

Timaru District Council 50 Year Infrastructure Strategy

2018 – 2068



Quality Record Sheet

Timaru District Council 50 Year Infrastructure Strategy 2018 - 2068

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1.0 EXECUTIVE SUMMARY

Welcome to the second Timaru District Council Infrastructure Strategy.

Section 101B of the Local Government Act 2002 requires the Council to develop an Infrastructure Strategy (IS). The first IS was developed for the 2015-25 Long Term Plan and this experience has been used to refine the 2018-68 IS.

Council decided during 2017 to extend the IS to 50 years and to add the Waste Minimisation activity. As a minimum, the IS must cover Council's water, sewer, stormwater and roading activities for 30 years.

The purpose of the IS is to:

- Identify significant infrastructure issues;
- Identify principal options for managing those issues;
- Identify the implications of the options.

In addition, the Council must outline how it intends to manage its infrastructure assets taking into account the need to:

- Renew or replace existing assets;
- Respond to growth or decline in demand;
- Increase or decrease in levels of service;
- Maintain or improve public health and environmental outcomes;
- Provide for infrastructure resilience.

1.1 Strategy Direction

The strategy includes an overriding direction of 'Responsible Stewardship' - "ensuring responsible stewardship of our key infrastructure assets to meet the needs of tomorrow's community". It aims to ensure the district's infrastructure is meeting the community's needs aligned with the Council's Strategic Direction.

It considers potential future factors that will affect the Council's infrastructure, particularly the ageing of infrastructure, societal change and resilience. The strategy sets out the Council's priorities as:

- Timely and cost effective maintenance of infrastructure to optimise its life
- Replacing ageing infrastructure in a timely manner
- At a minimum, maintaining existing levels of service
- Managing the impacts of growth and land use change in a sustainable way
- Compliance with legislative requirements
- Providing long term affordable services
- Managing the impact of technology changes

The IS outlines four key future issues, as follows:

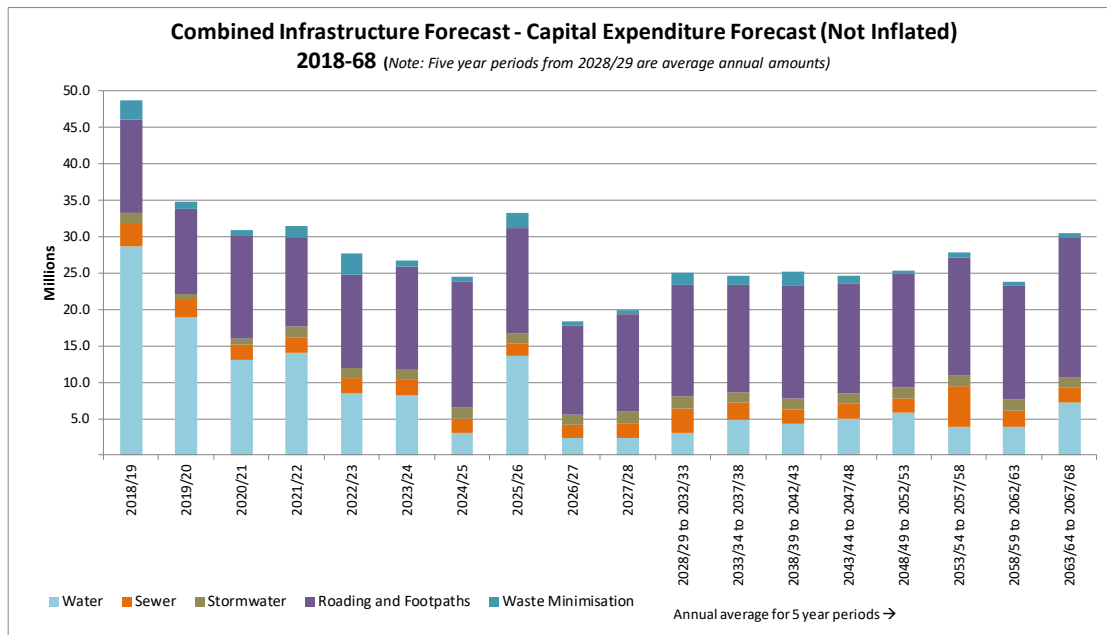
- Roading renewals
- Securing Timaru's water supply
- Timing and Funding the Stormwater strategy
- Extending the life of the Redruth Landfill.

Options are presented relating to these issues and the Council's preferred option is included in the overall financial impact of the Strategy.

1.2 Financial Impact

Capital expenditure of \$1.3 billion is included in the proposed draft IS over the 50 years, of which \$297 million is currently incorporated into the proposed 10 year budget. Current loan levels are forecast to peak at \$126 million in 2020/21. This peak is well within the limits prescribed within the liability management policy.

The graph below shows the planned expenditure across the five activities included in the Strategy:



For these activities, the following table shows total expenditure and the expected spend related to growth, levels of service and renewals over the next fifty years:

Asset	Total Expenditure	Growth	Levels of Service	Renewals
Roding and Footpaths	\$770M	4% (\$33M)	22% (\$169M)	74% (\$569M)
Water Supply	\$300M	3% (\$8M)	27% (\$80M)	70% (\$213M)
Sewer	\$130M	4% (\$5M)	1% (\$1M)	96% (\$124M)
Stormwater	\$73M	3% (\$2M)	72% (\$53M)	25% (\$19M)
Waste Minimisation	\$55M	5% (\$3M)	61% (\$34M)	33% (\$18M)

2.0 INTRODUCTION

This is Timaru District Council’s second Infrastructure Strategy. It has been prepared from Council’s 2018 suite of Activity Management Plans and forms part of the Long Term Plan.

The issues discussed reflect the current legislative environment and the communities’ priorities across the district.

The financial forecasts are estimates and the reliability of the forecasts decreases beyond ten years and towards the fifty year planning horizon.

2.1 Strategy Layout

The Strategy document sections and corresponding Local Government Act (LGA) sections are tabled below:

Table 1: Strategy Layout

Strategy Section		LGA 2002 (Section 101B)
1	Executive Summary	
2	Identifies the purpose of the Infrastructure Strategy and the core infrastructure included in this strategy	2(a) and 6
3	Describe the district and illustrate the linkage between strategic documents	2(a)
4	Describe the core infrastructure, its condition and performance while recording the significant assumptions, risks and mitigation	2, 3(e), 4 (c) & (d)
5	Discuss the emerging issues that will impact on the core infrastructure assets	3 (b) to 3(e)
6	Discuss Council’s response to the emerging issues and the significant decisions to be made during the term of this strategy	2(b), 4(b)
7	Identifies the response options for the significant issues and documents the benefits, cost, timing and funding source	2(b); 3(a) to (e) & 4(a) to (c)
8	Identifies the costs associated with the actions proposed	4(a)

2.2 Purpose

Local Government Act 2002

Section 101B – Infrastructure Strategy states:

- (1) A local authority must, as part of its long-term plan, prepare and adopt an infrastructure strategy for a period of at least 30 consecutive financial years.
- (2) The stated purpose of the Infrastructure Strategy is to;
 - a) Identify significant infrastructure issues for the local authority over the period covered by the strategy; and
 - b) Identify the principal options for managing those issues and the implications of those options.

Section (6) defines infrastructure assets as including:

- a) existing or proposed assets to be used to provide services by or on behalf of the local authority in relation to the following groups of activities:
 - i. water supply;
 - ii. sewerage and the treatment and disposal of sewage;
 - iii. stormwater drainage;
 - iv. flood protection and control works;
 - v. the provision of roads and footpaths; and
- b) any other assets that the local authority, in its discretion, wishes to include in the strategy.

2.3 Timaru District Core Infrastructure Assets

The core Timaru District Infrastructure Assets are tabled with 2016/17 closing book values below:

Table 2: Timaru District Infrastructure Assets

Asset	Description	Asset Book Value	% of total
Roading and Footpaths	Roads (arterial, collectors, local; kerb and channels), bridges, footpaths	\$422M	65%
Water Supply	Water supply plant facilities and reticulation network	\$72M	11%
Sewer	Wastewater treatment plants, pump stations and reticulation network	\$107M	17%
Stormwater	Stormwater drainage assets	\$34M	5%
Waste Minimisation	Waste management including kerbside collection, transfer stations, disposal at landfill and processing (compost, recycling, reuse), and community services.	\$15M	2%
TOTAL		\$650M	100%

2.3.1 Other Activities

In addition to the mandatory requirements, the Timaru District Council has agreed to include the Waste Minimisation activity in the Infrastructure Strategy. The Timaru District Council has extended the Infrastructure Strategy to a fifty-year timeframe.

3.0 TIMARU DISTRICT

Geography & Climate

Timaru District covers 2,737 square kilometres of South Canterbury. Two rivers naturally define its northern and southern boundaries, the Rangitata and Pareora, with the district stretching along the gentle curve of the South Canterbury coastline. Timaru District is the fourth largest district by population and sixth largest by area in the Canterbury region. It has a population density of approximately 16.5 persons per square kilometre. The district has a temperate climate, with Timaru getting an annual average of 1,826 hours of sunshine and 573mm of rain. The district includes a variety of geographical environments ranging from densely populated low lying urban areas to remote sparsely populated mountain areas.

Demographics

The estimated resident population of the Timaru District as at June 2017 was 47,100. The 2013 Census population was 43,929. The District's population is projected to increase to 49,400 (+8.8%) by 2028, peaking in 2038 at 50,200.

Population Growth

Population growth is projected to occur at around a rate of 0.6% annually until 2028. Based on the medium projection, the rate of natural increase will become negative from around 2028, meaning there are more deaths than births. This reflects the age makeup of the Timaru District population. Growth from 2028 will be reliant on net migration.¹

Ageing population

The District's population is expected to continue to age into the future. The 65+ age group will grow from 20.1% of the population in 2013 to 28.2% in 2028 and 32.9% in 2043. In population numbers, between 2013 and 2028 this represents an increase of 4,780 people aged over 65. By 2043, the total increase in those aged 65+ will be 7,350. It is noted that this forecast growth is at a slower rate than previously forecast.

The population aged over 65 will also get progressively older, with those aged 75+ representing 50.1% of the total 65+ age groups in 2028 (2013: 46.7%) and 61.1% in 2043. Those aged 85+ will represent 13.9% of the total 65+ age groups in 2028 (2013: 13.5%) rising to 21.1% in 2043.

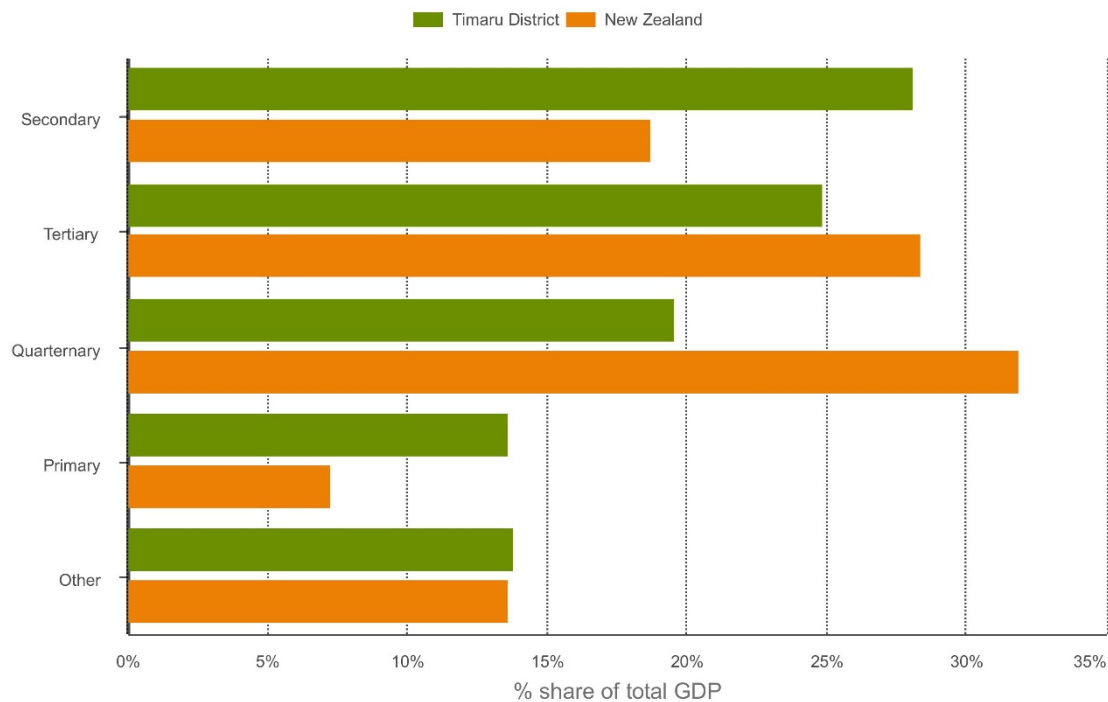
Economy

The Timaru economy is strongly influenced by its agricultural heritage. Agriculture is diverse, including dairy, sheep and deer farming and land suitable for all kinds of cropping. Significant manufacturing operations are located in the district, including Fonterra's Clondeboy dairy factory, McCain's food processing plant, DB Mainland Breweries, NZ Light Leathers, Alliance Group Smithfield plant, Silver Fern Farms Pareora plant and Barkers Fruit Processors. The district is centrally located for distribution and PrimePort Timaru provides a gateway for exports and imports.

An analysis of the District's industrial structure shows that:

- Secondary industries (manufactured and other processed goods) account for the largest proportion of the districts GDP (28.1%). This is followed by tertiary industries (lower value adding service industries) at 24.9%.
- Within the secondary industries Dairy Product Manufacturing made the largest contribution to overall growth in the Timaru District between 2015-2016. The industry grew by over 11% during this period.
- When compared with the New Zealand average both primary and secondary industries have a greater contribution to the local economy

¹ Based on Stats NZ Medium Population Projections for Timaru District (update December 2016)

Figure 1: Timaru District's Economic Diversity

Employment

Employment in the district is strong, Total employment averaged 24,926 in the year to March 2016, up 0.2% from a year earlier. Sectors that make the largest contribution to employment are manufacturing (18.1%), Health Care and Social Assistance (11.3%), Retail Trade (10.8%), and Agriculture, Forestry and Fishing (10.2%)².

Our Communities

Timaru is the largest community, housing nearly two thirds of the total population of the district (27,038). The next largest community is Temuka (4,050), followed by Geraldine (2,301) and Pleasant Point (1,278)³. Our communities are well serviced with education, health and recreational services along with a vast range of clubs and organisations. The South Canterbury District Health Board is a major health provider, with the Ara Institute of Canterbury providing local tertiary educational services.

Our Environment

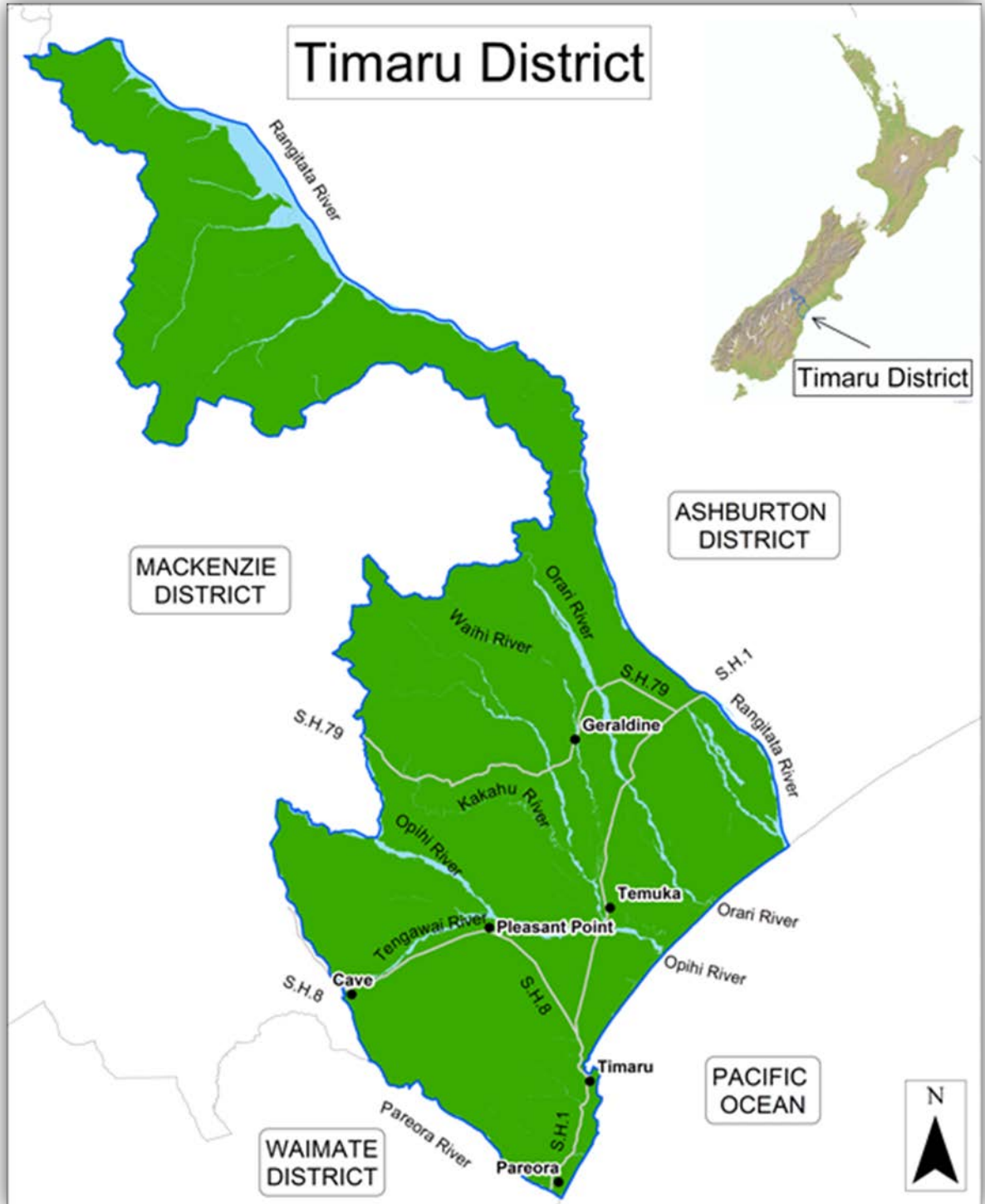
The diverse landscapes of the Timaru District include rolling downlands, tussock land, coastal plains and wetlands, forest remnants, river gorges and rugged mountain ranges. The coastal plains to the north and downlands to the south are highly modified for intensive cropping, meat, wool and dairy production. Pasture and exotic woodlots dominate the modified hills and downs from Peel Forest to Cave, with occasional shrub and forest remnants. Limestone outcrops and volcanic sediment add to the diversity of the landforms. The district is also defined by a number of waterways, including the Orari, Opihi, Rangitata, Waihi and Pareora Rivers. The Rangitata and Pareora physically define the district and all waterways are highly valued by the community for their recreational, social, natural amenity and economic values. The district has a number of outstanding natural features and landscapes, as well as areas of

² Based on Timaru District Economic Profile 2016 – Infometrics

³ Based on 2013 census

significant native vegetation habitats of native fauna. There are also numerous important heritage sites, buildings and places. **Figure 2** shows a map of the district.

Figure 2: Timaru District Map



3.1 Timaru District Council Strategic Direction

Vision

Fantastic Lifestyle – Thriving Economy – Strong Identity – Inspiring Leadership

- Fantastic, sustainable lifestyle second to none
- Thriving and innovative economy where opportunities abound
- Strong and enviable reputation and identity
- Inspiring, people-focused leadership

The Timaru District Council’s Long Term Plan includes the Council’s strategic direction. This encompasses a Vision, Community Outcomes and Strategic Priorities. The Strategic Direction can be viewed in full in the Long Term Plan.

3.2 Linkage with Other Documents

The Infrastructure Strategy (IS) and Financial Strategy (FS) feed into the Long Term Plan as foundation documents. Planning for the activities included in the IS is covered within the relevant Activity Management Plan, as well as being informed by other documents such as the Growth Management Strategy and other strategies and legislation as shown in Figure Three.

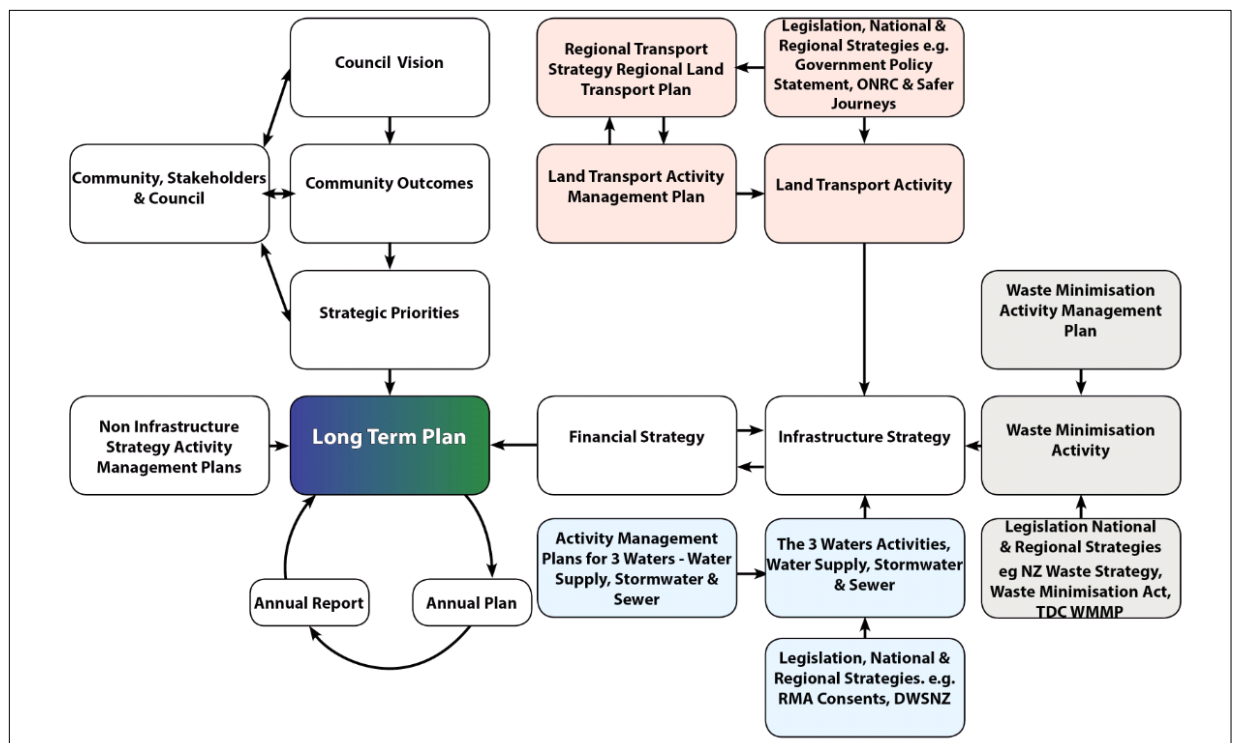


Figure 3: Infrastructure Strategy Linkage with other Documents

Financial Strategy

The Financial Strategy defines the financial direction of the Council over the 10 year period of a Long Term Plan. It provides direction, drawn from a balancing of ratepayer affordability against community needs and aspirations.

The relationship between the IS and FS is two way. The FS presents a balance between ratepayer affordability and the following matters that arise from the IS:

- the need to maintain, replace and renew core infrastructure,
- the obligation under law to build new infrastructure to meet new standards; and
- a desire to respond to the aspirations of the community for new and improved community infrastructure.

Significance and Engagement Policy

Council's Significance and Engagement Policy is the mechanism that underpins Council's sustainable decision-making. The purpose of the policy is to:

- enable the Council and its communities to identify the degree of significance attached to particular issues, proposals, assets, decisions and activities
- provide clarity about how and when communities can expect to be engaged in decisions about different issues, assets or other matters
- inform the Council from the beginning of a decision-making process about:
 - the extent of any public engagement that is expected before a particular decision is made, and
 - the form or type of engagement required.

With the exception of the Waste Minimisation activity, the assets and networks included in this IS are listed as Strategic Assets in the Significance and Engagement Policy – namely the Roothing network as a whole, Wastewater and Stormwater networks as a whole, and Water supply networks as a whole.

The policy states that Council will use the Special Consultative Procedure in relation to any decisions to transfer the ownership or control of a strategic asset to or from Council, as required by the Local Government Act.

While the Waste Minimisation activity is not listed in the policy as a strategic asset, any decisions relating to the ownership or control of the activity would trigger many of the significance criteria used to determine the level of community engagement required before decisions are made and potentially the Special Consultative procedure.

3.3 Timaru District Council

Timaru District Council was formed in 1989 following the amalgamation of the Timaru City Council, Geraldine Borough Council, Strathallan County Council and the Temuka Borough Council.

Currently the Timaru District Council has an elected Mayor and nine Councillors elected over three wards:

- Timaru Ward - 6 Councillors
- Pleasant Point-Temuka Ward - 2 Councillors
- Geraldine Ward - 1 Councillor

There are three Community Boards in Geraldine, Pleasant Point and Temuka with 16 elected board members.

4.0 CORE INFRASTRUCTURE

4.1 Asset Description

4.1.1 Roading and Footpaths

The Timaru District's land transport network comprise of roads, bridges, drainage (e.g. culverts), and footpaths.

Roads

A summary of information on the district's road network is provided in **Table 3** below, by network length (km) and journeys travelled (million vehicle km) based on ONRC performance measures reporting tool (as of October 2017).

Table 3: Timaru District Road Network Statistics

ONRC Category	Urban (Km)	Rural (Km)	TOTAL LENGTH (Km)	Urban Journeys	Rural Journeys	ANNUAL TOTAL JOURNEYS TRAVELLED (M Veh Km)
Regional	3	11	14	2	8	10
Arterial	12	17	29	26	13	38
Primary Collector	27	48	75	42	23	65
Secondary Collector	44	285	329	24	40	64
Access	91	452	543	15	18	33
Low Volume	61	668	729	3	8	11
TOTAL NETWORK	237	1,481	1,718	111	110	222

The pavement surfacing on the network is mostly chipseal (96%). However, over a quarter of the highest class routes (Primary Collector, Arterial and Regional) are surfaced in asphalt. Condition data available on the network is limited to visual condition rating, roughness, historical maintenance cost and some pavement strength data. Therefore data available is at moderate confidence. Council is looking at doing High Speed Data (HSD) capture over the years to improve data confidence.

Based on the latest condition rating survey, cracking is the primary defect. Where cracking is observed, over 40% occurs on asphalt surfaced pavements. This data suggests there is no observed defect on the majority (>90%) of the network, leading to the expectation the chipseal network is currently in good surface health. The asphalt surfaced routes are in average condition.

The Amenity measure within NZTA's ONRC (One Network Road Classification) framework assesses user comfort over the network based on roughness values. The rural network has displayed very smooth travel and is performing well against expectation. However, the urban network is not meeting Amenity measures – specifically Peak Roughness with almost 10% of Urban length exceeding roughness thresholds (ONRC allows up to 5% exceedance).

Council has undertaken FWD (Falling Weight Deflectometer) testing to ascertain the remaining useful lives of all Access road are above HPMV (High Productivity Motor Vehicles) routes and all Primary Collector (rural) are above ONRC classified roads. High Speed Data (HSD) testing is now proposed in order to provide better asset condition information, which then better informs decision-making.

Bridges

The information in Table 4 is as at May 2017, and includes stormwater kerb and channels.

Table 4: Bridges and Drainage Statistics

Asset	Quantity	Asset	Quantity
Road Bridges	280	Drainage Facilities	
One lane	139	Catchpits, soak pits, sumps	3,226

Asset	Quantity	Asset	Quantity
Weight restricted	5	Culverts, side culverts	3,666
Timber bridges (road and foot)	37	Fords (Concrete, natural ground)	135
Footpaths	311.755 km	Drains (Subsoil, cut-offs, other channels)	2,801
SW Channel – Kerb and Channel	398 km	Others	17

Figure 4 and Figure 5 illustrate the remaining useful life of bridges and major culverts in the District, based on current usage. Information presented is as at September 2015 (Doc #983990) and excludes Footbridges and Stock Underpasses. Assessments are conducted every three years, with the next assessment due in 2018.

With the information that has been obtained, it has been identified in the inspection report 2015/16 that 43 structures have been identified as requiring replacement within the next 5-10 years or significant renewal is required to address structural deterioration.

Figure 4: Timaru District Council Bridges Remaining Useful Life

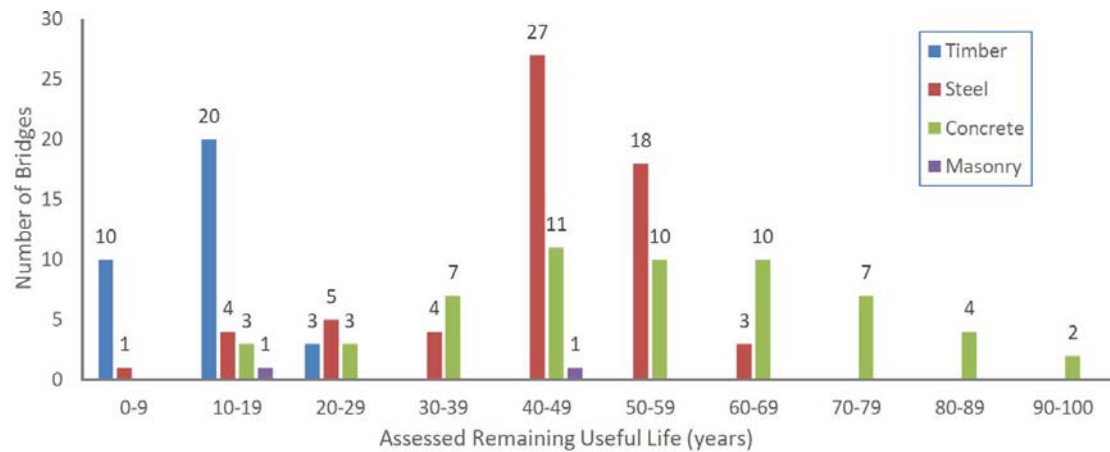


Figure 5: Timaru District Council Culvert Remaining Useful Life

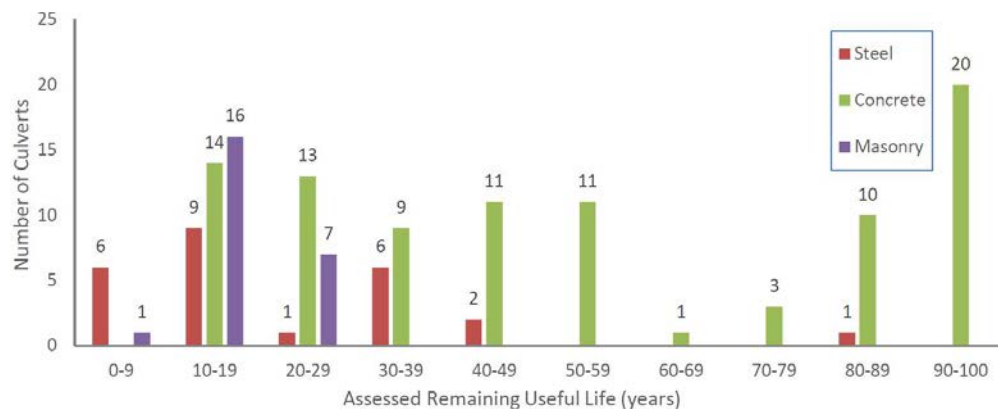
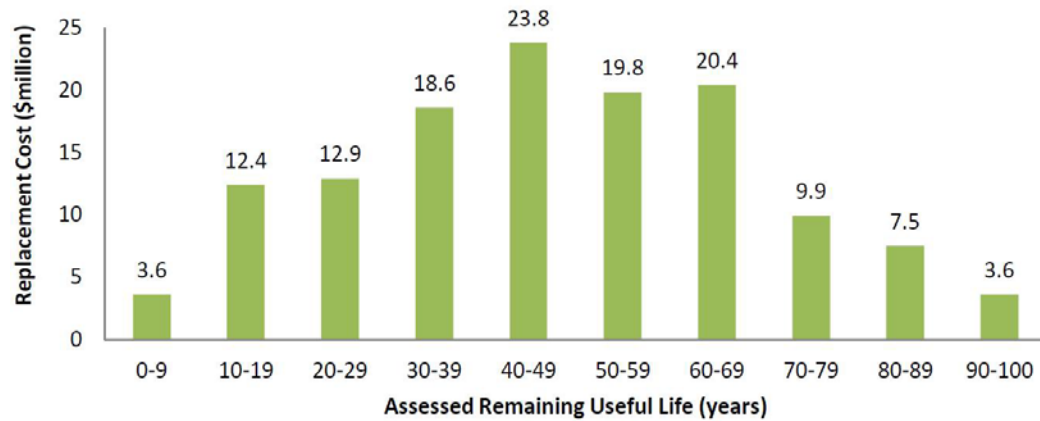


Figure 6: Bridge and Culvert Replacement Value



Replacement cost data in Figure 6 above are Rough Order Estimates (Doc #983990). It has been identified that it is unlikely that the current replacement programme Council has in place will keep up with the deterioration of the bridging stock beyond the short term, unless additional or alternative funding sources are allocated to this work.

Drainage (Kerb and Channel)

There has been a limited amount of data captured (27% of total) on the condition of the kerb and channel asset. Council is currently assessing and data capturing kerb and channel condition. With the assets that have been visually checked, it has been identified that there is a high level of kerb and channel in good condition. Data in Figure 7 below is as at August 2017 (Doc #1096724).

Figure 7: Condition Length of Kerb and Channels by Age Band

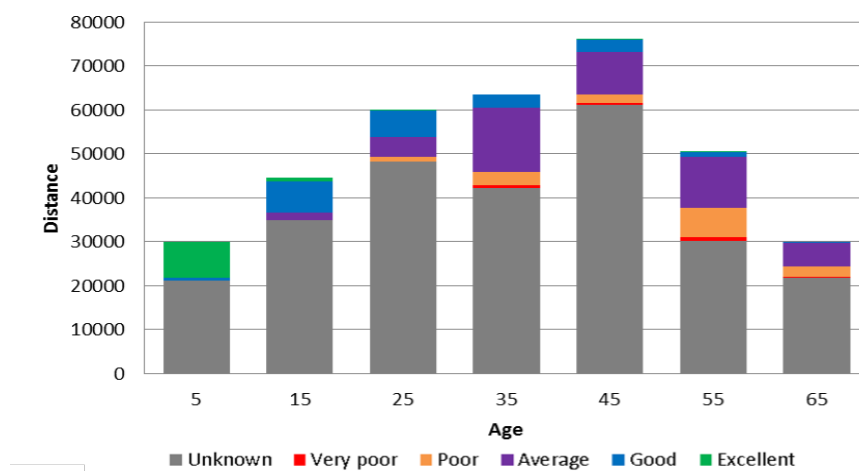


Figure 8: Age Distribution of Kerb and Channel

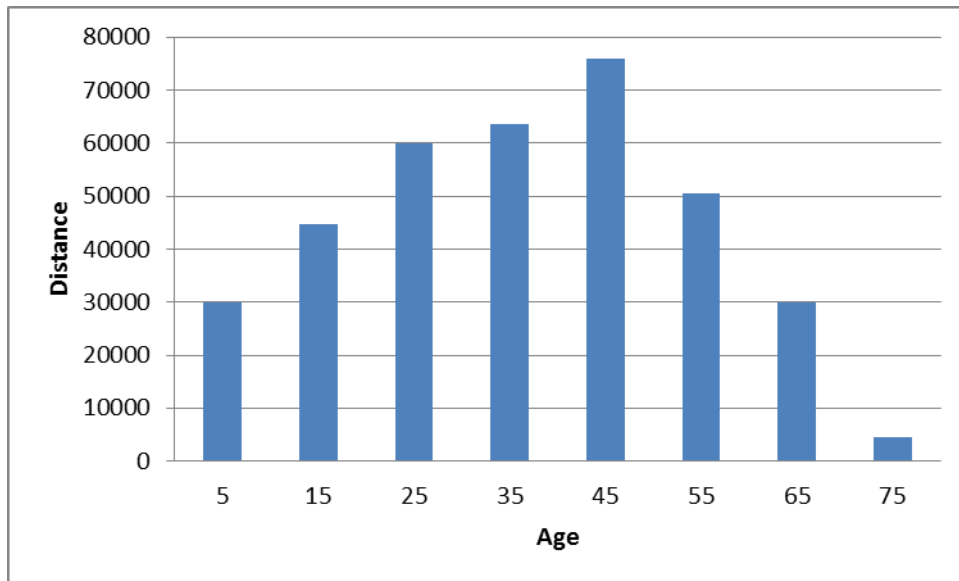
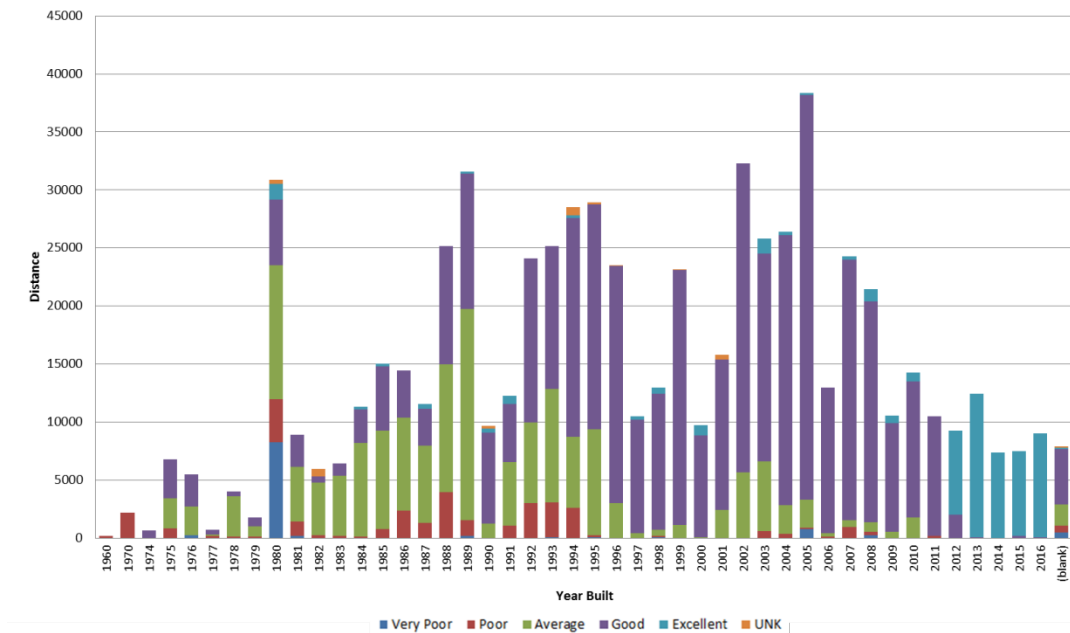


Figure 8 identifies that there is about 30km of kerb and channel in the 60-70 year band, but with the correct maintenance programme, it may be able to extend the useful life of the asset before looking at renewal. Data presented is at August 2016 (Doc #1096724).

Footpaths

In the past few years, Council has developed footpath condition data for the whole District, but an update of the condition data is currently being assessed and captured. The general condition of footpaths in the Timaru District is good, but there is a wave of older footpaths that will require addressing in the next 10-15 years. Data presented are as at December 2016 (Doc #1096789).

Figure 9: Quantity of Footpath by Age showing Condition



Roading and Footpaths - Information Sources

The Timaru District Council conducts multiple surveys, analysis, and studies to obtain data and information on our assets, including:

- **Road User Surveys**

Conducted biannually through an independent consultant, *Key Research Limited*. The survey obtains the perceptions of a broad range of road users across the District, which is used to identify the expected transport levels of service and the current perceived asset performance. From the survey result, Council is able to determine the areas for possible improvements.
- **NZTA Investment Audits**

The objective of this audit is to provide assurance that the New Zealand Transport Agency's (NZTA's) investment in Timaru District Council's land transport programme is being well managed and delivering value for money. NZTA also sought assurance that the Council is appropriately managing risk associated with the Transport Agency's investment. NZTA also recommends improvements where appropriate.
- **dTIMS Pavement Deterioration Modelling**

This modelling is performed by Opus for the Timaru District Council's sealed road network. The report provides evidence that can be used in support of the Long Term Programme request and Better Business Case Approach. The key objectives for undertaking this modelling were to determine the optimal maintenance expenditure/quantities in order to achieve the long-term standards for the network, aligned with the NZTA's ONRC) requirements, and the consequences of various maintenance regimes on the long-term condition of the network.
- **Crash Data – CAS**

The NZTA manages the Crash Analysis System (CAS) – New Zealand's primary tool for capturing information on where, when, and how road crashes occur. The system provides tools to analyse and map crashes and enables users to identify high-risk locations and monitor trends and crash sites. This information helps inform transport policy, design and prioritise road safety improvements and monitor their effectiveness. The CAS database has been used to record details of road crashes since 1980. The system records all crashes whether fatal, injury, or non-injury, and is an important tool in the analysis of road, intersection, and road user groups safety. All road crashes have a standard crash report prepared by Police that records details about the driver, occupants, vehicle, crash factors, and crash events. A copy of the crash report is provided by Police to Council for information, and report is sent to NZTA for entering in the CAS database.
- **TDC General Bridge Inspection**

Timaru District Council commissions Opus to complete the three-yearly general inspections of all Council's bridge structures. This is in accordance with NZTA guidelines. TDC bridge inventory information is then updated with new relevant information and updated maintenance and component replacement schedule, and bridge replacement programme is prepared.
- **Traffic Counts**

Timaru District Council has 10 traffic counters that are utilised to perform 7-day average daily traffic counts on the District roads. The count sites are determined by Council staff using RAMM. The frequency of traffic counts is generally based on road hierarchy although traffic counts on all roads should be a maximum of five yearly intervals. The traffic counter setup, installation, and retrieval and data download is performed by a contractor. The traffic count data is stored in RAMM and used by TDC staff to assist with providing supporting information/evidence to other asset.
- **Footpath, Kerb and Channel Usage and Condition Analysis**

Footpath, kerb and channel usage and condition data capture and analysis is done to provide stronger understandings of the TDC's assets. With the information, better informed decisions can be made. This is not done on a regular basis but TDC is looking at possibly capturing the information six yearly.

4.1.2 Water Supply

TDC owns and operates six urban water supply schemes, four rural water supply schemes and two stockwater supplies. Around 90% of the district population is served, with the rest relying on their own private supplies outside the public water supply scheme boundaries.

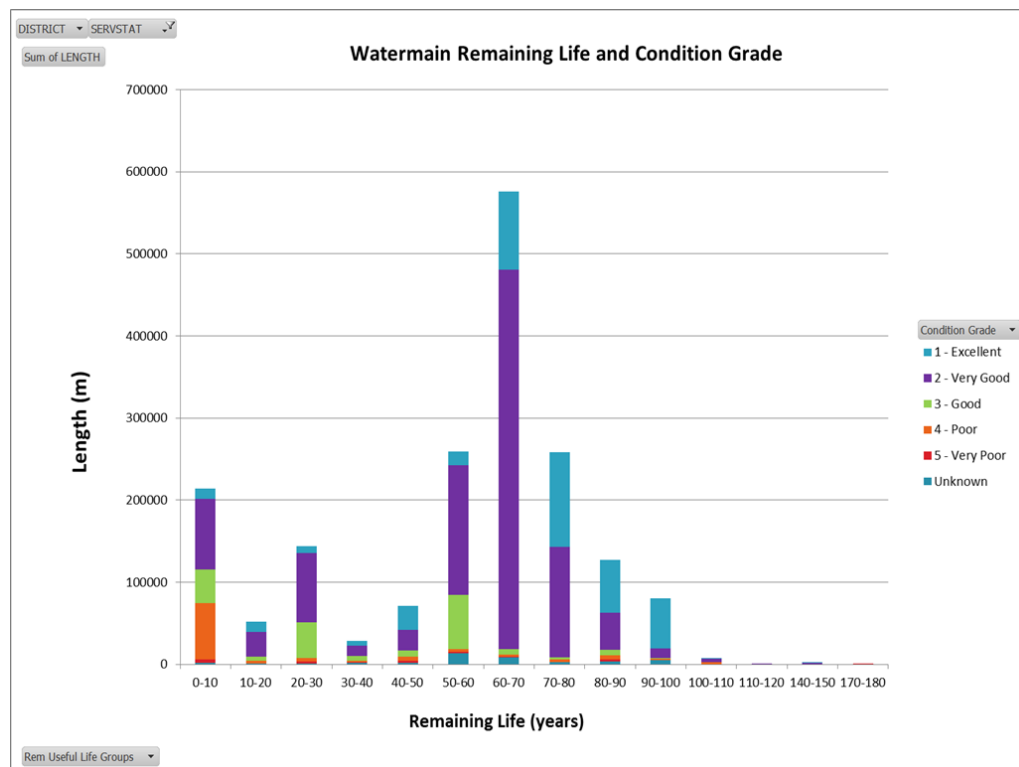
The District takes its drinking water supplies from rivers and bores or underground sources. The Ophi River and the Pareora River supply Timaru which accounts for about 60% of the total water consumption. All water takes are subject to resource consents and some of these could be restricted during very dry periods when river flows are low.

TDC provides the infrastructure to harvest, treat, store and distribute water to consumers. The main asset base consists of 12 treatment plants, 24 pump stations, 35 reservoirs, and around 1,854 kilometres of water reticulation network. These assets have a current replacement value of around \$255 million.

As at 2017, around 98% of the reticulation has been condition-assessed via physical sampling, expected life based on installation dates and failure rates. Of these, about 92% are in good to excellent condition while 8% are in poor to very poor condition. Council follows a cyclic approach in the renewal of its pipe assets that are reaching the end of their economic life. The annual renewal programme of water mains averaged \$1.5 million/year in the last 3 years.

The reservoirs and other building structures for water treatment and storage were recently assessed in line with the identification of earthquake prone buildings owned by Council. A number were identified as requiring seismic strengthening and have been programmed for renewal. In general, condition assessment of above-ground assets has been largely informal and a protocol to improve the practice will be developed. Being above-ground, plant facilities are more accessible and can be checked routinely, thus mitigating failure risks. We have good confidence in our current knowledge of the condition of these assets.

Figure 10: Water Supply Reticulation Network Profile



TDC's Growth Management Strategy in the next 30 years suggests there will be moderate incremental increase in the demand for water from an increase in the number of consumers as well as in economic activity. Currently, roughly 50% of supply is utilised for domestic and 50% for industry use. Council acknowledges that climate change is impacting on the security

of the district’s water supplies and accounts for it in asset planning and management to meet future demand.

In addition to future demand considerations, more stringent statutory and regulatory regimes around ensuring safety of drinking water supplies are also being anticipated in the water industry. These will have funding and cost implications for water supplies to ensure compliance.

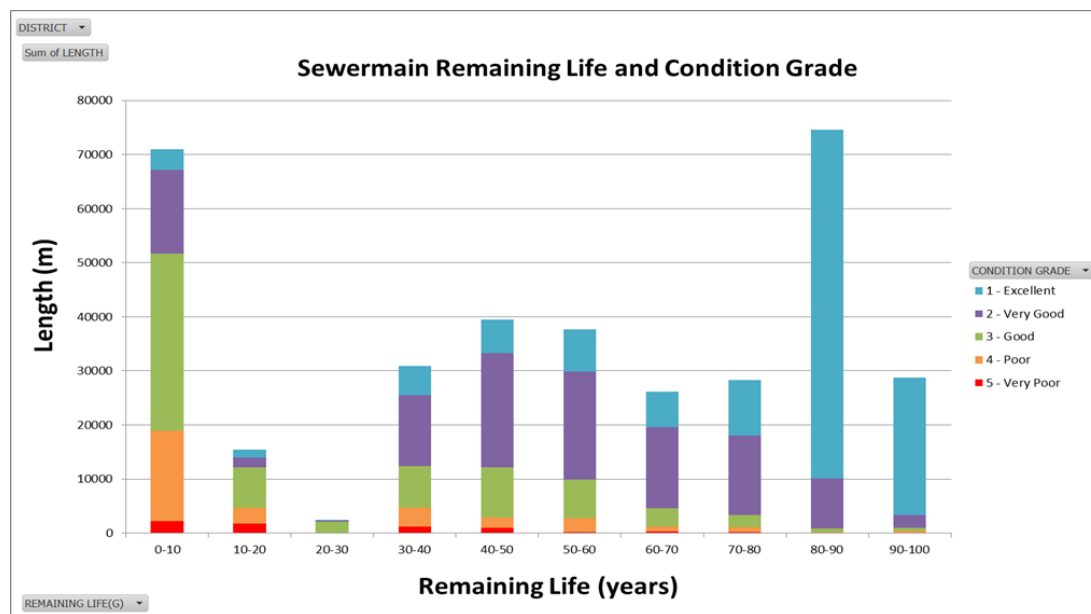
4.1.3 Sewer

TDC provides sewer services to the four main urban areas of the district including the township of Timaru and the inland towns of Geraldine, Pleasant Point and Temuka. Each area has a piped sewer network. Around 85% of the district population is served. Those located in the rural areas manage their own effluent. There are two significant industrial areas connected to the Timaru sewer network. These areas are located in the Port area and at Washdyke.

The main infrastructure asset base consists of three oxidation ponds at the inland towns of Geraldine, Pleasant Point and Temuka, a domestic and an industrial wastewater treatment plant, 23 pump stations, a reception facility for tankered discharges, an ocean outfall, and around 354km of sewer pipe network. Pump stations and treatment plants have been upgraded at various periods in the last 15 years with the implementation of the district wide wastewater strategy. These assets are generally in excellent condition. Renewals of the treatment plant facilities will occur at various periods within the next 50 years with a total estimated cost of around \$17 million.

All assets have an assigned nominal life and are expected to perform for that time. Some 70km of the district’s sewer pipe is estimated to reach the end of its economic life during the next 10 years. The pipe renewal forecast is based on an assessment of remaining life, criticality, condition, maintenance history, future capacity requirement and the option of repair, rather than renewal, if appropriate. The renewal programme is re-assessed annually taking account of additional information, particularly from physical sampling of pipes. Deferred renewals are not expected or are minimised as Council funds the renewals from depreciation.

Figure 11: Sewer Reticulation Network Profile



The physical condition of sewer pipes is based from CCTV Condition Grading and from the Coarse Condition Grading for those pipes that have no CCTV data.

As of 2017, around 50% of the 354 km sewer pipe network has been inspected via CCTV. The CCTV pipe condition assessment is an ongoing programme and is targeting aging, high flow and high criticality sewer mains to ensure the structure and serviceability of the pipes are

able to deliver the LOS and not creating any detrimental impact to the environment, public health, and other infrastructure. When CCTV inspection is impossible, laser and sonar inspection or other available inspection technology is used to analyse and determine the condition of assets relative to its assumed remaining life. Overall, based on CCTV inspection, some 28% of the sewer network is in good to excellent condition. Of the remaining un-CCTV'd portion of the network, a Coarse Condition Grading report in 2014 estimated that 30% of these pipes are in good to excellent condition.

There are inflow and infiltration issues associated with very old pipes in the network. The annual pipe renewal programme prioritises work required to maintain the level of service, and averaged \$1.7 million per year in the last 3 years. Estimated total replacement value of assets is around \$246 million (2014 assessment).

Currently, domestic wastewater accounts for 40% of the wastewater flows while industry contributes 60%.

Due to the construction of a separate facility for domestic wastewater treatment, there is more plant capacity for industrial wastewater treatment in support of future industrial growth. Most of these industries are located in the Washdyke and Port areas of Timaru.

Additional demand for domestic sewer lines may come from requests for extension of urban services at the periphery of residential zones.

Other than demand factors, the performance of the district's sewer infrastructure is also impacted by frequent intense or long duration wet weather which causes groundwater inflow and/or stormwater infiltrating into the defects of sewer pipes, thereby consuming some of the capacity of the sewer network with resultant network overflows.

4.1.4 Stormwater

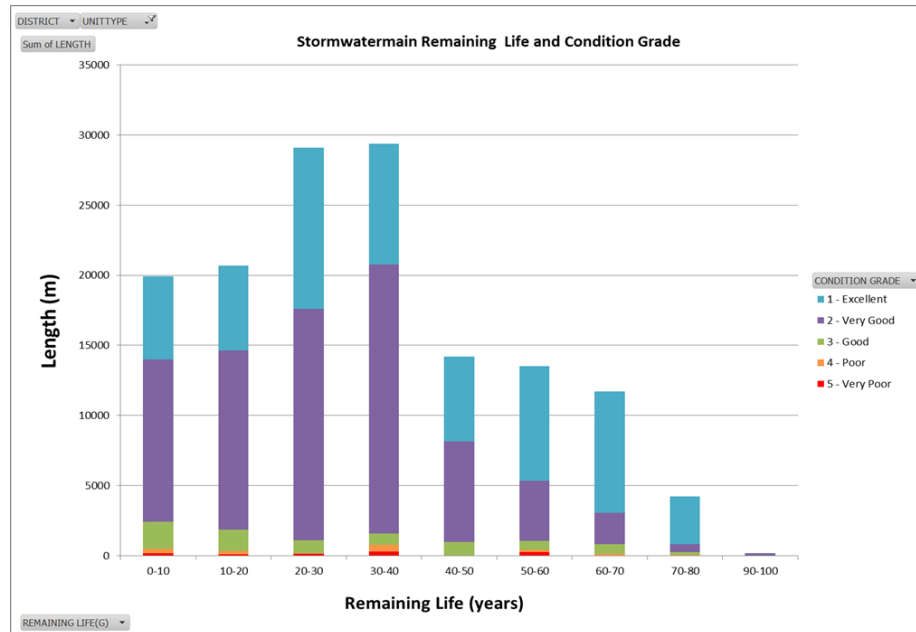
TDC provides stormwater services in the urban townships of Timaru, Temuka, Geraldine and Pleasant Point. Rural stormwater is managed mainly through land drainage with minimal infrastructure provided in Winchester, Cave and Pareora. Around 70% of the district's population is served.

The stormwater assets consist of 145km piped network, open channels, manholes, soakage pits, detention dams and swales. The network is generally aged. There is limited information on the physical condition of the pipes. Only about 15% of the pipe network have been CCTV'd and there is high confidence in this data. CCTV inspection is an on-going program for all of Council's piped networks. For the rest of the stormwater network that is unassessed, we rely mainly on the age of the pipe and its repair and maintenance history to gauge the condition of the asset. There is lower confidence in these data which are mainly based on desktop estimates. However, unlike sewer assets which are subjected to daily flow, stormwater assets only operate during rain events. They lie dormant for a large portion of their lives and there have been minimal failure issues in the last 10 years. This mitigates the risk of level of service failure arising from poor asset condition. Pipe renewal expenditure averaged \$180,000 per year in the last 3 years. Estimated replacement value of stormwater assets is around \$159 million.

Council has adopted a district-wide Stormwater Management Strategy which provides the overall framework and direction to Council's decision-making on stormwater using an integrated management approach. It is driven by the policies and rules of the Canterbury Land and Water Regional Plan (LWRP) which now requires that Council obtain a resource consent for its stormwater discharges, and comply with set standards and limits to the stormwater discharges from its reticulated network. There are a number of units within TDC that are involved in stormwater regulation and management. TDC's Stormwater Strategy aims to streamline its approach by setting specific goals, directives and methods relating to stormwater planning and regulation, asset management, the receiving environment, and stakeholder engagement and education. The Asset Management component of the Stormwater Strategy is implemented through the Stormwater Activity Management Plan and the stormwater-related activities of the Land Transport Plan and the Waste Minimisation Plan. Overall, Council's approach to stormwater asset management is to acknowledge the

requirements of the CLWRP. This includes progressively upgrade the network at the time of renewal to incorporate systems for attenuation and treatment of stormwater flows using low impact design or green infrastructure approaches where appropriate. The ongoing development of Stormwater Management Plans for urban catchments within the district will identify more specific infrastructure requirements. This will shape the asset renewal/development programme in the longer term and is expected to have significant cost and funding implications.

Figure 12: Stormwater Reticulation Network Profile



Although growth within the district is not projected to be at a high level, population and household number changes will still impact on stormwater services in the next 50 years. As more areas are built-up, or with increasing infill development, more impervious areas will be created with increased levels of contaminants and there is further potential for the natural paths for stormwater flows and soakage to be occupied. This puts greater pressure on the existing capacity of stormwater networks which increases the infrastructure requirement to manage stormwater flows.

To address these issues, it is necessary to provide treatment for the removal of contaminants and the attenuation of stormwater flows to better match the natural pre-development flows. The use of low impact options, such as first flush retention dams, swales and rain gardens provide appropriate solutions, and these are being built into new residential development areas.

4.1.5 Waste Minimisation

TDC provides a range of waste minimisation services including education and business support. Every urban household and many rural households (around 85% total) have access to a three-bin kerbside waste minimisation service. This service consists of an organic waste 240 litre bin emptied weekly, and a recyclables 240 litre bin and a 120 litre residual waste bin emptied on alternate weeks.

All of the district’s population has access to waste services at the transfer stations in Timaru, Temuka, Geraldine and Pleasant Point. Major infrastructure is provided at the Redruth Resource Recovery Park for processing and landfilling in Redruth, Timaru. Organic waste is processed into compost, recyclables are sorted and sold and the residual waste is buried in the landfill.

Kerbside collection

The kerbside collection system assets comprises of approximately 60,000 wheelie bins. The Timaru District Council receives comprehensive data from their contractor on bin numbers, bin repairs, and bin replacements. The original bin stock is now 12 years old and the budget allows for an increasing number of replacements until the number of replacements stabilises. Based on bin replacements to date and a reassessment of bin life this data is at a high level of confidence.

Transfer stations

Transfer stations roads and buildings are in good condition and well maintained. All sites will need renewals of the compactors and compactor bins in the near future. These have been budgeted for.

Materials Recovery Facility (MRF)

The Materials Recovery Facility was built in 2005 and has a maintenance schedule. It is in good condition.

Compost Facility

The eight compost pads were built in 2005 and have been allocated a life of 20 years. The pads will be rebuilt in a different location at that time with better grounding on a compacted pad. Current pads are in a poor condition due to landfill subsidence, but operational controls, such as regular cleaning mitigate this issue.

Redruth Landfill

The current landfill is operated by Waste Management NZ Ltd on behalf of Council. Stage 3 is a modern A-grade landfill with full sub-soil and leachate drainage systems. Each cell will be capped in the short term after completion of filling and an LFG system installed. Filling will recommence in Stage 2 in early 2019, so full capping and gas installation can take place over the next 5 years.

Other businesses

The Crows Nest building was built in 2004 and is in good condition.

Asset performance

Waste Minimisation assets are recorded in the Hansen database, however, condition and lifecycle information is not allocated. Any assessment of assets is visual rather than databased. This is an area identified in the WMMP Improvement Plan and a project is planned during the next 3-year period to improve condition and lifecycle information to enable better asset planning.

4.2 Assumptions and Risks

The Assumptions are based on the Long Term Plan General and Financial Assumptions which reflect the issues that may impact on Council activities in the next 50 years. These assumptions underpin Council's determination of the most likely scenarios for management of key assets, and the significant decisions on capital expenditure over the period of the strategy.

Table 5: Significant Assumptions

Significant Assumptions	Risk	Consequence	Mitigation
Macro-Level Assumptions			
<p>Legislative demands on Council</p> <p>Government legislation relating to some activities that Councils are involved in will change over the period of the Infrastructure Strategy.</p> <p><i>Comment:</i> With the change of Government in September 2017, a number of legislative changes have been signalled. However, details are yet to flow through the parliamentary cycle. In the next three years, the following legislative impacts on Council are potentially expected in the following areas of Council operations – Building, Resource Management, Dog Control, Local Government Service Delivery, Water Supply management, Managing for Climate Change, Employment conditions, Rooding and Transportation.</p>	<p>The impact of government legislation is more or less than expected.</p> <p>New legislation is introduced that alters the nature and scope of one or more Council activities.</p>	<p>Unrealised impacts of legislation may create greater impacts on Council operations, including operating budgets, workloads, increased time and resource availability. Lesser impacts may mean some operational review is required. These may lead to additional costs for the resident or ratepayer.</p>	<p>Council will regularly review existing and potential legislative change across its activities as it moves through the parliamentary cycle.</p> <p>The Council may submit on legislation where appropriate to encourage reduced or improved impacts on Council operations and better value for money for ratepayers.</p> <p>Where legislation requires review of Council processes or staffing, the Council will seek to achieve the most efficient and cost-effective way forward.</p> <p>Where legislation requires Councils to provide additional services or increased levels of service, this may require cost recovery through increases to rates or user fees.</p>
<p>Currency and oil price fluctuations</p> <p>Currency fluctuations are not forecast to cause significant variability in Council costs.</p> <p>Exchange rates are forecast to remain unchanged from current rates.</p> <p>Oil prices will continue to fluctuate due to international influences and exchange rate movement.</p>	<p>Exchange rates fluctuate more than expected.</p> <p>Oil price fluctuations are greater than expected.</p>	<p>Variability of prices from international suppliers could cause variability in Council costs. This may impact on the ability of Council to complete programmed work within budget.</p>	<p>Council purchases goods predominantly from New Zealand suppliers with contracts in New Zealand dollars.</p> <p>Currency exchange rates and oil prices will be continually monitored. Work programmes may need adjustment depending on the scale of any changes.</p>

Significant Assumptions	Risk	Consequence	Mitigation
<p>Inflation</p> <p>The LTP is prepared on the inflation rates assumed in the table below for periods beyond 2018/19 which is based on Local Government Cost Index (LGCI) prepared by BERL:</p> <ul style="list-style-type: none"> • 2018/19 2.0% • 2019/20 2.2% • 2020/21 2.2% • 2021/22 2.2% • 2022/23 2.3% • 2023/24 2.3% • 2024/25 2.4% • 2025/26 2.5% • 2026/27 2.6% • 2027/28 2.7% 	<p>The rate of inflation differs from that assumed.</p>	<p>A significant change in inflation will result in changed revenue and expenditure. This could be significant and may adversely affect the ability of the Council to set rates at a level that is affordable to the community.</p>	<p>The Council will review its budget annually through the LTP/Annual Plan process and may adjust work programmes/budgets where necessary.</p>
<p>Climate Change</p> <p>Climate change will impact on the Council's operations and will require an appropriate response to adapt and prepare for potential impacts.</p> <p><i>Comment:</i> Climate change effects on Timaru District may include an increase in temperature, stronger winds, sea level rise, longer dry periods and more intense rainfall events. These may impact directly on several Council services, such as stormwater, water supply and emergency management.</p>	<p>The effects of climate changes are more or less severe than expected.</p>	<p>Unrealised effects of climate change are likely to create additional costs to mitigate their impacts, such as improving protection of critical infrastructure.</p> <p>More severe weather events resulting from climate change may increase damage to infrastructure and place pressure on Council finances.</p>	<p>Council activities will build appropriate mitigation responses into infrastructure development.</p> <p>The Council will continue to monitor climate change science and the response of central government and adapt its response where required.</p>
<p>District Level Assumptions</p>			
<p>Population Change</p> <p>The District's Population is projected to increase to 49,400 (+8.8%) by 2028, peaking in 2038 at 50,200. This represents the Stats</p>	<p>Population change across the District occurs at a higher or lower rate than expected.</p>	<p>A significant and consistent decline in population may adversely affect the ability of the Council to set rates at a level that is affordable to the community.</p> <p>A significant and consistent rise in population</p>	<p>Council will continue to monitor population change in the District. Generally, small increases in population can be managed within the existing level of service. Declines in population will not necessarily reflect lower</p>

Significant Assumptions	Risk	Consequence	Mitigation
<p>NZ medium⁴ projection scenario</p> <p><i>Comment:</i> Population projections do not represent forecasts, but indicate what the future size and structure will be if the underlying assumptions regarding births, deaths and migration prevail. Growth is projected to occur at around a rate of 0.6% annually until 2028. Based on the medium projection, the rate of natural increase will become negative from around 2028, meaning there are more deaths than births. This reflects the age makeup of the Timaru District population. Growth from 2028 will be reliant on net migration. Projections use the 2013 Census based Estimated Resident Population as a base and were prepared by Statistics NZ.</p>		<p>may adversely affect the ability of Council to deliver some services to existing service levels.</p>	<p>number of ratepayers as the number of people per household is declining.</p> <p>Where growth requires additional infrastructure (e.g., subdivisions), Council can require financial contributions for this work.</p> <p>Costs over this amount may result in additional Council expenditure which is likely to be funded out of debt.</p>
<p>Household Change</p> <p>The District's households are projected to grow to 21,500 in 2028 (+11.4%), rising to 22,300 households in 2038. This represents the Stats NZ medium⁵ projection scenario.</p> <p><i>Comment:</i> Timaru District household change has historically been characterised by steady growth of households, with pockets of stronger growth in some locations and communities. Household size is declining over time as the population ages. Household projections do not represent forecasts, but indicate what future households will be if the underlying assumptions prevail. Projections use the 2013 Census based Estimated Resident Population as a base and were prepared by Statistics NZ.</p>	<p>Household change across the District occurs at a higher or lower rate than expected.</p>	<p>A slower rate of household growth may mean some activities have overinvested in infrastructure (i.e., have too much capacity too soon).</p>	<p>Council will continue to monitor household change in the District. Existing infrastructure is being managed to address specific growth factors associated with an activity (e.g., traffic demand) which may be generated from an increase in households.</p> <p>Where growth requires additional infrastructure (e.g., subdivisions), Council can require financial contributions for this work.</p>

⁴ Based on Stats NZ Population Projections Update (released December 2016)

⁵ Based on Stats NZ Family and Household Projections (released December 2017)

Significant Assumptions	Risk	Consequence	Mitigation
<p>Demographic Changes</p> <p>The District's population is expected to age significantly into the future.</p> <p><i>Comment:</i> The most notable change is the projected ageing population with an anticipated 28.2% (or nearly 14,000 people) of the Timaru District population above the age of 65 by 2028 (2013 Census: 20.1% or 9,100 people). By 2028, the median age will be 47.4 years (2013: 44.3 years). Population increase is expected to occur mainly in age groups above 65. All other age groups are expected to slowly decline. Gender-wise, the population will see a levelling of the male to female ratio over time. Ethnically, the population is expected to remain largely NZ European/New Zealander with a slowly increasing Maori, Asian and Pacific Islands population. This represents the medium scenario. Projections do not represent forecasts, but indicate what the future population size and structure will be if the underlying assumptions regarding births, deaths and migration prevail. Projections use the 2013 Census based Estimated Resident Population as a base and were prepared by Statistics NZ. Other information is sourced from the 2013 Census.</p>	<p>Demographic changes across the District occur at a higher or lower rate than expected.</p>	<p>Changes to projected demographics may place pressure on some Council services due to increased demand over time, leading to provision of a lower level of service.</p>	<p>Forecast demographic changes for a rapidly ageing population have been projected for Western world economies for a number of years. Due to the makeup of the Timaru District population, it will feel these potential effects more acutely.</p> <p>Council will continue to monitor demographic change in the District and adapt or redirect activity provision to meet needs where possible within reasonable costs.</p>
<p>Service Levels</p> <p>Levels of service do not significantly change.</p> <p><i>Comment:</i> Service level changes may be initiated from increased community expectations or demand, a need to vary level of service across the district due to local expectations, or changes required as a result of government legislation or regional policy. These may also impose significant new</p>	<p>Significantly enhanced service levels are demanded by the community or imposed by the government on local authorities in one or more area of activity.</p>	<p>Increased or improved service levels inevitably require additional cost and/or resources to provide them.</p>	<p>The Council regularly monitors existing service provision within its operation on a day to day basis and through activity management planning and corporate planning processes.</p> <p>Minor changes may be made to service levels where budget, contracts and resources allow. These will generally occur within existing budgets. Service levels may change due to technology enhancements.</p> <p>Major changes in service levels will be</p>

Significant Assumptions	Risk	Consequence	Mitigation
service levels on the Council.			confirmed with the community via consultation. These will generally require increase to fees or rates, depending on how the service involved is funded.
<p>Demand</p> <p>Actual demand will be within expected levels.</p> <p><i>Comment:</i> The impact of demand on Council activities will vary. Activities will be influenced by factors specific to them (e.g. a rise in building consents for building control). Activities may also be influenced by broader factors or trends (e.g. population change, demographic changes, household changes).</p>	Changes in demand are significantly higher or lower than expected.	Significant and consistent variation from projected levels may adversely affect TDC's ability to meet levels of service at an affordable cost.	<p>Council will continue to monitor growth and development changes and adapt or redirect activity provision to meet needs within reasonable costs.</p> <p>Updated demand information where available will be incorporated into future planning work.</p>
<p>Strategic Assets</p> <p>Council will remain involved in all activities involving strategic assets and continue to own and control all strategic assets.</p>	Changes in control or ownership of strategic assets are required.	Changes in control or ownership of strategic assets will likely affect the level of service provided to the community.	Changes in control or ownership of strategic assets must occur as part of an LTP development or amendment, with a formal process required through the Local Government Act.
<p>Useful Life of Significant Assets</p> <p>It is assumed that asset information is reliable and reflects the condition and performance of the assets. It is assumed that no significant assets will fail before the end of their useful lives as determined by the depreciation rates included in the accounting policies.</p> <p><i>Comment:</i> Useful lives are detailed for significant assets in Asset/Activity Management Plans. These provide information to support replacement and renewal plans. Useful lives used in the calculation of depreciation are stated in the Council's Accounting Policies under Depreciation.</p>	Significant assets fail sooner or later than estimated.	A significant change in the useful life of a major asset may have significant financial repercussions.	Asset life is based on the estimates of engineers and valuers. These are regularly reviewed through asset monitoring and testing. In the event of assets wearing out earlier than anticipated, capital projects could be brought forward. This may affect borrowing and depreciation expenses. Negative impacts are likely to be at least partially offset by some assets lasting longer than estimated. Mitigation may also involve reprioritisation of the capital expenditure program.

Significant Assumptions	Risk	Consequence	Mitigation
<p>Joint Venture or Shared Service Arrangements/Council Controlled Organisations (CCOs)</p> <p>Existing joint venture or shared service arrangements or Council Controlled Organisations (CCOs) are expected to remain over the life of this Infrastructure Strategy.</p>	<p>New arrangements are proposed due to circumstances beyond the Council's control or existing arrangements are no longer tenable.</p>	<p>Additional costs may be created as the result of the failure of an existing arrangement.</p>	<p>Joint venture or shared service arrangements or CCO creation are undertaken following analysis of the potential benefits and costs and any proposed changes are subject to robust analysis.</p> <p>Where government legislation is involved, this will be monitored for any impacts on joint venture arrangements.</p> <p>Under Section 17A of the Local Government Act 2002, Councils are required to review the cost-effectiveness of current arrangements including governance, funding and delivery of activities every six years. A programme is in place to manage this requirement for any joint venture or shared service arrangements.</p>
<p>Availability of Contractors and Materials</p> <p>Contractors and materials will be available to undertake the work required to agreed standards, deadlines and cost.</p>	<p>Projects could be delayed if there is a shortage of contractors or materials, or contractors will not deliver to agreed standards, costs and timeframes.</p>	<p>Might increase cost and/or delay projects or mean something is delivered to a lesser level of service.</p>	<p>Spread projects as much as possible. Continue to engage with contractors.</p> <p>Ensure robust contracts are in place.</p> <p>Look at alternative resources.</p>
<p>Funding Sources</p> <p>Funding sources (including external funding sources) do not change over the life of this Infrastructure Strategy.</p> <p><i>Comment:</i> Funding sources are specified in the Revenue and Financing Policy and Financial Strategy. This applies to user fees, charges and external funding towards projects and assets. It is assumed that the policy of not collecting Development Contributions will continue.</p>	<p>Projected revenue from user charges financial assistance is not achieved.</p> <p>Levels and sources of funding differ from those forecast.</p>	<p>Revenues could reduce without the ability to reduce expenditure proportionately. In this event, the account would run in deficit, with charges reviewed for the next financial year.</p> <p>Project and asset funding could result in projects being revised or alternative funding sources used.</p>	<p>Levels of revenue from user charges have been set at realistic levels in accordance with the ratios outlined in the Revenue and Financing Policy.</p> <p>There is a concentration of risk associated with a small number of industrial consumers for some revenue streams (e.g., extraordinary water charges and trade waste charges). Regular liaison is maintained with these consumers.</p> <p>Funding for projects and assets is considered before the commencement of each project or asset.</p> <p>A significant impact from changes in funding or funding sources may result in a revised capital</p>

Significant Assumptions	Risk	Consequence	Mitigation
			work programmes, or changes in the level of user fees and charges, borrowing or rating requirements.
Credit Availability Credit can be obtained from financial markets on competitive terms and conditions.	Required credit cannot be obtained from financial institutions.	Funding would need to be obtained from alternative sources or work programmes adjusted.	Prudent debt levels are maintained to mitigate risk for financial institutions. Relationships are maintained with various financial institutions and Council regularly monitors credit markets. A credit rating is maintained.
Costs Costs will remain stable over the period of the Infrastructure Strategy (refer also to Inflation assumption). <i>Comment:</i> Maintenance expenditure has been based on historical trends.	Costs are higher or lower than anticipated.	Variability of prices, such as for oil, could cause variability in costs.	The Council and management will review its budget annually through the LTP/Annual Planning process and may adjust work programmes/budgets where necessary.
Asset Depreciation Rates Asset depreciation rates will not change as shown in the Accounting Policies.	Further work on planned capital works may alter the depreciation expense.	Increased depreciation costs would result from assets that have shorter useful lives.	Asset life is based on the estimates of engineers and valuers. These are regularly reviewed through asset monitoring and testing. Negative impacts are likely to be at least partially offset by some assets lasting longer than estimated.
Revaluation of Significant Assets The Council have adopted deemed cost as its approach to revaluation <i>Comment:</i> This has been applied from 1 July 2005 for most assets. Investment properties and forest assets will be revalued annually in terms of their respective accounting policies.	Minimal risks as asset revaluations will not occur in the future for property, plant and equipment.		Revaluation affects the carrying value of fixed and infrastructural assets and the depreciation charge in the years subsequent to the revaluation. Annual revaluations are undertaken for investment properties and forestry assets.
Rating Base The number of rating units will not change significantly over the period of the	Rating units could grow at an increased rate or could contract.	An increase in the overall rating base could result in a decrease in rates for rating units as the total rates are spread across a larger base. If the rating base was to reduce, there could	The rating base is reviewed annually when determining the rates for the year.

Significant Assumptions	Risk	Consequence	Mitigation
<p>Infrastructure Strategy.</p> <p><i>Comment:</i> For the Infrastructure Strategy, no significant change is expected over the 10 years. A small increase may occur in the following 40 years to reflect smaller units, both residential and rurally. The commercial sector is however likely to see a reduction in rating units as smaller units are amalgamated.</p>		<p>be an increase in rates.</p>	
<p>Resource Consents</p> <p>Resource consents will be obtained with acceptable conditions, and expiring resource consents will be renewed with similar conditions during the period of the Infrastructure Strategy.</p> <p><i>Comment:</i> Resource consents due for renewal can be found within the relevant Activity Management Plan for individual activities. A resource consent to discharge stormwater will be applied for within the year or next.</p> <p>As the maximum period for any resource consent is 35 years, every consent for water services held by Council (water, sewer and stormwater) will be due for renewal within the period of this Infrastructure Strategy.</p>	<p>Resource consent is not obtained or renewed, or conditions imposed are unacceptable.</p>	<p>The non-granting or non-renewal of a major resource consent for a Council activity would have significant impacts on costs and the ability to provide that activity. A major non-renewal may mean an entirely new approach to the activity would be required. Non-granting of resource consent may delay project benefits.</p>	<p>Appropriate planning for resource consent applications/renewals should ensure that they are obtained.</p> <p>Monitoring of compliance with existing resource consent conditions will provide a record of compliance for future processes.</p> <p>The renewal of consents is dependent upon the legislative and environmental standards and expectations that exist at that time.</p>
<p>Natural Hazards/Local Natural Disaster</p> <p>There are no significant local disasters during the term of this Infrastructure Activity.</p> <p><i>Comment:</i> The District is at risk from natural hazards such as flooding, earthquakes, storms, tsunami and wildfire. These events can strike without warning.</p>	<p>Natural disasters occur that have a significant impact on the District and Council services.</p>	<p>A disaster event can potentially cause significant unbudgeted costs, beyond the capacity of the Council to cope.</p>	<p>Council is a member of the Local Authority Protection Programme Disaster Fund Trust (LAPP) and has a variety of insurance cover which would cover some emergency works.</p> <p>Council also has a Disaster Relief Fund for the replacement of infrastructural assets excluding roading in the event of a natural disaster. Central government has role in disaster recovery after a natural disaster.</p>

Significant Assumptions	Risk	Consequence	Mitigation
Activity Specific Assumptions			
Roading and Footpaths			
<p>NZ Transport Agency Funding Assistance</p> <p>There will be no further changes to the funding assistance approach for transport funding administered by the New Zealand Transport Agency (NZTA), including funding criteria and NZTA funding.</p> <p><i>Comment:</i> Funding assistance rates are currently 52% for 2018/19 and 51% thereafter for all projects.</p>	<p>Changes in NZTA subsidy rates or to criteria for roading and footpath projects have a positive or negative effect on Council's transport budget.</p>	<p>Funding would need to be obtained from alternative sources or work programmes adjusted. Levels of service may need to be adjusted.</p> <p>If sufficient funding is not available, it may mean that projects are delayed or scrapped.</p>	<p>The Council and management will review the budget annually through the LTP/Annual Plan process and may adjust work programmes/budget where necessary.</p> <p>NZTA Funding Assistance Rates have been set to decrease to a level of 51%. The rate will lower to 52% in 2018/19 and 51% from 2019/20. These rates apply to all work.</p>
<p>Maintenance of State Highways</p> <p>State highways to continue being maintained by NZTA.</p>	<p>Reduced levels of service</p>	<p>State Highways through District poorly maintained.</p>	<p>Potential Council funding contribution.</p>
<p>Legislation for heavy vehicle mass</p> <p>There will be no further changes to the legislation of permitted heavy vehicle mass limits on the roads.</p>	<p>Legislation permits increased mass limits. Roading assets (pavement and bridge) are not fit for purpose.</p>	<p>Greater deterioration of Council roads, assuming Council took control of the road. Roading assets unable to provide suitable level of service.</p>	<p>Testing and prioritising of decision and work. Rates and NZTA funding request increase to pay for the costs or service levels could reduce</p>
<p>Collaboration</p> <p>Collaboration continues to happen between the Mid-South Canterbury Councils.</p>	<p>Loss of commitment to collaboration and levels of service differ.</p>	<p>Loss of efficiency opportunities.</p>	<p>Implement suggested S17A review option. (Doc # 1089408)</p>

Significant Assumptions	Risk	Consequence	Mitigation
<p>Bitumen Availability</p> <p>There will be bitumen available and within reasonable price to sustain the ability to lay future roads.</p>	<p>Availability of bitumen becomes limited due to multiple reasons, including changes in vehicle technology (electric vehicles), therefore bitumen is not “produced” as a by-product of the process of producing fuel. This therefore could cause the cost of bitumen to become too expensive, and causing the cost for laying pavements too high and not value for money.</p>	<p>Pavements are not value for money and becomes really expensive to create / renew / maintain.</p>	<p>Monitor technology changes and their effects.</p>
Water Supply			
<p>Fire Fighting Requirement</p> <p>Fire Fighting Code of Practice (FF COP) SNZ PAS 4509:2008 remains voluntary.</p>	<p>FF COP becomes mandatory resulting in significant reticulation upgrades.</p>	<p>Increased infrastructure costs.</p>	<p>Consideration of progressive upgrades to meet FF COP requirements when renewals are programmed.</p> <p>Monitoring of legislative changes.</p>
Sewer			
<p>Compliance by Industry</p> <p>Industries comply with tradewaste discharge agreements.</p>	<p>Industries unable to comply with tradewaste discharge agreements.</p>	<p>Non-compliance may result in increased monitoring and compliance costs and ultimately industrial wastewater treatment upgrades.</p>	<p>Regular liaison with industry and close monitoring of industry compliance for early detection of issues.</p>
Waste Minimisation			
<p>Waste quantities</p> <p>Waste quantities remain static or increase/decrease incrementally</p>	<p>That waste quantities vary unexpectedly.</p>	<p>Sudden increases in quantities mean landfill life is reduced.</p> <p>Sudden decreases in quantities mean income is reduced.</p>	<p>Communication with major commercial contractors.</p> <p>Management of landfill costs and charges.</p>
<p>Resource Consent Compliance</p>	<p>That Redruth Landfill consent is not renewed in 2030</p>	<p>Closure of landfill with airspace remaining. Increased costs to community for waste disposal.</p>	<p>Continue active work in monitoring and environmental management.</p> <p>Regular liaison with ECan.</p>



Significant Assumptions	Risk	Consequence	Mitigation
<p>Stormwater Discharge Quality</p> <p>The deadline for meeting the environmental quality standards by 2025 is flexible.</p>	<p>No extension to the deadline.</p>	<p>Significant cost will be needed to implement stormwater treatment and comply with statutory environmental quality standards.</p>	<p>Regular liaison with ECan.</p> <p>Monitoring of legislative changes.</p> <p>Implement stormwater management projects over time.</p> <p>Monitor stormwater quality.</p>

5.0 EMERGING ISSUES

The task of building, operating and maintaining these infrastructure assets in an affordable and sustainable manner is becoming increasingly challenging in view of the following emerging issues.

5.1 Demographic Changes

For the 2018-28 Long Term Plan Council is using Statistics New Zealand Population Projections released in December 2016 (based on the 2013 census).

Key points from the projections (*under the medium scenario*) are:

- Timaru District population is projected to peak at around 50,200 in 2038. Beyond this, on current projections the population will remain steady or may slightly decline. Based on the medium projection, the rate of natural increase will become negative from around 2028, meaning there are more deaths than births. This reflects the age makeup of the Timaru District population. Growth from 2028 will be reliant on net migration.
- Virtually all growth in future years will be in age groups 65+. It is noted that this growth is now forecast at a slower rate than previously. The 65+ age group will grow from 20.1% of the (Timaru District) population in 2013 to 28.2% in 2028 and 32.9% in 2043.
- Growth is projected to occur at around a rate of 0.6% annually until 2028.
- The District’s households are projected to grow to 21,500 in 2028 (+11.4%), rising to 22,300 households in 2038.
- Household size is declining over time as the population ages.

The following graphs summarise the population and household projections:

Figure 13: Projected Population of the Timaru District 2013-2043, by projection variant

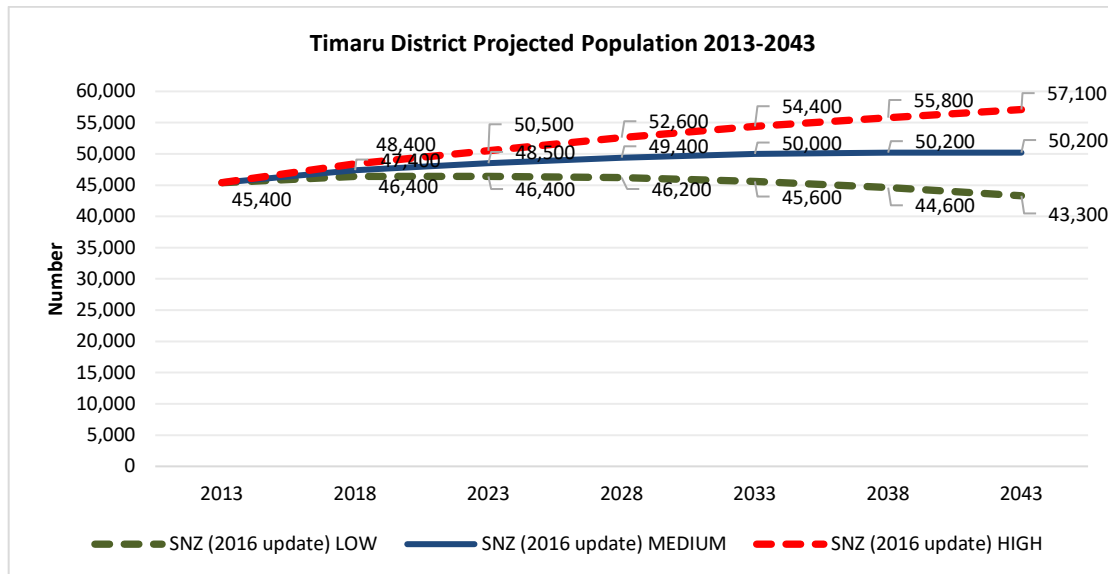
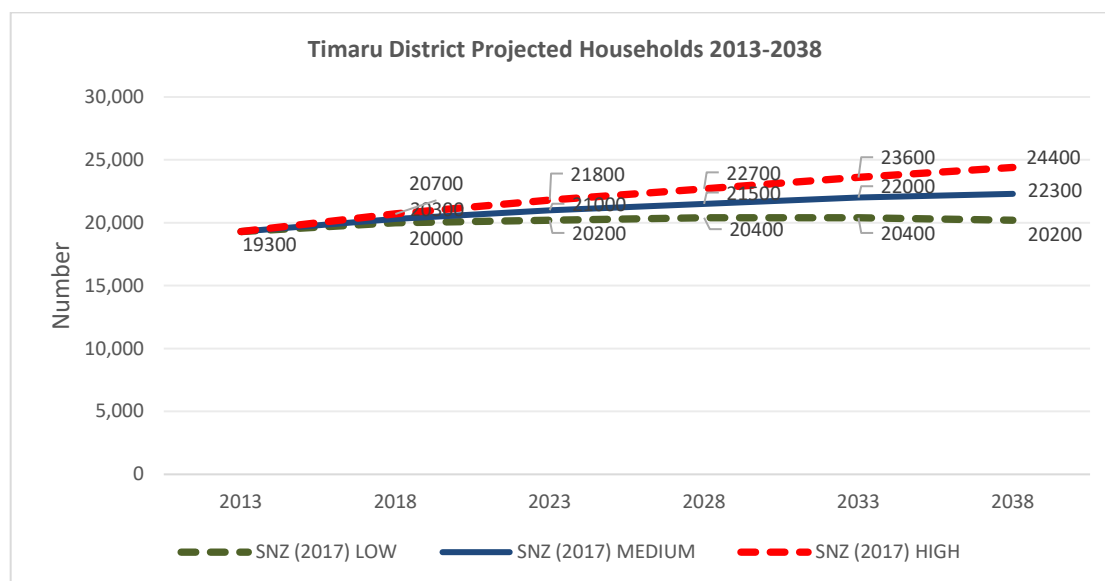


Figure 14: Projected Number of Households in the Timaru District 2013-2038, by projection variant



5.2 New Technologies

Industry practices are constantly evolving and technological advancements are an ongoing improvement that TDC aims to use in the roading, water services and waste minimisation activities. The impact of these is described below on the activities covered by this IS.

5.2.1 Roading and Footpaths

Technology in the transportation, roading, and road vehicle industry is growing rapidly. There are multiple areas that Council has to monitor and consider. These technologies will potentially improve:

- Road and vehicle Safety
- Vehicle Emissions
- Traffic and vehicle Efficiency
- Resilience
- Data
- Communication

According to the Ministry of Transport website, “The Ministry of Transport is taking an active interest in the use of the following transport technologies in New Zealand:

- Road vehicle technologies
 - Autonomous (driverless) vehicles
 - Connected vehicles
 - Engine technologies (electric and hydrogen)
- Air navigation technologies
- Unmanned Aerial Vehicles (UAVs) (also known as Remotely Piloted Aerial Systems (RPAS), Unmanned Aircraft System (UAS), or drones)
- Smartphones and tablets
- Positioning systems”.

In the Timaru District, electric vehicles are increasing in popularity and numbers. These include but are not limited to:

- E-cars / vans
 - Driver assisted
 - Autonomous (Driverless)
- E-bikes

- Mobility scooters
- Paxters

These sorts of vehicles have their benefits, but have multiple impacts on roading activity (e.g. Road safety - vehicular and pedestrians, charging stations – as demand increases, asset capability, cellular coverage).

Numerous software applications are emerging and in use. Some of these applications/software can assist with providing information to drivers (such as GPS mapping), and some assist organisations in gathering information.

Global Positioning System (GPS) are as good as the information available. If the software is not updated by the user or by the organisation, then the system can send users to unsuitable locations, all dependent of the options selected, such as “shortest routes”. The road user may not have the right vehicle to handle the road conditions that the GPS has identified for them to travel.

With the younger generation more in-tune with the current technology, information such as Wi-Fi direct availability, charging points, online shopping, bus (real-time) location information, are becoming the standard expectation.

5.2.2 Water Services (Water Supply, Sewer and Stormwater)

For water services, technological improvements continue to evolve and be promoted within the water services industry. Council acknowledges the utility and advantages of using more up to date materials and processes for operational efficiency. A process is embedded in the procurement of services where Council is provided a choice, for example, of the types of materials and methodologies to be used by contractors. In particular, Council’s assessment of technology is around what could help increase asset performance, minimise life-cycle costs, and sustainably achieve community outcomes. These include, but are not limited to, the following:

- high performance pipe materials (e.g., crack/pressure resistant PE pipes)
- non-destructive pipe condition assessments (e.g., ultrasonic testing, broadband electromagnetic testing)
- more effective and environmentally sustainable treatment processes (e.g., for wastewater odour control; for stormwater treatment)
- greater integration of Information and Communication Technology tools in business processes (e.g., electronic identification and tagging of buried assets; customised computers for field work management)

Looking at the 50-year horizon, Council will continue to pursue technological advancement that will bring about the greatest opportunities for efficiency and effectiveness in service delivery, taking into account the community’s appetite for advancement or modernisation of public services given the associated costs.

5.2.3 Waste Minimisation

For waste minimisation, the application of new technology will include:

- RFID tags being trialled as a way to improve delivery of kerbside collection services.
- Electric trucks for kerbside collection are likely to be implemented in the next 5 years.
- New technologies and product stewardship schemes will emerge to deal with various waste streams.

Council can facilitate a wide range of projects recovering/recycling waste which correlates with the long term vision for the Redruth site to provide a resource recovery hub. Waste to energy may provide an alternative option following the closure of the landfill.

5.3 Changing Government Priorities and Legislative Environment

The change of government in September 2017 may impact significantly on the delivery of some infrastructural services. At the time of preparation of this IS, much of the associated detail is unclear.

The government's current objective is that, "In 2045 New Zealand's infrastructure will be resilient and coordinated, and contribute to a strong economy and high living standards"⁶. This will be achieved through better use of existing assets and better allocation of new investment, as set out in the New Zealand Infrastructure Plan 2015.

Environmental compliance and progress is reflected through national policy statements and promulgated through regional and district plans.

The following provides a summary of the areas likely to impact on the delivery of Council infrastructure, based on current knowledge.

5.3.1 Roothing and Footpaths

Changes to the Government Policy Statement (GPS) on Land Transport

This is being revised to take account of the government's priorities, including:

- giving public transport greater priority in cities and expanding the public transport system to support new housing and interregional commuting
- increasing the use of rail to enable efficient passenger and freight use
- supporting regional development
- increasing support for active modes – walking and cycling
- delivering health, safety and environmental improvements
- reducing the environmental impact of transport
- mode neutrality in freight transport planning.

A draft of the new GPS is expected in early 2018, with the final document not due until August 2018. This will impact on the Regional Land Transport Plan as prepared by all Canterbury Councils, and potentially the funding and approach applied to the delivery of roading and footpaths services in the Timaru District.

5.3.2 Water Services (Water Supply, Sewer and Stormwater)

Government Enquiry into Havelock North Drinking Water

With the Havelock North drinking water incident, government has a focus on water quality and the safety of drinking water supplies. There are likely to be changes in standards and regulatory controls with funding and cost implications for water supplies.

An enquiry into the Havelock North water supply contamination incident commenced in 2016 and was completed in December 2017. The second stage of this report deals with recommendations around:

- Any legal or regulatory changes or additions necessary and desirable to prevent or minimise similar incidents
- Any changes or additions to operational practices for monitoring, testing, reporting on and management of drinking water supplies, implementation of drinking water standards, contingency planning, and responses by local and central government to address the lessons from this incident; and
- Any other matter which the Inquiry believes may promote the safety of drinking water and/or prevent the recurrence of similar incidents.

The second stage report was released in December 2017. Government is currently considering their response to the report, and it may have significant implications on the delivery of water supply services.

National Policy Statement for Freshwater Management

The amendment in 2017 of the National Policy Statement for Freshwater Management 2014 (NPS-FM) is one component of central government's clean water reforms. This could translate into more stringent conditions in obtaining/renewing resource consents with associated asset development/upgrade costs.

⁶ National Infrastructure Unit, 2015 Thirty year New Zealand Infrastructure Plan, Wellington

Environmental compliance and progress is reflected through national policy statements and promulgated through regional and district plans.

5.3.3 Waste Minimisation

Indications are that the change of government in late 2017 could bring about further legislative and policy changes that place a greater emphasis on environmental protection.

5.4 Climate Change

Climate change is an important consideration in the Council's long-term planning. Guidance from the New Zealand government, based on the best available climate science is used to support the planning.

The Ministry for the Environment information on <http://www.mfe.govt.nz/climate-change/how-climate-change-affects-nz/how-might-climate-change-affect-my-region/canterbury> provides a summary of projected climate changes over the period 2031-2050 and 2081-2100, compared with 1986-2005 and the key impacts this is likely to have.

Potential key impacts are likely to include:

- *Water shortages* – Higher temperatures, less rainfall and greater evapotranspiration are likely to cause increasing pressure on water resources. Droughts are likely to become more frequent and more extreme.
- *Fire risk* – Strong winds, combined with high temperatures, low humidity and seasonal drought may result in an increased fire risk. The length of the fire season is expected to increase.
- *Sea level rise* – As the climate changes and the sea level rises, the risk of flooding will increase. Coastal erosion is also likely to increase.
- *Biosecurity* – Climate change could increase the spread of pests and weeds. Banana passionfruit, a frost-tender plant, appears to be spreading, and argentine ants have survived through two winters, which was previously not thought possible. There may also be an increased threat to native species from changed distribution of disease vectors.
- *Agriculture* – Warmer temperatures, a longer growing season and fewer frosts could provide opportunities to grow new crops. Farmers might also benefit from faster growth of pasture and better crop growing conditions. However, these benefits may be limited by negative effects of climate change such as prolonged drought, increased flood risk, and greater frequency and intensity of storms. There is also likely to be increasing pressure on water resources.

These key likely impacts have been factored into the planning for our infrastructure assets.

5.4.1 Roothing and Footpaths

Some Roothing and Footpaths infrastructure is exposed to the effects of climate change, including:

- Rise of sea level
- Adverse weather events:
 - Intensity of rainfall
 - Strong winds
 - Droughts
 - Snowfall
- Changes in average temperatures

These effects have the potential to increase:

- Longer dry periods causing increased dust on unsealed roads
- High temperatures causing bitumen softening causing flushing and reducing skid resistance.
- Flooding and scouring damaging roads and bridges
- Trees and other structures falling / blocking roads

These all can affect road accessibility and network resilience. The mitigation of these will be reactive through timely response to events and repair works undertaken as required.

5.4.2 Water Supply

The associated risks to water supply relate to the availability and quality of source water. The increasing frequency of droughts could result in the probability of severe restrictions being imposed increasing above the 5% chance of occurring in any one year. More frequent and intense rainfalls could adversely impact on the quality of our raw water sources making it more difficult to treat to drinking water standards. These factors are acknowledged in Council's planning and operation of its assets, and measures are progressively being put in place (e.g. in design standards) to adapt to the effects of climate change. In the immediate term, universal urban water metering and pricing is being investigated as a demand management measure to encourage more efficient use of water and increase water availability. Over the longer term, greater resilience to climate change may require development of new water sources, investing in additional storage capacity, and/or treatment upgrades to mitigate the risks.

5.4.3 Sewer

The occurrence of more intense rainfall events in the district could exacerbate inflow and infiltration (I&I) into the sewer network, with implications on the performance of the assets. Levels of service failure could occur if the existing design capacity of the wastewater network is not able to deal with these more intense rainfall events.

The rate of I&I into the wastewater network is also a key factor in future wastewater volumetric demands. Most urban systems across New Zealand experience I&I with stormwater making up 20% to 40% of wastewater volumes.

Incidents involving overflow from the sewer network due to high levels of I&I make it more likely that breaches of resource consents will occur. Council has an ongoing Inflow and Infiltration Assessment Programme targeting known problem areas and test results are used to inform the pipe renewal programme. Overall, timely renewal of defective pipes is key to mitigating the risk of sewer network overflows.

5.4.4 Stormwater

The effects of climate change on the district's stormwater networks are not quantifiable with any degree of accuracy. What is known is the district's primary stormwater networks are designed to meet a 1 in 5-year return rainfall event (i.e. a 20% chance of occurring in any one year) in residential areas and a 1 in 10 year return rainfall event (i.e. a 10% chance of occurring in any one year) in industrial and commercial areas.

The district's stormwater network is generally aged. With higher intensity rain events, some parts of the network do not meet their intended level of service resulting in overflows. Increasing the level of service to contain greater stormwater flow rates and volumes will involve significant investment in network capacity upgrade and development, and will be a major decision for Council and the community to consider. The LTP 2018 Consultation Document includes a decision that needs to be made on the funding and timing of this and other stormwater improvements. It is likely that improvements will be implemented in a staged fashion (short to long term), with environmental outcomes progressively enhanced.

5.4.5 Waste Minimisation

Waste has a contributing effect to climate change through the generation of methane gas. Under the National Environmental Standard for Air Quality, Redruth Landfill is required to implement systems for gas collection and destruction. Landfill gas systems are planned for at each stage of cell development capping and closure.

High intensity rainfall will increase stormwater flow within the site and from the surrounding catchment. Stormwater planning will review controls required to mitigate the risks to the landfill stormwater system posed by climate change.

The location of the Redruth Landfill in a coastal area means the site may be at long term risk of erosion. This will be monitored. However, it is noted that the South Island main trunk railway lies between the Redruth landfill and the coast. The Redruth site may also be susceptible to flooding, but high bunds and swales to divert stormwater mitigate the risk.

5.4.6 Coastal Erosion & Inundation

The district does not have significant roading or wastewater treatment infrastructure subject to the immediate threat of coastal erosion or inundation. However, it does have low lying recreation areas which are subject to it, for example the Otipua Wetlands and associated paths and bridges. The Redruth landfill is also potentially subject to erosion or inundation during the lifetime of this strategy. The issue can be summarised as follows:

- Coastal erosion is occurring along most of the South Canterbury Coastline with the exception of Caroline Bay, which is accreting.
- Erosion has been worsening in recent times as beach shingle is depleted, particularly in severe Northeasterly swells.
- Most at risk from current levels of erosion are coastal walkways, the Rail Corridor for the South Island main trunk railway line, Otipua Beach and the Otipua Wetlands.

Looking to the next 25 to 50 years, more significant assets in terms of infrastructure may be affected by coastal erosion. If sea levels rise as predicted, together with more frequent extreme weather events, the rate of erosion and inundation will increase. This could potentially affect the following:

- Washdyke Lagoon – if the seaward side of the lagoon were to be completely eroded, it may expose a main sewer line to the risk of damage from the effects of coastal erosion

The TDC Wastewater Treatment Plant and Oxidation Ponds have been built outside the coastal erosion zone, as defined by Environment Canterbury. It is anticipated that the plant and ponds may be at risk but not within the 100 year timeframe.

The Redruth landfill could be affected by erosion and inundation during the next 50 years. This could largely depend on whether KiwiRail take steps to protect the South Island main trunk railway line. If they do, that protection will likely protect the landfill. If not, the landfill could be at risk depending on the rate of erosion

Coastal erosion and inundation is a dynamic and variable phenomenon, which is hard to predict and does not occur in a linear manner. Accordingly, this is an issue that Council needs to monitor closely and address as required.

5.5 Infrastructure Resilience

Customers have a high expectation of continuing functionality and service delivery. Resilience is based on a design philosophy which acknowledges that failure will occur. Resilience requires early detection and recovery, but not necessarily through re-establishing the failed system. Multiple projects ongoing or planned contribute to improving resilience. For example, the installation of a new trunk water main to Washdyke is currently being investigated.

We have to consider managing and mitigating the risks to, and the resilience of our infrastructure assets not only from natural disasters but also from the impact of development and other factors (e.g. unexpected failure). Weakness in asset condition monitoring is also a risk to asset performance.

To be resilient and sustainable, we need to plan for and respond to both anticipated and unexpected changes. Canterbury faces disruption from acute events, such as floods, winds, earthquakes or serious vehicle crashes. The design of infrastructure and provision of alternative routes can help alleviate these risks.

More gradual and predictable threats provide even greater challenges in the long-term. Changes in demand will occur due to population growth, demographic and economic growth changes. Other changes need to be anticipated and planned for such as climate change.

The current heavy reliance on non-renewable fuels and its contributions to climate change emissions is a sustainability issue. At a regional level, the infrastructure and services provided will make relatively little difference to these issues. More substantial progress requires

national and international responses, including strong policy responses and the introduction of new technology.

The integration of infrastructure and services with land use planning also contributes to long term sustainability as it can reduce costs and enhance accessibility, amenity and safety. More accurate physical condition assessment of assets can improve targeting of renewals and increase resilience of the infrastructure networks.

5.6 Ageing infrastructure

The district's infrastructure is ageing and the district is approaching an important period to ensure that its infrastructure assets continue to meet the current and future needs of the community.

TDC's renewal strategy is intended to provide for the progressive replacement of individual assets that have reached the end of their useful life. The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard, which reflects its age profile, and ensures that the community's investment in the district's Roding and Footpaths, Water Services (Water Supply, Sewer and Stormwater) and Waste Minimisation infrastructure is maintained.

The rate of required renewals determines the funding required. Deferred renewals may affect levels of service and increase maintenance costs. Timely renewal intervention in accordance with good asset management practice is needed to ensure long-term maintenance costs are minimised, Levels of Service are maintained and renewal costs optimised.

As stated by Office of the Auditor General⁷, *"Asset management interventions should be driven by data about the factors that determine the cost of service to ratepayers and other users. This includes information about:*

- *Performance, condition, works, and cost, which is required to understand the current cost of service and trends;*
- *Cost driven information such as demand, volume, input price, and demand-related decay models, which is required to forecast maintenance and renewal need and cost; and*
- *Works achieved compared to target/expectation, maintenance compared to renewals expenditure, unit service delivery costs, and condition, which is required to assess trends in the effectiveness and efficiency of maintenance and renewal programmes."*

5.6.1 Roding and Footpaths

A significant amount of the District roding infrastructure was constructed between 50 and 80 years ago during the "pioneer" or "boom" times that provided access to land, industry, rail and ports. As a consequence these assets are in the second half of their useful life. This is most evident in the district's bridge stock where many will need replacing in 10 to 20 years time. Provision must be made for this "hump" of renewal expenditure.

In recent years, there has been a significant growth in the freight task and a modal shift to road transport. The result is more heavy vehicles using our roads and increases in the mass of these vehicles. This has accelerated the deterioration of our road assets shortening their useful lives. Hence, a significant renewal programme is required. This is monitored on an ongoing basis by the following:

- Lifecycle assets strategy and plan implementation
- Condition monitoring and assessment
- Deterioration modelling (dTIMS)
- Effective and timely maintenance
- Renewals programmed and completed in effective and timely manner
- Costs recorded and intervention actions based on whole of life costs.

⁷ Reference??

Currently, dTIMS (deterioration predictive modelling) is used for pavements, which identifies intervention strategies and determines timing, frequency and treatment type to be implemented. This also optimises intervention strategies and produces expenditure forecasts, work programmes and predictions of future condition.

Bridges are inspected and structurally assessed every three years and renewal programmes are reviewed based on these assessments. The ageing of the assets and accelerated deterioration will result in challenges for future funding and resources to meet demand. This is a significant issue for the Council.

5.6.2 Water Services

TDC's issue with the ageing of its water, sewer and stormwater services infrastructure is more relevant to its underground assets or buried pipes as they cannot always be visually inspected anytime, and condition assessment is generally inferred from the theoretical age of the asset and from sampling of certain portions of the entire pipe network. The timing of renewal of the asset becomes crucial and decisions around deferring a renewal is critical as there is always a considered risk that adjusted asset lives or extended use of an expired asset could cause operational issues and service level failure anytime.

5.6.2.1 Water Supply

The district's water supplies were established at various periods, the oldest being the Timaru town water supply in 1880, followed by Temuka in 1906, and Downlands, Geraldine and Pleasant Point in 1938. Peel Forest supply was established prior to 1950. The Winchester reticulation was installed in 1966-67. Seadown, Te Moana and Orari supplies were installed in the 1970s.

Figure 15 and Figure 16 show the age profile of the water supply network and the cost of the renewal programme, respectively. Around 200 km of water mains (or 10% of the entire network) needs replacement within the next 10 years with an associated cost of around \$60M. These comprise mainly of steel and asbestos cement (A/C) pipes which were the typical older pipe installations. The quantum of pipes reaching the end of their theoretical economic life is going to progressively increase from an estimated 10% in the next 10 years to about 30% of the entire water supply network within the 50 year period of this Infrastructure Strategy. Renewals of assets are generally funded from reserves which have previously been funded from rates. If there are insufficient funds in the appropriate reserve for the renewal expenditure, council has elected to borrow to pay for some of the renewals.

Later in the period (i.e. from around year 50) there is a significant jump in pipe renewals required, yet they appear to cost significantly less. The difference relates to the size (diameter) of the pipes being replaced. For example, a large trunk main can cost many millions of dollars (e.g. \$20M for Pareora pipeline), whereas smaller water mains pipes cost a lot less to replace.

Because of the identification of unexpected degradation of the Temuka trunk main in December 2017, it is proposed to carry out a review of the sampling, testing and determination of remaining life of asbestos cement water pipes in the Timaru District.

Figure 15: Age Profile of the Water Supply Network

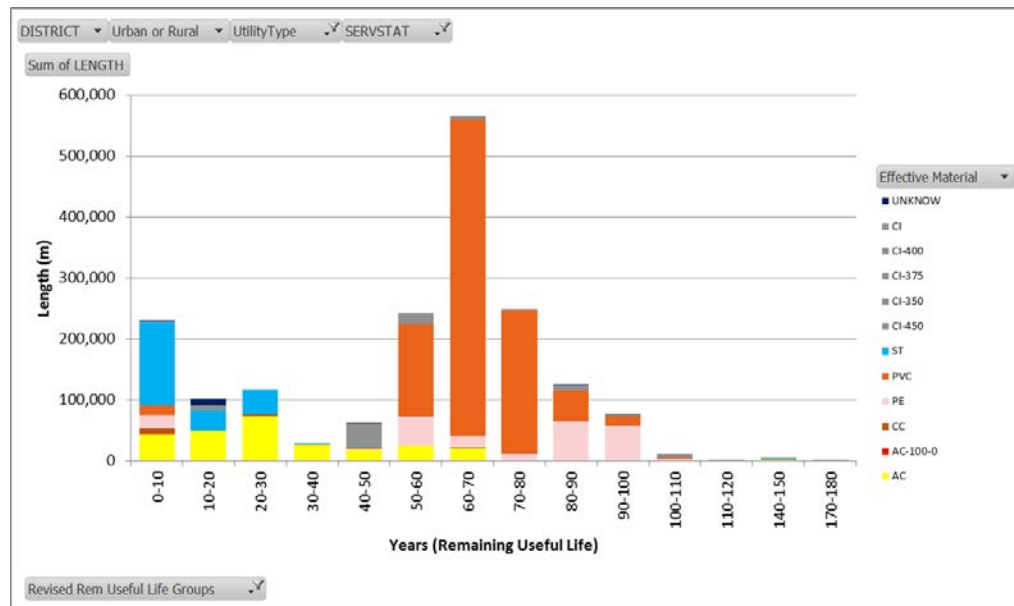
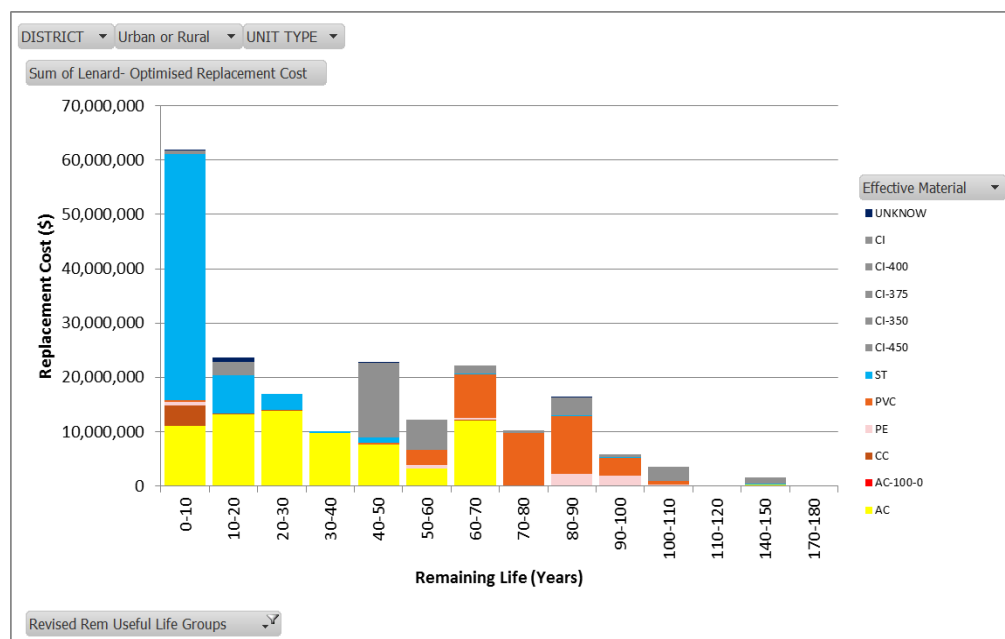


Figure 16: Age Profile of the Water Supply Network - Cost



5.6.2.2 Sewer

Figure 17 and Figure 18 show the age profile of the sewer network and the cost of the renewal programme, respectively. Poor condition of pipes and manholes associated with the age of the asset has led to higher rates of inflow and infiltration in the sewer systems. Cracks in pipes lead to intrusion of foreign materials, such as rocks, gravel, and solid waste matter into sewage flows and impact on the performance of the pipes, pumps and treatment facilities. Based on the assumed remaining life of the pipe assets, around 141km (40% of total network) need replacing over the next 50 years. There is an estimated \$15 million cost to renew around 20km (or 6%) in the next 10 years.

Figure 17: Age Profile of the Sewer Network

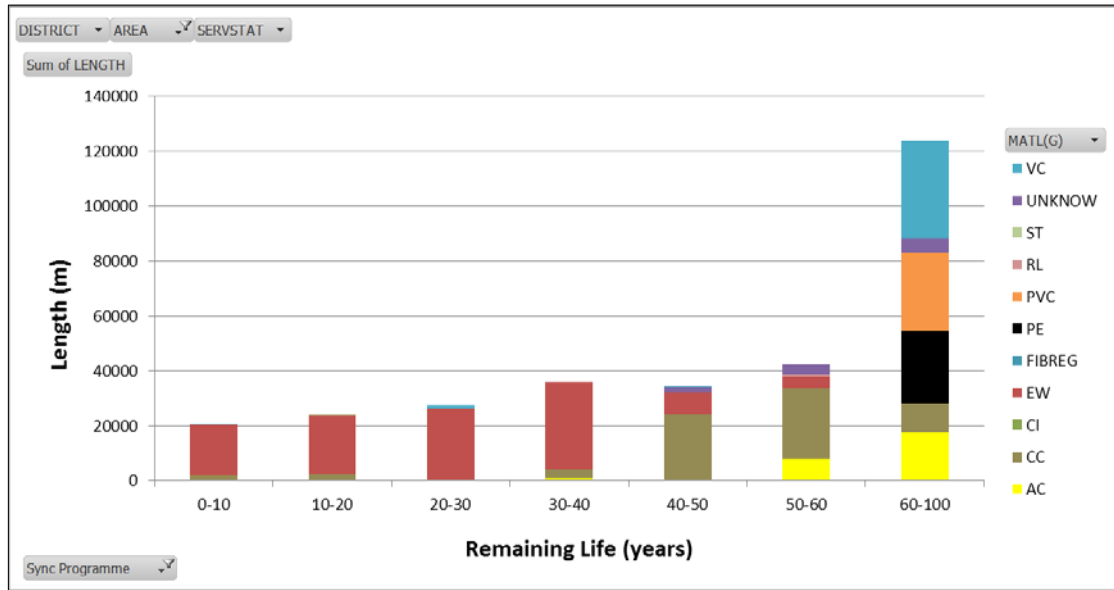
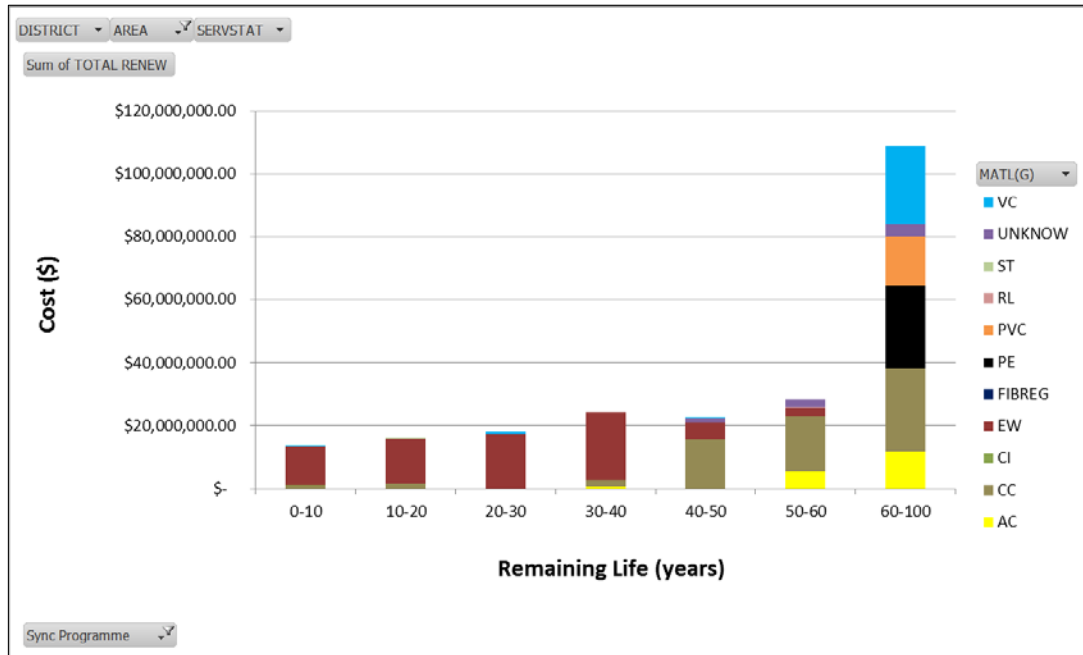


Figure 18: Age Profile of the Sewer Network - Cost



5.6.2.3 Stormwater

Figure 19 and Figure 20 show the age profile of the stormwater network and the cost of the renewal programme, respectively. The issue with the district’s aged stormwater reticulation relates not so much with physical deterioration of the asset but with the capacity of parts of the network not being able to meet the current levels of service (i.e., no network overflows for rainfall return period of 1 in 10 years for residential areas and 1 in 20 years in commercial areas). Council has acknowledged this as a legacy issue that needs to be addressed in the renewal of the network. Evidently, the district’s stormwater network was originally designed based on smaller rain events relevant at that time. Some 3km of the stormwater pipe network will be renewed within the next 10 years at around \$3 million cost.

Figure 19: Age Profile of the Stormwater Network

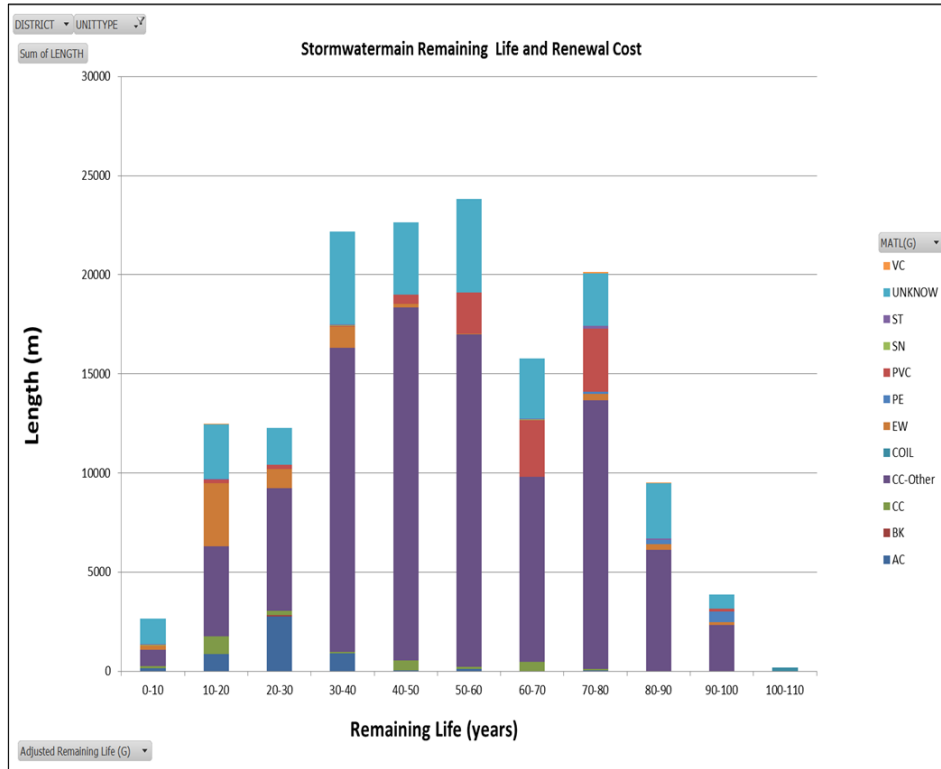
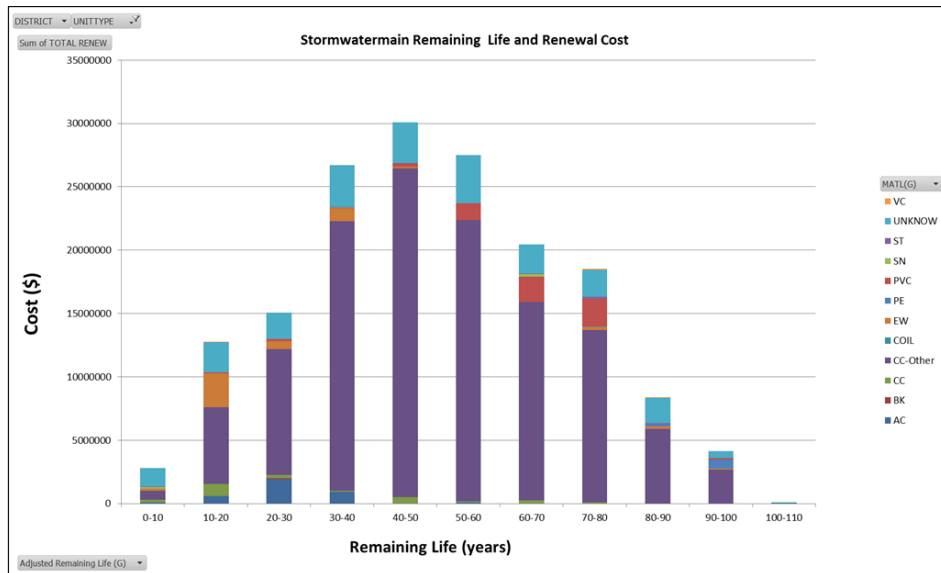


Figure 20: Age Profile of the Stormwater Network - Cost



5.6.3 Waste Minimisation

In Waste Minimisation many of the assets are buried within closed or active landfills. The Stage 1 Redruth landfill, closed in 1996, has no such buried assets, but requires capping to improve environmental outcomes. Stage 2 and 3 combined form the “new Redruth Landfill” which will require an aftercare period of 30 years post-closure.

Pumps are the main landfill asset requiring renewal, and due to harsh conditions are often replaced on a failure basis. The transfer station infrastructure is between 17-25 years old and

generally in good condition. Renewals are required for compactors after the initial 10-year period.

Above ground assets are listed in a database and more work is required to date and report on these assets to improve renewals planning and funding requirements.

5.7 Land Use Change

The use of land in the Timaru District has changed substantially in the last 15 years. In the future, significant growth in demand for infrastructure services is expected to occur in the following parts of the District:

- Washdyke as the main industrial growth area
- Timaru CBD and (potentially) the Showgrounds land for commercial use
- Residential growth continuing in Gleniti areas as well as Old North Road area
- Port-related land

At Washdyke, in 2011-14, Council rezoned 120 hectares of land from Rural to Industrial. This rezoning will result in developments that will require extensive new infrastructure, particularly roads, piped networks and electricity distribution systems. Council has determined that this recently zoned land will have infrastructure provided by developers at the time of development.

Rural land intensification has also occurred throughout the District with resultant impacts on infrastructure, particularly roads and bridges. In more recent times heavy trucks have been approved at a 50 tonne gross vehicle mass. The additional vehicle movements have resulted in extra costs in order to meet specified community levels of service.

Land use change impacts on water services are also significant. The increasing number of lifestyle blocks on the fringes of the District's urban areas has increased demand for extension of water supply services to these properties. As residential development continues, the extent of impervious areas grows and creates more demand for stormwater infrastructure services.

The current District Plan Review and subsequent revisions is required by the Resource Management Act 1991 to provide for the expected demand for additional urban land. The plan-led strategic approach taken by the Draft Growth Management Strategy (GMS), which will inform the District Plan Review will ensure that any new areas of urban land are serviced with or can be serviced with infrastructure and that infrastructure is a key consideration in any decision on managing urban growth. This will help ensure new infrastructure provision is efficient. The issue of who prepares Outline Development Plans (ODPs) will be addressed in the GMS or by a Council policy. If Council decides to prepare ODPs, that will increase the demand for design work.

5.8 Funding

Capital, maintenance, and operational funding of the Roothing and Footpaths, Water Services and Waste Minimisation activities is complex and made up of a number of streams.

Existing funding sources are as follows:

Roothing and Footpaths

- General Rates based on land values and differentiated
- NZ Transport Agency (NZTA) Funding Assistance
- Depreciation funds
- Loans
- User charges
- Private parties

Water Services

- General Rates based on land values based on community of interest for stormwater
- Targeted Rates via uniform annual charges for water and sewer

- Targeted Rates via land area (for rural water)
- Targeted Rates via water volumes (for rural water)
- Subsidies for approved sewer schemes
- Depreciation funds
- Loans
- User charges
- Private parties

Waste Minimisation

- Targeted Rates via uniform annual charges
- Depreciation funds
- Loans
- User charges
- Private parties - leases

For details on how these activities are funded, refer to the Council's Revenue and Financing Policy in the Long Term Plan. This policy outlines the proportion of funding that will come from each source. Financial Contributions are charged under the current Financial Contributions policy in the District Plan. Currently, the Council does not use Development Contributions as provided for in the Local Government Act. However, Financial Contributions are being legislatively phased out and the Development Contributions Policy is to be reviewed before 2021.

Rating for these activities differs according to where the property is located, the land value of the property and the services received.

5.8.1 Roading and Footpaths – Government Funding

Funding for Roading and Footpaths from government through NZTA is reducing. This is subject to a number of potential changes as summarised below:

- **Government Policy Statement (GPS)** - funding category allocations are being reviewed by the government.
- **Funding Assistance Rule (FAR)** - the NZTA FAR review has implemented a flat rate for all activities and the outcome for Timaru is a reduced FAR of 52% for 2018/19 and 51% thereafter.
- **Business Cases** – business cases are to be prepared to support national priorities and contestability issues.
- **One Network Road Classification (ONRC)** – this is a national road classification hierarchy system. The ONRC system allows comparative analysis both nationally and with relevant peer groups. These comparative analysis reports provide evidence on a district's expenditure and asset management strategy efficiency.

Timaru District must carefully manage its investment in infrastructure to ensure it gets value for every dollar spent and provide infrastructure in a lawful, functional and affordable manner.

5.8.2 Waste

Waste Minimisation income from user charges varies annually according to tonnages disposed of. This presents a risk that income from user charges can vary significantly, particularly if waste flight occurs.

6.0 FIFTY YEAR STRATEGY

Timaru District Council will comply with the relevant New Zealand legislation, while working towards the Strategic Direction, as outlined earlier in this document.

6.1 Responsible Stewardship

The main theme underpinning this Infrastructure Strategy is ensuring responsible stewardship of our key infrastructure assets to meet the needs of tomorrow's community.

This acknowledges the many and varied factors that influence the delivery of the district's infrastructure, as discussed in Section 5, including:

- Ageing Infrastructure – the need to address a 'bulge' of infrastructure that is nearing the end of its life. Infrastructure needs replacement to modern design and environmental standards. In some instances, significant redesign may be required to ensure it is fit for purpose.
- Societal change – our society is rapidly changing. Land use change, changing demographics, new government legislation and demands, technological change and increasing community expectations. New infrastructure development needs to be future-proofed and responsive to this change.
- Resilience – Built infrastructure needs to be able to handle the impact of natural hazards, at a minimum to protect human life. But this is not all, it must also cope with future demand and change, such as the impact of a growing economy and changes in land use.

Some of these challenges are legacy issues (e.g. the decisions of past Councils or how things were built over 40 years ago). Others are simply the demands of a progressive society that is constantly seeking to improve. Either way, the Council is responsible for ensuring built infrastructure enhances community wellbeing and is fit for purpose, good quality, safe, future-proofed, cost effective and appropriately funded.

The Council's priorities are:

- Timely and cost effective maintenance of infrastructure to optimise its life
- Replacing ageing infrastructure in a timely manner
- At a minimum, maintaining existing levels of service
- Managing the impacts of growth and land use change in a sustainable way
- Compliance with legislative requirements
- Providing long term affordable services
- Managing the impact of technology changes

6.2 Asset and Service Management Strategy

Council's management strategy is to be a prudent and knowledgeable asset manager that makes investment decisions based on asset age, condition, performance, deterioration and maintenance factors. Increasing legislative standards are acknowledged and actioned in all asset renewal projects.

Strategic and organisational priorities set the direction for planning of infrastructure that will continue to support quality living, economic development and environmental integrity in the District in the long-term. Looking ahead to the next 50 years, Council's approach is to be prudent in its investment decisions using a holistic lifecycle approach to asset management, responding to changes in demand for services, allowing for changes in levels of service, and mitigating identified risks. In planning and providing the district's infrastructure requirements in the next 50 years, Council will:

- **Maintain and optimise asset life** - through timely and effective maintenance. TDC's philosophy is to view maintenance as a value driver rather than a cost centre. The decision to perform maintenance at any time is based on cost/benefit analysis, understanding that maintenance can add economic value to assets. There is no one-size-fits-all care programme for all of council's infrastructural assets. TDC will continue to utilize a mix of approaches, including preventive maintenance, reactive

maintenance, run-to-failure (breakdown maintenance), predictive maintenance which is condition rather than age based, and risk-based maintenance for critical assets that need to be monitored more frequently. The decision on what will work best requires a delicate balancing between the value that improved reliability can bring and the cost of maintenance.

- **Continue to replace ageing infrastructure** – through a robust asset renewal programme. Council has adopted a cyclic renewal strategy that provides for the progressive replacement of assets that are reaching the end of their useful life. The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard which reflects its criticality and age profile, and ensures that the community's investment in the infrastructure is sustained.

Deciding the timing of capital and maintenance expenditures is based on Council's understanding of the current condition and capacity of the assets, as well as future capacity, criticality and reliability requirements. Council will also consider the cost and risk associated with implementing or deferring renewals, upgrades or improvements. Council's strategy will be to:

- Prioritise capital and renewal projects within the next ten year period based on the strategic objectives of the Timaru District's Long Term Plan and Infrastructure Strategy and a holistic risk based condition assessment; and
- Forecast capital renewal, replacement and upgrade costs over the following 40 year period; and
- Forecast the funding requirements based on estimates of costs and asset valuations
- **Maintain the current level of service** - through a holistic lifecycle approach to asset management that covers the assets and their supporting resources, business processes, data and enabling technologies, critical to sustainably delivering agreed levels of service. This holistic approach to lifecycle asset management enables critical asset data, particularly condition and performance tracking, to be effectively used on a practical day-to-day business level to maximise the performance and life of the asset.
- **Manage the impacts of growth and land use change** – by providing the conceptual framework of infrastructure in support of development. The TDC's Growth Management Strategy provides guidance on potential future infrastructure development in the district through identifying the potential location and scale of future growth. Contributions from development will be taken to fund necessary infrastructure so that growth pays for growth, and costs are not unfairly borne by established communities.
- **Comply with legislative requirements** – by acknowledging and actioning legislated standards in infrastructure planning and development. Compliance with the RMA, through the resource consenting process, will drive sewer and stormwater including road infrastructure expenditures. Anticipated increase in regulatory controls for drinking water supplies signals that additional capital expenditures will need to be made to upgrade water treatment processes and other infrastructure (e.g. A/C pipes).

Land Transport must continue to meet increasing requirements of the Land Transport Management Act, Transport Act and new road user rules such as heavy vehicle mass.

- **Provide long-term affordable services** - through prudent financial management that complements asset management. The financial strategy will continue to reflect the balancing of ratepayer affordability against community needs and aspirations.
- **Manage the impacts of technology changes** – through monitoring technology developments and appropriate responses. The next 50 years will see significant advances in technology, particularly in transportation, and roading infrastructure will need to respond to support these changes. These will include electric vehicle/bike charging stations, information technology on direction, travel and safety and providing appropriate infrastructure for autonomous vehicles. Other potential technology changes that may need a response are in waste disposal areas such as incineration, water quality monitoring, energy sources and use.

The Council has an Activity Management Policy that defines the appropriate level of asset management in line with the International Infrastructure Management Manual 2015 (IIMM). Activity Management Plans are prepared that incorporate key information for managing each individual aspect of the activity. These plans are reviewed regularly.

6.3 Cost Effective Delivery of Services

Section 10 (Purpose of Local Government) of the Local Government Act 2002, sets out a clear requirement to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.

The Act defines good-quality, *in relation to local infrastructure, local public services, and performance of regulatory functions, as infrastructure, services, and performance that are*

- (a) efficient; and*
- (b) effective; and*
- (c) appropriate to present and anticipated future circumstances.*

In order to deliver services that are efficient, effective and appropriate, Timaru District Council has adopted a philosophy of using a mix of in-house resources and consultants/contractors to carry out its work programme.

Core work is carried out by a wide range of professionals and support staff employed by the Timaru District Council. These staff carry out a base load of work and consultants are hired to carry out specialised work and also when the volume of work is greater than the internal capacity. The cost of hiring staff versus utilising consultants is evaluated on a job by job basis.

Water and Wastewater treatment operations are carried out by inhouse TDC staff. The reason for this approach is that Council wishes to be risk averse where public health and environmental matters are a priority. The consequence of failure to comply with Drinking Water Standards or resource consent conditions are so important to the TDC organisation it has been determined that close and direct control is required and therefore these tasks are carried out inhouse.

As for service delivery, whether for maintenance or construction work TDC has determined that contractors will be used. The Timaru area is well resourced with contractors with many national companies having bases in the District. The engagement of contractors is by negotiation, quotation or tender. Evaluation and assessment of quotations and tenders for roading work is via lowest price, weighted attributes or Price Quality methods as specified by the New Zealand Transport Agency.

The TDC has a procurement strategy that contains guidelines as well as a flow chart to guide asset managers on how to procure external resources to carry out work.

Currently, in the Land Transport activity, Timaru District Council is working in collaboration with other boundary Councils (Ashburton, Mackenzie, Waimate District Councils) as part of the Mid-South Canterbury (Aoraki) Roothing Collaboration (ARC). This collaboration was established to actively seek to collaborate and co-operate with each other to improve effectiveness and efficiency. The Councils aim to improve management and operations of their roading networks by working together. As part of the collaboration, the following contracts have been successfully awarded:

1. Road Network Operations and Maintenance Contract
 - o Joint procurement and documentation
2. Road Resurfacing Contract
 - o Single South Canterbury joint contract (2 years from 1/8/17)

6.3.1 LGA Section 17A Delivery of Services

TDC undertook a review of the delivery of its services to meet the transitional provision under Section 17A of the Local Government Act 2002 Amendment Act 2014, requiring all services to be reviewed before 7 August 2017.

For the Water Supply, Sewer, Stormwater and the Waste Minimisation activities, Council determined that the services are being delivered cost effectively under existing governance, funding, management, and delivery approaches including contracting arrangements for operation, repair and maintenance of council assets.

In July 2017, Council received a Morrison Low on the Land Transport activity. A wide range of service delivery options were considered for the future delivery of the Land Transport activity by the Council. The following two options were the service delivery options recommended in the review report that could provide improvements to the status quo for the Council:

1. Enhanced Status Quo
 - a. Involves implementing the improvement initiatives to build upon the regional collaboration that has already taken place in the physical works space.
2. Shared Service Agreement between the Councils
 - a. Involves a major change from the status quo and would represent a transformational shift in the way that the roading activity was managed and delivered in South Canterbury.
 - b. Includes the development of a formal South Canterbury Roading Alliance with a shared services business unit incorporating all roading teams from the participating Councils.

Council's Policy and Development Committee in July 2017 considered a report presenting the recommendations and resolved the following:

- a. "That Timaru District Council supports the enhancement of the status quo for the delivery of roading professional services, building further on the Mid-South Canterbury Collaboration work to date.
- b. That Timaru District Council supports further investigation of the development of a roading professional services alliance with Ashburton, Mackenzie, and Waimate District Councils and enters into discussions with them to explore the implementation of this option."

6.4 Addressing Resilience

"The infrastructure strategy must outline how the local authority intends to manage its infrastructure assets, taking into account the need to...provide for the resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks." (Source: LGA Section 101B (3)(e))

TDC's Risk Management Policy provides that risks, to which Council is exposed, must either be avoided or controlled to an acceptable level. The policy directs the development of subsidiary risk management plans for each of Council's activities. A register of risks is held on Council's infrastructure assets. Risks are generally managed through the lifecycle management of assets which covers capital works, operations and maintenance.

6.4.1 Natural Hazards

In terms of natural hazards, the District's overall risk profile identifies earthquakes and flooding as the predominant natural hazards for Timaru⁸.

Council's primary approach in addressing risks from natural hazards is ensuring strong organisational capacity and capability to respond to events that may occur. This means having an operable local Emergency Response Management Plan, Contingency Plan or Business Continuity Plan in place. Ongoing capability building on emergency response is provided to TDC personnel through Council's Emergency Operations Centre.

Regionally, TDC is a member of the Canterbury CDEM Group. The group adopted a Canterbury CDEM Group Plan in June 2014, a strategic document that provides direction on how comprehensive, risk-based emergency management will be implemented in the Canterbury region. In implementing the plan, the Canterbury CDEM Group will work towards its vision of "A Resilient Canterbury — Waitaha Tukaha".

⁸Source: Canterbury CDEM Group Plan (2014), Annex B – Timaru District Risk Profile

In particular, the Canterbury CDEM Group has established coordinative linkages among the region's Lifeline utilities that provide essential infrastructure services to the community (e.g. water, wastewater, transport, energy and telecommunications). Lifeline utilities are required by section 60 of the CDEM Act to continue to provide their services to the fullest possible extent during and following emergency events. Lifeline utilities in the region have developed and maintain response arrangements. Should, for example, a major event occurs that results in prolonged power outage in the district or the region, Council has standby generators and fuel supply as a contingency measure. However, it can be expected that the power utility and fuel suppliers will assist us through their own response plans.

Financial provision for replacement of water supply, sewer and stormwater infrastructure assets following catastrophic damage by natural disaster is covered by insurance. The below-ground assets are insured by Local Authority Protection Programme (LAPP). The above-ground assets are insured by Council's general insurance policy.

Provision for funding road damage from significant natural events is jointly provided by the NZ Transport Agency from the National Land Transport Fund and Council from the Disaster Recovery Fund.

6.4.2 Asset Resilience

On a day-to day basis, Council addresses all types of hazards to its assets and operations and progressively builds resilience through a whole-of-life approach to asset management. The aim is to continue to deliver the required level of service at all times. Activity Management Plans are updated on a 3-yearly cycle and identify specific risks to assets and operations. These are factored into the development of the associated capital expenditure strategies/programmes. For example, seismic assessments done of Council buildings have indicated a high risk of structural failure of the Pleasant Point and the Temuka water supply reservoirs in the event of a local earthquake occurring. Seismic strengthening is therefore a major design input into the renewal of these facilities.

Resilience to changes in the demand for Council's infrastructure-based services (e.g., increased traffic on roads, bigger volumes of waste to the landfill, increased volume of stormwater flows, declining industry demand for water) is a major consideration in the long term planning of the district's infrastructure. Key performance indicators are continually measured and trended for significance. Any projected capital works are funded through the LTP budget, consistent with the financial/funding strategy at the time.

Both physical and system resilience are crucial. This means:

- Design and construction standards (where cost effective) that ensure infrastructure is able to withstand natural hazards and long term changes in circumstances such as those resulting from climate change.
- Organisations and networks of organisations with the ability to identify hazards must share information, assess vulnerabilities, and plan for and respond to emergencies.
- Acknowledging the value of adaptability and redundancy in the network to improve business confidence.
- Identifying and managing cross-sectoral dependencies, such as power supply for communications infrastructure.

In order to improve resilience, the Council's approach will be to:

- Investigate options for alternative service provision and system redundancy
- Identify critical assets and ensure mitigation methods are developed
- Better integration of resiliency criteria in infrastructure design and ensure design standards meet climate change effects.
- Improve accuracy of asset condition data for better targeting of renewals
- Strengthen integration of infrastructure services planning with land use planning
- Obtain insurance where this is deemed to be the most cost effective approach or ensure Council funding provision for large scale events is available.
- Plan for Resilience - Network Resilience Maintenance, Monitoring and Prioritised Improvement Plan in place and actionable.
- Do Proactive Maintenance - number of events where journeys are lost due to loss of road function through proactive maintenance taking place

- Plan for Alternative Routes – a plan is in place that details an alternative route(s) available for vulnerable routes is robust in case of road closure
- Prepare an Emergency Response Plan - an Emergency Procedures and Response Plan (EPRP) is in place and actionable

6.5 Improving our Evidence Base

Council acknowledges there are limitations with its data that affects decision-making, as outlined in Section 4.0. A commitment to improving data collection and analysis is indicated below. The approach to data collection, management and implementation timeframes are discussed in the respective asset management plans and budgets included where appropriate.

Table 6: Data Improvements

Activity	Data to be collected	Data to be analysed	Value this data provides
Roading	Traffic counts of Heavy Vehicles	Classified vehicle counts and HPMV vehicles	Heavy traffic counts will help identify key routes and align these with pavement management
Roading	Network road safety risk	Out of context curve corners Speed environment Vehicle crashes	Allows risks to be identified and more targeted investment to improve road network safety
Roading	Road safety education customer survey	Understanding and awareness of road safety campaigns	Allow assessment of campaign effectiveness
Roading	Asset condition data – High speed road condition data	Pavement strength / remaining useful life	Provides a baseline for pavement condition and regular measurement of key routes will identify the rate of deterioration, therefore improving pavement lifecycle analysis and management.
Roading	Kerb and channel condition rating	Remaining useful life	This will ensure appropriate programming for renewal and ensure timely replacement whilst allowing assets to obtain full life (just-in-time renewal)

Activity	Data to be collected	Data to be analysed	Value this data provides
Roading	Drainage data and improvements	Extent of drainage in rural network	Provides evidence of current drainage facilities on the rural network (limited surface water channels) and ensures a good programme for improvements targeting areas that have no drainage and high heavy vehicle movements
Water supply	Network condition data – pipe sampling, etc.	Asset condition/performance	More robust renewals forecasting and capital expenditure planning
Water supply	Metered water, volume	Water demands	Universal metering provides a comprehensive data set which is currently not leveraged to understand peak demands
Water supply	Water loss	Asset condition/performance	Informs renewals planning and maintenance planning
Sewer	Network condition data from CCTV, pipe sampling, etc	Asset condition/performance/failure mode	More robust renewals forecasting and capital expenditure planning
Sewer	Inflow and Infiltration data	Network condition/performance	Targeted renewals planning
Sewer	Information generated from modelling the sewer network	Network capacity Inadequate sections of the network Impact of growth and development	Capital works/services planning
Stormwater	Network condition data from CCTV, pipe sampling, etc	Asset condition	More robust renewals planning
Stormwater	Stormwater quantity – flow rates (rates of stormwater runoffs from urban catchments)	Network capacity	Level of service assessment/Capital works planning
Stormwater	District profiling on sources/sites of stormwater pollutants: - transport corridors - industrial and commercial activities - hazardous sites - roof types	Treatment opportunities	Level of service assessment/capital expenditure planning

Activity	Data to be collected	Data to be analysed	Value this data provides
Stormwater	Catchment modelling	Stormwater systems capacity and performance	Programming of capital works
Waste Minimisation	Asset age and condition	Lifecycle and renewals	Evidence based scheduling of maintenance and renewals

6.6 Significant Decisions Required

Taking a long term view to the management of infrastructural assets, Timaru District Council needs to make key decisions in a timely manner. In addressing community desires and priorities, the following key decisions have been identified.

Table 7: Significant Decisions

Key Decision	Indicative Timeframe
Roading and Footpaths	
<p><i>Affordability</i></p> <p>Consideration of policy on funding road activities eligible for but not financially assisted by above NZ Transport Agency and extend of such funding to maintain current level of service</p>	<p>3 Yearly (in conjunction with Long Term Plan)</p>
<p><i>Bridges</i></p> <p>A significant number of road bridges will reach the end of their useful life in 10-20 years. The renewal of these bridges will require an increase in expenditure from \$600 per annum to over \$21 million annum. A renewal and funding strategy needs to be determined to manage this to maintain affordability.</p>	<p>2025/26</p>
<p><i>Southern Port Access Overbridge</i></p> <p>A deed of grant for the existing road to cross railway land at the Southern Port Access (Heaton Street) was granted for fifteen years in 2017. This allows the deferral of a new overbridge. Council will need to consider the future form of access prior to the expiry of the deed of grant.</p>	<p>2030</p>
<p><i>Road Maintenance</i></p> <p>The current road maintenance contract will expire on 30 November 2020. This contract is a generic contract for the four Mid-South Canterbury Councils. A decision is required on the future form of contract and further collaboration one year prior to the contract expiry.</p>	<p>2019</p>
<p><i>Road Collaboration</i></p> <p>The S17A Review identified efficiency opportunities in a potential alliance arrangement for road professional services delivery with co-location and resourcing of the South Canterbury Councils. Council resolved to further investigate the feasibility and support</p>	<p>2018-19</p>

Key Decision	Indicative Timeframe
<p>in 2017 and will need to review this in 2018.</p>	
<p>Water Supply</p>	
<p><i>Level of Service for Fire Fighting Capacity Provided by the Water Reticulation</i></p> <p>Whether to progressively upgrade the water reticulation network at the time of pipe renewal to meet the NZ Code of Practice for Fire Fighting requirement at schools, hospitals, aged care facilities and industrial sites in addition to that currently provided for residential fire fighting.</p>	<p>2018 onwards</p>
<p><i>Drinking Water Treatment and Provision Changes</i></p> <p>The imminent changes in regulatory controls for drinking water supplies(as a result of the Havelock North Drinking Water Inquiry) is expected to result in increased standards for drinking water, which may include mandatory treatments. In line with this, a decision needs to be made by Council of the approach it will take in order to comply with these new requirements, particularly in providing for the necessary treatment upgrades across all of its drinking water supplies.</p>	<p>2018</p>
<p><i>Asbestos Water Pipes Replacement</i></p> <p>In regard to ageing water pipes, there needs to be a determination from Council of the possible replacement of major asbestos cement trunk mains across the district's water supply network as a matter of priority. This is in consideration of the criticality of these assets and to mitigate associated risks.</p>	<p>2018-21</p>
<p><i>Universal Urban Water Metering and Pricing</i></p> <p>There is a high demand for water by consumers in the district's urban supplies. This puts pressure on the availability of water. Water use restrictions are imposed during dry periods. A decision by Council is required on the approach to increase security of the district's urban water supply. The preferred option is to implement metering and pricing of all consumption to manage demand and reduce excessive use of water. The reduction in demand is expected to be significant to offset and delay any required investment in a new groundwater source.</p>	<p>2018-21</p>
<p>Sewer</p>	
<p>The resource consent for discharging of the district's treated wastewater to the ocean will be due for renewal in 2046. A decision needs to be made on whether to make any changes or modifications to the resource consent conditions and, therefore, in the associated further treatment that is appropriate before discharging into the ocean.</p>	<p>2038-42</p>
<p>Stormwater</p>	

Key Decision	Indicative Timeframe
<p>Council has adopted a Stormwater Strategy including concepts for treatment and flow mitigation to be implemented in order to meet resource consent conditions and environmental standards. A decision is required on the timing and funding of the work required. The preferred option is to complete the work required over 10 to 15 years starting 2018/19 whilst spreading the cost so that the impact on rates increase is alleviated.</p>	<p>2018</p>
<p>Waste Minimisation</p>	
<p><i>Landfill Life</i></p> <p>Landfill life can be extended by a commitment to proactively implementing further diversion strategies. The landfill life will already extend beyond the expiry date of the resource consent, but further diversion will increase the life of the landfill. This will defer the need to implement alternative disposal methods.</p>	<p>2019 onwards</p>

7.0 SIGNIFICANT INFRASTRUCTURE ISSUES

The Local Government Act 2002 Section 101B – Infrastructure Strategy states:

“(2) The purpose of the infrastructure strategy is to—

- (a) identify significant infrastructure issues for the local authority over the period covered by the strategy; and*
- (b) identify the principal options for managing those issues and the implications of those options.”*

In developing this 50 Year Strategy Council identified the anticipated significant infrastructure issues using its Significance and Engagement Policy as criteria (refer to details in Section 3.1), the considered actions, and the associated costs and benefits of the actions.

The significant infrastructure issues with the options to address these are presented in sections 7.1 to 7.4 and include the following:

- Roothing Renewals
- What price....Our water? - A resilient future water supply? How should we achieve this? - Securing Timaru's Water Supply
- Do we really want better waterways? - Dealing with Stormwater to improve our environment - Timing and Funding the Stormwater Strategy
- Extending the Landfill's Life

7.1 Roading Renewals

Council's goal is to provide the Timaru District ratepayers, community, road users, and others a fit for purpose roading network.

Table 8: Roading and Footpaths Significant Issue - Renewals

Issue – Roading Assets Renewal (Bridges/Structures and Pavements)	
<p>Renewals of road pavements and road bridges is a significant issue over the coming years. Obtaining the funding and managing the renewals will be challenging.</p> <p><u>Pavements</u> – The consumption of the asset is increasing due to the increase in freight task (numbers, weight and dimensions of heavy vehicles). This decreases the useful lives of the asset. In order to maintain fit for purpose roads, the structural integrity of pavements need to be renewed more frequently and increased in strength to optimise asset life.</p> <p><u>Bridges/Structures</u> – Many bridges were constructed over a short period of time. With the ageing of these bridge assets and the changes occurring in the area of freight task, the General Bridge Inspection Report 2015/16 has identified that there are a significant number of bridges/structures that will require renewals/replacements to address structural deterioration. The Council Bridge Policy (Doc # 423438), Council has identified that bridges on all primary collector and higher hierarchy roads shall be two lanes, and that all new and replacement bridges within the District shall be capable of minimum 50MAX capacity, and on collector and higher hierarchy roads shall be capable of full HPMV capacity.</p>	
Main Options	Implication of Options
<p>Option 1 – Responsive Level of Service(PREFERRED)</p>	<p><u>Pavements</u> – To keep up with the increasing freight task, Council has to provide a level of service that is fit-for-purpose. In order to address this, pavement strengthening is required, and added drainage may be required. This leads to additional funding and resources required.</p> <p>Cost: \$139,000 million over the next 50 years.</p> <p>Benefit: Increases in Levels of Service to ensure the road assets remain fit-for-purpose and effectively meeting the demands of increasing heavy vehicles. There are also improvements in road safety and resilience.</p> <p><u>Bridges/Structures</u> – There are a number of bridge/structure assets that are reaching their end-of-useful life. To meet the changes occurring with freight tasks, the bridge/structure assets will require improvements to increasing their level of service. Keeping in line with the Council's Bridge Policy, new and replacement bridges within the District on specific road hierarchies will need to be strengthened and changed to two</p>

	<p>lanes.</p> <p>Cost: \$91,000 million over the next 50 years. There is a increase in cost from year 10 as an increasing number of bridges reach the end of their useful life.</p> <p>Benefit: Increases in Levels of Service to ensure the road assets remain fit-for-purpose and effectively meeting the demands of increasing heavy vehicles. There are also improvements in road safety and resilience.</p> <p>This option is the preferred approach to ensure continued support for the increasing economic growth of the district and meeting the freight task associated with this growth. Managing this option could be challenging as it may strain funding and resources.</p>
<p>Option 2 – Do Minimum Level of Service</p>	<p><u>Pavements</u> – The levels of service on roads can be reduced by allowing the road pavements to deteriorate and fail through less regular maintenance and deferral of renewals until full pavement failure. The reduction of levels of service may increase vehicle operating cost, reduce road safety and increase road roughness. There will be restrictions on heavy vehicle use of some roads that will increase freight costs and potentially restrict economic growth.</p> <p><u>Bridges/Structures</u> – The levels of service is reduced for bridges/structures as bridge renewals are deferred. This will result in an increasing number of weight/speed restricted bridges/structures or closures. Portions of the roading network will be restricted and unable to be used by large heavy vehicles and it will be difficult to meet the increasing freight task. This may impact access, travel times and increase freight costs that will potentially restrict economic growth in our district.</p> <p>Cost: The monetary cost of renewals reduces, but maintenance will increase. The costs in other areas such as safety, risks, and Council image increases. An increase in other costs (freight transport) for stakeholders is expected. Assets may not be fit for purpose.</p> <p>Benefit: Allowing for a reduction in levels of service will allow for Council to reduce overall renewal cost for the asset and gain additional life at a reduced Level of Service.</p>
<p>Option 3 – Current Level of Service</p>	<p><u>Pavements</u> – This will see the pavement asset deteriorating as pavements are not strengthened / widened. They will therefore not be fit-for-purpose and premature pavement failure will be an ongoing issue.</p> <p><u>Bridges/Structures</u> – The current bridge/structure assets renewals will not keep pace with the asset useful life expectation of these structures and therefore bridge load restrictions will become necessary. This will restrict access to large heavy vehicles particularly High Productivity Vehicles that may increase travel</p>

times, restrict vehicle size and increase freight costs that will potentially restrict economic growth in our district.

Cost: Council faces an increasing renewal demand as many bridges constructed in the early 1900's reach the end of their useful life and to meet pavement improvements. Current renewal funding will not address this "hump" and bridges renewals will need to be deferred. This means increasing maintenance cost and restricted network that increases freight and travel costs that will potentially restrict economic growth in our district. There is a risk of reduced road safety and also reduced asset resilience.

Benefit: This option allows maintaining current funding levels long term and therefore minimises future rates increases requirements for roading.

Preferred option

Option 1 – Responsive Level of Service

Implementation period

Continual over Infrastructure Strategy period.

Cost of preferred option

Cost (\$000 in 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-15	Year 16-20	Year 21-25	Year 26-30	Year 31-35	Year 36-40	Year 41-45	Year 46-50	Total Cost
	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28/29-32/33	33/34-37/38	38/39-42/43	43/44-47/48	48/49-52/53	53/54-57/58	58/59-62/63	63/64-67/68	
Capital																			
- Pavements	2,600	2,600	2,600	2,450	3,350	3,350	3,350	3,350	3,350	3,350	11,750	11,750	12,500	12,500	15,000	15,000	15,000	15,000	138,850
- Bridges	760	760	860	800	800	800	800	800	800	1,400	7,040	7,040	7,040	7,040	13,540	13,540	13,540	13,540	90,900
Operation	3,835	3,925	3,925	3,895	3,955	3,925	3,895	3,955	3,925	3,895	19,845	20,095	20,345	20,595	20,845	20,845	20,845	20,845	203,390
Total	7,195	7,285	7,385	7,145	8,105	8,075	8,045	8,105	8,075	8,645	38,635	38,885	39,885	40,135	49,385	46,385	49,385	49,385	433,140

Assumption

7.2 Securing Timaru’s Water Supply

Council’s goal is to support and underpin the health, well-being and financial prosperity of the community by providing a lawful, reliable, sustainable and cost effective supply of water to meet the needs of the consumer.

Table 9: Water Supply Significant Issue

Issue	
<p>Water shortage in the Timaru Water Supply Scheme is an emerging issue during dry weather periods when restrictions are imposed on its consents to take water from its existing sources, the Pareora River and the Opihi River. The Current Peak day demand is 29 ML/d (megalitres per day), including an Industrial demand of up to 15 ML/d. The Projected Future Peak day demand (with no additional industry) is 31 ML/d. The current Minimum water availability, based on Pareora low flows and Opihi capacity limitations, is 24 ML/d.</p> <p>The combined effects of dry weather periods and growth in demand intensifying into the future could potentially lead to greater future limitations in resource consents to take water from the Pareora and the Opihi River during low river flows. Council acknowledges that if it does nothing, more stringent water use restrictions will have to be imposed to manage demand during periods of water shortage.</p>	
Main Options	Implication of Options
<p>Option 1 – Secure additional water from an existing source through increased capacity from the Opihi River source with upgraded treatment at Claremont</p>	<p>The Canterbury Land and Water Regional Plan places community drinking water supplies as the highest priority in terms of water allocation and therefore it is probable that the Opihi source would not be restricted in times of drought. In that case the probable likely minimum water availability, with Opihi capacity upgrades, would be 40 ML/d, which would therefore be able to meet a 60% increase in industrial demand.</p> <p>Ensuring sufficient water is available from the Opihi during dry periods would currently require an intake upgrade and an upgrade to the Claremont treatment process (from ozone to membrane filtration), in order to treat the poorer quality water that could occur when the take is maximised. An upgrade to the Opihi pipeline would also be necessary once demand has increased. Although this option would be a significant cost, it would supply water of a quality similar to existing and could be staged to meet demand.</p> <p>Cost:</p> <p>Opihi intake and staged treatment costs at \$22 million capital; pipeline and increased treatment capacity costs to meet demands of \$23 million capital. Operational cost increases of \$0.5 million per year.</p> <p>Benefit:</p> <p>Increased level of service with less risk of stringent water use restrictions being imposed due to</p>

	<p>unavailability of water.</p> <p>Increased domestic and industrial demand capacity.</p>
<p>Option 2 – Development of new sources and treatment</p>	<p>Development of groundwater has risk related to developing the bore(s) to obtain the required take, and the local groundwater requires significant treatment to remove hardness, iron and manganese. The resultant water quality will have a detrimental impact on water users, especially industrial users that heat the water. This option, including a pipeline to deliver the treated water to Timaru would not be staged.</p> <p>Cost:</p> <p>New bore field, treatment plant, and pipeline costs of \$35 million capital. Operational cost increases of \$0.8 million per year.</p> <p>Benefit:</p> <p>Increased level of service with less risk of stringent water use restrictions being imposed due to unavailability of water, however additional water will have residual hardness components.</p> <p>Increased domestic and industrial demand capacity. Increased resilience.</p>
<p>Option 3 – Introduction of universal urban water metering and charging (PREFERRED OPTION)</p>	<p>Universal water metering and charging results in a well documented volumetric reduction of the peak day demand of 15 to 30% (normally 20 -25%).</p> <p>The introduction of universal urban water metering and charging is expected to result in the reduction of peak day demands of approximately 3 to 5 ML/d, which could delay the need to secure additional water for several years.</p> <p>Cost:</p> <p>Additional capital costs of \$15 million for installation of meters on all urban connections. Operational cost increases of \$0.2 million per year, including charging administration. Meter replacement is on a 15 year cycle.</p> <p>Benefit:</p> <p>A reduction or deferment of capacity driven capital works would result (including intake, treatment and network upgrades). There would also be reduced operational treatment costs, although there would be increased water charging administration costs.</p>

																				Environmental sustainability would be achieved, with sustainable resource use for present and future generations. Water consumption would be charged on a user pays basis.
Preferred option																				Option # 3
Implementation period																				Investigation in 2018/19. Implementation to commence in 2021/22.
Cost of preferred option																				
Cost (\$000 in 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-15	Year 16-20	Year 21-25	Year 26-30	Year 31-35	Year 36-40	Year 41-45	Year 46-50	Total Cost	
	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28/29-32/33	33/34-37/38	38/39-42/43	43/44-47/48	48/49-52/53	53/54-57/58	58/59-62/63	63/64-67/68		
Capital	60	60	20	5,000	5,000	5,000	0	0	0	0	0	10,000	5,000	0	10,000	5,000	0	10,000	55,140	
Operation	0	0	0	50	50	100	200	200	200	200	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	9,000	
Total	100	0	0	5,050	5,050	5,100	200	200	200	200	1,000	11,000	6,000	1,000	11,000	6,000	1,000	11,000	64,140	
Assumption																				<p>The current high residential demand from the urban water supplies will significantly reduce with water metering.</p> <p>The savings in water from water metering will be sufficient to a) meet growth in demand; and b) offset or delay investment in a new groundwater source for the Timaru Water Supply.</p>

7.3 Timing and Funding the Stormwater Strategy

Council's goal is to provide for the collection, treatment and disposal of stormwater to acceptable environmental standards.

Table 10: Stormwater Significant Issue

Issue	
<p>Rules and regulations regionally under the Canterbury Land and Water Regional Plan (LWRP), and nationally through the National Policy Statement for Freshwater Management require Council to apply a higher level of service to the management, attenuation and treatment of stormwater. Poor stormwater quality affects the health of waterways, reduces their intrinsic value and limits the use of the resource. Council must increase efforts to reduce the level of contamination in discharges of stormwater.</p> <p>Stormwater treatment improvements are necessary to meet regulatory requirements and to reduce the levels of contaminants that discharge to urban waterways through stormwater. The rate of implementation of the stormwater treatment will impact on how quickly improvements to the environmental quality of the waterways are achieved.</p> <p>How quickly should the Stormwater Management Strategies be implemented and therefore what should the funding strategy be?</p>	
Main Options	Implication of Options
<p>Option 1 – Fund and complete stormwater treatment work over a period of 5 years</p>	<p>Fast tracked environmental quality improvements, with very high funding requirements.</p> <p>Cost: Approximately \$3 million per year additional capital, with a significant increase in operating costs of up to \$700,000 per year. Total additional capital cost of around \$15M.</p> <p>Benefit: Increased levels of service in relation to stormwater treatment and management achieved in the short term.</p> <p>Achieving environmental quality improvement outcomes as quickly as possible.</p>
<p>Option 2 – Fund and complete stormwater treatment work over a period of 10 to 15 years (PREFERRED)</p>	<p>Environmental quality improvements achieved over the term of the stormwater discharge consent, with medium funding requirements.</p> <p>Cost: Approximately \$1 million per year additional capital, with a gradual increase in operating costs of up to \$600,000 per year. Total additional capital cost of around \$15M+.</p> <p>Benefit: Increased levels of service in relation to stormwater treatment and management achieved in the</p>

	<p>medium term.</p> <p>Achieving environmental quality improvement outcomes in a progressive measured manner.</p>																																																																																																																				
<p>Option 3 – Fund and complete stormwater treatment work over a period of 20+ years</p>	<p>Environmental quality improvements achieved over many years, with the least impact on rates.</p> <p>Cost: Approximately \$0.5 million per year additional capital, with a slow increase in operating costs of up to \$300,000 per year. Total additional capital cost of around \$15M+.</p> <p>Benefit: Increased levels of service in relation to stormwater treatment and management achieved in the long term.</p> <p>Achieving environmental quality improvement outcomes gradually.</p>																																																																																																																				
<p>Preferred option</p>	<p>Option 2</p>																																																																																																																				
<p>Implementation period</p>	<p>15 years commencing in 2018/19</p>																																																																																																																				
<p>Cost of preferred option</p>																																																																																																																					
<table border="1"> <thead> <tr> <th rowspan="2">Cost (\$000 in 2018)</th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> <th>Year 4</th> <th>Year 5</th> <th>Year 6</th> <th>Year 7</th> <th>Year 8</th> <th>Year 9</th> <th>Year 10</th> <th>Year 11-15</th> <th>Year 16-20</th> <th>Year 21-25</th> <th>Year 26-30</th> <th>Year 31-35</th> <th>Year 36-40</th> <th>Year 41-45</th> <th>Year 46-50</th> <th rowspan="2">Total Cost</th> </tr> <tr> <th>18-19</th> <th>19-20</th> <th>20-21</th> <th>21-22</th> <th>22-23</th> <th>23-24</th> <th>24-25</th> <th>25-26</th> <th>26-27</th> <th>27-28</th> <th>28/29-32/33</th> <th>33/34-37/38</th> <th>38/39-42/43</th> <th>43/44-47/48</th> <th>48/49-52/53</th> <th>53/54-57/58</th> <th>58/59-62/63</th> <th>63/64-67/68</th> </tr> </thead> <tbody> <tr> <td>Capital</td> <td>250</td> <td>500</td> <td>750</td> <td>1,000</td> <td>1,000</td> <td>1,000</td> <td>1,000</td> <td>1,000</td> <td>1,000</td> <td>1,000</td> <td>5,000</td> <td>5,000</td> <td>5,000</td> <td>5,000</td> <td>5,000</td> <td>5,000</td> <td>5,000</td> <td>5,000</td> <td>48,500</td> </tr> <tr> <td>Operation</td> <td>16</td> <td>21</td> <td>36</td> <td>56</td> <td>100</td> <td>141</td> <td>184</td> <td>217</td> <td>259</td> <td>305</td> <td>2,200</td> <td>2,700</td> <td>2,700</td> <td>2,700</td> <td>2,700</td> <td>2,700</td> <td>2,700</td> <td>2,700</td> <td>22,435</td> </tr> <tr> <td>Total</td> <td>266</td> <td>521</td> <td>786</td> <td>1,056</td> <td>1,100</td> <td>1,141</td> <td>1,184</td> <td>1,217</td> <td>1,259</td> <td>1,305</td> <td>7,200</td> <td>7,700</td> <td>7,700</td> <td>7,700</td> <td>7,700</td> <td>7,700</td> <td>7,700</td> <td>7,700</td> <td>70,935</td> </tr> </tbody> </table>	Cost (\$000 in 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-15	Year 16-20	Year 21-25	Year 26-30	Year 31-35	Year 36-40	Year 41-45	Year 46-50	Total Cost	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28/29-32/33	33/34-37/38	38/39-42/43	43/44-47/48	48/49-52/53	53/54-57/58	58/59-62/63	63/64-67/68	Capital	250	500	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	48,500	Operation	16	21	36	56	100	141	184	217	259	305	2,200	2,700	2,700	2,700	2,700	2,700	2,700	2,700	22,435	Total	266	521	786	1,056	1,100	1,141	1,184	1,217	1,259	1,305	7,200	7,700	7,700	7,700	7,700	7,700	7,700	7,700	70,935	<p>Stormwater discharge quality in the district's urban areas will not deteriorate significantly within the next 7 years (2018-2025).</p> <p>A resource consent will be obtained with favourable conditions for achieving defined environmental outcomes in a progressive measured manner.</p>																		
Cost (\$000 in 2018)		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-15	Year 16-20	Year 21-25	Year 26-30	Year 31-35	Year 36-40	Year 41-45	Year 46-50		Total Cost																																																																																																
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Capital	250	500	750	1,000	1,000	1,000	1,000	1,000	1,000	1,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	48,500																																																																																																		
Operation	16	21	36	56	100	141	184	217	259	305	2,200	2,700	2,700	2,700	2,700	2,700	2,700	2,700	22,435																																																																																																		
Total	266	521	786	1,056	1,100	1,141	1,184	1,217	1,259	1,305	7,200	7,700	7,700	7,700	7,700	7,700	7,700	7,700	70,935																																																																																																		

7.4 Extending the Landfill's Life

Council's goal is to provide safe, affordable, sustainable waste minimisation services that fully meet the environmental, economic and social needs of the district.

Table 11: Waste Minimisation Significant Issue

Main Issue	Landfill life
Sub-issue 1: Diversion Strategy - does TDC wish to actively move towards an aspirational goal of Zero Waste and continue to implement programmes aimed at diversion	
Option 1a - Maintain status quo with limited future action for diversion strategies	<p>Implications – Maintain the status quo without further investment in diversion. New programmes will not be taken up and landfill life will be shorter as a consequence.</p> <p>Cost: \$40,000</p> <p>Benefit: Existing waste minimisation programmes will continue</p>
Option 1b - progressively implement diversion strategies	<p>Implications – TDC will implement waste minimisation projects every year, both minor and major including increase in staffing levels to implement / manage projects</p> <p>Cost: \$604,000</p> <p>Benefit: Redruth Landfill life will be lengthened. Best economic option for council and the community as high costs of moving to another landfill option will be deferred. LoS for waste disposal will not change, but LoS for business visits will improve. The benefit of the capital spend on landfill operations is maximised. Business growth can be encouraged as waste fees will be lower than sending waste out of district.</p>
Preferred Option	Option #1b
Implementation Period	2018 - 2038

Cost of Preferred Option

Cost (\$000 in 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-15	Year 16-20	Year 21-25	Year 26-30	Year 31-35	Year 36-40	Year 41-45	Year 46-50	Total Cost
	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28/29-32/33	33/34-37/38	38/39-42/43	43/44-47/48	48/49-52/53	53/54-57/58	58/59-62/63	63/64-67/68	
Capital	10	10	10	10	10	10	10	10	10	10	50	50							200
Operation	26	50	100	56	50	10	26	10	10	10	50	96							494
Total	36	60	110	66	60	20	36	20	20	20	100	146							694

Assumption

That diversion is a cost-effective way to lengthen the life of the landfill.

Sub-issue 2: Resource Consent Renewal - the consent for the Redruth landfill expires in 2030 and this will be before the landfill is completely filled. A consent renewal will be required in order to continue using the site.

Option 2a – Do not renew consent

Implications – Alternative disposal would need to be sought.

Cost: \$2,765,000 + early progression to Issue 3

Benefit: None. There would be environmental consequences and costs to closing the landfill before it is completely filled. Alternative disposal would cost more for the community, and have significant transport implications.

Option 2b – Renew consent

Implications – Redruth Landfill can continue filling to closure.

Cost: \$300,000

Benefit: Best environmental and economic option for the community as it allows full use of



consented space. Completing all filling and capping will shed stormwater, reduce leachate and capture and flare gas. All these beneficial effects are maximised with landfill closed according to Whole Of Life Plan.

Preferred Option	Option #2b
Implementation Period	2025

Cost of Preferred Option

Cost (\$000 in 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-15	Year 16-20	Year 21-25	Year 26-30	Year 31-35	Year 36-40	Year 41-45	Year 46-50	Total Cost
	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28/29-32/33	33/34-37/38	38/39-42/43	43/44-47/48	48/49-52/53	53/54-57/58	58/59-62/63	63/64-67/68	
Capital							100				20								120
Operation											80	100							180
Total							100				100	100							300

Assumption	That the consent will be renewed. That waste tonnages remain constant at 27,000 tonnes per annum.
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Sub-issue 3: Post Redruth Landfilling - when the Redruth Landfill is full, an alternative means of disposal must be found.

Option 3a - seek a new landfill site in the Timaru District	<p>Implications – Significant cost and community consultation involved as well as 10+-year planning timeframe.</p> <p>Cost: \$49,555,000</p>
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		Benefit: Local landfill controlled by TDC. Transport risk is reduced.																	
Option 3b - seek a new landfill site in South Canterbury with collaboration.		<p>Implications – Significant cost and community consultation involved as well as 10+-year planning timeframe. Collaboration with other parties required.</p> <p>Cost: \$41,325,000</p> <p>Benefit: Regional landfill controlled by TDC and other parties reducing future transport risk.</p>																	
Option 3c - Send waste to an alternative landfill site south of Timaru		<p>Implications – Subject to availability of space and permission to deliver waste. Cost of waste (including transport) likely to increase significantly.</p> <p>Cost: \$51,635,000</p> <p>Benefit: Risk and cost of operations and management lies with external party.</p>																	
Option 3d - Send waste to an alternative landfill site north of Timaru		<p>Implications - Subject to Canterbury Waste Joint Committee approval, it is possible Timaru District Council may opt into the Canterbury agreement for landfilling at Kate Valley north of Amberley. Cost of waste disposal (including transport) likely to increase significantly.</p> <p>Cost: \$53,735,000</p> <p>Benefit: Risk of operations and management lies with regional group.</p>																	
Preferred option		Option #3b																	
Implementation period		2022 – 2068																	
Cost of preferred option																			
Cost (\$000 in 2018)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11-15	Year 16-20	Year 21-25	Year 26-30	Year 31-35	Year 36-40	Year 41-45	Year 46-50	Total Cost
	18-19	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28	28/29-32/33	33/34-37/38	38/39-42/43	43/44-47/48	48/49-52/53	53/54-57/58	58/59-62/63	63/64-67/68	



Capital				20	50					100	650	1,100	1,000	500					3,420
Operation														1,805	9,025	9,025	9,025	9,025	37,905
Total				20	50					100	650	1,100	1,000	2,305	9,025	9,025	9,025	9,025	41,325

Assumption	That landfilling is the most appropriate disposal method. Alternative technologies are not viable.
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7.5 Summary of Significant Infrastructure Issues

Schematic or summary table of the Significant Infrastructure Issues.

Be creative in how you demonstrate the summary of projects. The imaginative use of infographics helps put projects in context and can be very effective in getting the message across while providing a holistic view of the minimum 50 year term.

Include a summary of capital projects including when and inflated estimated cost (see spreadsheet).

8.0 FINANCIAL ESTIMATES

The Local Government Act 2002 Section 101B – Infrastructure Strategy states:

(4) The infrastructure strategy must outline the most likely scenario for the management of the local authority’s infrastructure assets over the period of the strategy and, in that context, must—

“(a) show indicative estimates of the projected capital and operating expenditure associated with the management of those assets—

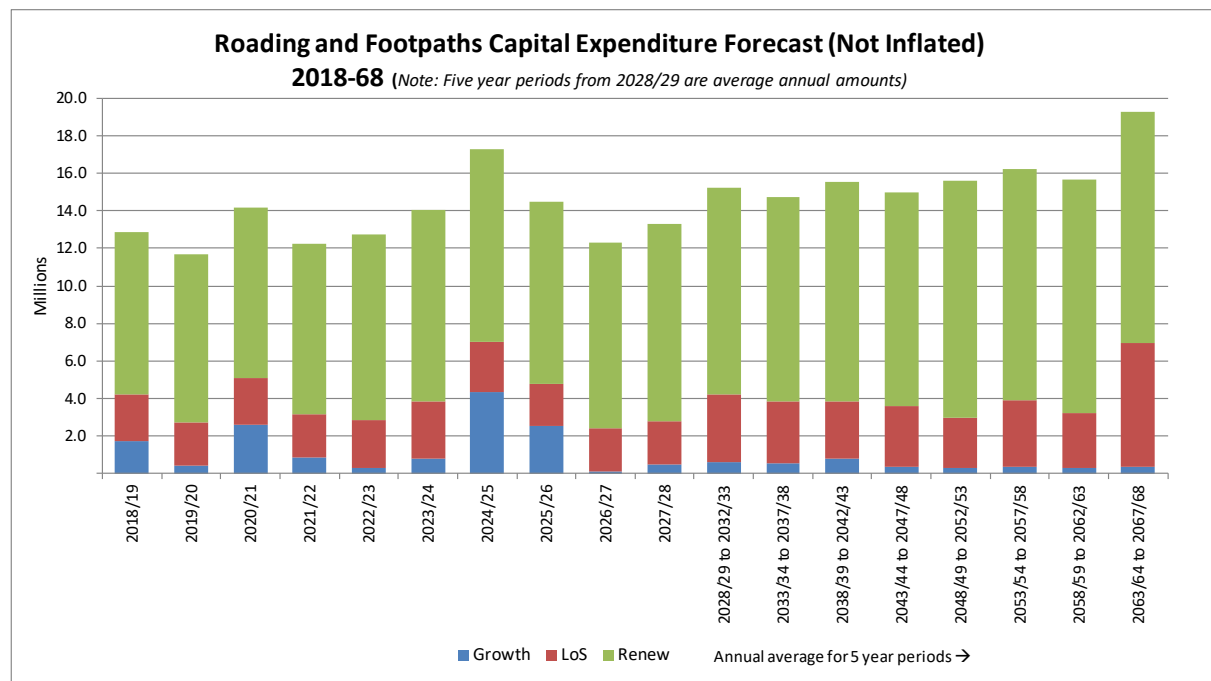
“(i) in each of the first 10 years covered by the strategy; and

“(ii) in each subsequent period of 5 years covered by the strategy

8.1 Roothing and Footpaths

The projected capital expenditure associated with the Roothing and Footpaths infrastructure assets is shown below.

Figure 15: Projected Capital Expenditure - Roads and Footpaths



There is an estimated total of \$770 million capital expenditure in the next 50 years. Of this:

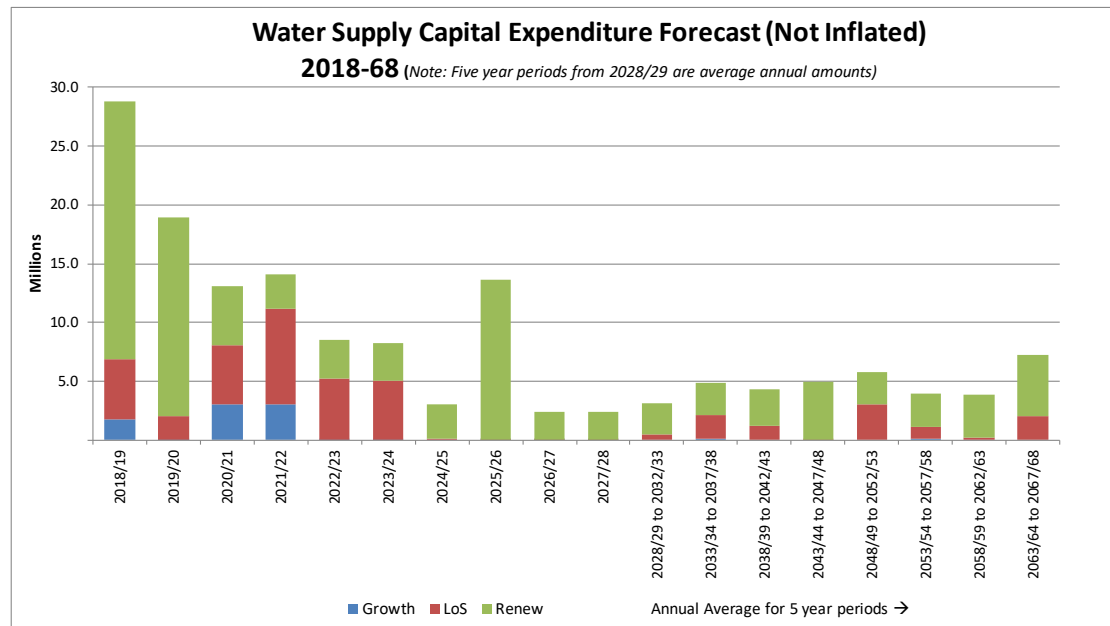
- Around 4% (\$33M) relates to expenditure to meet growth or additional future demand (e.g. heavier vehicles, new connections required). This includes upgrading of Washdyke and Temuka roads, seal widening, improvements to Port roads including Heaton Street, construction of news roads, bridge strengthening, a new carpark in Timaru South and potential overbridge for southern access to the Port.
- Around 22% (\$169M) relates to capital expenditure for levels of service. This includes provision for seal extensions, road upgrading, two laning of bridges, construction of new bridges, improved stormwater run-off treatment, and new footpaths and cycleways.
- Around 74% (\$569M) is renewals expenditure for replacement of assets that are reaching the end of their lives. This includes pavement rehabilitation, resealing, replacing bridges, kerb and channel, culverts, traffic services, footpaths and streetlighting along with other assets such as the Piazza lift and carpark equipment.

Over the next 10 years, capital expenditure for roading and footpaths infrastructure will total around \$135M. Operating expenditure associated with this will total around \$77M.

8.2 Water Supply

The projected capital expenditure associated with the Water Supply infrastructure assets is shown below.

Figure 16: Projected Capital Expenditure – Water Supply



There is an estimated total of \$300 million capital expenditure in the next 50 years. Of these:

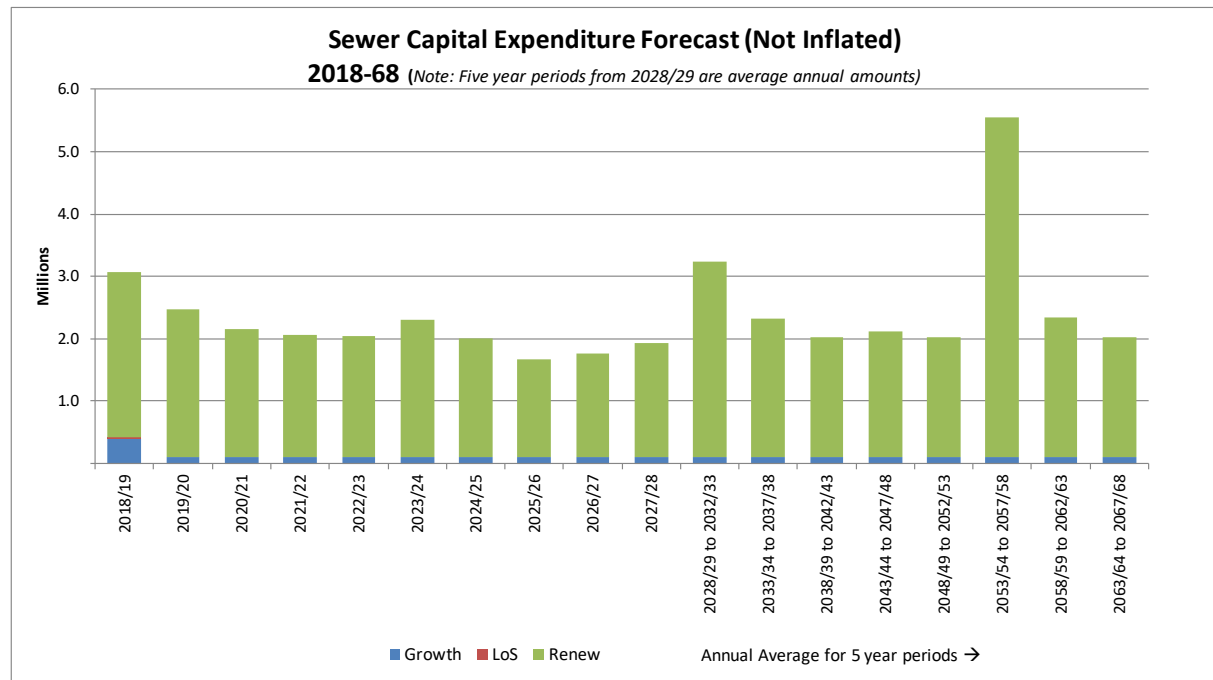
- Around 3% (\$8M) relates to expenditure in order to meet growth or additional future demand.
- Around 27% (\$80M) is capital expenditure for levels of service. These include upgrading of treatment facilities and processes in order to meet the Drinking Water Standards for New Zealand.
- Around 70% (\$213M) is renewals expenditure for replacement of aged assets. The bulk of the renewals expenditure relates to reticulation renewals throughout the district. Major plant/facilities renewals are identified for a number of water supplies.

Over the next 10 years, capital expenditure for water supply infrastructure will total around \$112M. Operating expenditure associated with this will total around \$35M.

8.3 Sewer

The projected capital expenditure associated with the Sewer infrastructure assets is shown below:

Figure 17: Projected Capital Expenditure - Sewer



There is an estimated total of \$130 million capital expenditure in the next 50 years. Of these:

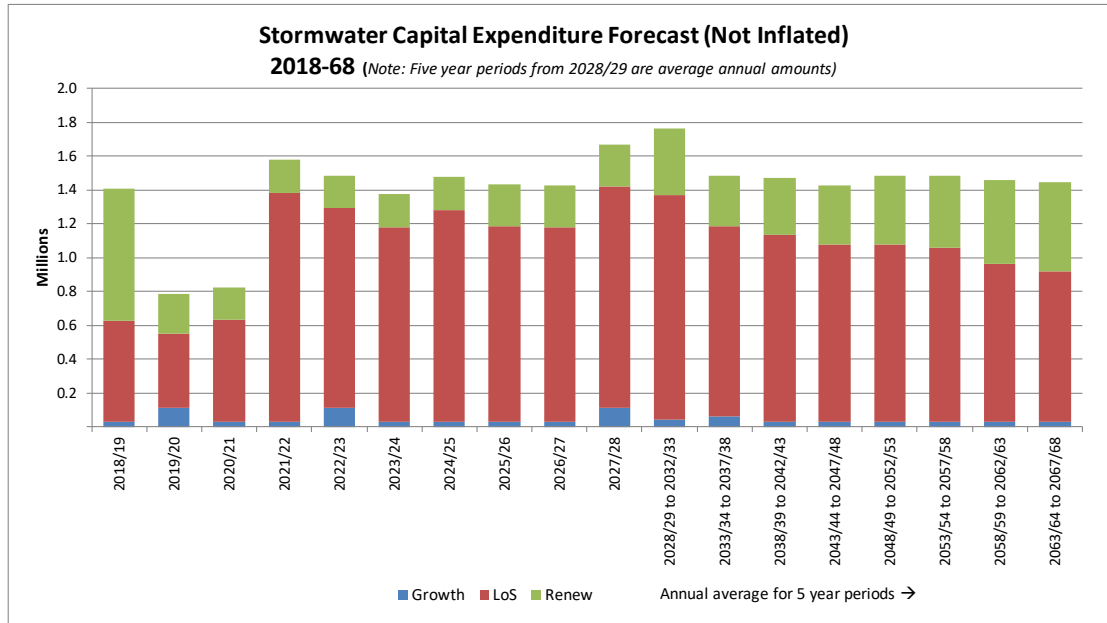
- Around 4% (\$5M) relates to expenditure in order to meet growth or additional future demand.
- Less than 1% will be capital expenditure for levels of service upgrade.
- Around 96% (\$124M) will be renewals expenditure for replacement of aged assets to maintain the levels of service. The bulk of the renewal expenditures relate to reticulation renewals throughout the district. Major plant/facilities renewals are identified for a number of treatment plants.

Over the next 10 years, capital expenditure for sewer infrastructure will total around \$21M. Operating expenditure associated with this will total around \$24M.

8.4 Stormwater

The projected capital expenditure associated with the Stormwater infrastructure assets is shown below.:

Figure 18: Projected Capital Expenditure - Stormwater



There is an estimated total of \$73 million capital expenditure in the next 50 years. Of these:

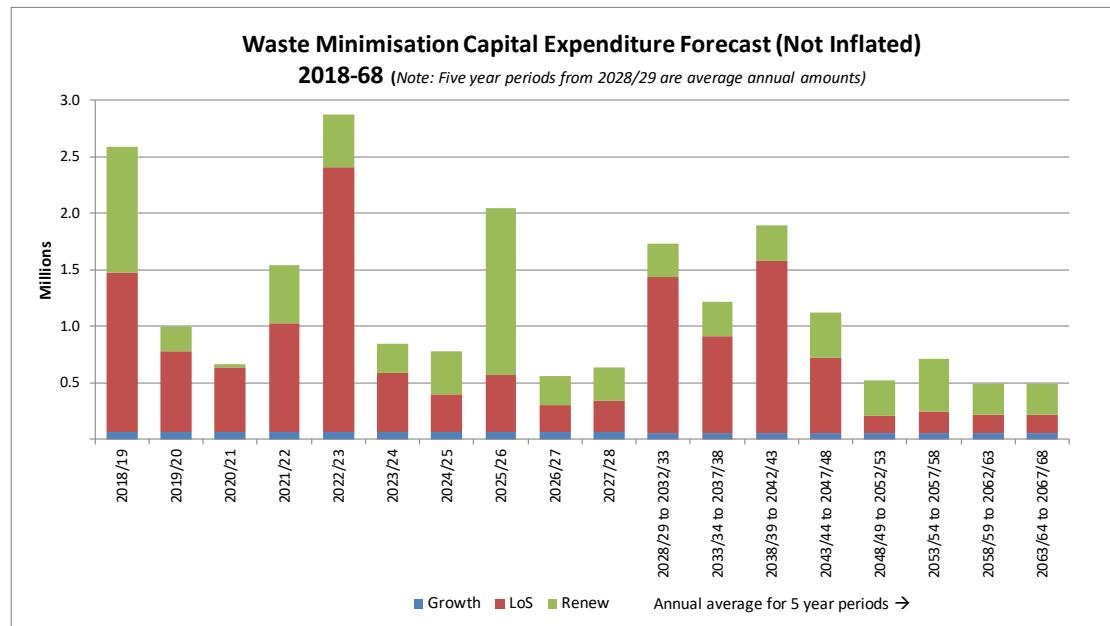
- Around 3% (\$2M) relate to expenditure in order to meet growth or additional future demand.
- Around 72% (\$53M) will be capital expenditure for levels of service upgrade. These include installing stormwater treatment and attenuation structures to improve the quality of the district’s stormwater discharge. Network capacity upgrades are also programmed relating to the climate change factor that predicts a progressive increase in the frequency and/or intensity of rain events in the district.
- Around 25% (\$19M) will be renewals expenditure for replacement of aged assets to maintain the levels of service. The bulk of the renewal expenditures relates to reticulation renewals throughout the district.

Over the next 10 years, capital expenditure for stormwater infrastructure will total around \$13M. Operating expenditure associated with this will total around \$8M.

8.5 Waste Minimisation

The projected capital expenditure associated with the Waste Minimisation infrastructure assets is shown below:

Figure 19: Projected Capital Expenditure - Waste Minimisation



There is an estimated total of \$55 million capital expenditure in the next 50 years. Of these:

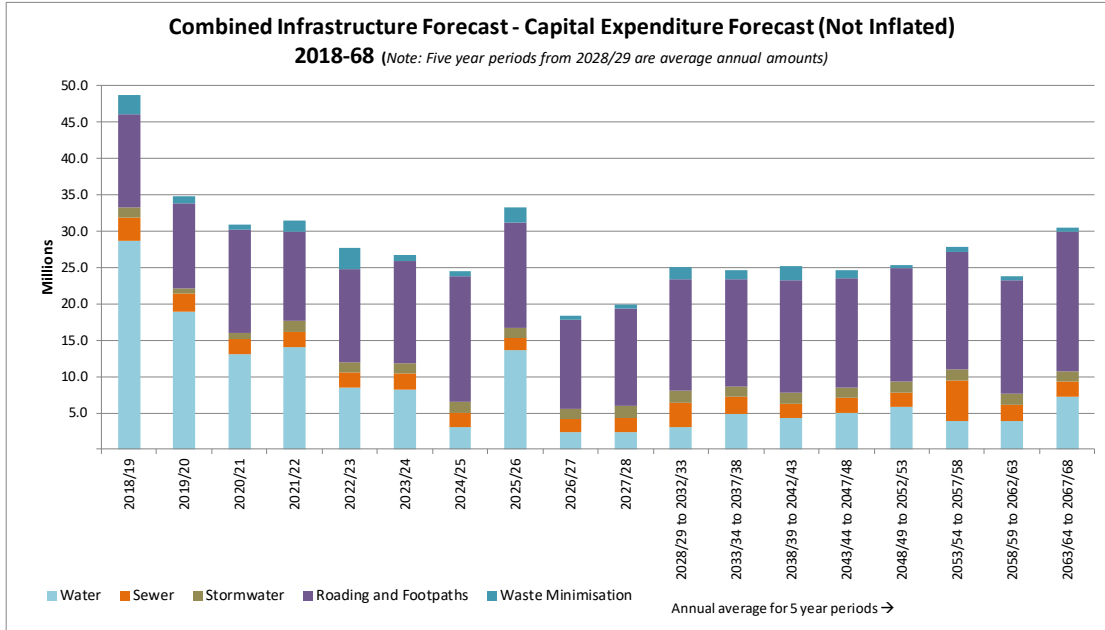
- Around 5% (\$3M) will be related to expenditure in order to meet growth or additional future demand, such as purchase of new wheelie bins
- Around 61% (\$34M) will be capital expenditure for levels of service upgrade. These include cell construction, other landfill and transfer station site works, landfill capping and landfill aftercare and construction of a new landfill
- Around 33% (\$18M) will be renewals expenditure for replacement of aged assets to maintain the levels of service.

Over the next 10 years, capital expenditure for waste minimisation infrastructure will total around \$14M. Operating expenditure associated with this will total around \$78M.

8.6 Total Expenditure

The projected capital expenditure associated with the five infrastructure activities included in the Infrastructure Strategy is shown below.

Figure 20: Projected Capital Expenditure - Infrastructure Assets

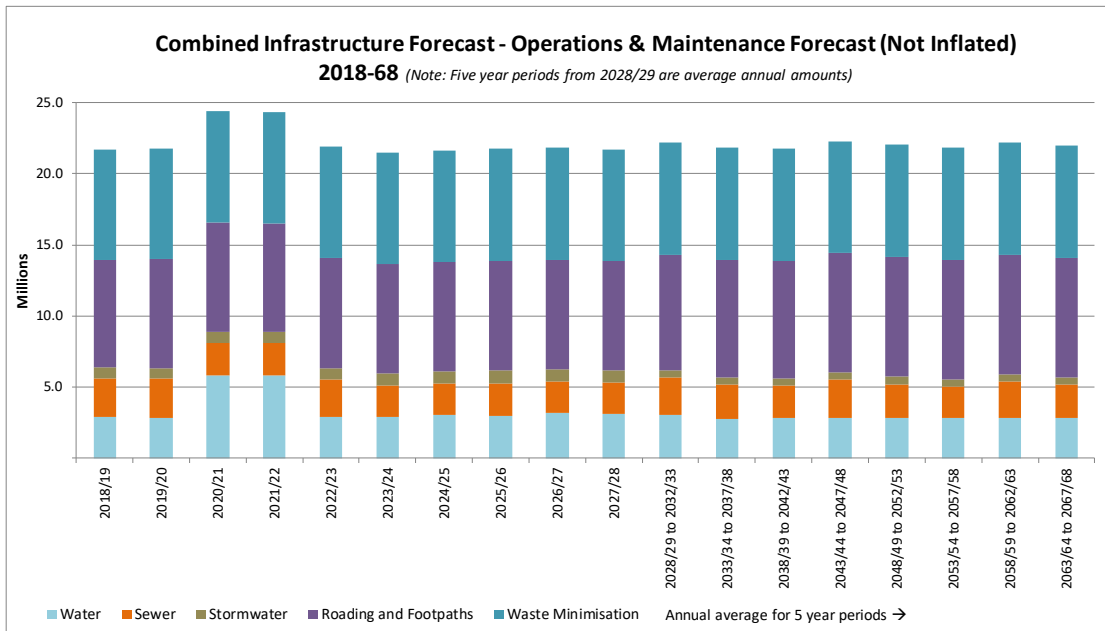


There is an estimated total of \$1.3 billion capital expenditure in the next 50 years. Of these:

- Around 4% relates to expenditure in order to meet growth or additional future demand.
- Around 25% will be capital expenditure for levels of service upgrade.
- Around 70% will be renewals expenditure for replacement of aged assets to maintain the levels of service.

Over the next 10 years, capital expenditure for the five infrastructure activities will total around \$297M. Operating expenditure associated with this will total around \$223M.

Figure 21: Projected Operational Expenditure – Infrastructure Assets



8.7 Financial Impacts of the Infrastructure Strategy

Funding for asset renewals will be primarily funded from Depreciation Funds held by the Council. The Depreciation Funds held are not sufficient to fully fund all renewals and it will be necessary for fund some renewals via loans.

To reduce the amount of renewals that need to be loan funded, the amount of depreciation funded was increased as part of the 2015 Long Term Plan. This was based on the average renewals over the term of the Infrastructure Strategy. The increase was phased in over a period of six years from 2015. As part of the 2018 Long Term Plan, depreciation funding has also been reviewed and increased to reflect the renewals contained within the 2018 Infrastructure Strategy.

Expenditure associated with levels of service and growth will be loan funded to reflect the benefits being received by future ratepayers. Both internal loans and external loans will be used for this funding.