PART D: Infrastructure Strategy 2021-2051

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1. Infrastructure overview

1.1 Our infrastructure

Grey District Council owns and manages $502 million of infrastructure assets *(Replacement Cost – 2020 valuation)*.

Council is responsible for the management of the roading network, networks and associated infrastructure for water, wastewater and stormwater, the Port, one aerodrome situated in Blaketown and eight public car parks in Greymouth.

The Port, Aerodrome and car parks are not deemed to be significant infrastructure and therefore are not included in this Strategy.

Infrastructure breakdown

Water	Two separate water schemes * 208km pipes Nine reservoirs 12 pump stations Delivering over 2.6 billion of litres of water a year to 5,140 businesses and households
Wastewater	Six wastewater schemes and treatment plants 39 pumping stations 182km pipes Servicing 5,512 properties
Stormwater	Five pump stations 132km urban stormwater pipes
Land Transport	648km road (62% sealed) 106.8km footpaths 209 bridges and large culverts (over 3.4 square metres in area) Port Aerodrome

* Note: While the Runanga water supply has been upgraded, it has not been commissioned and that community is currently connected to the Greymouth water supply. A decision to proceed has been deferred pending the outcome of the Three Waters reform.

This Infrastructure Strategy (IS) as part of the Long Term Plan (LTP) and provides a 30 year view of potential strategic issues and options in relation to these services and outlines a 30 year view of expenditure requirements.

Table D-1: Grey District Council's infrastructure value (Replacement Cost – 2020 valuation) M = millions

Water Supplies	$65.8M	13.1%
Wastewater	$93.3M	18.6%
Stormwater	$89.4M	17.8%
Land Transport	$253.4M	50.5%

The total depreciated replacement value of these assets is $298 million and annual total depreciate is $7.6 million.

1.2 Current position

Council has outlaid a significant amount of capital expenditure in recent years, over $144 million since 2006. We have had to bring our wastewater schemes up to modern day compliance requirements, ensure our water supplies meet NZ Drinking Water Standards and have created new community assets such as swimming pools, gym and stadium and Town Square in our CBD. A summary of the larger projects include:

Aquatic Centre	$10 million *(subsidies and donations received)*
Westland Recreation Centre	$11 million *(mostly funded through fundraising and subsidies)*
Wastewater treatment plants	$43 million with work ongoing for the Greymouth scheme *(subsidies received of varying levels for individual schemes)*
Water supply upgrades	$6 million with work ongoing for a new Kaiata supply *(subsidies received of varying levels for individual schemes)*

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Town Square and Tainui Shared Street	$1.9 million *(subsidies received of $1M)*
Croesus Road upgrade	$2.7 million *(funded from a PGF subsidy)*

Because Council had prioritised spending on new infrastructure in recent years, hard decisions had to be made on what was spent in other areas to ensure that we could continue to provide our services without passing on unaffordable rates increases to the community. As is often the case in large businesses and organisations, this prioritisation included deferring the issue of addressing the funding of required renewals in the future.

However, this has only ever been a short term solution as the renewal requirements continue to accumulate, leading to what is known as deferred renewals (also commonly called renewals backlog). With the large new infrastructure spending mostly complete, Council began focussing on addressing deferred renewals as part of the last long term plan and will continue to do so as part of this long term plan.

What are deferred renewals?

Council assets, like any asset, have a specific useful life. The useful life of assets are calculated using a combination of:

- Industry best practice
- Our own previous experience of using the same or similar assets
- Specific environmental conditions where the asset is located which may extend or reduce the useful life
- Amount of use
- Type of use, this is particularly relevant where changes in demand or some other change (e.g. truck loading) decrease the useful life.

Once an asset has reached the end of its useful life, then it is expected that it will require replacement (renewal) if Council is going to continue to provide that service. If we use the asset beyond the end of the useful life, then this is known as deferred renewal (also commonly referred to as renewal backlog or renewal deficit).

Our asset information and useful lives are based on the best information we have to hand and Council has made reasonable progress in recent years increasing the quality and reliability of the information. Understandably however, a useful life is never going to be an exact science (measure) for each asset. Some may not last as long; others will last longer. In addition to this, there are areas of the asset database where assumptions and estimates are applied, which introduces uncertainty in some areas.

It is fair to say however that when an asset fails before the end of its planned useful life, this is unexpected and not an ordinary occurrence. An asset that fails when in use beyond its planned useful life could not be considered unexpected. Continuing to use assets beyond their assessed useful life represents a risk to the Council and community that these assets may fail. Long-term deferring of asset renewals can lead to more breakdowns and service disruption, substandard services and, in the end, failure of services

Why do deferred renewals happen?

Deferring expenditure has become a part of business for many organisations, particular those with tight budgetary constraints. Local authorities in rural areas are regularly faced with tough decisions about maintaining networks of assets as populations decline. Not all assets can be easily relocated or used for a different purpose, eg water. When budget constraints are necessary, deferring renewals is usually the first option considered.

However, in the case of Councils, we also have an obligation to maintain our infrastructure as failure to do so could result in a significant health risk for our community and could have adverse effects on our reputation with businesses and the community.

Why hasn't Council addressed this earlier?

Over previous years Council has been 'sweating its assets' (a term used to describe a way of extending the use of an asset beyond its useful life) in the interests of keeping rates rises down and using funds to complete other prioritised and expensive capital projects. This approach increases the risk of unexpected disruptions to service delivery.

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Confidence ratings

We commissioned external providers to evaluate our infrastructure assets and provide confidence ratings. These are outlined below and have been useful in allowing us to prioritise funding to where it is most needed.

Three waters

Provided by WSP NZ Ltd

4.2 CONFIDENCE RATINGS

Confidence ratings have been assigned to the source data, unit cost rates and to other items as appropriate. The confidence ratings used are summarised below:

Table 4.2 Confidence Ratings

Grade	Label	Description	Accuracy
A	Highly Reliable	Data based on sound records and recognised as the best method of assessment	±5-10%
B	Reliable	Large portion of data based on sound records but has minor shortcomings (e.g. old data, some missing documentation, reliance placed on unconfirmed reports and extrapolations)	±10-15%
C	Uncertain	Significant data incomplete, unsupported or extrapolated from a limited sample.	±15-25%
D	Very uncertain	Data based on unconfirmed verbal reports, cursory inspection and judgement of experienced person.	±25-40%

Source: *Grading and Description are based on Table 3.5.3 of the 'International Infrastructure Management Manual - 2011*

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	Description	Replacement Cost	Depreciated Value	Annual Depreciations	Accumulated Depreciations	Overall Confidence Rating
Stormwater	**Stormwater**	**89,385,364**	**40,331,855**	**1,032,053**	**49,053,509**	B
sw_line	Pipelines	74,184,940	33,623,824	820,295	40,561,115	
sw_plant	Structures, pumps, electrical	1,848,828	896,630	38,938	952,198	
sw_point	Service chambers, connections	13,351,597	5,811,401	172,820	7,540,196	
Wastewater	**Wastewater**	**93,330,534**	**69,481,233**	**1,343,033**	**23,849,301**	
ww_line	Pipelines	61,210,687	45,255,181	666,571	15,955,506	
ww_plant	Structures, pumps, electrical	23,311,421	18,048,041	568,060	5,263,380	
ww_point	Service chambers, connections	8,808,425	6,178,010	108,402	2,630,415	
Water Supplies	**Water Supplies**	**65,843,368**	**34,671,951**	**996,880**	**31,171,417**	
ws_line	Pipelines	47,090,124	26,187,220	592,913	20,902,904	
ws_plant	Structures, pumps, electrical	13,234,382	6,190,259	246,486	7,044,123	
ws_point	Service chambers, connections	5,518,862	2,294,472	157,481	3,224,390	
Grand Total		**248,559,266**	**144,485,038**	**3,371,966**	**104,074,227**	
						By WSP

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	Cost Rate	Quantity	Total Life	Remaining Life	Current Value	Cost Rate	Quantity	Total Life	Remaining Life	Current Value	Justification
Stormwater	B	B-C	B	B-C	B						
sw_line						B	B	B	C	B	Condition assessments
sw_plant						B	B	B	B	B	Annual inspections
sw_point						B	B	B	C	B	Condition assessments
Wastewater	B	B-C	B	B-C	B						
ww_line						B	A	B	B	B	Newer assets and condition assessments
ww_plant						B	A	B	B	B	Annual inspections
ww_point						B	A	B	B	B	Newer assets and condition assessments
Water Supplies	B	B-C	B	B-C	B						
ws_line						B	A	B	C	B	Condition assessments
ws_plant						B	A	B	B	B	Structures, upgraded, renewed in recent times, Annual inspections
ws_point						B	A	B	C	B	Condition assessments
Grand Total											
	By WSP	**By WSP**	**By WSP**	**By WSP**	**By WSP**	**By GDC**	**By GDC**	**By GDC**	**By GDC**	**By GDC**	

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Land Transport

Provided by Stantec

Based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0, Table 4.3.1: Data confidence grading system:

A	**Highly Reliable**	Data based on sound records, procedure, investigation, and analysis which is properly documented and recognised as the best method of assessment.
B	**Reliable**	Data based on sound records, procedures, investigation, and analysis which is properly documented but has minor shortcomings.
C	**Uncertain**	Data based on sound records, procedures, investigation, and analysis which is incomplete or unsupported, or extrapolation from limited sample for which grade A or B data is available.
D	**Very Uncertain**	Data based on unconfirmed verbal report and/or cursory inspection and analysis.

Asset Description	Confidence	Comments
Formation	B – Reliable	Assumed depths
Sealed Pavement Surface	A - Highly Reliable	No assumptions made.
Sealed Pavements	B – Reliable	Assumed depths, pavement ages
Unsealed Pavements	B – Reliable	Assumed depths, pavement ages
Drainage	B – Reliable	Some assumed construction ages
Surface Water Channel	B – Reliable	Some assumed construction ages
Footpath	B – Reliable	Some assumed construction ages
Traffic Facilities Signs	B – Reliable	Some assumed construction ages
Traffic Facilities Retaining Walls	B – Reliable	Contained in both minor structure as well as retaining wall tables.
Traffic Facilities Railings	B – Reliable	Some assumed construction ages
Traffic Facilities Markings	B – Reliable	Some assumed construction ages
Traffic Facilities Islands	C- Uncertain	Utilised Assetfinda Data from 2017 valuation
Traffic Facilities EMP's	C-Uncertain	Utilised Assetfinda Data from 2017 valuation
Streetlights	B – Reliable	LED register provided by Council
Bridges and Bridge Culverts	B – Reliable	Footbridge Register provided by Council

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What are we going to do about the renewals backlog?

Council has known for some time that there is likely to be a renewals backlog but didn't have accurate data about the actual condition of our assets. A key focus of the 2015-2025 LTP was to try and gain a better understanding of the actual condition of our infrastructure. Council has undertaken a considerable amount of work carrying out 'condition assessments' in recent years of our underground and above ground assets. These condition assessments give us a greater understanding on how long we can expect the assets to serve their purpose (ie useful life) and greater certainty/comfort that the information relied on for planning purposes is accurate and appropriate.

It should be noted that underground assets present their own challenges in assessing condition and obtaining reliable data is often costly. Without digging up these assets, there will always be an element of uncertainty, which can influence how well asset maintenance can be planned. Even above ground assets such as bridges can present some inspection challenges. Although we already had asset management plans and infrastructure databases and managed them actively, "we only know what we know" and much of the previous information we had before the condition assessments were carried out was unreliable or non-existent. The process of gathering information is ongoing, with an increased emphasis in this LTP on land transport assets.

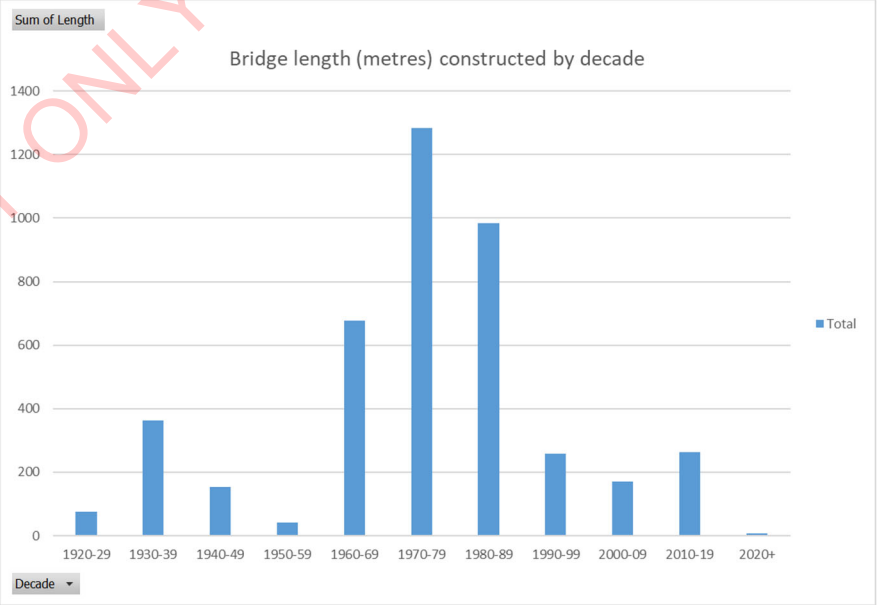
The outcome of the condition assessments confirmed that we face deferred renewals in the Water Supply, Wastewater, Stormwater and Land Transport activities, some of them significant.

With improved information on the condition of its assets, Council increased funding as part of the 2018-2028 LTP to allow for an increased rate of renewal of our infrastructure to ensure we continue to provide good quality and reliable services to our community. Using the information from our condition assessments, we intend to continue to plan to:

- Prioritise the most critical areas requiring replacement; and
- Consider the most appropriate solutions for replacing/renewing (eg maybe a pipe can be relined rather than replaced in its entirety or key components of a bridge can be replaced without replacing the entire bridge).

When assets will require renewal/replacement is determined by the original install date plus its useful life. Because historically there have been periods of more intensive infrastructure development (eg post Second World War, 1960's/1970's high growth era), the total value of assets reaching their end of useful life varies from year to year and generation to generation. Some years there may be a large volume; other years not so much. For example, a large number of new road bridges were built in the Grey District in the 1960's/1970's. We therefore have a relatively large portion of the bridges well through their useful lives in a short period. The following graph illustrates the total length of bridges constructed by decade that are still in use in the Grey District. Note the peak in the 1930's (all of which are nearing the end of their intended useful life) and then subsequent peaks in the 1960's, 1970's and 1980's. Compounding an increasing condition issue, is within the last ten years legal truck loading limits have been increased from the former Class 1 (44 tonnes) to higher limits.

Figure D-2: Bridge length (metres) constructed by decade



This trend is typical across all of our infrastructure assets, and we go in to more detail on this below.

These 'infrastructure renewal waves' represent a large challenge for the Council as the requirement to maintain current levels of service by maintaining and replacing assets needs to be balanced with the community's ability to pay. Council may have to consider borrowing money to 'smooth' the impact of large infrastructure renewals. Please refer to our Financial Strategy for more information.

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What are the implications of not starting to address deferred renewals now?

Not addressing deferred renewals has serious implications, including running the risk of breakdowns, service disruption, extra costs for ongoing maintenance and potentially total failure of our services.

We are fully aware that finding the balance between funding and required maintenance is incredibly challenging. The data obtained from the condition assessments means we have the information we need to accurately and reliably plot the useful lives of our assets. We undertook a moderate funding increase towards starting to address deferred renewals as part of the 2018-2028 LTP and this LTP further prioritises those areas requiring the most attention, with extra funding to be assigned. It is important that we find the appropriate balance between budgets and the maintenance and renewals that are required, as well as looking after our assets correctly now and into the future.

How will this be funded?

We are planning continue to increase rate funding on a year by year basis to address deferred renewals in Stormwater, (from Year 2), Land Transport, Water Supply (after Year 3) and Wastewater (after year 7) activities.. Council has prioritised stormwater as the area requiring the most funding at present, so one off borrowing will be used in years one and two to expand capacity and addresses urgent works with an increase from year two in renewals funding to a level that prevents the deferred renewals increasing over the life of the plan..

We note that this approach will still carry some risk to Council and the community, i.e. higher ongoing maintenance costs and risk of asset failure, but believe this is a prudent approach. Once the level of required stormwater renewals have decreased, Council will be able to widen its focus to other areas.

Refer to the relevant sections for the Water Supply, Wastewater, Stormwater and Land Transport activities for more information.

1.3 Land Transport overview

In terms of value, the road network represents over half of our infrastructure. This activity includes the road surface, footpaths and bridges.

Key issues facing this activity

Bridges and large culverts	Some of our bridges are nearing the end of their recommended useful life and we need to start planning for the necessary renewals/replacements. We also need to take into account works or replacements required for seismic reasons or to increase load capacity for heavier legal truck loading. Climate change will also affect decisions with respect to the location and size of assets. Flood capacity in many cases needs to be considered now for future increases given these assets are in service for up to 100 years. Fish passage requirements means particularly where culvert options are being considered for renewals, providing sizes bigger than hydrological minimums to replicate natural stream beds.
Road Surfaces	We currently do not renew our road surfaces (ie resealing) as often as recommended/suggested by industry best-practice. This has contributed to a backlog in roads required to be resurfaced.
Footpaths	The condition of footpaths in the District are often a key issue for our community especially with an increasing aged demographic.. With assistance from Waka Kotahi – NZ Transport Agency (NZTA), Council has significantly increased maintenance and renewal of footpaths, however the situation needs to be continued to be monitored to see if there is an improvement in community expectations.
Speed Management	Part of the Road to Zero 2020-30 Government road safety strategy which aims to review safe speed limits on all roads in NZ.
Climate Change	Over the term of this plan climate change is likely to continue to affect the location and capacity of infrastructure. Area presently affected are Rapahoe and the southern end of Cobden. See also comments under Bridges and large culverts. Further research is being carried out in the near future which will inform future infrastructure strategies.

Plan for the future

- Council plans to maintain existing levels of service with regards to the Land Transport activity and does not envisage any increases in the service it provides, with the following exceptions:
  - Seismic strengthening of bridges.
  - Strengthening or replacing bridges to cater for 50MAX/ high productivity motor vehicles (HPMVs).

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  - Increasing the flood carrying capacity of bridges and culverts at the time of replacement to cater for climate change.
  - Provision for fish passage for culvert renewals.
  - Considering relocation, protection, or abandonment of assets relating to this activity where there are no alternatives to cater for climate change. Responses to this issue will form part of wider work being undertaken at a regional level, and will include Council and other agencies being part of collaborative conversations with affected communities, as private and public land is affected.
- Condition and service level renewals will start to be addressed on bridges (renewals or replacements for structures that are nearing the end of their service life) with data from condition and posting assessments used to prioritise renewal works to where the most critical need is.
- Start applying additional funding towards surface renewals from year 1.
- We will continue to carry out our current level of footpath renewals, which have been increased by 36% from the previous LTP, with works prioritised to areas deemed as having the most critical need. Overall increase in funding for maintenance and renewal of footpaths has increased by 71% from the previous LTP.
- Speed management may result on lower speed limits on local roads, however Council's focus on maintaining levels of service relate to road safety, that is prevention or avoidance of crashes, injuries and deaths.
- Increase funding to improve asset management and planning including obtaining data particularly on the age and condition of assets such as smaller culverts, kerb and channel, traffic facilities and footpaths.

Funding

We are planning on increasing rates input into this activity to address the above key issues.

The increased funding and borrowing in years three and four of the plan will initially be allocated towards condition based renewals in bridges and increased funding towards road/street surface renewals from year one.

It should be noted that Council receives financial assistance from the New Zealand Transport Agency (Waka Kotahi - NZTA) for certain types of works. Bridge renewals or replacements receive a subsidy from Waka Kotahi - NZTA which since the last LTP now includes footpath renewals. This subsidy rate for Waka Kotahi has increased from 58% to 63% from 2022. It makes financial sense for Council and is more beneficial to the community for money to be targeted towards projects which receive the highest subsidy, thus generating more money to invest in land transport infrastructure.

Please refer to PART D: Section 4 – Land Transport for full details on this activity.

1.4 Water Supply overview

There has been significant investment in the water supply network over the last decade. Upgrades to treatment facilities have been carried out with the aim of meeting the NZ Drinking Water Standards.

Key issues facing this activity

The Government is presently working with all Councils through a significant review of how the Three Waters (drinking water, wastewater and stormwater) services are delivered to our communities. A number of changes are likely to occur to water supply service delivery and regulation over the term of the LTP, as a result of the review.

From 2022 onwards, there is likely to be a new regional entity responsible for delivering water supply services in the Grey District and wider region. At the time of preparing this Strategy however, there is no specific proposal or format for any new entity around which community consultation can take place. It has not yet been determined if Council will continue to have a role in the stewardship and supply of water supply services. The approach that we have taken is to identify the key issues for the future, regardless of which agency is responsible.

Deferred renewals	We have carried out condition assessments on our water supply network and information to hand confirms we have deferred renewals which need to be addressed. Addressing deferred renewals also has the added benefit of addressing high leakage rates.

Plan for the future

- Treatment plant upgrades were completed with the last LTP. The main focus over the next 30 years is expected to be on maintaining and renewing the existing water infrastructure to meet current drinking water standards. The exception is while the Runanga water supply has been upgraded, it has not been commissioned. A decision to proceed has been deferred pending the outcome of the Three Waters reform.
- Deferred renewals will start to be addressed from year three onwards, with data from condition assessments used to prioritise renewal works to where the most critical need is.

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- Council intends to continue with its focus on leak detection and repair for water supplies, which will provide a better level of service to consumers and reduce wastage.
- If deemed necessary, carry out Stage II treatment for the Greymouth water supply. This would be considered necessary if we no longer comply with requirements set by the Ministry of Health. The situation is being closely monitored and as it is not an issue at present, it has not been included in the LTP.
- Upgrades and replacement of our supervisory control and data acquisition (SCADA) control and monitoring systems, is also planned over the first 10 years of the strategy. Continuous supply and monitoring of data to measure the quantity and quality of water supply indicators essentially cannot be achieved without such a system in place.
- Monitoring in years 1 to 3 and if required management of chlorine residuals commencing in Year 4 at $100,000 per year
- In addition, increase the capacity of the Greymouth Reservoirs to at least meet the New Zealand fire fighting standard.
- Consider new options for demand management for water supply use within the first three years of the strategy. Indications are that as well as high leakage losses, actual water use by consumers is significantly higher than average consumer use in NZ. This work is part of ongoing implementation of recommendations from the 2016 Greater Greymouth Water Supply Master Plan, which focuses on demand management and options for addressing the issues identified.
- Consider relocation, protection or abandonment of assets relating to this activity where there are no alternatives to cater for climate change. Responses to this issue will form part of wider work being undertaken at a regional level, and will include Council and other agencies being part of collaborative conversations with affected communities, as private and public land is affected.
- Investigate the feasibility of extending water supply and waste water collection services to Gladstone – Camerons area.
- Extending the existing Greymouth water supply to Kaiata is underway during the preparation period for the plan and is expected to be completed by 30 June 2021.
- While the Three Waters Reform may introduce organisational changes, the new water services regulator Taumata Arowai will likely review and introduce changes to the drinking water standards. Such actions have not been allowed for in this Strategy, and would need to be addressed at the time any changes are finalised. Refer to PART D: Section 5 – Water Supply for more details.

Funding

At the time of preparing this strategy, other sources of funding are being offered from Central Government as part of the Three Waters Reform. Council has decided to take up this funding, which means a reduced need for funding from targeted rates.

- We are planning on increasing targeted rates input into this activity from year 3 onwards, to address deferred renewals.
- Increasing the capacity and relocation of the Greymouth water reservoir is planned to be funded from Central Government Funds.
- Government Grants towards:
  - SCADA renewals and upgrades across the three waters (Central Government)
  - Water supply pipe renewals
  - Extension of the water supply to Kaiata Township and Kaiata Park
  - Additional intake bore for the Greymouth Scheme

Please refer to Part D: Section 5 – Water Supply for full details on this activity.

1.5 Wastewater overview

There has been significant investment in the wastewater network over the last decade. Upgrades to treatment facilities have been carried out with the aim of achieving resource consent compliance for treated wastewater effluent discharges.

Key issues facing this activity

As outlined above, the Government is presently working through a review of how water, wastewater and stormwater services are delivered. At the time of preparing this strategy it has not been determined if Council will continue to have a role in the stewardship and supply of wastewater services. Council is aware that from 2022 onwards, there is likely to be a new regional entity responsible for delivering these services in the Grey District and wider region, but as yet there is no specific proposal that the community can be consulted on. The approach that we have therefore taken in this strategy is to identify the key issues for the future, regardless of which agency is responsible.

Deferred renewals	While there is a level of deferred renewals applicable to this activity, they are not as significant in the short to medium term (up to 10 years) as those in the water supply and stormwater activity. In the longer term deferred renewals does start to significantly increase.

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	Future LTP's and Infrastructure Strategies will review levels of funding.
Connection of the Karoro Waste Collection System to the Greymouth Treatment Plant	At present liquid waste from Karoro, South Beach and Paroa is being collected and treated at the Karoro Waste Water Treatment Plant (WWTP). A commitment entered into when the resource consents were renewed is to consider the option of transferring the effluent for treatment at the Greymouth Treatment Plant at Preston Road. The advantages and disadvantages of this alternative option need to be presented to the Regional Consent Authority by 1 Feb 2025. The existing consents expire in 2028.
Climate Change	Over the term of this plan climate change is likely to continue to affect the location and capacity of infrastructure. The effects of climate change may be a significant factor in determining the future of the Karoro waste water treatment plant. It is noted that Blaketown Breakwater contributes to build up of beach gravels to the south and northern literal drift also brings river gravels north.

Plan for the future

- The main focus over the next 30 years is expected to be on maintaining and renewing the existing wastewater infrastructure to meet resource consent conditions.
- The Runanga sewerage system was previously found to have parts of the network in very poor condition and the majority of the network requires replacement. Council commenced these upgrades in 2012 and will continue to carry out staged replacement over the next 10-20 years.
- Enhanced UV disinfection of the treated Greymouth effluent discharge at Johnston Street will be carried out if deemed necessary. At present we are meeting the discharge requirements of our Resource Consent, but if we can no longer do so, we will need to consider the required upgrade works. Work is included in this LTP commencing in year 2.
- Preparing a report to the Consent Authority on the advantages and disadvantages of transferring liquid waste from the Paroa, South Beach and Karoro communities to the Greymouth Scheme, which needs to be presented by 1 Feb 2025. Assessment included in year 3 of the LTP. If the advantages outweigh the disadvantages and Council agrees or is required to do so, we will fund the infrastructure to transfer liquid waste from the Karoro WWTP to the Greymouth WWTP.
- Investigate the feasibility of extending water supply and waste water collection services to Gladstone – Camerons area.
- Upgrades and replacement of SCADA is also planned over the first 10 years of the strategy. Continuous supply and monitoring of data and the measuring of the quantity and quality water supply indicators essentially cannot be achieved without such a system in place.
- Consider relocation, protection or abandonment of assets relating to this activity where there are no alternatives to cater for climate change. Responses to this issue will form part of wider work being undertaken at a regional level, and will include Council and other agencies being part of collaborative conversations with affected communities, as private and public land is affected.
- While the Three Waters Reform may introduce organisational changes, the new water services regulator Taumata Arowai may also review and introduce changes to the fresh water standards. Repeal of the Resource Management Act may also introduce changes that affect this activity. Such actions have not been allowed for in this strategy and would need to be addressed at the time any finalised regulatory changes take effect.

Refer to PART D: Section 6 – Wastewater for more details.

Funding

Council received $3.8 Million in funding from the Three Waters Reform in 2020/2021. The bulk of this funding has been used for water and stormwater projects as these have been identified as a higher priority due to higher levels of deferred renewals than wastewater. Funding was also allocated for the upgrade of the SCADA system and a report on the transfer of waste water from Karoro to Greymouth WWTP.Please refer to PART D: Section 6 – Wastewater for full details on this activity.

1.6 Stormwater overview

Since 2008 the total length of stormwater pipe networks has increased from 84.5km to 132.4km. Most of this increase is in the Blaketown, Cobden and Greymouth areas, where existing combined stormwater-sewer pipes have become dedicated stormwater only pipes.

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The now dedicated stormwater pipes are ageing and condition assessments have confirmed that due to focussing on upgrading our wastewater treatment plants in previous years, we now face significant deferred renewals in this activity.

As described earlier, the Government is presently working through a review of how water, wastewater and stormwater services are delivered. At present, this reform programme is centred around the delivery of drinking water and wastewater services as a priority, rather than stormwater. There is significant uncertainty around whether and when any changes in the delivery of stormwater services may be reviewed. The approach that we have therefore taken in this strategy is to identify the key issues for the future, regardless of which agency is responsible.

Key issues facing this activity

Deferred renewals	We have carried out condition assessments on our stormwater network and these have confirmed there are significant deferred renewals which need to be addressed.
Climate change	The effects of climate change mean there is potential for flooding events in increasing numbers and volume for which our existing stormwater network cannot cope. Rising sea levels will also contribute to rising river levels and higher underground water tables, which over time will lead to reduced capacity of flood protection structures and more rapid stormwater runoff.

Plan for the future

- The main focus over the next 30 years will be on renewing the stormwater infrastructure to current modern design standards on a prioritisation basis using information collected from the condition assessments, as well as maintaining the network we currently have.
- When renewing stormwater infrastructure we will assess the size of pipes required to cater for climate change. This is likely to result in replacing existing pipe sizes with bigger diameter sizes to maintain the same level of service over the life of the new replaced asset. For example, catchment assessments and allowance for climate change will be taken into account when designing replacement pipeline and this may mean, example only, a 300mm diameter line may require replacement with a 450mm diameter pipeline. There may be some sites where this is not possible and if this is the case, alternative options will be considered.
- Consider relocation, protection or abandonment of assets relating to this activity where there are no alternatives to cater for climate change. Responses to this issue will form part of wider work being undertaken at a regional level. This will include Council and other agencies being part of collaborative conversations with affected communities, as private and public land is affected.
- The Plan also includes provision of new stormwater infrastructure to address flooding in localised areas. See Part D: Section 7 – Stormwater for full details on this activity.

Funding

Council received $3.8 Million in funding from the Three Waters Reform in 2020/2021. The bulk of this funding has been used for water supply upgrades but funds have been set aside for stormwater SCADA upgrade. Council intends to address deferred renewals by increasing rates input from year two of the LTP to a level that will prevent deferred renewals increasing over the life of the plan. In Years 5 and 6 a one off boost in rates funding is allocated to elp deal with existing deferred renewals, then from year 7 of the rates funding increases cumulatively $50,000 per year. Failure to address these issues would have serious implications, including the potential for critical failure and extensive damage to property.

Please refer to PART D: Section 7 – Stormwater for full details on this activity.

1.7 Current data on our assets

For the Three Waters, Council uses a geographical information system with specifically developed assets management software developed and supported by AssetFinda Ltd to collate asset information on the location, age, condition and material of assets. Other important information such as additions, disposals and costs of assets are also collated in this system. The system also is able to provide valuation information and predictive analysis.

While significant condition assessments for the water supplies, wastewater and stormwater assets have been completed, itis noted that condition assessment of such assets is continuing on an ongoing basis.

Land Transport, to meet New Zealand Transport Agency requirements, Council has recommenced using a Road Asset Management Maintenance System (RAMM) support by **think project** Deutschland GmbH. Essentially the same features are provided as for the Three Waters assets management software.

As already stated, condition assessments carried out to date confirm there are renewals backlogs (also known as deferred renewals) in the Water Supply,

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Stormwater, Wastewater and Land Transport activities. Changes from estimated useful lives to actual useful lives of pipes have been included in this Plan and they are more or less as assumed for the last LTP.

The outcome of the condition assessments mean we now have better information about the actual useful lives of our assets than we did before. This information, combined with valuation data has been used to determine the levels of deferred renewals we are facing. However, whilst we have based our Strategy on the best information available, there is still some level of uncertainty about the data which may mean that the financial forecasts could end up being materially different.

In recent years Council has carried out a review of the seismic capacity of bridges. The results of this study have been used to develop a prioritisation list for renewals/upgrades of bridges included in the LTP and will be used to prioritise future renewal plans.

Lifecycles

Lifecycles for major assets are summarised in the activity section and detailed for all assets in the relevant Activity Management Plans (AMPs). The approach to developing our AMPs is life cycle asset management which means:

> *Considering all management options and strategies as part of the asset lifecycle from planning, creation then disposal. The objective is to look at the lowest long term costs (rather than short-term savings) when making asset management decisions.*[1]

Whilst this is the desired approach, Council is also constrained by affordability as is discussed in this strategy and also the Financial Strategy. Council has to consider all its desired objectives across all its activities when it prepares its budgets. Realistically, for instance, optimal levels of funding for renewals cannot always be achieved.

Over the long term Council's aim is to achieve lowest long term costs. However it has to, as a trade-off across all its activities, accept higher risks and, for instance, increase operational and maintenance costs while it works towards achieving lowest long term costs.

Useful life

The Council has made a number of assumptions about the useful lives of its assets by assessing condition using the age, material and local knowledge. The detail for each asset category is reflected in the statement of accounting policies. We have also incorporated factual data obtained from the detailed condition assessments which have been carried out.

The useful lives are consistent with the assumptions applied to valuing each asset category and were determined by experienced and qualified asset valuers. Renewals have currently been determined by assessing condition using the age, material and local knowledge.

More detailed information is available in the Activity Management Plan (AMP) for each activity.

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[1] International Infrastructure Management Manual – Version 3.0 2006 p 1.10

2. Purpose of this Strategy

The Local Government Act 2002 requires local authorities to develop an Infrastructure Strategy covering a minimum period of 30 years. The purpose of the Strategy is to:

a) Identify significant infrastructure issues for Grey District Council over the period covered by the Strategy; and

b) Identify the principal options for managing those issues and the implications of those options.

The Strategy is both informed by, and provides strategic direction to, the infrastructure asset management plans (AMPs). It is also intended to align with the Council's Financial Strategy.

2.1 District context

Council's Long Term Plan provides an overview of the community profile now and over the next 30 years. A brief summary of expected changes, as they may impact on the provision of infrastructure, is as follows:

- A stable or slightly declining population;
- An ageing population, already older than the national average (this impacts on levels of service such as footpath standards);
- A community with an average income significantly lower than the national average; and
- Government regulation, for instance high productivity motor vehicles (HPMV). Council has a significant number of bridges that do not meet the required standard to enable their use by these vehicles.
- While the Covid-19 pandemic has significantly impacted on overseas tourist numbers in the short term, over the longer term a return to increasing demand on infrastructure from tourists is anticipated. There has been and will continue to be investment in tourist attractions within the District.
- In recent years land use changes have not significantly impacted on the infrastructure covered under this strategy (primarily land subdivision has been rural life-style block). Note the combined regional Te Tai O Poutini Plan may create impacts once it is operable.
- The District is potentially at risk from a number of natural hazards – earthquake, tsunami, climate change and flooding – the latter being the most regularly experienced. As part of renewals programmes Council will be considering the resilience of asset component replacements and also the capacity (for example, stormwater systems).

Future demand

With the exception of the long term return to an upwards trend in tourism numbers, overall, economic and social changes are not expected to drive any significant changes in demand for services other than an ageing population.

Over the next thirty years, the District's population is expected to remain relatively static. Any increase in demand for infrastructure services is more likely to be driven by commercial-industrial changes or a ratepayer desire for expansion of the networks.

Two potential activities where tourism is predicted to impact on infrastructure services are roads and water supplies (refer to relevant sections below for more detail). However, it is noted that in the short term, there will be limited overseas tourists visiting the District.

2.2 Strategic links of infrastructure

Strategic links to Council's purpose, vison and community outcomes are outlined in the following table. Further detail is provided in previous sections of the Long Term Plan. It can be inferred that the purpose, vision and community outcomes are supported by this infrastructure strategy.

Our purpose 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 <u>communities in the present and for the future.</u>
The Grey District works towards this purpose through our Vision and Community Outcomes.
Our Vision is a <u>Thriving, Connected and Resilient</u> Grey District.
Our Community Outcomes (our goals and aspirations) we aim to achieve are linked to the four Community Wellbeings.

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Economic	Social	Cultural	Environment
• Strong • Diverse • Sustainable • Prosperous	• Safe • Inclusive • Connected • Enabled	• Proud • Unique • Inter-connected • Vibrant	• Bold • Practical • Resilient • Strategic

Key aspects that show the link are portrayed by the underlining of key phrases and words above. While the Infrastructure Strategy does need to deal with the here and now, it is, because of its time span also, future focused.

Achieving these Community Outcomes requires:

- Resilient infrastructure
- A clean reliable supply of water for drinking and firefighting;
- A safe reliable and fit for purpose land transport network;
- Protection of private property and transport corridors from the effects of stormwater; and
- Safe disposal of wastewater.

Our infrastructure activities support a number of Grey District community outcomes, as detailed in each AMP. The primary focus of the roading, stormwater, water supply and wastewater activities is supporting economic activity (thriving, connected) and protecting property (resilient). Water supply and wastewater services to urban, commercial and industrial customers not only contribute to enabling economic activity but additionally support public health and, for wastewater schemes, help protect the environment.

Council's specific objectives for each activity are expressed through the levels of service and performance measures which are described in each AMP and summarised in this Long Term Plan.

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3. Significant issues

3.1 Issue 1: Deferred renewals

Possibly the most significant issue facing our infrastructure into the future is what we call deferred renewals. This applies to the Stormwater, Land Transport, Water Supply and Wastewater activities.

Once an asset has reached the end of its useful life, it is expected that it will require replacement (renewal) if Council is going to continue to provide that service. Over previous years Council has been 'sweating its assets' (a term used to describe a way of extending the use of an asset beyond its useful life) in the interests of keeping rates rises down and in order to complete other prioritised and expensive capital projects. This approach increases the risk of unexpected disruptions to service delivery.

A significant and related matter for renewals is the issue of climate change. Given the long life of the proposed renewed infrastructure, part of the decision criteria to proceed with a renewal includes whether is it is actually appropriate to renew the infrastructure in the same location and whether increased capacity needs to be provided.

How will we address this?

We have carried out condition assessments over recent years and this information, along with what we already knew (refer '1.2 Current position'), means we now have improved information about the actual expected life of our assets. Using the information from our condition assessments, we now plan to:

- Continue to prioritise the most critical areas requiring replacement;
- Consider the most appropriate solutions for replacing/renewing (eg maybe a pipe can be relined rather than replaced in its entirety); and
- Consider the most appropriate location and size of the asset to be renewed.

How will this be funded?

We are planning to increase rate funding to address deferred renewals, prioritising the areas deemed higher need. Funding also takes into account other requirements such as new capital works for these infrastructure activities and also Council's overall requirements for other activities.

Council's immediate focus is on addressing the more significant needs in Stormwater and Land Transport. We have focussed on our water supply (treatment plants, new townships or extension of supply) and wastewater assets over the last 10-20 years. However overall the age profile of our stormwater pipeline assets raises significant potential issues and this is therefore the focus of our expenditure in three waters renewals. Similarly, road surface and footpath renewals are planned as a priority, as well as starting to address condition and service level based renewals of bridges (including renewals or replacements for structures that are nearing the end of their service life).

For our water supply and wastewater activities, we will continue to address prioritised deferred renewals within our existing budgets. It is planned to revisit the allocation of additional funding towards deferred renewals for these activities at year three for water supply and around year seven for wastewater. This will be continuously reviewed, notably at the next LTP.

The following two graphs illustrate the level of deferred renewals forecast over the next 30 years, comparing:

1. What the backlog (deferred renewal) looks like based on current levels of renewal investment; versus
2. What the backlog (deferred renewal) looks like based on the planned increased levels of renewal investment.

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Figure D-3: Forecast deferred renewals with existing funding level – all infrastructure

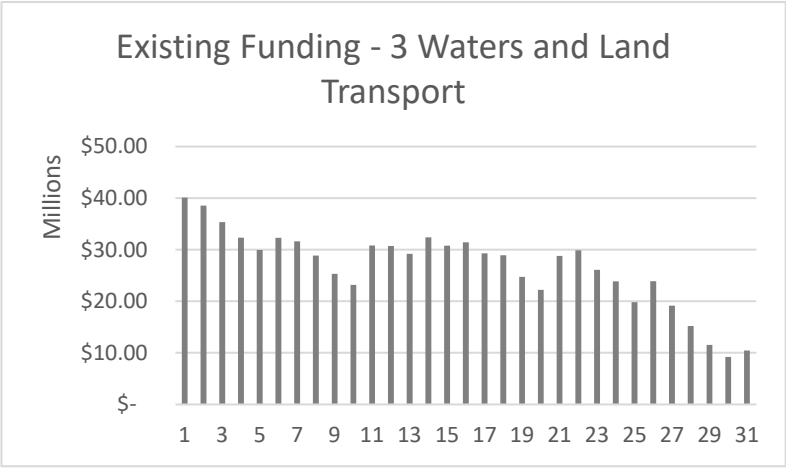
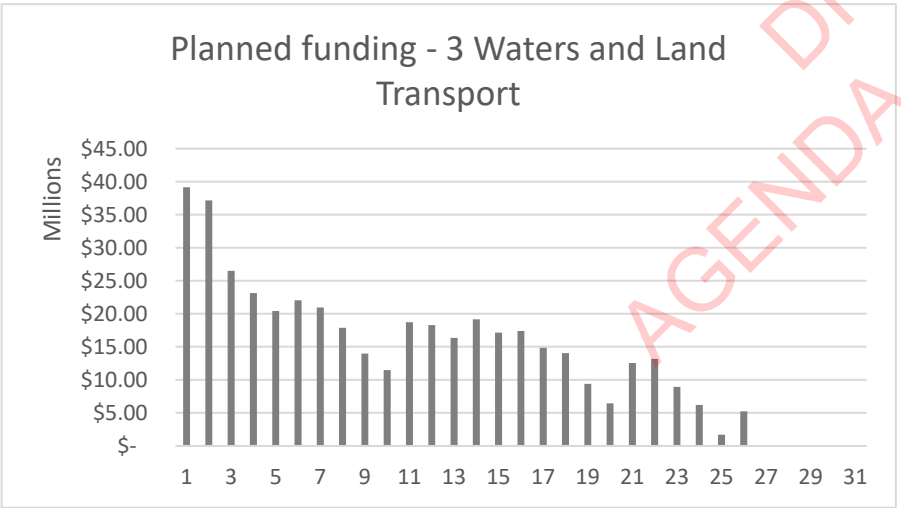


Figure D-4: Forecast deferred renewals with planned increased funding – all infrastructure



3.2 Issue 2: Affordability

Our prosperity depends on the adequate supply of cost effective three waters services to support our community, businesses and community services. However, for many Councils, including ours, the cost of investing in three waters infrastructure, including any additional costs resulting from increased standards and new regulation, can be significant.

In the past our wastewater schemes and water supply treatment schemes have received central government subsidies for the installation to meet legislative requirements (Health Act and Resource Management Act). The new or enhanced schemes would not have been affordable for ratepayers without the subsidies. Therefore a significant issue for the district will be how to afford replacing these scheme components when they come up for renewal without subsidy.

It is always a challenge for our community to be able to pay for services with a smaller and statistically slightly older rating base than some other Districts in New Zealand. We're committed to making sure we deliver value for money in our services, as well as addressing our key issues such as those identified in section 3.1 above, in a responsible and prudent manner and planning appropriately for the future. We know that affordability can be an issue for our community; we have to balance the needs and wants of the community with the ability and willingness to pay for the services and activities it provides. However it is also important to that we don't put our heads in the sand when it comes to making decisions affecting our District in the sole interest of keeping rates low. Addressing issues now, such as increasing funding for our deferred renewals, may cost in the short term but will save larger financial headaches later.

How will we address this?

Council plans on addressing this over the longer term by putting aside enough money for replacement when the time comes (e.g. continuing rate increases for wastewater and water supply treatment schemes over the long term). We will also lobby Central Government for any subsidies which may be available at the time. Council has recently entered in to funding arrangements with the Government to access funding for our Three Waters services, which will reduce the impact on rates.

We have recognised the need to address our infrastructure issues and the costs of doing so in the Financial Strategy. The Strategy's financial goals seek to achieve prudent financial management, not only for the present but also setting out a path to the future. This means recognising and addressing the most critical issues in our renewals from now onwards by increasing the rate of renewals to reduce

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backlogs, rather than delaying further these backlogs and thereby incurring increased costs later and increasing the potential for future failures.

Council proposes increasing rates to 9.9% in year 1, capped at 6% for each year thereafter. This will provide funds to address these potentially significant infrastructure issues and allow for reserves to fund required maintenance and renewals, thereby reducing risks and costly failures in the future. While the strategy means reducing risks, risks will still remain as until the backlogs are removed asset lives will be extended beyond there typical industry service life. That is, assets will continue to sweat.

Based on planned funding levels, backlogs are estimated to be removed by year 26.

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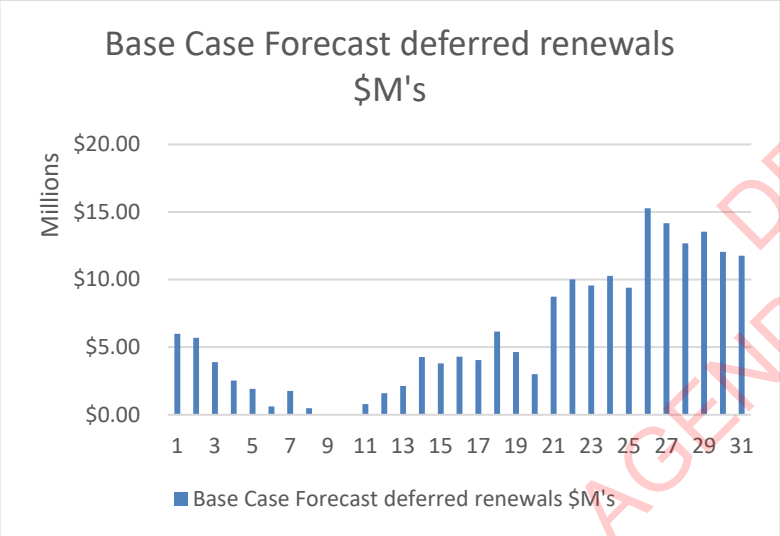
4. Land Transport

4.1 Background

In terms of value, the road network represents over half of the Grey District infrastructure. This activity includes the road surface (pavement), structure, road signs/streetlights, footpaths and bridges.

Our road network of 648 kilometres with a current total replacement cost of $253.4 million[2], is generally in fair condition relative to the national average. The following graph summarises the backlog of renewals based age and how they will grow over the next 30 years if Council continues with its current level of renewal funding.

Figure D-5: - Forecast renewals backlog with existing funding level



The road formation and sub-base materials are normally not replaced when renewing the asset so this reduces the replacement cost of the asset to $151.4 million. Of this figure the biggest asset component is bridges, which makes up (46%) as presented in the following chart.

Figure D-6: Asset replacement cost, $151.4 million

Asset Description	Replacement Cost	% of Replacement Cost
Base Layer	$19,934,702	13.2%
Sealed Surface	$16,730,328	11.1%
Unsealed Wearing Course	$602,846	0.4%
Drainage	$12,957,132	8.6%
Surface Water Channels	$13,035,385	8.6%
Footpaths	$12,435,361	8.2%
Traffic Facilities	$3,092,703	2.0%
Streetlights	$2,585,768	1.7%
Bridges and Major Culverts	$70,002,851	46.2%
Total	**$151,377,076**	100.0%

In addition to the most recent revaluation, information in this part of the strategy is based on the combined 2021-2031 West Coast Transport Activity Management Plan, which was a collaboration between Buller, Grey and Westland District Councils.

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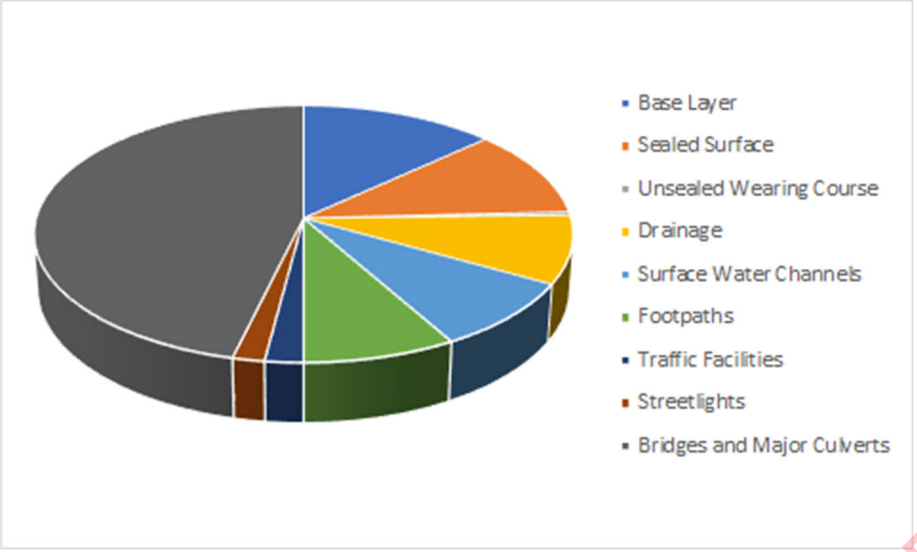
[2] Valuation to 30 June 2020



Bridges

There are 209 road bridges and large culverts[3] and a further 13 pedestrian bridges in the Grey District maintained by Council. Some key points to note are:

- There are 16 brides that are posted at less than Class 1 (less than 44 tonnes allowable total load). A further 9 bridges have been identified as needing to be assessed based on their condition. This represents 12% to the total 209 road bridges and large culverts.
- There are 4 bridges with speed restrictions to lessen the impact of loads on the bridge.
- Together with other key criteria, increased emphasis is being placed on condition and capacity assessments to determined bridge replacements and strengthening works.
- There are 48 bridges (23%) that do not have the capacity to allow high productivity motor vehicles (HPMV's) to cross.
- Nine structures have been identified for priority seismic strengthening work.

In 2020 the Government set up a number of economic stimulus funds available to Councils and other organisations for infrastructure projects including transport. Council sought and received some of this stimulus funding for replacement of the following bridges over the next two years:

- Rough River Bridge – Atarau Road
- Moonlight Bridge – Atarau Road
- William Stewart Bridge – Taramakau River – Kumara Inchbonnie Road

All three bridges are not able to cater for HPMV loads and Rough River, if not replaced, requires significant seismic strengthening.

A Life Cycle Management Plan (LCMP) has been developed as part of the Activity Management Plan. This strategy takes into findings of the LCMP.

Most of the bridges on our network were constructed between 1930's and 1990's as shown in the age profile, Figure D-8. A substantial part of the bridge inventory ($7.4 million) will be coming to the end of its expected life within this 30 year period (refer Figure D-9). Bridge replacements are initially assessed on the basis of their expected lives. These are then modified by taking into account:

- Routine and structural condition assessments
- Service level impairment such HPMVs not able to cross
- Seismic capacity impairments
- Other environmental issues such as corrosion of structures in aggressive environments
- Waterway issues (debris build-up and impact of scour and riverbed changes)
- Traffic volumes and traffic demand
- Nature of the traffic using the bridge (such as significant heavy vehicle use)

Maintenance, component renewals, full bridge replacements and upgrades are prioritised using the above criteria.

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[3] Large culverts are defined as typically rectangular or round pipes with a cross sectional area of 3.4 square metres or greater.

Figure D-7: Age profile versus total length (metres) of BRIDGES

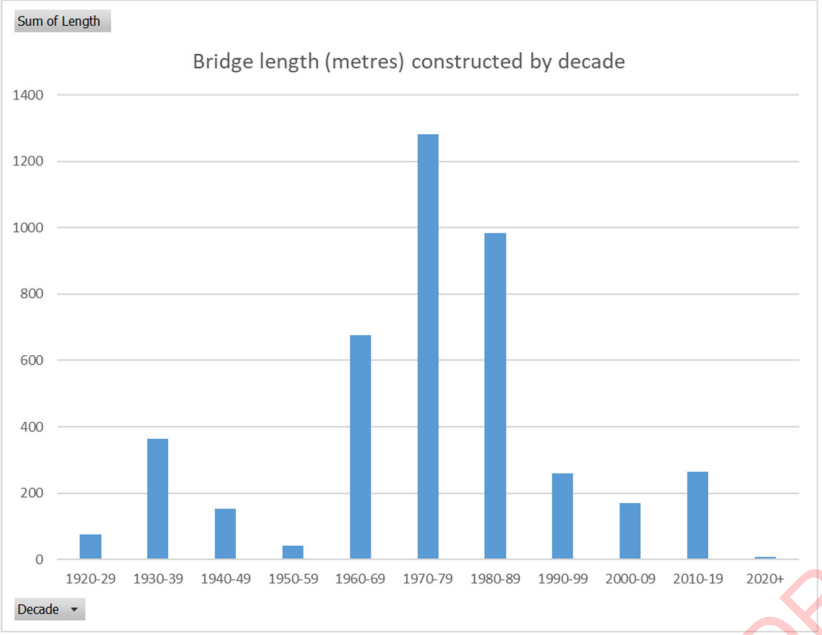
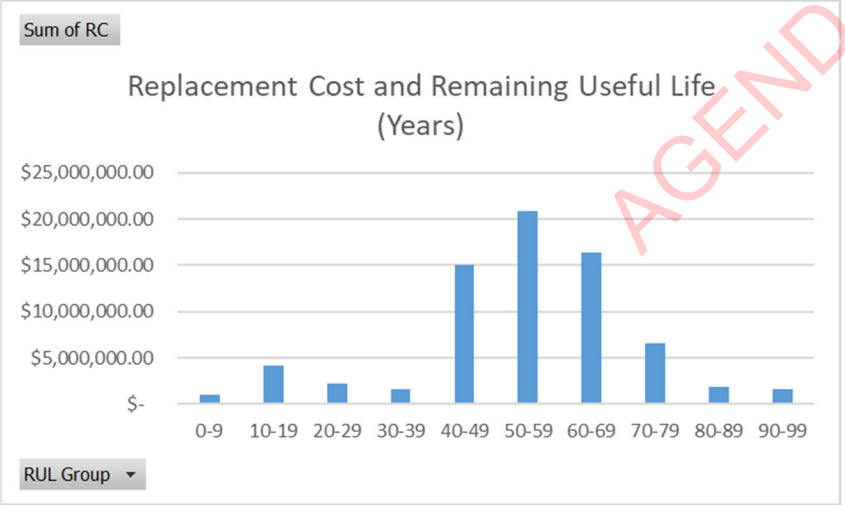


Figure D-8: Replacement Cost and Remaining Life



It is noted that the level of renewals appears less than in the previous strategy. This is because the useful life of road bridges and culverts has been reset to 100 years (50 years for pedestrian bridges), whereas previously there was a range of useful lives assumed.

Bridge replacement can be significant one-off cost items. It is also noted that the age profile of Council's bridges shows a cluster over 50 years old, which is pointing to an upcoming potential renewals demand.

The following bridges are currently included in our renewals programme:

Rough & Tumble Bridge and Deep Creek No. 1 Bridge, both situated on Bell Hill Road	Both bridges are currently posted at 80% Class 1 (maximum 44 tonne loads), however the reasoning behind replacement is that they are both hardwood structures that are nearing the end of their useful design lives. The road itself is a strategic link that is becoming increasingly used as an alternative route for heavy transport because it provides something of a 'short cut' for vehicles travelling from the Grey Valley to Rotomanu and vice versa. There has also been recent dairy expansion carried out through Haupiri which has caused this route to become more popular with the tanker drivers.
Stillwater Overbridge, on Stillwater to Blackball Road	Due to age, over dimension and overweight restrictions and increasing use of this route from heavy traffic including 50MAX and HPMV's.

A further six bridges have been identified for condition based replacement. The total cost of replacing these bridges is estimated to be $1.15 million.

A further 14 bridges are inspected at least annually due to their condition. If they need to be replaced, their total cost is estimated to be $6.1 million.

Bridge renewal funding continues to be provided for after the above priority replacements are addressed, with the actual bridges to be replaced still to be determined based on bridge assessments carried out in the future.

For all of the above bridges, at least annual bridge inspections are carried out. In addition to considering replacement, future work is proposed to assess if the bridge lives and their components can be extended.

In summary for bridges this strategy includes:

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- Based on the LCMP increasing maintenance to bridges, recognising there is need to increase condition based needs to $365,000 per year.
- Sustaining structures component renewals programme at $300,000 per year.
- With the support of Waka Kotahi – NZTA, including a new work category for condition based replacement of bridges and structures of an average of $720,000 in the first three years and thereafter at an average of $550,000 per year.
- Based on the Seismic Assessment Report as part of the Waka Kotahi - NZTA Low Cost/Low Risk programme, funding $900,000 of improvements over the next three years.

Council will need to consider carefully how to schedule these replacements to avoid significant financial impacts. This can be achieved by staggering replacements and considering loan funding over shorter terms to smooth the financial impact if required. Refer to our Financial Strategy for the implications of this.

Footpaths

Council's footpath network of 106.8km, serving mainly urban areas, has adequate capacity and is generally in fair condition where it is provided. Not all urban streets have a footpath down both sides.

It is important to continue to ensure our footpaths remain fit for purpose, especially given the Grey District has an increasing ageing population.

Since developing the 2018-2028 LTP, Waka Kotahi (Waka Kotahi - NZTA) have introduced a new financially assisted works category for the maintenance and renewal of footpaths. This enabled Council to double its investment in footpaths to around $500,000 per year.

Other than ensuring footpaths are safe to use given the ageing demographic, over the next ten years there is unlikely to be a significant increase in demand based on the overall population growth projections for the Grey District. However two trends have been identified:

- Based on a review of resource consent applications and the Census information, including normally resident population and dwellings, **rural residential development** has occurred and is likely to continue to occur in the following Census areas: South Beach-Camerons, Barrytown, Marsden-Hohonu, Arnold Valley and Nelson Creek-Ngahere. This type of demand and the effects on the roading activity will be monitored and are mostly to be managed through subdivision consent requirements.
- **Long-term tourism growth**, including new or developing attractions. Recent pre-Covid examples include new tourist parking and public toilet facilities in Cobden, Blaketown, Rapahoe and the Pike 29 Great Walk (opened in December 2019 by the Department of Conservation). These developments are likely to increase pressure on networks which may need upgrading. Covid-19 has impacted significantly on international tourist numbers. However a recovery in tourism is anticipated in the medium to long term. Urban areas such as Moana and Blackball are identified as areas of future demand.

Our focus when it comes to footpaths will be on sustaining and maintaining the current levels of service. We are not looking at providing any extensions to levels of service provided.

Whilst there is a lot of public interest in the issue of footpaths and potentially merit in extending the service in some areas of the District, Council has to prioritise where its limited budget is spent.

The below graph shows the profile of footpaths reaching the end of useful life over the next 50 years. Improved information has been achieved since the last strategy with all footpaths being condition assessed and surface materials recorded. Over 90% of footpaths will need to be renewed over the next 30 years. This is because almost 50% of footpath surfaces are chip seal which has a total useful life of 25 years and 60% of concrete footpaths are older than 30 years (total useful life of 50 years), and although while it has not been able to be assessed some concrete footpaths will be older than 50 years.

A similar approach to bridges is being adopted where condition assessments are also taken into account when planning forward works.

Footpaths that have been assessed as being in very poor condition are 2.9 % of the network by length, which has a replacement cost of $362,600. Annual depreciation of footpaths has been assessed at $342,600 per year. This strategy allows for $200,000 for maintenance and $300,000 for footpath renewals. Future condition assessments will be used to monitor the sufficiency of these funding levels.

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Figure D-9: Remaining useful life by total length (km) of FOOTPATHS

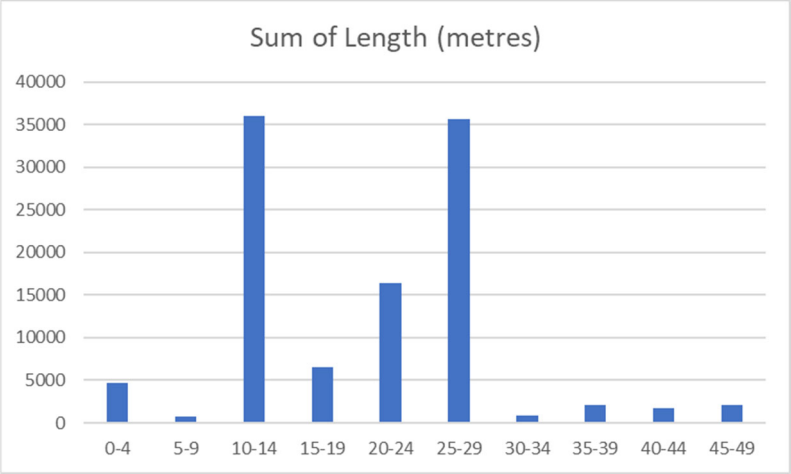
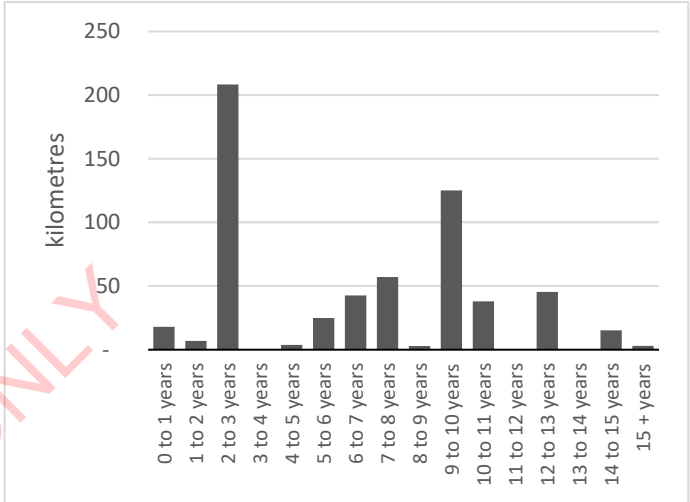


Figure D-10: Remaining useful life by total length (km) of SEALED PAVEMENT SURFACES



Road and street pavements

Currently the renewal programmes for pavements (surfaces and pavement structure) are based on a range of inputs such as condition surveys, age, and treatment selection analysis and confirmed by inspection. The remaining useful life profile of sealed pavement surfaces as shown in Figure D-11 shows that Council has a large portion of the network due for renewal over the next three years (66%). This is consistent with the recent practice of renewing less of the sealed network. As part of the AMP a new forward works programme has been developed for sealed surfaces. This is for chip seal surfaces. Council's recent approach of 'sweating the asset' had been adopted to accommodate previous funding reductions. However Council now proposes to increase its funding to achieve an improved rate of renewals of about 20 kilometres per year.

Council also has a small volume of asphalt concrete road surfaces where the surface lasts between 25 to 30 years depending on traffic mix and volumes.

The age profile for pavement structures as shown in Figure D-12 indicates significant construction activities took place up until the early 1990's (likely to be development phases), whereas from around the 1990's work has been more focused on renewing (pavement rehabilitation) the asset with less capital improvements and extensions of the network. The latter was driven at the time by primarily the coal industry and to a lesser extent subdivision development.

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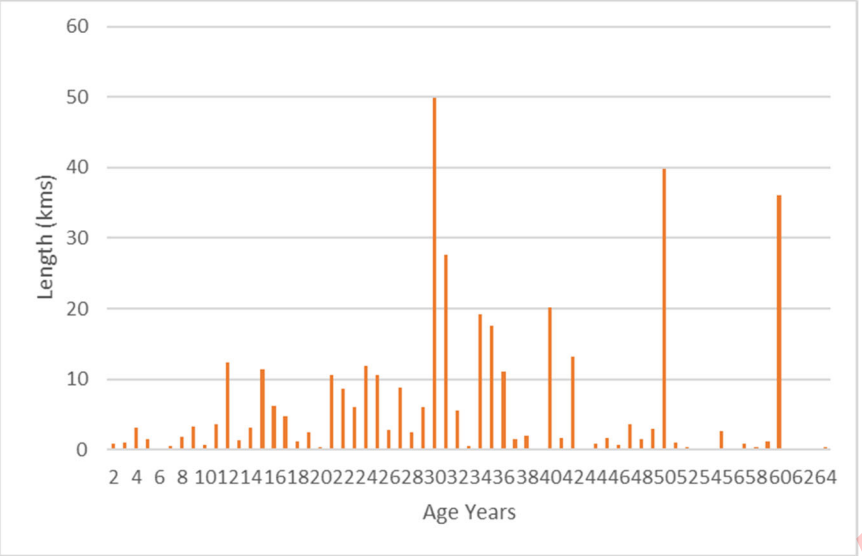
Figure D-11: Age profile - PAVEMENT STRUCTURE



We need to ensure we continue with sufficient levels of pavement rehabilitation to maintain the integrity of the pavement from age deterioration and traffic use effects into the future. As shown in Figure D-13, 85% of Council's pavement structure is due for renewal within the life of this Strategy. This figure is based on age and assumed total useful life of the pavement layers. Is it noted as above, the above assessment does not include the foundation and subbase layers as typically these layers are not replaced when the pavement structure is renewed.

Noting the potential age issues with sealed surfaces and pavement structures, as part of the development of the Transport AMP a 20 Year Forward Works Programme was developed. One of the findings from this assessment was that the sealed road network is in relatively good condition for traffic volumes and age.

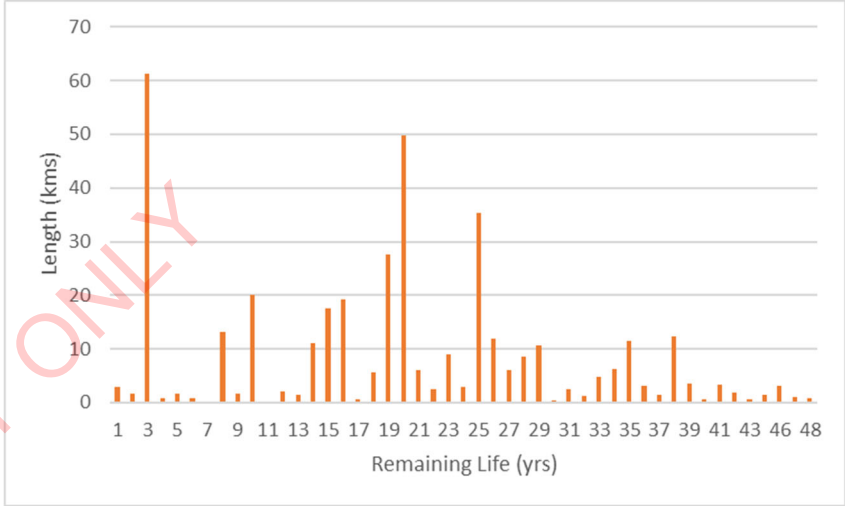
An optimised programme has been developed for the future which includes, where possible, extending pavement age to optimise funding.

Sealed pavement maintenance has been reduced from $480,000 per year to $400,000 per year, whereas unsealed pavement maintenance has been increased to $230,000 per year to address recognised level of service issues.

Sealed road resurfacing has been increased from $1 million per year to $1.2 million to recognise the potential seal backlog issue Pavement structures renewals have been reduced from $380,000 to $300,000 per year.

More information on pavement condition and renewal options is provided in the AMP.

Figure D-12: – Remaining useful life by total length (km) of PAVEMENT STRUCTURE



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Waka Kotahi - NZTA Financial Assistance

The financial assistance Council receives from the Waka Kotahi - New Zealand Transport Agency (NZTA) will increase from 58% to 63% from the 2021/2022 financial year. It is not expected to change further, however it should be noted that Waka Kotahi - NZTA review their rates every five years.

Council are intending to maintain the level of rates funding and increasing by inflation to this activity over the life of the LTP. Due to the increase in the subsidy rate, this equates to a 5% increase in rates funding activity to start addressing deferred renewals.

It should be noted that Council receives financial assistance from the New Zealand Transport Agency (Waka Kotahi - NZTA) for certain types of works. It makes financial sense for Council to target its money to where it receives the highest subsidy, thus generating more money to spend. For instance at a financial assistance rate of 63%, $100,000 of rates investment equates to $270,000 of combined Waka Kotahi - NZTA and Council total available funding for road works and services.

Transport Activity Management Planning, Network and Asset Management

This strategy includes increases funding for Activity Management Planning in the short term. There is a need to enhance data collection and analysis, not only for Council's Road Asset Management Systems but also to meet the requirements for external funding providers such as Waka Kotahi – NZTA.

Over the longer term the strategy also allows for enhanced funding for Network and Assets Management. This is to provide resources to deliver an overall increased works programme and to develop activity management planning further in-house. Such skills as the development of businesses cases are needed to ensure Council can justify future works programmes.

4.2 Issues and options

ISSUE	OPTIONS	SHORT TERM (YEARS 1-10)	MEDIUM TERM (YEARS 11-30)	LONG TERM (YEARS 30+)
Deferred renewals for bridges. Nine bridges have been identified for condition based replacement. A further 14 bridges are inspected at least annually due to their condition. If they need to be replaced their total cost is estimated to be $6.1 million.	1. Using condition based assessments plan for replacement of bridges and renewal bridge and structure components. 2. Using information from seismic review and data from truck load assessments to create prioritisation list for renewal/replacement. 3. Investigate where structural components need replacing versus full bridge replacement. 4. Increase funding to this activity, i.e. rates, financial assistance. Consider loan funding over the shorter term to smooth the effects of large capital expenditure.	✓	✓	✓
Community expectations of footpath maintenance and renewals not meeting Council's planned programme.	1. Continue with an increased Waka Kotahi - NZTA and Council funded programme of $500,000 per annum on maintenance and renewal of footpaths. (Previous LTP was rate funded only at $80,000 for maintenance and $240,000 for renewals per year.)	✓		
	2. Carry out renewals based on prioritisation programme where the need is deemed most critical and continue to monitor satisfaction levels. If satisfaction levels not considered by Council to be improving then review funding levels for the next LTP.	✓	✓	✓
The changing function of the network over time means there are pockets of infrastructure that are no longer fit for purpose, eg age/condition of critical assets, crashes, understrength bridges (seismic resilience/heavy traffic).	1. Reinstate/maintain/increase capacity/service at sites and locations where there are confirmed gaps in levels of service, e.g. improve strength of existing bridges, replace if at end of economic life. Prioritise areas for renewals based on the importance of the infrastructure to consumers and other critical factors.	✓	✓	✓

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	2. Maintain quality of asset components so they remain fit for purpose.	✓	✓	✓
	3. Defer renewals.	✓	✓	✓
	4. Rationalise the road network and road assets, where possible based on the One Network Framework to ensure funding goes to areas of greatest need.	✓	✓	✓
	5. Post bridges to reduce loading impact for safety reasons.	✓	✓	✓
	6. Use safety signage and other means (reduced posted speed limits), safety guard rails to reduce impact and safety issues on roads.	✓	✓	✓
	7. More cost effective materials, operations and construction methods, ie concrete line existing pipes.	✓	✓	✓
	8. Continue to lobby Waka Kotahi - NZTA for increased financial assistance rates based on evidence and identified needs.	✓	✓	✓
Resilience of key roading assets, especially bridges, needs to be improved to mitigate potential damage from natural hazards, eg earthquakes.	1. Carry out upgrade works based on priorities established from condition assessments. Strategy provides for $900,000 of seismic strengthening to priority bridges first three years. Thereafter further review is proposed to identify next highest priority bridges.	✓	✓	✓
The increasing intensity and number of natural events impacts on the security of the network and raises the risk of isolated communities (increasing extreme events, high temperatures, rainfall, road closures).	1. Maintain network asset quality to ensure they remain fit for purpose to the best of Council's ability including ensuring when assets are replaced they take into account capacity and durability requirements relating to climate change	✓	✓	✓
	2. Ensure contracting resources are available to keep roads open or reopened as soon as possible after events.	✓	✓	✓
A constrained transport network. This inhibits the potential for economic development and reliability, as well as heightening the potential for conflict between increasingly different user types in the form of crashes (eg productivity of commercial vehicles, crashes, complaints/service requests, increasing tourist traffic).	1. Monitor trends in the mix and volume of road users and crashes.	✓	✓	✓
	2. Develop and provide solutions where identified issues are occurring such as signage, safety improvements, widened roads, encouraging alternative transport modes (ride sharing, public transport, walking, cycling), strengthening road asset components.	✓	✓	✓

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Council has adopted a CBD Redevelopment Plan. Prior to any major works being carried out, it is crucially important to initially locate existing underground services in order to as much as possibly avoid delays and increased costs. • Proposed requirement for new infrastructure • Other related underground infrastructure (power and communications) • Where will the funding come from for these works? • Funding for maintenance of new assets	1. Carry out traffic calming and safety improvement works in the Greymouth CBD area which align with Council's CBD Redevelopment Plan.	✓		

4.3 Implications of not addressing these issues

- Potential for critical failure if assets are not renewed/replaced in time.
- If assets are not replaced/renewed on a timely basis, we risk increased maintenance costs having to fix assets nearing or past their useful life.
- If not maintaining/renewing/replacing bridges as required, restrictions to weight or speed may have to be imposed.
- Emergency works may be expensive and Council may have to loan fund this expenditure – this will impact on Council's debt levels and ability to borrow for other unforeseen events.
- Failures will mean a reduction in the level of service currently provided by Council, or even loss of service. Effects could include negative impacts on the economy, increased travel times, increased vehicle operating costs, more crashes etc.
- Higher cost if renewing/replacing before the end of the asset's useful life.
- Lower resilience of older infrastructure in event of a natural disaster, eg earthquake.
- There may be safety issues if levels of service change, which could increase legal liabilities on Council and increase insurance premiums.
- Lower levels of satisfaction from users in some areas, impacting on Councils' reputation. This is especially relevant to footpaths.
- Funding uncertainty (boundary bridges are co-funded between neighbouring Councils).

Waka Kotahi - NZTA Financial Assistance

The One Network Framework adopted by Waka Kotahi - NZTA may see changes to levels of service and Waka Kotahi - NZTA funding for low volume roads. Refer to the AMP for more information on the ONF.

Climate change

The expected increase in intensity of storms may see a higher level of flooding and droughts with associated road damage. Droughts may accelerate cracking and differential settlement. While limited research is available at this stage, higher temperatures may impact on the melting point of bitumen in sealed roads. Higher melting point bitumens or different road surface materials may be required for the future, which are likely to be at higher costs.

Sea level rise may impact coastal roads. Ongoing monitoring will occur, but at this stage no specific options have been scoped. Currently two areas, being Rapahoe and the southern end of Cobden, have been affected by coastal erosion. Over the life of this plan it is likely that more areas will be affected if projected sea level rise continues.

Council is currently working in a collaboration with the West Coast Regional Council and Buller and Westland District Councils on a combined District Plan for all of the three District Councils on the West Coast, called *Te Tai o Poutini* Plan. This plan will establish planning zones for the region, and will include identification of areas subject to hazards and the effects of climate change. This information once finalised and released will be used by infrastructure service providers, to make

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informed recommendations to decision makers as to whether to plan for retreat, relocate infrastructure or protect infrastructure.

Road safety

The number of fatal and injury crashes needs to reduce to achieve Waka Kotahi - NZTA targets for road safety. Council is working with a Road Safety Group of key stakeholders to deliver a Road Safety Action Plan. Most initiatives relate to driver behaviour rather than road safety upgrades, though these do occur as part of the Minor Improvements programme. Together with continuing to promote good driver behaviour this plan will also be reviewing the following across the district:

- Speed limits on all roads
- Need for engineering actions such as more safety guard rails on identified high risk roads.

Resilience

Land Transport is the only activity that has an annual budget set aside for natural disasters - approximately **$620,000 per annum** is included in the financial forecasts.

Council has various resilience factors and financial resources in place to call upon if an event were to occur, including:

- Financial Assistance from Waka Kotahi - NZTA (funding provided for events with a greater than 1:20 year return period; and
- Disaster Recovery Fund, which from year 5 of the current LTP is set to increase by 1% ($234,000) of the rate take per year.

4.4 What we're planning on doing

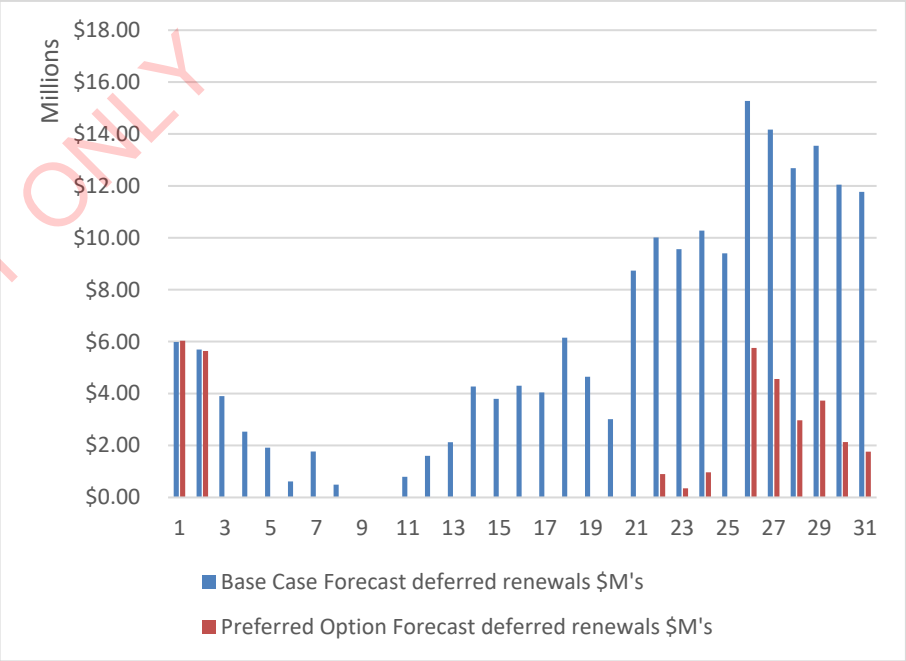
Addressing deferred renewals

Council is planning on increasing funding to this activity. The increased funding will be prioritised towards condition and service level renewals in bridges and pavement surfaces.

We have a number of bridges currently in our renewals programme and we will be investigating the most cost effective and responsible methods of proceeding, ie replacement of structural components versus full replacements. Works will be carried out over the next ten years as the funds become available, based on critical need and a prioritisation basis.

Figure D-14 summarises the assets that have reached the end of their useful life, forecast over the next 30 years and taking into account what Council currently spends renewing (replacing) assets each year plus increase funding of $30,000 (above inflation) in year one and then an average increase of $240,000 per annum (including inflation) for years 2-10 (annual increases range from $77,000 to $345,000, including inflation). This creates an overall increase of rates revenue of $2.2 million by year ten.

Figure D-13: Forecast deferred renewals backlog with planned increased funding (base case included for comparison)



Where the deferred renewals goes into a negative amount (below the line) this effectively means that Council is in a position to start setting funds aside for future renewals (based on the longer term requirements).

Council already allows for a certain level of footpath renewals in the budgets. Works outside of that will be addressed on a prioritisation basis and will be dependent on available funding.

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4.5 Expenditure forecasts

Figures D-14 and D-15 present the expenditure forecast for roads and footpaths. These are based on the following assumptions:

- No seal extensions will occur (other than those created and funded through subdivision developments, if any).
- Expected service lives of the various types of roading asset are shown in Table D-20. Data accumulated over time will allow revision of the service lives, with a view to extending them as far as possible while still maintaining levels of service.
- Pavement rehabilitation of around 1km per year, mainly arterial and collector roads, with patching and resurfacing of local and low volume roads.
- Pavement resurfacing of around 20km per year based on the AMP forward works programme, with this figure to be reviewed in future LTP's.
- Council is not anticipating any significant additional changes to legislation or government policy.
- Despite the increased level of renewal expenditure, Council is not forecasting an associated decrease in operational expenditure as given the sustained level of renewal backlog being carried through the majority of the 30 years existing demands on maintenance (operational expenditure) are expected to be sustained.
- There will be no additional unforeseen events such as natural hazards other than what Council currently budgets for, being primarily storm/flood events which regularly affect road infrastructure.

The financial forecasts for the first ten years of this Strategy are adjusted for projected inflation based on the BERL indices with the exception of Year 1, as per the assumptions outlined in our Long Term Plan. In Year 1, we have used indices based on our knowledge of the market and our local expertise. Forecasts for years 11 to 30 have been inflated at using BERL 20 year average.

Figure D-14: Annual Land Transport operating expenditure forecasts – next 10 years

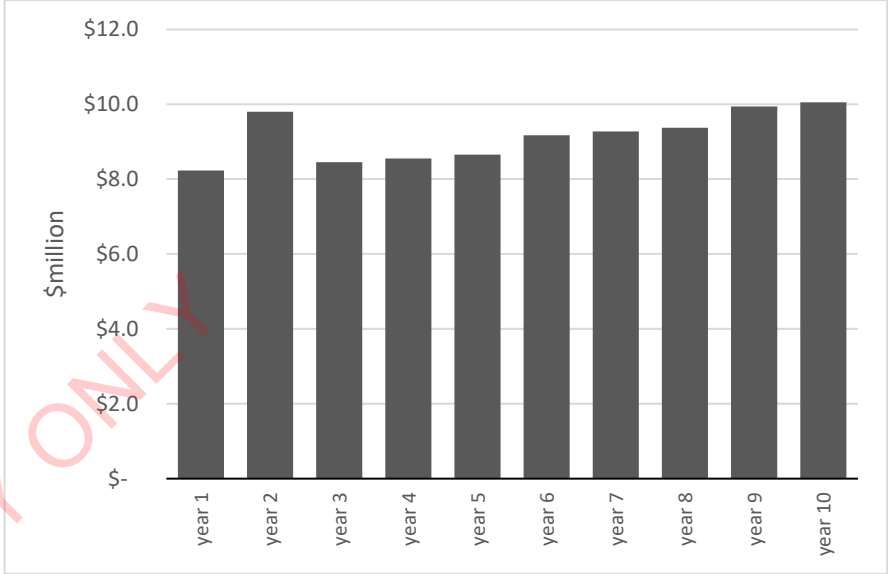
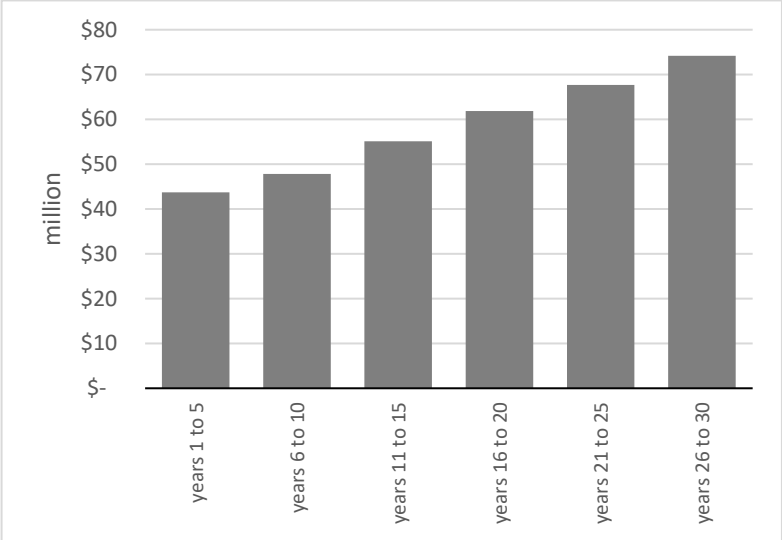


Figure D-15: Five yearly Land Transport operating expenditure forecasts – next 30 years



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Capital expenditure

Figure D-16: Land Transport capital expenditure – next 10 years

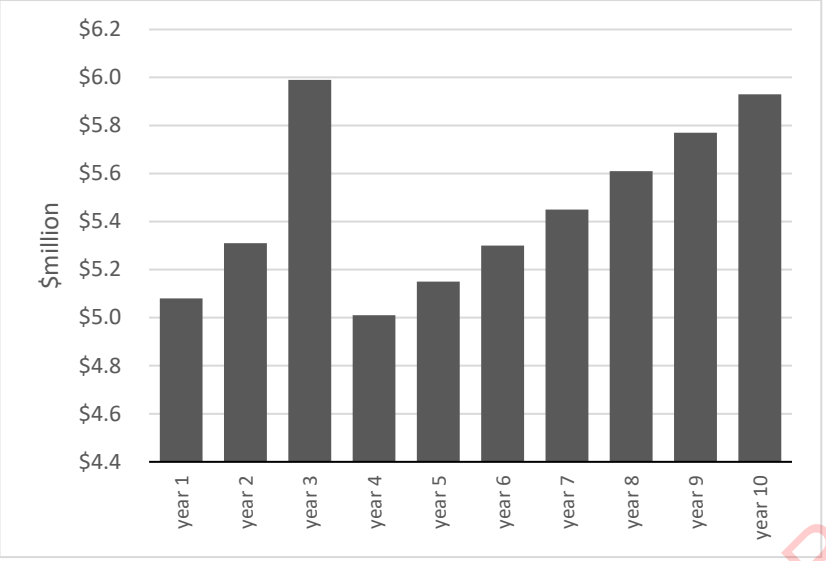
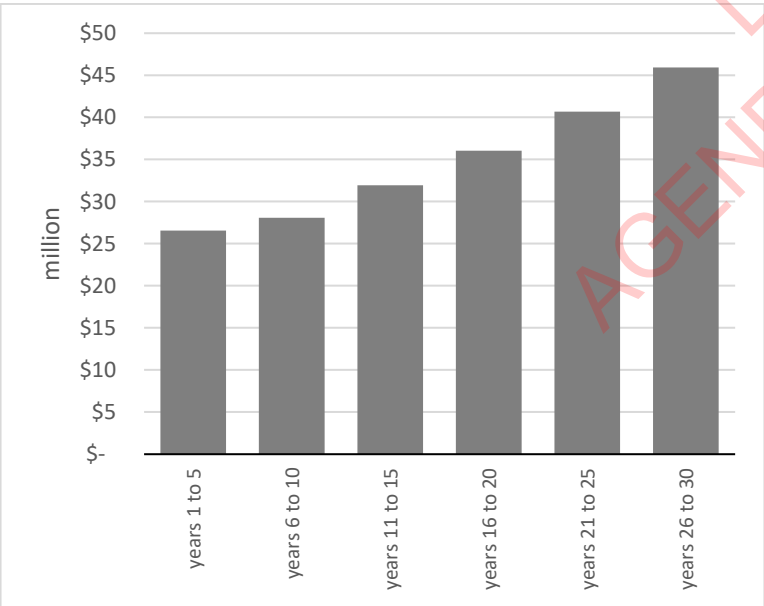


Figure D-17: Land Transport capital expenditure – next 30 years



Levels of service

Based on the information above we are planning on maintaining existing levels of service as the strategy is focused on renewal. Exceptions are:

- While still to be assessed, Stillwater Overbridge may be replaced with a two lane structure (currently single lane).
- Existing Class 1 (44 Tonne) bridges more likely to be replaced with current bridge loading standards unless there is a low need for use by heavy trucks.

Funding

Years 1-10	Council reduced its funding in 2019/2020 due to Covid-19 but this returns funding to pre Covid-19 levels.. Combined with the increase in the Waka Kotahi subsidy from 58% to 63%, this is an increase in funding of $390,000 in year 1. For years 2-10 annual rates increases range from an additional $12,000 to $112,000, including inflation) *
Years 11-20	Council has applied approximately 3% rate increase every year 0.5% above estimated inflation directed towards deferred renewals
Years 21-30	Council has also applied approximately 0.5% rate increase every year above inflation directed towards deferred renewals

* It should be noted that this subsidy is provided for certain types of works only. Bridge renewals or replacements receive a subsidy from Waka Kotahi - NZTA whereas footpath renewals do not. It makes financial sense for Council and is more beneficial to the community for money to be targeted towards projects which receive the highest subsidy, thus generating more money to spend.

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Table D-18: Expected service lives of major road assets

Asset	Asset Life
Formation	Unlimited
Pavement structure (sealed/unsealed)	25 to 50 years
Sealed pavement surfacing	8 to 15 years
Unsealed pavement surfacing	1 to 3 years
Drainage – culverts (up to 3.4 square metre end area)	50 to 100 years
Traffic facilities	5 to 15 years
Streetlights	15 to 25 years
Bridges and large culverts (3.4 square metre end aera and above)	50 to 100

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5. Water Supply

5.1 Background

Since 2008 Council has spent approximately $7 million invested in upgrading schemes to comply with New Zealand Drinking Water Standards (NZDWS). This includes projects at Blackball, Stillwater, Taylorville, Greymouth and Runanga.

Connection of the Stillwater community to the Dobson-Taylorville Supply and the connection of this community to the Greymouth Supply in 2016 has resulted in a more effective, efficient and resilient water scheme with improved water quality.

At present Council is about to release a contract to connect the township of Kaiata (currently on rainwater tanks) to the Greymouth Scheme and extend the service to also include the Kaiata Park Developments area.

While the treatment plant for Runanga-Rapahoe has been upgraded, Council is unable to commission the plant without further investment in chlorination treatment to meet revised requirements from the Ministry of Health for an approved Water Safety Plan. In the meantime the townships are connected to the Greymouth Scheme which is a compliant scheme. At this point Council is considering its options of either continuing to proceed with the standalone scheme for Runanga-Rapahoe or retain the connection to the Greymouth Scheme.

Unless there are unforeseen changes to regulatory standards (resource consent conditions at water takes or drinking water standards), or the schemes do not continue to meet current consent conditions, no major upgrades are expected in the 30 year period. The one exception is for the Greymouth Scheme; replacing the reservoir for resilience reasons and increasing the reservoir capacity to meet minimum water supply reserve capacity for fighting urban fires.

Council has received advice that following the Havelock North Drinking Water Inquiry, an increase in required Drinking Water Standards is "more likely" than less likely. While there are no details as to what this could involve, it is assumed the outcome will be that all water supplies will be required to be treated.

In addition, the Government has established Taumata Arowai, a new Drinking Water Regulator and is considering through a nationwide review and information gathering exercise changing the organisational structure of drinking water suppliers. The stated preference of Government is for larger organisational structures but there is as yet no specific detail on these reforms. Council has therefore continued to plan for this activity, on the basis that communities will continue to need water supplies regardless of which entity is delivering them.

At present all Council supplies in the Grey District are treated with chlorination and UV filter.

It is not known if any proposed Drinking Water Standards changes will require an increase in the level of treatment. If they do, it means additional costs for properties connected to the remaining water supply schemes in the Grey District. As there are no details on any changes, no provision for this has been included in the LTP.

Our water schemes

Council currently has two operational water schemes:

Greymouth	Servicing central Greymouth, CBD, Cobden, Blaketown, Karoro, Boddytown, Paroa, South Beach, Dobson, Taylorville and Stillwater, Runanga, Rapahoe and Dunollie
Blackball	Servicing the Blackball community

Note: While the Runanga water supply has been upgraded, it has not been commissioned and that community is currently connected to the Greymouth water supply. A decision to proceed has been deferred pending the outcome of the Three Waters reform.

It should be noted that Council may be asked to take over the operation and maintenance of various community run water supplies. If this occurs, any proposal would need to be assessed in the context of the current reforms, and also at that time assessment would need to be undertaken to confirm if they meet in full all the standards required of a Council managed water supply scheme. No budget for this has been included.

Figure D-19: Water infrastructure and distribution

	Greymouth	Blackball	Runanga/Rapahoe*
Number of connections	4,286	204	650
Bacterial compliance – treatment plant	Yes	Yes	Yes
Protoza compliance – treatment plant	Yes	Yes	Yes
Bacterial compliance – reticulation zone	Greymouth – yes	Yes	Runanga – yes

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	Cobden – yes		Rapahoe – yes

* Note: While the Runanga water supply has been upgraded, it has not been commissioned and that community is currently connected to the Greymouth water supply. A decision to proceed has been deferred pending the outcome of the Three Waters reform.

The above information is for the period 1 July 2019 to 30 June 2020 and is published by the South Island Drinking Water Assessment Unit.

All schemes for the compliance period met requirements for bacterial and protozoa protection including the Runanga Scheme, as it was and currently remains connected to the Greymouth Scheme.

Blackball is protected, but a turbidity issue in the raw water bladders led to operational issues and is planned to be resolved .

An intermittent chemical non-compliance is occurring in the Greymouth Scheme. This is caused by a build-up of disinfection by-products in the distribution zone, which is happening because of high concentrations of natural organic matter in the source water. Levels fluctuate and non-compliance is intermittent. At this stage the advice is to monitor the situation to learn more about the issue in order to determine appropriate solutions. The situation may be aggravated by older-internally rougher pipes retaining build up on the inside of the pipes. This plan allows for an investment to be considered in year's 4 to 10 of the LTP.

Condition of water network assets

Figure D-20 indicates the approximate date of construction and age profile of the water supply pipe network in ten year brackets.

Figure D-20: Age (years) profile of Water Supply pipes

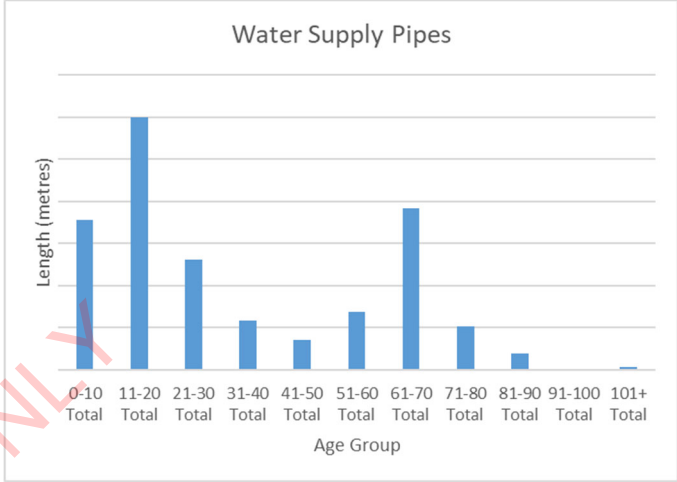
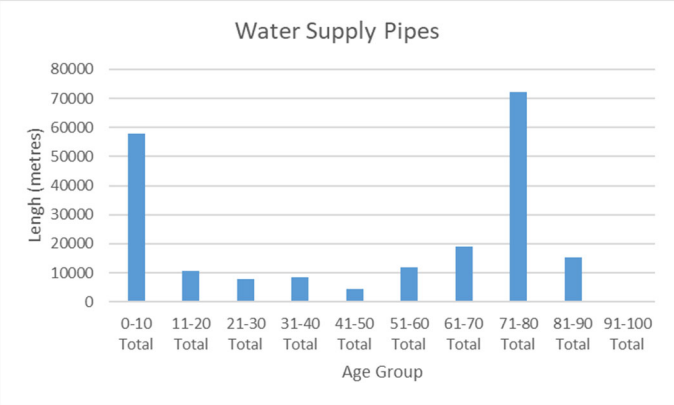


Figure D-21: Remaining useful life profile of Water Supply pipes



Significant condition assessments have been completed for water supplies. This assessment confirms what the age profile assessments also indicate, that there is a backlog of deferred renewals which will need to be addressed. This strategy proposes that stormwater renewals are addressed immediately as a matter of priority, with additional funding to increase water supply renewals provided from year 3. Condition assessments are ongoing.

The condition assessments provide us with more accurate and reliable asset knowledge which will be used to prioritise future renewal and replacement works.

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Map of renewals backlogs

The following table provide a good picture of the level of renewals required for this activity. This table show that older pipes that are past their potential use-by date exist in the more earlier established communities. This is about 47 kilometres of pipe (23%) that is past its use-by date.

LEGEND:

Deferred renewals - requires addressing

Renew within term of Infrastructure Strategy

Renew after Infrastructure Strategy

Sum of Quantity / Length (metres)	Water Supplies			
Community	**Beyond 30 Years**	**Deferred, Renew Now**	**Within 30 Years**	**Grand Total**
Ahaura	0.87		-	**0.87**
Blackball	10,944.90	427.70	797.91	**12,170.51**
Blaketown	5,313.56	1,841.75	3,544.47	**10,699.78**
Cobden	10,473.54	2,870.66	6,971.21	**20,315.41**
DOBSON URBAN	2.55		-	**2.55**
Dobson/Taylorville	8,628.06	6,685.05	2,245.08	**17,558.19**
Greymouth	45,243.89	12,850.09	11,216.30	**69,310.28**
Iveagh_Bay	38.14			**38.14**
Karoro	10,672.57	2,094.19	2,418.55	**15,185.31**
Moana	1,322.84		-	**1,322.84**
RAPAHOE	23.00		-	**23.00**
Runanga	14,996.90	20,188.85	1,295.02	**36,480.77**
Rural	3,551.00	-	19.77	**3,570.77**
SOUTH BEACH		-		-
South_Beach/Paroa	16,641.35	-	22.04	**16,663.39**
Stillwater	3,172.90	483.88	824.87	**4,481.65**
Grand Total	**131,026.07**	**47,442.17**	**29,355.22**	**207,823.46**
% Total Length	**63%**	**23%**	**14%**	**100%**

Greymouth water reservoir

The Greymouth water reservoir at Omoto, having been constructed in 1904, is now over 100 years old and past its useful life. As well as requiring renewal, it is currently located on land which has been identified as a high seismic hazard. In the event of a major earthquake, it would be very likely that the reservoir would be damaged and we would lose our water supply.

Council agreed to part fund the replacement of this reservoir to separate reservoirs for Cobden and Greymouth. Council is funding around $1 million in the 2020/2021 year for Cobden and the Government, as a result of business continuity initiatives relating to Covid-19 and the 3 Waters Reform, have agreed to fund the additional renewals and increased capacity requirements of about $4 million. This work is scheduled for completion in the first year of this LTP and since it has already been funded is not reflected in financial forecasts.

Future demand/upgrades

Significant (generally over $100,000) changes to demand and upgrades for other reasons have been identified as follows:

- Tourism growth:
  - Increased capacity to the Blackball Scheme of $500,000 commencing in year 4. This project is signalled for the next LTP. Demand will be monitored over the first three years of the 2021-2031 LTP and, if required, the proposal will be consulted on in the 2024-2034 LTP and budgets included.
  - New scheme for Moana, estimated cost of $2 million, driven by subdivision to meet by domestic tourism demand and size of township – increased safety for fire fighting commencing in year 4. This project is signalled for the next LTP and is subject to consultation. Demand will be monitored over the first three years of the 2021-2031 LTP and, if required, the proposal will be consulted on in the 2024-2034 LTP and budgets included.
- New 'wet' industry requiring water supply:
  - None identified.
- Zone Changes through Te Tai o Poutini Plan (One Plan):

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- None notified at this stage, although the proposed timeline for *Te Tai O Poutini* One District Plan shows this will occur during this LTP period.
- Natural hazards assessment. It has been signalled that the new One Plan will include updated hazards assessments which, following extensive community consultation, will underpin new planning zones in the region. This will include identification of areas subject to hazards and the effects of climate change. This is likely to impact on but not be limited to existing developments in coastal areas. This matter is likely to become more significant for future LTPs, if retreat from high risk areas is proposed. Retreat may involve closing down and removal of infrastructure and the potential creation of new supporting infrastructure in new development zones.
- Availability of land for development. Potentially more rural land will be zoned residential. This will trigger the need to upgrade the capacity of existing infrastructure and/or provide new infrastructure. This effect will need to be largely funded by those parties who seek to develop any new areas.

- Community Demand:
  - Gladstone–Camerons Area water supply and wastewater – $100,000 ($50,000 from water supply and $50,000 from wastewater) included for a feasibility study in year 1. This project will then be assessed and, if required, will be consulted on and budgets included in the next LTP at an estimated cost of $3.5 Million.
- General Growth and Climate Change, as well as more intense storms climate change signals longer dry periods:
  - Additional intake Bore at Coal Creek for Greymouth Supply - $250,000 in year 1. (Also predicted to be needed if continuing with the option of supplying Runanga-Rapahoe community with drinking water from the Greymouth Scheme.)
- Resilience:
  - New link main between Dobson and Kaiata Townships - $300,000 in year 4. This project is signalled for the 2024-2034 LTP, with demand being monitored over the first three years of the 2021-2031 LTP.
  - Will be taken into account with respect to the replacement of existing infrastructure including the appropriate location of replacement infrastructure.
- Compliance and Management:
  - Investment in supervisory control and data acquisition systems (known as SCADA) to meet and improve the management, compliance and reporting requirements for waters supplies to the Ministry of Health and the new water supply regulator, Taumata Arowai. $100,000 in Year 1, may be funded through the Government's 3 Waters Reform stimulus funding.
  - The Greater Greymouth Water Supply Master Plan recommends a focus on demand management through splitting the current reticulation into district metered areas (DMA's) and monitoring the use in each area with flow meters. Those areas showing high use can then be prioritised for focussed investigations and funding. Installation of additional zone area trunk main water meters has been included at $75,000 per year for years 1 to 5 of the LTP to identify and isolate high water leakage areas in the pipeline networks.
  - Management of chlorine residuals commencing in Year 4 at $100,000 per year.
- General:
  - Enhanced Leak Detection Programme - $50,000 in years 1 and 2.
  - Enhanced Pipe Renewal Programme - $440,000 in year 1, funded through the Government's Three Waters Reform stimulus funding.

It is noted that the replacement reservoirs for Greymouth are being funded by Council ($1m), Provincial Growth Fund ($1m) and DIA ($2.7m) and are due for completion in 2021/2022.

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5.2 Issues and options

ISSUE	OPTIONS	SHORT TERM (YEARS 1-10)	MEDIUM TERM (YEARS 11-30)	LONG TERM (YEARS 30+)
Deferred renewals. The outcome from condition assessments carried out to date confirm we have deferred renewals which need to be addressed in order to maintain levels of service and avoid potential critical failures.	1. Increase funding levels, i.e. from targeted rates from year 3 onwards. 2. Carry out upgrade works based on priorities established from condition assessments. 3. Pressure reduction to extend the life of assets where feasible and acceptable to consumers. 4. Improve efficiencies. 5. Utilise more cost effective materials, operations and construction methods.	✓	✓	✓
Ownership of Community Infrastructure Assets. A direct issue as who owns and who will fund this infrastructure asset affects who will make decisions and who will be in a position to plan for future investment.	1. Status Quo • Potentially not an option if the Government enacts new legislation for change	✓		
	2. New Organisational Structure • Monitor developments in this area and if status quo is not an option, then ensure the communities that own the infrastructure continue to have a voice in future decision making.	✓	✓	✓
Climate Change Existing residential and other developments at risk from coastal erosion and other climate change effects. Communities at Rapahoe and southern end of lower Cobden currently at risk.	1. Retreat of residential and other developments • May mean removal and/or relocation of infrastructure including protection works at a new location	✓	✓	✓
	2. Protect existing residential and other developments • Will mean provision of or upgrade of existing infrastructure to protect communities and other infrastructure.	✓	✓	✓
	3. Other strategies instead or as well as above options such as: • Reduce carbon heat emissions to slow down, halt and reverse global warning.	✓	✓	✓
Te Tai o Poutini Plan (One Plan) – Management of risks from natural hazards and climate change The TTP Plan will identify areas subject to hazards, undergo community consultation and develop appropriate planning zones.	1. Work collaboratively with other Councils during the process of identifying and responding to hazard and climate change risks. See also options above for Climate Change.	✓	✓	✓
Te Tai o Poutini Plan (One Plan) – Increase in Urban Zoned Land	1. Monitor progress on consultation and adoption of the One District Plan and promote funding of urban expansion through financial contributions.	✓	✓	✓

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ISSUE	OPTIONS	SHORT TERM (YEARS 1-10)	MEDIUM TERM (YEARS 11-30)	LONG TERM (YEARS 30+)
	2. As for option 1 but also promote urban renewal options to promote the effective and more efficient use of existing infrastructure.	✓	✓	✓
Damage to water supply network components from natural hazards, eg earthquakes.	1. Improve the resilience of schemes as budgets allow, e.g.:	✓	✓	✓
	○ Ensure the provision of main reservoir pipeline burst valves to stop reservoirs draining water if pipelines are broken during earthquake	✓	✓	✓
	○ Use flexible pipelines in replacements	✓	✓	✓
	○ Bolt down all equipment and pumps	✓	✓	✓
	○ Undertake longer term assessments on buildings and structures.	✓		
	○			
Upgrades may be required to existing treatment plant(s) if they do not meet current or new (higher) standards.	1. Upgrades to be investigated if required. Note: No funding has currently be allowed in the budgets for any future changes.	✓	✓	✓
Requests from the community for new schemes or from developers for schemes in specific locations.	1. Council will remain receptive and support community initiatives when approached. See projects identified above and included.	✓	✓	✓
	2. Council will continue to consult with developers to determine demand and capacity requirements. See projects identified above and included.	✓	✓	✓
Water supply is an important Lifelines component in the event of an emergency.	1. Council will continue to maintain its water supply network to the best of its ability	✓	✓	✓
Council has adopted a Master Plan for the CBD Renewal Project. Experience with the first two stages is that it is crucially important to initially locate existing underground services in order to as much as possibly avoid delays and increased costs. • Proposed requirement for new infrastructure • Other related underground infrastructure (power and communications) • Where will the funding come from for these works? • Funding for maintenance of new assets Note: Building over our pressurised pipelines is not an option.	1. Revise CBD Renewal designs to accommodate existing underground infrastructure.	✓		
	2. Provide funds to relocate or protect existing underground infrastructure.	✓	✓	

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5.3 Implications of not addressing these issues

- Potential for critical failure if assets are not protected/renewed/replaced/ relocated in time.
- If assets are not protected/replaced/renewed/relocated on a timely basis, we risk increased maintenance costs having to fix assets nearing or past their useful life.
- Emergency works may be expensive and Council may have to loan fund this expenditure – this will impact on Council's debt levels and ability to borrow for other unforeseen events.
- Failures will mean a reduction in the level of service currently provided by Council, or even loss of service (outage).
- Lower levels of satisfaction from users in some areas, eg potential for lower quality of drinking water or pressure (ie colour, taste, flow rates).
- Higher cost if renewing/replacing before the end of the asset's useful life.
- Lower resilience of older infrastructure in event of a natural disaster, eg earthquake.
- Lack of stored water available in the event of a fire fighting emergency.
- Public health/safety issues.
- Impact on Council's reputation.
- Quality of drinking water won't meet current or future drinking water standards. Water Supply Regulator may impose fines or other punitive measures.

Ageing pipes

There was a significant network of asbestos cement and brittle water pipes added to the networks in the 1970s, some of which is starting to require higher rates of repair - refer Table D-22 below.

Table D-22: Water Supply Pipe expected average service lives

Detailed Description	Expected Service Life (years)	Average of Age	Length (metres)	% Total Length	Average of RUL for Replacement (Years)
Asbestos Cement (AC)	50-60	59	42900	20.7%	5
Concrete Lined Steel	60	68	585	0.3%	6
Cast Iron (CI)	90	75	9737	4.7%	17
Low Density Polyethylene (LDPE)	40-90	35	17988	8.7%	17
Copper	50-70	43	1407	0.7%	27
Steel	80-90	57	6909	3.3%	31
Unknown	60-70	38	6345	3.1%	33
Conc Lined Ductile Iron	60	14	420	0.2%	47
Galvanised Steel	80-90	25	141	0.1%	64
Polyvinyl chloride - Unplasticized (uPVC)	80-90	20	66762	32.2%	70
Polyvinyl chloride - Modified (PVC-M)	90	16	4766	2.3%	75
Medium Density Polyethylene (MDPE)	50-90	13	29572	14.2%	75
High Density Polyethylene (HDPE)	80-90	4	6559	3.2%	79
Polyvinyl chloride - Orientated (PVC-O)	80-90	5	13517	6.5%	81
Totals		**27**	**207607**	**100.0%**	**51**

RUL means Remaining Useful Life. Figures are averaged, which means some pipes are beyond their predicted service life.

Where a range has been shown for the expected service life, this reflects a range of factors such as ground conditions, and original installation standards for specific areas.

Aspects of the above table are also shown in graphical from in the figure below. This also shows that AC pipe and brittle pipes are at or near the end their service life.

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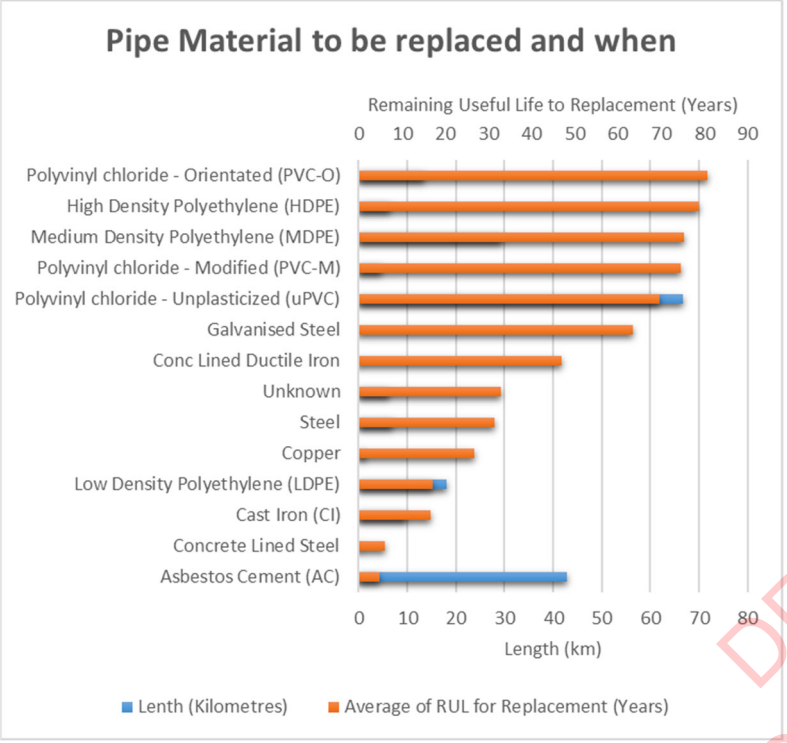
Figure D-23: Pipe Material to be replaced and when



These ageing pipes represent a high percentage (26%) of pipework and are projected to need replacing after their estimated year lifespan. Options include:

- Proactively replacing, focusing in critical – high importance areas first; and
- Continuing to repair on failure until maintenance costs exceed the cost of replacement or reliability level of service targets are not met.

These works will be carried out within available budgets.

The cost of handling the asbestos pipes are covered within the financial forecasts and the pipes are left in-ground in many instances.

Natural and technical hazards

Increased drought periods due to climate change may increase urban demand. Other than climate change, the water supply network could be adversely affected by earthquake given that approximately 26% of Council water reticulation is made up of older Asbestos Cement and brittle pipework. Major flood washouts and power supply failures could also adversely affect Council's ability to provide an uninterrupted service to residents. Details of mitigation strategies are included in Council's Asset Management Plans.

5.4 What we're planning on doing

Over recent years Council has upgraded a number of water supplies to meet current treatment standards. Parts of the existing water supply pipe network are nearing the end of useful life and Council is faced with addressing a backlog of renewal work to maintain the existing levels of service.

In addition to pipes, in the next 30 years other components of the water supplies will also need to be replaced such as pumps and electrical control systems.

Address deferred renewals

Council intends to continue with increasing rate funding to this activity from Year 3 onwards, so that we can address the required renewals on a prioritisation basis. We will initially concentrate on replacing critical components.

The following graph illustrates the level of deferred renewals forecast over the next 30 years, comparing:

1. What the backlog (deferred renewal) looks like based on no increases in levels of renewal investment (that is prior to 2018-2028 LTP changes); versus
2. What the backlog (deferred renewal) looks like based on the planned increased levels of renewal investment.

It is noted that this strategy is similar to the previous strategy with additional renewal investment in year 1 of $440,000 (DIA funds) and annual increases commencing from year 3, however due to future renewals falling due on top of renewal backlogs, it is likely to take about till year 24 to reduce the backlog in deferred renewals.

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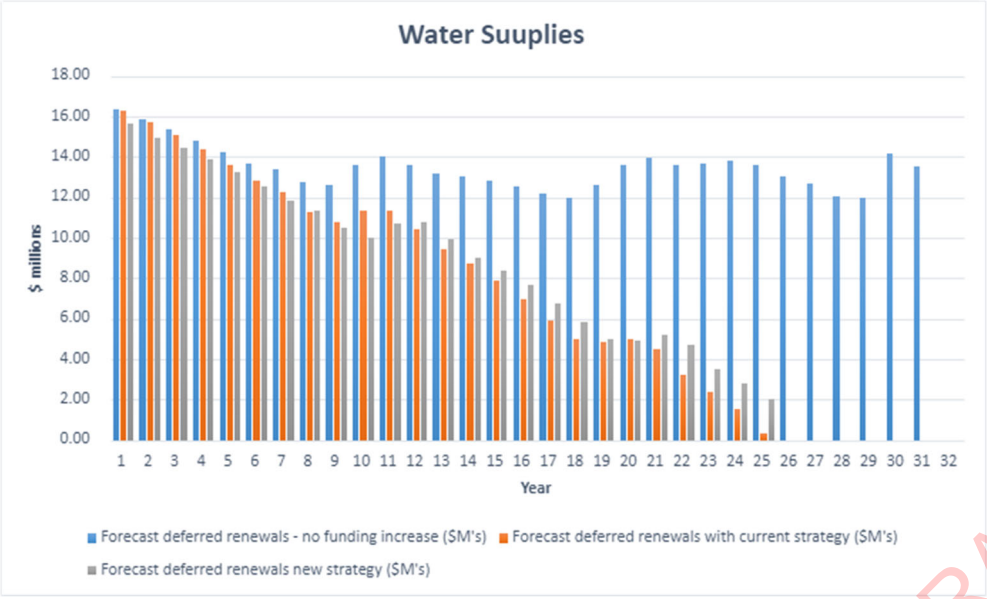
Figure D-24: Forecast deferred renewals backlog with existing funding level



Note: Where the deferred renewals goes into a negative amount (below the line), this effectively means that Council is in a position to start setting funds aside for future renewals (based on the longer term requirements).

Comparing across the Strategy, the backlog of renewals is addressed in a similar time frame to the Stormwater activity. The effect of the strategy will be monitored and reviewed for the next LTP given the criticality of the water supply being deemed higher than other activities and the consequences of a loss/reduction in service considered more severe.

Levels of service

Council is mostly looking to maintain existing levels of service and the required renewals will ensure we can continue to provide the existing service to consumers.

Exceptions to this include:

- Recognising the need to address other demands outlined above.
- Increased focus on leak detection, thus providing an improved service.
- Renewed pipes will be upgraded to meet Fire Fighting Standards.

5.5 Expenditure forecasts

The graphs on the following page presents the operating forecasts for the water supply activity. These are based on the following key assumptions that outline the **most likely scenario** for the District:

- Further regulatory changes are unknown and any associated investment has not been budgeted for (although it has been signalled that increases to the Drinking Water Standards are "more likely" than "less likely", these potential changes have not been included in this plan due to the lack of details available);
- Demand (quantity) will remain relatively unchanged, or at least will not increase to an extent that capacity upgrades are required. The exception could be tourism demand and District Plan changes (which are unknown). These this will be monitored over the life of this plan;
- Levels of service will remain unchanged, with the exception that as pipes are renewed they will be upgraded to meet Fire Fighting Standards where required and built with more modern, resilient materials;
- Provision for replacement of assets will be as forecast by the renewal model set out in the Activity Management Plan and is aligned to the Financial Strategy which has been formulated to ensure that our services remain affordable to our community;
- The financial forecasts for the first ten years of this Strategy are adjusted for projected inflation based on the BERL indices with the exception of Year 1, as per the assumptions outlined in our Long Term Plan. In Year 1, we have used indices based on our knowledge of the market and our local expertise. Forecasts for years 11 to 30 have been inflated at the BERL 20 year average rate.

Any significant capital works upgrades required to extend the network to new customers or provide supply to major new users would be considered on a cost recovery basis.

Other initiatives such as leak detection and repair of leaking pipes will be funded from maintenance and renewals. This will improve the level of service to that community.

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Figure D-25: Annual Water Supply operating expenditure forecasts – next 10 years

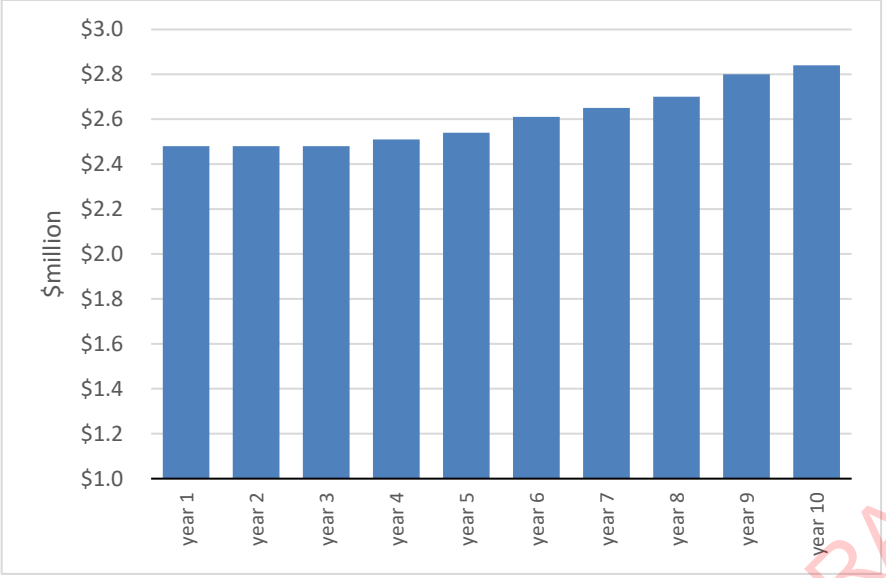
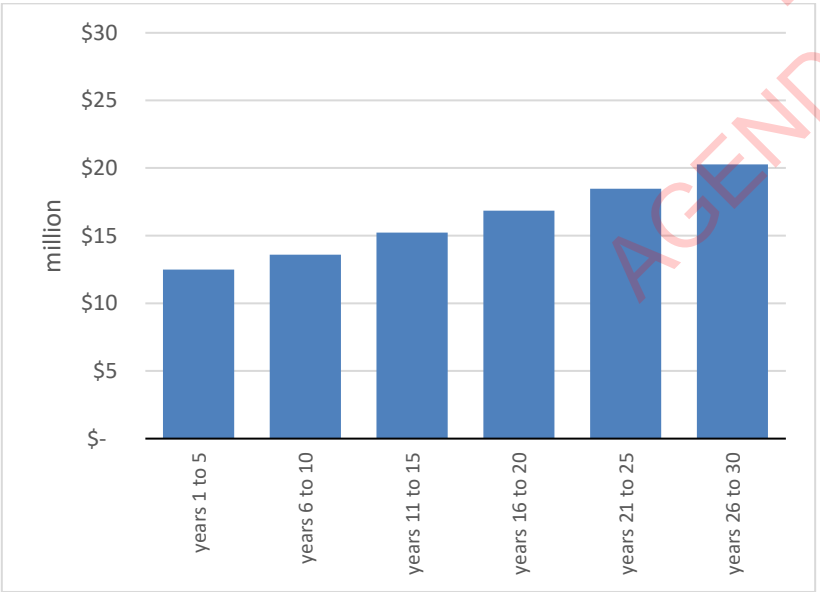


Figure D-26: Five yearly Water Supply operating expenditure forecasts – next 30 years



Capital expenditure

- One off capital expenditure items are signalled above in the section on Future Demands/Upgrades
- The increased funding for deferred renewals is summarised in the table and figure below.

Funding

Years 1-10	Year 1 of the Plan includes subsidies from PGF and the Three Waters Reform Fund for major capital projects, with deferred renewals being addressed through rates funding from year 3 onwards, with a $64,000 plus inflation (0.3% rates increase from 2023/2024) increase per annum year on year, ie cumulative increases.
Years 11-20	Increases continue to address the backlog and more assets falling due for replacement.
Years 21-30	Increases cease around year 24 after which Council continues funding renewals at levels close to that of the depreciation expense

Figure D-27: Water Supply capital expenditure – next 10 years

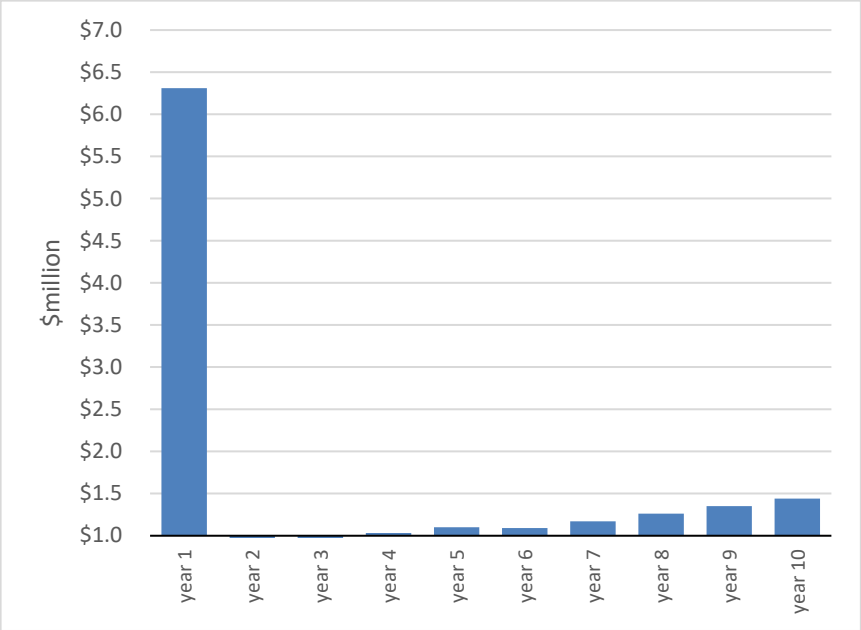


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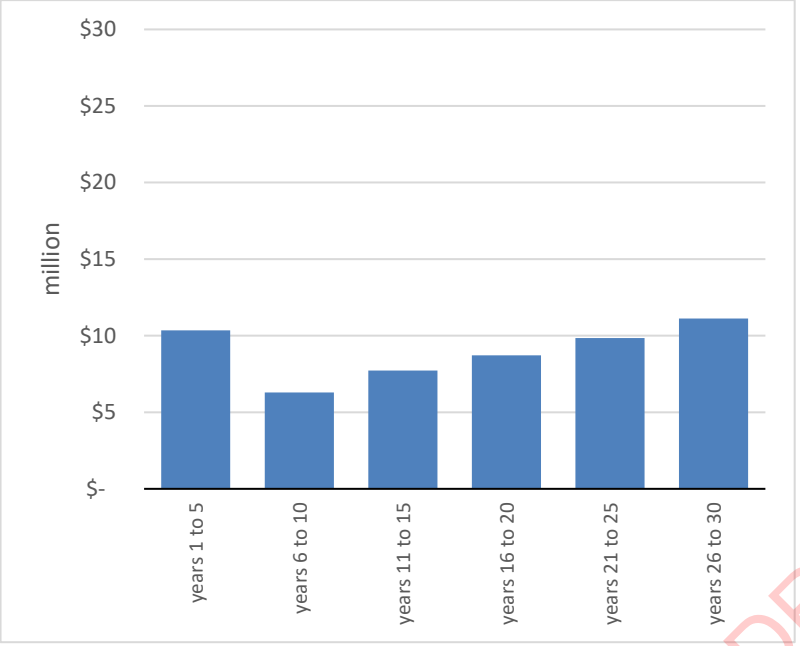
Figure D-28: Water Supply capital expenditure -next 30 years



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6. Wastewater

6.1 Background

Many of the original wastewater schemes were constructed in the last 50 years with around 95% of the pipe network built since 1970. Figure D-29 indicates the construction periods and age profile of the wastewater pipe network.

Council has invested heavily in wastewater infrastructure with the installation of a new separated sewer reticulation and treatment facility for the Greymouth scheme ($38 million). Council has also completed the Taylorville, Dobson and Kaiata Scheme ($7 million), which will utilise treatment capacity at the new Greymouth treatment plant. All treatment plants were designed and constructed to meet environmental requirements as set out within resource consents and respective standards. These standards are aimed at ensuring that effluent discharges do not negatively impact receiving water quality and the environment.

Discharge consents are in place for all treatment facilities. Council expects to be able to continue to comply with consent conditions imposed and does not foresee any undue issues in renewing consents under current standards.

Within the last ten years, the Greymouth wastewater treatment plant has been constructed and is operational. During the same period, the existing combined stormwater and sewer pipes were replaced with new sewer only pipes. Most of this separation work is complete by the commencement of this Plan.

Individual properties within the Greymouth scheme area are required to connect to this scheme and around half of affected properties have connected to date. This figure includes Dobson, Taylorville and Kaiata communities which are now connected to the Greymouth Scheme.

To enable the Greymouth wastewater treatment plant to run optimally, we need more properties connected to it. Council is now requiring property owners to do this and if they do not within a 2 year notification period Council is making arrangements to connect the property.

In addition, Council has also progressively upgraded treatment facilities throughout the district over the past decade. The Moana, Karoro/South Beach & Paroa facility capacities were upgraded around ten years ago and the Blackball scheme reticulation and treatment facility ($2 million) was constructed in 2008.

Alongside our water supplies, the Government is considering through a nationwide review and information gathering exercise changing the organisational structure of wastewater service delivery. The stated preference of Government is for larger organisational structures but there is as yet no specific detail on these reforms. Council has therefore continued to plan for this activity, on the basis that communities will continue to need wastewater services, regardless of which entity is delivering them.

Condition of wastewater network assets

Figure D-29 below indicates the approximate date of construction and age profile of the wastewater pipe network in ten year brackets.

Figure D-29: Wastewater pipe network age profile

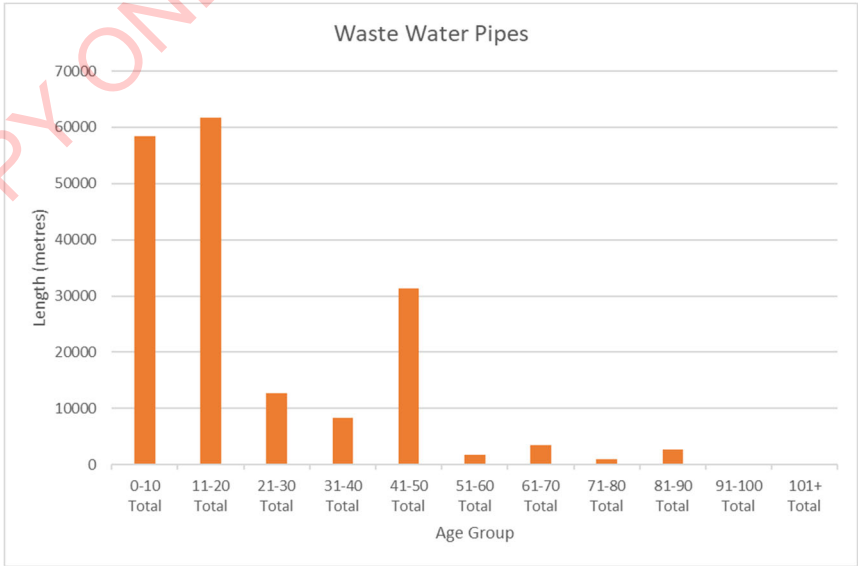

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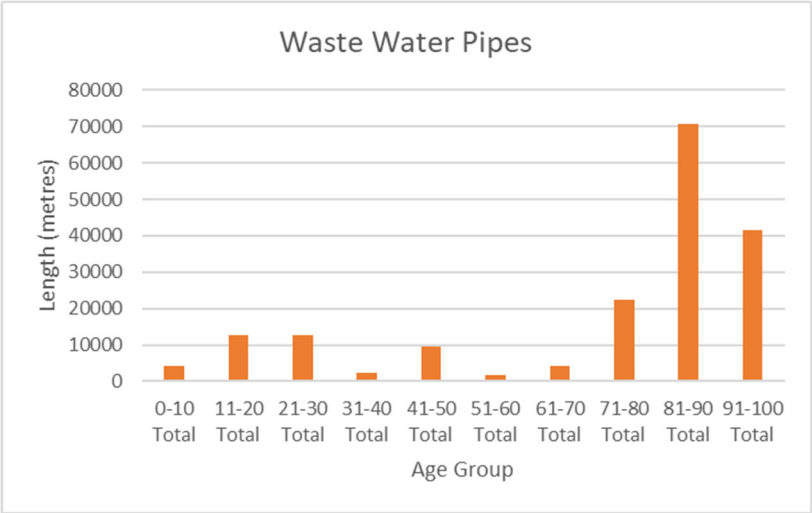
Figure D-30: Remaining useful life profile - Wastewater



Typical of many of the earlier wastewater schemes, substandard pipe material and harsh ground conditions can have adverse effects on the networks to varying degrees. In particular this affects the Runanga scheme where a combination of poor pipe material and high water levels has meant the pipes have failed earlier than expected. Major parts of the network require replacement - Council is addressing this at the moment and will continue to do so during this plan.

While there are some deferred renewals in the Wastewater activity, Council is choosing to focus on addressing the more significant needs in the Water Supply, Stormwater and Land Transport activities. We have focussed on our Wastewater assets over the last 10-20 years and overall the age profile means most of the Wastewater assets do not require attention at this stage. We will continue to address prioritised deferred renewals within our existing budgets. After seven years, the plan is to start applying more funding to wastewater renewals, noting that the appropriateness of this strategy will be reviewed as part of each subsequent LTP.

Future demand/upgrades

Significant (over $100,000) changes in demand and upgrades for other reasons have been identified as follows:

- Domestic Tourism growth:
  - Upgrade Moana Scheme for Moana. Estimated cost not confirmed at this stage as major subdivision plans not lodged (only signalled) at present. Driven by subdivision to meet domestic tourism demand and will be reviewed as part of the next LTP.
- New 'wet' industry requiring waste water collection:
  - None specifically identified.
- Zone Changes through Te Tai o Poutini Plan (One Plan):
  - None notified at this stage, although the proposed timeline for Te Tai O Poutini Plan shows this will occur during this LTP period.
  - Natural hazards assessments. It has been signalled that the new Plan will include updated hazards assessments, which following extensive community consultation will underpin new planning zones in the region. These will include identification of areas subject to hazards and the effects of climate change. This is likely to impact on but not be limited to existing developments in coastal areas. This matter is likely to become more significant for future LTPs, if retreat from high risk areas is proposed. Retreat may involve closing down and removal of infrastructure and the potential creation of new supporting infrastructure in new development zones.
  - Availability of land for Development. Potentially more rural land will be zoned residential. This will trigger the need to upgrade the capacity of existing infrastructure and/or provide new infrastructure. This effect will need to be largely funded by those parties who seek to develop any new areas.
- Community Demand:
  - Gladstone–Camerons Area water supply and wastewater – $100,000 ($50,000 from water supply and $50,000 from wastewater) included for a feasibility study in year 1. This project will then be assessed and, if required, will be consulted on and budgets included in the next LTP at an estimated cost of $3.5 Million.
  - Extension of Runanga Scheme to Rapahoe This project is signalled for the 2024-2034 LTP at an estimated cost of $1.5 Million and will be subject to consultation at that time, with demand being monitored over the first three years of the 2021-2031 LTP.
- Compliance and Climate Change:
  - Investigate in Year 3 connection of Karoro-South Beach- Paroa Scheme and, if confirmed as the best option, proceed in year 5 at an estimated cost of $2 Million. A resource consent condition of the existing scheme requires Council to carry out an investigation of this option by 1 February 2025. This project, if deemed the best option, would be subject to consultation as part of the 2024-2034 LTP.
- Resilience:

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- None specifically identified. Will be taken into account with respect to the replacement of existing infrastructure including the appropriate location of replacement infrastructure.

- Compliance and Management:
  - Investment in supervisory control and data acquisition systems to meet and improve the management, compliance and reporting requirements for wastewater systems at a cost of $100,000 in year 1 funded through the Government's Three Waters Reform stimulus funding. (This initiative is combined with water supply upgrades.)

- General:
  - A specific renewal to note at a total cost of $1.5 million in years 2 and 3 is the replacement of the UV Treatment plant for the Greymouth Scheme. It is now 20 years old and is reaching the end of its useful life.
  - Once most properties in the Blaketown area become connected to the new wastewater pipes, the link main to Greymouth needs to be downsized at a cost of $400,000 in year 4 of the LTP.

6.2 Issues and options

ISSUE	OPTIONS	SHORT TERM (YEARS 1-10)	MEDIUM TERM (YEARS 11-30)	LONG TERM (YEARS 30+)
Ownership of Community Infrastructure Assets. A direct issue as to who owns and who will fund this infrastructure asset affects who will make decisions and who will be in a position to plan for future investment.	1. Status Quo • Potentially not an option if the Government enacts new legislation for change	✓		
	2. New Organisational Structure • Monitor developments in this area and if status quo is not an option, then ensure the communities that own the infrastructure continue to have a voice in future decision making.	✓	✓	✓
Climate Change Existing residential and other developments at risk from coastal erosion and other climate change effects. Communities at Rapahoe and southern end of lower Cobden currently at risk.	1. Retreat of residential and other developments • May mean removal and/or relocation of infrastructure including protection works at a new location	✓	✓	✓
	2. Protect existing residential and other developments • Will mean provision of or upgrade of existing infrastructure to protect communities and other infrastructure.	✓	✓	✓
	3. Other strategies instead or as well as above options such as: • Reduce carbon heat emissions to slow down, halt and reverse global warning.	✓	✓	✓
Te Tai o Poutini Plan (One Plan) – management of risks from natural hazards and climate change The TTP Plan will identify areas subject to hazards, undergo community consultation and develop appropriate planning zones.	1. Work collaboratively with other Councils during the process of identifying and responding to hazard and climate change risks. See also options above for Climate Change.	✓		

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Te Tai o Poutini Plan (One Plan) – Increase in Urban Zoned Land	1. Monitor progress on consultation and adoption of the One District Plan and promote funding of urban expansion through financial contributions.	✓		
	2. As for option 1 but also promote urban renewal options to promote the effective and more efficient use of existing infrastructure	✓	✓	✓
Deferred renewals. The outcome from condition assessments confirm we have a level of deferred renewals but they are not as significant as those in the stormwater and water supply activities.	1. While there is a level of deferred renewals applicable to this activity, they are not as significant in the short to medium term (up to 10 years) as those in the stormwater and water supply activity. In the longer term deferred renewals do start to significantly increase. Future LTP's and IS's will review levels of funding.	✓	✓	✓
Some parts of the original 1970's sewerage schemes are nearing the end of their useful life and need replacing.	1. Utilise the information from the condition assessments to identify priority areas for renewals based on the importance of the infrastructure to consumers and other critical factors, e.g. effect on the environment if failure occurs.	✓	✓	✓
	2. Budget sufficient funds for timely replacement.	✓		
Runanga/Dunollie network has failed earlier than expected and a major part of the network requires replacement.	1. Council has already budgeted funds for these works.	✓		
	2. Works are ongoing.	✓		
Council has adopted a Master Plan for the CBD Renewal Project. Experience with the first two stages is that it is crucially important to initially locate existing underground services in order to as much as possibly avoid delays and increased costs. • Proposed requirement for new infrastructure • Other related underground infrastructure (power and communications) • Where will the funding come from for these works? • Funding for maintenance of new assets Note: Building over our pressurised pipelines is not an option.	1. Revise CBD Redevelopment Plan designs to accommodate existing underground infrastructure.	✓		
	2. Provide funds to relocate or protect existing underground infrastructure.	✓	✓	✓
Requests from the community for new schemes or from developers for schemes in specific locations.	1. Council will remain receptive and support community initiatives when approached.	✓	✓	✓
	2. Council will continue to consult with developers to determine demand and capacity requirements.	✓	✓	✓

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Upgrades may be required to existing treatment plant(s) if they do not meet current or new (higher) standards.	1. Upgrades to be investigated and invested in if/as required.	✓	✓	✓
Potential legislative changes that may lead to increasing levels of treatment before discharge to the environment.	1. Council will consider any changes when proposed.	✓	✓	✓
Damage to wastewater network components from natural hazards, eg earthquakes.	1. Improve the resilience of schemes as budgets allow, e.g.:			
	○ Use flexible pipelines in replacements	✓	✓	✓
	○ Bolt down all equipment and pumps	✓	✓	✓
	○ Undertake longer term assessments on buildings and pump stations	✓		
Wastewater is an important Lifelines component in the event of an emergency.	1. Council will continue to maintain its wastewater network to the best of its ability.	✓	✓	✓

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6.3 Implications of not addressing these issues

- Potential for critical failure if assets are not protected / renewed / replaced / relocated in time.
- If assets are not protected / replaced / renewed / relocated on a timely basis, we risk increased maintenance costs having to fix assets nearing or past their useful life.
- Leakage of untreated discharges to properties and the environment could occur.
- Higher cost if renewing/replacing before the end of the asset's useful life.
- Emergency works may be expensive and Council may have to loan fund this expenditure – this will impact on Council's debt levels and ability to borrow for other unforeseen events.
- Failures will mean a reduction in the level of service currently provided by Council, or even loss of service (outage).
- Lower resilience of older infrastructure in event of a natural disaster, e.g. earthquake.
- Impact on Council's reputation.
- Public health/safety issues.

Table D.31 - Wastewater pipes - expected average service lives

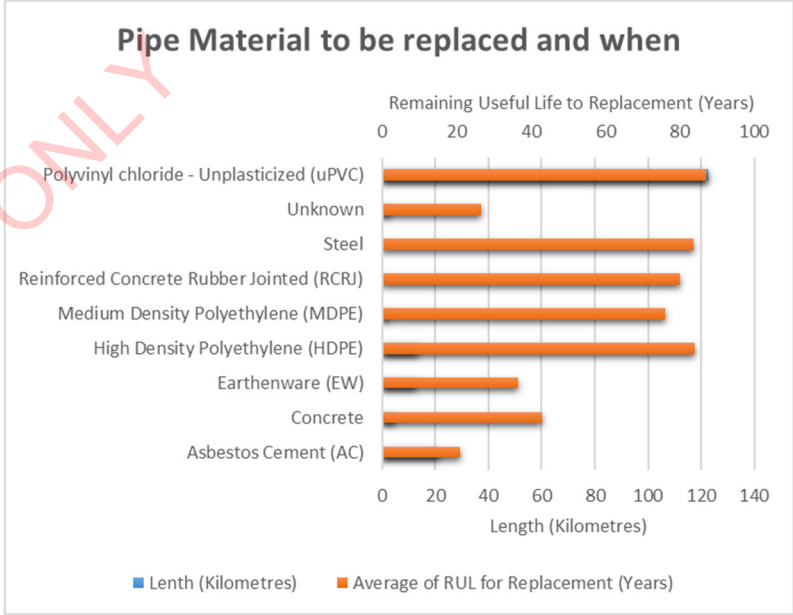
Detailed Description	Expected Service Life (years)	Average of Age	Length (metres)	% Total Length	Average of RUL for Replacement (Years)
Asbestos Cement (AC)	60-70	46.2	21578.7	12%	21
Unknown	70	45.3	2975.7	2%	27
Earthenware (EW)	90	54.3	12740.4	7%	36
Concrete	95	51.9	5072.6	3%	43
Medium Density Polyethylene (MDPE)	80-90	13.2	2610.2	1%	76
Reinforced Concrete Rubber Jointed (RCRJ)	95	15.0	7.5	0%	80
Steel	90	7.2	127.3	0%	84
High Density Polyethylene (HDPE)	90	6.2	13763.3	8%	84
Polyvinyl chloride - Unplasticized (uPVC)	100	13.0	122783.0	68%	87
		22.4	**181658.8**	100%	**73**

RUL means Remaining Useful Life. Figures are averaged, which means some pipes are beyond their predicted service life.

Where a range has been shown for the expected service life, this reflects a range of factors such as ground conditions, and original installation standards for specific areas.

Aspects of the above table are also shown in graphical form in the figure below.

Figure D-32: Pipe Material to be replaced and when



6.4 What we're planning on doing

Addressing deferred renewals

Deferred renewals in the water supply and stormwater activities are considered bigger priorities than wastewater at present. There is no planned increase in rate funding to this activity until year 7, where renewals work will receive additional funding.

Notwithstanding, it is planned to revisit the allocation of additional funding towards deferred renewals for the Stormwater and Water Supply activities at the next LTP

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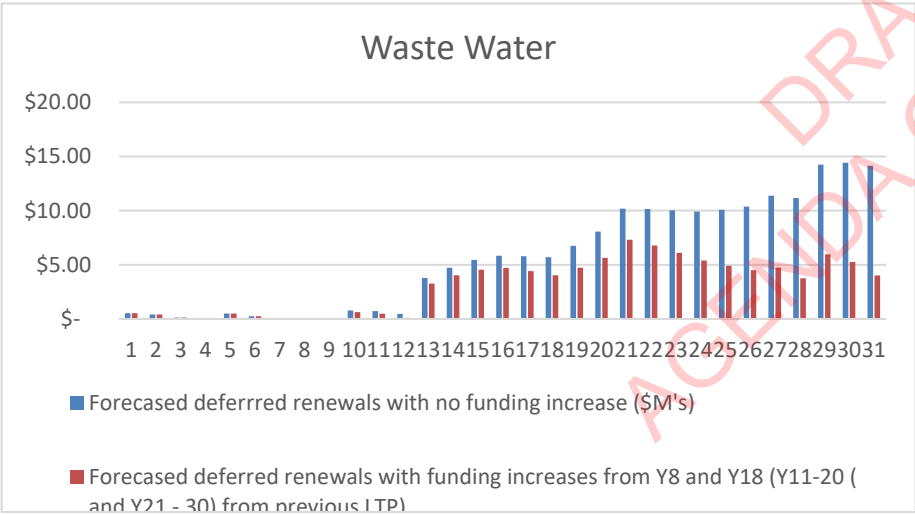
and potentially include the Wastewater activity in the funding split. This will be reviewed further in future LTPs.

The following graph illustrates the level of deferred renewals forecast over the next 30 years, comparing:

1. What the backlog (deferred renewal) looks like based on current levels of renewal investment; versus
2. What the backlog (deferred renewal) looks like based on future planned increased levels of renewal investment, increasing by $25,000 each year from Year 7 and then by a further $25,000 after year 17. Backlog reduced to around $4M in Year 30 whereas without increased funding backlog in Year 30 would have been $14M.

Figure D-33: Forecast deferred renewals backlog with planned increased funding (from year 7+)



Note: Where the deferred renewals goes into a negative amount (below the line), this effectively means that Council is in a position to start setting funds aside for future renewals (based on the longer term requirements).

Council plans to address deferred renewals on a prioritisation basis using information from the condition assessments within existing budgets.

Replacement reserve

Council received subsidies towards the Greymouth, Dobson, Taylorville schemes, with the balance of the costs funded from a targeted rate on the benefiting properties (via loan repayments). Because of the subsidies, the local communities are not paying the actual total cost of the schemes - if they had to, it would be unaffordable. As a result these activities generate an annual deficit as the depreciation expense reflects the full cost of the new assets.

The targeted rate levied to repay the loan raised to meet the project cost will be repaid over a 30 year period, which will be before the assets need renewing. At this stage the intention is that a large part of the targeted rate will continue so as to start setting aside funds for the future replacement. That is, the funding raised for loan repayments required over the next 30 years will, once the loans are fully repaid, continue to be raised and transferred to asset replacement reserves.

Complete Runanga wastewater works

The Runanga wastewater network failed earlier than expected due to a combination of poor material and adverse ground conditions (ie high water levels). Major parts of the network require replacement - Council is addressing this at the moment and will continue to do so during this plan.

6.5 Expenditure forecasts

Figures D-34 and D-35 present the operating forecasts for the wastewater activity. These are based on the following key assumptions:

- Any increased environmental standards in relation to freshwater management are unknown and associated investment (such as to upgrade treatment standards) has not been budgeted. Four consent renewals are due within the timespan of the 2021-2031 Long Term Plan – refer to the AMP for more information;
- Levels of service will remain unchanged other than where capital works are proposed to meet demands of other upgrade responses listed above;
- Provision for replacement of assets will be as forecast by the renewal model set out in the AMP and is aligned to the Financial Strategy which has been formulated to ensure that our services remain affordable to our community;
- The financial forecasts for the first ten year of this Strategy are adjusted for projected inflation based on the BERL indices with the exception of Year 1, as per the assumptions outlined in our Long Term Plan. In Year 1, we have used indices based on our knowledge of the market and our local expertise.

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Forecasts for years 11 to 30 have been inflated using the BERL 20 year average inflation factor.

Figure D-34: Annual Wastewater operating expenditure forecasts – next 10 years

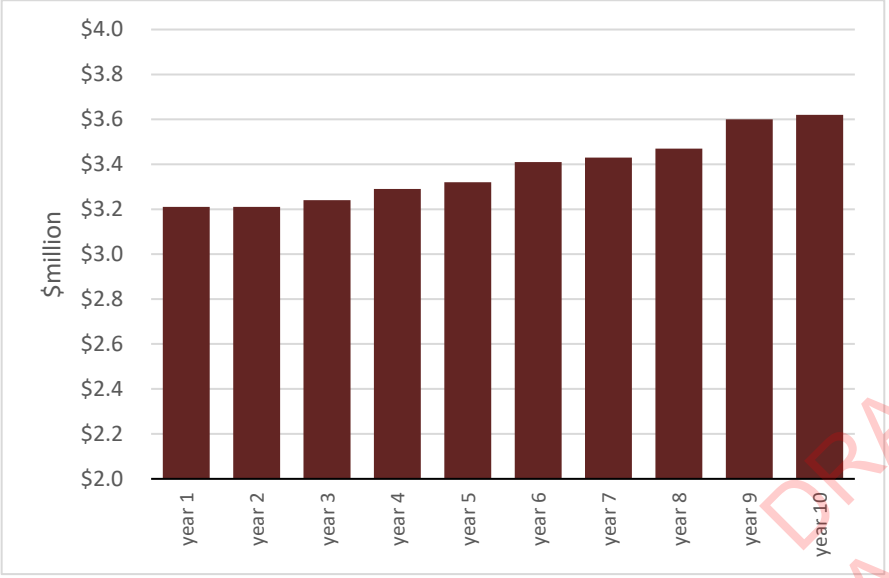
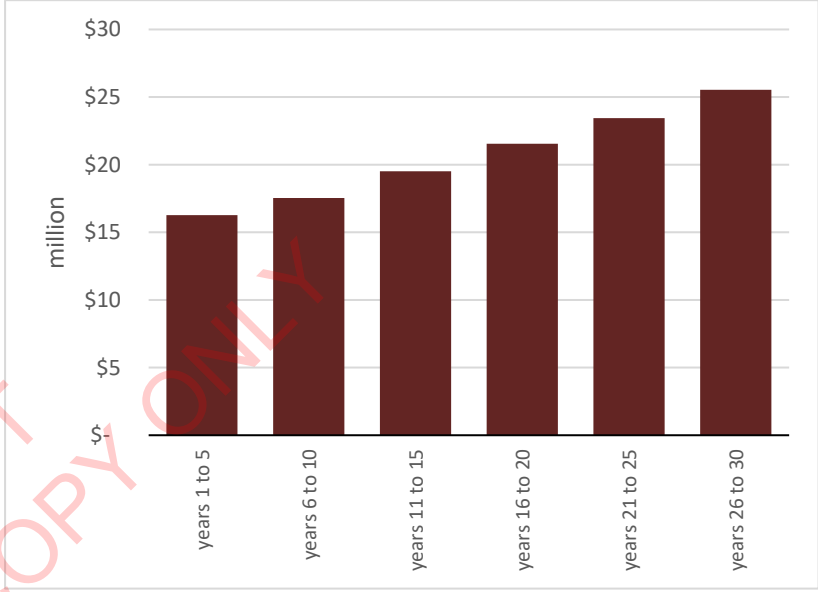


Figure D-35: Five yearly Wastewater operating expenditure forecasts – next 30 years



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Capital expenditure

- Completion of outstanding separation works for the Greymouth Scheme and requiring individual properties to connect to the scheme in the areas of Greymouth, Blaketown, Cobden, Taylorville, Dobson and Kaiata.
- On-going replacement of part of Runanga wastewater scheme.
- Other new capital expenditure is planned as listed above.

Funding

Years 1-10	No additional funding is budgeted for in the first seven years of this plan as funding is prioritised to other infrastructure activities. From year 7 Council has applied a rates increase of approximately 0.2% towards the funding backlog.
Years 11-20	Council has applied approximately 0.15% rate increase every year above inflation directed towards funding 'backlog'
Years 21-30	Council has also applied approximately 0.3% rate increase every year above inflation directed towards funding 'backlog' Backlog estimated to be removed between Years 31-40.

Figure D-36: Wastewater capital expenditure – next 10 years

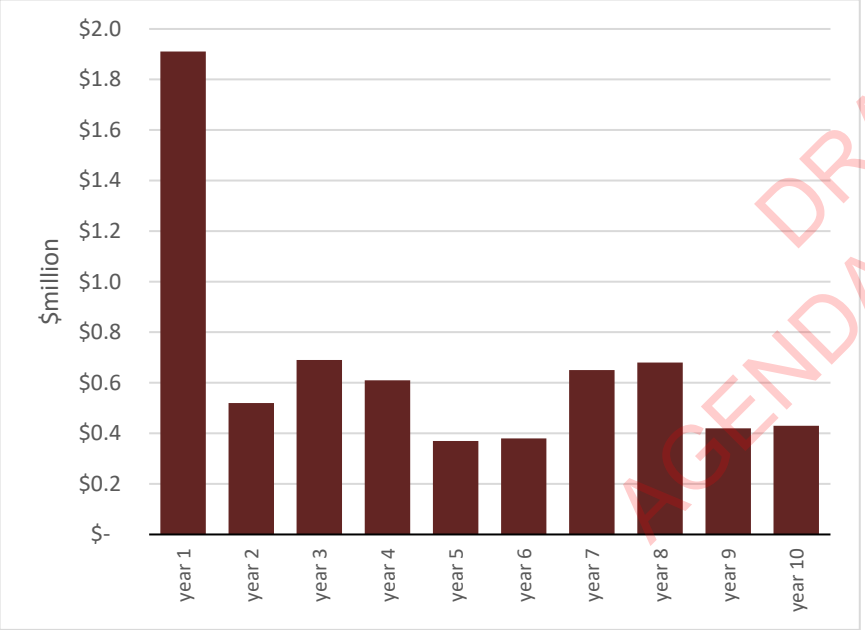
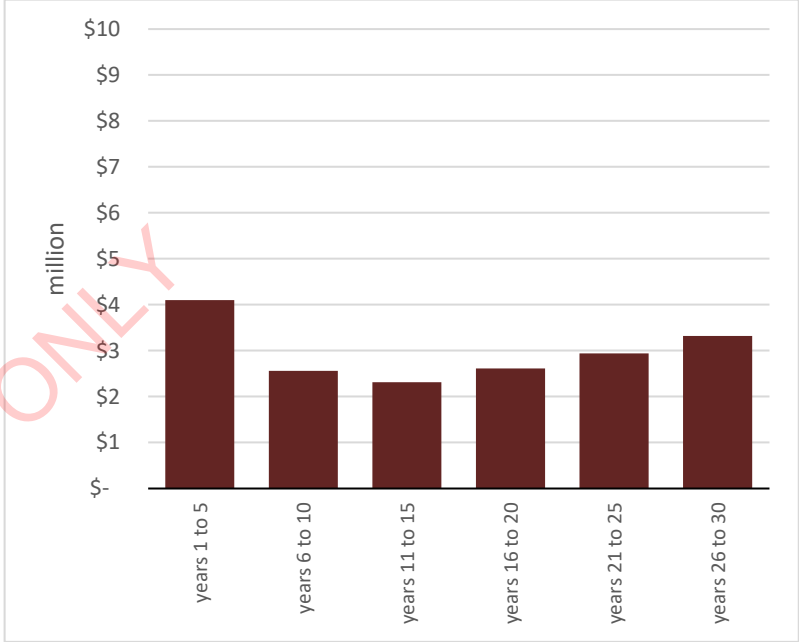


Figure D-37: Wastewater capital expenditure – next 30 years



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7. Stormwater

7.1 Background

Council provides urban stormwater networks in all of the main towns.

The Grey District enjoys high rainfall with individual rain events often involving heavy falls. It is important to ensure that flooding measures are in place in the District to deal with the disposal of any surface water accumulation and that excess flows are controlled and channelled towards waterways and that areas prone to flooding are protected.

All urban systems, with the exception of Greymouth CBD, are designed to cope with a 1-in-5 year on average storm - no ponding is evident after two hours after the rain stops and there is no damage to houses.

There are some older areas which do not currently meet stormwater design standards where flooding caused by restricted reticulation capacity is a known issue. These areas include the Greymouth CBD, Petrie Avenue, Puketahi Street, Whall Street areas and the south-east Greymouth CBD.

The Greymouth CBD system is designed to cope with a 1-in-1 year on average storm. Capacity limitations of the CBD system mean it often experiences severe surface flooding during extreme rain events. However, physical constraints make it very difficult to improve the system performance without considerable capital investment. Where available, stormwater backup surface flooding is managed by the Greymouth Flood Scheme stormwater pumps which pump the water over the floodwall.

As part of the wastewater upgrade for Greymouth, new wastewater only pipes were installed. The previously combined sewer/stormwater pipes are now dedicated stormwater pipes. This has significantly grown the stormwater network, however many of these are older pipes, especially in the Blaketown, Cobden and Greymouth areas.

New developments are required, at a minimum, to be hydraulically neutral and not increase peak runoff flows during flood events.

While the Government's three waters reform programme signals potential changes to who will manage and deliver stormwater services, its stated intention is to proceed with water supply and wastewater services reform initially. Stormwater may be the subject of review at some time in future. Council is continuing to plan for the provision of stormwater services in the period of this LTP, on the basis that communities will continue to need stormwater services, regardless of which entity is delivering them.

Condition of stormwater network assets

Most of our stormwater networks have been progressively built since the 1920's, as indicated in the age profile in Figure D-38. Pipes older than 100 years exist in the Greymouth and Cobden areas and are brick arches, concrete and earthenware pipes.

Figure D-38: Age profile - stormwater pipe

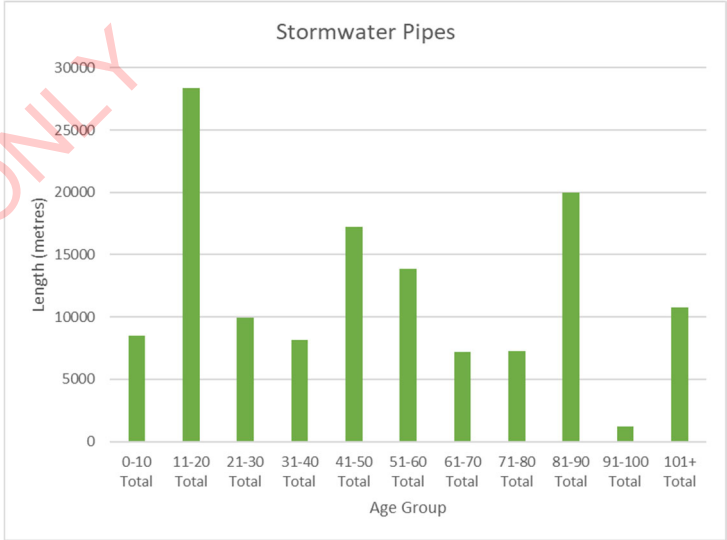

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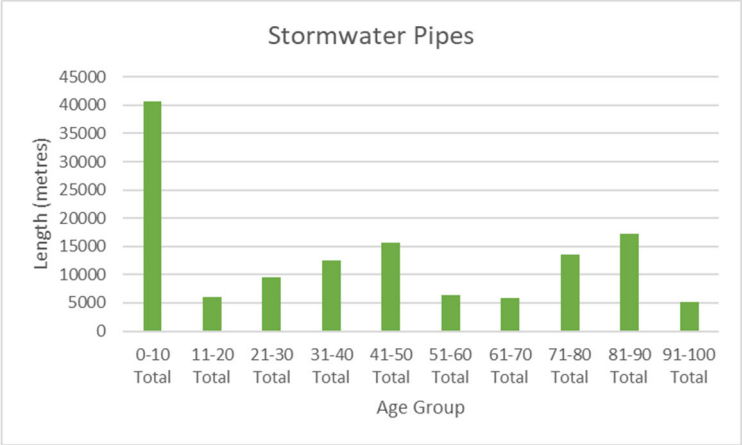
Figure D-39: Remaining useful life profile of stormwater pipes



There have been some pipe failures in recent years. Such failures have occurred on older arch type structures and predominately older earthenware/concrete pipe. It is believed that such failures will continue to occur based on the age of the asset.

As signalled in the 2018-2028 LTP, Council has carried out condition assessments of our stormwater network assets. These detailed condition assessments of stormwater pipes have resulted in the useful service lives of some different pipe materials being extended, however they do confirm significant deferred renewals for this activity, namely due to:

- The repurposing of combined sewer-stormwater pipes as stormwater only has significantly increased our network (many of these are older pipes);
- Ageing and deteriorating pipes; and
- The previous low renewal rates due to Council's focus on other prioritised projects, ie new wastewater treatment schemes or upgrades and upgraded treatment for water supplies.

Map of renewals backlogs

The following table and maps provide a good picture of the level of renewals required for this activity. This table and maps show that older pipes that are past their potential use-by date exist in the more earlier established communities. This is about 28 kilometres of pipe (21%) that is past its use-by date.

LEGEND:

Deferred renewals - requires addressing

Renew within term of Infrastructure Strategy

Renew after Infrastructure Strategy

Sum of Quantity / Length	Stormwater			
Community	**Beyond 30 Years**	**Deferred, Renew Now**	**Within 30 Years**	**Grand Total**
Ahaura	1,021.39		9.89	**1,031.28**
Blackball	2,059.12		-	**2,059.12**
Blaketown	2,217.91	6,208.08	1,521.62	**9,947.61**
Cobden	8,924.12	5,240.43	6,237.48	**20,402.03**
DOBSON URBAN	80.27			**80.27**
Dobson/Taylorville	3,619.49	318.11	1,502.35	**5,439.95**
Greymouth	30,332.64	15,557.20	14,965.50	**60,855.34**
Iveagh_Bay	1,618.23			**1,618.23**
Karoro	5,793.76	350.11	903.45	**7,047.32**
Moana	4,315.01	21.29	580.02	**4,916.32**
Runanga	9,197.68	273.30	2,118.54	**11,589.52**
Rural	3,022.82		196.60	**3,219.42**
South_Beach/Paroa	4,073.71	-	171.62	**4,245.33**
Stillwater	12.80		-	**12.80**
Grand Total	**76,288.95**	**27,968.52**	**28,207.07**	**132,464.54**
% Total Length	**58%**	**21%**	**21%**	**100%**

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The following maps provide a good picture of the level of renewals required for this activity.

LEGEND:

Deferred renewals - requires addressing

Renew within term of Infrastructure Strategy

Renew after Infrastructure Strategy

Figure: Map of Deferred Renewals and Renewals within Infrastructure Strategy Time Frame – Greymouth and Cobden

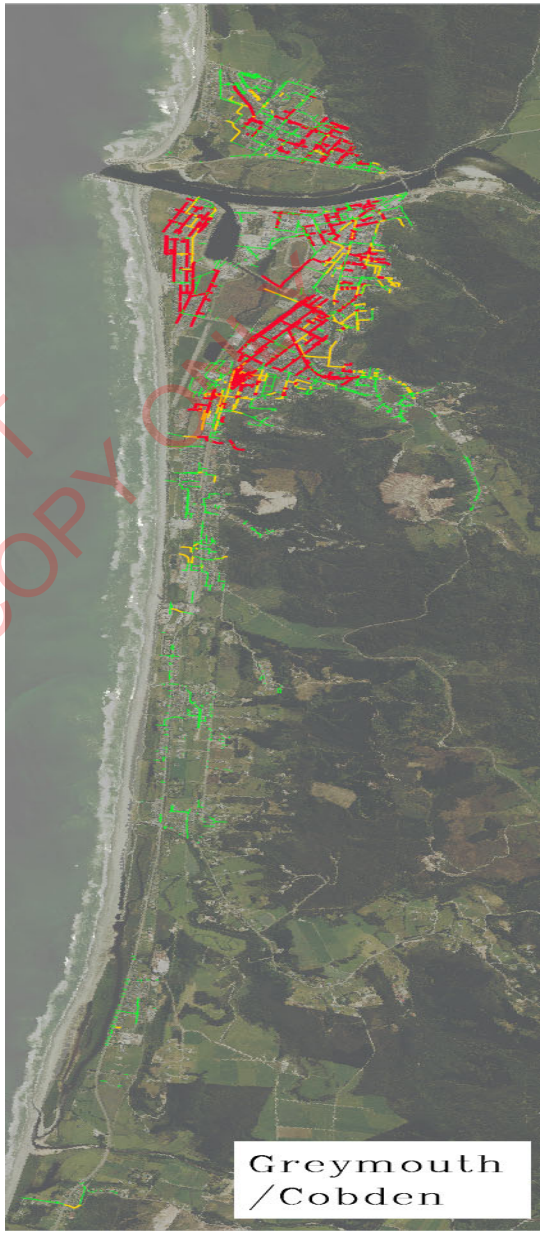

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Figure: Map of Deferred Renewals and Renewals within Infrastructure Strategy Time Frame – Runanga and Dunollie

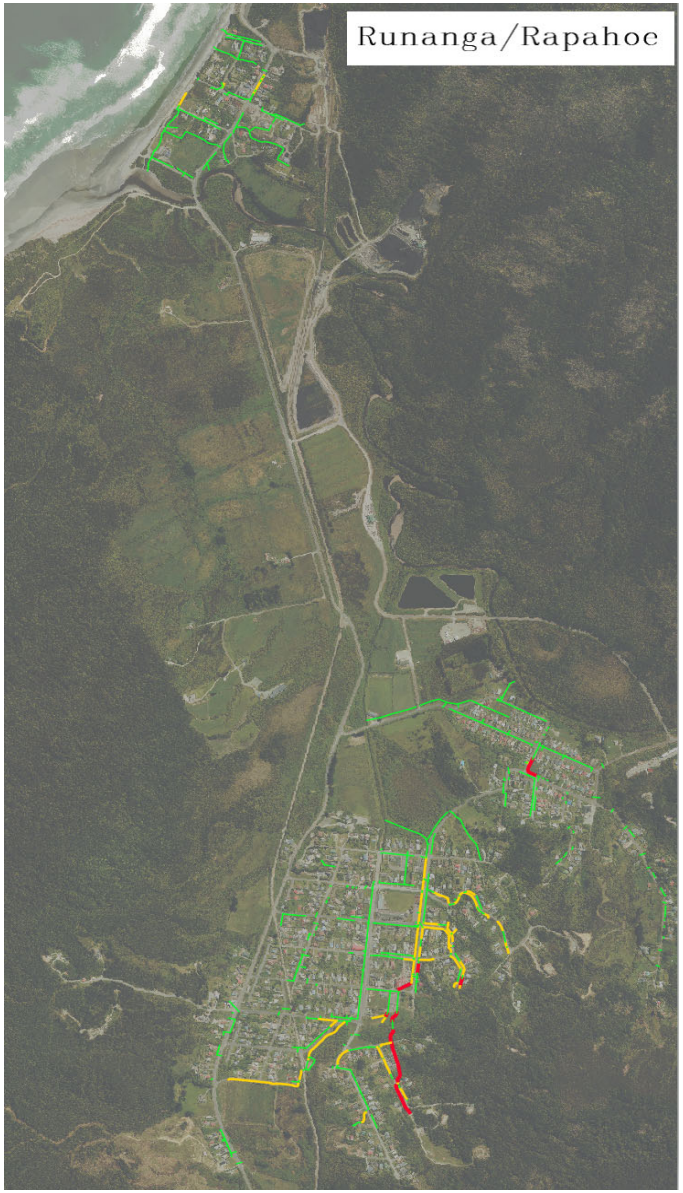
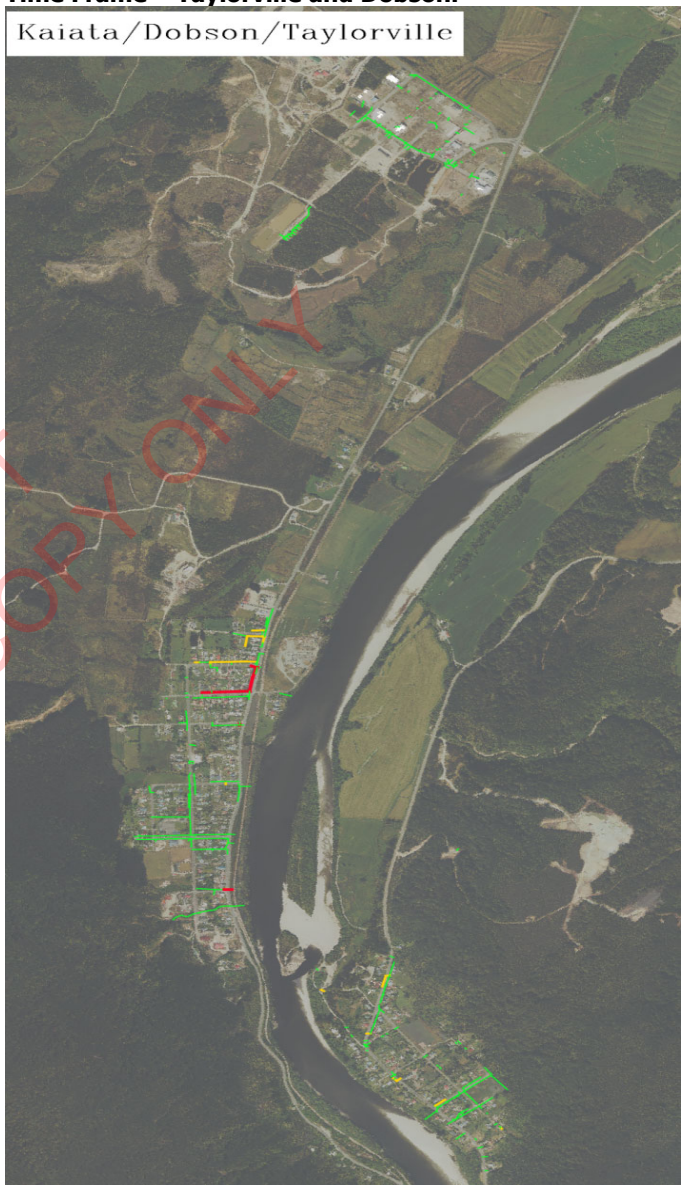


Figure: Map of Deferred Renewals and Renewals within Infrastructure Strategy Time Frame – Taylorville and Dobson.



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As we now have improved asset knowledge on the condition of our stormwater network, this will be used to prioritise future renewal and replacement works so that we can start to address the most critical areas first.

Future demand/upgrades

Significant (over $100,000) changes in demand and upgrades for other reasons have been identified as follows:

- New industry requiring stormwater disposal:
  - None specifically identified.
- Zone Changes through Te Tai o Poutini Plan (One Plan):
  - None notified at this stage, although the proposed timeline for Te Tai O Poutini Plan shows this will occur during this LTP period.
  - Natural hazards assessments. It has been signalled that the new Plan will include updated hazards assessments, which following community consultation will underpin new planning zones in the region. These will include identification of areas subject to hazards and the effects of climate change. This is likely to impact on but not be limited to existing developments in coastal areas. This matter is likely to become more significant for future LTPs, if retreat from high risk areas is proposed. Retreat may involve closing down and removal of infrastructure and the potential creation of new supporting infrastructure in new development zones.
  - If decisions are made to protect communities in high risk areas then this option may include flood protection walls (rivers and/or sea), upstream detention ponds, stormwater pump stations to remove accumulated stormwater that will back up behind flood protection walls and further pump stations to remove elevated ground water.
  - Availability of land for Development. Potentially more rural land will be zoned residential. This will trigger the need to upgrade the capacity of existing infrastructure and/or provide new infrastructure. This effect will need to be largely funded by those parties who seek to develop any new areas.
- Resilience:
  - None specifically identified. Will be taken in to account with respect to the replacement of existing infrastructure including the appropriate location of replacement infrastructure.
- Compliance and Management:
  - Investment in supervisory control and data acquisition systems (SCADA) to meet and improve the management, compliance and reporting requirements for stormwater systems. $100,000 in Year 1, may be funded through the Government's Three Waters Reform stimulus funding. (This initiative is combined with water supply and wastewater scheme upgrades.)
- General Upgrades (over $100,000):
  - In Central Greymouth: Petrie Avenue, Puketahi Street and Whall Street stormwater system upgrades. Review preliminary design Year 4 and implement over Year 5 - $447,000, Year 6 - $497,000 and Year 7 - $487,000
  - In Southern Greymouth: Shakespeare Street Area stormwater system upgrade. Design in Year 1 and implement over Year 2 - $275,000 and Year 3 - $275,000.
  - In Dobson: Moa Street – Design and construct Year 4 - $200,000
  - In Karoro: Nolan Crescent Stage 2 Construction in Year 9 - $175,000
  - In Central Greymouth: Leonard Street / William Street – Greymouth Design and Construct Year 8 - $400,000

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Disposals

The Greymouth floodwall structure has been a strategic asset under ownership of the Grey District Council due to a historical decision and currently all costs are paid by the West Coast Regional Council, including insurance, maintenance and renewal costs. They also rate for the floodwall and make all operational decisions with regards to it. It is proposed to officially transfer ownership of this asset to the West Coast Regional Council during year 1 of the plan.

There is a Joint Floodwall Committee set up to help manage the asset - Grey District Council have representation on this committee. The asset transfer will not change this arrangement. No conflicts of interest regarding the proposed transfer have been identified. There are no financial implications for Grey District Council as currently it is just a line in our accounts as an asset

7.2 Issues and options

ISSUE	OPTIONS	SHORT TERM (YEARS 1-10)	MEDIUM TERM (YEARS 11-30)	LONG TERM (YEARS 30+)
Deferred renewals. The outcome from condition assessments carried out to date confirm we have significant deferred renewals which need to be addressed in order to maintain levels of service and avoid potential critical failures.	1. Utilise information from the condition assessments to identify priority areas for renewals based on the importance of the infrastructure to consumers and other critical factors, e.g. effect on the environment if failure occurs. 2. Increase rate funding to this activity. 3. Improve efficiencies. 4. More cost effective materials, operations and construction methods, (e.g. concrete lining of existing pipes).	✓	✓	✓
Ownership of Community Infrastructure Assets. A direct issue as who owns and who will fund this infrastructure asset affects who will make decisions and who will be in a position to plan for future investment.	1. Status Quo • Potentially not an option if the Government enacts new legislation for change.	✓		
	2. New Organisational Structure • Monitor developments in this area and if status quo is not an option, then ensure the communities that own the infrastructure continue to have a voice in future decision making.	✓	✓	✓
Climate Change Existing residential and other developments at risk from coastal erosion and other climate change effects. Communities at Rapahoe and southern end of lower Cobden currently at risk.	1. Retreat of residential and other developments • May mean abandonment / removal and/or relocation of infrastructure including protection works at a new location	✓	✓	✓
	2. Protect existing residential and other developments • Will mean provision of or upgrade of existing infrastructure to protect communities and other infrastructure.	✓	✓	✓
	3. Other strategies instead or as well as above options such as: • Reduce carbon heat emissions to slow down, halt and reverse global warming.	✓	✓	✓
Te Tai o Poutini Plan (One Plan) – management of risks from natural hazards and climate change The TTP Plan will identify areas subject to hazards, undergo community consultation and develop appropriate planning zones.	1. Work collaboratively with other Councils during the process of identifying and responding to hazard and climate change risks. See also options above for Climate Change.	✓		

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ISSUE	OPTIONS	SHORT TERM (YEARS 1-10)	MEDIUM TERM (YEARS 11-30)	LONG TERM (YEARS 30+)
Te Tai o Poutini Plan (One Plan) – Increase in Urban Zoned Land	1. Monitor progress on consultation and adoption of the One District Plan and promote funding of urban expansion through financial contributions.	✓	✓	✓
	2. As for Option 1 but also promote urban renewal options to promote the effective and more efficient use of existing infrastructure.	✓	✓	✓
Fund Greymouth and other community stormwater upgrades. See General Upgrades list above which has been developed through community requests to previous LTP's / Annual Plans.	1. Fund these works in this LTP.	✓	✓	
Vulnerability of buried pipes in soft ground to natural hazards such earthquakes and liquefaction.	1. Carry out upgrade works based on priorities established from condition assessments.	✓	✓	✓
	2. Carry out catchment wide assessments for storm water networks to identify capacity constraints and areas for targeted improvements. Improvements may include detention ponds, storm water pumping systems, increased pipe capacity and additional storm water networks.	✓		
	3. Managed retreat where other options are not economically feasible.	✓	✓	✓
Natural hazards and/or climate change causing backup flooding to properties. Need to consider detention ponds, stormwater pumping systems, increased pipe capacity and additional stormwater networks.	1. Funding through West Coast Regional Council (WCRC) rating districts.	✓	✓	✓
	2. Possible part funding through Council.	✓	✓	✓
	3. Allow for capacity increases as pipelines are replaced.	✓	✓	✓
	4. Review capacity of stormwater systems in townships to cope with current and future predicted storm events. Include possible stormwater network enhancements in future LTPs.	✓	✓	✓
Requirement for improved flood protection in the lower Cobden area from Grey River and Tasman Sea inundation (in consultation with West Coast Regional Council (WCRC)).	1. Some works have already been carried out by the WCRC, which have resulted in a lower flood risk for the lower Cobden area. This situation will be monitored.	✓	✓	✓
Damage to stormwater pump stations from natural hazards, eg earthquakes.	1. Carry out resilience works as budgets allow.	✓	✓	✓

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ISSUE	OPTIONS	SHORT TERM (YEARS 1-10)	MEDIUM TERM (YEARS 11-30)	LONG TERM (YEARS 30+)
Council has adopted a CBD Redevelopment Plan and it is crucially important to initially locate existing underground services in order to as much as possibly avoid delays and increased costs. Issues identified to date include: • Proposed requirement for new or upgraded stormwater infrastructure (to compensate for lowered road levels and removal of kerb and channel if these options are chosen) • Effects on existing stormwater infrastructure • Consequential issues relating to excavation to install new underground infrastructure such as the presence of coal tar (requiring resource consents) and unknown old underground infrastructure (power and communications) • Where will the funding come from for these works? • Funding for maintenance of new assets	1. Provide funds to relocate or protect existing underground infrastructure.	✓		
	2. Revise CBD Redevelopment designs to accommodate existing underground infrastructure.	✓		
Stormwater is an important Lifelines component in the event of an emergency.	1. Council will continue to maintain its stormwater network to the best of its ability.	✓	✓	✓

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7.3 Implications of not addressing these issues

- Potential for critical failure if assets are not protected / renewed / replaced / relocated in time.
- If assets are not protected / replaced / renewed / relocated on a timely basis, we risk increased maintenance costs having to fix assets nearing or past their useful life. Some of our existing networks are quite old.
- Lower levels of satisfaction from users in some areas.
- Some areas have a very low level of service, ie the CBD. There is some increase in service level included this plan. This will assist in mitigating the effects such as flooding, property damage, risks to health and safety.
- Council may be vulnerable to legal issues following flooding events.
- Emergency works may be expensive and Council may have to loan fund this expenditure – this will impact on Council's debt levels and ability to borrow for
- other unforeseen events.
- Failures will mean a reduction in the level of service currently provided by Council, or even loss of service (outage). Risks of this include flooding, property damage and health and safety issues.
- Lower resilience of older infrastructure in event of a natural disaster, e.g. earthquake, leading to compromised safety, property damage and increased cost.
- Lower level of capacity of existing infrastructure through incremental increases in surface runoff through climate change.
- Higher cost if protecting / renewing / replacing / relocation before the end of the asset's useful life.
- Reputational impact for Council.
- Public health/safety issues.
- Property damage.

Age of assets

Table D-40: Stormwater pipes expected average service lives

Detailed Description	Expected Service Life (years)	Average of Age	Length (metres)	% Total Length	Average of RUL for Replacement (Years)
Brick	110	100	402	0.3%	10
Stone	110	100	125	0.1%	10
Unknown	50-70	70	6,136	4.6%	14
Arch	110	96	179	0.1%	15
Earthenware (EW)	90	76	31,429	23.7%	16
Asbestos Cement (AC)	60-70	54	3,414	2.6%	19
open Channel Unlined	50-60	33	11,541	8.7%	29
Novaflow	50	19	1,030	0.8%	31
Aluflow	70	33	65	0.0%	37
Low Density Polyethylene (LDPE)	70	22	44	0.0%	48
Concrete	70-95	46	51,381	38.8%	49
Steel	90	35	384	0.3%	56
Dish Channel	80	2	133	0.1%	78
Polyvinyl chloride - Unplasticized (uPVC)	100	18	25,049	18.9%	82
Reinforced Concrete Rubber Jointed (RCRJ)	70-95	9	1118	0.8%	84
Totals		**44**	**13,2429**	**100%**	**50**

Where a range has been shown for the expected service life, this reflects a range of factors such as ground conditions, and original installation standards for specific areas.

Climate change

Climate change is expected to increase the frequency and intensity of storms. In effect, this will lower the design capacity of the primary pipe network (what is currently a ten year return period event may become an eight year return period, for example).

Council designs new/renewed stormwater infrastructure to expected future storm event return periods, however other than the targeted areas listed above, there is no plan to upgrade existing stormwater pipes other than as part of the renewal programme and this has been factored into the financial forecasts.

In addition sea level rise may lead incrementally to rises in river bed, lagoon bed and water tables. These consequential effects are likely to also compound surface flooding on lower lying coastal areas. It will become increasingly important to consider an integrated approach through such initiatives as the Te Tai o Poutini Plan (One Plan), which will identify and manage areas subject to hazard risk through appropriate zoning.

7.4 What we're planning on doing

Addressing deferred renewals

Council is planning on increasing rate funding to this activity so that we can start to address the required renewals and targeted upgrades on a prioritisation basis.

The following graph illustrates the level of deferred renewals forecast over the next 30 years, comparing:

1. What the backlog (deferred renewal) looks like based on current levels of renewal investment; versus
2. What the backlog (deferred renewal) looks like based on the planned increased levels of renewal investment.

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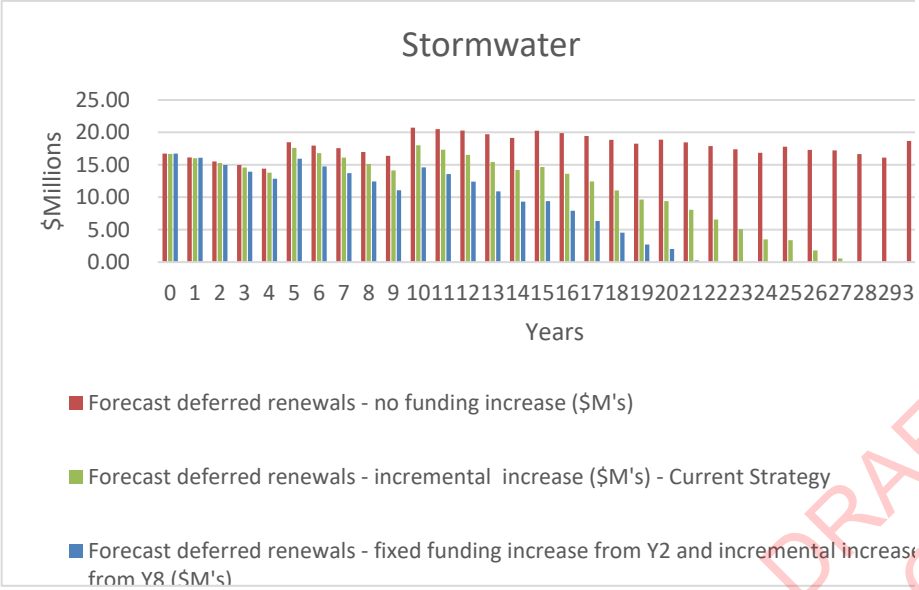
Figure D-41: Forecast deferred renewals backlog with planned increased funding



Note: Where the deferred renewals goes into a negative amount (below the line), this effectively means that Council is in a position to start setting funds aside for future renewals (based on the longer term requirements).

7.5 Expenditure forecasts

The expenditure forecasts in Figures D-42 and D-43 are based on the following assumptions:

- Other than targeted upgrades and allowing for increased capacity to address climate change, the level of service will remain the same;
- Provision for replacement of assets will be as forecast by the renewal model set out in the Asset Management Plan and is aligned to the Financial Strategy which has been formulated to ensure that our services remain affordable to our community; and
- The financial forecasts for the first ten year of this Strategy are adjusted for projected inflation based on the BERL indices with the exception of Year 1, as per the assumptions outlined in our Long Term Plan. In Year 1, we have used indices based on our knowledge of the market and our local expertise. Forecasts for years 11 to 30 have been inflated at the BERL 20 year average inflation factor.

Figure D-42: Stormwater operating expenditure forecasts – next 10 years

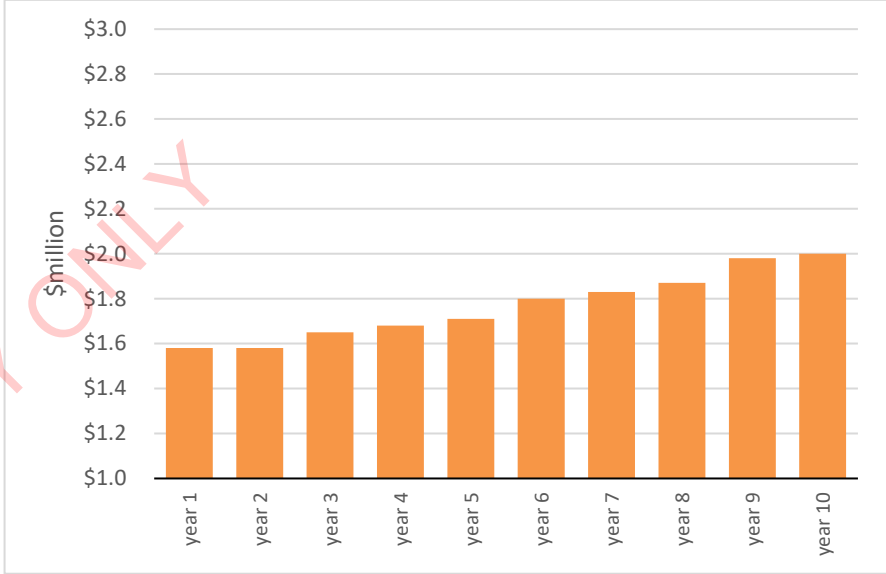


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Figure D-43: Five yearly Stormwater operating expenditure forecasts – next 30 years

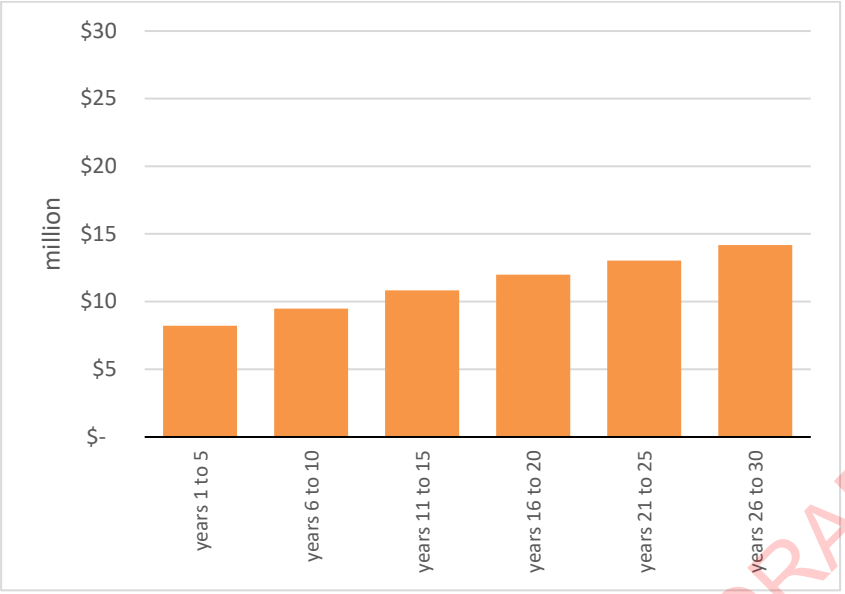
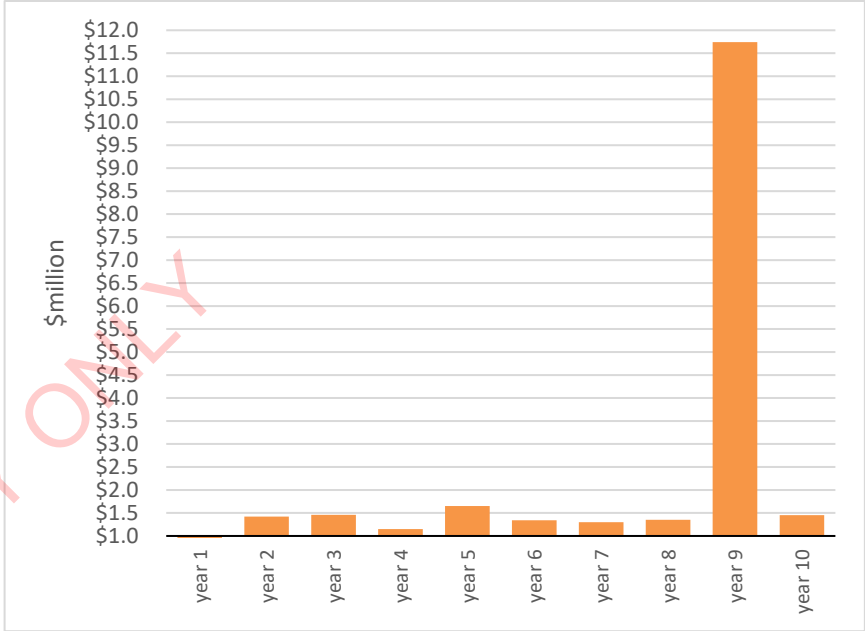


Figure D-44: Stormwater capital expenditure – next 10 years



Capital expenditure

- Some capital expenditure is signalled in the Plan as listed above which will enhance the level of service in these targeted areas.

Funding

Years 1-10	• Fixed funding increase to $1.1M from year 2 (approximately 2.2% rates increase). • Further one-off additional $650K (total) in years 4 and 5. • Further funding increase of $150K in year 7. • Cumulative funding increases of $50K per year from year 8, in additional to existing increases (excluding one-off increases)
Years 11-20	Continue with Years 1-10 funding strategy directed towards addressing deferred renewals
Years 21-30	Increases cease around Year 22 after which Council continues funding renewals at levels close to that of the depreciation expense

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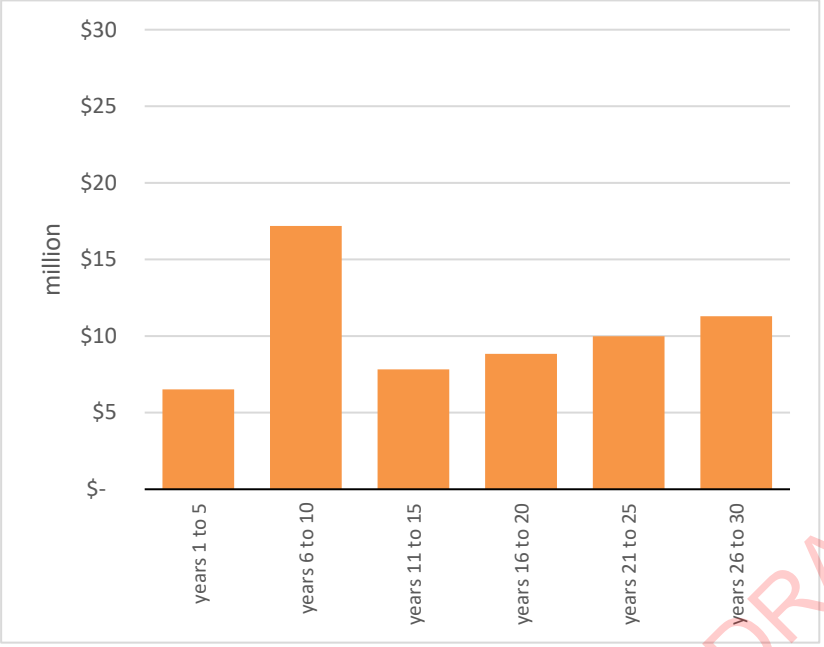
Figure D-45: Stormwater capital expenditure – next 30 years



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8. Summary

8.1 Levels of service

The **most likely scenario** for the District is outlined as follows:

- Other than for some targeted upgrades and incremental upgrades as part of renewal programmes to cater for climate change and resilience improvements, levels of service will remain largely unchanged.
- Potential new infrastructure forecasts will be needed for the next LTP as information on additional urban zoned land becomes known through the development of Te Tai o Poutini Plan (One Plan). This is likely to occur through provision of new urban areas to offset existing areas that may be identified as subject to natural hazard or climate change risk, or to provide for the long term development needs over the One Plan planning horizon.
- A continued emphasis on leak detection on our water supply networks will provide a better level of service to consumers and reduce costs.
- An increased emphasis on bridge renewals.
- The exception is the road network, where changes in levels of service may occur on low volume roads as the One Network Framework and a focus on safety through speed reduction is likely to see changes, however this will have a low financial impact on infrastructure.

8.2 Service delivery

We deliver these services using a combination of contractors and consultants as well as in-house staff resources. Maintenance works are contracted out through term contracts of up to five years. Renewal capital works and new capital works are also contracted out, using a tendering process. Council has in-house engineering and project management resources and engages specialist consultant support for specialised projects as appropriate. It has recently increased resources to these areas and will continue to review this as needed, in order to deliver planned programmes. Overall there are no planned changes to service delivery methods over the term of the LTP.

8.3 Capital programme delivery

Our capital programme has been developed to ensure that the programme is both financially sustainable and aligned with Council's ability to deliver.

This Strategy clearly sets out the challenge of the significant backlog in deferred maintenance and acknowledges that it is going to take, in some cases, over two decades to resolve.

Council has also resolved at this point to not address some matters in order that priority work can be undertaken in the sort to medium term instead. In the immediate future this priority work includes the Infrastructure Ready, PGF and the DIA projects.

Council has moved to invest in systems and capability in its asset management function and there is a significant increase in resource to manage and deliver these projects. Council will also move to focus on ensuring it consistently delivers against service level expectations.

Over this time, ongoing reviews will take place as Council obtains further information about its assets from the planned programme of condition assessments. Funding has been put in place for this work over a number of years to ensure that current and future decisions are based on asset condition.

It is acknowledged that there is some risk to being able to deliver the planned programmes within the timeframes set out in the LTP. Council, in its planning, has assumed that appropriately skilled staff and contractors and necessary materials will be available to undertake the work required, to agreed standards, deadlines and cost. This assumption is acknowledged as having a medium level of uncertainty and could impact significantly on deliverability of the programmes. This risk will be managed by programming work to spread delivery of capital projects to reasonable timeframes, robust project and contract management and ongoing asset condition assessments to feed in to planning and review of projects.

8.4 Demand

The **most likely scenario** for the District is outlined as follows:

- Demand for infrastructure services will remain relatively unchanged based on low to negative population growth.

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- Capacity upgrades and network extensions may be required to accommodate new industry or through environmental planning zone changes, but this has not been budgeted for.

8.5 Implications of uncertainty

Council has levels of uncertainty in relation to assumptions in the following areas:

1. Future regulatory changes such as changes to Drinking Water Standards or District and Regional Environmental Policies and Standards. Without any signals to the contrary, no change has been budgeted for. Typically there is a long lead time for significant proposed change as well as industry consultation, and the Council would respond and plan as required. Further changes to drinking water standards have been assessed as "low" with further changes to resource management policies and standards assessed as "high".
2. The level of reliability of the asset information underlying the renewal forecasts varies by activity and by asset class, creating a medium to high level of uncertainty in the renewal forecasts. Data reliability will improve as more information is gathered through ongoing asset condition and performance monitoring programmes detailed in the AMPs. In the three waters area, the renewal models provide ranges of likely expenditure. The results of the condition assessments may have an impact on our financial forecasts. If the renewals backlog is greater than expected, Council will need to look at funding the works sooner rather than later.

Accuracy of the valuation takes into account the data confidence levels for asset quantities, unit costs and lives. Using the International Management Manual (IMM) grading system the assessed grades for the Council assets are as follows:

Three Waters – extract from WSP Peer Review – September 2020 of Valuation to 30 June 2020

4.2 CONFIDENCE RATINGS

Confidence ratings have been assigned to the source data, unit cost rates and to other items as appropriate. The confidence ratings used are summarised below:

Table 4.2 Confidence Ratings

Grade	Label	Description	Accuracy
A	Highly Reliable	Data based on sound records and recognised as the best method of assessment	±5-10%
B	Reliable	Large portion of data based on sound records but has minor shortcomings (e.g. old data, some missing documentation, reliance placed on unconfirmed reports and extrapolations)	±10-15%
C	Uncertain	Significant data incomplete, unsupported or extrapolated from a limited sample.	±15-25%
D	Very uncertain	Data based on unconfirmed verbal reports, cursory inspection and judgement of experienced person.	±25-40%

Source: Grading and Description are based on Table 3.5.3 of the 'International Infrastructure Management Manual - 2011

In our judgement, the accuracy of the data used in this valuation has resulted in an overall rating of B (± ten to fifteen percent) for the valuation of the Council's infrastructure assets.

Land Transport – extract from Stantec Valuation to 30 June 2020

GDC has utilised the RAMM Administrations Asset Valuation Module (RAVM) for the majority of components for this valuation. See Table 4-1 for a summary in data confidence.

Table 4-1: Data Confidence

Asset Description	Confidence	Comments
Formation	B – Reliable	Assumed depths
Sealed Pavement Surface	A - Highly Reliable	No assumptions made.
Sealed Pavements	B – Reliable	Assumed depths, pavement ages
Unsealed Pavements	B – Reliable	Assumed depths, pavement ages
Drainage	B – Reliable	Some assumed construction ages
Surface Water Channel	B – Reliable	Some assumed construction ages
Footpath	B – Reliable	Some assumed construction ages
Traffic Facilities Signs	B – Reliable	Some assumed construction ages
Traffic Facilities Retaining Walls	B – Reliable	Contained in both minor structure as well as retaining wall tables.
Traffic Facilities Railings	B – Reliable	Some assumed construction ages
Traffic Facilities Markings	B – Reliable	Some assumed construction ages
Traffic Facilities Islands	C- Uncertain	Utilised Assetfinda Data from 2017 valuation
Traffic Facilities EMP's	C-Uncertain	Utilised Assetfinda Data from 2017 valuation
Streetlights	B – Reliable	LED register provided by Council
Bridges and Bridge Culverts	B – Reliable	Footbridge Register provided by Council

Based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0, Table 4.3.1: Data confidence grading system:

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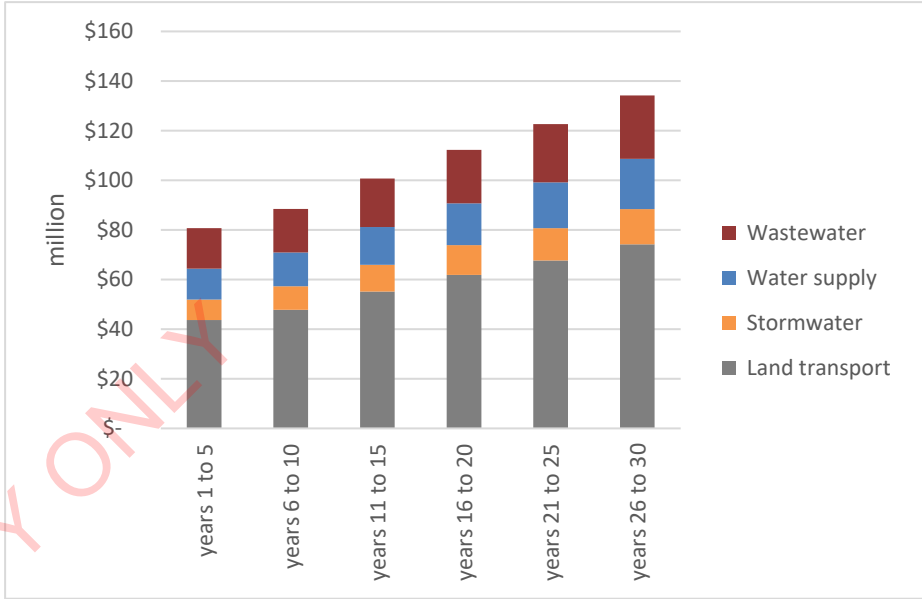
8.6 Financial forecasts

Our Infrastructure Strategy aligns with our Financial Strategy, which focuses on:

1	**Rates revenue set to meet Council and community needs.** ***Setting rates at a level that enables Council to practice prudent financial management by addressing significant issues, eg deferred renewals, funding future projects and reducing annual rates deficits.***
2	**Decrease debt over the life of the Plan.** ***Borrow for significant projects to take advantage of current low interest rates with the overall goal of decreasing debt over the life of the plan. Savings on finance costs will then be used towards operational costs or increasing reserves over the life of this Plan.***
3	**Retain capacity to borrow for unforeseen events.** ***For example, natural disasters. Debt levels to be kept within our policy limits.***

The following graphs show the **most likely scenario** for total operating expenditure, total renewals versus depreciation expenditure and the total renewals Please note that new capital expenditure is not shown as very little, if any, is planned. We have listed some of the capital projects we're planning to undertake elsewhere in the Strategy.

Figure D-46: Total operating expenditure forecasts



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8.7 Funding implications

The **most likely scenario** impact on rates and charges arising from these expenditure forecasts is detailed in Council's Financial Strategy. This will also be the basis of our consultation with the community. In summary:

Land Transport

Years 1-10	Council reduced its funding in 2019/2020 due to Covid-19 but this returns funding to pre Covid-19 levels.. Combined with the increase in the Waka Kotahi subsidy from 58% to 63%, this is an increase in funding of $390,000 in year 1. For years 2-10 annual rates increases range from an additional $12,000 to $112,000, including inflation.
Years 11-20	Council has applied approximately 3% rate increase every year 0.5% above estimated inflation directed towards deferred renewals
Years 21-30	Council has also applied approximately 0.5% rate increase every year above inflation directed towards deferred renewals

Water Supply

Years 1-10	Year 1 of the Plan includes subsidies from PGF and the Three Waters Reform Fund for major capital projects, with deferred renewals being addressed through rates funding from year 3 onwards, with a $64,000 plus inflation (0.3% rates increase from 2023/2024) increase per annum year on year, ie cumulative increases.
Years 11-20	Increases continue to address the backlog and more assets falling due for replacement.
Years 21-30	Increases cease around year 24 after which Council continues funding renewals at levels close to that of the depreciation expense

Wastewater

Years 1-10	No additional funding is budgeted for in the first seven years of this plan as funding is prioritised to other infrastructure activities. From year 7 Council has applied a rates increase of approximately 0.2% towards the funding backlog.
Years 11-20	Council has applied approximately 0.15% rate increase every year above inflation directed towards funding 'backlog'
Years 21-30	Council has also applied approximately 0.3% rate increase every year above inflation directed towards funding 'backlog' Backlog estimated to be removed between Years 31-40.

Stormwater

Years 1-10	• Fixed funding increase to $1.1M from year 2 (approximately 2.2% rates increase). • Further one-off additional $650K (total) in years 4 and 5. • Further funding increase of $150K in year 7. • Cumulative funding increases of $50K per year from year 8, in additional to existing increases (excluding one-off increases)
Years 11-20	Continue with Years 1-10 funding strategy directed towards addressing deferred renewals
Years 21-30	Increases cease around Year 22 after which Council continues funding renewals at levels close to that of the depreciation expense

Summary Infrastructure – Rates

Infrastructure rates as a percentage of total rates - the graph below shows how the rates described above contribute to the overall rates increase over the next 30 years. In years 1 to 10, the percentages include CPI, as per our assumptions in the Plan. In years 11 to 20, CPI is estimated at 2.0%.

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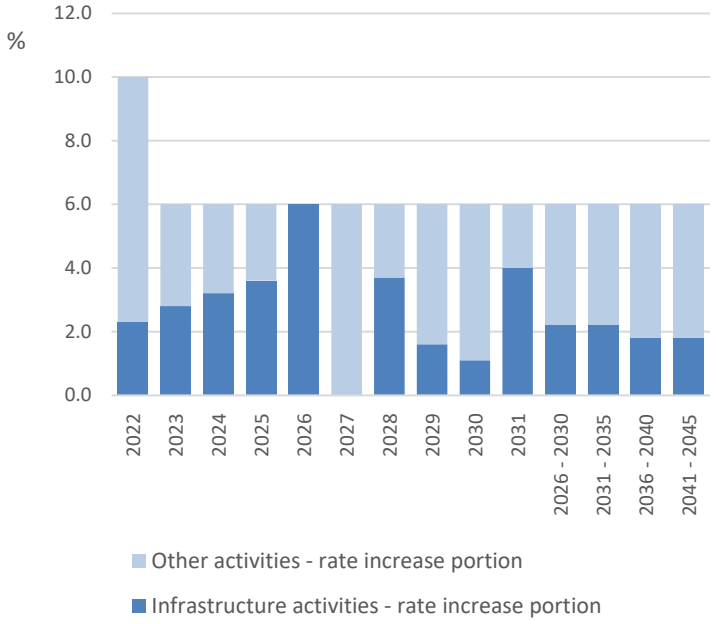
Figure D-47: Infrastructure rates as a percentage of total rates



Note that in Years 11 – 30, the annual rates increase is per annum.

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