's deliver

their infrastructure services. For example, the 2015 update of the National Infrastructure Plan (NIP 2015) sets out the following key objective:

"By 2045 New Zealand's infrastructure is resilient and coordinated and contributes to a strong economy and high living standards."

This continues to be at the forefront of Council's Infrastructure planning.

3.2.1. National Infrastructure Plan (NIP)

Council will see the above objective achieved through better use of existing assets and better allocation of new investment.

The NIP 2015 is the third National Infrastructure Plan to be released by the Government and identifies the following challenges:

- We have several aging infrastructure networks that will need renewing.
- Some of our regions will grow and others will shrink.
- Our population is also aging.
- At the same time, our lifestyles are changing.
- Technology is driving change everywhere.
- We also face economic challenges.
- On top of these challenges, our climate is changing, and our natural resources are under pressure.
- These challenges need to be met at a time when central and local government face financial constraints.

There are three main elements to the response outlined in the National Infrastructure Plan.

- a better understanding of the levels of service we want to deliver
- more mature asset management practices
- more effective decision-making that considers non-asset solutions

3.2.2. Local Government Act 2002

The Local Government Act 2002 is the paramount statute for Council. It directs and enables Council to undertake its day-to-day activities.

Section 10 of the LGA 2002 states: *the purpose of local government is—*

> *to enable democratic local decision-making and action by, and on behalf of, communities; and to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future.*

Section 17A of the LGA requires:

local authorities to review the cost-effectiveness of current arrangements for meeting the needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions.

Council has undertaken two Section 17A reviews in record time (roading and pools) and will continue to use this mechanism to refine its service delivery provision.

These embody a requirement to meet the current and future needs of communities for good-quality local infrastructure and local public services in a way that is most cost-effective for households and businesses.

Mandatory reporting standards require additional data collection and reporting obligations associated with operational activities.

3.2.1. Potential Impacts:

The above legislative influences have been in place for a number years and therefore Council have had time to adapt both their process and priorities to reflect current legislation. However, recently governments are more focused on the robustness and accuracy of Council's data management systems. It's important for this system to provide a high level of confidence in order to effectively plan the necessary improvements across the network.

The Three Waters Stimulus package has provided Council an opportunity to improve its data monitoring systems particularly in relation to sewerage and water supply so real time data can be collected and investigated.

3.3. New Technologies

New technology is becoming available within all infrastructure areas and adoption is essentially a continuous process. Some innovations, such as the use of increased fines content aggregate on unsealed roads, improve the quality of service provided (in this case lowering dust levels) while others such as pipe bursting for water main replacement provide cost reductions.

From a strategic point of view Council seeks to remain aware of technological advances through staff involvement in industry developments via training, seminar attendance and directly from suppliers. Internal development of new technologies is advanced through collaboration between staff and with other councils. Staff maintain strong relationships with professional staff from neighbouring councils. Council is also looking to introduce technological changes through contract partnerships and alliances.

3.3.1. Potential Impacts

Changing technologies can have a direct impact on the Council's infrastructure in the following ways:

- Improvements in construction materials (e.g. more resilient roading materials to provide longer lasting roads)
- Improvements to construction techniques (e.g. It's becoming more and more important for Council's to seek out carbon neutral construction techniques, sourcing materials locally where possible and recycling older assets where possible)

- Improvements to data capturing methodologies can improve the accuracy of the data, and therefore help Council's make more informed decisions around infrastructure improvements
- Changing infrastructure (e.g. the pivot towards carbon neutrality has lead to the investigation of biogas and renewable energy sources to power wastewater facilities.)

3.4. Climate Change

Climate change is a critical consideration in the Council's long-term planning. This Council uses guidance from the New Zealand government, based upon the best available climate science, to support the planning.

Mackenzie District Council is in the process of developing a Climate Change Response Policy for the whole of Council. The policy acknowledges the role of Council and the outcomes sought by the community. Key inputs into this policy and its implementation are the National Climate Risk Assessment for New Zealand (Ministry for the Environment, 2020) and the Climate Change Projections for the Canterbury Region (NIWA, 2020). The Ministry for the Environment information on https://www.mfe.govt.nz/climate-change/likely-impacts-of-climate-change/how-could-climate-change-affect-my-region/Canterbury provides a summary of projected climate changes over the period 2031-2050 and 2081-2100, compared with 1986-2005 and the key impacts this is likely to have.

Table 6 Climate Change effects on infrastructure

Climate Change	Impact on environment	Impact on infrastructure
Temperature	Compared to 1995, temperatures are likely to be 0.7˚C to 1.0˚C warmer by 2040 and 0.7˚C to 3.0˚C warmer by 2090. By 2090, Canterbury is projected to have from 6 to 35 extra days per year where maximum temperatures exceed 25˚C and the number of frosts could decrease by around 13 to 38 per year.	A reduction of frosts per year will likely have a positive effect on the council's roading, with fewer incidents and damage related to frost heave. Extreme heat can also mean roads fail more quickly from buckling, cracking creating potholes. However, it is unlikely temperatures will reach this high.
Rainfall	By 2090, winter rainfall is projected to decrease by up to 12 per cent in Christchurch and up to 10 per cent in Hanmer, but increase by 6 to 28 per cent in Tekapo. According to the latest projections, the frequency of extreme rainy days in the Canterbury region is not projected to significantly change as a result of climate change.	Whilst projections indicate that extreme rainfall will not increase significantly, the recent flooding events indicate that the impacts from these events can be significant. Currently estimates indicate that between $1 and $3 million has been invested in the restoration of roads across the Mackenzie District. It is therefore critical that the council have emergency funding available for these events, and to ensure the roads are kept at a relatively high level of service. Extreme rainfall events can also impact water infrastructure. Soil run-off/ oversaturated soils can lead to slips which can damage infrastructure and could also pollute water sources.
Snowfall	The Canterbury region will likely experience significant decreases in seasonal snow. By 2090 the number of snow days is projected to decrease by up to 30 days per year. The duration of snow cover is also likely to decrease, particularly at lower elevations.	As indicated above, flooding events will have an impact on both roading and water infrastructure. Again council will need to be sure its infrastructure is maintained to an appropriate level of service.

Climate Change	Impact on environment	Impact on infrastructure
	Less winter snowfall and an earlier spring melt may cause marked changes in the annual cycle of river flow in the regions. Places that currently receive snow are likely to see increasing rainfall as snowlines rise to higher elevations due to rising temperatures. So for rivers where the winter precipitation currently falls mainly as snow and is stored until the snowmelt season, there is the possibility of larger winter floods.	Additional engineering resilience's will need to be implemented as these events increase.
Wind	The frequency of extremely windy days in Canterbury by 2090 is likely to increase by between 2 and 10 per cent. Changes in wind direction may lead to an increase in the frequency of westerly winds over the South Island, particularly in winter and spring.	Extreme wind events and increase in wind speeds, could increase the damages to infrastructure. Fallen trees, signs, etc. will mean council will gain need to ensure its emergency response funding is adequate to quickly and efficiently repair damages
Water Shortages	Higher temperatures, less rainfall and greater evapotranspiration are likely to cause increasing pressure on water resources, particularly in North Canterbury. Droughts are likely to become more frequent and more extreme.	Potential future water shortages will increase the need for Council to improve or increase its water storage capacities. The Council are already investigating the potential for water metering in Twizel. This will reduce water leakages within the water network. Additionally the Council are looking to improve the reservoirs in Fairlie within this LTP period.
Fire risks	Strong winds, combined with high temperatures, low humidity and seasonal drought may result in an increased fire risk in some areas. The length of the fire season is expected to increase.	Fire resilience's within existing and new infrastructure will need to be prioritised as fire risks become more prevalent.

The potential resilience issues and mitigations are further discussed below.

3.4.1. Resilience

MDC customers have a high expectation of continuing functionality and service delivery. A changing climate and the recent high profile natural disasters have raised public awareness, but there is still a significant need to increase actual preparedness – both in general (e.g. household plans and emergency supplies) and for specific circumstances (e.g. tsunami preparedness in lake communities). However, resilience is not only applicable to natural hazards, but also needs consideration at an operational level where an asset failure is not necessarily a service failure.

Robust systems are designed to prevent failure. Resilience is about early detection and fast recovery. Resilience is defined as the intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions.

Council acknowledge that resilience is not only about physical assets. It is about the people. It includes but are not limited to:

- connecting people and communities (neighbour to neighbour; educate; access to household resilience items, etc.)
- supporting community organisations
- the built environment and asset systems which are robust

Adverse weather events, natural disasters, climate change and the related impacts cannot be avoided and as a result Council have to factor this into long term planning, civil defence planning and determining the infrastructure requirements moving forward to ensure the community's expectations are met with regard to safe and reliable services and general wellbeing.

In order to improve resilience Council approach will be to:

- Actively participate in CDEM planning and activities, at both regional and local levels
- Investigate options for alternative service provision and system redundancy
- Identify critical assets and ensure mitigation methods are developed
- Obtain insurance where this is deemed to be the most cost effective approach

Council also have a number of bridges that are at risk from natural flood disasters and earthquakes. Some of these are being replaced and others have had work completed to improve their resilience. Staff recommend that it is worth undertaking a study of structures focused around lifelines to assess critical structures and look at ensuring these against natural events.

3.5. COVID-19

The 2019–20 coronavirus pandemic is ongoing at the time of writing of this Plan. The timeline of events are as follows:

Table 7 Covid-19 Government response timeline

Date	Event	NZ Government Response	MDC Response
11/02/2020	World Health Organisation declares an official pandemic		
28/02/2020	NZ first reported case		
18/03/2020			
21/03/2020		Alert Levels (1-4) announced	
			EOC activated
24/03/2020		Move to Alert Level 3	
26/03/2020		Move to Alert Level 4	
1/04/2020			
25/04/2020			
27/04/2020		Move to Alert Level 3	

Date	Event	NZ Government Response	MDC Response
14/05/2020		Move to Alert Level 2	
15/05/2020			Economic & Community Recovery Action Plan
10/06/2020		Move to Alert Level 1	

3.5.1. Potential impacts

The impacts will be wide ranging and could include a significant and protracted recession. This presents an opportunity for Council to collaborate with Central Government to invest and progress infrastructure projects giving the economy the injection it will desperately need.

As an initial response Central Government decided to fast track eligible development and infrastructure through amendments to the Resource Management Act. This will aid in getting much-needed infrastructure programmes underway as soon as possible.

Further response includes the establishment of the Infrastructure Industry Reference Group (IIRG) to seek out infrastructure projects that are ready to start as soon as the construction industry returns to normal to reduce the economic impact of the COVID-19 pandemic. These 'shovel ready' projects include water, transport, clean energy and buildings. They would also have a public or regional benefit, create jobs and be able to get underway in short order.

Council did not apply for Government funding for shovel-ready projects, instead opting to bring forward shovel-ready projects as part of MDC COVID-19 recovery including $9.5m of water supply projects. Projects include the new Fairlie Water Treatment Plant and associated reservoir, replacing water pipes in Twizel and Fairlie and upgrading the Burkes Pass water supply treatment plant. In roading, prioritising key shovel ready minor and safety improvement projects, maximising available NZTA co-funding and low interest rates for Council's 49% share. The majority of these projects will be footpaths and shared-use paths to promote a fit and healthy community.

The COVID 19 pandemic created a very dynamic environment where circumstances can change on a daily basis. At the time of writing this Plan the assumption is that the Mackenzie district will be able to weather the storm as the districts' primary industries, agriculture and forestry, are less affected than for example tourism. Domestic tourism numbers appear to hold steady, but international tourism which made a significant contribution to the Mackenzie district economy is severely affected. The Department of Internal Affairs 'Local Government Sector COVID-19 Financial Implications Report 2 – Alert Level Scenarios, Assumptions and Updated Analysis' report projects "The agriculture sector is expected to perform relatively well in the short- and long-term".

Council will first attempt to reduce spending in ways that do not require reductions to service levels. Higher levels of reduction in spending would be more likely to require deferral of larger capital projects which may impact on Council's ability to comply with legislation and environmental standards in the 3Waters area.

Council could defer the replacement of assets for a period and potentially reduce the priority of capital expenditure so they can sustain service levels. The deferral of asset replacement may increase infrastructure resilience risks and increase long term costs.

The response to COVID 19 provided a snapshot of how quickly our environment can change and how quickly we can adapt. People working from home. The uptake of technology. Change in transportation patterns. Online sales and deliveries. Outdoor activities. Socio economic impacts and response. Furthermore, the incidence of a pandemic has the potential flow-on effect of the Council failing some of its non-financial reporting measures.

4. PARTNERSHIP OPPORTUNITIES

There is a need for the Council to establish strong and long-lasting relationships with key partners. These include:

- Nga Rūnanga o Ngai Tahu, (Arowhenua, Waihao, Moeraki)
- Environment Canterbury
- Waka Kotahi (NZTA)
- Mackenzie Community
- Property Developers
- Other Local Councils
- Central Government

Strong partnerships and relationships; based on trust and information sharing, allow councils to fully understand and acknowledge key infrastructure issues and address these issues using a collaborative approach. The Strategy will seek to improve these relationships by including key partners in the decision making process. More specifically, the Council will consider the partnership opportunities that exist for infrastructure projects when it is prioritising what infrastructure investment decisions to progress within strategies and plans.

Table 8 key partners and how they can contribute to core infrastructure for the district.

Table 8 Partnership contribution to strategic infrastructure and planning

Partner	Contribution	Current Projects
Nga Rūnanga,	Working in collaboration with iwi strengthens Council's decision making by providing alternative views and approaches to be put in place prior to the commencement of a project	The District Plan Review Three Waters Management Te Manahuna Ki Uta
Environment Canterbury	Provide regulatory standards which must be met by councils	Te Manahuna Ki Uta 'Destination Mackenzie'. Overall regulation management
Waka Kotahi (NZTA)	Waka Kotahi are a major share holder of assets within the Mackenzie District (51% of roads)	Transportation system provision Te Manahuna Ki Uta 'Destination Mackenzie'.
Mackenzie Community	Council engagement with the community is important to ensure the communities needs are being met by core infrastructure	The District Plan Review Three Waters Management Te Manahuna Ki Uta 'Destination Mackenzie'.
Property Developers	It is important for the Council to work closely with potential developers to ensure that residential or commercial developments are timed to coincide with growth related infrastructure.	District wide developments

Partner	Contribution	Current Projects
Other Local Councils	The Council partners with other neighboring councils when there is a shared asset.	The Alps to Ocean upgrade project is shared between Waitaki and Mackenzie District. Te Manahuna Ki Uta 'Destination Mackenzie'.
Central Government	Central government partners with the Council when providing and funding infrastructure that has benefits that are beyond the local area.	Three Waters Management
Department of Conservation (DOC)	Council must collaborate with DOC when considering any project which could impact on DOC owned land, or could impact visitors within the Mackenzie Basin	Te Manahuna Ki Uta 'Destination Mackenzie'. The Alps to Ocean upgrade project is shared between Waitaki and Mackenzie District.

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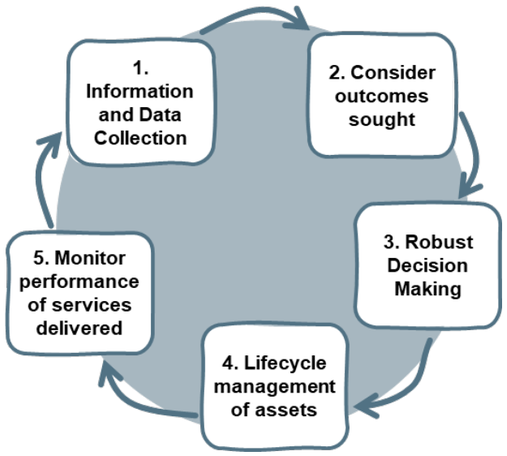
5. COUNCIL STRATEGY

It is necessary for foreseeable community needs and environmental impacts to be reflected in a defined Infrastructure Strategy to ensure that Council can provide cost effective local infrastructure for households and businesses.

In order to develop infrastructure operations and maintenance programmes, as well as identify capital projects, a strategic approach is taken. The following cyclical steps are necessary to ensure core infrastructure is consistently developed and maintained in a way which provides for the community.

1. **Information and data collection:** The Council uses a number of data management tools to process and store information and manage the Council's infrastructure assets. This develops an evidence base which helps inform any key decisions. These are outlined in Section 5.1 below.
2. **Consider outcomes sought**: The overarching vision and goals for the Council is outlined in Section 1. However, in addition to achieving the wider community outcomes, Councils is also responsible for maintaining core infrastructure to a certain Level of Service. This is further outlined in Section 5.2 below.
3. **Robust decision making:** Providing services that meet the needs of customers have to be balanced with affordability. The opportunities for Council to contribute to the wellbeing of its community are endless, so key decisions must be robust and timed accordingly. This is further outlined in Section 5.3
4. **Lifecycle management of assets:** Lifecycle asset management focuses on management options and strategies from initial planning through to disposal, while considering all relevant economic and physical consequences. Council's approach to lifecycle management is further outlined in Section 5.4
5. **Monitor performance of services delivered:** Data is systematically collected and stored to monitor and assess the performance of key infrastructure against its Level of Service indicators. This is further discussed in Section 5.5.

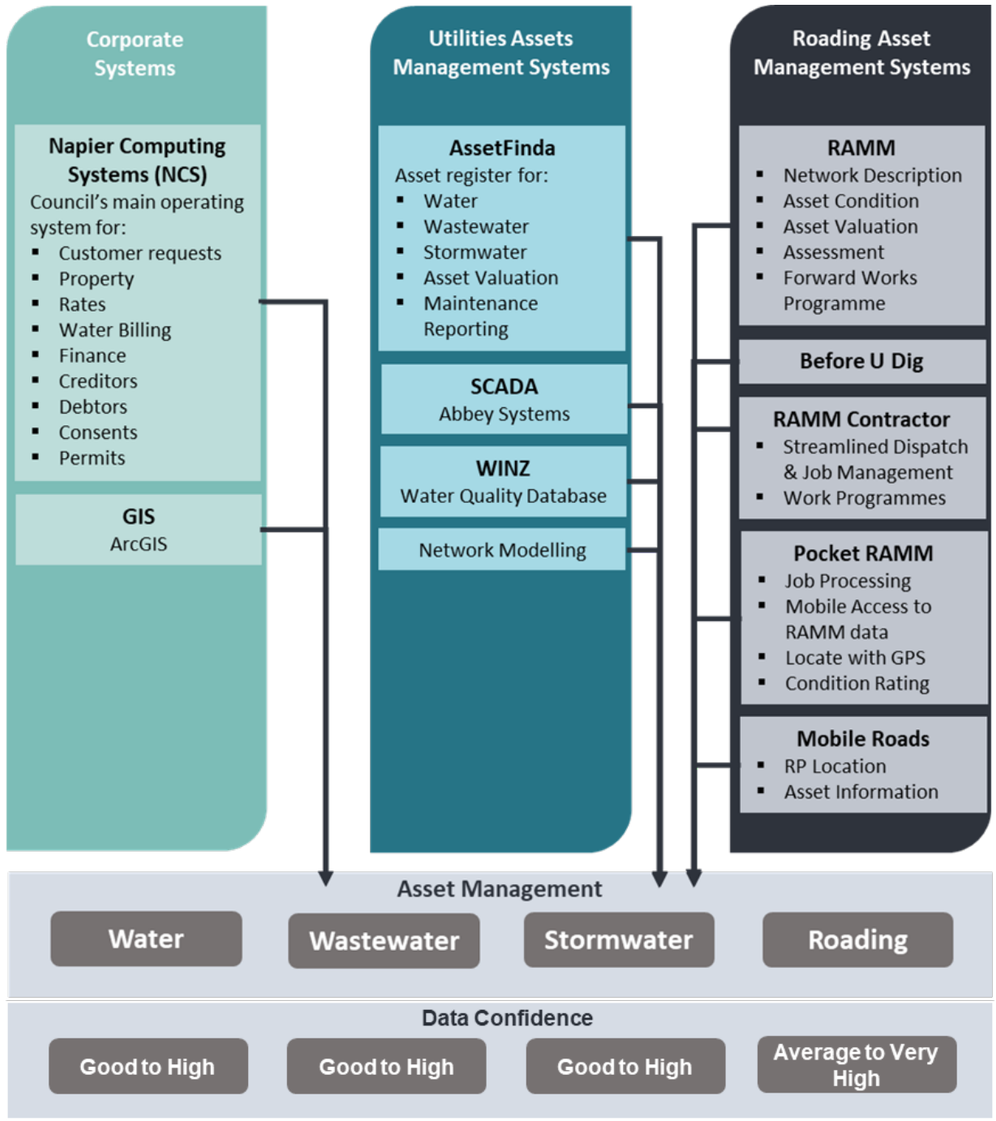


5.1. Asset Management Practices

Evidence based decision-making is crucial to achieve asset management and sustainability goals. Having the correct asset information available is important to support the decision-making process.

The information and data systems available to Council staff are shown below and discussed within this section. These systems are used to provide Council with information which can be used to assess performance and provides insights into what can be improved to better service the community. It is vital that the information and data collection systems accurately portray the current state of infrastructure and are updated and maintained regularly.

Figure 8 Information and Data Systems Support



5.1.1. Three waters

Data confidence grades are held against each individual asset within the AssetFinda asset register. These grades indicate the type of data source and the confidence in the specific data source. Since the last independent data confidence review there has been a significant improvement in base asset information. An independent assessment to reassess the data confidence grades of the AssetFinda register would be of value to determine the improvement opportunities prior to the next LTP. An in-house assessment showed an improvement to the data confidence ratings from previous years but the table below reflects the data confidence status at the last independent review (2019). A summary of the confidence levels in the attributes of the assets are detailed in the following table.

Table 9 Data confidence for three waters asset

Valuation element	Water Supply	Wastewater	Stormwater
Asset register or database	Good Condition	Good Condition	Good Condition
Attribute details	Good Condition	Good Condition	Good Condition
Asset category	High confidence	Good Condition	Good Condition
Optimisation information	Average Condition	Average Condition	Average Condition
Useful lives information	Good Condition	Good Condition	Good Condition
Unit rates	Good Condition	Good Condition	Good Condition

In general, there is a relatively high understanding of the conditions of three waters assets. However, the Council are, through the Three Waters Stimulus Funding, undertaking a full CCTV assessment of its wastewater network which will allow for a much better understanding of condition of these pipes and their expected lifespan. The assessment will be undertaken in accordance with the New Zealand Gravity Pipe Inspection Manual 2019 and data captured and assessed accordingly.

Unfortunately, CCTV monitoring cannot be replicated for water pipe assets. Instead, Council performs condition assessments on its water pipes when a failure occurs, or a larger connection or pipework cut in is undertaken. Pipelines are inspected in general accordance with best practise and relevant Water New Zealand Technical Manuals, and the results reported to the 3 Waters Manager for an assessment of the likely remaining life of the asset. In some cases, the section of pipe removed during the repair process may be sent away for detailed deterioration and expected remaining life analysis , as Council engineers have done for AC pipe in the past. By taking this information on selected pipelines the data can be used to infer the condition of that section of pipeline to give a complete picture of the network.

Despite the lack of real time data for these water assets, the Assetfinda register still has an expected remaining life of majority of its pipe network aligned with national best practise. Council is working on improving its data relating to criticality and vulnerability.

5.1.2. Transportation

The level of confidence with roading and transportation data has remained relatively static since the last iteration of the IS completed in 2018. Data has been updated, but the focus has been on removing historic errors to improve data quality going forward. Council has carried out a significant auditing and validation programme on its RAMM data, completed by OPUS Consultants Ltd (now WSP). All previous assets excel

spreadsheets and modelling practises have been integrated with this validated data. Subsequent to this as part of the Road Efficiency Group (REG)group there has been a report released rating all Local Authorities RAMM Data sets. There are still areas that require Council attention in the RAMM databases:

- Traffic count data could be more complete and representative of the wider network
- Missing remaining useful life data makes it difficult to determine renewal profiles based on the age of the asset
- More complete records of asset attributes would assist in the monitoring and assessing of assets.

Council undertake regular inspections and condition assessments on its assets to determine whether the asset is in need of replacing (see section 6.2.2 of the Transportation AMP for details on how condition assessments and inspections are undertaken on roading assets). More complete and accurate data would help streamline and forecast for future renewals and capital works.

The table below shows the assessed data confidence quality of the Council RAMM and spread sheet data tables as described in the 2019 Roading Asset "Mackenzie District Infrastructure Revaluation" report.

Table 10 Data confidence for transportation assets

Valuation Element	Pavement	Footpath	Structures	Drainage	SWC	Signs	Lights
Asset Registers or Databases	High	Good	High	High	Good	Good	Good
Attribute Details	Good	Good	Good	High	Average	High	Good
Asset Categorisation	Very high	High	Very high	High	High	High	Good
Optimisation Information	High	Good	High	High	High	High	High
Useful Lives Information	Average	Good	Average	Average	Average	Average	High
Unit Rates	High	High	Good	Good	Good	Average	Good

The Council recognise that there is significant improvement which can be made with regards to its data management for roading assets and has since contracted Geo-Solve to undertake pavement testing over various locations within the district. This will provide data to check pavement depths and ensure performance, deflection and strength.

Through the retendering of its Road Maintenance Contract in 2020/2021, Council has secured Waka Kotahi support to undertake a quality based procurement methodology as it looks to secure a maintenance delivery partner that brings not only physical network maintenance services, but also Asset management and Data capability. This, alongside Council seeking to employ a dedicated asset data manager in order to prioritise the improvement and confidence level of the roading data, will support significant improvement in data over the coming years..

5.1.3. Risks of using aging data

Mackenzie District Council has historically planned its renewals and investments to address compliance requirements. Traditionally it has based its renewals on age and limited asset condition information. The

useful life of an asset is theoretical. The actual life of an asset varies depending on several conditions which is why regular inspections and condition assessments are necessary. There is a risk that Council's current renewal and investment strategy will vary significantly as more information is discovered about the assets. It is important that as much asset condition and performance information is gathered to better inform infrastructure investment decisions. Council has recognized this and projects are in place to update and generate more up to date and reliable asset management information.

As previously mentioned, Council has aligned is age data with national best practice. It is improving this data through the collection of specific asset condition information. While our age data is aligned with national best practice there is a risk that if these national figures under estimate the life of the asset Council could be replacing assets earlier than required. If however the life is over estimated, Council will experience an increasing number of breakages and failures. It needs to be noted that a lot of the Councils three waters infrastructure was installed as part of the hydro developments within the Mackenzie basin and as such is approaching the end of its theoretical life at the end of this LTP. Now is therefore an optimum time for Council to gather detailed asset condition data

5.2. Level of Service

Asset management planning requires a clear understanding of customer needs and preferences and the minimum obligations that must be met. A key objective of this activity plan is to match the level of service provided by the asset with the expectations of the customers given legislative, financial, technical and safety constraints. Service standards, set to meet this objective, provide the basis for the life cycle management strategies and work programmes.

During 2020 Council developed a new vision statement, mission statement, supporting value statements and community outcomes (see Figure 2). The new community outcomes align with the Local Government (Community Well-being) Act which focuses and restores the four wellbeings. (See Table 11).

Table 11 Wellbeings aligned with Council's Community Outcomes

Community Outcomes	Well beings			
	Cultural	Economic	Environmental	Social
A Treasured Environment	✓		✓	✓
Resilient successful Communities			✓	✓
Strong and Innovative economy	✓	✓	✓	✓
Embrace Heritage and Diversity	✓	✓	✓	

This acknowledges Councils' broader role in looking after our communities, rather than simply providing core services.

Specific Level of Service performance measures and their targets over the next 10 years are outlined within APPENDIX A.

5.3. Robust Decision Making

Providing services that meet the needs of customers have to be balanced with affordability. The opportunities for Council to contribute to the wellbeing of its community are endless, so prioritisation, transition and risk management are required in order to make effective decisions.
Council's highest priority for activities is meeting legal compliance, this may occur over a period of time where improvements are required. Similarly, it may not be affordable for the community to fund and implement many compliance initiatives at the same time. Often there is the ability to transition such changes, such as with Drinking Water Standards compliance.

Investment levels and funding capability (affordability) are a fine balance. Decision making need not only consider the impact of either progressing or not progressing particular actions.

Figure 9 Investment and Affordability Considerations

Taking a long-term view to the management of infrastructure assets, Council needs to make key decisions in a timely manner. Much of the improvement work for Three Waters is underway, while any improvements that might be required as a result of the Three Water Reform process are largely unknown.

In addressing Community desires and priorities the following key decisions have been identified.

Table 12 Key Decisions Identified in Addressing Community Desires and Priorities

Period	2021/22 - 2031/32	2031/32 - 2041/42	2041/42 - 2051/52
Core Infrastructure Activity:	*These are discussed in greater detail in the Long Term Plan*	*Basic scope required*	*Conceptual*
Water Supply	Water sector reforms – role of Council anticipated to change to regional management. ***Key Decision:*** ***How will that best serve our community?***	Level of compliance across all schemes Demand management ***Key Decision:*** ***What will implementing the actions from the Sustainable Infrastructure Strategy and the Sustainable Water Strategy look like?***	Improved efficiencies

Period	2021/22 - 2031/32	2031/32 - 2041/42	2041/42 - 2051/52
Wastewater	Water sector reforms – role of Council anticipated to change to regional management. ***Key Decision:*** ***Treatment and disposal options for Takapō/Tekapo– what form should then take and when will it be required?***	Level of compliance across all schemes ***Key Decision:*** ***Does valuing our environment mean going 'above and beyond' legal requirements for treatment and discharges?***	
Stormwater	Water sector reforms – role of Council expected to continue for stormwater management	***Key Decision:*** ***Does valuing our environment mean going 'above and beyond' legal requirements for treatment and discharges?***	
Transportation	Replacement or upgrade of low use/end of network bridges	Drainage upgrade to cope with storms	
	Transition of unsealed roads methodology	Seal extensions on key unsealed roads	
	Better linkages for walking and cycling	Major linkages for walking and cycling	
	Funding assistance rate review		
	Key Decision: Upgrading our road network so it is more suited to the future? How rapidly do we make changes and how do we fund it?		

5.4. Lifecycle Management Plans

Lifecycle asset management focuses on management options and strategies from initial planning through to disposal, while considering all relevant economic and physical consequences. The effective application of asset management principles will ensure the reliable delivery of service and reduce the long-term cost of ownership and in this way reduce service costs. A well-structured lifecycle management plan will reduce the long term costs of ownership and in so doing reduce the service cost.

The Lifecycle Management Programme cover five key categories of work necessary to achieve the required outcomes. These key categories and goals are:

Table 13 Lifecycle Management Categories

Lifecycle Categories		Aim
Management Plan	Management functions required to support the other Programmes	To maintain the assets to ensure that the assets achieve their service potential
Operations and Maintenance Plan	To ensure efficient operation and serviceability of the assets so that they achieve their service potential over their useful lives. This includes the day-to-day work to keep the assets operating	
Renewal Plan	To provide for the progressive replacement of individual assets that have reached the end of their useful lives (restores the original capacity)	
Development Plan	To improve parts of the system currently performing below target service standards and to allow development to meet future demand requirements	To meet future demand and close any service gaps
Disposal Plan	To better plan for disposal of assets through rationalisation of asset stock or when assets become uneconomic to own and/or operate	To dispose of assets appropriately

The AMPs for each of the core assets (water, wastewater, stormwater and transportation) outline the detailed changes for each of the lifecycle categories.

5.5. Monitor Performance of Service Delivered

Currently monitoring of operational performance is tracked through a number of activity specific parameters, asset management practices and detailed budget control. Performance reviews are undertaken with Waka Kotahi NZTA, industry groups (e.g. Water New Zealand), regional Council (resource consent reporting) and central Government (e.g. water test results, Three Waters Reform and mandatory reporting standards).

However, Council acknowledges there are limitations with its data that affect decision-making. A commitment to improving data collection and analysis is indicated below. These are further outlined in section 5.1 above.

Table 14 Data Improvements

Activity	Data to be collected	Data to be analysed	Value this data provides
Transportation	Traffic counts of Heavy Vehicles	Counts – numbers and proportion of total traffic	Heavy traffic counts will help identify key routes and align these with pavement management
	Asset Criticality	Demand patterns	Inform programmes
Three Waters	Asset Criticality	Demand patterns	Inform programmes

Water Supply	Water use	Water demands	Universal metering provides a comprehensive data set which is currently not leveraged to understand peak demands

Council has good condition and performance data to support decision-making alongside these improvement areas.

The approach to data collection and management will be discussed in the respective AMPs and budgets where appropriate. Data quality programmes for Transportation follow national guidance.

5.6. Infrastructure Sustainability Strategy

Council is progressively moving to a more sustainable approach to delivery of services. This is in response to changing community priorities and Government direction (refer to section 2.2). In lieu of this, Council is embarking on a Sustainable Infrastructure Strategy that will be critical to inform the district plan and the next Long-Term Plan. In the meantime, the Council's level of service focus on environmental outcomes and are outlined in Table 15.

The table shows that over the past five years there have been no non-compliances recorded against resource consents for water supply, wastewater, or stormwater activities. Water use per household remains high along with the number of dry weather sewerage overflows. While this is associated with the dry summers, Council can encourage a reduction in water use through education and policy change.

Whilst many of the set KPIs are being met, the existing three waters network is still very vulnerable to failures especially as the number of households start increasing and regulatory standards become more rigid. Several water and wastewater infrastructure upgrades are planned to accommodate for the increase in regulatory focus and environmental standards.

Table 15 Performance Measure that contribute to Sustainability Outcomes in Three Waters

Sustainability Outcomes		Performance Measure	Estimated target:	Results 2015/16	Results 2016/17	Results 2017/18	Results 2018/19	Results 2019/20
WATER	Water and energy use	The percentage of real water loss from the networked reticulation system (Approximate)	<25%	✓ 12%	✓ 24%	✓ 12%	✓ 19%	✓ 21%
	Water and energy use	The average consumption of drinking water per day per resident within the district.	<1.2m^3 per person per day within urban schemes	✗ 2.27	✗ 2.41	✗ 2.30	✗ 1.95	✗ 1.6

Sustainability Outcomes		Performance Measure	Estimated target:	Results 2015/16	Results 2016/17	Results 2017/18	Results 2018/19	Results 2019/20
WASTEWATER	Discharges to the environment	The number of dry weather sewerage overflows from Council's sewerage system, expressed per 1000 sewerage connections to that sewerage system	≤5 Reduced in 2018/19 to ≤2	✗ 7.2	✓ 0	✓ 1.5	✗ 3.26	✗ 3.11
	Discharges to the environment	Compliance with the Council's resource consents for discharge from its sewerage system measured by the number of: a) abatement notices b) infringement notices c) enforcement orders, and d) convictions	Nil	✓ Nil	✓ Nil	✓ Nil	✓ Nil	✓ Nil
STORMWATER	Discharges to the environment	Compliance with the Council's resource consents for discharge from its stormwater system, measured by the number of abatement notices, infringement notices, enforcement orders, and convictions	Nil abatement or infringement notices, enforcement orders, or convictions	✓ Nil	✓ Nil	✓ Nil	✓ Nil	✓ Nil

Whilst the above performance measures relate specifically to the improvement of environmental outcomes, sustainability in general goes beyond just building a sustainable environment. Transport related performance measures can be found in Appendix A (Table 53).

Sustainable asset management practices include action that recognise the need for environmental, economic, social and cultural sustainability in the following ways:

- The natural environment needs to be preserved for future generations and not degraded as a result of Council's asset management operations, maintenance, management and development projects
- Financially there is a limit to what ratepayers and developers, and therefore Council, can afford. Expenditure needs to remain within this limit and the costs need to fall equitably on the generations which derive the benefits
- Social relationships between individuals, interest groups and Local Government are valuable, and Council needs to facilitate and encourage this by providing infrastructure that services and facilitates these stakeholders

- Our history, customs and creativity are valuable to us. Their preservation and enhancement over time is facilitated by providing venues and services which can support the ways in which they are practiced, preserved and displayed

The Council has identified a number of actions to take place over the next 30 years which will contribute to more sustainable outcomes. These actions include various policy changes, behavioural changes and changes to the physical infrastructure and are classified under six key themes:

- Our environment is a taonga
- Resilient Infrastructure and Communities
- Climate Change
- Partnership with Nga Rūnanga,
- Growth (sustainable development)
- Economy (incl. Tourism)

It should be noted that this strategy is still under development and the following strategic timelines are indicative only at this stage.

Table 16 Actions contributing to sustainable outcomes

LTP Year	1	2	3	4	5	10	→	20	→	30
Themes / Year	2021	2022	2023	2024	2025	2030		2040		2050
Our environment is a taonga		*Establish Global consent for Transportation works*	*Replicate natural processes for stormwater disposal*	*Full wastewater system compliance*						
Our environment is a taonga		*Green waste collection and composting*					*Revise Wastewater management eg. Biosolids to compost*		*Zero Waste*	
Resilient Infrastructure and Communities		*Stormwater Management (culverts)*	*Water Use*							
Resilient Infrastructure & Communities		*Coordinate responsible gravel extraction process*								
Climate Change - Mitigation			*Transitioning to Hybrid Fleet*				*Transitioning to Electric Fleet*			***ZERO CARBON***
Climate Change - Mitigation				*Carbon footprint assessment*						***ZERO CARBON***
Climate Change - Mitigation	*Sustainable / Enviro building requirements Power Materials Water Landscaping*		*Energy Audit*	*Water use*		*Efficiency of use - modifying practices*	*Assess alternative energy options*		*Energy neutrality*	

LTP Year	1	2	3	4	5	10	→	20	→	30
Themes / Year	**2021**	**2022**	**2023**	**2024**	**2025**	**2030**		**2040**		**2050**
Climate Change - Adaptation	*Unsealed roads practices*	*Water storage reliability*	*Infrastructure upgraded to cope with storms*							
Climate Change - Leadership on the Community	*Climate Change Impact Assessment and Response Policy*	*Reducing Water use*	*Water meter trial*	*Demonstration landscaping*						***ZERO CARBON***
Partnership with Nga Rūnanga,										
Growth (sustainable development)		*Spatial Planning*								
Growth (sustainable development)			*Walking and Cycling Linkages*							
Economy (incl. Tourism)										

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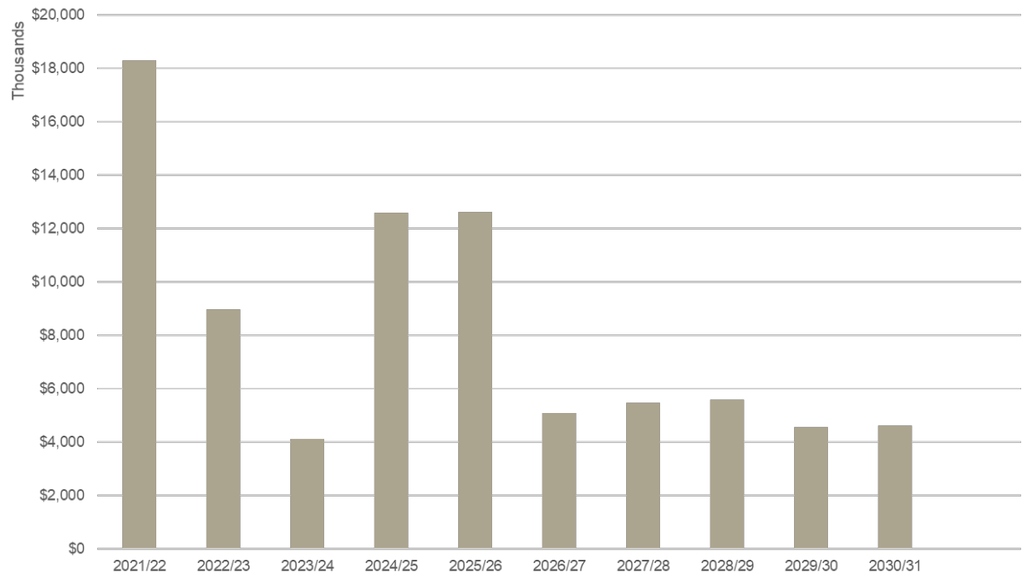
5.7. Capital Programme Summary

A large majority of Council projects over the 10 years of the Long-Term Plan (LTP) are front loaded into years 1 and 2, and many of these carry forward works, or works that have been allocated over two financial years (the Three waters Stimulus Program is a good example).

Year 4 and 5 see an increase in investment due to the renewal of the Takapo Wastewater Treatment plant.

Figure 10 Total Capex Programme (three waters and transport – uninflated)



Council has traditionally had a small Capex program (in the past between $3.5 – $5.5m) and delivered most of the projects in house, through existing roles and as part of “Business as Usual”.

In the 2020/21 Annual Plan Council accelerated its AC water main renewal program and shared use path network in response to the Covid 19 pandemic. This was alongside the already budgeted for Fairlie Water Treatment Plant and reservoir Project.

The level of complexity of these projects, the value associated with them and the risk of non-delivery, prompted Council to contract out the project management and delivery of the works via an open process. Beca Limited (Beca) were successful in securing the works and are progressing delivery via a dedicated project manager and delivery team.

Progress on these works is outlined in the table below:

Table 17 2021 Capital works programme (three waters and transport)

Project Title		Stage of Progress	Progress	Expected Completion Date
Water Main Renewals - Twizel	Package 1	Tender let	In progress, construction underway	Oct-21
	Package 2	Tender Let	Contractor in mobilisation phase	Construction phase - 24 weeks Possession of site 10 days following award (28/06)
	Package 3	On Government Electronic Tender Service (GETS) week 5th July	Tender drafted and sent to pre qualified contractors via GETS	Est. Completion Date December 2021
Water Main Renewals - Takapo		In Design		Smallest package, estimated completion date Dec 2021
Water Main Renewals - Fairlie		In Design	May not progress due to budget issues	TBA – if affordable
Fairlie Water Treatment Plant and Reservoirs		Concept Design	Completed and internal review	July 2022, next stage to determine detailed design pathway
Shared Use Paths (roading)		Construction and handover	Completed	In hand over phase

Beca provide monthly reports on progress of the works, which is reported to Council via the Engineering and Services Committee.

Unspent funds will be carried forward into this LTP. The annual plan contained an insufficient allocation of funds for the Fairlie WTP upgrade and additional funds to deliver the project are in year 1 and 2 of the 2021/31 LTP. This work will be externally resourced in both detailed design and construction monitoring.

Council has also received an additional $5.11 million allocated to Council for opting into Tranche one of the Three waters Reform Program. The funding was allocated for the delivery of non LTP funded projects. In November 2020 Council signed a Memorandum of Understanding (MoU) with Central Government outlining the funding and delivery of works which is to be completed by March 2022.

The funding is allocated to a number of projects (16 Capital and 20 Operational Projects, see section 10.3.1 for further detail) and Council have contracted a dedicated resource to project manage its delivery. The stimulus package consists of approximately 5% of the total three waters capital works program.

The balance of Councils Capital works program for the Long Term Plan contains projects related to the stimulus works (the upgrade of the Takapo Wastewater Treatment Plant) and projects focused on upgrading Council owned buildings to address condition issues.

As mentioned previously, Council has traditionally relied on internal staff to deliver works alongside their BAU and does not have a Project Management Framework in place to support delivery. Outside of the major projects mentioned above, Council have focused on allocating funds to projects over a period of

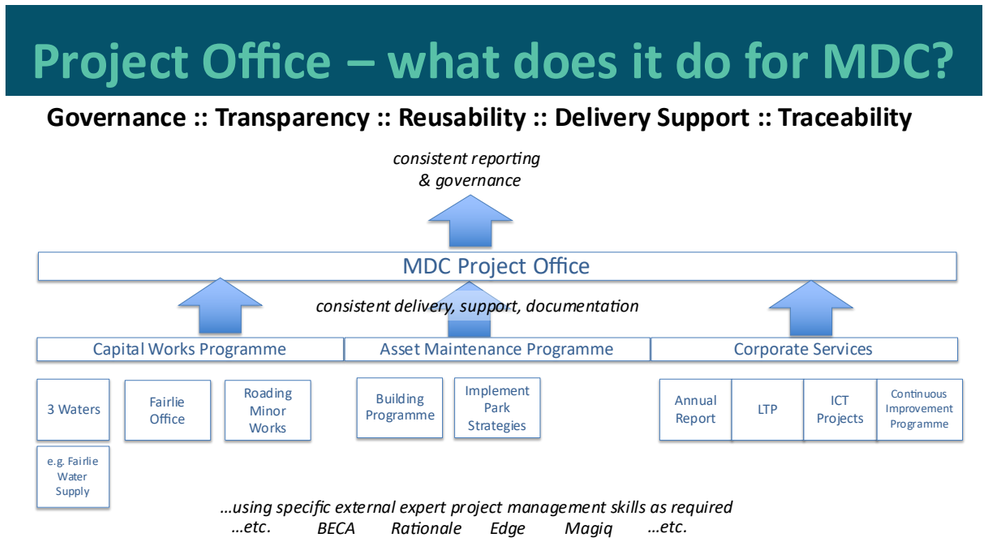
years to reflect the need to investigate, design, tender and construct works. An example of this is the Takapo Wastewater Plant upgrade, with works progressing over a number of years reflecting a process of consenting, land procurement, design and construction.

Councils Transport Capital works program is small in comparison to many of its other workstreams and the first three years of the LTP has a significantly reduced Low Cost Low Risk project program. The new Road Maintenance Contract has been tendered with an ability to add capital and renewal works via a performance-based approach and this has been approved by Waka Kothi. This will result in a seamless approach to the delivery of these works, on the basis of contractor performance.

To facilitate the delivery of the large works program, Council is proposing the set up of a Program Management Office and employment of a Program Manager. This approach has been endorsed by Council and work is commencing on setting the delivery framework and engaging a resource to run the office.

Shown below is the suggested framework for any PMO.

Figure 11 New project management office structure



Council focus in the first years of the LTP will continue to be a "Smart Procurer "of services and use all tools available to it through its Procurement Policy, to ensure the delivery of the works program.

Council is a member of the All of Government Procurement Panel and also has a Procurement Assurance Contract set up with Audit New Zealand to support procurement processes and ensure that the speed of delivery does not suffer from poor procurement processes.

5.8. Key Assumptions

This strategy is based on the same assumptions developed for the 2021-2031 Long Term Plan. These are available in the Long Term Plan document. Key issues associated infrastructure planning are highlighted below. Refer to Appendix B for a full list of assumptions, the level of uncertainty and potential mitigation strategies.

5.8.1. Organisation

This strategy is based on the philosophy that Mackenzie District Council will remain a viable unit of local Government in its own right. This assumes it will continue to own, manage and operate the Three Waters (water, wastewater and stormwater) infrastructure, either directly or through another entity.

Even though there may be some form of shared service arrangement with neighbouring Councils, Mackenzie will continue to manage and maintain the local road network and the Three Waters (water, wastewater and stormwater) networks.

5.8.2. Population, demographic, and household forecasts

It is assumed that growth in the district's population will generally be consistent with the medium projections developed for Mackenzie District Council in 2020. It is anticipated that changes to household numbers and composition will generally reflect population projections and forecast changes to demographics (that is, an ageing population). This is not expected to create any significant impact on demand for infrastructure and services, given the relatively small increase in total population projected to occur.

5.8.3. Tourism and dwelling numbers

It is assumed that visitor numbers will return to pre-COVID-19 numbers around 2022/23, and from that point visitors to Mackenzie District will be at least equivalent to the growth level experienced pre-COVID-19. It is also assumed growth in domestic visitors to Mackenzie District will be significantly higher than pre-COVID-19 while international travel is limited.

It is assumed that growth in dwelling numbers will primarily be driven by demand for short-stay visitor and holiday accommodation due to year-on-year increases in both domestic and international visitor numbers to the district particularly after 2022/23 when international visitors start increasing above previous numbers.

5.8.4. COVID-19

The Pandemic will be controlled in New Zealand and Level 1 restrictions will cease prior to 1 July 2021

Borders will remain closed to tourists/casual travellers for a further twelve months, at which point limited tourism will resume. From 2021 to 2030 tourism activity will progressively return to 2020 levels. However, there is still relatively high uncertainty regarding when international boarders will be opened. Prolonged periods of closed boarders will impact economic activity in the council limiting population and business growth.

5.8.5. Levels of Service

It is expected that Council will continue to provide similar services to the community in the future to those delivered currently. Changes to the delivery of water services are imminent, but Council will in some form remain responsible.

System upgrades are complete or underway for many treatment plants, and there is an ongoing programme of renewals and upgrades to meet the required service level standard.

The roading infrastructure maintains the current levels of service over most of the activity. The exception to this would be the replacement of weight restricted bridges. If renewed they will all be able to take Class 1/HPMV/50 Max traffic loading, which is an improved level of service. Waka Kotahi has introduced new funding requirements for work to replace small bridges as a "like for like" upgrade in the 2021-2024 National Land Transport Plan. "Like for like" should be interpreted as providing for a modern replacement to current design standards appropriate for the network that is to be serviced over the life of the new replacement structure, e.g. replacing a timber bridge with a steel and / or concrete structure that meets the current base design standard (generally to Class 1).

5.8.6. Insurance and Risk

There are numerous active faults within Mackenzie District and surrounding areas. Of these, some of the most significant - in terms of potential lifeline impacts - include the Ostler and the Irishman Creek Fault Zones in the Mackenzie Basin. Both fault zones have the ability to generate significant earthquakes. The Alpine Fault on the District's northern boundary has the ability to generate the largest earthquakes and the greatest spread of damage which could severely impact Council's lifelines.

The Council holds $3,000,000 in cash reserves and has a strong balance sheet to enable it to borrow to meet its local share obligations. Council also insures its above ground assets such as water tanks and reservoirs. It is unlikely Council would obtain insurance for underground assets. It is essential that Council continues to maintain the cash reserve or put in place an insurance regime to replace/complement it, should changes to the current policy be implemented.

In addition to Council's insurance, in the event of natural disaster it is expected that Central Government will contribute up to 60% towards the restoration of water, drainage and sewerage assets and provide a subsidy of 55-75% towards the restoration of roads.

5.8.7. Funding Assumptions

The following assumptions have been made regarding the levels of funding from the various funding sources, and how inflation, interest rates and borrowing has been treated within out forecasts.

- **Inflation -** All budget projections have allowed for inflation (September 2020 projections).
- **Interest Rates and borrowing -** Borrowing costs are assumed to be as included in Financial Forecasts.
- **Three Waters (water, wastewater and stormwater) -** In the process of producing this Infrastructure Strategy and the underlying supporting plans, Council has considered the following:

- Council priorities in terms of the overarching aim for delivering core services
- Implementation of the Three Waters Reform in-progress through Parliament
- Alignment with the Community Outcomes in the LTP
- Delivery against the four community well-beings (environmental, economic, social, and cultural)
- The need to manage the assets at a Core (3 Waters - water, wastewater and stormwater) level in accordance with appropriate asset management best practice
- Delivering cost effective services that are efficient, effective and appropriate
- Providing an appropriate level of resilience

5.8.8. Useful Lives of the Infrastructure Assets

The assumed useful lives of the assets have a significant impact on renewal planning and depreciation calculations; Expected Useful Lives (taken from the LTP) are used in preparing this Strategy:

Table 18 Useful Lives of the Infrastructure Assets

Operational assets	Depreciation method	Life (years)	Operational assets	Depreciation method	Life (years)
Transportation			***Water supplies***		
Plant and machinery	Straight line	5-10	Piping mains	Straight line	60-80
Land under roads	Not depreciated	-	Pumps	Straight line	25
Roads and footpaths	Straight line	6-80	Service lines	Straight line	80-100
Formation	Not depreciated	-	Hydrants	Straight line	80
Sub-base	Not depreciated	-	Valves and air valves	Straight line	80
Base course	Straight line	75-100	Meters	Straight line	25
Surfacing	Straight line	0-17	Reservoirs	Straight line	80
Kerb and channelling	Straight line	10-100	**Wastewater**		
Street signs	Straight line	13	Mains	Straight line	60-80
Resource consents	Straight line	Over the life of the consent	Pumps	Straight line	15
Street lighting	Straight line	20-40	Manholes	Straight line	80
Bridges	Straight line	80-100	Oxidation ponds	Not depreciated	-
Box culverts	Straight line	100	***Stormwater***		
			Lines	Straight line	100
			Manholes	Straight line	100
			Open drains	Not depreciated	-

6. WATER

6.1. Existing Infrastructure and performance

Mackenzie District operates four public water supplies in the following townships:

- Burkes Pass
- Fairlie
- Takapō/Tekapo
- Twizel

It is also the asset owner of the Allendale and Albury scheme. Along with the physical treatment and reticulation infrastructure assets, resource consents to take water are also key assets. The term of these consents is key to forward planning and can often determine the timeframes for upgrades.

The replacement costs of the following water supply assets were estimated to be $46.0 million (as of the June 2020 valuation). This includes $345,000 of treatment plant and facility assets, $882,000 on rural water supply assets and $44.8 million on all other assets (e.g. reticulation and pump stations).

Table 19 Water Supply Overview

Supply	Population Supplied (UR)	Type of Supply	Source	Treatment	Storage (m^3)	Pump Stations	Reticulation (km)	Valves	Hydrants
Fairlie/Kimbell	**1,000**	U	S	Cl_2	190	1	43.1	196	**122**
Takapō/Tekapo	**552**	U	G	Cl_2 & UV	1,100	2	27.7	235	**100**
Twizel	**1,500**	U/R	BG	F & Cl_2 & UV	7,500	1	71.4	563	**312**
Burkes Pass	**30**	Ut	CG	Cl_2	22	-	3.3	2	**1**
Allandale	**291**	R	R	Cl_2	NA	-	117,7	64	**2**
Albury	**200 (est)**	R	C		180	-	107.9	2	**-**
Stockwater (Ashwick, School Rd)						**114km of open water race**			
Water Total	**3,343**					**4**	**373**	**1,059**	**532**

Type of Supply	*Source*	*Treatment*
U = Urban (on demand)	***B = Bore***	***Cl_2 = Chlorine***
Ut = Urban (tank)	***C = Creek***	***F = Filtration***
R = Restricted	***G = Gallery***	***N = No treatment/disinfection***
	S = Spring	***UV = Ultra-Violet Irradiation***
	R = River	
	WR = Water Race	

6.1.1. Resource Consents

All the water scheme resource consents will require renewal during the life of this strategy. The following table lists the water resource consents that are presently held for the taking of water and land use:

Table 20 Resource Consents - Water

System	Consent #	Description	Expiry Date
Fairlie	CRC176495	Take and use water	19 August 2044
Lake Tekapo	CRC971414	To take groundwater	13 August 2033
Twizel	CRC042741	Take and use water	20 August 2047
Burkes Pass	CRC971594	to divert water for Burkes Pass community supply	29 October 2032
	CRC971595	to discharge by-wash water to Paddy's Market Stream	29 October 2032
Allandale	CRC020124.1	Take and use water	19 October 2030
Albury	CRC990685	To divert water	20 January 2034
	CRC990686	To take water for community water supply	20 January 2034
	CRC991431	To disturb, and place and maintain structures	20 January 2034
	CRC991418	to discharge water	20 January 2034

Resource consents are required for the abstraction of all natural water that is used for public supplies. These usually stipulate the quantity of the water that can be taken, and a maximum rate for its extraction. When water is treated and backwash is part of the process, consents are also required for discharge of the backwash water.

6.1.2. Current Performance

The Water Supply networks are generally performing well with a few leakage problems in Fairlie. These are generally tied to older concrete pipes with perished rubber sealing rings. Specific condition for each asset is not currently measured, but as noted above, representative sections of the network are inspected and the results extrapolated across the network. There is good condition information for Water Supply assets with the majority of assets graded at 2 or better (89%). Only 3% of the network is graded as having a rating of 4 and no asset is graded as requiring replacement. However, Fairlie has a programme to replace all the pipework installed in the 1940s as this has defective rubber sealing rings allowing significant leakage.

A significant portion of the Twizel reticulation is Asbestos Cement pipe (21.9km/31%) was installed during the early 1970s. A replacement programme for the AC pipe in Twizel based on a predictive failure model from the various pipe samples started during 2015. As part of the COVID 19 recovery package Council have accelerated this renewal programme and the completion is programmed for the end of 2021.

Additional key issues are summarised in Table 21 below. The table highlights both where the issues are occurring, the key driver for change (i.e. Growth, Level of Service or Renewal) and a potential resolution.

Table 21 Key water issues

Issues	Resolution
All Systems	
3 Waters Reform	Collaborate with the Government and other local authorities in the region to consider future 3Waters service delivery arrangements
Integrity of water supply	Backflow prevention
Demand management	Universal (smart) metering in urban on demand supplies
Maintaining and monitoring chlorine residual	Install FAC monitoring at pump stations and connect to SCADA
Water Safety Plans	Gap analysis to align with regulatory changes
DWSNZ Protozoa compliance	Investigate resolution (connect Allendale to Fairlie, upgrade Fairlie WTP).
Fairlie	
DWSNZ compliance	Treatment Plant upgrade (2021-23)
Storage	Build additional reservoir (2021-23)
AC pipe	Planned renewals
Lake Tekapo	
Cast Iron, Galvanised Iron & AC mains	Planned renewals
Resilience – trunk main from reservoir to reticulation	Double trunk main
Resilience - storage	Provide storage on east and west side of the Tekapo River
Twizel	
AC pipe	Planned renewal (completion programmed for end of 2022)
Trunk main capacity	Modelling to ascertain trunk main capacity
Resilience – trunk main from treatment plant to reticulation	Double trunk main
Burkes Pass	
Manage demand within consent limits	Consider changing from on demand to restricted supply
Equal access to water supply	
Allandale	
Poor workmanship on PE pipes	Investigate resolution
DWSNZ Compliance -	Potentially connect to Fairlie
Protozoa compliance	
Power to treatment plant	
Didymo clogging up filter	
Albury	
Locally managed (Risk)	Water Safety Plan in place and implemented

It is probable that new legislation will be passed that will place responsibility for water fluoridation with District Health Boards. At the time of writing this strategy it is unclear whether this change will lead to a requirement to fluoridate drinking water supplies in our district. Any move to introduce fluoride is likely to be contentious and this strategy has been formulated on the basis that the status quo will remain.

6.1.3. Critical Assets

Council engineers have not performed a documented formal criticality assessment of the infrastructure assets, but Council engineers use practical experience and skilled application of staff and service providers in consideration of critical assets. Development of a formal documented criticality assessment is included as an improvement item (**IP 1**).

In the absence of a formal criticality assessment Council's approach in the water activity is based on the following methodology:

Table 22 Critical asset assessment approach

Criticality Category	Condition Assessments	Renewal
Critical Assets Trunk mains, rising mains and large diameter mains supplying significant areas or key industries or businesses/customers. Treatment plants are also considered to be critical assets	Condition assessments performed during connections and pipe repairs. Detailed analysis obtained as deemed necessary	Renewal timing based on conservative base live and actual condition assessments of asset and estimated future deterioration.
Non-Critical Assets – distribution network of smaller diameter mains and property laterals	Sample inspections of material types and age bands during connections and pipe repairs. Greater proportion for assets nearing end of base life. Inspections of assets associated with major roading asset renewals to confirm condition.	Generally "run to failure" with renewals on a reactive basis.

A number of aspects could be considered in identifying those assets that are critical including but not limited to:

- Location of asset, e.g. State Highway
- Asset type, e.g. pump stations and detention dams
- Flood hazard assessments and areas without adequate existing secondary flow paths
- Network configuration, e.g. single main servicing large area
- Customer type, e.g. Central Business District, Medical Facilities, Rest Homes.

6.2. Water Infrastructure strategy

Council seeks to improve water treatment in all parts of the District to meet the requirements of the Health (Drinking Water) Amendment Act 2007. Council has been upgrading numerous treatment plants over the last number of years to meet the requirements of the Act.

Over the next ten years Council plans to:

- Maintain consumer's access to water,
- Comply with the Health Act,
- Continue to monitor and respond to the Government's new Water Regulatory Framework, and
- Continue maintenance and renewal of the water network to meet the needs of current and future consumers.

This vision is supported by a detailed Water AMP.

6.2.1. Key Capital & Renewal Projects

There are some significant water capital and renewal projects which are planned over the next 10 years. These projects are driven by the need to improve the level of service for water quality and to renew aging infrastructure.

Table 23 Significant Infrastructure decisions - Water

Issue – Compliance with Drinking Water Standards - Fairlie	
Main Options	**Implication of Options**
Option 1 -	Upgrade Fairlie's water supply to meet the NZ Drinking Water Standards. This involves the construction of a new plant capable of managing the current source water quality fluctuations (this project has been delayed).
Option 2 -	Do nothing. This is not a viable option as the MOH requires compliance with the NZDWS and the current treatment does not meet required treatment standards.
Time period	2021- 2023
What is the benefit	Growth and increased Levels of Service
Assumption	This is based on the new source confirming the ability to provide 28 l/sec flow rate. Initial test pumping has confirmed this but has been carried out with the new gallery in place.
Issue – Insufficient Storage of Treated water - Fairlie	
Main Options	**Implication of Options**
Option 1 -	Construct a new reservoir on the Fairlie water supply.
Option 2 -	Do nothing. The current reservoir has served the town very well over many years and will continue to do so for some time. However, if there is increased demand then the few hours' storage will be inadequate even though it the supply is fed by a continuous gravity supply.
Time period	2021 – 2023 (upgrades in 2026/27 and again in 2030/31
What is the benefit	Levels of Service

Issue – AC Reticulation renewals	
Main Options	**Implication of Options**
Option 1 -	Undertake renewals based on current understanding of pipe condition
Option 2 -	Delay replacement until failures become more common
Option 3	Accelerate replacement programme
Time period	Between 2021/22 to 2030/31
What is the benefit	Renewal and increased Levels of Service

The biggest issue facing the three communities in the next thirty years is the need to replace AC water mains. There is 34.6km of AC pipe in the district; 6.9km in Fairlie, 5.8km in Takapō/Tekapo and a further 21.9km in Twizel. AC pipe is affected by both internal water and external soil conditions. External stresses such as soil conditions, quality of installation, additional loadings, and maintenance have a significant effect on the useful life of underground assets. The inherent variations of in-situ conditions and subsequent rate of deterioration make it difficult to accurately formulate a renewals priority programme without a sampling regime.

The recent sampling and testing programme for Twizel has confirmed the level of deterioration and the associated risk. This strategy provides for continuation of a district wide sampling and testing programme in Takapō/Tekapo and Fairlie, to further our understanding of the level of deterioration and the associated risks in those towns.

In the 2020/21 Annual Plan, Council fast tracked the replacement of AC pipes, investing $7.5 million the first year. Works are primarily focused on Twizel, with some work in Fairlie to be completed. It is expected that all of the AC network is planned to be replaced in the first 10 years. Pipe renewals will continue beyond 2031 for all other water pipes in the district. However, this timing will be confirmed or amended depending on the outcome of the proposed sampling programme.

The preferred option is to continue tracking asset condition and refine an ongoing programme of renewals. Some accelerated renewal is being undertaken to utilise stimulus funding available and undertake works during periods of less tourism.

It should also be noted that currently the council invest 4% of total costs towards the Downlands Water Supply Scheme which is completely managed by Timaru District Council. This is not included within this Infrastructure strategy as the council has no involvement in the projects development.

All other significant projects and their funding sources are summarised in the following table and chart.

Table 24 Water Projects – Capital Costs

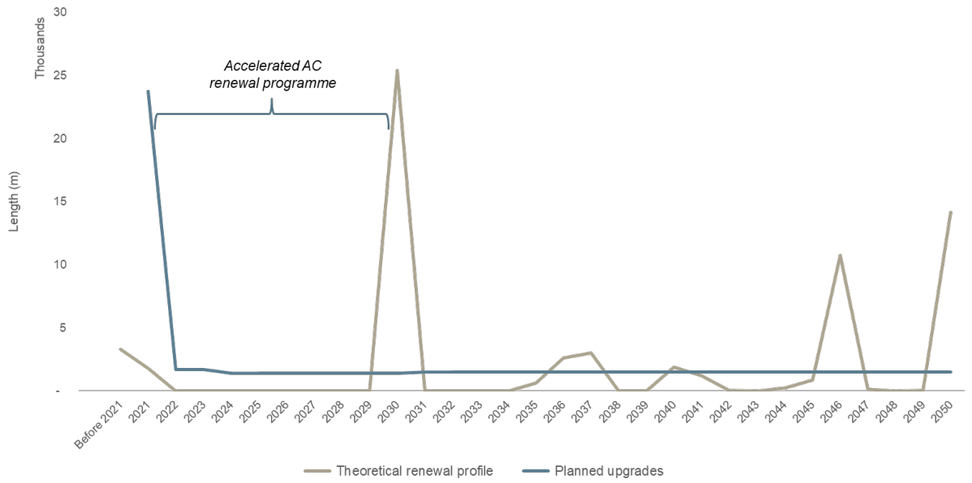
Project	Priority Type	Year	Amount (uninflated)	Amount (inflated)	Description
Service Connections - new	Renewal	2021/31	$3,024,000	$3,532,714	Existing mains and service connections to water supply which are being upgraded
Reticulation – new	LOS	2021/31	$13,021,928	$13,764,718	Renewals – refurbishment, replacement of pipes and facilities equipment for water supplies is estimated to be $13.8m over the next 10 years. This includes the planned renewal the AC pipes in Twizel (completion programmed for end of 2022). This will replace all the small diameter mains that require replacing.
Treatment - new	LOS	2021/31	$7,214,080	$7,390,514	Fairlie Water Treatment Plant Upgrade and storage.
Allandale/Spur Road water supply - Reticulation extension	LOS	2025/26	$554,660	$599,960	Installation of connection of Allandale to Fairlie water supply
Water Supply Renewals[1]	LOS	2021/22	$0	$0	Renewal works to Water supply infrastructure (this has since been completed in 2020/21)
Water Metering Trial - Twizel Install[1]	LOS	2021/22	$322,753	$322,753	Installation of water meters in Twizel.
Potable Water Supply Remote Properties - install[1]	LOS	2021/22	$175,000	$175,000	Remote supply of potable water investigation and implementation
Total			**$24,312,421**	**$25,785,659**	

[1]Projects funded by the three waters stimulus package (refer to section 10.3.1)

Figure 13 provides the cost spend cashflow over the next 30 years. Cost estimates from year 2031/32 through to 2050/51 were developed based on the following:

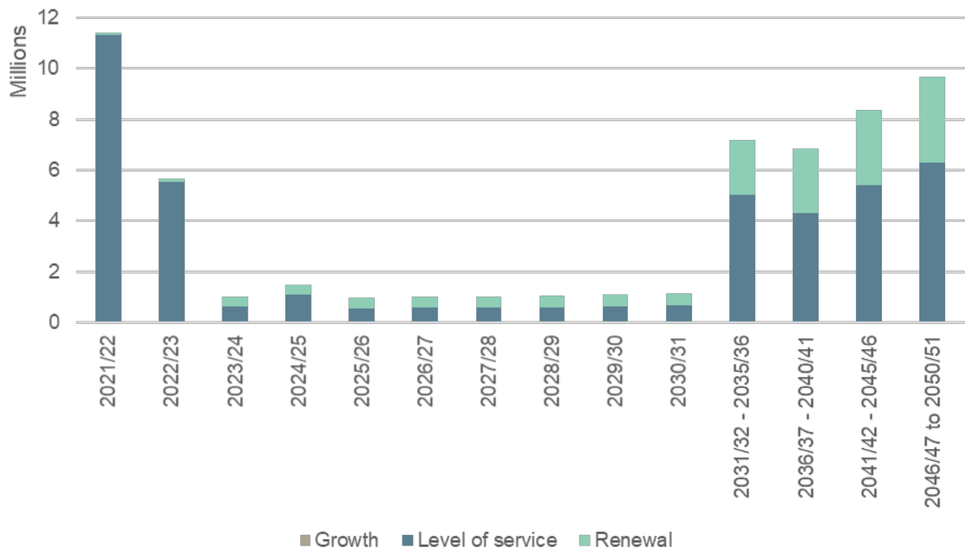
- Average expenditure over the first ten years which was then extrapolated out. This includes a renewal profile for water pipes. It should be noted that the Stimulus package altered the renewal programme by pushing forward the AC pipe renewal programme. This was originally planned out over a 20-year period but is now occurring within the next two years. The figure below outlines the theoretical replacement of the districts water pipes over the next 30 years based on the theoretical design life of the pipe. This has been compared against the planned replacement programme. A significant portion of the replacements are occurring in 2021/22. The remaining renewals have been evenly spread across the 30 year timeframe. Regular testing will still be undertaken on the district's water pipes to assess their condition. This may change the future profile of water pipe replacement.
- Increase in vested assets which will require additional operations and maintenance expenditure overtime
- The renewal of resource consents – all 10 resource consents listed above will need to be renewed between 2032 and 2044. It is assumed that water take resource consent for larger takes will cost up to $250,000 while smaller water take consents will cost $100,000.

Figure 12 Theoretical vs planned water reticulation programme



Future expenditure is represented in the table below as the total inflated cost over 5-year periods.

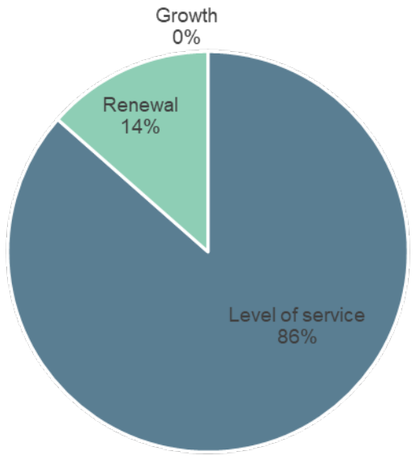
Figure 13: Water Project Cost Profile (Inflated)



Each of the above infrastructure upgrades responds to one of the of the three key drivers: meeting growth, improving the level of service and replacement and renewal of aging infrastructure. The figure below shows

the proportion of water projects over the next 10 years which respond to each of these drivers. Majority of water infrastructure projects seek to improve the level of service.

Figure 14 Key priority types of Water Infrastructure projects (year 1 to 10)



7. WASTEWATER

7.1. Existing Infrastructure and performance

The Council operates four wastewater schemes:

- Burkes Pass
- Fairlie Township
- Takapō/Tekapo Twizel

Along with treatment and reticulation infrastructure, resource consents for treated wastewater are key assets. The term of these consents is key to forward planning and can often determine the timeframes for treatment upgrades.

The replacement costs of the following wastewater assets were estimated to be $34.9 million (as of the June 2020 valuation). This includes $3.2 million of wastewater treatment plants and facility assets and $31.7 million on all other assets (e.g. reticulation, pump stations and manholes).

Table 25 Wastewater overview

System	Population (UR)	Length of Reticulation (km)	Manholes	Pump Stations	Treatment Facility
Fairlie	693	12.9	104	1	**Oxidation ponds**
Takapō/Tekapo	369	27.8	362	3	**Oxidation ponds**
Twizel	1,137	64.8	554	2	**Oxidation ponds**
Burkes Pass	30	1.6	17	-	**Oxidation pond**
Total	**2,229**	**107.1**	**1,037**	**6**	**4**

7.1.1. Resource Consents

All of these resource consents will require renewal during the life of this strategy.

Table 26 Resource Consents - Wastewater

System	Consent #	Description	Expiry Date
Fairlie	CRC992647	Discharge odour to air	**17 December 2038**
	CRC992608.1	Discharge to land	**17 December 2038**
Lake Tekapo	CRC042914	Discharge to land	**17 December 2038**
Twizel	CRC172311	Discharge to land & air	**11 April 2053**
Burkes Pass	**CRC992607**	**Discharge to land**	**7 June 2040**

Discharge permits are required for the discharge of treated effluent to land or water, and the discharge of odours associated with wastewater treatment plants. There are no resource consents which will expire within the next 10 years.

7.1.2. Current Performance

The four sewer networks are performing well with limited blockages. These are generally tied to tree root intrusion. Specific condition for each asset is not currently measured but internal inspections of representative sections of the network are carried out and the results extrapolated across the network. There is good condition information for Wastewater assets with the majority of assets graded at 2 or better (88%). Only 1% of the network is graded as having a rating of 4 and no asset is graded as 5 (unserviceable).

Whilst the sewer network is in relatively good condition, there are a number of issues with the wastewater treatment process and the monitoring system which need to be addressed. These are summarised in Table 27 which outlines the issue and a basic resolution.

Table 27 Key wastewater issues

Issues	Resolution
All Systems	
3 Waters Reform	Collaborate with the Government and other local authorities in the region to consider future 3Waters service delivery arrangements
Sludge levels	Monitor, and desludge (Fairlie, Tekapo, Twizel programmed for 2021l)
System capacities	Develop hydraulic model for each system to help identify problem areas through simulation and to evaluate the benefits of specific solutions.
Fairlie	
Dumping of septage	Surveillance cameras at treatment plant
Consent compliance	Reduce high faecal count through improved treatment efficiency. Increased monitoring of DO, COD, BOD
Sludge levels	Milliscreen at intake to improve treatment
Lake Tekapo	
Disposal of effluent (consent limits)	Investigate, consider resolution options and implement.
Capacity of Lakeside Drive Pump Station	Station Bay subdivision triggered the need for an upgrade and has extra storage added and pumps replaced
Twizel	
Dumping of septage	Review Wastewater Bylaw to provide mechanism to prosecute offenders
Condition of the AC pipe	Review with surveillance cameras and determine remaining useful life of the asset with a view to developing a replacement programme
Mackenzie Park Pump Station	Connect Mackenzie Park PS to the treatment plant through new rising main
Burkes Pass	
Consent compliance	High faecal count at discharge – investigate and consider options (aeration/additional pond)

7.1.3. Critical Assets

Council engineers have not performed a documented formal criticality assessment of the infrastructure assets, but Council engineers use practical experience and skilled application of staff and service providers in consideration of critical assets. Development of a formal documented criticality assessment is included as an improvement item (**IP 1**).

In the absence of a formal criticality assessment Council's approach in the wastewater activity is based on the following methodology:

Table 28 Critical asset assessment approach

Criticality Category	Condition Assessments	Renewal
Critical Assets trunk mains, rising mains and large diameter mains supplying significant areas or key industries or businesses/customers	Condition assessments performed during connections and pipe repairs. Detailed analysis obtained as deemed necessary	Renewal timing based on conservative base live and actual condition assessments of asset and estimated future deterioration.
Non-Critical Assets – distribution network of smaller diameter mains and property laterals	Sample inspections of material types and age bands during connections and pipe repairs. Greater proportion for assets nearing end of base life. Inspections of assets associated with major roading asset renewals to confirm condition.	Generally "run to failure" with renewals on a reactive basis.

A number of aspects could be considered in identifying those assets that are critical including but not limited to:

- Location of asset, e.g. State Highway
- Asset type, e.g. treatment plant and pump stations
- Network configuration, e.g. single main servicing large area
- Customer type, e.g. Central Business District, Medical facilities, Rest Homes.

7.2. Wastewater Infrastructure Strategy

In order to achieve the above goal the Council plans to:

- Continue to collect, treat, and dispose of wastewater
- Upgrade treatment facilities where required to comply with resource consent conditions
- Plan for future development and needs
- Consult with the community on issues such as health and legislative compliance issues

This vision is supported by a detailed Wastewater AMP.

7.2.1. Key Capital and Renewal Projects

There are some significant wastewater capital and renewal projects which are planned over the next 30 years. These projects are driven be the need to improve the level of service for effluent quality, to renew aging infrastructure and to meet a growing population.

Table 29 Significant Infrastructure project - Wastewater

Issue – Potential for increased effluent flows coming from the Takapō/Tekapo wastewater treatment plant and issues associated with growth.	
Main Options	**Implication of Options**
Option 1 -	Identify a new permanent disposal site, and design and install the system to dispose of the effluent for the next 50 years. Council is presently constructing a new disposal field adjacent to the existing site. This will address the problem in the short term and is an interim measure only. Council's strategic planning work is programmed to start in Year 1 of the LTP (2020/21), with design, construction and implementation programmed to commence in 2022/23. The total cost of this work is estimated to be $18.1 million (see table below)
Option 2 -	Do nothing: This is unlikely to address the longer term issues associated with growth.
Time period	Between 2021/22 and 2025/26
What is the benefit	Growth/LoS/Renewal
Assumption	Option 1 assumes that an appropriate site can be identified, that infiltration testing confirms that and that Council is able to obtain a discharge consent on that site.

Key wastewater projects being implemented over the next 10 years are listed below, and costed in Table 30.

- **Takapō/Tekapo upgrades – Wastewater treatment plant: between 2021/22 and 2025/26:** Installation of additional pond aerators and the establishment of a new discharge site
- **Takapō/Tekapo upgrades – Lakeside Drive: 2021/22:** renewal of the lakeside pump station including installation of additional monitoring equipment.
- **Twizel AC pipe replacement 2021/22**: acceleration of asbestos cement line previously planned for 2026/27 due to 3 waters stimulus funding.
- **Twizel – Mackenzie Park: 2021/22:** A new rising main is also programmed from Mackenzie Park to the Twizel oxidation ponds in order to improve the treatment and manage growth. All other significant projects are summarised in the following table and chart below.

To ensure on-going affordability of the wastewater service Council will continue to consider options in delivering the service, including collaboration with other local authorities as we did with the SCADA and Timaru District Council.

Table 30 Wastewater Projects – Capital Costs

Project Description	Priority Type	Amount (uninflated)	Amount (Inflated)	Year	Description of work
Sewer Reticulation - new	LOS	$4,160,000	$4,788,569	2021/29	Renewals – refurbishment, replacement of pipes and facilities equipment for wastewater systems is estimated to be $4.8m over the next 10 years. This includes the replacement of AC pipeline in Twizel.
Pump Station Renewal	LOS	$300,000	$300,000	2021/22	Lakeside drive pump station upgrade to improve performance. Will also deliver additional capacity
Treatment	Growth	$17,450,000	$19,232,125	2021/26	Disposal of effluent for the Tekapo treatment plant - Investigate, consider resolution options, updating resource consents and implement and construct option. Station Bay subdivision triggered the need for an upgrade and requires extra storage added and pumps replaced
Upsize foul sewer - Fairlie Golf Course[1]	LOS	$35,000	$35,000	2021/22	Upsize foul sewer - Fairlie Golf Course[1]
Rising Main Mackenzie Park to Twizel WWTP – Design[1]	Growth	$14,690	$14,690	2021/22	Connect Mackenzie Park PS to the treatment plant through new rising main
Rising Main Mackenzie Park to Twizel WWTP – Construct[1]	Growth	$990,000	$990,000	2021/22	
Lakeside WW pump station - Design/Construct[1]	Growth	$48,598	$48,598	2021/22	Station Bay subdivision triggered the need for an upgrade and has extra storage added and pumps replaced
Deer Fence ponds - Tekapo, Fairlie[1]	LOS	$15,000	$15,000	2021/22	Deer Fence around ponds in Tekapo and Fairlie
Burkes Pass WWTP upgrade - install outlet flowmeter[1]	LOS	$25,540	$25,540	2021/22	Investigate and consider options (aeration/additional pond)
Burkes Pass WWTP upgrade – baffles[1]	Growth	$50,000	$50,000	2021/22	Burkes Pass WWTP baffles installation
WWTP monitoring equip - design & install1	LOS	$210,000	$210,000	2021/22	Upgrade / relocate equipment so that Council can get real time updates of the condition of the oxidation ponds.
WWTP Influent Screens Design - 3 Sites[1]	LOS	$22,525	$22,525	2021/22	Milliscreen at intake to improve treatment
Connect Allandale Rd WW to Fairlie WW Network[1]	LOS	$45,000	$45,000	2021/22	Connect Allandale Rd WW to Fairlie WW Network
Stimulus Package - Delivery	LOS	$62,722	$62,722	2021/22	Programme delivery of the three waters stimulus package projects
Total		**$23,429,075**	**$25,839,769**		

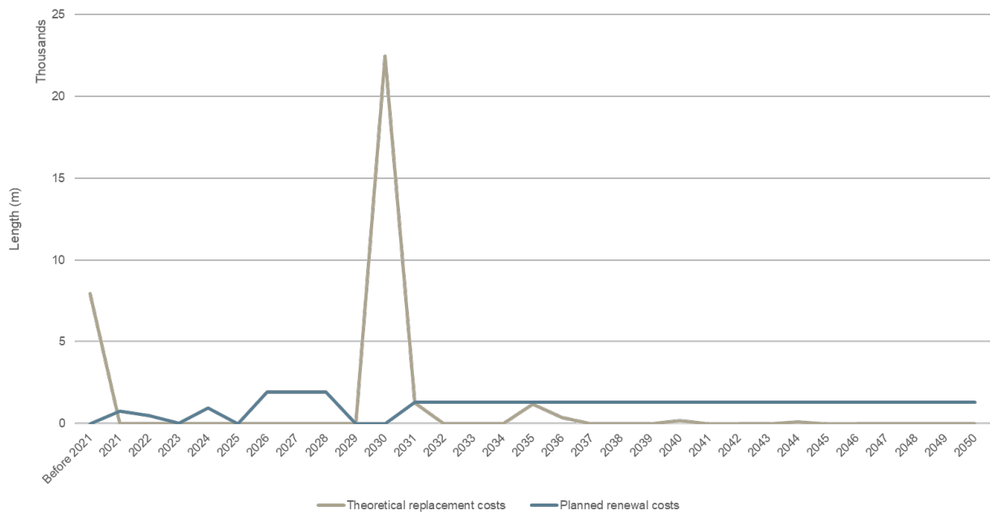
[1]Projects funded by the three waters stimulus package (refer to section 10.3.1)

Figure 16 provides the cost spend cashflow over the next 30 years. Beyond 2031, the Council has budgeted an annual average expenditure of approximately $856,000 for wastewater renewals and improvements to levels of service. This will include the renewal of pump stations and switch boards, etc. and the likely increase or change in government standards. Other considerations which were used to estimate costs beyond 2031 include:

- Average expenditure over the first ten years which was then extrapolated out to inform our base estimates
- Increase in vested assets which will require additional operational and maintenance expenditures overtime
- The renewal of resource consents – 4 of the 5 resource consents listed above will need to be renewed between 2038 and 2040.
- The renewals of wastewater mains which has been spread across the next 20 year period.

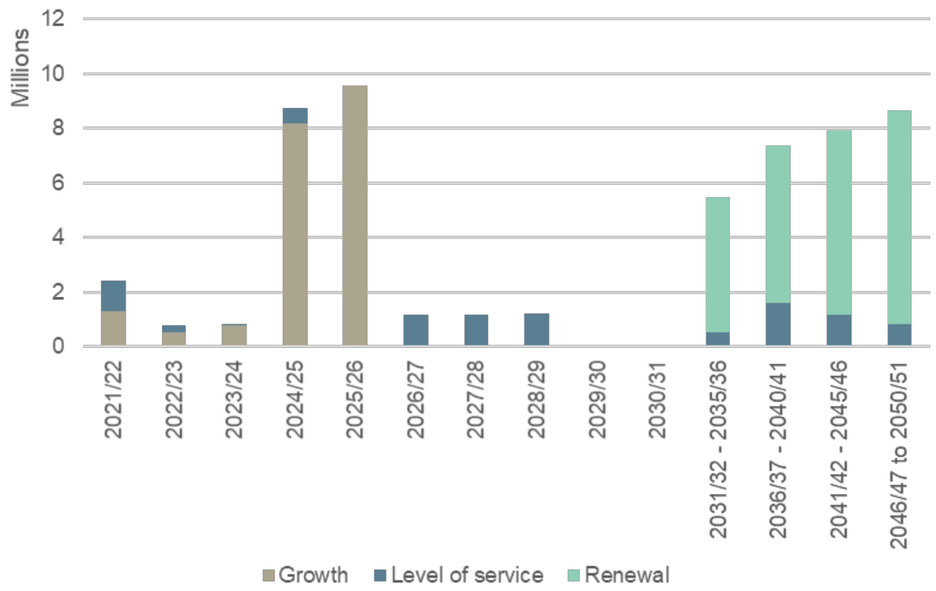
It should be noted that the Stimulus package altered the renewal programme by pushing forward the Twizel reticulation renewal programme. This was originally planned out over a 20-year period but is now occurring within this LTP period. The council is still assessing the impact of this change on their water asset renewals profile and therefore expenditure beyond 2031. An estimated renewal expenditure has been determined based on the existing theoretical renewals profile of wastewater mains. This is reflected in Figure 15 below which shows a gradual replacement of pipes over the next 30 years in order to avoid large spikes in rates. CCTV is currently being upgraded to better assess the condition of these pipes which may alter the future cost profiles.

Figure 15 Theoretical vs planned wastewater reticulation programme



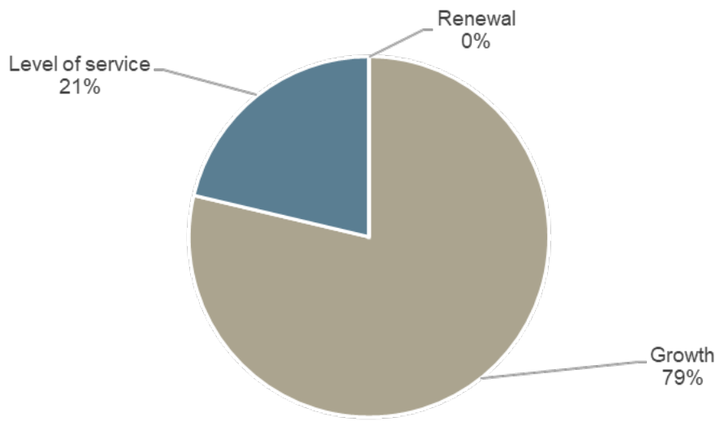
Future expenditure is represented in the figure below as the total inflated cost over 5-year periods.

Figure 16 Wastewater Project Cost Profile (Inflated)



Each of the above infrastructure upgrades responds to one of the of the three key drivers: meeting growth, improving the level of service and replacement and renewal of aging infrastructure. The figure below shows the proportion of wastewater projects over the next 10 years which respond to each of these drivers. The majority of wastewater projects respond to growth issues across the district.

Figure 17 Key priority types of wastewater infrastructure projects (Year 1 to 10)



8. STORMWATER

8.1. Existing Infrastructure and performance

The Council manages stormwater networks in Fairlie, Tekapo and Twizel. Each of these schemes are subject to resource consent conditions imposed by Environment Canterbury. The term of these consents is key to forward planning and can often determine the timeframes for treatment upgrades.

Table 31 below summarises the extent of the existing stormwater assets within the Mackenzie region.

The replacement costs of the following wastewater assets were estimated to be $9.8 million (as of the June 2020 valuation). This includes all the council's drainage assets.

Table 31 Stormwater Overview

System	Population (UR)	Length of Pipe Reticulation (km)	Manholes	Sumps	Pump Stations	Retention/ Treatment area
Fairlie	693	5.0	36	9	-	-
Takapō/Tekapo	369	10.2	213	216	-	5
Twizel	1,137	7	93	186	-	-
Total	**2,199**	**22.2**	**342**	**411**	**-**	5

Council is currently preparing a Stormwater Management Plan for the district as required by the Regional Plan, and to give effect to Te Mana o te Wai through the requirements of the National Policy Statement for Freshwater Management. It is likely that there will be a need to install improvements on the small non-consented discharges particularly in Fairlie and Takapō/Tekapo.

8.1.1. Resource Consents

All the following resource consents will require renewal during the life of this strategy.

Table 32 Resource Consents - Stormwater

Scheme	Consent Number	Expires
Fairlie	CRC203556	In Progress
Takapō/Tekapo - Sealy Street Discharge	CRC042748	18 February 2040
Takapō/Tekapo - Hamilton Drive Discharge	CRC146447 & CRC146445	24 September 2039
Takapō/Tekapo – Domain Discharge	CRC 141077	23 December 2049
Twizel Stormwater Discharge	CRC042742	18 February 2040

Scheme	Consent Number	Expires
Pukaki Airport Stormwater Discharge	CRC081120	7 December 2042
Takapō/Tekapo – Simpson Lane	CRC157319	3 August 2050

8.1.2. Current Performance

Performance issues for drainage control assets relate to:

- coverage (i.e. are there open water tables or ponding areas that could be serviced by pipe drains or formed channels?)
- improving drainage where storm events cause flooding problems
- stormwater capacity to culverts
- conformity with provision standards (e.g. kerb and channel in all urban streets)

Overall, the performance of drainage assets is adequate. The main concern is coverage. A number of urban streets are without any kerb and channel. Most existing drainage assets are performing well and have been adequately designed. Some swale drains are still being developed.

Upcoming issues during the next ten years

The Canterbury Land and Water Regional Plan (LWRP) became operative in January 2014 and is a key driver for the stormwater activity, as it imposes increased environmental requirements for stormwater discharges.

Discharges to land or water require resource consent. Council has obtained resource consent for Lake Tekapo and Twizel and the global resource consent for stormwater discharge from the Fairlie stormwater system is being processed at the time of writing this Plan.

The Regent Street stormwater line (in Fairlie) takes water from an open ditch off School Road and conveys it to the river. The pipeline is the old steel penstock pipe from an obsolete power generation plant. In one location it is poor condition but in the balance of the pipe it is okay. A number of camera access ports have been cut into this pipe to monitor its condition by CCTV. It is planned to internally inspect the Regent Street storm water pipe to assess its condition. Depending on the results of that inspection it may be necessary to programme a replacement sometime in the next 10 years. The Sloane Street timber main is being replaced as part of the three waters stimulus package in 2021/22

For compliance with Environment Canterbury's Land and Water Regional Plan, it is likely that there will be a need to install improvements on the other non-consented discharges in 2027 - 29. Estimated cost of $15,000 each at Denmark Street and Regent Street. This will necessitate an operational increase in maintenance and compliance monitoring costs.

The Stormwater Management Plan for Fairlie is under development at the time of writing this Plan.

Both the Lochinver subdivision and stages 1 to 3 of the west Tekapo subdivision known as The Cairns, have dedicated stormwater disposal systems using a dry pond, detention areas and wetlands that require specific maintenance requirements to operate as designed. Every five years, depending on the results of

soil tests, any bare areas will be re-vegetated and contaminated soils replaced at a cost of $10,000 each time. The Lochinver system is expected to require revegetation in 2022/23. Lake Tekapo Enterprises Ltd (CRC094183 and CRC184387) and Bluewater Resort Ltd (CRC094181.1) hold the stormwater discharge consents for their catchment areas respectively. This resource consent will stay private until such time as assets are vested to Council. Although Council has no control over the consent compliance it is important for Council to ensure at such time the stormwater system performed to specification and complied with resource consent conditions.

Other key issues relating to compliance, aging infrastructure and general improvements for all stormwater assets are outline in Table 33 below. This identifies key issues, their main drivers for change (level of service, renewal or growth) and potential resolutions.

Table 33 Key stormwater issues

Issues	Resolution
All Stormwater Systems	
Environmental compliance	Comply with the requirements of the Canterbury Land and Water Regional Plan including but not limited to Stormwater Management Plans etc.
Monitoring (first flush)	Develop and implement monitoring plan
Fairlie	
Old timber stormwater systems	Programmed for replacement
Condition of steel pipe at the top end of Regent Street	Investigate issues, resolution options and implement
Lake Tekapo	
Increased environmental conditions and compliance parameters	Consideration of options and resolution. Application for resource consent lodged
Old discharge points and retention basins	
Twizel	
No specific issues	

8.1.3. Critical Assets

There has been no formal criticality assessment performed on the stormwater system assets. This is included as an Improvement Item (**IP 1**).

In the absence of a formal criticality assessment Council's approach in the stormwater activity is based on the following methodology:

Table 34 Critical asset assessment approach

Criticality Category	Condition Assessments	Renewal
Critical Assets The flow treatment of stormwater in Tekapo and its discharges into significant water bodies	Condition assessments performed during connections and pipe repairs. Detailed analysis obtained as deemed necessary	Renewal timing based on conservative base live and actual condition assessments of asset and estimated future deterioration.
Non-Critical Assets – distribution network of smaller culverts and drainage and property laterals	Sample inspections of material types and age bands during connections and pipe repairs. Greater proportion for assets nearing end of base life. Inspections of assets associated with major roading asset renewals to confirm condition.	Generally "run to failure" with renewals on a reactive basis.

Many of the critical stormwater assets are already covered through roading asset management. For example, culverts and kerbs are both considered a roading asset. One of the key critical assets is the stormwater treatment facility at Tekapo.

8.2. Stormwater Infrastructure Strategy

Council plans to maintain current levels of service for the life of this plan, unless legislation, consent conditions, or community expectations change. Over the next ten years Council plans to:

- Continue to collect, treat, and dispose of stormwater in a manner that protect public health, property, and the environment.
- Develop and implement Catchment Management Plans
- Plan for future development and needs
- Consult with the community on issues such as health and legislative compliance issues.

This vision is supported by a detailed Stormwater Activity Management Plan (AMP).

8.2.1. Key Capital and Renewal Projects

There are a number of stormwater capital and renewal projects which are planned over the next 30 years. These projects are largely driven by the need to improve the level of service to meet new legislative standards in stormwater.

Table 35 Significant Infrastructure projects - Stormwater

Issue – Canterbury Land and Water Regional Plan - Compliance	
Main Options	**Implication of Options**
Option 1 -	The Council is preparing a Management Plan prior to lodging a discharge permit application in order to comply with Rule 5.93 of the plan. It is anticipated that this

Issue – Canterbury Land and Water Regional Plan - Compliance	
	will lead to improved treatment at some of the more significant discharges from the various stormwater networks in Fairlie, Takapō/Tekapo and Twizel. Those improvements will arise out of the plan, but budget has been allowed to install cyclonic separation devices on four outfalls.
Option 2 -	Do nothing. Whilst this an option it is not deemed realistic due to the strategic direction central government is taking on protection of water quality.
Time period	2021-23
What is the benefit	Increase in Levels of Service
Assumption	It is anticipated that most but not all outfalls will require treatment and the installation of a "Humeceptor" or similar will be the appropriate level of treatment due to the confined nature of each of the outfalls.

Significant projects and their funding sources are summarised in the following table and chart:

Table 36 Stormwater Projects – Capital Costs

Project	Primary Type	Year	Amount (uninflated	Amount (Inflated)	Project Description
Reticulation - new	LOS	2021/23	$750,000	$764,000	Refurbishment, replacement of stormwater assets estimated to be $0.750m over the next 10 years. All stormwater system renewal work will be funded either by stimulus package funding or by the annual depreciation provision where funds are available
Stormwater Management Control (Flooding)[1]	LOS	2021/22	$25,000	$25,000	Comply with the requirements of the Canterbury Land and Water Regional Plan including but not limited to Stormwater Management Plans etc.
Sloane St Box Culvert Replacement[1]	LOS	2021/22	$34,670	$34,670	Sloane St Box Culvert Replacement
Total			**$809,670**	**$823,670**	

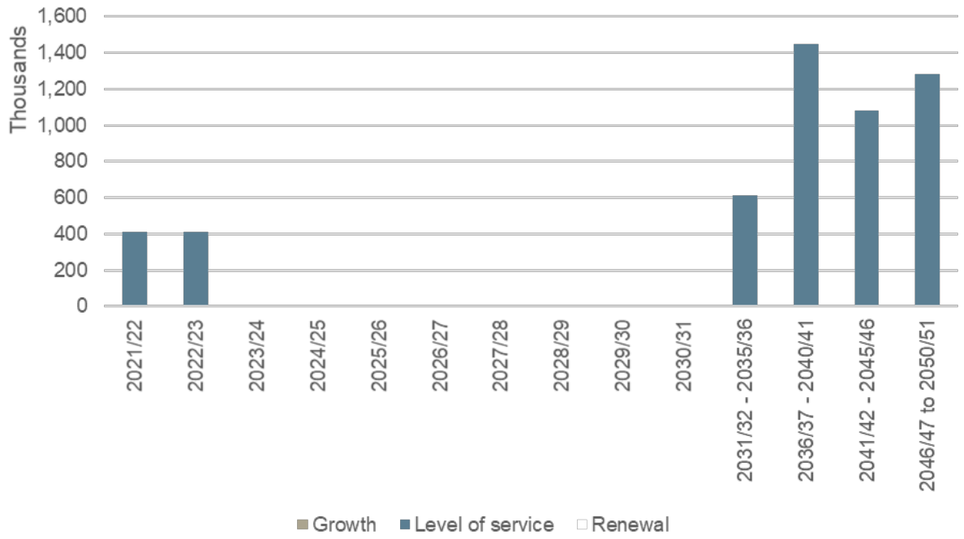
[1]Projects funded by the three waters stimulus package (refer to section 10.3.1)

The figure below provides the cost spend cashflow over the next 30 years. Beyond 2031, the Council has budgeted between $80,000 and $161,000 per year for improvements to Level of Service. These future costs were estimated based on:

- Average expenditure over the first ten years which was then extrapolated out to inform our base estimates
- The renewal of all six consents which are estimated to cost the council approximately $100,000 each
- The increase in operations and maintenance related to the increase in vested assets overtime
- Currently no renewals are planned for stormwater assets. This may change depending on the outcomes of inspections and assessments of stormwater assets.

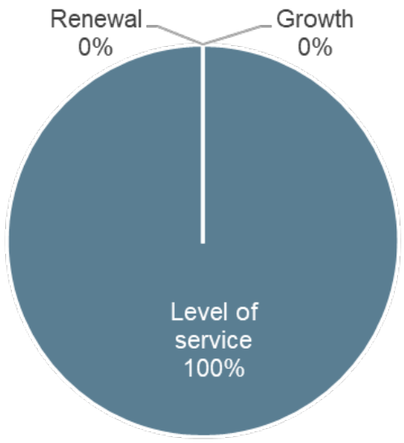
Future expenditure is represented as the total inflated cost over 5-year periods.

Figure 18: Stormwater Projects Cost Profile (Inflated)



Each of the above infrastructure upgrades responds to one of the of the three key drivers: meeting growth, improving the level of service and replacement and renewal of aging infrastructure. The figure below shows the proportion of stormwater projects over the next 10 years which respond to each of these drivers. One hundred percent of stormwater projects seek to improve the level of service.

Figure 19 Key priority types of Stormwater infrastructure projects



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9. TRANSPORTATION

9.1. Existing Infrastructure and Performance

The backbone of the roading network in the district is provided by the following State Highways which are the responsibility of Waka Kotahi New Zealand Transport Agency (NZTA).

- State Highway 8:Timaru - Fairlie - Lake Takapō/ Tekapo Twizel - Omarama
- State Highway 79:Fairlie - Geraldine
- State Highway 80:Twizel - Mt Cook Village

The Mackenzie District roading consists of a network of Secondary Collector, Access and Access (Low Volume) “Principal” and “Local” roads leading from the state highways to many remote localities and providing convenient access in and around the three main urban centres of Twizel, Lake Takapō/ Tekapo and Fairlie (Mt Cook Village is administered by the Department of Conservation). The network is predominantly rural (93%), unsealed (71%) and with light average daily traffic volumes (less than 500 vehicles per day).

The transport asset includes all Council owned & managed road reserve, roads, streets, bridges, footpaths and related infrastructure within the District as shown in Table 37. The June 2020 valuation estimated the costs of the Council’s transportation assets at $170.6 million.

Table 37 Existing transport assets

Asset Description	Sub-Asset Description	Quantity	Quantity	Unit
Land		1,395Ha		
Roads	All roads	732.19km		
	Urban - Sealed	50.07km	1,486,074	m
	Urban - Unsealed	5.12km	2,357,730	m2
	Rural - Sealed	163.3km		
	Rural - Unsealed	513.65km		
Footpaths		59km	163,743	m2
Drainage	Culverts	18.07km	18,040	
	Catch Pits	309	309	
	Side Drains	16.1km	16,102	
	Soak Pits	40	61	
	Earth Surface Water Channel	739.97	632,269	m
	Kerb and Channel	63.8km		
Bridges	Bridges - Timber	7	8,377	m2
	Bridges – Other (Including 7 large Box Culverts)	88		
	Cattle stops	58	56	each
	Concrete Fords	20	45	each

Asset Description	Sub-Asset Description	Quantity	Quantity	Unit
Signage	Signs	3342	5,984	each
	Posts	1145		
Lighting	Lanterns (include brackets)	791	1,008	each
	Columns	696		
Features (gates, Intersections, Monuments, stockpile sites)			164	

Unformed and paper roads are not included.

9.1.1. Resource Consents

There are a number of activities within the roading activity that require resource consents from Environment Canterbury. These all relate to the use and maintenance of structures, bridges or ford structures on, in or under the bed of a lake or river. These are detailed below:

Table 38 Resource Consents – Transportation

Scheme	Consent Number	Expires
ROADING	CRC971431	15-Jan-32
ROADING - Lochaber Road	CRC980696	04-Feb-33
ROADING - Clayton Road Bridge	CRC980697	04-Feb-33
ROADING- Clayton Settlement Road	CRC980698	04-Feb-33
ROADING - Clayton Road Bridge	CRC980699	04-Feb-33
ROADING- Lochaber Road Bridge	CRC980700	04-Feb-33
ROADING- Lillybank Road Bridge	CRC980701	04-Feb-33
ROADING -Haldon Road Bridge	CRC980702	04-Feb-33
ROADING - Tengawai River	CRC980703	04-Feb-33
ROADING - Orari River, Lochaber Road Bridge	CRC980704	04-Feb-33
ROADING - Macauley River Ford	CRC980705	04-Feb-33
ROADING - Snow River Bridge	CRC980706	04-Feb-33
ROADING- Glen Lyon Road	CRC001191	09-Mar-35
ROADING- Cass River Ford Maintenance	CRC054668	16-Dec-40
ROADING- Pareora River	CRC062058	18-Oct-41
ROADING –Stoneleigh Road	CRC064164	14-Dec-41

All these current resource consents will require renewal during the life of this strategy unless Environment Canterbury changes its rules to allow any of these activities to be permitted. This is unlikely and allowance has been made to re-apply for them prior to their expiry date.

9.1.2. Current Performance

The basis of lifecycle management planning is the current condition and performance of the asset. These allow assessment of the delivery of services in comparison with the prescribed level of service. From this, a gap analysis was completed to determine the current performance of the assets compared to the level of service requirements (this is further detailed in Appendix A). Table 39 below provides a high-level summary of the current performance of transportation assets, focusing specifically on some of the key issues.

Table 39 Key transport asset issues

Asset	Issues
Sealed Pavements	Many of the District's sealed roads evolved from tracks to unsealed roads that were constructed to absolute minimum standards in terms of pavement strength, width and drainage facilities. Only since the 1970's has pavements been designed to carry an expected traffic loading over a projected 25-year design life, and the 1970's design loads were significantly less than the current design loads given recent increases in heavy commercial vehicles (HCV). The cost of construction has also been considered in the past and it is often that the pavement design comes in at a significant cost which are outside of budget allowances meaning a risk assessment is undertaken and pavement reduced or a shorter length of construction is completed.
Unsealed Pavements	High use routes (Godley Peaks Road, Braemar Road, Lilybank Road and Haldon Road) remain a challenge. Ideally, these would be upgraded and sealed - with adequate strength to withstand the freeze-thaw conditions. The cost is considerable, and this is problematic for funding by Council and Waka Kotahi. A separate business case would be appropriate for this programme. Other roads are performing well following the application of blended materials.
Bridges	Seven bridges will reach their end of remaining useful life in this period, however, approximately only five have been identified for replacement with the remaining two potentially to be handed over to the adjacent landowner or replaced with a box culvert/concrete ford. This would come to a total replacement cost of $3.25 million. Unfortunately, due to funding constraints the Council are unable to do any of the bridge replacement works within this LTP period. Instead, the Council will conduct regular inspections to ensure the bridges are safe to use. Each bridge only services a single owner and is therefore not deemed an immediate priority for Council. It should be noted that if funding does become available, the Council will prioritise the Otama Road Bridge (as this bridge services three properties and has only 3 to 10 years of remaining useful life) and Cass River Bridge (due to the weight restrictions and increased number of heavy vehicles accessing the site).
Footpaths	Footpath resurfacing has been delayed until the high speed fibre network is installed. New footpath linkages are being investigated as part of the spatial planning work. Footpath work focuses on supporting mode shift and particular safety benefits.

Asset	Issues
Drainage	Performance issues for drainage control assets relate to: • Coverage (i.e. are there open water channels or areas where water accumulates that should be serviced by pipe drains or formed channels?) • Pavement damage due to drainage problems • Improving drainage where storm events cause recurring scour problems • Entrance capacity of culverts • A large quantity of wash over culverts/fords • River fords may require closing four to five times per year • Conformity with standards (kerb and channel in all urban streets)
Streetlights	Streetlight capacity and performance issues relate to light intensity, reliability and safety. The District street lighting other than on the state highways has evolved from perceived need rather than being based on standard performance design requirements. Older fluorescent and mercury vapour lanterns had been upgraded over the last ten years to low pressure sodium. The change out to LED fittings will provide improved performance, resilience and energy savings.
Traffic Services	Performance issues for signs and road marking relate to legibility, ease of comprehension, absence of too many signs, accuracy of placement, visibility and conformity with standards. Overall, the condition of traffic services assets is considered to be good. But with traffic increases and as the district moves away from its historic rural nature it is important that improve delineation and signage quality and quantity is implemented as well as traffic calming measures. The level provided is dependent on the ONRC classification which is transitioning to the One Network Framework (ONF).

9.1.3. Critical Assets

Critically is based on ONRC and redundancy. Much of the network is a 'fishbone pattern' running off the State Highway and is very important to users. Traffic volumes can be used as a proxy for criticality, but this ignores the level of access the assets provide:

- As lifelines for people (evacuation routes)
- As corridors for reaching critical infrastructure and utilities

These additional factors are considered when council are assessing criticality.

Formal asset criticality assessments are yet to be undertaken. These have been identified as an action item in the Activity Management Plan. Once complete these assessments will be used to guide operations and renewal planning.

The table below outlines a high level methodology the council currently use to identify, assess and renew critical and non-critical assets.

Table 40 Critical asset assessment approach

Criticality Category	Condition Assessments	Renewal
Critical Assets Critical assets include; main feeder roads, secondary connectors, roads servicing critical utilities, Bridges/ all structures servicing more than one landowner, Culverts >400mm diameter, roads with only one access point, failures which impact access (i.e. there are no alternative route or it's an interconnecting route), footpaths (when the failure destroys all other available and safe walkways)	The council currently undertake - Roughness and rating of sealed road network - Random pavement testing samples and collection across the network - Footpath ratings - Continual condition rating of unsealed network (assessing potholes, scours etc.) - Three yearly bridge inspections (Annual inspection for at risk structures or as required)	At the moment, Council have been maintaining its assets in perpetuity due to budgetary constraints. The Council optimize their assets with innovating and exploring new maintenance techniques to reduce future maintenance costs, extending their design life and undertake inspections to prevent any critical failures. This approach is expected to change moving forward. Renewals will in future be aligned with their design life, assuming budgetary constraints allow for it.
Non-Critical Assets Non-critical assets include; roadside furniture, bridges accessing one property, fords which can be crossed even when a failure occurs, roads servicing one land owner, roads which have alternative access, smaller culverts <400 mm diameter	Non-critical assets are assessed slightly differently: - Bridges are inspected default as a 3 yearly programme where a third are inspected each year. - Any structure which has changed from the previous inspection is put on annual cycle of inspections until fixed - Timber and/or posted structure are inspected annually - Road classification will determine the frequency of inspection - All other non-critical assets are inspected over a greater time period than critical assets. For overall network condition assessments, they are typically inspected as per the above for efficiency	Design lives for non-critical assets are typically extended further by seeking alternative methods of treatment and/ or risk profiling if there is a LoS drop or access is disturbed (e.g. gravel materials and two coat seals).

Whilst there is no formal criticality assessment, the Council are able to physically inspect their roads on a regular basis. This is due to the fact that the network is relatively small with easy access. Roading assets are also all above ground and visible, making it easier to assess their condition.

9.2. Transportation Infrastructure Strategy

Changes in practice such as unsealed road management align with the shift to delivering sustainable infrastructure outcomes. Incremental changes are intended to progress the network to being fit for purpose in the future.

Funding will continue to be a challenge in maintaining a satisfactory level of service for the users of Mackenzie's roading network. The major portion of cost to maintain the network is associated with resealing of the sealed portion of the network and re-metaling of the unsealed roads. This strategy sets a conservative approach. This means keeping a tight rein on maintenance budgets, while still ensuring we include enough to avoid backlogs and to maintain appropriate levels of service and operating conditions for vehicles.

There are currently a number of options available for council to fund the appropriate transport improvements across the network. These are discussed in Table 41 below.

Table 41 Significant Infrastructure decisions – Transportation

Issue – Pressures on our Transport network due to growth, land use intensification and tourism growth.	
Main Options	**Implication of Options**
Option 1	At the moment there are issues across the district both within the urban and rural areas that may drive increased levels of service to address maintenance and safety issues. Proposed projects to address these issues come under the NZTA work category "Low Cost Low Risk" for isolated roading improvements. These are being worked through as part of our Transportation Strategy where specific improvements will be identified. Option 1 is for Council to budget $1,050,000 in year 1 for "Low Cost Low Risk" roading improvement projects. This increases to 1.6 million by year 10 ($789,000 being our share)[4]. This gradually increases rates over the period of the LTP, and gives ratepayers certainty regarding the level of funding of these projects. However it means that projects will have to be prioritised and some delayed. In terms of maintenance, the Council will match what NZTA will co-fund to undertake required maintenance to maintain current levels of service. The maintenance budget will be unaffected.
Option 2	That Council borrows to co-fund/match NZTA funding for all "Low Cost Low Risk" roading improvement projects as they are proposed. This would more quickly address issues of pressure on parts of the road network from increased use and growth in the district. However, it would result in larger rates rises across the ten years of the LTP. Council sees value in the improvements but due to the impact on rates, for reasons of fiscal responsibility and prudence and following consultation with ratepayers, it decided against this option.

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[4] Inflated figures

Issue – Pressures on our Transport network due to growth, land use intensification and tourism growth.	
	In terms of maintenance, the Council will match what NZTA will co-fund to undertake required maintenance to maintain current levels of service. The maintenance budget will be unaffected.
Time period	2021 - 2031
What is the benefit	Growth/LoS/Renewal
Assumption	That the land use intensification and tourism growth continues at similar levels to current.

9.2.1. Key capital and renewal projects

The significant transportation improvements for the next 10 years include:

- **Low-Cost Low Risk Projects: 2021/31:** This includes safety focused projects like site benching, seal widening, traction seals, speed management, travel management demand measures, kerb and channel improvements and intersection improvements.
- **Unseal road metalling: 2021/31:** Road metalling will continue particularly on high risk and high trafficked road like Lilybank and Braemar Road. An investigation will be undertaken in 2021/22 to assess the viability of seal extensions along these roads.
- **Alps to Ocean upgrades: 2021/22:** The council has planned to take the Alps to Ocean great ride fully off-road to improve safety and increase the attractiveness of the trail
- **Upgrading of footpaths in the major urban centres: 2021/31:** Footpaths will be upgraded in all major towns in response to the increasing focus on active modes of travel and reducing carbon emissions
- **Ongoing sealed road resurfacing upgrades: 2021/31**: Resurfacing of sealed roads is programmed to respond to the need to improve the condition of sealed roads across the district

The transportation programme includes works that will assist with meeting the current and future demands on the network. The majority of the infrastructure projects identified within the AMP are either responding to an increase in the Level of Service or are the replacement or renewal of an aging asset.

Table 42 Transportation projects - Capital costs (inflated)

ROADING	Primary Type	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
		(thousands)									
Plant and Equipment	Renewal	20	12	13	3	13	3	3	4	4	4
Rural Seal Extensions	LOS	12	0	0	0	0	0	0	0	0	0
Unsealed Road Metalling	Renewal	700	722	743	898	924	951	979	1,007	1,036	1,066
Sealed Road Resurfacing	Renewal	500	516	531	579	596	613	631	772	794	817
Drainage Renewal	Renewal	90	93	96	120	124	127	131	135	139	143
Sealed Road Pavement Rehabilitation	Renewal	130	134	138	229	236	243	250	257	265	272
Structures Component replacements bridges	Renewal	30	31	32	74	64	79	81	70	86	88
Structures Component replacements cattle stops	Renewal	0	0	0	0	18	0	0	20	0	0
Bridge & Structures Renewals	Renewal	52	54	55	58	78	61	63	85	67	69
Environmental Renewals	Renewal	25	25	26	0	0	0	0	0	0	0
Cycle Path Renewal	Renewal	466	0	0	0	0	0	0	0	0	0
Footpath Renewal	Renewal	210	217	223	229	236	243	250	257	265	272
Streetlight LED Upgrade	LOS	727	12	13	13	13	14	14	15	15	16
Low Cost Low Risk Improvements	LOS	1,053	464	462	948	947	976	1,484	1,509	1,523	1,610
Car Parking Renewal	LOS	0	0	0	219	225	231	238	245	252	259
Urban Seals	LOS	0	0	0	0	0	0	0	0	0	0
Walking & Cycling Projects	LOS	0	0	0	82	84	87	89	92	95	97
Traffic Services Renewal	Renewal	88	91	93	98	101	104	107	110	113	117
Total Roading Capital Expenditure		**4,102**	**2,370**	**2,425**	**3,552**	**3,659**	**3,733**	**4,321**	**4,576**	**4,653**	**4,831**

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Future costs, beyond 2031 were estimated based on the first 10 years costs. Additional deferred renewals were also considered. This included the following bridge renewals which have been deferred over this LTP period.

- Otama Road
- Coal Pit Rd No 2
- Clayton Settlement
- Single Hill
- Cass River
- Black Birch Stream

Council has decided to take a prudent approach with regards to its bridge replacement strategy. Of the bridges listed above most only serve a single owner or have alternative access by an adjacent ford. These low access, low volume bridges are therefore not an immediate priority for Council and will not be replaced.

Council has also commenced a process to determine which bridges can potentially be divested back to the owner or alternatively which bridges can be replaced with a ford, or culvert. At this stage Goodman's Bridge fits into this category. Otama Road and Mowbray Road could also be replaced with a box culvert, which current funding can facilitate, if necessary.

A significant portion of the renewals budget from year 11 to year 30 is dedicated to the renewal, replacement and divestment of bridges (an average budget of $741,000 has been allocated to bridge replacements for years 2031 to 2051)[6].

There are other projects which were also deferred within this LTP period. One of the key projects includes the seal extensions of Lilybank Road, Braemar Road, Hayman Road and Haldon Road. The Council are budgeting an average cost of $785,000 pa for unsealed road metalling for the next 10 years. It's anticipated that this budget will continue beyond 2031. It is also anticipated that metalling costs are likely to increase with increasing difficulty obtaining materials and increasing number of vehicles and heavy vehicles putting greater pressure on the network[7].

The seal extension work has been deferred to 2031. Between 2031 and 2041 an average annual spend of $300,000 is budgeted for these seal extensions. Beyond 2041 this budget has been reduced to $100,000 per year. A business case is to be undertaken in year 1 of this LTP period to determine the financial feasibility of the seal extensions and the most appropriate location. In addition to this, alternative longer lasting materials are being investigated in order to increase the lifespan of the existing unsealed roads. This will allow the Council to minimise bow waves in the future as design lifespans are improved[8].

High level theoretical renewal profiles were developed for other transportation assets. It is assumed that the current expenditure profiles will be adequate for funding future renewals beyond 2031. However as noted in section 5.1, the council are seeking to improve their data capture processes, which will allow Council to better understand the age and condition of its assets in order to better forecast for its replacement or upgrade.

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[6] These values represent uninflated values
[7] Ibid
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The table below provides high level indicate theoretical renewal costs (based on assets age) and compares this against the planned spend profile.

Table 43 Theoretical vs planned renewal profiles (uninflated values)

Roading Asset	Theoretical Renewal Average cost per year (2021-2030)	Planned Average cost per year (2021-2030)	Theoretical Renewal Average cost per year (2031-2050)	Planned Average cost per year (2031-2050)
Unsealed Road Metalling	Unknown - insufficient data	$785,000	Unknown - insufficient data	$785,000
Sealed Road Resurfacing	$435,500	$551,000	$1,174,020	$551,000
Drainage Renewal	$176,000	$104,000	$176,000	$104,000
Sealed Road Pavement rehabilitation	Unknown - insufficient data	$186,000	Unknown - insufficient data	$186,000
Structures Component replacement bridges	See bridges below	$54,000	See bridges below	See bridges below
Structures Component replacement cattlestops	$7,900	$3,200	$7,900	$3,200
Bridge & structures renewals[9]	$15,000	$56,000	$15,000	$56,000
Traffic services renewals	$110,000	$89,000	$188,000	$89,000
Footpath Renewal	$114,000	$210,000	$95,000	$210,000
Bridge renewal (Typically this is part of the low cost low risk line item)	$207,000	$0	$665,000	$741,000

The theoretical values shown in the table above are based on data sourced from RAMM. The following assumptions were made:

- Cattlestops, fords (i.e. bridges and structures) and drainage structures did not have age or construction date data. The theoretical renewal cost is therefore the total cost of all the assets divided by the theoretical design life
- In the case where there were only some missing data points (with regards to the material, size and cost of the asset) an assumed value was given based on the average of all other assets
- All unit costs were sourced from the 2019 Valuation report.

In most cases the average renewal cost proposed for this LTP period has been carried through to all future costs, except for bridges which sees a substantial increase in costs over the 2031-2051 period. It is noted

[9] This refers to Minor structures and includes Fords Only. The bridge renewal profile is outlined in the bottom row

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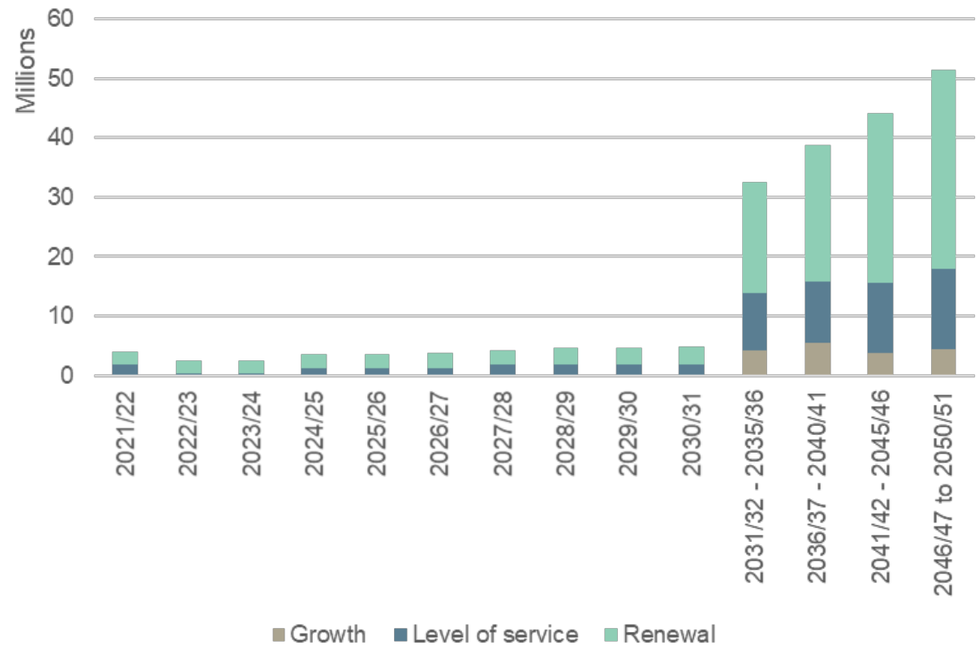
that both traffic services and footpath renewals may need to be reinvestigated. Council wish to improve its asset data and data management systems before any reallocations are made to the above renewals.

Future costs also consider the expected growth in Twizel and Tekapo over the next 30 years. Growth projections show that the residential population of both Tekapo and Twizel will more than double over the next 30 years. This doesn't include the expected increase in visitor numbers (once international boarders are reopened). The Council has budgeted between $300,000 and 370,000 per year between 2031 and 2041 to cater for this additional growth[10].

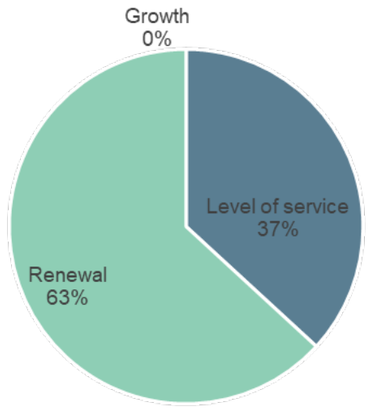
Figure 20 Transportation Project Cost Profile (Inflated)



Each of the above infrastructure upgrades responds to one of the of the three key drivers: meeting growth, improving the level of service and replacement and renewal of aging infrastructure. The figure below shows the proportion of transportation projects over the next 10 years which respond to each of these drivers. The majority of transportation projects respond to the renewal of aging assets and improvements to the level of service.

[10] The above values are uninflated

Figure 21 Key priority types of transportation infrastructure projects



10. FINANCIAL SUMMARY

10.1. Total Capital Expenditure

The projected capital expenditure associated with the significant infrastructure assets are outlined in Table 44 and Table 45.

Table 44 Total expenditure summary (Uninflated Costs)

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32 - 2035/36	2036/37 - 2040/41	2041/42 - 2045/46	2046/47 - 2050/51
Thousands														
Stormwater														
Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LoS	410	400	0	0	0	0	0	0	0	0	405	805	505	505
Renewal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transport														
Growth	0	0	0	0	0	0	0	0	0	0	3,007	3,347	2,049	2,049
LoS	1,792	462	447	1,155	1,129	1,131	1,533	1,518	1,495	1,528	6,745	6,245	6,095	6,095
Renewal	2,310	1,837	1,837	2,096	2,126	2,096	2,096	2,217	2,196	2,196	13,024	13,791	14,907	15,048
Wastewater														
Growth	1,303	500	750	7,500	8,500	0	0	0	0	0	0	0	0	0
LoS	1,116	250	10	500	0	1,000	1,000	1,000	0	0	358	958	608	358
Renewal	0	0	0	0	0	0	0	0	0	0	3,422	3,422	3,422	3,422
Water														
Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LoS	11,295	5,353	600	1,000	500	515	500	500	500	525	3,500	2,600	2,800	2,800
Renewal	100	100	353	353	353	353	353	353	353	353	1,512	1,512	1,512	1,512

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Table 45 Total expenditure summary (Inflated Costs)

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32 - 2035/36	2036/37 - 2040/41	2041/42 - 2045/46	2046/47 - 2050/51
Thousands														
Stormwater														
Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LoS	410	414	0	0	0	0	0	0	0	0	612	1,446	1,077	1,280
Renewal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transport														
Growth	0	0	0	0	0	0	0	0	0	0	4,283	5,521	3,915	4,535
LoS	1,792	476	475	1,262	1,269	1,308	1,825	1,860	1,885	1,982	9,606	10,302	11,646	13,490
Renewal	2,310	1,893	1,950	2,290	2,390	2,425	2,495	2,716	2,768	2,848	18,544	22,743	28,472	33,288
Wastewater														
Growth	1,303	518	796	8,180	9,539	0	0	0	0	0	0	0	0	0
LoS	1,116	259	11	545	0	1,154	1,191	1,230	0	0	517	1,611	1,191	817
Renewal	0	0	0	0	0	0	0	0	0	0	4,942	5,757	6,707	7,814
Water														
Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LoS	11,295	5,540	637	1,091	561	594	595	615	636	688	5,018	4,329	5,415	6,290
Renewal	100	104	375	385	396	407	420	434	449	463	2,168	2,518	2,924	3,397

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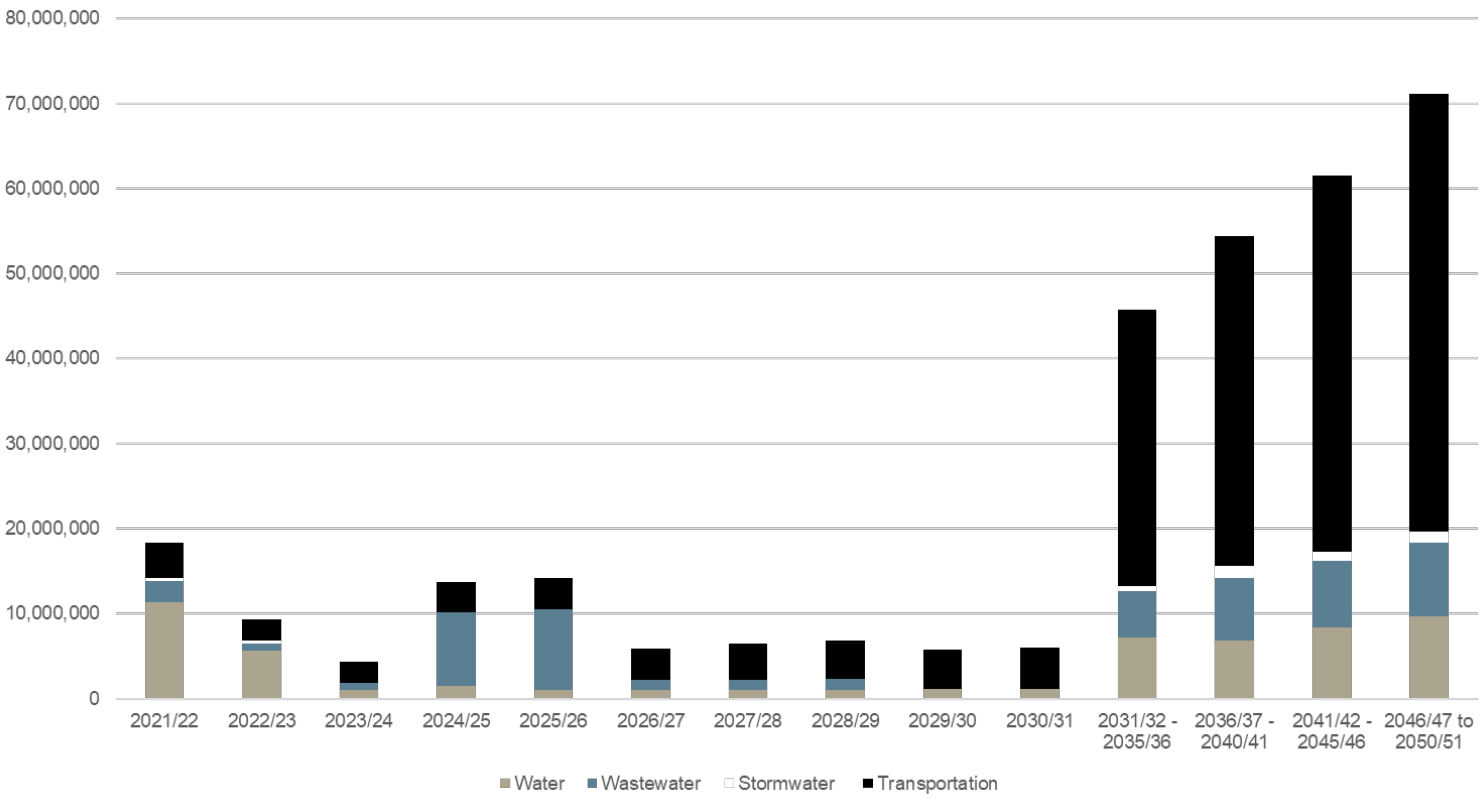
Figure 22: Projected Capital Expenditure - Infrastructure Assets (Inflated)



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10.2. Total Operational and Maintenance Expenditure

The projected operational and maintenance expenditure associated with the significant infrastructure assets are outlined in Table 46 and Table 47 and are also graphically represented below.

Table 46 Total expenditure summary (Uninflated Costs)

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32 - 2035/36	2036/37 - 2040/41	2041/42 - 2045/46	2046/47 - 2050/51
Thousands														
Water	732	760	846	905	995	1,067	1,085	1,099	1,195	1,196	6,375	6,374	6,374	6,374
Wastewater	348	395	430	470	488	530	537	585	592	583	3,929	3,400	3,400	3,400
Stormwater	40	43	44	48	48	52	52	57	57	58	400	400	400	400
Transportation	2,039	2,045	2,114	2,353	2,390	2,417	2,394	2,420	2,440	2,393	13,938	11,900	12,019	12,738

Table 47 Total expenditure summary (Inflated Costs)

	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32 - 2035/36	2036/37 - 2040/41	2041/42 - 2045/46	2046/47 - 2050/51
Thousands														
Water	732	785	896	983	1,111	1,224	1,284	1,341	1,507	1,554	9,010	10,402	12,010	13,868
Wastewater	348	408	456	512	547	612	639	719	753	765	5,633	5,662	6,576	7,638
Stormwater	40	45	47	52	53	60	62	70	73	76	573	666	774	899
Transportation	2,039	2,101	2,227	2,535	2,639	2,733	2,772	2,871	2,965	2,982	18,813	18,195	20,819	24,996

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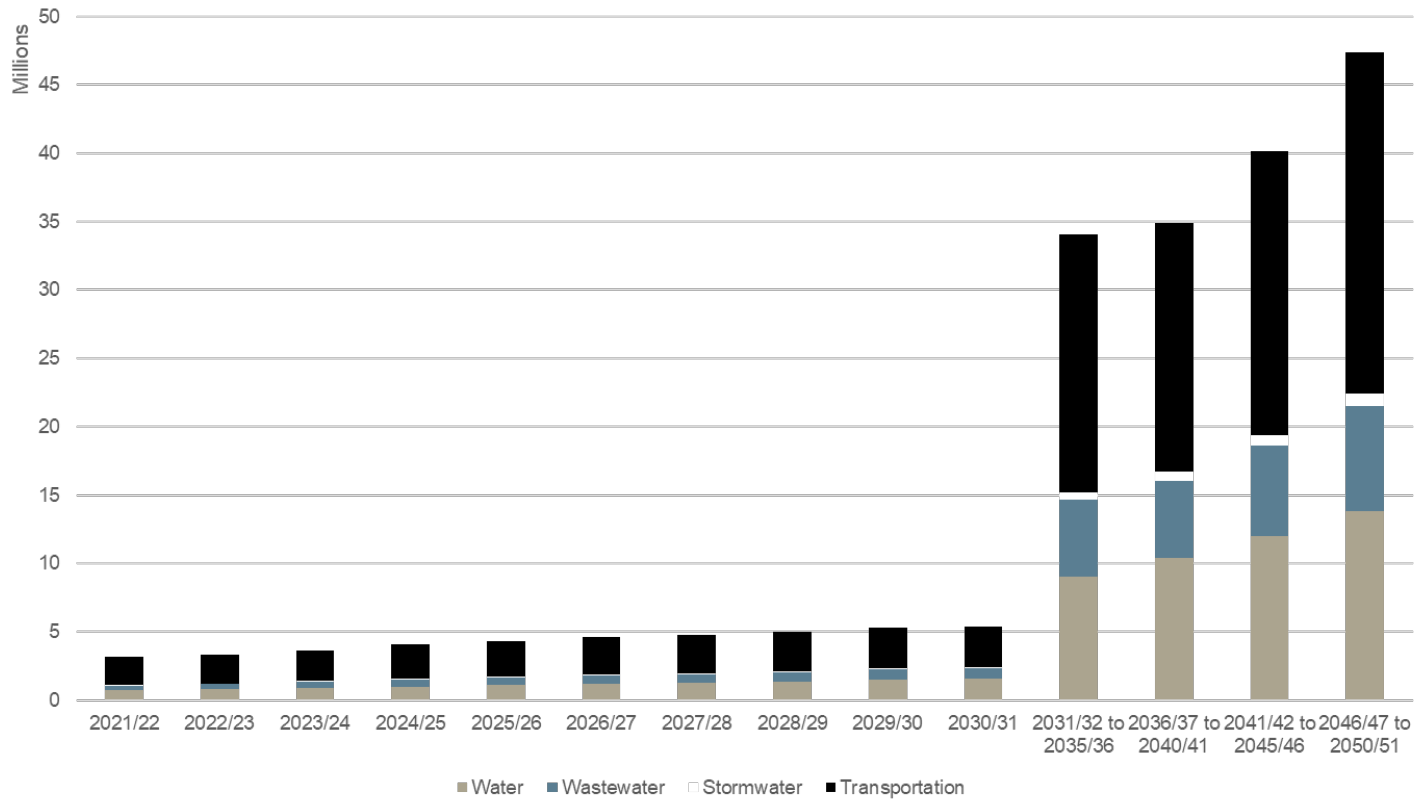
Figure 23: Projected Operational Expenditure –Infrastructure Assets (Inflated)



10.3. Funding Sources

Typical sources of funding used to fund both the operation and maintenance and capital expenditure for all three waters and transport infrastructure projects include:

- Targeted rates
- Development and financial contributions
- Lump sum contributions
- Borrowing
- User charges
- Grants and subsides
    - Three Waters stimulus package
    - Waka Kotahi contributions

Some of the above funding sources are further detailed below.

10.3.1. Three Waters Programme stimulus package

The Council has accepted crown stimulus grant funding for projects as part of the Three Waters Services Reform. The crown has committed approximately $500m nationwide in tranche 1, and the MDC allocation is $5.11m, of which $2.56m has already been received by MDC as an advance payment. These stimulus projects are in addition to current LTP projects already underway. There are 33 projects listed in the approved Three Waters Reform Delivery Plan, which the Department of Internal Affairs (DIA) require to be completed by 31 March 2022 as part of the stimulus package. Of these projects, around 24 involve studies or design, with 8 of these resulting in physical works within this tranche 1 funding. There will be additional capital or operational expenditure to follow these designs/studies, with funding from either tranche 2 or in the LTP. Approximately $455k is forecast to be spent from the stimulus grant this FY20-21, with the balance to be spent FY21-22.

It should be noted that 19 of these projects have been identified as operational activities. A breakdown of the Three Waters Programme activities is outlined in Table 48.

Table 48 Three Waters Programme

	Project	Capex/ Opex	2020/21	2021/22 (LTP yr 1)	Total
Water	Water Supply Mains Renewals - scope/design/constn (Fa/Tek/Twi)	CAPEX	$573,247	$0	$573,247
	Potable Water hydraulic modelling - 2 sites - study	OPEX	$165	$49,835	$50,000
	Water Supply Sources Database (identify sources and quality)	OPEX	$3,590	$41,410	$45,000
	Water Metering Trial - scope Twizel & tender pacakge	OPEX	$8,267	$16,734	$25,000
	Water Metering Trial - Twizel (part) Install	CAPEX	$0	$322,753	$322,753
	Potable Water Demand Study (usage reduction) & Exemplar projects	OPEX	$5,562	$284,438	$290,000
	Potable Water Supply to remote properties - study	OPEX	$6,270	$38,730	$45,000
	Potable Water Supply to remote properties - install new	CAPEX	$0	$175,000	$175,000

	Project	Capex/ Opex	2020/21	2021/22 (LTP yr 1)	Total
	Albury WS Scheme - Compliance incl Protozoa - study	OPEX	$330	$29,670	$30,000
	Allandale WS Scheme - Compliance incl Protozoa - study	OPEX	$165	$29,835	$30,000
	Preparation for Reform - implications for MDC structure/ops/rates	OPEX	$31,505	$18,495	$50,000
Wastewater	Future Planning for Tekapo WWTP - Study	OPEX	$9,158	$290,843	$300,000
	Upsize Foul Sewer through Fairlie Golf Course - Design only	CAPEX	$0	$35,000	$35,000
	New Rising Main Mackenzie Park to Twizel WWTP - Design	CAPEX	$20,310	$14,690	$35,000
	New Rising Main Mackenzie Park to Twizel WWTP - Construct	CAPEX	$0	$990,000	$990,000
	Lakeside wastewater pump station, Takepo/Tekapo - design /construct	CAPEX	$1,403	$48,598	$50,000
	Iwi - review the wetlands planting (Miscanthus) in the disposal zone at Fairlie.	OPEX	$0	$15,000	$15,000
	Review existing fencing - Deer fence the ponds	CAPEX	$0	$15,000	$15,000
	Removal of non-natives such as wilding pines	OPEX	$0	$15,000	$15,000
	Stock Truck effluent station - Twizel (Study)	OPEX	$0	$20,000	$20,000
	Septic Tank disposal - Twizel (Study)	OPEX	$0	$45,000	$45,000
	Burkes Pass WWTP upgrade - assess/install outlet flowmeter for compliance	CAPEX	$4,460	$25,540	$30,000
	Burkes Pass WWTP upgrade - assess/design baffles to increase residence time	CAPEX	$0	$50,000	$50,000
	CCTV condition assessments networks	OPEX	$10,000	$190,000	$200,000
	Sewerage hydraulic modelling (uncalibrated) - 3 sites - study	OPEX	$825	$199,175	$200,000
	WWTP monitoring equipment all sites - study	OPEX	$165	$24,835	$25,000
	WWTP monitoring equipment all sites - design & install	CAPEX	$0	$210,000	$210,000
	Desludge Ponds - 3 sites - design incl tender prep	OPEX	$30,000	$0	$30,000
	Desludge Ponds - 3 sites - contract	OPEX	$0	$850,000	$850,000
	WWTP Influent Screens - 3 sites - Study/Concept Design	CAPEX	$2,475	$22,525	$25,000
	Connect Allandale Rd Industrial WW to Fairlie WW network - study/design	CAPEX	$0	$45,000	$45,000
	Twizel WWTP - Groundwater monitoring sites (compliance testing)	OPEX	$908	$14,093	$15,000
	Stimulus Package - Programme Delivery*	CAPEX	$53,678	$62,722	$116,400
	Stimulus Package - Programme Delivery*	OPEX	$41,785	$41,815	$83,600
SW	Stormwater Management Control (Flooding) - Alloway area, Fairlie - study/des	CAPEX	$0	$25,000	$25,000
	Realign or replace Sloane Street SW timber box culvert - design only	CAPEX	$330	$34,670	$35,000
	Review stormwater discharges in Fairlie and Takepo/Tekapo	OPEX	$0	$15,000	$15,000
	TOTAL COSTS		**$804,596**	**$4,306,404**	**$5,111,000**

*Stimulus package - programme delivery is categorised under Wastewater, however it applies to the wider programme. This cost has also been split between capital and operational activities.

Table 49 below provides a timeline of *all* three waters capital projects (including those funding from other sources). Whilst the table illustrates the large portion of projects which are being funded by the stimulus

package, the figure shows that the stimulus package funds only 4% of the total capital cost for three waters projects for the Council over the next 10 years.

Table 49 Three Waters CAPEX project timeline

		2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
		1	2	3	4	5	6	7	8	9	10
Three waters stimulus funding	Wastewater	*Upsize foul sewer - Fairlie Golf Course*									
		Rising Main Mackenzie Park to Twizel WWTP – Design									
		Rising Main Mackenzie Park to Twizel WWTP – Construct									
		Lakeside WW pump station – D&C									
		Deer Fence ponds - Tekapo, Fairlie									
		Burkes Pass WWTP upgrade - install outlet flowmeter									
		Burkes Pass WWTP upgrade – baffles									
		WWTP monitoring equipment all sites - design & install									
		WWTP Influent Screens Design - 3 Sites									
		Connect Allandale Rd WW to Fairlie WW Network									
	Water	*Water Supply Renewals*									
		Water Metering Trial - Twizel Install									
		Potable Water Supply Remote Properties - install									
		Stimulus Package - Programme Delivery									
	SW	*Stormwater Mgmt Control (Flooding)*									
		Sloane St SW box culvert									

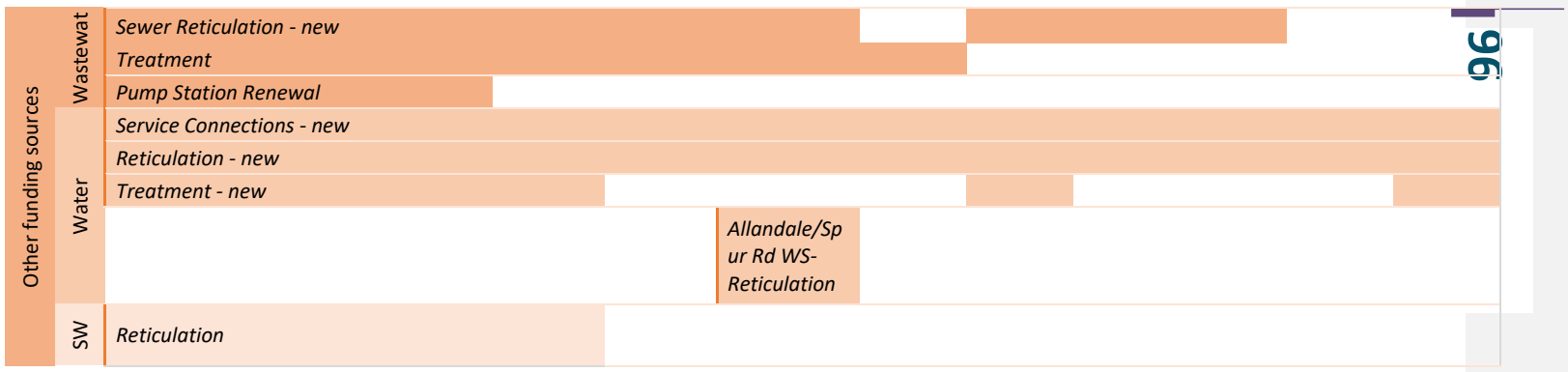
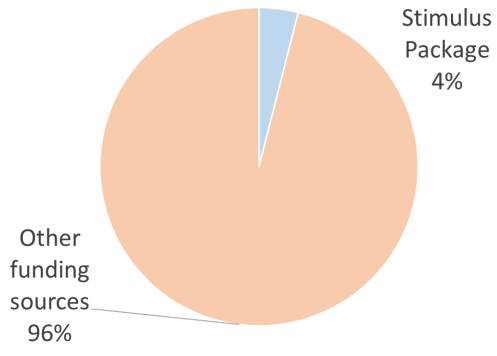


Figure 24 Proportion of funding from Three Waters Stimulus vs Other Funding sources



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10.3.2. Waka Kotahi Financial Assistance

To fund roading maintenance, operating, and renewals (capital) expenditure, Council receives a percentage of the cost as a subsidy from Waka Kotahi (New Zealand Transport Agency). The level of subsidy, or co-investment, is the Financial Assistance Rate (FAR), the level of which is review tri-annually by Waka Kotahi. Councils FAR rate is 51%. In association with this, through the National Land Transport Plan (NLTP), Waka Kotahi requests from Council a three-year work program and supports, or otherwise, the requested investment level by funding 51% of the costs.

A recent funding announcement from Waka Kotahi lowered their level of investment into the Councils submitted roading programme for the next 3 years. This has seen Council received 51% funding for a substantially smaller program (in 21/22 the roading programme applied for totalled 5.3m– NZTA only approved a programme totalling $3.4 m) that it deems is required to manage the roading asset appropriately. The funding Assistance rate is still 51% for most categories (except LED which attracts a funding assistance rate of 85%).

Council is supporting continuing the increased local funding share in 21/22 the total roading programme notwithstanding Waka Kotahi's reduced support meaning that ratepayers now fund a higher portion of the overall roading programme. This brings the total roading programme to $4.2 m. We deem this necessary to ensure we maintain our roading network to meet expected levels of service. This trend is likely to continue in 22/23 and 23/24.

Staff are working with Waka Kothi to understand the reduction in funds in the Asset Management area, where Council earlier signalled an increased investment was required and which was formally endorsed (increase in 2.5 FTE's).

10.4. Affordability and prioritisation

Investment into both three waters and transportation infrastructure was prioritised by using the following high-level principles:

- Improvements to the Level of Service was generally prioritised first, specifically around improved safety and compliance.
- The renewal of aging infrastructure was prioritised next. Specifically, infrastructure which is high use and/or showing signs of failure. Assets which are at the end of their theoretical design life but are still structurally sound (no signs of failure) and are also used very infrequently are not targeted for replacement, but are instead regularly inspected.
- Projects which address growth were prioritised last. Currently the Mackenzie district are seeing a fall in visitor numbers giving Council breathing space to prioritise other aspects of infrastructure improvement first and get in place appropriate planning and delivery tools. Additionally, developers are, in the first instance, responsible for providing the infrastructure for new developments.

The following sections provide further details regarding the prioritisation and affordability of its infrastructure projects.

Three Waters Infrastructure

As noted above, levels of service was prioritised first, particularly when related to community safety. The Health (Drinking Water) Amendment Act 2007 requires water suppliers to take all practical steps to comply with the (previously voluntary) NZ Drinking Water Standards. To comply with the Act, Council must have in place a water safety plan which is approved by the Ministry of Health for each urban water supply. Dates for compliance with the Act are staggered depending on the size of the community.

For Fairlie, Tekapo and Twizel, the compliance date was 1 July 2014. The Tekapo and Twizel supply both meet the drinking water standards for bacteriological compliance. Further technical work is needed to demonstrate compliance with Protozoological standards. This work will be partly funded through the Three Waters Tranche One project process. In Fairlie, the expected capital outlay to enable compliance is approximately $7.4 million. This is programmed for 2021/26.

Upgrades to sewerage and stormwater systems are also required in the Long Term Plan (LTP) period. While no significant change to the operation of most of the Council's stormwater assets is proposed, the Council is required to develop 'stormwater management plans' under the Land and Water Regional Plan, and stormwater discharges will be required to be progressively upgraded to improve discharge quality.

For wastewater treatment, the Takapo wastewater Plant is flagged for renewal in 2021-26 with funding allocated within the LTP. Fairlie and Twizel are both pond based systems and minor improvements being undertaken in the first year through the Three Waters Program (desludging and instrumentation as examples) will set the plants up for continued compliant operation over the foreseeable future. CCTV'ing of the entire wastewater network will allow Council to better understand pipe condition and plan for renewals when and where necessary.

The district's urban water supply schemes vary in age and condition and there are some large renewal costs over the next decade. This, combined with an increase in costs to meet new drinking-water standards and other requirements, leads to a large financial burden of providing these water supplies.

The Council will fund large capital spends associated with the upgrades either through internal borrowing from its own cash reserves, or external borrowing. The Three Waters Stimulus Package will also assist with the funding of several capital and operational projects. Depreciation and repayment of debt is charged as part of the targeted water rate.

The general approach to funding of the annual costs of the Three Waters schemes starts from the premise that those who benefit (either directly or indirectly) should pay. – termed targeted rating.

Transportation

Recent funding constraints has limited the Council's ability to renew or improve some of its roading assets. The council have had to mitigate these issues by prioritising their renewals based on the overall condition of the asset, the frequency of use and it's criticality with regards to access. Furthermore, the Council is investigating ways of improving the lifespan of its current assets. The following provides a brief summary of some of the key affordability issues and how these are being addressed:

- **Bridges:** The following bridge renewals have been deferred over this LTP period:

- Otama Road
- Coal Pit Rd No 2
- Clayton Settlement
- Single Hill
- Cass River
- Black Birch Stream

In Lieu of replacing these bridges, Council will instead conduct regular inspections to ensure the bridges are safe to use. Each bridge only services a single owner or have and alternative ford adjacent and is therefore not seen as an immediate priority for Council. Currently an average annual budget of approximately $200,000 (uninflated) is dedicated to the replacement of bridge structural components, bridges and structures and operational and maintenance activities.

- **Seal extensions**: One of the key projects includes the seal extensions of Lilybank Road, Braemar Road, Hayman Road and Haldon Road. The Council are budgeting an average of $785,000 pa (uninflated) for unsealed road metalling for the next 10 years. It's anticipated that this budget will continue beyond 2031. It is also anticipated that metalling costs are likely to increase with increasing difficulty obtaining materials and increasing number of vehicles and heavy vehicles putting greater pressure on the network. The seal extension work has been deferred indefinitely and has not been included in any future cost estimates. A business case is to be undertaken in year 1 of this LTP period to determine the financial feasibility of the seal extensions. In addition to this, alternative longer lasting materials are being investigated in order to increase the lifespan of the existing unsealed roads. This will allow the Council to minimise bow waves in the future as design lifespans are improved.
- **Sealed road renewals:** The theoretical renewal profile estimated an average expenditure of $435,000 pa over 2021-2031 and then increases to $1,174,020 from 2031-51. Currently the LTP budget has a stepped up approach to sealed road resurfacing starting at approximately $500,000 in year 1 and $630,000 by year 10. The theoretical renewals profile is based on an expected design life between 10 and 18 years (depending on whether a second coat has been applied). However, in reality it is likely that the surface will be able to see a design life of between 20 and 25 years. This reduces the risk of a bow wave occurring in the future.
- **Footpath renewals:** Currently the council are able to budget up to $210,000 pa (uninflated) for this LTP period. Based on the theoretical renewals profile, this budget will likely be able to deliver the appropriate level of service without the risk of bow waves in the future.
- **Traffic services renewals:** Traffic services include both lights and signage. A high-level estimation has been undertaken to determine a theoretical renewal profile which was then compared against the planned investment. It showed that the average theoretical cost of replacing these assets was slightly higher than planned costs over the next 10 years. However, it should be noted that the actual life span of these assets is expected to be longer than it's theoretical design life.
- **Drainage renewals:** The current LTP budgets approximately $100,000 pa (uninflated) on its drainage assets. The theoretical average annual renewal cost was estimated to be $176,000 pa (uninflated). However, this makes a conservative assumption that the average lifespan of the existing drainage assets is between 50 and 75 years when in reality drainage assets can last to up to

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100 years. It is assumed that this budget will be adequate to provide the appropriate level of service without causing a bow wave in the future.

- **Pavement renewals:** The majority of council roads and assets have evolved over time meaning; the pavement was never 'properly' constructed in the first instance and also that data wasn't sufficiently recorded. Because of the general lack of information regarding the pavement condition, it has been assumed that the pavement acts like dirt or subgrade rather than a pavement. Some pavement testing has been undertaken this financial year and some work is still to be completed on the analysis of this data. This will help Council understand the relative condition of the pavement. Until there is enough data to understand the condition of pavements, a provisional average cost of $186,000 per year (uninflated) has been budgeted for the pavement renewal of 1km of pavement.

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10.5. Impacts of recent flooding event

A significant storm event occurred at the end of May 2021, impacting on our district.

Damage to our roading network includes 282km of roads, 46 bridges and 705 culverts. The impact on three waters infrastructure from the flooding event was relatively minor.[11]

Preliminary assessments estimate repair costs between $2.3 and $3.075 million. Waka Kotahi has confirmed it will co-fund a total of $2.04m of flood damage. The flood damage assistance rates is capped at 51% for the first 10% of the Council's maintenance budget and then the FAR rate will be increased by a maximum of 20%. This means that Council's maximum funding rate would be 71%. Over the past few weeks Council staff have developed a priority programme. This program reflects that some of the initials works were undertaken in the first days of the event and therefore are reflected in the previous financial year. The priority programme outlines a total of $553,000 of works that need to be addressed as soon as possible. The balance of the works will need to wait to be completed when local funds can be allocated or an alternative source of funds can be identified. The value of works will attract the enhanced funding assistance rate but will be limited to $200,000. It is not possible to increase the local share any further given the sizeable rates increases. Discussions are being held with the agency to understand the process for applying for higher levels of funding assistance.

Staff are taking a whole of network approach to addressing the priority one works list. This will mean that the works will occur over the next 6-12 months and or as needs require them to be. This will allow for the network to be managed in consultation with customers in the impacted areas and adjusting maintenance activities district wide to accommodate these works. Should further funding eventuate, the programme can be accelerated in line with the funding. As such the approach will see no impact in the overall Long term plan estimates and levels of service.

[11] Council ordered in a tanker of water to supplement the water supply, whilst the boil water notice was in place. The council also undertook extra testing, rediverted a stream, and pumped out a pump station overnight with sucker trucks. The cost of these activities was not significant and covered within the operational cost budget.

APPENDIX A LEVEL OF SERVICE PERFORMANCE MEASURES

A1 Water Performance Measures and Targets

Council has suite of performance measures agreed with the community and reported on annually by the Annual Reports. This performance is measured as per contractual requirements and changes in indicators such as increased flooding or maintenance. However Central Government introduced a suite of mandatory performance measures covering Transportation, Three Waters and Flood Control that came into force on 1 July 2014.

These mandatory performance measures have been adopted by Council for inclusion in the 2021-31 Long Term Plan and no other measures will be used.

Table 50 Water performance measures and targets

What you can expect from us	What we will measure	Latest result (2019/20)	Targets: 2021/22	2022/23	2023/24	By 2030/31
Water supply						
Provide safe drinking water.	Compliance with Drinking Water Standards (part 4) – Bacterial Compliance*	75%	≥ 95%	≥ 95%	≥ 95%	≥ 95%
	Compliance with Drinking Water Standards (part 5) – Protozoal Compliance[12]*	0%	2 of 5 suppliers compliant	2 of 5 suppliers compliant	3 of 5 suppliers compliant	3 of 5 suppliers compliant
Maintain excellent water supply network services.	The percentage of real water loss from the networked reticulation system*	21%	≤ 25%	≤ 25%	≤ 25%	≤ 25%
Maintain excellent customer services	The median response times to attend a call-out in response to a fault or unplanned interruption to the network reticulation system:*					
	a) attendance for urgent call- outs	1hr 21m	≤ 2h	≤ 2h	≤ 2h	≤ 2h
	b) resolution of urgent call-outs	1h 21m	≤ 12h	≤ 12h	≤ 12h	≤ 12h

[12] This measures the water quality of Tekapo, Twizel, Fairlie, Allendale and Albury water supplies. It is expected that Twizel and Tekapo will be compliant by 2021/22 and Fairlie will be compliant by 2023/24. There is the potential for Allendale to be compliant within this LTP period if it is found that it is feasible to connect it to Fairlie. Albury will not be compliant. Council is currently working on understanding the status of the Albury Rural water supply.

What you can expect from us	What we will measure	Latest result (2019/20)	Targets: 2021/22	2022/23	2023/24	By 2030/31
	c) attendance for non-urgent call-outs	25h	≤ 72h	≤ 72h	≤ 72h	≤ 72h
	d) resolution of non-urgent call- outs	26h	≤ 120h	≤ 120h	≤ 120h	≤ 120h
	The total number of complaints received about any of the following:* a) drinking water clarity b) drinking water taste c) drinking water odour d) drinking water pressure or flow e) continuity of supply f) MDC response to any of the above	1.4 per 1,000 connected properties	≤ 5 per 1,000 connected properties	≤ 5 per 1,000 connected properties	≤ 5 per 1,000 connected properties	≤ 5 per 1,000 connected properties
	The percentage of ratepayers satisfied with the water supply service	80%	≥ 80%	≥ 80%	≥ 80%	≥ 80%
Provide demand management of water supply services	Average consumption of drinking water per day per resident with the district*	1.6m^3	≤ 1.2m^3	≤ 1.2m^3	≤ 1.2m^3	≤ 1.2m^3

* Mandatory Performance Measure

A2 Wastewater Performance Measures and Targets

Council has suite of performance measures agreed with the community and reported on annually by the Annual Reports. This performance is measured as per contractual requirements and changes in indicators such as increased flooding or maintenance. However Central Government introduced a suite of mandatory performance measures covering Transportation, Three Waters and Flood Control that came into force on 1 July 2014.

These mandatory performance measures have been adopted by Council for inclusion in the 2021-31 Long Term Plan and no other measures will be used.

Table 51 Wastewater performance measures and targets

What you can expect from us	What we will measure	Latest result (2019/20)	Targets: 2021/22	2022/23	2023/24	By 2030/31
Wastewater						
Maintain excellent sewer network services	The number of dry weather sewerage overflows from Council's sewerage system, expressed per 1,000 sewerage connections to that sewerage system*	3.11 per 1,000 connected properties	≤ 2 per 1,000 connected properties	≤ 2 per 1,000 connected properties	≤ 2 per 1,000 connected properties	≤ 2 per 1,000 connected properties
Wastewater is discharged in a safe manner	Compliance with the Council's resource consents for discharge from its sewerage system measured by the number of:					
	a) attendance for urgent call- outs	Nil	Nil	Nil	Nil	Nil
	b) resolution of urgent call-outs	Nil	Nil	Nil	Nil	Nil
	c) attendance for non-urgent call-outs	Nil	Nil	Nil	Nil	Nil
	d) resolution of non-urgent call- outs	Nil	Nil	Nil	Nil	Nil
	received by the Council in relation those resource consents*					
Maintain excellent customer services	Where the Council attends to sewerage overflows resulting from a blockage or other fault in the Council's sewerage system, the following median response times measured:*					
	a) attendance time	2.75h	≤ 1h	≤ 1h	≤ 1h	≤ 1h
	b) resolution time	2.5h	≤ 4h	≤ 4h	≤ 4h	≤ 4h

What you can expect from us	What we will measure	Latest result (2019/20)	Targets: 2021/22	2022/23	2023/24	By 2030/31
	The total number of complaints received about any of the following:* a) sewage odour b) sewerage system faults c) sewerage system blockages, and d) MDC response to issues with its wastewater system.	9.4 per 1,000 connected properties	≤ 50 per 1,000 connected properties	≤ 50 per 1,000 connected properties	≤ 50 per 1,000 connected properties	≤ 50 per 1,000 connected properties
	Satisfaction with wastewater treatment and disposal service.	94%	≥ 85%	≥ 85%	≥ 85%	≥ 85%

* Mandatory Performance Measure
Attendance time: from the time that the Council receives notification to the time that the service personnel reach the site.
Resolution time: from the time that the Council receives notification to the time that service personnel confirm resolution of the fault or interruption

A3 Stormwater Performance Measures and Targets

Council has suite of performance measures agreed with the community and reported on annually by the Annual Reports. This performance is measured as per contractual requirements and changes in indicators such as increased flooding or maintenance. However Central Government introduced a suite of mandatory performance measures covering Transportation, Three Waters and Flood Control that came into force on 1 July 2014.

These mandatory performance measures have been adopted by Council for inclusion in the 2021-31 Long Term Plan and no other measures will be used.

Table 52 Stormwater performance measures and targets

What you can expect from us	What we will measure	Latest result (2019/20)	Targets: 2021/22	2022/23	2023/24	By 2030/31
Stormwater						
Maintain excellent network services	The number of flooding events in the Mackenzie district*	0	≤ 2	≤ 2	≤ 2	≤ 2
	For each flooding event, the number of habitable floors affected (per 1,000 properties connected to the Council's stormwater system)*	0	≤ 2	≤ 2	≤ 2	≤ 2
Stormwater services managed according to required environmental standards	Compliance with the Council's resource consents for discharge from its stormwater system, measured by the number of:*					
	a) abatement notices	Nil	Nil	Nil	Nil	Nil
	b) infringement notices	Nil	Nil	Nil	Nil	Nil
	c) enforcement orders	Nil	Nil	Nil	Nil	Nil
	d) convictions	Nil	Nil	Nil	Nil	Nil
Maintain excellent customer services	The median response time to attend a flooding event*	0	≤ 2h	≤ 2h	≤ 2h	≤ 2h
	The total number of complaints received about the performance of the stormwater system* *expressed per 1,000 connected properties*	1.4	≤ 5	≤ 5	≤ 5	≤ 5
	The percentage of ratepayers satisfied with the stormwater service	80%	≥ 80%	≥ 80%	≥ 80%	≥ 80%

* Mandatory Performance Measure
Response time: from the time that the Council receives notification to the time that service personnel reach the site

A4 Transportation Performance Measures and Targets

Council's key levels of service and performance measures as defined in the 2021-2031 LTP are summarised in the table below. These show how levels of service contribute to the community outcomes and provides a technical measure that enables Council to monitor current levels of service against target levels of service.

Table 53 Transportation performance measures and targets

What you can expect from us	What we will measure	Latest result (2019/20)	Targets:			
			2021/22	2022/23	2023/24	By 2030/31
Council provides safe, smooth, quality sealed roads in order to reduce travel times and vehicle wear.	The average quality of ride on a sealed local road network, measured by smooth travel exposure. *	98.0% for rural and 94.0% for urban roads.	90% for rural and 75% for urban roads.	90% for rural and 75% for urban roads.	90% for rural and 75% for urban roads.	90% for rural and 75% for urban roads.
	The percentage of the sealed local road network that is resurfaced. *	5.84%	≥4%	≥4%	≥4%	≥4%
	The percentage of the unsealed road network renewed using wearing course and stabilisation techniques	5.70%	≥2%	≥2%	≥2%	≥2%
	The percentage of road users are satisfied with the roading network.	78.50%	≥85%	≥85%	≥85%	≥85%
Council provides a safe and efficient roading network	The change from the previous year in number of fatalities and serious crashes on the local road network, expressed as a number.	-2	Change from each previous financial year= 0.(Equates to a total target of ≤2 fatality and serious injury crashes)	Change from each previous financial year= 0.(Equates to a total target of ≤2 fatality and serious injury crashes)	Change from each previous financial year= 0.(Equates to a total target of ≤2 fatality and serious injury crashes)	Change from each previous financial year= 0.(Equates to a total target of ≤2 fatality and serious injury crashes)

What you can expect from us	What we will measure	Latest result (2019/20)	Targets: 2021/22	2022/23	2023/24	By 2030/31
	The number of death and serious injuries recorded for the financial year on local roads under control of the Mackenzie District Council.	N/A (wasn't recorded)	<1 (In line with the road to zero vision)	<1 (In line with the road to zero vision)	<1 (In line with the road to zero vision)	<1 (In line with the road to zero vision)
	The number of reported crashes on local roads under control of the Mackenzie District Council.	N/A (wasn't recorded)	≤10	≤10	≤10	≤10
	The percentage of customer service requests relating to roads and footpaths to which	86%	≥75% of service requests relating to roads and footpaths will be responded to within 10 working days.	≥75% of service requests relating to roads and footpaths will be responded to within 10 working days.	≥75% of service requests relating to roads and footpaths will be responded to within 10 working days.	≥75% of service requests relating to roads and footpaths will be responded to within 10 working days.
Footpaths are maintained in good condition and are fit for purpose	The percentage of footpaths that fall within the level of service or service standard for the condition of footpaths that is set out in the LTP. *	95%	≥75% of the total length of footpaths are at or above the 'average condition rating'. Condition rating will be undertaken at not less than 5 years frequency.	≥75% of the total length of footpaths are at or above the 'average condition rating'. Condition rating will be undertaken at not less than 5 years frequency.	≥75% of the total length of footpaths are at or above the 'average condition rating'. Condition rating will be undertaken at not less than 5 years frequency.	≥75% of the total length of footpaths are at or above the 'average condition rating'. Condition rating will be undertaken at not less than 5 years frequency.

APPENDIX B KEY ASSUMPTIONS

Table 54 Detailed list of LTP assumptions

GROWTH ASSUMPTIONS						
Assumption	Level of Uncertainty *(High/Medium/Low)*			Risk	Impact of variation to assumption	Management of risk
	H	M	L			
Population Growth It is assumed that growth in the district's population will generally be consistent with the medium projections developed for Mackenzie District Council in 2020. These indicate a growth rate of around three percent year on year, with population projections of 6,561 in 2030 and 9,050 in 2050.		✓		Population change occurs within the district at a higher or lower rate than predicted.	A significant, consistent decline in population may adversely affect Council's ability to set rates at a level affordable to the community. A significant, consistent increase in population could adversely affect Council's ability to meet some service levels.	Council will continue to monitor population measures within the district and respond to meet needs where possible.
Demographic Changes Most population growth within the District is expected to be at older ages (55+ years), with the proportion of over 65s living in the district projected to be slightly higher than the NZ average. Twizel and Fairlie have a higher proportion of older people (65+) than other areas in the district and this is not expected to change over the life of the plan. Younger workers (20-30 years) will make up a considerable portion of the population employed in the tourism market.		✓		Demographic changes occur at a higher or lower rate than expected.	Changes to the projected demographics may place pressure on some Council services due to increasing demand, which may lead to a lower level of service in these areas or a requirement for additional investment.	Council will continue to monitor demographic changes within the district and respond to meet needs where possible.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Household Changes It is anticipated that changes to household numbers and composition will generally reflect population projections and forecast changes to demographics (that is, an ageing population). This is not expected to create any significant impact on demand for infrastructure and services, given the relatively small increase in total population projected to occur.		✓		Household changes across the district occur at a higher or lower rate than expected.	A slower rate of household growth may mean that some service activities have overinvested in infrastructure (too much capacity too soon).	Council will continue to monitor household changes within the district. Where rapid growth occurs, this is likely to be within existing subdivisions where servicing provision has already been made or, where growth requires additional infrastructure, developers can be required to meet this demand through the payment of financial contributions.
Dwelling Numbers It is assumed that growth in dwelling numbers will primarily be driven by demand for short-stay visitor and holiday accommodation due to year-on-year increases in both domestic and international visitor numbers to the district. Growth in demand for private holiday accommodation is predicted to have an impact on the availability of residential housing. However, the large proportion of unoccupied dwellings in the district, particularly in Tekapo (60%) and Twizel (52%), is not anticipated to change or increase significantly.		✓		Dwelling changes across the district occur at a higher or lower rate than expected.	A higher or lower rate of dwelling growth may impact on provision of services, such as the issue of resource and building consents.	Council will continue to monitor dwelling growth in the district and adjust provision of supporting services as required.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Distribution of development across the district The pattern of growth will be consistent with the spatial planning used to inform the District Plan Review The pattern of growth will be guided by the next generation district plan which will be operative in 2022. Understanding of the growth pattern will be sufficient for infrastructure planning		✓		Development will be more focused in one area than another Growth will occur at a rate that differs from infrastructure planning and provision	Provision of infrastructure will not align with development	Guide development through the district plan, and track development levels
Tourism Numbers It is assumed that visitor numbers will return to pre-COVID-19 numbers around 2022/23, and from that point visitors to Mackenzie District will be at least equivalent to the growth level experienced pre-COVID-19. It is also assumed growth in domestic visitors to Mackenzie District will be significantly higher than pre-COVID-19 while international travel is limited.	✓			Change to tourism numbers and composition occurs at a rate significantly above or below the growth levels assumed.	Increases in projected visitor numbers may place pressure on supporting services and infrastructure. Conversely, a drop in tourism to the district may mean that service activities have overinvested.	Council will continue to monitor tourism numbers to the country and district and respond to meet needs where possible.
COVID-19 Borders will remain closed to tourists/casual travelers for a further twelve months, at which point limited tourism will resume. From 2021 to 2030 tourism activity will progressively return to 2020 levels	✓			Borders will remain closed for a significant period,	Economic activity and international migration will be limited, affecting population and business growth.	Council will continue to track trends and provide for the wellbeing of the community. Investment will be advanced to support employment and prepare infrastructure for the future.

ECONOMIC AND FINANCIAL ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Economic activity, income levels and affordability It is assumed that there will sufficient economic activity and incomes within the district to support Council activities		✓		Service provision becomes unaffordable	If there is insufficient economic activity and incomes of district residents are businesses are strained, it would be difficult for Council to fund the range of activities it is responsible for	Economic activity is tracked and the funding impact strategy is reviewed in line with the economic circumstances
Inflation To develop a consistent approach for local government to account for inflation, the Society of Local Government Managers (SOLGM) contracted Business and Economic Research Limited (BERL) to construct forecasts for inflation. It is assumed that long term inflation will be consistent with BERL's Local Government Cost Index (LGCI) forecasts.		✓		Inflationary costs in some areas may increase at a rate different to that forecast. Local Government Cost Adjustor Forecasts Three scenarios	If inflation rates are higher than forecast in the financial model this will mean that either additional money will be required, or planned work is reduced to fit the fiscal envelope. If the work is not reduced this could mean using additional reserves, increasing debt or increasing rates.	In preparing the LTP, Council is required to use best estimates in determining the level of costs to be budgeted and to account for the effect of price changes or inflation expected over the ten year period. Council has endorsed the 'mid-scenario' rates produced by BERL (September 2020) as the assumption for accounting for inflation for the preparation of the LTP. Some types of costs (e.g. roading and transport costs) have been subject to fluctuations in recent years, so it is inherently difficult to predict trends with accuracy. However, these costs will be mitigated through the annual plan

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
						process where the annual adjustment can be made.
Interest Rates and Borrowing Borrowing costs are assumed to be as included in Financial Forecasts. Council assumptions on interest rates are based on the Official Cash Rate (OCR) plus an appropriate margin. For the life of the LTP the borrowing rate is assumed to range from 1.7% to 2.4%. That rate will be used for calculating interest rates and will be adjusted annually.		✓		Forecast interest rates are higher or lower than forecast.	The movement in interest rates has a wide ranging effect on the Council. The Council's cash investments have derived interest at the market rates and the Council's internal financing policy bases the interest paid to or charged to individual communities on the Official Cash Rate. The level of works and services rates levied is dependent in part on the interest rate used in Council's internal funding policy.	Any exposure to borrowing interest movement will be managed by a preference for a higher percentage of fixed term rates.
Waka Kotahi (NZTA) Financial Assistance The Long Term Plan assumes that the subsidy from New Zealand Transport Agency will be 51% across all activities for the life of the Long Term Plan, and that these subsidy rates will remain at this		✓		Council's risk is the roading programme may reduce due to a number of factors. These include 1. a further change in subsidy rates and/or size of the programme	The roading programme could be reduced from what is shown, due to limitations on the amount of work NZTA is prepared to financially support. Expenditure may differ in	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
level until the Funding Assistance Rate is reviewed.				in years 4-10. This plan assumes Council will maintain or expand its spend through additional unsubsidised work. 2. the NZTA subsidiseable programme may differ from what has been assumed, which may impact the Council's spend in future years..	any year from that forecast. If Council wanted to continue its roading programme, other funding sources such as rates would need to be utilised.	
Dividends received – Alpine Energy Ltd It has been forecast that the dividend based on Council's shareholding will be $123,000 per year. This value could change from year to year based on Alpine Energy decisions.		✓		The dividend could be less than that anticipated,	A lower dividend would reduce this funding source, meaning greater reliance on other revenue sources or reduction in expenditure.	While a level of funding is expected, the financial strategy will consider if this revenue stream is lost
Development and Financial Contributions Costs associated with growth will be partially funded through development and/or financial contributions	✓			Council does not recoup costs associated with meeting infrastructure costs associated with growth	The ability to fund infrastructure costs will fall on ratepayers alone.	Council will review its Development Contributions and Financial Contributions policy as part of the Long Term Plan/Infrastructure Strategy process.
Waste levy The waste levy will be progressively increased to $60/tonne, at the same time opportunity to receive funding for waste			✓	That the cost and revenue associated with the change is inappropriate	That increased waste levy costs will discourage responsible disposal of	Sufficient explanation to the community about the costs and benefits

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
minimisation education and initiatives will increase					waste, and illegal dumping will increase That funding of programmes will not be available for waste minimisation education and initiatives in Mackenzie district.	
Sale or Transfer of Assets It is assumed throughout this plan that we will retain ownership of our significant assets and continue with the current Council Departments.		✓		That the objectives whether financial or non-financial of holding strategic assets are not achieved.	Should specified returns not be attainable, we would review our investment. Such a review may have a financial impact.	Any decision to sell or partially sell would be significant. A proposal with options would be provided to the community for feedback as part of a special consultation process.
Sources of Funds for the Future Replacement of Assets It is assumed that funding for the replacement of existing assets will be obtained from the appropriate sources as detailed in Council's Revenue and Financing Policy.		✓		A particular funding source is not available.	Depreciation funds renewals funded mainly through rates and user charges. Should other sources of capital funding such as subsidies or development / financial contributions differ from levels forecast in a particular activity, Council is able to access	

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
					borrowings through its central treasury function.	
Timing & Level of Capital Expenditure The Long Term Plan assumes that the timing and cost of capital projects and associated operating costs are as determined through the Council's activity management planning process.	✓			There is a risk that capital projects may not occur as planned, or actual costs may vary from the forecast therefore may have an impact on the costs. Transport projects seeking subsidy will need a Business Case approach to NZTA which may change originally anticipated outcomes.	If projects do not occur as planned, capital expenditure may differ from forecast. Delays may change the cost of individual projects and defer planned borrowing. This will impact on rates increases. Delayed renewals could lead to an increase in maintenance costs. Any significant delay will have a negative Impact on the delivery of future capital programme due to a limited number of resources Council has available to deploy in any one year.	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes. High level of vigilance over capital delivery to Executive level, resulting in timely corrective actions if required Regular reporting to Council on the programme so Council has full visibility of programme, milestones, and tracking Programme is prioritized by vulnerability and criticality to ensure projects that would lead to loss of service or additional costs are top of the list Regular market assessments undertaken including critical supply chains to ensure programme is realistic and deliverable Council have the ability to value engineer the project if it exceeds estimates. In addition, the Council has contracted external project managers to oversee the programme and project management and delivery of key 3 Water projects.

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Asset Revaluations Council has a policy of revaluing its buildings, land and infrastructural assets on a three yearly basis. The LTP assumes that the book values of the relevant assets as at the revaluation dates will be increased by inflation rates as per the inflation assumption.			✓	Inflationary costs in some areas may be different from that forecast. The condition of the assets may be different to that assumed and the value of the asset may differ accordingly.	There may be a higher or lower asset value and a lower or higher depreciation charge.	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes.
Planning Horizons and Asset Lifecycles It is assumed that the planning horizon for growth (30-45 years) and asset lifecycles (30 years plus) are sufficient to inform the ten year forecasts included in the LTP.			✓	The planning horizon for growth and asset life services differ from that assumed.	There is insufficient planning to guide decision making and investment	LTP and IS are thoroughly developed relevant to District issues
Useful Lives of Assets The useful lives of assets have been assumed as set out in the following table, which matches the depreciation policy under the Statement of Accounting Policies:		✓		Assets last longer than the lives assumed, or assets deteriorate at a faster rate that the lives assumed.	Assets require replacement earlier or later in their life cycle.	Ongoing assessment of the quality of assets means this information is updated regularly and work programmes adjusted to minimise the chance of asset failure. In the event of assets wearing out earlier than anticipated, capital projects could be brought forward. This may affect borrowing and depreciation expenses. Negative impacts are likely to be at least partially offset by some assets lasting longer than estimated. Mitigation may also involve reprioritisation of the capital expenditure programme.

Assets	Depreciation method	Life (years)
Buildings	Straight line	13-80
Computer hardware	Straight line	3-10
Computer network cabling	Straight line	10
Furniture and fittings	Straight line	10
Heritage assets	Straight line	60-150
Land	Not depreciated	-
Motor vehicles	Straight line	5
Office equipment	Straight line	5-10
Light plant and machinery	Straight line	10-25
Plant and machinery	Straight line	10-25
Resource recovery parks	Straight line	10-33
Flood protection and control works	Not applicable	-
Landfills	Straight line	30-50
Village projects	Straight line	5-80

Assets	Depreciation method	Life (years)
Alps 2 Ocean cycleway	Straight line	50
Formation	Not depreciated	-
Surfacing	Straight line	0-17
Land under roads	Not depreciated	-
Roads and footpaths	Straight line	6-80
Formation	Not depreciated	-
Sub-base	Not depreciated	-
Base course	Straight line	75-100
Surfacing	Straight line	0-17
Kerb and channelling	Straight line	10-10
Street signs	Straight line	13
Street lighting	Straight line	20-40
Bridges	Straight line	80-100
Resource consents	Straight line	10-33

Assets	Depreciation method	Life (years)
Stormwater		
Lines	Straight line	60-150
Manholes	Straight line	150
Open drains	Not depreciated	-
Wastewater		
Mains	Straight line	60-80
Pumps	Straight line	15
Oxidation ponds	Not depreciated	-
Box culverts	Straight line	100
Manholes	Straight line	80

Assets	Depreciation method	Life (years)
Water supplies		
Piping mains	Straight line	60-80
Pumps	Straight line	25
Service lines	Straight line	80-100
Hydrants	Straight line	80
Valves and air valves	Straight line	80
Meters	Straight line	25
Reservoirs	Straight line	80

GOVERNMENT, LEGISLATION AND REGULATION ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
Legislative Change and Regulatory Reform As an organisation that is created and derives its powers from statute, changes to legislation have a direct impact on the way we conduct our business. The speed and scale of legislation review depends largely on the policy direction and priorities of the government of the day. Reform of the Resource Management Act 1991 will proceed in 2021-22. A new legislative framework will include the Natural and Built Environments Act, the Climate Change Adaptation Act, and the Strategic Planning Act. The Strategic Planning Act is intended to integrate functions under the RMA, Local Government Act 2002, Land Transport Management Act 2003 and the Climate Change Response Act 2002 so changes are also expected with those Acts. It also assumes the Council		✓		The impact of government legislation is more or less than expected. New legislation is enacted that alters the activities Council undertakes or provides.	Unrealised impacts of legislative changes may create greater impacts on Council operations, including operating budgets, workloads, time and resource availability. These pressures may lead to additional costs for ratepayers. Where legislative changes require Council to provide additional services or increased levels of services, this may impact fees and charges for cost-recovery activities.	Most changes to legislation are known in advance, giving councils the ability to prepare for implementation. Council will monitor existing and potential legislative changes as they move through parliamentary process. Where appropriate, Council will submit on legislation to encourage reduced or improved impacts on Council operations and limit costs to ratepayers. Historical trends have been for services transferred from central government to local government. The cost and impact on our activities as a result of future legislative changes cannot be quantified at this stage as it would be dependent on the specific services affected by the legislative change. Financial uncertainty in this area would generally impact the cost of introducing changes, and the

Assumption	Level of Uncertainty (High/Medium/Low) H	M	L	Risk	Impact of variation to assumption	Management of risk
will remain an independent unit of local government during the next 10 years.						mechanisms required to fund any new services.
Legislation Reform – Water Services While it is assumed that that there will be change to the ownership and delivery of Three Waters in the next ten years, Council is not able to predict with absolute certainty what those changes will be. It is unlikely that details will be known earlier than mid-to-late 2021. This LTP has been developed on a business-as- usual basis for the delivery of Three Waters; but the change is very likely to occur over the mid-term (3-5 years). The replacement value of all Three Waters assets total $90.7 million (as of 30 June 2020). Planned capital projects will be valued at $52.6 m at the end of the LTP. The major capital projects are the $4.8m sewerage reticulation upgrade and $18.1m waste water treatment plant upgrade. In addition currently underway we have $7.4m	✓			Legislation changes under urgency in parliament that must be implemented and transitioned to over a period of time	Changes are required to be implemented more quickly than anticipated and the changes are mandatory rather than voluntary.	Council closely monitors any and all developments, and responds accordingly

Assumption	Level of Uncertainty (High/Medium/Low) H	M	L	Risk	Impact of variation to assumption	Management of risk
water treatment projects underway (20/21 and 21/22).[13]						
Resource Consents It is assumed that the conditions of resource consents held by Council will not be changed significantly and that the Council will be able to renew and obtain the necessary resource consents for its planned projects.		✓		Resource consents are changed through reviews, or applications for Council projects are not approved or have significant compliance or monitoring costs.	Projects will cost more if compliance requirements are significant, or may not proceed as planned if consents are not obtained.	The Council will consider the impact of any change as part of the annual budget process and consider the funding implications of any cost changes.

ENVIRONMENT ASSUMPTIONS

Assumption	Level of Uncertainty (High/Medium/Low) H	M	L	Risk	Impact of variation to assumption	Management of risk
Climate Change Climate change is already impacting how our communities live and function and these impacts are expected to increase in magnitude and extent over time. Impacts include increases to mean temperature, with		✓		There is a risk that climate change effects are not understood and appropriate action taken. There is a risk that Council actions will not be consistent with community opinion.	If climate change happens more quickly or in a different way to that projected; Council may need to carry out work on its infrastructure assets. Council's business units may not recognise climate change in the delivery of their services. Decisions	Climate change assumptions are factored into Council strategies and plans including the District Plan Review and Infrastructure Strategy. Council activities will build appropriate mitigation responses into resilient infrastructure development including the improved water storage in Fairlie, water metering, the establishment of

[13] All values are inflated values

Assumption	Level of Uncertainty (High/Medium/Low) H	M	L	Risk	Impact of variation to assumption	Management of risk
corresponding reductions in snow and frost days. We anticipate an increase in the frequency and severity of extreme weather events.					made now without this consideration may have intergenerational effects on land use decisions, environmental policy and infrastructure decisions e.g. relying on undersized assets and resources in highly vulnerable areas.	the emergency operations centre reserve fund and Council's risk management work through the Canterbury Emergency Management Group. Council will continue to monitor climate change science and the response of central government and adapt its response where required.
Natural Hazards / Local Natural Disasters The district is at risk from natural hazards such as flooding, earthquake, and storms. These events can occur at any time, without warning. It assumed that there will be no major adverse events during the period covered by this Long Term Plan beyond Council, Regional and National capabilities. While events may occur at any time, Council's planning will focus on operational resilience and Emergency Management.	✓			A major adverse event occurs resulting in a significant impact on the district and Council's services.	A disaster has the potential to cause significant, unbudgeted impact on the Council and the community. In the event of a major disaster, Council has assumed additional central government support will be forthcoming. Council would need to borrow additional funds to make repairs and meet the costs of restoration	Council seeks to mitigate this risk through its Civil Defence, Risk Management and Insurance Policies. Council keeps appropriate levels of cash reserves ($3.0m) and sufficient head room in its borrowings to enable it to undertake any repairs on its underground assets. Central government has a role in disaster recovery after a natural disaster. Council will progressively build a reserve to fund the local share of Emergency Works applications to NZTA
Civil Defence and Emergency Management		✓		CDEM structures and planning are not	The response to an event would not be suitable	Ongoing involvement in CDEM planning and governance

Assumption	Level of Uncertainty (High/Medium/Low) H	M	L	Risk	Impact of variation to assumption	Management of risk
CDEM functions will continue to be provided across the district, via the Canterbury Regional Group				appropriate for application to Mackenzie		
Insurance Council will hold a reserve fund of at least $3 million to respond to emergencies and that this will be adequate for immediate requirements			✓	A major event will have significant financial implications that are beyond Council's ability to fund	It is assumed this will be adequate to meet the portion Council needs to fund – this is highly variable	A review is proposed on the insurance of assets and the suitability of a reserve fund as 'self-insurance'
Earthquake prone buildings There are no earthquake prone buildings affecting strategic transport routes. There are no unknown earthquake risks associated with Council owned buildings. Council's building control responsibilities can be delivered through normal management and operational processes			✓	Actions required by Council have not been allowed for	Processes are required, that would put additional workload on staff	Actions assigned to staff

LEVELS OF SERVICE AND SERVICE DELIVERY ASSUMPTIONS

Assumption	Level of Uncertainty (High/Medium/Low)	Risk	Impact of variation to assumption	Management of risk

	H	M	L			
Level of Service It is assumed the level of service expectations of the community will remain similar to current level, or change progressively over time.		✓		That there is a rapid change in expectations	Service provision may not be able to be adapted quickly to meet changes	On going customer satisfaction assessment is undertaken and consultation over service levels occurs through the LTP and Annual Plan processes
Service Delivery Modes & Contracts It is assumed that there will be no significant changes to current modes of service delivery for each service area or variations in terms of contract prices (above inflation and inventory adjustments) for current operations and maintenance contracts. Council will continue to consider collaboration opportunities and assess changes to service delivery on a case by case basis.			✓	Maintenance contracts may be re-tendered during the plan period. If maintenance and service contracts are consolidated and/or re-tendered there is a possibility contract prices will be higher than anticipated.	This would require Council to either increase rates and/or operating revenue if efficiencies cannot be found or it may consider reducing levels of service.	

OTHER ASSUMPTIONS

Assumption	Level of Uncertainty *(High/Medium/Low)* H	M	L	Risk	Impact of variation to assumption	Management of risk
New Technologies There will be no new technologies deployed within the period covered by the Long Term Plan that will significantly change the demand for or provision of services.			✓	Technologies may become available which significantly change the demand for or provision of services.	Inefficient of ineffective provision of services in the traditional manner when other alternatives maybe available.	Council will regularly monitor existing and proposed technologies as they relate to service provision.
Collaboration and Shared Services Opportunities for joint initiatives will continue to be explored (e.g. Waste Management Service Delivery, Aoraki Roading Collaboration, Water Services review). District and Community Board Autonomy will remain similar to the current level.	✓			Council is not sufficiently represented in decision making	Council is unable to provide services that are fit for purpose or efficiently	Council will engage in and commit to combined initiatives for the benefit of Mackenzie residents.
Te Rūnanga o Ngāi Tahu and ngā papatipu rūnanga Council has established and enduring relationships with Te Rūnanga o Ngāi Tahu (TRoNT) and the three papatipu rūnanga whose rōhe (area) include the Mackenzie District: Te Rūnanga o Arowhenua, Te Rūnanga o Waihao, and Te Rūnanga o Moeraki.			✓	Engagement and consultation is not effective and appropriate for the relationships	Decision making does not include Maori as required under legislation; or as is appropriate for the wider Mackenzie community	There is ongoing dialog with Te Rūnanga o Ngāi Tahu and ngā papatipu Rūnanga

Mackenzie

DISTRICT COUNCIL

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