



Central Otago District Council

Transport

2021 Activity Management Plan

Document Control

Prepared by

Central Otago District Council

1 Dunorling Street

Alexandra

New Zealand

Telephone 03 440 0056

www.codc.govt.nz

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AMP At A Glance

Our Transport activities enables the movement of goods, people and services across our District. Our plan starts with looking after our existing assets.

Our Roads

We currently have 1,935km of roads, with 1,779km of rural roads and 158km of urban streets. 72% of our roads are unsealed, a total length of 1,407km.

We have 179 bridges (including five footbridges maintained by Council), 179km of footpaths and greenways and just over 5,300 culverts. These roading assets are contained in close to 12,000 hectares of road reserve across the District, 3,750 hectares of which has formed and maintained carriageway.

The replacement value of our transport assets is \$654 million.

These assets are depreciating at the rate of \$6 million per annum.

Our Levels of Service

Network levels of service have been relatively stable from 2018, with some reduction in levels of service on our lowest volume gravel roads. We have also overseen a managed change in urban sealed road surface conditions on our lowest volume urban streets. Additional modest investment in our roadsides has been focussed on delivering urban and rural drainage improvements.

Resident satisfaction has remained high. Levels of satisfaction with sealed roads are at 85%, unsealed roads 77%, footpaths 78% and carparks 83% (from the 2020 Resident Opinion Survey).

Growth

Central Otago has experienced an extended period of exceptional population growth, with the resident population growing by 30% between 2006 and 2018. Population growth is forecast to continue for the next 10 years at a rate of 2% per annum (peaking at 4% in 2019). Projections for our District anticipate little impact from the Covid-19 pandemic in the medium-term. This is resulting in subdivision growth generating up to 3 km of new or upgraded road assets vested in Council each year, with high amenity drainage and footpath assets increasing at a rate of around 7% growth per year.

The proportion of people aged 65+ in the district has increased to 21%. This is higher than the national average of 14%. This trend is expected to continue.

The local economy is very buoyant and remains resilient. GDP increased by 3% per annum, averaged for the last 10 years. GDP per capita increased by 3.6%, and employment grew 3.3% in 2019.

Financial

We have one of the lowest cost roading networks in New Zealand, both in terms of cost/km and cost/vehicle km travelled. Our programmed expenditure for the next 10 years, including escalation is:

- \$57.1m on maintenance and operations;
- \$57.9m on renewals; and
- \$30.1m on capital improvements, including \$10.1m for road safety, walking and cycling.

Future Challenges

The key challenges we will work towards addressing in the next three years are:

- The costs of our unsealed road network are increasing due to traffic demand and reduced material availability;
- The affordability and resilience of our aging bridge network;
- Population, visitor and economic growth are placing pressure on our urban centres;
- Huge growth means we are acquiring a large amount of new assets. At the same time, older assets are servicing both increased demand and higher customer expectations.

Activity Planning In A Page

We will manage our Roothing network and assets to deliver the Transport services which support our community

Our Overarching Principles

We will provide Roothing services which are:

- Value for money
- Integrated, consistent, fit for purpose.
- Environmentally conscious.
- Reflective and innovative.
- Meeting legal requirements.
- Equitable for current and future generations.

Our 2021-24 Plans

Increase our investment in unsealed roads maintenance (a 21% real increase over three years) to enable a reliable and resilient delivery of existing levels of service across our unsealed network. This is supported by our work in developing the Unsealed Roads Network Performance Modelling Tool here in New Zealand.

Increase our renewals investment for unsealed roads and rural drainage by around 15% (in today's dollars) to enable us to meet the increased costs to deliver the same level of service. Our plans ensure that the maintenance and renewals response to higher traffic numbers on our gravel roads can be funded – and mitigate further negative impacts on our Low Volume Tracks.

Central Otago District Council is planning to invest in increased Network Management budgets, to ensure delivery of key strategic projects, including:

- The district's strategy for aggregate sourcing and supply. This is being developed in conjunction with the Unsealed Roads Network Performance Modelling Tool and cross-Organisation initiatives such as investing in glass crushing facilities. Cost savings are being targeted through improved gravel resources planning.
- Commencement of the Central Otago District Bridge Strategy, ensuring that our long-term investment in bridge assets provides the community with expected levels of service, whilst remaining affordable. We will continue our established programme of investment to replace high priority small bridges on our network.
- Supporting the Central Otago District Council in ensuring the infrastructure upgrades required as part of the huge growth continuing in the District, alongside the outcomes of the Cromwell Masterplan and Vincent Masterplan processes, can be funded.

Walking and cycling provisions remain a big area of focus for Central Otago:

- The Bannockburn Bridge clip-on structure, separating pedestrians and cyclists from one of the District's busiest rural roads, is due for completion in 2020/21. This facility provides a key link as part of the new Lake Dunstan Cycle Trail, and has been funded between Central Otago District Council, Waka Kotahi NZTA and the Central Otago Queenstown Trail Network Trust.
- Further Capital Improvements providing safe and enjoyable connections between the end of the Lake Dunstan Trail at the Clyde Dam, Clyde Historic Precinct and the Otago Central Rail Trail are planned between 2020/21 and 2023/24.
- Walking and cycling forms a key part of planned Capital Improvement investment in both Alexandra and Cromwell CBD's.

Some of these costs can be offset by a managed small reduction in maintenance and renewals expenditure for footpaths. Central Otago District Council has developed a first-of-its-kind asset deterioration model for footpaths, allowing optimisation of our planned work programmes.

Ensuring that our sealed road maintenance and renewals, and environmental maintenance, activities remain focussed on customer needs. Asset management best-practices are used by Roothing staff in delivering the council's established levels of service for sealed roads. The investment also ensures that levels of service that need to respond to growth in traffic and roading assets can be well managed and remain affordable.

Continue our modest planned investments in minor road safety improvements and new sections of footpaths, where level of service gaps and resilience issues have been identified on the network. This will continue to use the council's established process of minor project prioritisations, the organisation's Sustainability Strategy, Infrastructure Resilience Plan and desired community well-beings outcomes.

Table of Contents

Section 1	Introduction.....	1
1.1	Legal Authority	1
1.2	Relationship with other Documents	1
1.3	Significance	2
1.4	Scope of the Activity and Purpose of this Plan	2
1.5	Asset and Activity Management Policy	3
1.6	Activity Management Process.....	4
1.7	The Challenges We Face.....	5
1.8	Systems Thinking.....	7
1.9	Guiding Principles	8
1.10	One Network Road Classification	14
1.11	The Case for Change	19
1.12	Approval Process	20
Section 2	The Service We Provide	23
2.1	Introduction.....	23
2.2	Customers and Stakeholders.....	23
2.3	Linkages between National, Regional and Local Outcomes	24
2.4	Linkages between Council’s Outcomes and the Well-Being Framework	29
2.5	Understanding our Customer’s Needs	29
2.6	Customer Levels of Service by Road Classification	35
2.7	What We Will Provide and Our Current Performance	45
Section 3	Demand and Growth	99
3.1	Introduction.....	99
3.2	Population Growth.....	101
3.3	Demographic Change	102
3.4	Subdivision Development.....	102
3.5	Economic and Visitor Growth.....	104
3.6	Changes in Land Use in Rural Areas.....	105
3.7	Development of Recreational Areas	108
3.8	Modal Change.....	108
3.9	Change in Customer Expectations	109
3.10	Traffic Counting.....	109
3.11	Traffic Growth Sensitivity	110
3.12	Investment for Road Safety, Demand and Growth Opportunities.....	110
3.13	Investment for Network Resilience	118

Section 4	Assumptions, Negative Effects & Risks	119
4.1	Introduction.....	119
4.2	Assumptions.....	119
4.3	Political and Legal Assumptions	120
4.4	Negative Effects	120
4.5	Emergency Management	121
4.6	Risks.....	122
Section 5	Central Otago's Assets	129
5.1	Introduction.....	129
5.2	Sealed Roads.....	134
5.3	Unsealed Roads.....	140
5.4	Structures	146
5.5	Drainage Assets.....	156
5.6	Signs, Markings, Guardrails and Railings	161
5.7	Footpaths	165
5.8	Streetlights	168
Section 6	Management	169
6.1	Introduction.....	169
6.2	NZTA Technical Audit	170
6.3	Contracting Arrangements	171
6.4	Programming.....	173
6.5	Sealed Roads.....	175
6.6	Unsealed Roads.....	191
6.7	Bridges	205
6.8	Drainage.....	213
6.9	Signs and Road Markings.....	219
6.10	Street Lighting	224
6.11	Environmental and Winter Maintenance	227
6.12	Footpaths and Carparks.....	232
6.13	Road Safety	236

Section 7	What will it Cost and How will we Pay for it?	240
7.1	Introduction.....	240
7.2	Financial Management Systems	240
7.3	Financial Management and One Network Road Classification.....	240
7.4	Investment Scenarios.....	241
7.5	Overview of Financial Forecasts	242
7.6	Revenue and Financing Policy.....	245
7.7	Funding of Operating Expenditure	245
7.8	Funding of Capital Expenditure	246
7.9	Overview of Funding Mechanisms Used	247
7.10	Overall Forecasting Assumptions	250
7.11	The Value of the Assets	252
7.12	Development Contributions.....	254
7.13	Development Contribution History	254
7.14	Income from Rooding Development Contributions	254
7.15	Capital Works Cost Apportionment.....	255
7.16	30 Year Funding Provisions.....	255
Section 8	Improvement Plan	265
Appendix 1	– Risk Register	268
Appendix 2	– Visual Condition Rating Guide	272
Appendix 3	– dTIMS Detailed Outputs	281
Appendix 4	– Footpath Activity Management Plan.....	282



Section 1

Introduction

1.1 Legal Authority

The Local Government Act 1974, sections 316, 317 and 319, vests the property in roads and control of roads in the District, excluding state highways, with the council.

The Local Government Act (LGA) 2002, Sections 10 and 11 state the purpose of local government is to meet the current and future needs of communities through efficient and effective local network infrastructure that is appropriate for present and anticipated future circumstances.

As such, Council is required to control activities on roads and ensure the unhindered passage of the public along any road. While the council may set the level at which it will maintain road assets and provide services, it must take sufficient precautions to protect the general safety of the public, traffic and workmen on or near any road. Council is also required to ensure that those services currently meet the expectations of our community and can continue to do so as our district grows.

1.2 Relationship with other Documents

This Activity Management Plan (AMP) is one of a number of key strategic documents that detail Central Otago District Council's activities, with respect to how the council intends to deliver on the requirements of the Local Government Act. It provides detailed supporting information for the Council's Long Term Plan.

It also outlines how Council will contribute to the provisions of:

- The Land Transport Management Act 2003
- The Land Transport Management Amendment Act 2013
- The Local Government Act 1974, and Local Government Act 2002
- The Local Government Act 2002 Amendment Act 2015
- The Local Government (Community Well-being) Amendment Act 2019
- The Health and Safety at Work Act 2015
- The draft Government Policy Statement on Land Transport 2021/22-2030/31
- The draft Regional Land Transport Plan Otago Southland 2021-2031
- Road to Zero – New Zealand's Road Safety Strategy 2020-2030
- Arataki – Waka Kotahi New Zealand Transport Agency (NZTA) 10-year plan for the land transport system

Other whole-of-council strategies, and those more specifically focussed on the council's Infrastructure and Transportation strategies, policies and bylaws are listed in Section 6.

1.3 Significance

Central Otago District Council considers the council's roading network to be a strategic asset in terms of the Local Government Act 2002 s.90(2).

Not all the trading decisions made regarding these assets are considered as significant. Nor do they affect the asset's strategic nature. The roading network is strategic, but small parcels of land that make it up may not be, and the purchase or sale of such small pieces of land may not amount to significant decisions.

Operational decisions taken in managing the Central Otago District Council roading network are delegated to the council's roading staff and the Executive Manager of the council's Infrastructure Services activities.

1.4 Scope of the Activity and Purpose of this Plan

The Transportation activity enables the movement of goods, people, and services across our District. This includes:

- Providing a network of formed roads, bridges, footpaths and car parks which meet the needs of users
- Managing access to the road corridor for the location of services such as electricity, telecommunications, water and wastewater, and community events
- Managing the impacts and access from adjoining land
- Managing the land in unformed and partially-formed legal roads
- Influencing road user behaviour and choices

The council's Long Term Plan (LTP) and Annual Plan identify Central Otago's vision for the Transportation activity being:

To ensure an efficient, fully accessible, safe roading network.

In delivering this vision, the following core values as defined in the LTP are desired:

- Timely intervention
- Informed customers
- Quick response
- Efficient work practises
- Quality outcomes

The purpose of this Activity Management Plan is to outline how the council will undertake work and manage assets to deliver the above vision and core values sought by our customers.



1.5 Asset and Activity Management Policy

Council reviewed its Asset and Activity Management Plan Policy in September 2017. The Policy aims to provide a structured framework for Council to manage its assets effectively and meet the service needs of the community over the long term. A number of measures underpinning the council's Asset Management Policy have been implemented over the 2018-2021 period. A revised Policy will be presented to the council for adoption by the Organisation.

Through effective asset management practices, Council aims to:

1. Ensure that service delivery and costs are appropriate to meet the needs of the community.
2. Minimise lifecycle costs - whilst maintaining the required Levels of Service - at acceptable risk.
3. Provide transparent and effective Asset Management decision-making.

In preparing this Transport Activity Management Plan, the council has worked towards developing our service planning and delivery. Our aim is to demonstrate that our activity management and practices meet desired levels of maturity.

The council completed an Asset Management Maturity Assessment in October 2018. The Maturity Assessment follows the best-practice model documented in the International Infrastructure Management Manual (IIMM). This assessment has rated the Rooding (Transport) service delivery areas as shown in Table 1.1:

Activity Management Plans	Data and Systems	Levels of Service	Demand Forecasting	Risk Management	Operations Management	Investment Decisions
Intermediate	Advanced	Advanced	Intermediate	Intermediate	Intermediate	Intermediate
Financial Forecasts	Asset Valuations	Improvement Planning	AM Teams	Service Delivery Models	Quality Management	
Intermediate	Intermediate	Core	Core	Advanced	Core	

Table 1.1 2018 Assessment of Asset Management Levels of Maturity

The ratings assigned to the thirteen Asset Management functions used in this assessment are used to calculate a score of Maturity Index for the council's transportation Asset Management. For this 2018 assessment, an initial target index of 90 (**Advanced** classification) was proposed for Transport activities.

To support this aim, the council's Asset Management planning and improvement work have been focussing on the following Asset Management function areas for Rooding: Demand Forecasting, Risk Management, Operational Planning, Leadership and Teams and Improvement Planning. This work will continue during the three-year 2021-2024 AMP cycle.

Further guidance on the practices required to achieve these maturity levels are included in the International Infrastructure Management Manual (5th Edition) 2015, endorsed by New Zealand Asset Management Support (NAMS) and the Institute of Public Works Engineering Australasia (IPWEA).

1.6 Activity Management Process

The first step of the activity management process is to understand and define:

- the services and performance that the activity should deliver
- the demands placed on the activity, and
- the risks involved with delivery of the activity.

This is outlined in Sections 2 to 4 of the Activity Management Plan.

The second part of the process documents:

- the roading assets, which are required to deliver the activity,
- the operational management of these assets as part of roading activity management overall, and
- the financial investment required to sustain the activity, and how this is funded.

This is outlined in Sections 5 to 7.

These sections of the AMP are intended to identify and address any gaps between what is required and what is currently provided in delivering roading services to our communities. It aims to identify the most effective lifecycle strategies to manage these assets and ensure that the council's planned service delivery is affordable.

The final part of the activity management process is to identifying opportunities for ongoing improvement. Improvement projects that enable the council's roading team to deliver the expected Levels of Service are documented throughout the AMP. This is summarised in Section 8.

Additional work to ensure Improvement Plan items are successfully addressed through the delivery of this Activity Management Plan form a key part of the 2021-2024 strategic goals.



Figure 1.1 Activity Management Plan Process

1.7 The Challenges We Face

<p>The costs of our unsealed road network are increasing due to traffic demand and reduced material availability</p>	<p>Unsealed roads make up 72% of our roads and account for approximately one-third of our proposed transportation investment. We have a backlog of renewals work on unsealed roads, particularly on the lowest volume roads and tracks, which service land and back country areas.</p> <p>Improved productivity on rural land is generating more heavy vehicles on the gravel road network, and on bridges. Higher land use returns for agriculture and horticulture activities has resulted in reduced access to suitable gravel supplies, and higher royalty costs. This is increasing costs to provide a fit for purpose unsealed road network.</p> <p>We are proposing to substantially increase our investment in unsealed roads maintenance (a 21% increase over three years) to enable a reliable and resilient delivery of existing levels of service across our unsealed network.</p> <p>We have increased our renewals investment for unsealed roads by 13% to enable us to meet increased costs to deliver the same level of service. This does not fully address the backlog in renewals work over the 2021-24 AMP period, but ensures that the maintenance and renewals response to more roads being classified as 'Access Roads' can be funded – and ensure no further negative impacts on our Low Volume Tracks.</p>
<p>An aging bridge network will require us to consider options on how we provide an affordable level of service which meets future demands</p>	<p>We have 179 bridges on our network with 72 expected to reach the end of their economic life within the next 30 years. Many of these are on low volume roads where alternative routes exist. The economic viability of replacement options needs to be considered.</p> <p>The number and weight of trucks on our bridges are also increasing, because of regulatory changes and improvements in land productivity.</p> <p>We will continue our programmed replacement of structural components on some bridges, alongside prioritised small bridge replacements, funded from our capital renewals budgets. This programme is based on our assumption that not all bridges will be replaced at the end of their useful lives. We will complete detailed structural inspections and prepare a strategic assessment of the planned management of our bridges within the next three-year period, to inform community discussion regarding the shape of our network in the future. This is to be funded from increased Network Management budget allocations.</p> <p>We are proposing to invest in a substantial increase of \$100,000 p.a. in structures maintenance whilst this strategic assessment work is underway. The council has high confidence in the recent condition data collected for railings and bridges. Additional funding will also enable us to complete similar data improvements for the retaining walls and minor structures inventories.</p>

<p>Population, visitor and economic growth are placing pressure on our urban centres</p>	<p>The upward trends in tourism, traffic, business activity, job growth and property prices in the region are all combining to put traffic pressure on our commercial precincts. This pressure is building through the recognition of problems around access, traffic management, parking, pedestrian/cycling facilities, and the need for improved user experience of our public spaces.</p> <p>Funding has been provided for within the council's Network Management investment to allow Central Otago District Council to plan for growth, prepare the strategic information to support a range of transportation projects and deliver improvements on our roading network. We will continue to use internal staff capabilities and resources to do this but will also use additional external professional specialists where this represents best value.</p> <p>We will be continuing to develop outline and detailed business cases supporting the community's longer-term investment in transport infrastructure. Transportation infrastructure upgrades in Cromwell, Alexandra and Clyde are supported in the Long Term Plan 2021-30, and the Regional Land Transport Plan 2021-2031.</p>
<p>Huge growth means we are acquiring a large amount of new assets. At the same time, older assets are servicing both increased demand and higher customer expectations</p>	<p>Council has agreed to a more managed risk approach to the sealed road renewals programme. This is supported by an optimised decision-making framework using dTIMS modelling now undertaken by the council's own staff, then validated in the field. Our resurfacing program has been modestly increased to approximately 4.5% of our total sealed road lengths per annum. This requires investment levels to rise by 6% a year in response to the 2020 modelling work.</p> <p>We have approximately 850m of new urban streets being vested in Council each year. A further 2-3km of sealed road is being constructed to service rural development. We are managing the growth of the assets that make up our whole roading network (footpaths, drainage assets, signage, marking and minor structures in addition to roads) to ensure the required investment and service levels for these assets remain affordable. Our aim is to provide for additional capital expenditure to ensure we can deliver the right amount of renewal, replacement, and improvement work for signs and road markings. We are proposing to target operational expenditure increases to where it will address levels of service gaps in vegetation clearance and 'Track' maintenance.</p> <p>A very small proportion of the pavements of our urban streets are beginning to fail. It is no longer cost-effective to undertake routine maintenance and resurfacing of these sections of road. We will continue to fund the reconstruction (rehabilitation) of approximately 300m of urban streets each year, which was introduced from year 2 of the 2018-21 AMP period.</p> <p>This equates to an increase of 11% for our investment in sealed road resurfacing and pavement renewals, used to manage both existing and newly acquired roads. These costs can be partially offset by a small reduction in the costs of sealed roads maintenance.</p>

1.8 Systems Thinking

In 2008 Council commenced a review of its delivery of transportation activities using a systems thinking framework. This involved reviewing the following:

- Purpose or Vision
- Demand
- Performance
- Work flow
- System Conditions
- Thinking

The vision and core values were defined by analysing the customer demand.

This review has been ongoing throughout the 2009-2020 period and has resulted in continuous development of the operational management of the council's transportation activities. The Roding Physical Works contract embeds the systems thinking framework into the planning and delivery of almost all the maintenance, renewals and improvement projects funded from the council's roading investment. The information from the systems thinking work has been used in the development of this plan to:

- Develop vision and core values
- Develop performance measures that align with both the desired outcomes at a District and National level
- Improve asset information, inventory systems and information access
- Streamline management functions
- Streamline maintenance & operations activities
- Review renewals and improvement activities
- Encourage innovation in delivering outcomes through new practises, different materials and alternative equipment
- Improve asset lifecycle management practises
- Confirm procurement methods
- Prepare detailed work programs to develop robust financial forecasts
- Create greater understanding and management of cost drivers

We will continue to review our processes for all the activities we undertake over the next three years, with the expectation that further efficiencies and innovations will be achieved over this period.

1.9 Guiding Principles

National Strategic Drivers

Government Policy Statement on Land Transport 2021/22-2030/31 (GPS)

Waka Kotahi New Zealand Transport Agency (NZTA), the combined Otago/Southland Regional Transport Committee (RTC) and Central Otago District Council are expected to deliver on national strategic priorities set out in the draft Government Policy Statement on Land Transport 2021/22-2030/31 (GPS).

This AMP reflects the national **strategic priorities** set out in the GPS, which are:

- Safety
- Better Travel Options
- Improving Freight Connections
- Climate Change

There are no key priorities stated within the GPS, and “value for money” is now considered an integral part of delivering all transportation activities. The GPS encourages the assessment of all works and projects in terms of their benefits to well-being, public health, the environment, resilience and sustainability.

The draft GPS also builds on three themes, which were introduced in 2018:

- Supporting all available modes of transport in delivering the Transport Outcomes included in the GPS, through planning and investment decision-making processes.
- Integrating land use and transport planning and delivery.
- Incorporating technology and innovation into the design and delivery of land transport investment

The steps that the council needs to take to give effect to the GPS are included within the Transportation Activity Management Plan:

Safety

The GPS proposes ‘ring-fenced’ road safety funding for:

- Safety infrastructure
- Speed management planning and infrastructure
- Road safety promotion
- Road policing
- Safety cameras
- System management activities

All safety-related physical works, planning activities and community road safety work that is delivering on road safety outcomes can potentially be funded from this allocation.

Although the council would still need to fund the local share of any additional roading expenditure, the changes could allow road safety projects to be scoped and delivered in addition to the current maintenance, operations, renewals, and improvement budgets. More targeted road safety investments could be made, and potentially increase maintenance and improvement budgets for non-safety related activities.

Public Transport services and infrastructure

Although funding for Public Transport is currently not part of the council’s budgets, a large increase in Government investment is proposed for these activity classes. The options for looking-at the provision of services supported by the Central Otago District Council may be considered for funding in the future.

Walking and cycling improvements

The level of Government investment in walking and cycling improvements is proposed to remain at the increased levels made available in 2018. Projects that deliver improvements in walking and cycling service levels will continue to be a good fit with GPS priorities.

Although the council would still need to fund the local share of any additional roading expenditure, the changes could allow projects delivering new walking and cycling infrastructure to be scoped and delivered in addition to the current improvement budgets. More targeted investments could be made, and potentially support increased maintenance, operational, renewals and improvement expenditure on the Central Otago District Council roading and footpath networks.

Local road maintenance and improvements

The GPS has proposed higher funding levels for local road maintenance (increased by 29%) and improvements (increased by 13%) from 2015/16 levels. These planned increases for each activity class covers the NZTA share of all expenditure for:

- Roading maintenance and operations
- Renewal of local roads
- Emergency Works

The potential long-term effects of climate change mean that we are likely to experience an increase in the frequency and severity of weather events, which have a direct effect on network accessibility, resilience and reliability. Providing additional resources to address resilience issues is a good fit with the GPS priorities.

Crown Funding for Land Transport

The GPS is proposing that additional funding is made available to progress new infrastructure projects, through the New Zealand Upgrade Programme. \$6.8b has been committed over the next ten years, which represents investment over-and-above the National Land Transport Fund (NLTF).

Central Otago district is set to benefit directly from this Crown investment. The State Highway 6 and State Highway 8B Cromwell intersection upgrades announced by the Government in February 2020 are planned for delivery as part of the New Zealand Upgrade Programme.

Some changes in the GPS affect the objectives of each strategic driver. Section 2.3 of the AMP identifies the national, regional and local outcomes for transportation, and describes the linkages between them.

New Zealand Infrastructure Strategy

The New Zealand Infrastructure Commission – Te Waihanga (Infracom) is currently preparing a draft 30-year infrastructure strategy to supercede the current 30-year New Zealand Infrastructure Plan, published in 2015. Current information suggests that the draft Infrastructure Strategy will be presented to Parliament in late 2021.

The Commission is also developing the “Infrastructure Pipeline” tools and information, as a resource documenting the timing and scale of major infrastructure projects. The pipeline is intended to provide high level information to support long term planning of infrastructure resourcing at a National and Regional level.

District Strategic Drivers

Long Term Plan 2021-30

Central Otago District Council Community Outcomes

At a high level, Central Otago District Council has the following Community Outcomes underpinning the council's vision (Section 1.4). These are:

- **A Thriving Economy:** A thriving Economy that is attractive to both businesses and residents alike.
- **A Sustainable Environment:** This would be an environment that provides a good quality of life. The community would also have a healthy balance between its natural and built environment.
- **A Safe and Healthy Community:** This would be a vibrant community with a range of services and facilities. This would also be a community that valued and celebrated its rich heritage.

Through the Long Term Plan, these Community Outcomes are intended to provide a framework for all the Council's work. This guides and informs project development, planning processes and setting priorities.

They have been developed through feedback and discussions with communities to focus on what is important to our district and the council.

Local Government Community Well-Beings

The Long Term Plan 2021-30 also introduces the Well-Being Framework to support the council's delivery of successful outcomes for our communities, and how this success is measured.

Community outcomes are defined as the outcomes that a Local Authority aims to achieve in promoting the social, economic, environmental, and cultural well-being of its district or region - in the present and for the future - in the Local Government (Community Well-being) Amendment Act 2019. These outcomes have been grouped under four headings, which will support the alignment of all of council's objectives and service delivery to the Well-Being Framework:



Social

Involves individuals, their families, whanau, hapu, iwi, and a range of communities being able to set goals and achieve them, such as education, health, the strength of community networks, financial and personal security, equity of opportunity, and rights and freedoms.



Economic

Looks at whether the economy can generate the employment and wealth necessary to provide many of the requirements that make for social well-being, such as health, financial security, and equity of opportunity.



Environmental

Considers whether the natural environment can sustainably support the activities that constitute healthy community life, such as air quality, fresh water, uncontaminated land, and control of pollution.



Cultural

Looks at the shared beliefs, values, customs, behaviours and identities reflected through language, stories, visual and performing arts, ceremonies and heritage that make up our communities.

Figure 1.2 The Community Well-Beings (Society of Local Government Managers, 2019)

The work to establish and develop Central Otago's Community Outcomes, aligned with the Well-Being Framework, is underway and will be adopted within the Long Term Plan. Specific outcome measures that support the delivery of the transportation activities of the council will be included within this Activity Management Plan. This is discussed in Section 2.4 and included as part of Improvement Plan work.

While both Central Otago's vision and Community Outcomes are important guiding principles, the council has recognised that use of Community Outcomes on their own will not provide clarity regarding the strategic direction Council intends to take with provision of Infrastructure Services across the District.

Infrastructure Strategy 2021-2051

The Infrastructure Strategy ensures that the council has defined high level objectives – and a common framework - for the provision of Infrastructure Services. This enables alignment of what is important across multiple activity and asset groups.

This framework ensures that the understanding of need is the same between asset managers and governance decision makers, and that the work that is planned underpins the strategic direction set by Council.

The vision for Infrastructure Services is:

We will deliver infrastructure services which support our community.

The vision is supported by overarching principles. These underpin everything we do. The overarching principles are that the council's Infrastructure Services:

- Represent value for money and are affordable.
- Are integrated, consistent and fit-for-purpose.
- Are environmentally conscious.
- Are both reflective and innovative.
- Meet legal requirements.
- Are equitable for current and future generations.

The Infrastructure Strategy sets a common level of service framework for all infrastructure activities. Levels of service are measured against the following outcomes:

- Safe, healthy.
- Accessible.
- Resilience, reliability.
- Aesthetics.
- Sustainable.
- Cost effective.



The council defines the Customer Levels of Service that will be provided for in delivering transportation activities under these outcomes.

Sustainability Strategy 2019-2024

Council's operations impact on the sustainability of our communities. The council's Sustainability Strategy has been developed to focus on issues the council directly controls in the first instance:

- Infrastructure provides important social foundations within our communities.
- The way we provide infrastructure services can have a direct environmental impact
- Our regulatory processes are designed to mitigate the impacts of today's development on our future.

As well as providing infrastructure, and enabling sustainable development, our consenting and licensing functions also impact the local economy.

There are opportunities across these activities to reduce our carbon footprint, reduce environmental impacts and streamline our business processes. The council's vision of sustainability connects with our community outcomes and the supporting workstreams, goals, actions and measures of success.

OUR VISION	<i>A great place to live, work and play, now and into the future</i>					
COMMUNITY OUTCOMES <i>Align with the sustainability pillars – economic, environmental, social</i>	<i>Thriving Economy</i>		<i>Sustainable Development</i>		<i>Safe and Healthy Community</i>	
WORK STREAMS <i>How we group our efforts</i>	Ease of doing business	Economic development	Council's environmental footprint	Managing effects on the environment	Access to facilities and services	Celebrating our culture, heritage and landscape
OUR GOALS <i>What success looks like</i>	Being customer friendly, having enabling policies and appropriate infrastructure	Engaging with business to help our economy prosper and provide quality employment opportunities	Providing Council services while managing the associated environmental impacts	Enabling development while managing the associated environmental effects	Affordable and equitable provision of services to promote wellbeing	Managing change while protecting and enhancing our culture, heritage and landscape

Figure 1.3 High Level Objectives of the Sustainability Strategy

Delivery of the council's transportation activities are already aligned with specific strategic actions documented in the Sustainability Strategy:

- Ensuring our infrastructure is fit for purpose and cost-effective
- Reduce Council's impact on the environment
- Set targets and improvement steps in each impact area
- Managing environmental impacts through the district plan
- Improving access through improved facilities and coverage
- Facilitate active transport uptake

These are discussed further in Sections 2 and 6 of this Activity Management Plan.

Procurement Strategy for Transportation Activities 2020

Central Otago District Council and NZTA have endorsed the Procurement Strategy for transportation activities. This was adopted in July 2020. In reviewing this strategy, the council has been mindful that the purpose of procurement is to achieve the best outcomes for the customers and communities that the council services.

This strategy aligns closely with three of the council's infrastructure outcomes, which are to ensure that:

- we provide an integrated, consistent and fit-for-purpose transportation network
- we provide services and manage work programmes representing the best value for money to our communities
- the council's investment in transportation is equitable and affordable over the long term

In common to these objectives is the overall outcome of Cost Efficiency.

The Procurement Strategy has also sought to integrate the Government Procurement Rules and Charter into the council's processes and policies. The framework for ensuring that the Broader Outcomes of procurement are delivered by the council are currently emerging. The council intends to progress this as part of the Long Term Plan 2021-30 and develop a Procurement Strategy for all of Infrastructure Services.

Growth Drivers and Demand Changes

Growth in our district is changing the volume and make up of traffic on our urban and rural roads. This is resulting in pressures in our urban centres, increased demands on our bridges and unsealed roads, and an increasing asset base from subdivision development being vested in the council. Section 3 of the Activity Management Plan provides detail on the effects of growth on Council's transportation activities.

The vision for Infrastructure Services is:

We will deliver safe and reliable infrastructure services that support our local economy and communities, in a manner that is affordable, sustainable and equitable for current and future generations.



Figure 1.4 Central Otago District Council’s Combined Objectives

1.10 One Network Road Classification

In 2014 the One Network Road Classification (ONRC) was introduced in New Zealand to standardise data and create a classification system which identifies the level of service, function and use of road networks and state highways.

The One Network Road Classification involves categorising roads based on the functions they perform as part of an integrated national network. This reflects a more customer-focussed approach to service delivery. The ONRC also provides national standards and a performance measures framework, in a step towards ensuring equity and consistency.

The ONRC framework has been fully adopted by local government and the New Zealand Transport Agency to plan, invest in, maintain and operate the road network in a more strategic, consistent and affordable way throughout the country. The ONRC defines the nationally expected fit for purpose levels of service for each road classification to better enable delivery improvements and demonstrable value for money.

ONRC is used to categorise all of New Zealand’s publicly owned and maintained roads into seven strategic groups. This is based on:

- how busy they are (recorded as Annual Average Daily Traffic, or AADT)
- whether they provide for increased volumes of heavy vehicles or bus traffic,
- whether they connect to important destinations, or
- if they are the only route available.

Roads may be “lifted-up” by categories if a route provides strategic connectivity to hospitals, population centres, regions, airports and/or tourist attractions. The ONRC hierarchy of the Central Otago District Council maintained roading network is shown below. The chart shows the centreline lengths of roading within each category:

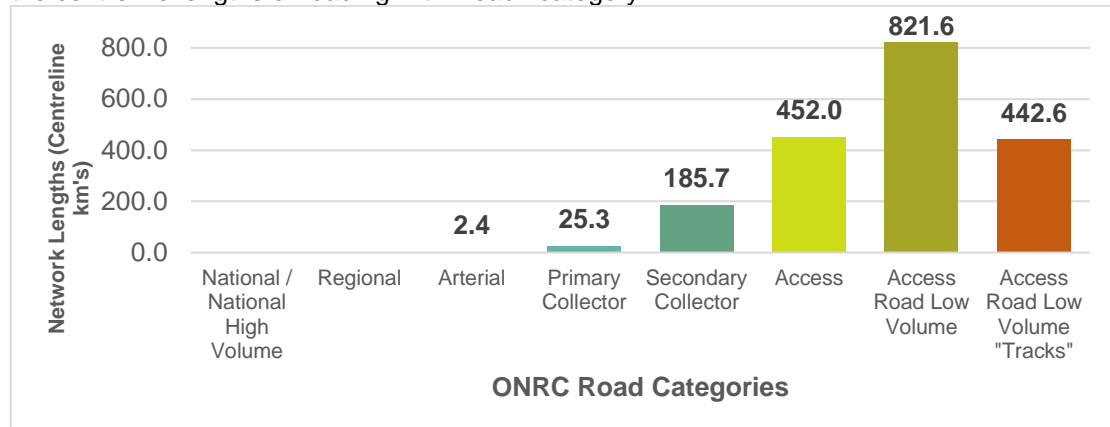


Figure 1.5 Length of Central Otago District Council roads by national ONRC hierarchy

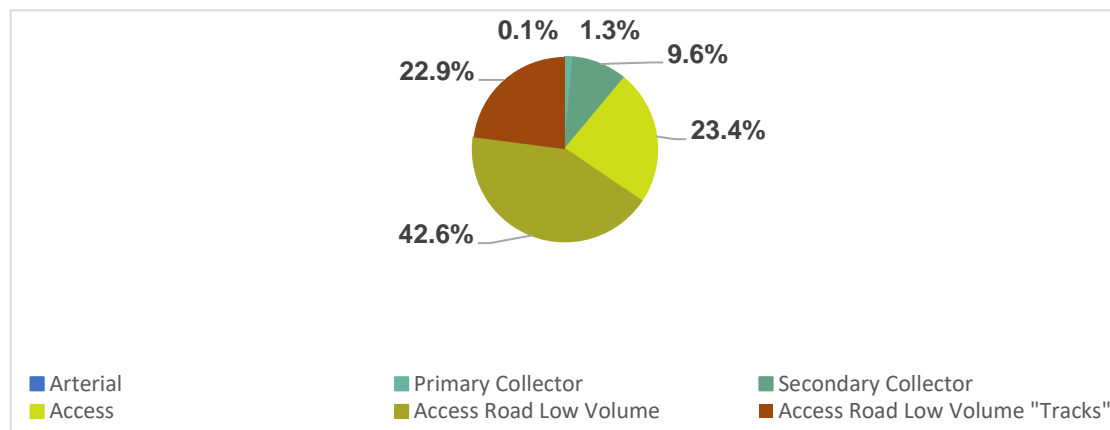


Figure 1.6 Percentage of Central Otago District Council network by ONRC classification

National (and National High Volume)

These are roads making the largest contribution to the social and economic wellbeing of New Zealand. They connect major population centres, major ports or international airports and have high volumes of heavy commercial vehicles or general traffic.

National Roads have more than 15,000 AADT in rural areas and more than 25,000 AADT in urban areas, or carry more than 800 heavy vehicles per day. National High Volume Roads have more than 20,000 AADT in rural areas and more than 35,000 AADT in Urban areas, or carry more than 1,200 heavy vehicles per day.

There are no National Roads on the Central Otago District Council network.

Regional

These roads are a major contribution to the social and economic wellbeing of a region and connect to regionally significant places, industries, ports or airports. They are also major connectors between regions and in urban areas they may have substantial passenger transport movement.

Regional Roads have more than 10,000 AADT in rural areas and more than 15,000 AADT in urban areas, or carry more than 400 heavy vehicles per day.

There are no Regional roads on the Central Otago District Council network. State Highway 6 between Cromwell and Queenstown is classified as a Regional road.

Arterial

These roads make a significant contribution to social and economic wellbeing and they link regionally significant places, industries, ports or airports. Their functionality is increased if they provide the only 'lifeline' route to some places within the region. In urban areas they may have significant passenger transport movements and a higher number of pedestrians and cyclists using the road.

Arterial Roads have more than 3,000 AADT in rural areas and more than 5,000 AADT in urban areas, or carry more than 300 heavy vehicles per day.

The only Arterial road on the Central Otago District Council network is Barry Avenue in Cromwell. This makes up less than 1% of the Central Otago District network. State Highways 6 (north of Cromwell), 8, 8A and 8B on the State Highway network are Arterial roads.

Primary Collector

These locally important roads provide a primary distributor/collector function by linking significant local economic areas or areas of population. They may be the only route available to some places within the region and in urban areas they may have moderate passenger transport movements and numbers of pedestrians and cyclists using the road.

Primary Collector Roads have more than 1,000 AADT in rural areas and more than 3,000 AADT in urban areas, or carry more than 150 heavy vehicles per day.

1.3% of the roads on the Central Otago District Council roading network are Primary Collector roads. There are no Primary Collector State Highways in Central Otago.

Secondary Collector

These are roads providing a secondary distributor/collector function, linking local areas of population and economic sites. They may be the only route available to some places within the local area.

Secondary Collector Roads have more than 200 AADT in rural areas and more than 1,000 AADT in urban areas, or carry more than 25 heavy vehicles per day.

9.7% of the roads on the Central Otago District Council roading network are Secondary Collector roads. State Highways 85 and 87 on the State Highway network are Secondary Collector Roads.

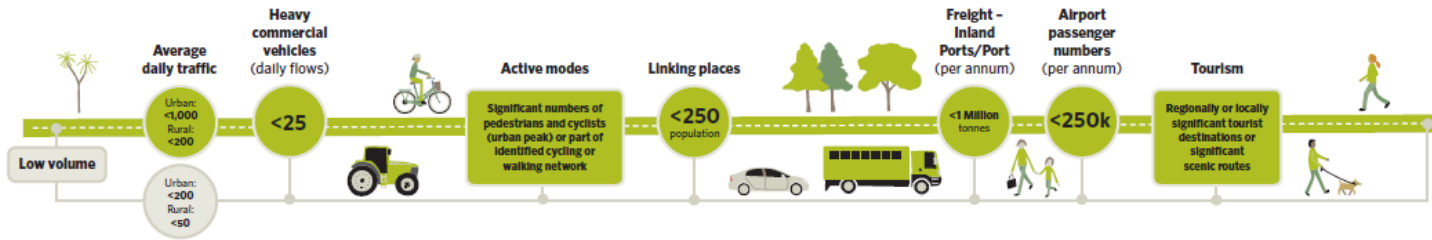
Access and Low Volume Access Roads

These roads provide access and connectivity at the start and end of most journeys in New Zealand. They link homes, schools, farms and businesses to the wider roading network.

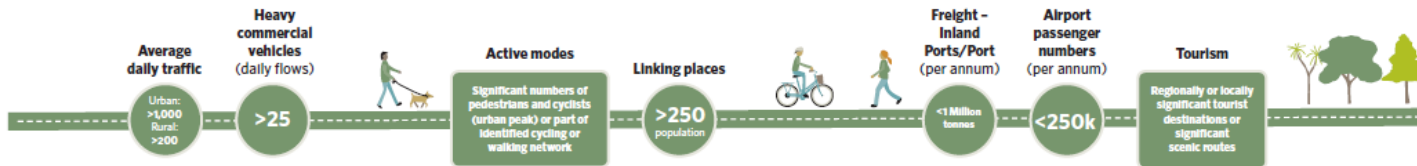
Access Roads have more than 50 AADT in rural areas and more than 200 AADT in Urban areas, and carry less than 25 heavy vehicles per day. Low Volume Access roads have less than 50 AADT in rural areas and less than 200 AADT in Urban areas.

24% of the roads on the Central Otago District Council roading network are Access roads, and 65% are Low Volume Access roads.

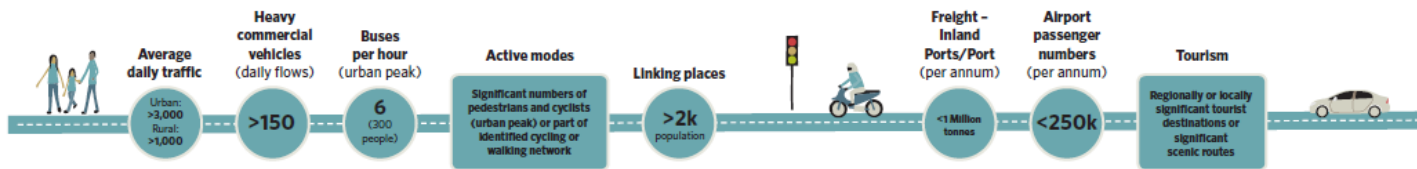
ACCESS



SECONDARY COLLECTOR



PRIMARY COLLECTOR



ARTERIAL

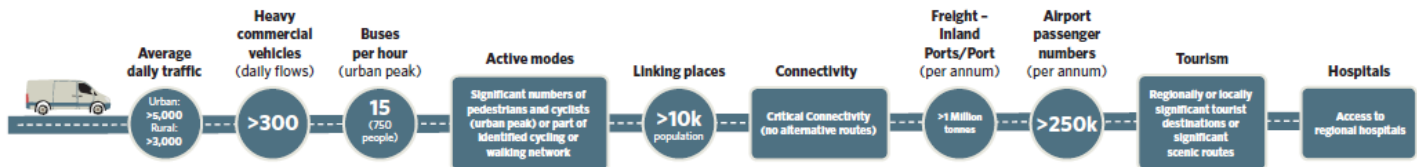


Figure 1.7 Waka Kotahi New Zealand Transport Agency ONRC Hierarchy covering Central Otago District Council roading classifications

One Network Road Classification and CODC Roding Hierarchy

Central Otago's 1,407km of unsealed roads sit within the Access and Low Volume Access classifications. The council has developed sub-classifications which are used to differentiate the roads within these two ONRC classes. These CODC Roding Hierarchy classes enable further prioritisation of the management of our roading network.

One Network Road Classification	Traffic Volume	CODC Roding Hierarchy		Total Unsealed Length (km)
		Sub-Classification	Length (km)	
Access Road	>50 vpd	Major	54.1km	221.8 km
		Intermediate	167.7km	
Access Road - Low Volume	<50 vpd	Minor	559.3km	1,184.9km
		Lane	183.0km	
		Track	442.6km	

Table 1.2 Access and Low Volume Access sub-classifications for Unsealed Roads

Once a road is classified under the ONRC, there is an expectation that the assets are managed and maintained to deliver a defined Customer Level of Service for roads of its type. The Customer Levels of Service are defined by six Customer Outcomes:

- Accessibility (land access and road network connectivity)
- Amenity (travel comfort and aesthetics)
- Resilience
- Safety
- Reliability (network availability and travel time)
- Efficiency (value for money)

Section 2 of the Activity Management Plan defines the expected customer experience of each classification against these outcomes. An example of how the ONRC classifications are used to determine Customer Levels of Service is included in Appendix 1.

ONRC Moderation

Central Otago District Council began the process of moderating our current ONRC hierarchy classifications for the roading network in June 2020, in collaboration with the NZTA and the Road Efficiency Group (REG). This process has reviewed every classified road section (around 825 roads, split into 3,000 sections) managed by the council against the latest traffic and usage data. The original ONRC hierarchy classification was completed in 2014. This has been managed over the last six years using any new data available from continuous improvements, new traffic count data and classification of new road sections added to the council's hierarchy. Traffic counts are a significant aspect of Central Otago's data collection for managing the roading network. More detail is included in Sections 3.10 and 3.11.

Once finalised, the revised hierarchy will be added to the council's roading management systems. This information is critical in determining future maintenance and renewals work and investment planning.

One Network Framework

High level work commenced by the NZTA and REG in 2019 aims to develop the existing ONRC hierarchy for much wider application, not just transport planning and activity management. This is in response to the recognition that shared, integrated planning approaches between transport and land planners will result in better outcomes. 'Systems thinking' allows us to link strategies and policies together and support decision-making, that in turn improves the liveability of places. The One Network Framework (ONF) is aligned with international best practice to support the creation of Network Operating Plans.

The intention of the One Network Framework (ONF) project is to evolve the current ONRC to:

- Be relevant for both urban and rural settings, by developing a common language that all practitioners can use
- Consider movement of people and goods via all modes of transport, rather than just vehicles
- Differentiate strategic networks of different modes of transport
- Consider movement in the context of place
- Prioritise and protect human life and help embed the Safe System approach
- Be simple to understand, use and interpret, providing additional layers of complexity only where needed
- Align with spatial planning processes, tools and frameworks
- Guide planning, operation and investment decisions in the short and long term.

Developing the One Network Framework classification for Central Otago's road network – and using this to inform Network Operating Plans for Cromwell, Alexandra and Clyde - is an Improvement Project for the 2021-24 Activity Management Plan period.

The proposed One Network Framework will be in full implementation for the National Land Transport Programme 2024-27.

1.11 The Case for Change

Council is investing in the network to provide the following customer outcomes:

- Reliability
- Resilience
- Safety
- Accessibility
- Aesthetics and comfort (Amenity)

In delivering these benefits to our communities, the work we are planning should underpin the strategic direction of Council:

- Why do we need to do this?
- Which option provides best value for money?
- What contracting option will provide best outcome?
- Can we afford to do this?
- How are we going to deliver the project?

The level of investment and type of work that is undertaken is optimised to ensure Council is cost-effective in delivering these outcomes and provides value for money. Our planned work aims to ensure delivery of the "right work, at the right time, in the right place".

Options for Future Investment

Three high level funding scenarios have been considered.

These options were:

- Flat-lined funding with a minor increase every three years – this had a high level of service and asset risk.
- Budget fully escalated to BERL forecasts, with most demands for increased level of service included, and low risk asset renewal and maintenance strategies.
- An optimised program, where budgets have been fully escalated to BERL forecasts. Service levels have been assessed based on historic expenditure, backlogs of work, customer satisfaction with level of service, and asset analysis and evidence. Detailed modelling of our unsealed road, sealed road and footpath assets have allowed the roading team to put forward a programme of targeted increases in investment to manage an acceptable level of risk for our asset renewal and maintenance strategies.

The optimised program takes a managed risk approach, based on a review of existing programs, costs and performance.

This profile includes current costs, or an estimate of future needs for some activities where changes have been identified as appropriate to meet levels of service requirements, manage risk, or ensure cost effective work practices. This includes increases in expenditure on sealed roads, unsealed roads, and environmental maintenance.

1.12 Approval Process

This Activity Management Plan has been prepared by the Asset Engineer with input from the Roothing Manager, and the Executive Manager for Infrastructure Services.

Workshops were held with Councillors to enable elected member input into the development of the Activity Management Plan. These meetings were held in July 2020 set the scene for both the preparation of the 2021-24 Transport Activity Management Plan, Infrastructure Strategy, and the Long Term Plan.

Discussions included:

- Budget Scenarios and Waka Kotahi NZTA funding implications
- Government Policy Statement
- Central Otago's benchmarked performance in delivering transportation activities
- Aggregate supplies and cost implications
- Levels of Service on our back-country roads (including Low Volume "Tracks")
- Bridge management and Levels of Service
- Growth pressures in our urban centres, and the masterplanning processes
- Network Operating Plans for Cromwell, Alexandra and Clyde
- Infrastructure for cyclists

The Draft Financial Plan is timetabled for presentation to Council in November 2020 and will be confirmed in June 2021, when the Long Term Plan 2021-30 is adopted. The Activity Management Plan will be adopted by Council after the Long Term Plan is adopted.

Planned Improvements Included in the 10 Year Plan

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Completing an Asset Management Maturity Assessment to ensure progress on strategic goals is being made.	The Asset Management Maturity of the Organisation directly influences the delivery of improved outcomes, organisational efficiency, and value-for-money	Complete future Asset Management Maturity Assessment and implement recommendations	External resource required
Establish and adopt Central Otago's Community Outcomes in-line with the Community Well-beings within the Long Term Plan.	Use of the Community Well-being framework for determining the Outcomes our communities want, and reporting/measuring our performance is a statutory requirement.	Specific outcome measures that support the delivery of the transportation activities of the council will be included within this Activity Management Plan	In-house resource funded from existing Network Management budget
Developing the One Network Framework classification for Central Otago's road network.	Adoption of the new national transport hierarchy/classification system to align transportation planning and	Prepare One Network Framework hierarchy.	In-house resource funded from existing Network Management budget
Network Operating Plans for Cromwell, Alexandra and Clyde.	Network Operating Plans allow for a long-term vision for the council's transport networks to be developed and documented using a common, agreed process	Network Operating Plans for Cromwell, Alexandra and Clyde are an Improvement Project for the 2021-24 Activity Management Plan period.	In-house resource funded from existing Network Management budget

Table 1.3 Planned improvements included in the 10 Year Plan



Section 2

The Service We Provide

2.1 Introduction

This section defines the levels of service Council delivers to its customers and the measures which are used to identify Council's performance in delivering these.

It also identifies how the levels of service for transportation activities contribute to the objectives of the Government Policy Statement on Land Transport 2021/22-2030/31 (GPS). The GPS contains the outcomes the Government expects from nationally funded transportation activities. The management strategies and work undertaken to achieve these outcomes are discussed further in Section 6.



Figure 2.1 High Level Strategic Linkages

2.2 Customers and Stakeholders

For this plan, customers are people who use any part of the roading corridor and stakeholders are those who may not use the roads directly, but who have an interest in how they are operated and managed.

Customers include:

- Vehicle drivers & passengers
- Pedestrians
- Cyclists
- Motorcyclists
- Mobility Scooter & wheelchair users
- Power, telecommunications, water, and wastewater service providers

Stakeholders include:

- Ratepayers (the investors that we represent)
- New Zealand Transport Agency (our co-investors)
- Ministry of Transport (National Strategy)
- Otago Regional Council & Regional Land Transport Committee (Regional Strategy)
- Councillors and Community Board Members
- Residents
- Adjoining landowners and users

2.3 Linkages between National, Regional and Local Outcomes

National and Regional strategic linkages between the Government Policy Statement on Land Transport 2021/22-2030/31, the One Network Road Classification and the Otago Southland Regional Land Transport Plan 2021-2031 are demonstrated in Table 2.1. Linkage with the Central Otago District Council's Transport Vision, Core Values and the Community Outcomes for the Infrastructure Strategy 2021-2051 are also established:

Central Government	National	Regional	District	Activity
Government Policy Statement Strategic Priorities and Themes	One Network Road Classification Customer Outcomes	Regional Land Transport Priorities and Strategic Objectives	Infrastructure Strategy Outcomes	Transportation Vision and Core Values
<p>Safety:</p> <p>A land transport system that is a safe system, increasingly free of death and serious injuries.</p>	<p>Safety:</p> <p>How road users experience the safety of the road.</p>	<p>Addressing and influencing network inconsistencies, community attitudes and behaviours.</p> <p>Encouraging alternative modes of transport.</p> <p>Reduced social and economic costs associated with poor road user behaviour and transport-related crashes.</p>	<p>Safety:</p> <p>Managing the safety of the public and workers on our networks by adopting a risk based approach.</p>	<p>Provide a <u>safe</u> roading network.</p>

Central Government	National	Regional	District	Activity
Government Policy Statement Strategic Priorities and Themes	One Network Road Classification Customer Outcomes	Regional Land Transport Priorities and Strategic Objectives	Infrastructure Strategy Outcomes	Transportation Vision and Core Values
A land transport system that increasingly mitigates the effects of land transport on the environment.	<p>Amenity:</p> <p>How road users experience and react to the overall road environment.</p>	<p>Environmentally sustainable modes of transport that are beneficial to public health, e.g. walking and cycling.</p> <p>An environmentally sustainable and energy efficient land transport network that responds effectively to external pressures.</p>	<p>Aesthetics and comfort:</p> <p>The user experience of our services, and the impacts they have on the environment.</p> <p>Services will be delivered in a manner which balances the current and future impact on the environment and makes use of sustainable practices.</p>	Provide a fully <u>accessible</u> roading network.

Central Government	National	Regional	District	Activity
Government Policy Statement Strategic Priorities and Themes	One Network Road Classification Customer Outcomes	Regional Land Transport Priorities and Strategic Objectives	Infrastructure Strategy Outcomes	Transportation Vision and Core Values
<p>Better Travel Options:</p> <p>A land transport system that addresses current and future demand for access to economic and social opportunities</p> <p>A land transport system that provides appropriate transport choice</p> <p>Supporting all available modes of transport in delivering the Transport Outcomes included in the GPS, through planning and investment decision-making processes.</p> <p>Integrating land use and transport planning and delivery.</p>	<p>Accessibility:</p> <p>The ease with which people are able to reach key destinations and the transport networks available to them, including land use access and network connectivity.</p>	<p>Addressing and influencing network inconsistencies, community attitudes and behaviours.</p> <p>Encouraging alternative modes of transport.</p> <p>Planning to fund and adapt to changing environmental and user demands to ensure a fit for purpose transport system.</p> <p>A transport system that provides an inclusive range of integrated, quality transport options for all users to meet their social, cultural, and economic needs</p>	<p>Accessibility:</p> <p>The ability and ease of accessing our networks.</p> <hr/> <p>Overarching Principles:</p> <p>An integrated district network which offers an increasingly consistent, fit for purpose level of service for users.</p>	<p>Provide a fully <u>accessible</u> roading network.</p>

Central Government	National	Regional	District	Activity
Government Policy Statement Strategic Priorities and Themes	One Network Road Classification Customer Outcomes	Regional Land Transport Priorities and Strategic Objectives	Infrastructure Strategy Outcomes	Transportation Vision and Core Values
<p>Improving Freight Connections: A land transport system that addresses current and future demand for access to economic and social opportunities.</p>	<p>Reliability: The consistency of travel times that road users can expect.</p>	<p>Planning to fund and adapt to changing environmental and user demands to ensure a fit for purpose transport system.</p> <p>Adapting our transport networks and those of our adjoining regions to reduce the instances of disruption to the functioning of our communities due to adverse events.</p> <p>An environmentally sustainable and energy efficient land transport network that responds effectively to external pressures.</p>	<p>Reliability: The consistency of our services and managing the impact of planned interruptions.</p>	<p>Provide a fully <u>accessible</u> roading network.</p> <p>Provide an <u>efficient</u> roading network.</p>
<p>Climate Change: A land transport system that is resilient.</p>	<p>Resilience: The availability (and restoration) of service to users of each road when there is a weather or emergency event, whether there is an alternative route available and the information provided to the road user.</p>		<p>Resilience: Our preparedness for emergency or weather events, and the availability and restoration of service when there is an event.</p>	

Central Government	National	Regional	District	Activity
Government Policy Statement Strategic Priorities and Themes	One Network Road Classification Customer Outcomes	Regional Land Transport Priorities and Strategic Objectives	Infrastructure Strategy Outcomes	Transportation Vision and Core Values
<p>Value for money: A land transport system that delivers the right infrastructure and services to the right level at the best cost.</p> <p>“Value for money” is now considered an integral part of delivering all transportation activities.</p> <p>Incorporating technology and innovation into the design and delivery of land transport investment.</p>	<p>Cost Efficiency: Value for money and whole of life cost will be optimised in the delivery of affordable customer levels of service.</p>	<p>Planning to fund and adapt to changing environmental and user demands to ensure a fit for purpose transport system.</p>	<p>Overarching Principles: An integrated district network which offers an increasingly consistent, fit for purpose level of service for users.</p> <p>Value for money and whole of life cost will be considered to deliver affordable levels of service.</p> <p>We will look for new ways and innovative practices to enable us to cost effectively deliver our services.</p>	<p>Provide an <u>efficient</u> roading network: Timely intervention, Informed customers, Quick response, Efficient work practises, Quality outcomes</p>

Table 2.1 Linkages between National, Regional and Local Outcomes

2.4 Linkages between Council's Outcomes and the Well-Being Framework

As discussed in Section 1.9 work to establish and develop the linkages between Central Otago District Council's desired outcomes for Infrastructure Services, which includes Transportation, and the Well-Beings Framework is underway. Initial work to align outcomes that support the delivery of the transportation activities has already identified where three of the four 'Well-Beings' are linked with our services. The Well-Beings Framework includes demographic data for our communities, which can also be linked to Customer Outcomes:

- Safe and healthy – Environmental Well-being, Social Well-being
- Accessible - Social Well-being, Demographics (Growth and Service Levels)
- Resilience, reliability - Social Well-being, Environmental Well-being
- Aesthetics - Social Well-being, Environmental Well-being
- Sustainable – Environmental Well-being, Demographics (Growth and Service Levels)
- Cost effective – Economic Well-being

The New Zealand Society of Local Government Managers have developed over 200 measures that allow benchmarking of the council's performance within the Community Well-Being Service. Many of these measures can be directly aligned with information collected and managed by the council's Infrastructure Services activities.

2.5 Understanding our Customer's Needs

As part of our systems thinking approach, all public calls to Council regarding transportation are recorded. Trends and call details are monitored and reported on quarterly. A review of public calls in 2017 was completed as part of systems thinking training for members of council's Infrastructure and Planning & Environment teams. This work supported the Transportation Vision and Core Values as the basis for measuring our performance in delivering Roding services.

Over the last three years, the council's roading team has experienced changes in management and technical staff. These changes have impacted on the workflow and processes administered by the team in managing public calls.

The numbers of calls are tracked, with an objective of reducing the number of calls over time. A reducing trend indicates that Council is delivering the vision and meeting the core values as defined in Section 1.4. A reduction in the number of calls also assists to improve efficiency as work can be undertaken in a more co-ordinated, proactive manner rather than in a reactive manner.

The council reports two performance measures targets directly related to public calls:

- Annual number of calls to the roading team to be less than 600 calls per year.
- 90% or more of all calls to be responded to within ten days of being contacted by the public.

Efforts to improve the roading team's performance against these two measures form part of the Improvement Planning for the 2021-24 AMP cycle.

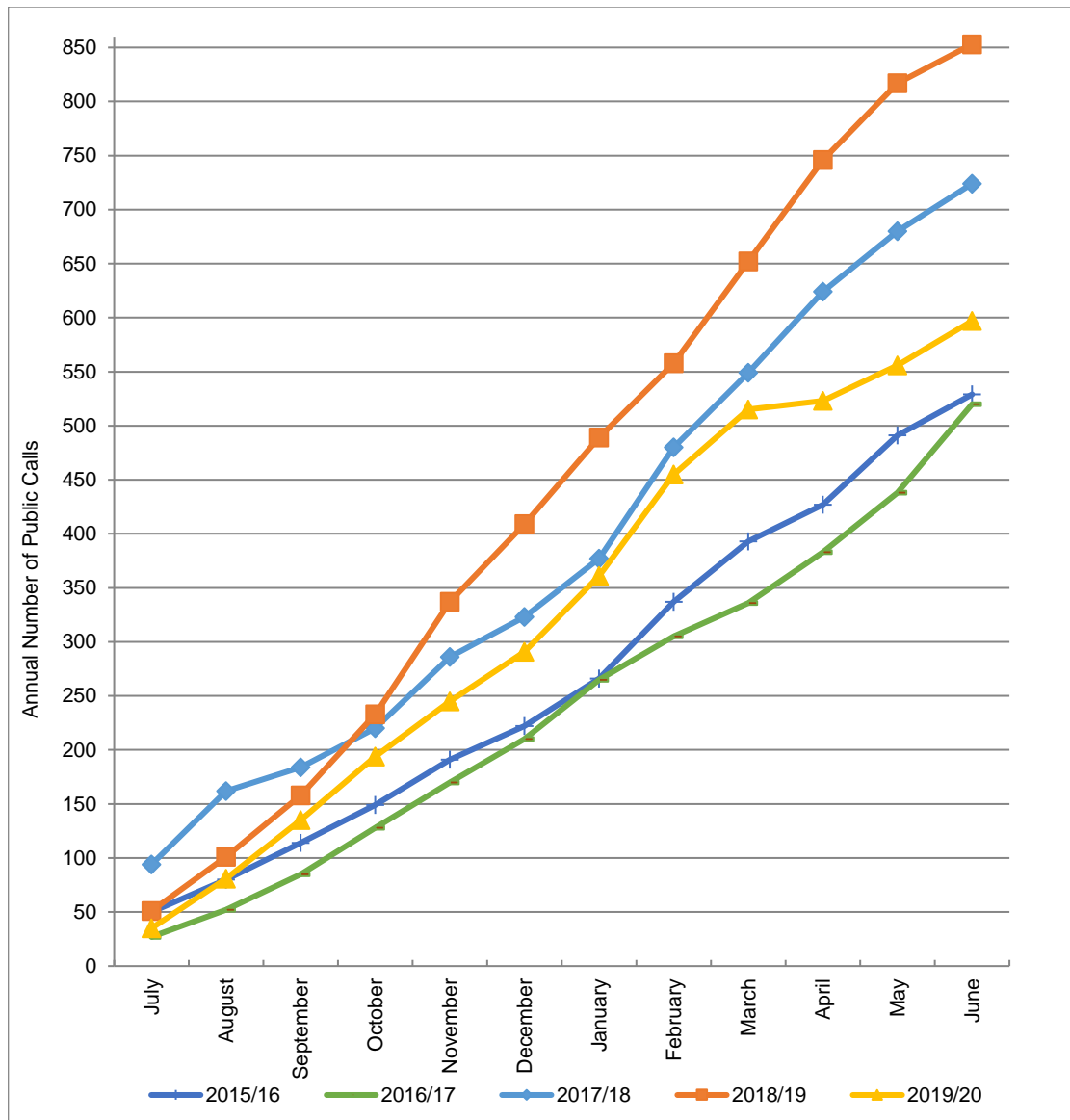


Figure 2.2 Cumulative Number of Calls per Annum (2015/16 – 2019/20)

Figure 2.2 shows that cumulative annual calls numbers have increased over the last three years, but the total number of calls in the 2019/20 financial year was within the performance measures target. The level of calls recorded and managed by the team in 2019/20 represents a marked improvement in performance, compared with 2017/18 and 2018/19. Whilst the impact of the COVID-19 Levels 3 and 4 lock-down on calls can clearly be seen in March and April 2020, the trend for the year was already far more positive.

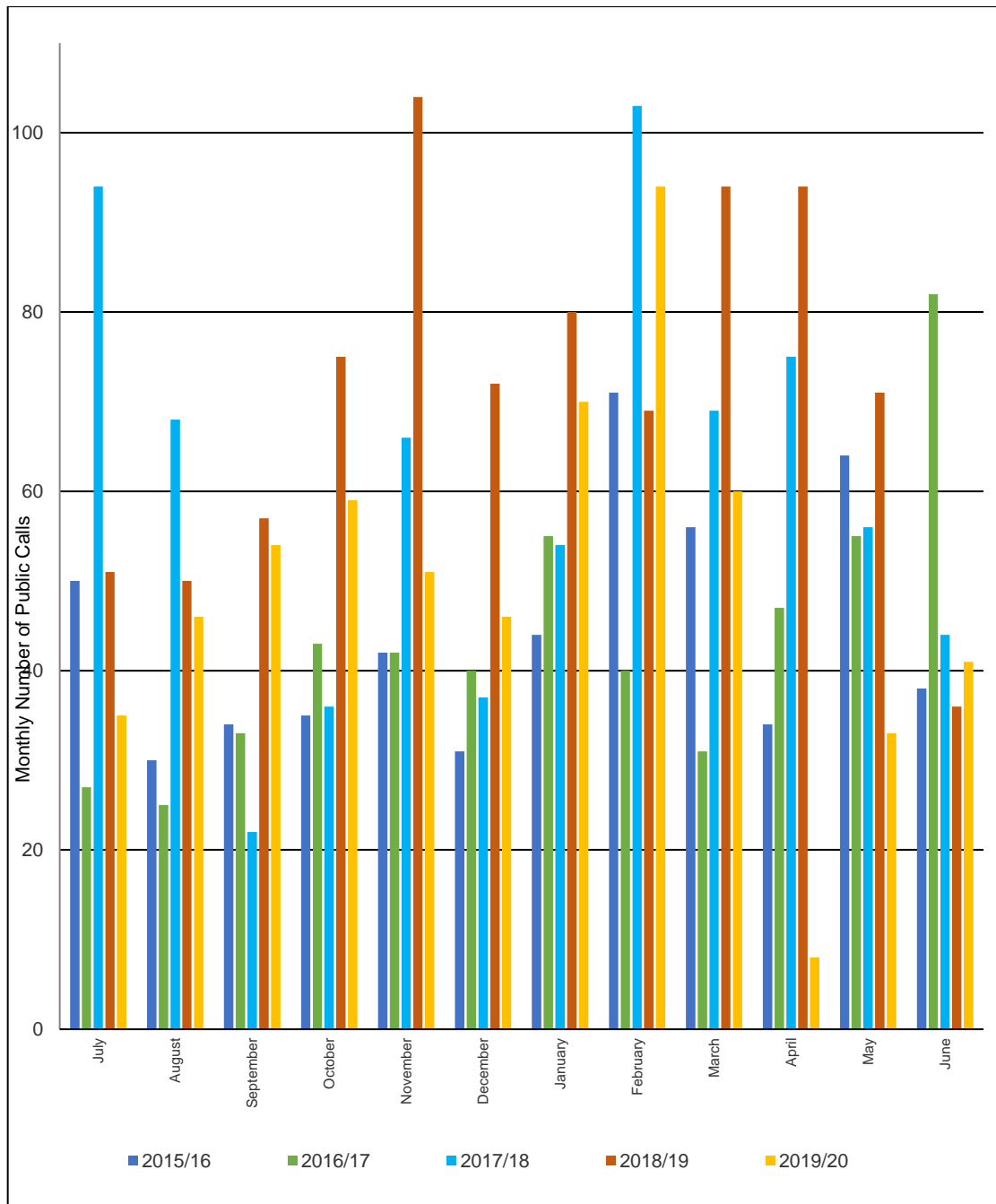


Figure 2.3 Monthly Number of Public Calls (2015/16 – 2019/20)

Figure 2.3 illustrates the monthly call numbers managed by the council's transportation staff over the last five financial years. This view of our public call data allows for a clearer understanding of trends over the year. It also enables a review of call spikes associated with significant weather events (2017 winter flooding from rain and snow-melt, the February 2018 and November/December 2018 flooding events and the February 2020 significant rainfall event).

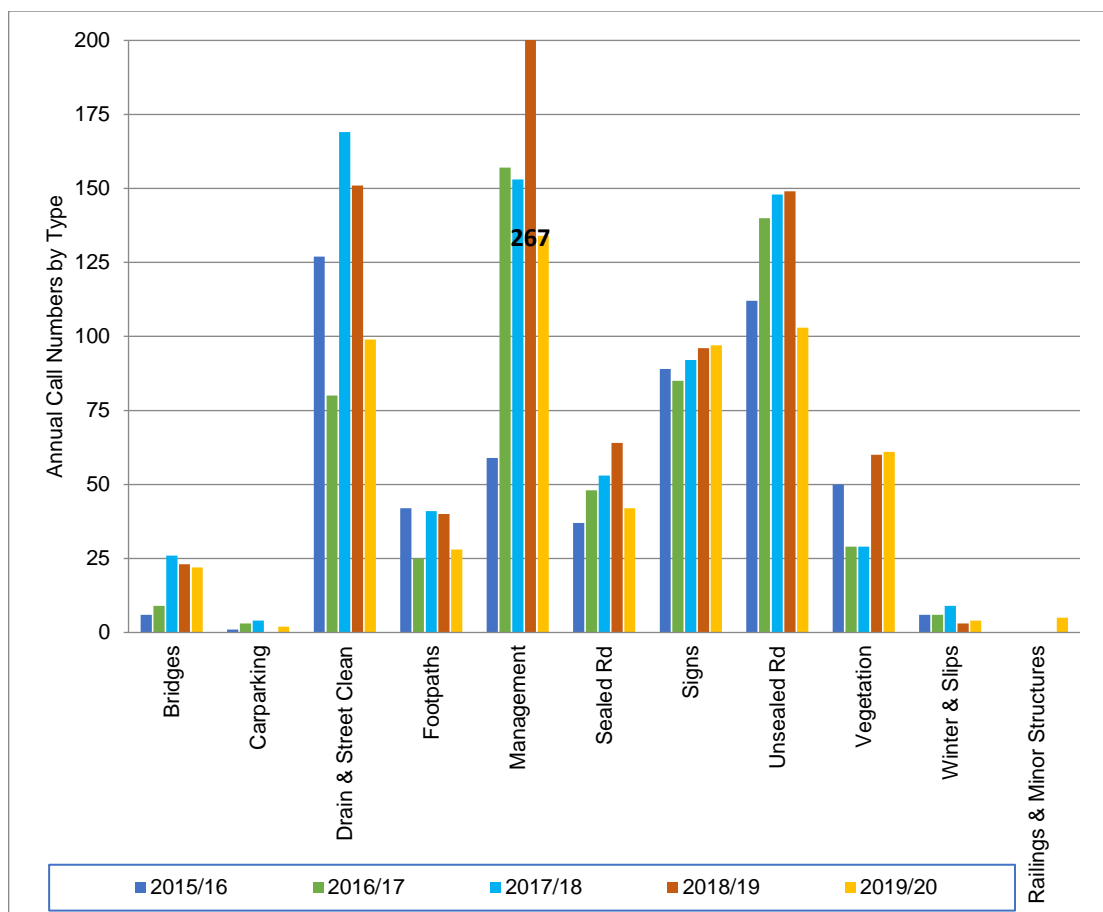


Figure 2.4 Calls by Fault per Annum (2015/16 – 2019/20)

Calls are also tracked by type to identify the area where more focussed efforts are required. In the previous three-year Activity Management Plan cycle, our public calls evidence suggested that drainage and unsealed roads remained as the two areas experiencing the highest number of calls. A change to how the council planned and delivered drainage works – with a shift towards proactive maintenance – has demonstrated improvement (measured in terms of fewer public calls) over the last two years. Central Otago District Council has already started to make use of data for unsealed roads being collected for new advanced Asset Management processes adopted by the organisation in 2019/20. Changes to how our programmes are managed has produced a very positive result in terms of public call volumes, but we are still seeing users of our network remaining dis-satisfied with the level of service offered by our lowest volume gravel roads.

Our latest data now indicates that the levels of calls regarding signage and vegetation issues are steadily increasing. Data for the council’s road sign assets was collected in January and February 2020. The intention is to use this information to develop changes in our programmes and delivery, to target work more effectively from the start of the 2021-24 AMP period.

Council also undertakes an annual Resident Opinion Survey to establish levels of satisfaction with our services. This now provides the organisation with twenty years’-worth of community feedback. Past results of this survey relating to roading activities are shown in Figure 2.5:

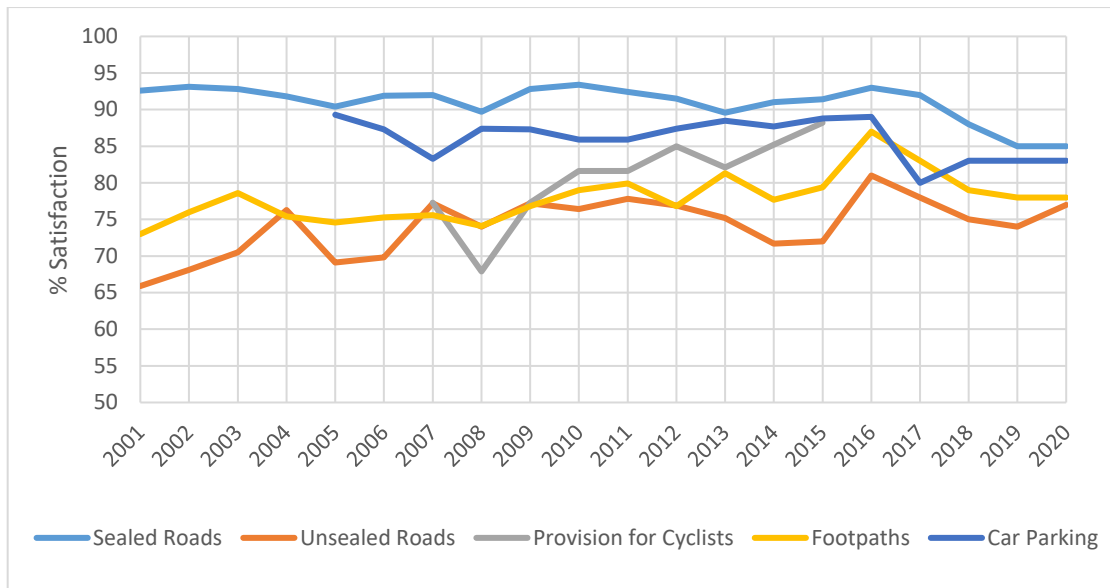


Figure 2.5 Resident Opinion Survey Levels of Satisfaction for Transportation Assets

Between 2001 and 2015, this survey was conducted in May as a paper-based survey. A random selection of residents was contacted by post and asked to rate their satisfaction level with Council services.

The methodology for the Resident Opinion Survey changed after 2015. In 2016 the survey was carried-out between June and July using online survey methods open to all members of the public for the first time. This was supported by a random sample selected in the same way as previous years. 474 fully completed surveys were analysed.

From 2017 onwards, the survey has been completed online, with members of the public able to request a paper survey. In 2019, four people requested and returned a paper survey out of a total of 693 fully completed surveys.

As the new survey method attracts a greater number of responses, is open to all residents and has been completed at the same times of the year (May and June), results from 2017 onwards are considered far more comparable. Satisfaction levels of greater than 80% for sealed roads and greater than 70% for unsealed roads means that we are meeting our performance measures targets, shown in Figure 2.6:

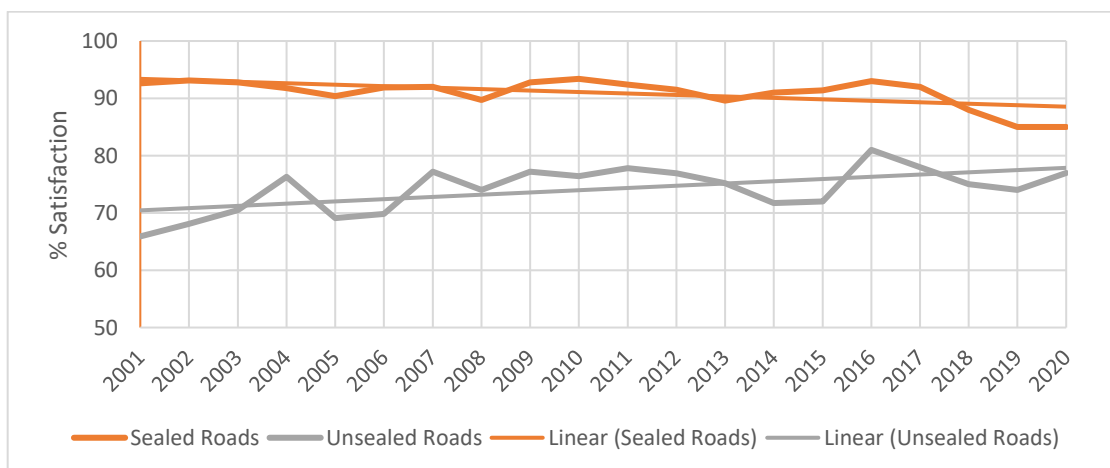


Figure 2.6 Resident Opinion Survey Levels of Satisfaction for Transportation Assets

Central Otago District Council and the University of Auckland have also carried-out a number of academic studies of the customer feedback received by the roading team since 2014. Fourth-year Bachelor of Engineering students have been invited to complete studies focussing on Central Otago's unsealed road network and methods of assessing and evaluating customer experience. These studies have provided critical information regarding what conditions and issues generate customer calls, when these calls are more likely to occur and how the responses to these calls can be measured to improve our systems.

In 2014/15, one student reviewed the initial data from the first roughness surveys. These covered two Financial Years where grading programmes had been changed due to budget constraints. In 2012/13, the council's first cyclic grading programme for unsealed roads had been developed and used on the network. In 2013/14, resource constraints had required the council to reduce the number of programmed grades across the unsealed roading hierarchy to one fewer grade over the course of the year. The network data gathered over these two years was used to establish the basis of a performance framework for Central Otago's unsealed roads, based on customer levels of service.

In 2017/18, students had four complete years of network survey data to work with, alongside the recorded public calls data for a full cycle of the council's Roading Physical Works maintenance, operations and renewals contract. In 2018/19 the students were able to take these studies and review them alongside the completed maintenance records and constructed renewals for the unsealed roads in our District.

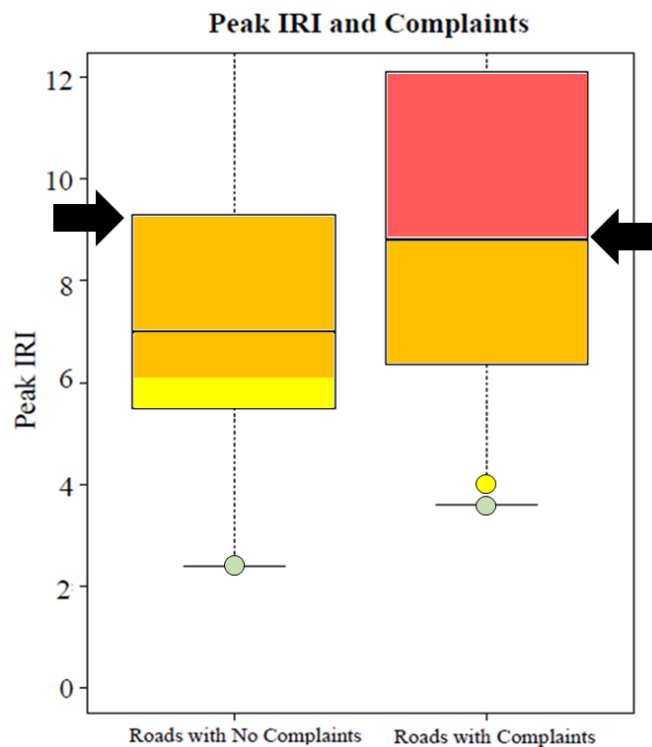


Figure 2.7 Levels of Unsealed Road Roughness and Customer Experience

These sets of studies have all been used in the development and use of the Unsealed Roads Network Performance Modelling Tool for Central Otago's unsealed network, including the dTIMS models that can now provide grading and re-metalling forward work programmes determined by desired level of service outcomes.

2.6 Customer Levels of Service by Road Classification

The level of service customers can expect for each road classification under each of the ONRC outcome areas are in Table 2.2. We have highlighted the expected overall performance of the road environment under each classification in bold. Colour coding, as defined in the Key below, demonstrates our assessment of our current service delivery against target Levels of Service.

Key

	Council believes it is currently delivering to the ONRC Customer Levels of Service				
	Council is delivering to a higher level of service, but this has no cost impact				
	Over-delivery in the level of service with potential for dis-investment				
	Under-delivery of Customer Levels of Service with a need for additional investment to close this gap				
ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
Reliability Resilience	Generally consistent travel times with some exceptions in urban heavy peak, holidays, during major events or during moderate weather events.	Generally consistent travel times except where affected by other road users (all modes) or weather conditions.	Travel times may vary as a result of other road users (all modes), weather conditions or the physical condition of the road.		
Resilience Resilience	Route is nearly always available except in major weather events or emergency event and where no other alternatives are likely to exist.	Route is nearly always available except in major weather events or emergency events and alternatives may exist.		Route may not be available in moderate weather events and alternatives may not exist.	

ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
(continued)	Clearance of incidents affecting road users will have a high priority .	Clearance of incidents affecting road users will have a moderate priority .		Clearance of incidents affecting road users will have a lower priority .	Clearance of incidents affecting road users will have the lowest priority .
	Road users may be advised of issues and incidents.			Road user information will have a lower priority .	Road user information will have the lowest priority .
Accessibility Amenity	Some land use access restrictions for road users, both urban and rural.	Land use access for road users generally permitted but some restrictions may apply.		Access to all adjacent properties for road users.	
	Road user connection at junctions with Arterial or Collector roads, and some restrictions may apply in urban areas to promote Arterials.		Road user connection at junctions with other Collectors or Access roads.		
	Traffic on higher classification roads generally has priority over lower classification roads.				
Accessibility	Some separation of road space for active road users in urban areas to provide network access and journey continuity. Extra care required around activity centres	Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed.			

ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
Amenity (continued)	Parking for all modes and facilities for mobility impaired at activity centres, and some shared spaces.			Enhanced accessibility via 'share the road' philosophy (active road users, mobility impaired and drivers).	
	Provision of quality information relevant to Arterial road user needs.	Provision of quality information relevant to Collector road user needs.		Provision of quality information .	
Amenity	Good level of comfort , occasional areas of roughness.	Good level of comfort , occasional areas of roughness.	Moderate level of comfort , longer areas of roughness.	Lowest level of comfort , may include extended areas of roughness and unsealed surfaces (on rural roads).	
	Aesthetics of adjacent road environment reflects journey experience needs of all road users and land use.	Aesthetics of adjacent road environment reflects journey experience needs of all road users and adjacent land use.		Aesthetics of adjacent road environment strongly reflects land use and place function.	
	Urban roads reflect urban fabric and contribute to local character.				
	Some separation of road space for active road users for amenity outcomes in urban areas.	Specific provision where active road users present.		Strong shared space philosophy between active road users (if present) and vehicular traffic. Active road users expect environment appropriate to their needs.	

ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
Amenity (continued)	Clean, safe and secure [lighting standards, good cycle numbers, cycle park facilities, and weather protection for public transport users].	Clean, safe and secure [lighting standards, reasonable cycle numbers, accessible parking facilities].		Urban areas clean, safe and secure [environment and lighting suitable for lower vehicle speeds].	
Safety (Optimal Speeds)	Higher speeds depending on assessed level of risk. Lower if mixed use, high intersection density, schools, shopping, concentrations of active road users. In urban areas travel speeds depend on assessed level of risk and recognise mixed use, schools, shopping strips and concentrations of active road users.	Travel speeds depend on assessed level of risk and recognise mixed use, intersection density, schools, shopping strips and concentrations of active road users.		As for Collector roads but also recognise access and use values.	

ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
Safety	Lower speeds and extra care required on some roads/sections particularly depending on topography, access, density and use.	Lower speeds and greater driver vigilance required on some roads/sections particularly depending on topography, access, density and use.			
	Variable road standards.	Variable road standards and alignment .			
	Road user safety guidance provided at high risk locations.	Road user safety guidance may be provided at high risk locations.			
	Some separation of road space for active road users in urban areas.	Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed.			
Cost Efficiency	Efficiency measures are required to provide assurance that the work we do is necessary, is co-ordinated and is delivering value for money . We will improve efficiency by ensuring the work we do is done at the right time, i.e. it is not done too early, nor is it done too late.				

Table 2.2 Customer Level of Service and Gaps in Current Performance on the Central Otago Network. Performance Monitoring and Reporting

Both the Council's Long Term Plan and Annual Plans report our performance against the five mandatory Department of Internal Affairs non-financial performance measures. There are five additional measures relating to customer service, network condition, and completion of our works programmes on budget. These performance measures are summarised annually and used to demonstrate the Levels of Service we are achieving on the Central Otago District Council roading network.

Results are reported quarterly within the organisation to inform staff and elected members where our transportation activities are on-track to deliver the vision and core values of the Council. Quarterly measures provide guidance as to when and where changes need to be made to work standards, practises, policies, and strategies. This can assist with reducing the amount of reactive maintenance and lower the number of public calls we receive.

As part of the development of national-level reporting of performance by Road Controlling Authorities, the Road Efficiency Group, Local Government New Zealand (LGNZ) and the NZTA has been providing publicly-available data collated from each council in New Zealand since 2017. The target of producing a summary 'dashboard' which is standardised across the country was met in June 2020 – using the previous financial year's results.

Annual Plan and Long Term Plan measures are reported at a network level, while ONRC measures are reported at classification level. From 2020, measures from both our internal reporting and national reports will be reported to Council in the second quarter of our financial year (October – December).

Objective : Better Travel Options, Climate Change				
Outcome	What we will measure	How we will measure	Type of measure	LTP Target
Resilience	Number of journeys impacted by unplanned events.	In accordance with ONRC requirements	ONRC Outcome	N/A
	Number of journeys impacted by unplanned events where there is no viable alternative route	In accordance with ONRC requirements	ONRC Outcome	N/A
Accessibility Reliability	Customer satisfaction with provisions made for footpath facilities and car parks.	% of residents who are satisfied with provisions made for footpath facilities and car parks as recorded in the annual resident opinion survey.	Customer satisfaction measure included in resident survey	N/A
	The % of footpaths that fall within the Council's level of service standard for the condition of footpaths.	Annual footpath roughness measures	DIA and LTP measure	>70%
Objective : Better Travel Options,				
Accessibility Reliability	Average length of time to issue a consent for access to a road.	The average length of time to issue consent for access to a road as recorded on the spreadsheet for consent applications and from the Submitica Control system.	Customer satisfaction measure reported in quarterly report	N/A
Amenity	Sealed Road Smooth Travel Exposure Index. The percentage of travel on roads which are smoother than a defined threshold.	Sealed Road Smooth Travel Exposure from annual roughness measures and traffic counts.	DIA, LTP and ONRC Outcome measure	≥90%
	Sealed Road Peak Roughness (NAASRA).	Sealed Road Peak Roughness (NAASRA) from annual roughness measures.	ONRC Outcome measure	N/A

	Customer satisfaction with unsealed roads.	% of residents who are satisfied with unsealed roads as recorded in the annual resident opinion survey.	LTP measure	≥70%
Objective : Improving Freight Connections				
Outcome	What we will measure	How we will measure	Type of measure	
Accessibility	% of network not accessible to Class 1 heavy vehicles due to bridge capacity.	In accordance with ONRC requirements.	ONRC Outcome	N/A
	% of network not accessible to 50 Max vehicles due to bridge capacity.	In accordance with ONRC requirements.	ONRC Outcome	N/A
	Length of road where the condition of the carriageway will not facilitate year round access to all classes of vehicle.	The roads which are assessed by staff as not meeting this criteria for all vehicle types for the full year due to renewal or maintenance failures. This is a subjective measure.	Network performance measure reported in quarterly report	N/A
Objective : Safety				
Outcome	What we will measure	How we will measure	Type of measure	
Safety	Change from the previous financial year in the number of fatal and serious injuries on the local road network.	By recording the five year trend for crash statistics for the local road network recorded in the CAS database.	DIA, LTP and ONRC Outcome measure	Stable or decreasing trend
	Collective Risk (fatal and serious injury rate/kilometre) by classification	This will be benchmarked against other Council's data as the information becomes available.	ONRC Outcome measure	N/A

	Personal Risk (fatal and serious injury rate/vehicle kilometres travelled [VKT])	This will be benchmarked against other Council's data as the information becomes available.	ONRC Outcome measure	N/A
Objective : Value For Money				
Outcome	What we will measure	How we will measure	Type of measure	
Efficiency	Total Cost/lane km by classification for sealed and unsealed roads maintenance and renewals, benchmarked against other Councils.	This will be benchmarked against other Council's data as the information becomes available.	ONRC Outcome measure	N/A
	Cost/VKT by classification for sealed and unsealed roads maintenance and renewals, benchmarked against other Councils.	This will be benchmarked against other Council's data as the information becomes available	ONRC Outcome measure	N/A
	Number of requests for service received from customers.	Number of public calls per annum recorded in the RAMM Contractor database.	Reported in quarterly report	N/A
	% of requests responded to within 10 working days.	% of public calls responded to within the required timeframe as recorded in the RAMM Contractor database.	DIA and LTP measure	≥90%
	% of budgeted capital works completed annually.	% of budget spent, and % of programmed minor improvement, rehabilitation, resurfacing, and metalling sites completed.	Reported in quarterly report	N/A

	% of sealed road network that is resurfaced.	The length of sealed road that is resurfaced annually (as a % of the total sealed road length).	DIA and LTP measure	>3.9%
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Table 2.3 Measures and Reporting Mechanism

2.7 What We Will Provide and Our Current Performance

RELIABILITY

This relates to the consistency of service that users can expect and managing the impact of planned interruptions.

OUR OBJECTIVE

Council will

- Provide increasingly consistent Levels of Service
- Advise customers of interruptions to service, and when service will be restored
- Plan and deliver works that will improve reliability and resilience of the network

CURRENT PERFORMANCE

The ONRC outcome measure for Travel Time Reliability relates to traffic throughput on arterials and higher classification roads in metropolitan areas. The ONRC measure for this does not apply to the Central Otago District Council network.

Central Otago District Council also reports the average length of time to issue a consent for access to a road, measured as the average number of days taken to manage each enquiry under several of our Roading Services procedures. This includes issuing Corridor Access Requests (CAR's) and approving Traffic Management Plans (TMP's). Currently this performance measure states that consents will take less than two days, on average, to process.

This performance measure is being met consistently, despite a huge increase in the number of consents issued in the last five years. The total numbers of consent applications received in each of the last three years have increased on average by 50% each year.

Type of Consent	Number of Applications Received				
	2015/16	2016/17	2017/18	2018/19	2019/20
Traffic management plans	112	124	234	323	259
Corridor access requests (CARs)*	148	245	587	889	650
License to occupy	33	23	33	25	18
Yard encroachment	12	22	31	3	5
Vehicle crossings	63	116	60	42	50
Generic traffic management plans	23	21	30	19	31
Road closures	6	6	9	10	17
Total for Financial Year	397	557	984	1311	1030

Table 2.4 Roading Consents Processed in the Last Five Years

Average response times throughout 2019/20 remained well within the two-day target, despite the huge growth in application numbers. New systems introduced for the start of the 2018/19 Financial Year enable the large volumes of Traffic Management Plan and Corridor Access Request approvals to be managed efficiently.

Council also measures reliability of the road network by monitoring road closures and measuring the proportion of the network that is unavailable in certain conditions, or inaccessible to heavy vehicles. This is covered in the “Resilience” section, below.

WHAT ARE WE DOING?

Planned Activities on the Network

The Council’s Rooding Policy was adopted in February 2014. It is currently under review during 2020. The purpose of this Policy is to enable Council to manage the activities of landowners and individuals when these affect the operation of the road network.

The Rooding Policy has different requirements depending on the classification of the road on which the activities are taking place.

Traffic Management Co-ordination

Council and the rooding contractor, Fulton Hogan, will co-ordinate traffic management with Waka Kotahi NZTA when there are temporary road closures for planned works or unplanned events (covered more under resilience).

Public Information Regarding Events and Impacts on Journey Time

Where delays due to planned activities will exceed 20 minutes, information will be made available to customers at least 10 days beforehand using the following Public Notification Procedure:

- On Council’s webpage, Facebook page, and Twitter account
- To other local media outlets (including social media applications)
- By email to the appropriate Community Board members and all Councillors
- By email to emergency services
- By email to other identified stakeholders (schools, major employers, freight companies, etc.)
- At the site of the planned works (local letter drops, door-to-door visits and temporary signs) where practical.

A letter drop will also be undertaken where work will impact customers using roads where there is no practical alternative route.

Where a change occurs to the delays resulting from a planned event on our Arterial, Primary Collector or Secondary Collector routes, Council will disseminate information regarding this change within 60 minutes of becoming aware of the incident via the above methods.

Information for School Bus Routes

The council, the Ministry of Education and GoBus worked collaboratively in 2018 and 2019 to ensure that new data for every school bus route in Central Otago was transferred into Central Otago District Council’s rooding Asset Management System, RAMM. School bus operators are now required to use data collection systems on their vehicles, which includes GPS tracking for route management. The rooding team are now able to identify roads used by school buses alongside other information about our network. We use this information in planning and responding to issues. This data will be updated on an annual basis, as a minimum.

Liaison will be undertaken with the school bus operators for work on rural roads and bridges, or in relation to work or road conditions on school bus routes. The council and it’s rooding contractor have ensured that the school bus operators now have access to the winter road condition reports managed for the District.

Network Management and Activity Management Planning

Central Otago District Council and Fulton Hogan both use the same Asset Management System (RAMM) to collect and maintain network information. During the 2018-21 AMP period, accessibility to this information has been improved.

The council adopted the Submitica Control tool, which creates all Corridor Access Requests and records planned network events in RAMM, in 2018. This information can be easily used and combined with other roading data. Central Otago has also implemented information and activity management processes using RAMM 'Road Status' tools developed by the Tararua Alliance team, which can currently be used by both the roading team and the council's roading maintenance contract staff. This is covered more under resilience.

Fulton Hogan has worked with the council to improve access to the Contract Workspace system they use. This gives officers greater visibility of information we manage for our roading network and work programme, using the same RAMM data.

RESILIENCE

This objective relates to our preparedness for emergency or weather events, and the availability and restoration of the road following an event. Resilience also includes provisions for making alternative routes and public information available, linked to our reliability outcomes. Climate change forecasts for Central Otago indicate that high intensity rainfall events will increase in the future, along with greater extremes of summer and winter weather, impacting on our Infrastructure Services delivery.

OUR OBJECTIVE

Council will:

- Ensure we are prepared for response to incidents and emergency events.
- Maintain and manage Resilience Plans and Emergency Response Plans.
- Keep customers informed during events.
- Restore services as soon as circumstances allow.
- Provide alternatives when feasible.
- Carry out mitigation to avoid disruption for critical services where appropriate.

CURRENT PERFORMANCE

The ONRC outcome measure for resilience reports the number of journeys impacted by unplanned events. This measure is calculated by Central Otago District Council by:

- Maintaining a 'live' dataset of roads impacted by closures or other events which significantly affect road access, and when they are re-opened.
- Multiplying the Annual Average Daily Traffic (AADT) on affected roads by the period the roads are closed. This gives the average number of vehicles that would have travelled on the road over the length of the closure.

Currently the performance measure is to achieve less than 16,423 impacted journeys a year – which was calculated from the estimated effects of historical closures across our network.

Data collected over the last 4 years, and earlier anecdotal knowledge, indicates that journeys on the network have not suffered significantly due to resilience issues. Resilience issues that have occurred usually result from heavy rain events coinciding with existing high river flows. This can result in roads being flooded, washed out or impacted by landslips. Extreme winter weather can also have a significant effect on our network.

Central Otago District Council did not achieve the performance measure target for impacted journeys in 2018/19, after a series of major flooding events. These occurred in the winter of 2017 from rain and snowmelt, a localised extreme rainfall event in Roxburgh in November 2017 and in February 2018 and November/December 2018 due to District-wide extreme rainfall. The most recent of these four flooding events impacted a large area of the Manuherikia and Maniototo valleys, resulting in closure of sections of the Ida Valley Omakau Road, Ranfurly Patearoa Road and Saint Bathans Loop Road for approximately 6 days (impacting on an estimated 4,800 journeys).

Council has set itself an internal target of ensuring that rural Primary Collector roads will be robust enough to ensure they are available 95% of the time, or a viable alternative will be provided. Similarly, where a critical risk is identified which cannot be mitigated, then an alternative route will be provided. These routes have been identified within the council's Infrastructure Resilience Plan and Infrastructure Response Plan, discussed below.

Number of Journeys Impacted by Unplanned Events

Financial Year	Number of journeys affected (by ONRC Hierarchy)					
	Arterial	Primary Collector	Secondary Collector	Access	Low Volume	Total Impacted Journeys
2016/17	0	0	0	1992	742	2734
2017/18	0	46	2994	6058	5357	14455
2018/19	0	660	7346	7265	3837	19108
2019/20	0	0	0	1660	67	1727

Table 2.5 Resilience Customer Outcome Measure 1 and 2

WHAT WE ARE DOING

Planning for Resilience

Council's Infrastructure teams have recently completed nearly three years of work to have a Climate Change Implications study, an Infrastructure Resilience Plan, and an Infrastructure Response Plan in-place at the end of the 2019/20 Financial Year for the Central Otago District.

The Infrastructure Resilience Plan and Infrastructure Response Plan have been prepared to ensure that information is available to:

- Manage responses for a range of scenarios that will impact on infrastructure assets and services
- Undertake hazard assessment – using hazard maps with asset mapping and data to identify which assets are most exposed to these hazards
- Identify assets which are most critical to service delivery and need to be inspected and restored as a priority if affected. This includes an initial assessment of options for backup or maintaining a minimum level of service.



The potential risks and vulnerabilities to infrastructure services that could arise from a range of natural disasters are now documented. This includes identifying where critical asset failures could occur and options to prepare for future challenges resulting from Climate Change.

Mitigations can include investing in work to either reduce or eliminate the risk of a hazard to assets or developing monitoring and mitigation plans to minimise the consequences of asset failures. Both plans provide information on specific assets or areas within the District that are being investigated to improve infrastructure resilience.

The Infrastructure Resilience Plan identifies mitigation work for Central Otago's roading infrastructure. These will be scoped, priced, and prioritised for inclusion in the 2021-2030 Long Term Plan, 30-year Infrastructure Strategy, and the council's current Activity Management Plans.

Responding to Emergencies and Events

Information has also been developed to support the response to emergency events which impact infrastructure assets. The Infrastructure Response Plan and supporting information currently:

- Reflects the breadth, scale, likelihood and consequence of an event
- Reflects "lifeline" asset considerations
- Applies the council's asset hierarchies to planning and prioritising responses
- Identifies typical resource availability to respond to emergency events within the District

It can be used by staff across the organisation, the council's contractors and by Civil Defence Emergency Management personnel. Council will work collaboratively with the Otago Regional Council, our neighbouring Local Authorities and State Highway networks to ensure the plan is cohesive and customer focussed.

Informing Customers During Events

Information will be made available to customers as soon as possible after Council is made aware of an event or a change in travel conditions during an event. This will follow the Public Notification Procedure outlined in the "Reliability" section above. Customers will be kept informed of changes to the estimated time for access will be restored, and when the next update will be.

Restoration of Services

Council has reviewed and ensured that existing response procedures are documented in the Infrastructure Response Plan. Our plans have addressed the operational need to mitigate against the loss of institutional knowledge that supports our responses to emergency events by:

- Detailing plans for prioritisation of restoration work and access, depending on classification and route criticality.
- Providing plans for continuity of essential services, and to support people to be prepared until access is restored.

Both the Roothing team and Fulton Hogan have updated the council's plan for snow events which have the potential to restrict accessibility to homes and services. This establishes a plan where snow clearing is prioritised by road classification within each area. It has been reviewed to ensure the resources required to implement the plan are available.

For Low Volume Access Roads, clearing will only be undertaken to the gateway of the last house. The length of time taken to clear roads in a snow event varies depending on the duration and depths of the snowfall, and the area of affected. In a major district wide event it is expected that it may take up to 3 days to clear to the last house on all Low Volume Access roads. Landowners are expected to make their own arrangements for obtaining access to stock on roads beyond the last house.

The Otago Regional Council have been working with the District in resilience planning for moderate and significant events, including serious crashes that may lead to prolonged closure. The council also intends to incorporate information from the Otago Region and New Zealand Climate Change Risk Assessment when this becomes available.

It is intended that these plans are living documents which will be updated and managed as the single source of information for emergency response.

Planned Improvements Included in the 10 Year Plan

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Developing our response to resilience issues	We need to plan for and prioritise potential work, using our improved understanding of route vulnerability and criticality.	We will continue to develop the Infrastructure Resilience Plan in managing identified vulnerabilities and criticalities.	Maintain transport planning budget under Network management investment.
Managing our response, communications and restoration activities in the event of an emergency	Our documented procedures need to be socialised and integrated with a range of service providers and key stakeholders.	We will continue to develop the Infrastructure Response Plan that formalises the council's emergency response procedures.	Internal staff resources funded under Network management.
Mitigation of known risks on Primary Collector and Secondary Collector Roads, or alternative routes	The importance of these routes and their contribution to the resilience of the network is vital. The Infrastructure Resilience Plan informs the decision on any necessary future investment.	Work to assess the need for upgrade of alternative routes to provide additional resilience (for example on the Hawksburn Road) is underway.	Increases in operational and capital investment across unsealed roads, drainage and environmental maintenance roading Work Categories
Plan for alternative routes	A plan is required for alternative routes where mitigation is not possible.	We will work with neighbouring networks to ensure the Infrastructure Resilience Plan is cohesive and customer-focussed. The plan will identify local roads that are alternative routes for events on State Highways.	Internal staff resources funded under Network management.

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Risks of bridge failure due to inappropriate use or lack of condition information.	Unpermitted overloading may cause bridge collapse risking resilience, customer safety, and asset damage. Mobile cameras are used to monitor reported non-compliance with posted weight restrictions.	<p>Identification of structures requiring an increase in the current levels of service to permit heavy vehicle access is on-going.</p> <p>Strengthening, or replacement, of priority structures will be undertaken where feasible. Some structures will still require access controls or clear identification of alternative detour routes which are not significantly detrimental to economic productivity.</p>	<p>Internal Staff and Structural Consultants to complete priority structural assessments as part of an increased investment in Network management</p> <p>Increased investment in structures maintenance for 2021-24 AMP cycle.</p>

Table 2.6 Planned improvements included in the 10 Year Plan

SAFETY

This objective relates to the safety of travel on our network.

OUR OBJECTIVE

Council's objective is to reduce the likelihood of crashes occurring and the consequences if they do.

CURRENT PERFORMANCE

Safety on the Central Otago District Council's local roads is comparatively good, with the number of serious and fatal injury crashes on local roads remaining at a low level.

Crash data used for performance monitoring only includes crashes which result in fatality or serious injury.

The number of crashes on the Central Otago network which result in serious injuries or fatalities are typically too small when split by classification to develop a meaningful trend. The total number of crashes over a ten-year period, and the percentage of serious crashes where specific road user groups or environmental conditions have been linked to the crash, provide a more useful analysis. Information by classification is provided in this document for Waka Kotahi NZTA.

Over the past ten years, vulnerable road user crashes (specifically motorcycle crashes) have been a significant proportion of the total number of serious crashes and are trending upwards. Crashes at intersections are trending downwards. The number of crashes at night and during wet conditions have been very low.

In summary, crash numbers are remaining relatively static, despite increasing traffic on the network. Crashes involving motorcycles, impaired drivers, and single vehicle loss of control crashes on open, rural roads remain Central Otago's key safety issues.

Number of Fatal and Serious Injuries

Table 2.7 provides the number of fatal and serious injuries sustained from crashes on Central Otago District roads for the past ten years. Improvements in the crash data systems used nationally in New Zealand now allow these reports to be provided as both rural and urban serious crashes. The data now also accurately incorporates crashes that have occurred at intersections between Central Otago District Council local roads and State Highways. This was identified as a key improvement required in New Zealand's road safety data, both at a District-wide and National level.

Total number of Fatal and Serious Crashes – Urban Crashes						
Reporting Year	Arterial	Primary collector	Secondary collector	Access	Access (Low Volume)	Total
2009/10			1			1
2010/11	1	1		2		4
2011/12			3			3
2012/13		1		2	1	4
2013/14			2	1		3
2014/15				1	1	2
2015/16	1	1				2
2016/17			1	3		4
2017/18		1	2			3
2018/19		1				1
2019/20			1			1
Total number of Fatal and Serious Crashes – Rural Crashes						
2009/10			1	1	7	9
2010/11			6	1	5	12
2011/12			1	1	1	3
2012/13		1	1	1		3
2013/14			1	1	2	4
2014/15			3	2	1	6
2015/16		2	1	2	6	11
2016/17		2		3	7	12
2017/18			4	2	2	8
2018/19			2	2	4	8
2019/20				5		5

Table 2.7 Fatalities and Serious Injury Crashes (Safety Outcome Measure)

An analysis of serious and fatal crashes across rural Districts shows a declining trend over the past decade. Over the last five years the trend in our District also shows a declining number of serious crashes. 13 serious and fatal crashes occurred in 2015/16, with 9 occurring in 2018/19. Data for 2019/20 provisionally suggests that six fatal and serious crashes have occurred on the Central Otago District Council road network. Due to the low numbers of crashes, it is difficult to draw statistically significant conclusions.

Regardless of this, the continued improvement of road safety through reducing the likelihood and consequences of crashes remains as a high priority.

The records in RAMM list a total of 105 fatal and serious injury crashes on local roads within the Central Otago District for the ten year period. This is now aligned with the corresponding data from the NZTA Crash Analysis System database. The CAS system is the 'one source of truth' for vehicle crash data in New Zealand. A major upgrade to this system was completed in October 2018 and the information is now validated and accessible as part of our roading datasets in RAMM.

Collective Risk (fatal and serious injury rate per kilometre)

Collective risk is evaluated by dividing the number of fatal and serious injuries by the length of road in each classification. A value less than 0.032 represents a low collective risk, nationally. The Central Otago range of low for each classification is consistent with other rural local authorities in New Zealand.

Outcome Measure	Arterial	Primary collector	Secondary collector	Access	Access (Low Volume)
Length of network (km)	2.4 km *	25.3 km *	185.7 km	452.0km	1264.2 km
Collective Risk rating (ten years to 2018/19)	0.083	0.023	0.015	0.006	0.002
Rural Districts peer-group average	0.085	0.033	0.012	0.004	0.002

Table 2.8 Road Safety Collective Risk (Safety Customer Outcome Measure 2)

* Central Otago's District road network has a short length of roads classified as Arterial and Primary Collector roads. This results in a small number of crashes being over-represented in 'collective risk' calculations.

We have undertaken a comparison of the collective risk level for each of our road classifications against the results of the 'Rural Districts' peer group set by the ONRC, containing 26 Road Controlling Authorities and the Department of Conservation roading networks.

Personal Risk (fatal and serious injury rate by traffic volume)

Personal risk is evaluated by dividing of the number of fatal and serious injuries by the Vehicle Kilometres Travelled (VKT). It is reported in terms of risk per 100 million VKT's. The calculated exposure to risk is grouped within the following ranges.

Personal Risk (per 100 million VKT's)	Risk Assessment
< 4	Low
4 - < 5	Low-Medium
5 - < 7	Medium
7 - < 9	Medium-High
> 9	High

Table 2.9 Road Safety: Personal Risk Ratings

Council completed an update of the Traffic Estimates on the Central Otago District roads in 2016 to enable more accurate reporting of Personal Risk. This data has been maintained over the last four years to support planning and reporting activities by our traffic counting programme (See Section 3.10)

Outcome Measure	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
Vehicle Kilometres Travelled [VKT] (2016/17 data)	3.9 million	14.2 million	36.9 million	23.4 million	12.2 million
Personal Risk [per 100 million VKT's] (ten years to 2015/16)	5	5	14	11	18
Vehicle Kilometres Travelled [VKT] (2019/20 data)	4.2 million	14.6 million	36.7 million	22.7 million	12.2 million
Personal Risk [per 100 million VKT's] (ten years to 2018/19)	5.1	4.0	7.7	11.4	16.9
Personal Risk Range	Medium	Low-Medium	Medium-High	High	High

Table 2.10 Road Safety Personal Risk (Safety Customer Outcome Measure 3)

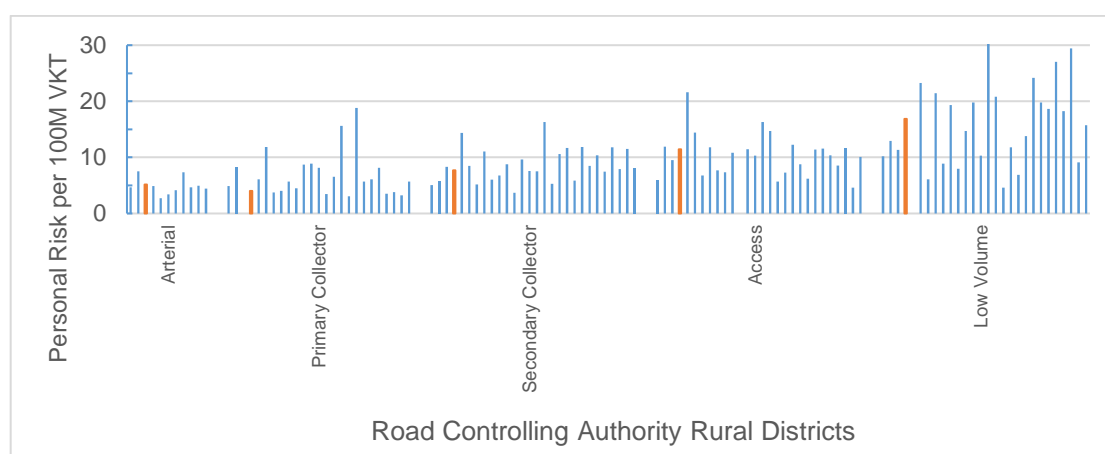


Figure 2.8 Road Safety Personal Risk Comparison for Rural Districts

Data currently suggests that there is a very slightly above-average risk of being involved in a serious crash on our rural Access Roads. Low Volume Roads are rated as being high risk as well, but at a lower level than our Rural Districts peer group.

Established data management systems, such as the ONRC Performance Measures Reporting Tool, enable us to compare data analysis directly for Central Otago's roading with other networks. The comparisons of data have indicated:

- The level of personal risk on our road network is remaining stable or decreasing (Table 2.10).
- The safety performance of our road network is typically in-line with our peer group (Figure 2.7).

This insight would have been previously undetected through traditional road safety data. As this is still a relatively new method of analysing and comparing network-wide safety performance, further work to understand this above-average risk rating is included within the Improvement Plan for the 2021-24 AMP period.

Vulnerable Users (Pedestrians, Cyclists and Motorcyclists)

The number of serious injuries or fatalities for vulnerable road users are too small when split by classification to develop a meaningful trend. Over the past five years vulnerable road user crashes (specifically motorcycle crashes) have been a significant proportion of the total fatal and serious injuries (25% to 30% on average each year) and are remaining at this level despite specific focus on this group of road users at a local and national level.

Vulnerable Road Users - Fatal and Serious Injuries (DSi)								
Reporting Year	Vehicle Type	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)	Total	% of Crashes
2009/10	Bicycle		1				1	8.3
	Motorcycle					1	1	8.3
2010/11	Bicycle	1					1	6.7
	Motorcycle			3	1	2	6	40
	Pedestrian				1		1	6.7
2011/12	Motorcycle (Moped)			1			1	14.3
2012/13	Bicycle					1	1	12.5
	Motorcycle			1	2		3	37.5
2013/14	Bicycle			1			1	14.3
	Motorcycle			1		1	2	28.6
2014/15	Motorcycle			2	3		5	55.6
2015/16	Motorcycle		2	1		3	6	37.5
2016/17	Motorcycle			2	2	2	6	30
	Pedestrian			1			1	5
2017/18	Motorcycle		1			1	2	15.4
2018/19	Motorcycle				1	1	2	18.2
2019/20	Motorcycle				2		2	33.3

Table 2.11 Fatal and Serious Injury Crashes involving Vulnerable Road Users (Safety Technical Output 9)

Crashes at Intersections

Crashes resulting in death or serious injury at intersections have reduced significantly over the past 5 years, despite increases in traffic volumes across our network.

Intersections - Fatal and Serious Injuries (DSi)							
Reporting Year	Arterial	Primary collector	Secondary collector	Access	Access (Low Volume)	Total	% of Total Crashes
2009/10		1				1	12.5
2010/11	1		2	1	1	5	41.7
2011/12			1		1	2	50
2012/13					1	1	16.7
2013/14			1	1		2	33.3
2014/15						0	0
2015/16	1					1	11.1
2016/17						0	0
2017/18		1		1		2	22.2
2018/19		1				1	11.1

Table 2.12 Fatal and Serious Injury Crashes at Intersections (Safety Technical Output 6)

Loss of Control Crashes in Wet Conditions and at Night

The total number of fatalities and serious injuries sustained on the Central Otago network in wet conditions and at night (Safety Technical Outputs 4 and 5) are too small to develop any meaningful trend. Since July 2009 there have been:

- Two night-time serious crashes in urban areas
- A total of five serious crashes on Access roads and Low Volume Access roads during wet conditions.

Recent crash data from the 2017/18, 2018/19 and 2019/20 Financial Years may indicate there is an emerging issue with crashes on rural Secondary Collector roads and Access roads at night resulting in an increase in deaths or serious injuries. This is shown in Table 2.13. These crashes have been investigated further using the full data available in the Crash Analysis System (CAS) database. Nine out of these 11 fatal and serious crashes (82%) have been recorded in as involving impaired drivers.

These crash types represent most Loss of Control, Run-off road and Head-on crashes on the Central Otago District Council roading network.

Loss of Control at Night – Rural - Fatal and Serious Injuries (DSi)						
Reporting Year	Primary collector	Secondary collector	Access	Access (Low Volume)	Total	% of Total Crashes
2009/10					0	0.0
2010/11				2	2	18.2
2011/12					0	0.0
2012/13					0	0.0
2013/14			1		1	20.0
2014/15					0	0.0
2015/16					0	0.0
2016/17					0	0.0
2017/18		1	3		4	50.0
2018/19		3			3	37.5
2019/20			4		4	33.3

Table 2.13 Fatal and Serious Injury Crashes at Night on Rural Roads (Safety Technical Output 5)

WHAT WE ARE DOING

Waka Kotahi Safe Network Programme

The Safe Network Programme (SNP) is a collaborative initiative that aims to save up to 160 deaths and serious injuries every year across New Zealand's highest risk state highways and local roads. The assessment tool used to recommend projects for the SNP "pipeline" of work has been available to Road Controlling Authorities since June 2020. Sites have been identified for the entire country, where safety improvement works would provide the most benefit to overall road safety.

Central Otago has sites on State Highway 8, State Highway 8B and State Highway 6 which are prioritised by Waka Kotahi NZTA for safety works.

The local road network in Central Otago currently has only one site, located on Ranfurly Patearoa Road, that is shown as a "High Benefit Opportunity". Roding staff are working with the Safe Network Programme team to develop the tool in conjunction with the council's Speed Management work.

Speed Management

The Speed Management Framework and the Setting of Speed Limits Rule underwent a significant change in 2017. The process for recommending new speed restrictions for community consultation is now linked with an assessment of roads where changes could make the biggest difference in preventing deaths and serious injuries, and where communities are calling for change. Speed limits need to reflect the risk on each road. Speed increases both the likelihood of crashes and the severity of crash outcomes, regardless of what causes a crash.

The council completed a review of the "Safe and Appropriate Speeds" recommended across the Central Otago District local roading network during 2018 and 2019. The NZTA is currently due to review State Highway speed limits across Central Otago in 2021, which include key routes through our townships.

The Council expects to prepare a new Speed Limit Bylaw for Central Otago during 2020 and 2021, which needs to be subject to public consultation before enacting any changes.

Permanent Hazards and Delineation

The council's aim is for all permanent hazards to be marked consistently across our District and be consistent with the statutory requirements and guidelines applicable across all of New Zealand. Roadside delineation is provided in accordance with the NZTA Guideline for Rural Road Marking and Delineation (RTS 5). Further detail regarding exactly what is provided by road classification is included in Section 6.

Council provides specific warning signs and hazard markers for all "out of context" hazards on Primary Collector and Secondary Collector roads in accordance with guidelines contained in the Manual of Traffic Signs and Markings (MOTSAM). Generic warning signs are provided and identified "out of context" hazards are marked, on Access and Low Volume Access roads.

"STOP" and "Give Way" controls are installed on all intersections on Arterial, Primary Collector, Secondary Collector and sealed Access Roads in accordance with the requirements of the Traffic Control Devices Rule and MOTSAM guidelines. Intersections on all gravel Access Roads are controlled with give way signs. Intersections on Low Volume Access Roads may be un-controlled in urban areas and only have controls in rural areas if there is a perceived problem.

Waka Kotahi NZTA began a consultation process on proposed changes to Part 5 of the Traffic Control Devices Manual (TCD) covering road markings and signage between intersections in June 2018. Road Controlling Authorities, traffic and transport practitioners and road user groups have been asked for feedback prior to finalising the document. The aim is to ensure the application of traffic control devices and road markings is fit-for-purpose and nationally consistent for those using the road network. Central Otago District Council have made a detailed submission as part of this consultation.

Identification of Temporary Hazards

The council requires Traffic Management to be installed at all work sites within our road corridors throughout the Central Otago District. All Temporary Traffic Management is in accordance with the NZTA Code of Practice for Temporary Traffic Management (CoPTTM). Temporary hazards, once identified, are also managed in accordance with this code.

Council's Roding staff have only undertaken Traffic Management surveys and audits in the past when issues have been raised. Network Management budgets have been increased to enable an additional entry level position to assist in proactively managing health and safety on the network.

Sight Distances and Visibility Requirements for Road Users

The level of service expectation is that sight distance (including visibility of hazard warning devices) is not obscured by vegetation or by unauthorised obstructions (advertising signs, etc.)

Measure	Performance in 2014/15				
	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
% audited	100	9.5	10	10	10.3
% of roads which comply	100	100	100	85.2	82.5

Table 2.14 Sight Distance and Roadside Obstructions (Safety Technical Outputs 3 and 10)

The target is 100% compliance. Council increased the funding provisions in the 2015 LTP to enable the level of service gap between what is currently provided and what is expected under the ONRC to be addressed in the most cost effective manner available. Further detail regarding this is contained in Section 8. At the time of the audit the roads had just been mowed. Future audits need to be undertaken prior to mowing and spraying.

Roadside Obstructions

The council's level of service is for roadside safety zones (sometimes referred to as "clear zones") remain free from unauthorised obstructions and the creation of new hazards.

Council's Roding Policy defines the requirements for locating fences, gates and temporary storage within the road reserve. It also includes policies which regulate temporary signs and street furniture within urban areas. The council's District Plan includes planning rules which apply to the installation of signs across the District, including within and adjacent to the road reserve. The Policy takes a risk-based approach and the requirements for clear zones from the edge of the carriageway vary depending on the road classification. Council has adopted a Roding Bylaw that enables effective enforcement for non-complying activities we consider are detrimental to road safety.

Street Lighting

The level of service expected is that lighting will be provided, and maintained, in a consistent manner. The aim is to support safe movement and provide personal security for road users.

Council completed the replacement of most of the aging fluorescent, mercury vapour, and high pressure sodium lights on the network with LED lights between July 2017 and June 2019. Many of the old lights were unreliable and no longer provided adequate light output to meet customer levels of service. More details of the street lighting assets owned and maintained by the council are included under Section 5.8 and Section 6.10.

Safe Road Use

The NZTA publish crash data for each Territorial Local Authority, grouped under a range of “driver” and “environmental” crash cause factors, in the Communities at Risk Register. This categorises the risk of being involved in a fatal or serious injury crash on Central Otago District roads as being below average, when compared with the Personal Risk levels for each Territorial Local Authority across the country.

This document does identify specific crash type descriptions, which are over-represented in the fatal and serious injury crashes on our network. These are:

- Rural road loss of control and/or head-on crashes – High strategic priority
- Crashes involving young drivers aged 16-24 – High strategic priority of high concern
- Crashes where the driver was distracted – Medium strategic priority of high concern
- Crashes involving motorcyclists – High strategic priority

Rural road crashes on open sections of our District network are identified as a “High” priority for the council. There have been 20 fatal and serious injury crashes of this type on Central Otago District Council local roads, resulting in 43 casualties, between July 2009 and June 2020. Reviewing these crashes alongside other crash factors shows:

- All 20 crashes occurred at night, and only one was in a location with any street lighting
- 17 of the 20 crashes records ‘driving too fast for the conditions’ as a potential crash factor
- 17 of the 20 crashes records alcohol and/or drug impairment as a potential crash factor
- 13 of the 20 crashes records that seatbelts not being worn were a potential crash factor (11 crashes involved vehicles where seatbelts would have been available)
- 12 of the 20 crashes records that at least one passenger was travelling in the vehicle(s)
- 24 of the fatalities and serious injuries (out of a total of 43) for this crash type involved people aged between 15 and 29.
- Three of the twenty crashes involved an overseas driver
- Two of the twenty crashes involved motorcyclists

Council provides a Community Road Safety Education program. This is targeted at projects which:

- a) Meet the criteria of the Government’s Road to Zero Road Safety Strategy;
- b) Address road safety issues associated with crash risk groups identified as having a ranking above the mean in the NZTA Communities at Risk Register 2019 within the Central Otago District; or
- c) Identify types of crashes and possible mitigation measures of specific concern within Central Otago District in this Activity Management Plan.

More details are included within Section 6.

Surface Friction

Sealed road surface friction is measured every three years on all Primary Collector and Secondary Collector and Access roads which are showing signs of deterioration.

Council is using survey information from High-Speed Data collection – carried-out by a highly specialised testing vehicle that travels the whole of New Zealand’s sealed road network - to monitor sealed surface friction deficiencies in high-risk locations such as intersections, curves and pedestrian crossing approaches.

Sealed roads are kept clear of loose gravel, with monthly inspections and sweeping on Primary Collector roads, and quarterly inspections and sweeping on Secondary Collector and Access roads.

Ice Management

Due to our extreme winter climate, there is a risk of ice forming on all roads within the District. However, when ice forms on sealed roads it has more of an impact on surface friction than when it forms on unsealed roads. Ice is a hazard at locations where braking occurs and on certain road surfaces (such as bridge decks and through cuttings). Ice also presents increased risks of serious crashes on Central Otago’s open rural roads, where travel speeds are higher.

Council’s ice management regime is risk-focussed. Routine ice management is undertaken on all sealed Arterial roads and on Primary and Secondary Collector Roads with a focus on corners, intersections, and bridges. Access roads are only treated at sites where it is known that ice forms regularly.



Guardrails and Barriers

All traffic-restraining devices such as bridge side rails, guardrails, wire rope barriers and crash cushions are inspected and maintained in an effective operating condition. Works are programmed under existing Traffic Services budgets, or when Council becomes aware of damage that represents an immediate risk to road users.

Inspections of all bridges are undertaken on a three-year cycle. Barriers and railings on these bridges are inspected and programmed for repair as part of this activity.

A full inventory audit and condition assessment of the District’s roadside guardrails and barriers was completed in 2017. Work to address deficiencies identified will continue being programmed and prioritised in the 2021-24 AMP cycle.

Planned Improvements Included in the 10 Year Plan

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Permanent hazards and delineation	Permanent hazards will be marked consistently across New Zealand	Council complies with existing national standards, but will be implementing sign replacements identified in NZTA Technical Audit	Increase traffic services renewals investment levels, offset by reductions in street lighting costs.
Management of road work sites	Due to resource constraints, we do not currently conduct routine audits of Temporary Traffic Management sites, unless we are notified of an issue.	Two additional entry level positions have been added to assist in proactively managing temporary hazards and health and safety on the network.	Increase Network Management Budget
Street lighting	Lighting will be provided, and maintained, in a consistent manner to support safe movement and provide personal security	Re-procurement of the council's streetlighting maintenance and energy supply arrangements are planned for the 2021-24 AMP period.	Cost neutral – offset by reduction in street light energy and maintenance costs following LED upgrades.
Safe road use	Areas of concern have been identified from the NZTA Communities at Risk Register, and the council's own analysis.	Re-visit the elements of our community road safety education and awareness program which targets identified areas of concern and develop appropriate delivery options.	Establishing a deliverable and sustainable level of community road safety investment.
Surface friction	2019 survey information on our busiest rural roads identifies few problem areas, which are at or below national targets for skid resistance levels.	Council continues to deliver an optimised sealed roads resurfacing programme, which is based on acceptable network levels of service.	Increase sealed roads resealing investment.

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Roadside obstructions and sightlines	New Rooding Policy and Bylaw takes a risk-based approach by classification to defining requirements for location of fences, gates and temporary storage within the road reserve.	Auditing of unauthorised obstructions will be included in the 10% sample of each classification, planned for the 2021-24 AMP period.	Increase network management and environmental maintenance budget
Introduction of the Speed Management Framework and Safer Network Programme	There are a number of locations within the District where speed limits are not appropriate for the current environment and are inconsistent with national requirements.	Speed Limit reviews have been undertaken in accordance with the 2017 Rule changes in 2019. Speed Limit Bylaw drafting and consultation is planned for 2020/21.	Increase network management budget Increase Traffic Services and Low Cost Low-Risk Improvement budgets to support "High Benefit" sites implementation.

Table 2.15 Planned improvements included in the 10 Year Plan

ACCESSIBILITY

Accessibility relates to the ability and ease of accessing our networks. This includes land accessibility, and access to roads for services and public events. It also involves ensuring that our road surfaces are adequate to enable the required level of access by different types of vehicles in most weather conditions.

OUR OBJECTIVE

Council will:

- Manage infrastructure assets and services to ensure accessibility for all users wherever possible.
- Provide customer-focussed processes for those requesting access.

CURRENT PERFORMANCE

Issuing Consents to Work in our Road Corridors

The response time to issue consents for access to the transport corridors by utility providers and contractors is very good, with the time to issue consent for access averaging between one to two days. Central Otago District Council sets its own target of two days, against the national Code of Practice measure of five working days.

Measure	5-Year Performance consent processing times for Corridor Access Requests				
	2015/16	2016/17	2017/18	2018/19	2019/20
Average length of time to issue a consent for access to a road.	<1 day	2 days*	1.5 days	1.5 days	1 day

* SiteWise requirement (or exemption) for all Contractors working in the road was introduced in July 2016. This has impacted on response times for this period.

Table 2.16 Processing Times for Consents to Work on Roads

Heavy Vehicle Access

Accessibility issues on the Central Otago network are due to either bridge capacity not enabling heavy and over-dimension vehicles to safely cross some structures, or where wet or freeze/thaw conditions can result in level of service failures on a minority of unsealed roads.

Class 1 and 50 max vehicles are able to access most of the network, except where:

1. Two bridges on our network prevent access to High-Productivity Motor Vehicles (HPMV) and 50 Max vehicles, where this may impact on freight connections. These are the Green Bridge (Waipiata) and Paerau Bridge. Structural investigations are underway to identify the work required to upgrade these bridges.
2. 5% of Low Volume Access Roads (excluding Tracks) are unable to be traversed year-round due to variability in the road conditions during and following extreme weather.
3. Most Tracks are not accessible during wet weather. Tracks make up 37% of the Low Volume Access Roads (by length).

The following tables only include deficiencies relating to bridge capacity and access for heavy vehicles (High Productivity Motor Vehicles and 50Max) to our 'Tracks'. The table does include the maximum detour length that heavy vehicles must comply with as part of the Cromwell (*) and Clyde (**) heavy vehicle restrictions. These were established during the 2017/18 Financial Year, in consultation with the community, business owners and freight operators.

Outcome Measure	Performance in 2017/18 length of road inaccessible to Heavy Vehicles				
	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
Length not accessible to Class 1	0.0% *	0.0% **	0.0%	0.0%	4.7%
Max Detour (one way) to achieve Class 1 access	6.2 km * (SH8b and SH6 to McNulty Road, Cromwell)	22.2 km ** (Earnsclough Road and Alexandra to Clyde via SH8)	0 km	0 km	No viable alternative available (Paerau Rd Bridge 155)
Length not accessible to 50Max	0.0% *	0.0% **	9.2%	4.8%	14.1%
Max Detour to achieve 50Max access	6.2 km *	22.2 km **	16.5 km (Roxburgh Bridge Restriction - Roxburgh to Roxburgh Dam and back via SH8)	50.5 km (Millers Flat Bridge Restriction - Millers Flat to Roxburgh Dam and back via SH8)	No alternative available (Paerau Rd Bridge 155) No access to 'Tracks' sub-classification

Table 2.17 Proportion of Network not Available to Heavy Vehicles (Accessibility Customer Outcome Measure 1) – 2017/18 Performance

Work completed by the council in 2017/18 and 2018/19 has ensured that heavy vehicle access is now available throughout the Teviot Valley. Work at the Jedburgh Street bridge in Roxburgh has allowed us to remove the posting and 30km/h speed restriction for vehicles. We have also been able to remove the posting on the Millers Flat Road bridge and complete the deck resurfacing works, following structural review of the structure. Both of these bridges can now be accessed by all vehicles, with the exception of Overweight vehicles requiring individual permits to travel.

Outcome Measure	Performance in 2018/19 length of road inaccessible to Heavy Vehicles				
	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
Length not accessible to Class 1	0.0% *	0.0% **	0.0%	0.0%	4.7%
Max Detour (one way) to achieve Class 1 access	6.2 km * (SH8b and SH6 to McNulty Road, Cromwell)	22.2 km ** (Earnsclough Road and Alexandra to Clyde via SH8)	0 km	0 km	No viable alternative available (Paerau Rd Bridge 155)
Length not accessible to 50Max	0.0% *	0.0% **	0.0%	0.0%	14.0%
Max Detour to achieve 50Max access	6.2 km *	22.2 km **	0 km	0 km	No alternative available (Paerau Rd Bridge 155) No access to 'Tracks' sub-classification

Table 2.18 Proportion of Network not Available to Heavy Vehicles (Accessibility Customer Outcome Measure 1) – 2018/19 Performance



Level of Service for Accessibility Issues due to Road Surface Conditions

	Performance in 2016/17					
	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)	Tracks
Target Value	0%	100%		95%	95%	95% (for May to September)
% length of road where vehicles of any type could traverse the route at an appropriate speed.	0%	100%				Not available**

* Length of road with accessibility ranking as “High” (see section 5.3 Condition of Unsealed Roads)

** Inspections of tracks will be undertaken over the summer in 2020/21. These inspections will provide the data to complete the table.

Table 2.19 Proportion of Network Surface Which is Adequate to Allow Travel in Wet Conditions

Level of Service for Footpaths

Council uses a roughness measuring device mounted on a mobility scooter to measure the roughness of footpaths. This presents roughness as an approximate International Roughness Index (IRI). This is then given an asset condition rating equivalent. These ratings have been reviewed during full network surveys during the summer of 2018 and 2020.

Condition	IRI
Excellent	< 2
Good	2.0 - < 4.5
Fair	4.5 - < 7.5
Poor	7.5 - < 9.5
Very Poor	> 9.5

Table 2.20 International Roughness Index (IRI) and Footpath Asset Condition Rating

Condition Survey Year	Adjusted IRI = 0.6 -7.5 (based on 2020 Survey Range)
Target Value (based on Resident Opinion Survey)	80% Fair or better
2015/16	86% Fair or better
2017/18	86% Fair or better
2019/20	84% Fair or better

Table 2.21 Approximate IRI and Target Performance

Central Otago District Resident Opinion Survey – Accessibility Measures

Council undertakes an annual resident satisfaction survey (the Resident Opinion Survey, discussed in Section 2.5). The following table provides the level of satisfaction recorded for the council’s transport activities relating to accessibility:

Performance - Resident Opinion Surveys							
% of residents satisfied	2014	2015	2016	2017	2018	2019	2020
Customer satisfaction with provisions made for cyclists	85.2	88.2	- *	-	-	-	
Customer satisfaction with footpath facilities	77.7	79.4	87	83	79	78	78
Customer satisfaction with car parks (and car parking)	87.7	88.8	89	80	83	83	83

* Measurement of satisfaction for provision for cyclists was removed from the survey questionnaire in 2015.

Table 2.22 Resident Opinion Survey Accessibility Satisfaction Results

These levels of satisfaction are remaining consistent in the face of significant demographic change and modal shift. Far more people in Central Otago are walking, cycling and using other non-vehicular forms of transport (eg. mobility scooters) on our network. This results in a big increase in the use of our footpaths and cycleways. Expectations for the quality of these assets are also rising, driven by three main factors:

- the needs of our communities (vulnerable road users requiring high-quality access)
- the growth in cycling numbers in the Central Otago district
- high amenity footpaths and walkways becoming more prevalent in local residential developments

This is covered further under Section 3.

WHAT WE ARE DOING

Utilities Access to the Network

The council has adopted the National Code of Practice for Utility Operators Access to Transport Corridors. This same process is also used for authorising access for private services within the road corridor.

The ability to locate privately owned services - such as irrigation infrastructure - within the road corridor is important to the economic prosperity of the District. A deed of grant is issued for private services which provides a legal agreement for these private assets to be located within the road reserve.

The length of time taken to issue a consent for access to the road corridor is recorded. The time taken typically averages between 1 and 2 days, with the target being within 5 working days. The ability to manage this quick turnaround consistently, despite the massive growth in applications for Corridor Access Requests, is as a result of having experienced Roding Services staff and streamlining of internal processes. Central Otago District Council began using the RAMM Submitica Control and Before-You-Dig systems for approving all applications to work in the road corridor during the 2017/18 Financial Year.

Heavy Vehicles, HPMV and 50Max Access

The use of heavy vehicles (up to 100% Class 1), 50Max and High Productivity Motor Vehicles (HPMV) within Central Otago is important for the economic prosperity of the District, as all freight is transported in and out of the District by road.

Council has approved access to 50Max vehicles over the whole of the Central Otago District road network. The only limitations for these vehicles is the capacity of some bridges, the heavy vehicle restrictions on some urban streets in Cromwell and Clyde, and the standard of the surface on Tracks.

Consent is provided for HPMV access on application. The only current limitations to HPMV access are the same as for 50Max. There are restrictions covering the use of Urban Access and Low Volume Access streets when there is an alternative Collector route available.

A heavy vehicle restriction is in place for part of Barry Avenue which is the only Arterial road within the District. A heavy vehicle restriction is also in place for the historic precinct area in Clyde. Alternative access is available via the State Highway network.

The Vehicle Dimensions and Mass (VDaM) Rule 2016 has been revised to increase in the "100% Class 1" Gross Vehicle Mass limit to a maximum of 46 tonnes, replacing the previous maximum weight of 44 tonnes. The capacities of the Central Otago bridge network were reviewed and changed as required to reflect the new Rule. This required the assessment of existing bridge restrictions, and other bridges identified by screening, to be undertaken before December 2017. This work supported the completion of structural upgrades and changes to management practices at the Jedburgh Street bridge at Roxburgh and the Millers Flat Road bridge.

Structural investigations are currently underway to identify what work will be required to upgrade the Patearoa Road "Green" Bridge at Waipiata (Bridge 140) for 50Max and HPMV. Multiple detours are available for this historic structure, the shortest is 13.6km via O'Neill Road and Ranfurly-Patearoa Road. The route is used by freight for a range of agricultural purposes.

In order to calculate the length of road which is not accessible to Class 1 or 50Max vehicles, the roads which have bridge restrictions and no other feasible alternative route were identified. The only bridge which falls into this category is Bridge 155 on Upper Taieri-Paerau Road. Where there was an alternative route, the length of detour was identified.



Overweight and Over-Dimension Vehicles

Very large or very heavy vehicles (assessed by both Gross weight or axle weight) are potentially able to travel on parts of the Central Otago District Council roading network, supporting our aim to deliver improved freight connections. All applications are made directly to the council and are processed at no cost to the applicant. The council has operated a list of “Designated Overweight Routes” since 2015, which can be issued for individual vehicles with appropriate notes and exclusions. Overweight vehicles can also be permitted for specific single or return trips on identified roads, on a case-by-case basis. The council typically issues around 80 Overweight Permits a year.

Maintaining the Network

The surface of Arterial, Primary Collector, Secondary Collector and sealed Access roads will be maintained to allow safe travel at an appropriate speed for all classes of vehicles, all of the time. The target for unsealed Access roads and Low Volume Access roads is that the surface will be maintained in an equitable and affordable manner - that allows reliable travel at a safe and appropriate speed - 95% of the time.

For unsealed Access and Low Volume Access roads (making up 72% of the Central Otago roading network) the maintenance of the surface to maintain accessibility is managed using the unsealed road hierarchy. Grading frequency is managed using a set programme which can be adjusted where roads begin to develop rough sections or result in increased customer calls, described in Section 6.6. The need for metalling is identified as follows:

- High - where the condition of the road is such that accessibility failure is occurring in wet conditions and customer experience of the road is routinely falling below our levels of service.
- Medium - where the condition of the road may be affecting safety and speed in extreme wet and freeze/thaw conditions, and
- Low - where the road has sections of surfacing which are bare of gravel but not yet affecting use of the road in most conditions.

Low Volume Access Roads - Tracks

Council has a Low Volume Access road sub-class called 'Tracks'. There are 443km of Tracks (26% of the Access and Low Volume Access roads).

Maintenance on Tracks is only undertaken between 15 October and 31 March and Tracks receive spot metalling on approximately 30% of their length on a 17-year cycle. The surface condition of these roads prevents use for extended periods by all classes of vehicle. These roads are not accessible to all vehicles year-round.

Tracks were originally intended as roads providing a back-country experience, with access to more remote agricultural blocks and recreational areas. It is expected that four-wheel drive (4WD) vehicles with a high ground clearance will be required to traverse Tracks during early spring and late autumn. These roads may become completely impassable, or unsafe to travel on, in winter and extreme weather conditions.

From 2013, the need for a 4WD with high ground clearance extended to the summer period for a number of these roads due to scouring and the inability to respond to these issues within the existing funding provisions without having a detrimental effect on higher classified gravel roads.

Council changed the level of service to provide for metalling of a greater percentage of the tracks (increased from 20%) on a 17-year cycle in 2015. While this is providing some improvement over time, it will not lift the levels of accessibility significantly to reach the accessibility target of 95%. The council is planning to ring-fence additional investment from unsealed road maintenance, unsealed road renewals and drainage renewals budgets to enable cost-effective interventions to improve conditions on priority Tracks in 2021-24.



Active Road Users

Barry Avenue in Cromwell is the only Arterial road on the Central Otago district roading network. Construction of cycle lanes on Barry Avenue was included as a project in the council's 2012-15 Minor Improvement Program but did not proceed following consultation with the Cromwell Community Board. The Board considered there were adequate alternative cycle routes available within the Cromwell Greenway system and cycle lanes on Barry Avenue were therefore not required.

The sections of State Highway 8 and State Highway 85 within Alexandra do have marked cycle lanes to the outside edge of the traffic lanes. These are maintained by Waka Kotahi NZTA.

A shared space philosophy is promoted for cyclists on all other Collector and Access roads within the District.

The Government Policy Statement for Transportation in 2018 and 2021 have both made active modes of travel (principally walking and cycling) a strategic priority for the New Zealand land transport system. The level of Government investment in walking and cycling improvements is proposed to remain at the increased levels made available in 2018. Projects that deliver improvements in walking and cycling service levels will continue to be a good fit with GPS priorities.

Although the council would still need to fund the local share of any additional roading expenditure, the changes could allow projects delivering new walking and cycling infrastructure to be scoped and delivered in addition to the current improvement budgets. More targeted investments could be made, and potentially support increased maintenance, operational, renewals and improvement expenditure on the Central Otago District Council roading and footpath networks.

There are some locations on Primary and Secondary Collector roads, where off-road facilities have been provided due to the volume of cyclists in these areas. These are urban staging areas for start points of the New Zealand Cycle Trails and connections between townships and cycle trail facilities, providing both a level of service for recreational and commuter cyclists. Council does not have any dedicated cycle paths and all cycle paths are shared-use pedestrian and cycling facilities.

Currently the facilities constructed (or under construction) as part of the 2018-21 Low-Cost Low Risk Improvement Program (previously the Minor Improvement Program) are:

- Bannockburn Shared-Use Path – connecting key residential, commercial and industrial employment centres and educational facilities in Cromwell with sections of the Lake Dunstan cycle trail and the Bannockburn Township. Provision of an off-road facility supports road safety and walking and cycling priorities for active travel on one of Central Otago's busiest Primary Collector roads
- Bannockburn Bridge Shared-Use "Clip-On" bridge – The 1980's bridge crossing the Kawarau Inlet at Lake Dunstan had no separated facilities for cyclists and pedestrians. A "clip-on" shared-use facility has been constructed to directly service both the Lake Dunstan Cycle Trail and the Bannockburn – Cromwell shared-use path, due for completion in 2020



- Omakau to Ophir Shared-Use Path – connecting the centres of Omakau and Ophir with a separated facility adjacent to Ida Valley Omakau Road. This provides a safe active travel option for local walkers and cyclists and connects the Historic Precinct of Ophir with cyclists riding the Otago Central Rail Trail at Omakau.

Development of the New Zealand Cycle Trail route within Central Otago will result in ongoing growth in cycle tourism and cyclists on the Central Otago road network. The new trails will connect Queenstown, Wanaka and Cromwell with the existing Central Otago trail network at Clyde.

Local Road improvements to provide safe and attractive linkages from the New Zealand Cycle Trail network to commercial areas are required to ensure the district can benefit from the economic growth that the Government expects from its investment in these trails.

The council's level of service for footpaths states there shall be a footpath on one side of every urban street, with footpaths on both sides near schools, early childhood centres and medical facilities. Footpaths are expected to be continuous along routes – so that the need to cross roads to complete journeys on foot is minimised. There is a desire for a dropped kerb suitable for disabled access to be provided at all existing – and new - kerb crossing points.

Access along paths will be kept clear and not be obstructed by vegetation or excessive signage. Property owners adjacent to footpaths are required to trim vegetation where this overhangs and obstructs paths. This is identified during annual inspections and by members of the public who report this to Roading staff.

The council's work programme for footpaths has been given much higher priority in the last two years. Waka Kotahi NZTA introduced co-funding of Footpath Maintenance and Footpath Renewals in September 2018, allowing us to undertake larger quantities of targeted work on sections of the network where Levels of Service were not being met. Work to install new footpaths in our townships has been funded where a gap in the network or a specific need has been identified (for example, in close proximity to schools, on a school walking route or near to medical facilities).

The dTIMS modelling strategy we have developed for our footpaths allows for the performance of the Central Otago District Council network to be monitored against the expected levels of service. The impact of our maintenance and renewals work can be tested against the performance of the network. This reflects the current condition of the existing network and the good level of public satisfaction. More detail is included in Section 6.12.

Signage and Guidance for Navigation

Road name signs are located at the start and end of each road and on every intersection in-between where there is access from another route. Through roads will not have road name signs on them at the intersection with a no-exit road.

In 2018, Waka Kotahi NZTA also divested the responsibility for all the road name signs on the State Highways, where a local road intersects with these routes.

Destination signs will generally only be located on Arterial and Collector roads and only at the start and end of each route, i.e. not at every Access or Low Volume Access road intersection with the higher classification road. They will not usually include distances.

All signs for tourist and commercial activities must comply with the Tourist and Commercial Fingerboard Policy.

Planned Improvements Included in the 10 Year Plan

Our investment in the continued improvement of accessibility outcomes is summarised below:

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Change in land use in back country areas	<p>The conversion of significant areas of high tussock land into pasture is resulting in demand for heavy vehicle movements year-round on roads that have traditionally only provided a very low, dry weather, back country level of service access.</p> <p>The existing investment on these roads is insufficient to support these increasing demands.</p>	<p>Staff will inspect and review Tracks to identify those that provide access to a back-country experience or a recreational area and those that provide access to farmland that is productive year-round. This will inform a programme of priority maintenance and renewals on some Low Volume Tracks.</p> <p>It will also support discussions with the Community regarding possible future changes in the levels of service.</p>	<p>Targeted maintenance and renewals investment for unsealed roads and rural drainage.</p> <p>Increase network management budget</p>
Change in land use – development of public recreational areas	<p>17 conservation estates have been established in the Central Otago high country, resulting in increased public access on unmaintained legal roads. This is creating safety issues and environmental damage.</p>	<p>Council will work with DoC and Search and Rescue to identify priority locations and management options. This will inform a programme of priority maintenance and renewals on some Low Volume Tracks (targeted metalling and drainage works) where recreational access is causing an unacceptable level of risk to road users.</p>	<p>Targeted maintenance and renewals investment for unsealed roads and rural drainage.</p> <p>Increase network management budget</p>

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Change in land use – increased gravel royalty costs	The changes in rural land use and improved land productivity is resulting in significant cost increases for gravel royalties. This is driven by increased commercial demand for gravel, and increased land value. Increasing cost and a fixed budget is resulting in a backlog of work occurring on the lowest priority roads, Tracks. Many of these are inaccessible in wet conditions.	Council is investigating alternative options to secure long-term gravel supplies, in conjunction with development of long term gravel demand modelling. The gravel road renewals budget will be increased to accommodate the increase in royalty costs	Increase in gravel road renewals budget Targeted investment from network management budget.
Maintaining the Network	The surface on 41% of the Low Volume Access Roads does not enable reliable travel at a safe and appropriate speed 95% of the time. The current budget does not meet annual re-metalling requirements and a backlog exists.	Increase gravel road budgets to ensure we deliver our target annual re-metalling requirements.	Increase in gravel road renewals budget
Active Road users and Modal Change	Development of the New Zealand Cycle Trail network linking Queenstown and Wanaka to Cromwell and Clyde will require improvements on the roading network to provide safe linkages to commercial areas.	Construction of pedestrian and cyclist provisions across the district, focussed on providing linkages with the Lake Dunstan Cycle Trail at Cromwell and Clyde.	Investment of \$5.9 million on walking and cycling projects over 10 years under Low-Cost Low Risk Improvement Program

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Active Road Users	<p>Footpaths have been surveyed using a roughness measuring device mounted on a mobility scooter in 2016, 2018 and 2020. This has provided data that can be used as alternative to visual Condition Rating. It also allows a robust comparison of footpath performance between different areas and over time.</p> <p>The 2020 dTIMS modelling has shown that we can deliver an optimised programme to deliver these outcomes.</p>	<p>Council will continue to develop and use the roughness survey results to develop a footpath deterioration model for our district. This allows footpath maintenance and renewals to be prioritised for the 2021-24 programmes.</p> <p>Current modelling suggests that some re-grouping of maintenance work can be programmed as renewals to deliver the most cost-effective outcomes.</p>	Maintain the current levels of footpath renewal investment, allowing for a managed decrease in footpath maintenance operational expenditure.
Increased visitors, economic and traffic growth	Traffic growth in commercial areas is eroding the experience for active road users, visitors and locals, and is creating safety issues	Development of business cases with local communities. These may result in improvements to roading networks in commercial areas in response to growth and changes in use.	Maintain transport planning budget under Network management investment to develop business cases, utilising increased capabilities in-house. Investment of \$16.9 million over 10 years under Low-Cost Low Risk Improvement Program

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Asset failure due to overloading of bridges	<p>The following critical bridges will not take Class 1, HPMV or 50Max vehicles.</p> <ul style="list-style-type: none"> • Bridge 140 “Green” Bridge at Patearoa Road, Waipiata. • Bridge 155 on Upper Taieri-Paerau Road. 	<p>Structural investigations are underway to identify what will be required to upgrade these bridges.</p> <p>Additional renewal funding is included within the budgets for 2021-24, but further investment may be required.</p>	<p>Maintain structural renewals and small bridge renewals budget (re-allocated from Low Cost Low Risk investment).</p>
Aging bridge infrastructure	<p>72 bridges are coming to the end of their economic life in the next 30 years. Replacement of these bridges to retain the original levels of service is unlikely to be economically viable or affordable to the community.</p> <p>Major bridge renewals work has been deferred to enable the structural investigations to be completed and network options to be evaluated.</p>	<p>Undertake structural investigations and option assessments to enable community consultation regarding the affordability and need for retaining the existing bridge network.</p> <p>Our works programme will include several sites where we will prioritise replacement of existing bridges based on assessment of their criticality. This may include the construction of box culverts or the installation of “wash over” structures where this is a feasible option.</p> <p>Retiring some bridges may also form part of this work.</p>	<p>Internal and contractor’s staff and specialist structural engineers under network management.</p> <p>Maintain structural renewals and small bridge renewals budget (re-allocated from Low Cost Low Risk investment).</p> <p>Increased investment in structures maintenance for 2021-24 AMP cycle.</p>

Table 2.23 Planned Improvements Included in the 10 Year Plan

AESTHETICS AND COMFORT (AMENITY)

This outcome relates to the level of travel comfort experienced by the road user and the aesthetic aspects of the road environment. This includes the cleanliness, comfort /convenience and security, which impact on the travel experience of road users.

Council will provide an appropriate level of ride comfort by maintaining the road roughness to agreed average and maximum benchmarks. We will work to ensure a pleasant travelling experience by maintaining the aesthetic value of the road environment and provide adequate lighting for use at night. These will be provided to 'fit for purpose' levels, relative to road classification.

CURRENT PERFORMANCE – OUTCOME MEASURES

Sealed Roads

The two tables below show Council's current performance for the outcome measures relating to Amenity. These results are discussed further under sealed road management in Section 5. Roughness survey data is collected on the whole of our sealed road network annually, with the last survey completed in April 2019. Current levels of roughness on sealed roads are expressed in terms of Smooth Travel Exposure, used as the measure of comfort for road users across New Zealand. Central Otago's sealed roads are within the national thresholds for each classification, shown in Table 2.24.

Smooth Travel Exposure (Sealed Roads) 95% of network should be within target	Arterial	Primary Collector	Secondary Collector	Access Road	Low Volume Access Road
2019 % Length of Network within Targets	98.6%	97.6%	98.7%	99.3%	99.0%

Table 2.24 Smooth Travel Exposure of Sealed Roads (Amenity Customer Outcome Measure 1)

Table 2.25 reports the overall performance of Council's sealed roads from measurement of peak road roughness. National thresholds are set for an acceptable level of roughness on New Zealand's roads. The distribution of peak roughness is recorded by classification, and if the road is within an urban or rural area. The target is for 95% or more of roads within each classification to be at, or below, the peak roughness threshold for that road type. Higher thresholds are acceptable in urban areas due to lower travel speeds.

Another way of describing this performance measure is that the condition of less than 5% of each classification of sealed road in the hierarchy is outside the expected threshold when compared across the whole of New Zealand. In many cases, all Central Otago's sealed roads under each classification are within the roughness threshold.

Peak Roughness (2019) 95% peak roughness value should be lower than the threshold	Arterial	Primary Collector	Secondary Collector	Access Road	Low Volume Access Road
Threshold Rural Sealed Roads	N/A	130	130	150	150
95% Peak Roughness Rural	N/A	84.8	104.0	110.0	145.8
Threshold Urban Sealed Roads	120	150	150	150	180
95% Peak Roughness Urban	100.7	144.1	118.6	133.0	149.7

Table 2.25 Peak Roughness of Sealed Roads (Amenity Customer Outcome Measure 2)

The data shows that Central Otago's sealed roads meet the national target threshold for peak road roughness. In 2017, the only exception to this was rural Low Volume Access roads. Whilst we plan for providing a lower level of service for these roads, as the most cost-effective method to address roughness on roads of less than 50 vehicles per day would be to convert them back to gravel roads, we also ensure the assets are maintained in a safe and comfortable condition. We use detailed asset modelling to ensure we are investing in the right maintenance and renewals work on our sealed roads in relation to this outcome. This is discussed in Section 6.

Central Otago Resident Opinion Survey – Comfort Measures

Council undertakes an annual resident satisfaction survey (the Resident Opinion Survey, discussed in Section 2.5). The following table provides the level of satisfaction recorded for our sealed and unsealed roads for the last ten years.

Performance - Resident Opinion Surveys										
% of residents satisfied	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Customer satisfaction with sealed roads	92.4	91.5	89.6	91	91.4	93	92	88	85	85
Customer satisfaction with unsealed roads	77.8	76.9	75.2	71.7	72	81	78	75	74	77

Table 2.26 Resident Opinion Survey Amenity Satisfaction Results

Central Otago District has a consistently high level of satisfaction with the sealed road network. We have been managing our sealed roads investment to enable some minor deterioration of the assets to occur over time, which may be demonstrated by the slight drop in satisfaction. Satisfaction with the unsealed road network has remained at a similar level over the last ten years, with the volume of traffic increasing over that time.

The improvement in 2016 followed the introduction of changes to grading programs and an increase in the lengths of re-metalling completed. In 2020, our Asset Management systems for managing the unsealed road network were changed to make use of new technology developed by Central Otago District Council, alongside national and international partners. We use detailed asset modelling to ensure we are investing in the right maintenance and renewals work on our unsealed roads in relation to this outcome. This is discussed in Section 6.

WE WILL PROVIDE AN APPROPRIATE LEVEL OF RIDE COMFORT

Sealed Road Roughness

The current level of maintenance funding will continue in the 2021-24 AMP cycle to ensure we continue to deliver our expected Level of Service across our network. A short length of pavement reconstruction will occur annually from 2019-20. The dTIMS modelling strategy allows for a managed level of deterioration to occur to bring the network closer to national targets. This reflects the current condition of the existing network and the high level of public satisfaction. This is discussed further in Section 6.5.

Unsealed Road Roughness

The level of service for unsealed road roughness states that no more than 5% of the length of roads in any group shall exceed the maximum roughness limits when measured as part of the annual gravel road roughness survey. This excludes roads in the Low Volume Access 'Track' sub-classification that have a lower level of service as defined under the Accessibility section above. We currently do not measure the roughness of our tracks.

Unsealed road roughness has been measured on the Central Otago Network since 2012, typically in either the April/May or September/October periods. The surface condition of gravel road networks is highly variable and changes from week to week. At any particular time, there will be roads at all stages of the grading cycle. The annual measure is intended to provide a network level snapshot which can be used to identify trends over time.

The historical data for this measure is stored in RAMM to enable analysis and future reporting of this measure by road classification. The roads have been measured using a roughometer developed by the Australian Roads Research Board (ARRB) that measures the International Roughness Indicator (IRI). values for each 100 metre section of road. This is then given an asset condition rating equivalent, shown in Table 2.27:

Peak IRI	Condition (network condition assessment)	Condition (visual condition assessment equivalent rating)	Percentile of assets by peak IRI (network condition assessment)
< 2	Low (1)	Very Good (1) *	15th
2 - <4		Good (2)	25th
4 - <6	Medium (2)	Average (3)	50th
6 - 9.5		Poor (4)	85th
>9.5	High (3)	Very Poor (5)	95th

Table 2.27 International Roughness Index (IRI) and Unsealed Road Condition Rating

These ratings were originally developed from analysing the roughness surveys completed in 2012, 2013 and 2014. They were then tested and reviewed using network surveys from 2016 and 2018. The survey completed in 2020 is yet to be reviewed but can now be directly input into Central Otago's Unsealed Roads Performance Framework model.

The dTIMS modelling strategy allows for the performance of the Central Otago District Council unsealed roading network to be monitored against the expected levels of service. The impact of our maintenance grading programmes, and re-metalling work, can be tested against the performance of the network. This reflects the current condition of the existing network and the good level of public satisfaction, which is high when compared with our peers. This is discussed further in Section 6.6.

WE WILL PROVIDE A PLEASANT TRAVELLING EXPERIENCE

Aesthetic Faults

There will be no more than 15 defects per 5km sample length of aesthetic related faults, such as litter, graffiti, vegetation etc. that are likely to detract from the customers experience.

Measure	Performance in 2014/15				
	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
% audited	100	10	10	10	10
% of roads which comply	100	100	100	85	83

Table 2.28 Amenity Performance Measure (ONRC Amenity Technical Output 2)

This assessment has not been carried-out in this format since 2015 and is included as an item within our Improvement Plan. We will ensure future audits are timed so that they are undertaken prior to mowing and spraying, as this impacted the results of the 2015 survey.

Dust Impacts on Gravel Roads

Council undertakes dust suppression over a 100m length of road where there is a residence within 100m of the road.

Historically this has been undertaken using oiling. This practice was already being phased out by the council due to environmental, level of service, and cost efficiency issues. It is no longer a permitted activity by the Otago Regional Council, as of July 2020. Eco-Sealing is being undertaken as our preferred alternative. This treatment is lasting for periods exceeding 9 years. This is undertaken following programmed metalling to ensure the best results are delivered from the establishment and construction process.

WE WILL PROVIDE CONFIDENCE FOR ACTIVE ROAD USERS TO TRAVEL AT NIGHT

The level of service for lighting is specified under the Street Lighting levels of service included under Section 2.7 "Safety", above.

Planned Improvements Included in the 10 Year Plan

Our investment in the continued improvement of our amenity outcomes is summarised below.

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Ride comfort – sealed roads	<p>Council will continue to manage an increase in pavement wear and marginal decrease in the smoothness measured on Arterial, Primary Collector and Secondary Collector roads.</p> <p>Our investment in resurfacing will continue to ensure an acceptable level of service on Rural Low Volume Access roads.</p> <p>The 2020 dTIMS modelling has shown that we can deliver an optimised programme to deliver these outcomes.</p>	<p>Adjust the existing investment split in our maintenance and renewal programmes for sealed roads, which reflects the current condition of the existing network and high level of public satisfaction.</p> <p>Short sections of urban pavement renewals remain in our programmes to address sites requiring rehabilitation.</p>	<p>Increase Sealed Road renewals to include an additional 2km of resealing per annum.</p> <p>Maintain maintenance investment and monitor works programmed in 2021-24.</p>
Ride comfort - unsealed roads	<p>The frequency of grading required to manage our unsealed roads in a “steady state” is higher than the current resources can deliver.</p> <p>The grading demand across our network is putting extreme pressure on our ability to establish a cost-effective grading program for lower classification roads across the District.</p>	<p>The 2020 dTIMS modelling has shown that we can adopt an optimised programme to deliver these outcomes, with optimal allocations of resources and budgets.</p>	<p>Increase unsealed road maintenance budgets to improve the effectiveness of the cyclic grading programme.</p>
Ride comfort unsealed roads - Tracks	<p>Demands on higher volume gravel roads result in resource being reprioritised from Tracks. This is resulting in a reduced level of service on Tracks.</p>	<p>dTIMS modelling allows us to more accurately align potential work on sections of Tracks with planned re-metalling on nearby roads, allowing the establishment and re-metalling of Tracks to be delivered at the lowest cost.</p>	<p>Targeted maintenance and renewals investment for unsealed roads and rural drainage.</p>

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Dust suppression on unsealed roads	<p>There are no plans to invest in further seal extension work, other than for sites potentially identified.</p> <p>Dust issues at specific locations will be addressed through the council's existing dust suppression policy in the first two years of the 2021-24 AMP period.</p> <p>Currently there is a backlog of approximately 3.5 kilometres for the 2020/21 programme.</p>	<p>Council's dust suppression policy provides for Eco Star sealing (OTTA sealing) of 100m sections of road where a residence is located within 100m of a road. This is undertaken following re-metalling.</p> <p>Budgets have been re-allocated in 2018-21 to complete up to 3 kilometres of dust suppression sealing, using an Eco Star seal treatment each year.</p>	<p>Maintain the increased investment required for dust suppression using Eco seals in 2021/22 and 2022/23.</p>
Aesthetic Faults	<p>Deficiencies on Access and Low Volume Access roads related to vegetation, sign conditions and poorly drained areas of roadsides.</p>	<p>A program of interventions to address the existing deficiencies will be prepared and prioritised within existing funding allocations</p>	<p>Increase rural drainage investment and Environmental Maintenance budgets.</p> <p>Increase traffic services renewals investment levels.</p>

Table 2.29 Planned Improvements Included in the 10 Year Plan

COST EFFICIENCY

This outcome demonstrates that value for money and whole of life costs are being optimised in the delivery of affordable customer levels of service.

Our investment in our transport network is equitable for our current ratepayers, ensures that costs are not being 'hidden' to impact unfairly on future residents and maintains the confidence of our co-funders and key stakeholders.

OUR OBJECTIVE

The council's overarching principles for Infrastructure are that:

- Value for money and whole of life cost will be considered to deliver affordable levels of service.
- Infrastructure services will be delivered as part of an integrated district network and should offer an increasingly consistent, fit for purpose level of service for users.
- Our work practices and network management will be sustainable and environmentally conscious.
- We will look for new ways and innovative practices to enable us to cost-effectively deliver our services.
- The council will meet our community's needs, legal requirements and financial obligations.
- Providing our transportation services is equitable for current and future generations.

CURRENT PERFORMANCE – OUTCOME MEASURES

Almost all of Council's costs incurred to deliver our maintenance and renewals programmes are entered into RAMM by individual road, which allows reporting of these costs by classifications. This information is then utilised by Waka Kotahi NZTA to monitor roading "Maintenance Cost", covering our maintenance, operations and renewals work.

This information is also used by the national One Network Road Classification Performance Measures Reporting Tool, reporting all costs associated with pavement maintenance activities on Council's roading network.

Table 2.29 has been populated with cost data from the 2018/19 financial year and shows the relative cost per lane kilometre of road, based on the total length of road in each hierarchy classification. Further efficiency measures are discussed in detail as part of Section 6.

Measure	Routine Pavement Maintenance and Renewal Costs/lane km - Sealed and Unsealed (\$/lane km)				
	Arterial	Primary Collector	Secondary Collector	Access	Access (Low Volume)
2018/19	\$303	\$868	\$276	\$376	\$210

Table 2.30 Routine Pavement Maintenance Costs (ONRC Cost-Efficiency Measure Output 10)

The charts provided in Figure 2.9, Figure 2.10 and Figure 2.11 are provided by NZTA and show the NZTA funding allocations to different Rural Councils across New Zealand for the three Financial Years from 2017/18 to 2019/20, grouped by the NZTA Maintenance Work Categories and Renewals Work Categories. The ONRC cost-efficiency measure in Table 2.29 provides cost reporting relative to the total length of network. The NZTA costs are reported based on the actual claimed value of work has been completed under the different Work Categories. These show Central Otago District Council remains one of the lowest-cost roading networks in New Zealand across all activities. Further development of reporting of network-wide maintenance costs by ONRC classifications, in conjunction with improvements to the ONRC Performance Measures Reporting Tools, is included in our Improvement Plan.

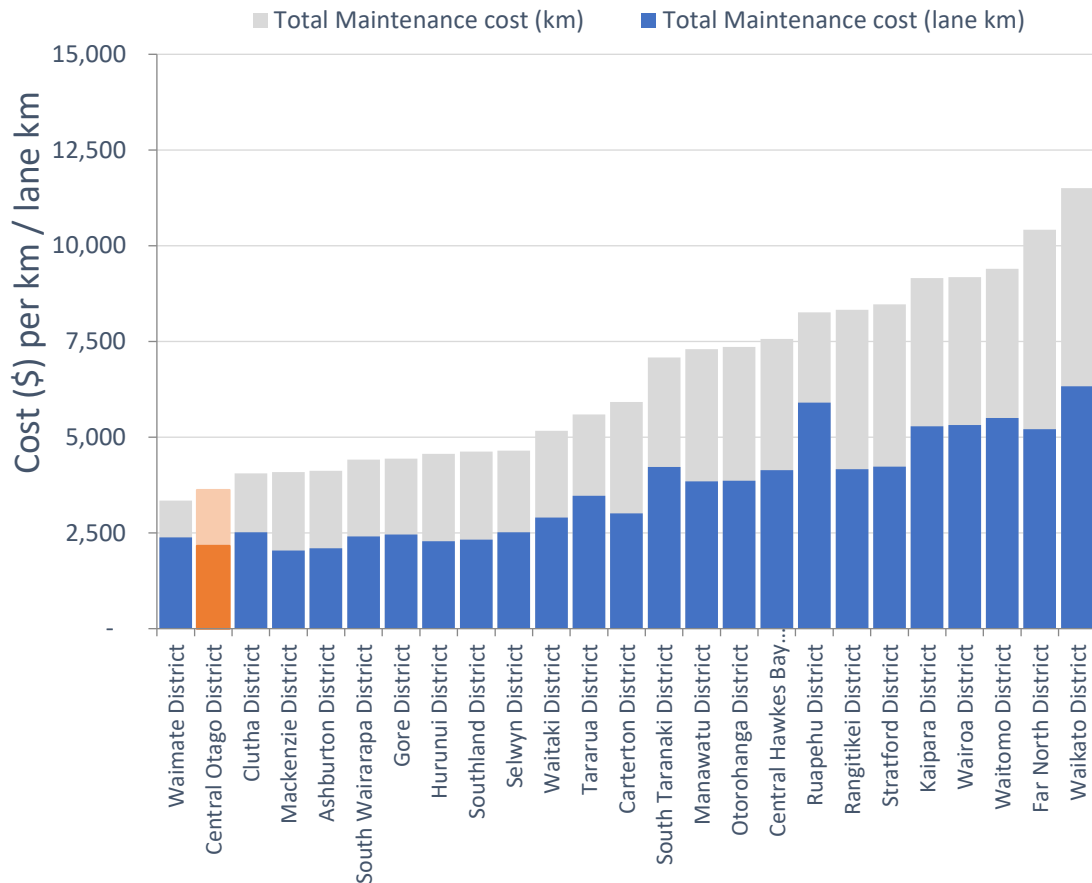
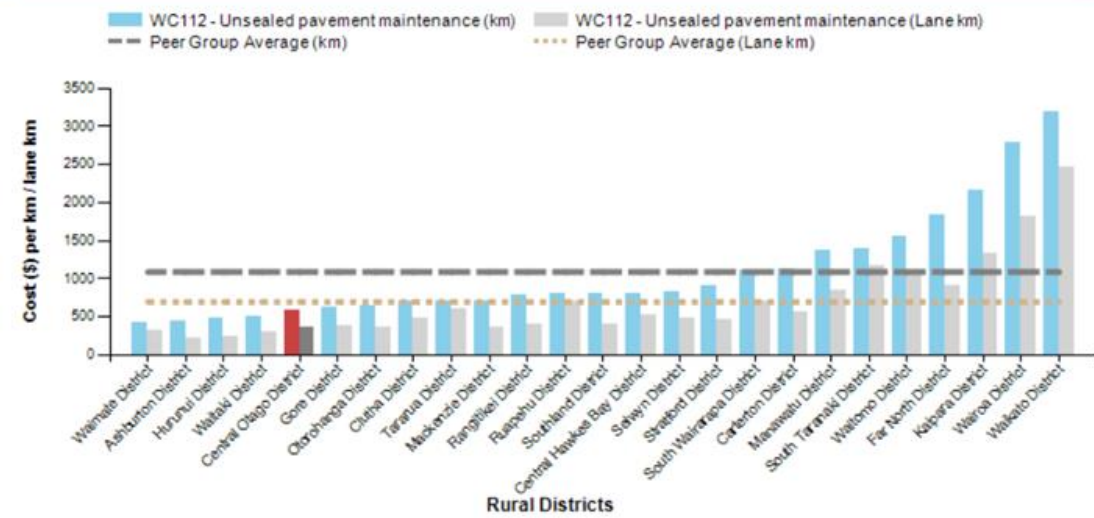


Figure 2.9 Maintenance Operations and Renewal – Costs per Kilometre for Rural Peer Group Road Controlling Authorities (3 Year Average 2018-2020)

WC112 - Unsealed pavement maintenance
Cost per Unsealed km/lane km by Peer Group
3 Year Average 2018-2020



WC211 - Unsealed road metalling
Cost per Unsealed km/lane km by Peer Group
3 Year Average 2018-2020

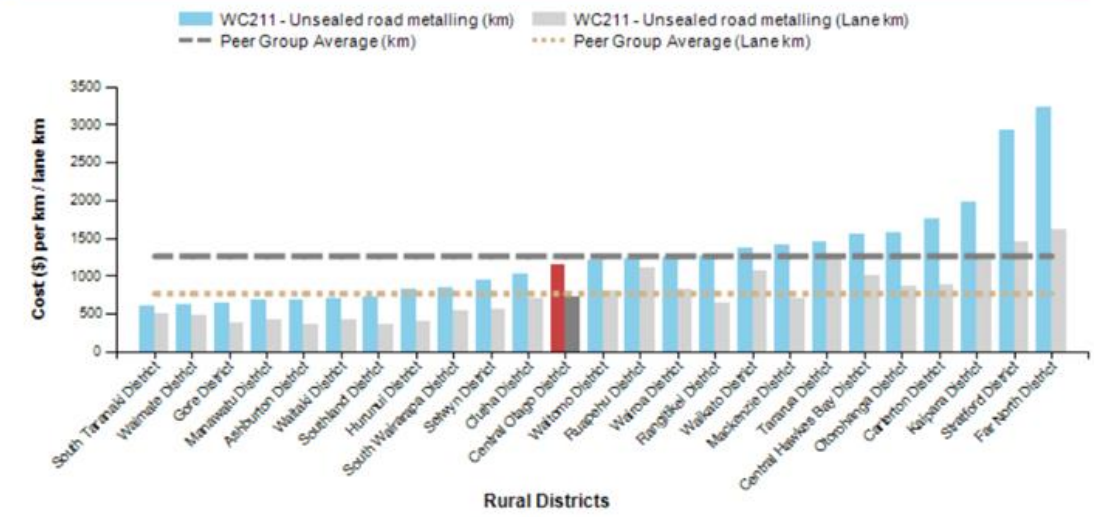


Figure 2.10 Unsealed Road Maintenance and Renewals – Cost per Kilometre for Rural Peer Group

**WC151 - Network and asset management
Cost per Network km/lane km by Peer Group
3 Year Average 2018-2020**

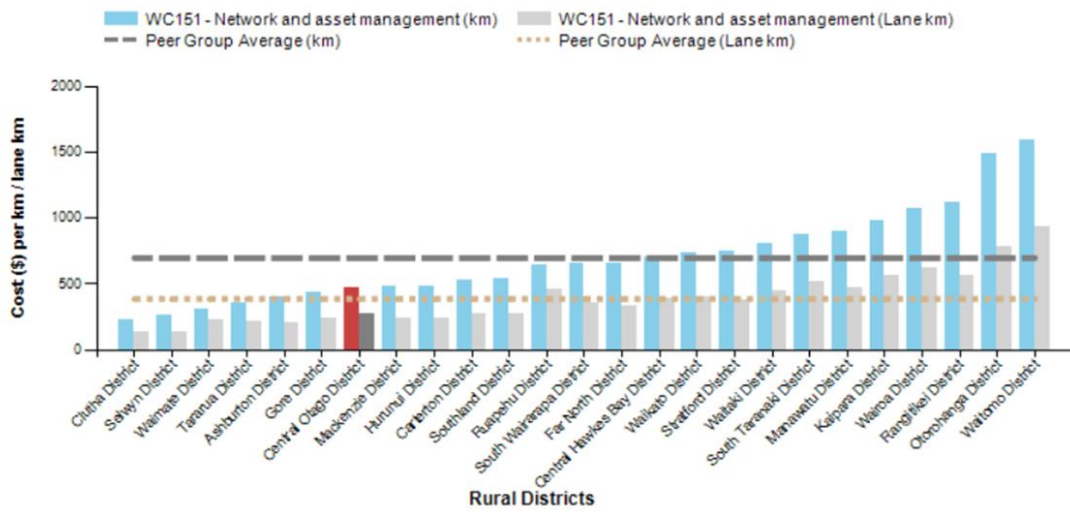


Figure 2.11 Network and Asset Management – Cost per Kilometre for Rural Peer Group

THE WORK WE DO IS NECESSARY, CO-ORDINATED, DONE AT THE RIGHT TIME AND DELIVERING VALUE FOR MONEY

Customer Response

The Roothing team target is that we will respond to our customers within ten working days of a “Request For Service” being made.

Urgent issues, which are significantly affecting safety or restricting access will be completed within five days. These are typically addressed within one day.

Many of the calls that the council receives regarding transportation are for non-urgent work that can be undertaken more cost-effectively as packages of work programmed in the area. In these cases, roading staff will contact the caller within the ten day time-frame to discuss the urgency and timing of the work with them. We make every effort to provide an expected completion date at this time.

Where the work is not routine, or falls outside the Levels of Service we provide, then the caller will be contacted within 10 days and advised of the date by which investigation of the matter will be complete.

Management Strategies

Details regarding how Council determines when work will be undertaken, how this is managed and information regarding performance for different types of work is provided in Section 6 of the Activity Management Plan.

Our existing cost efficiency is delivered by the drivers listed below.

Existing Cost Efficiency Drivers	
Maintenance contract form	The proven form of our Roothing Physical Works contract is a factor in our cost efficiency. The contract has created a close working relationship with the Contractor that seeks to deliver the best results while working within tight budget constraints. The maintenance contract includes all work, except lighting, on a cost reimbursement and agreed margin payment method. Significant items of plant are dedicated to this Contract, and Council works with the Contractor to achieve the greatest possible optimisation of plant and labour to reduce overall costs.
Customer response	We manage customer service requests for non-urgent work in a cost-effective manner, by carrying them out with other work programmed in the area. Council staff work collaboratively with the Contractor to maintain these programmes. We contact our customers within 10 days to discuss the urgency and timing of the work with them and provide an expected completion date.
Transportation Procurement Strategy	Central Otago District Council has adopted a new Procurement Strategy in 2020, endorsed by Waka Kotahi NZTA as our co-funder. This strategy clearly articulates our processes to ensure cost-effective management of our roading network. The Procurement Strategy also supports flexible arrangements with our Contractors and Professional Services consultants, enabling us to confirm services and works at the most affordable rates.

Existing Cost Efficiency Drivers	
Road Efficiency Group	The direct involvement of Central Otago District Council's Executive Manager of Infrastructure Services and the Asset Engineer with The Road Efficiency Group has provided continued opportunities to understand and influence the direction of REG. This has provided increased knowledge and the council's uptake of best practice case studies.
One Network Road Classification	Integrating use of the ONRC in all aspects of the roading services provides opportunities for benchmarking our efficiency. We can target interventions on the District network to provide the Levels of Service for each road classification and meet the agreed customer outcomes most cost effectively.
Asset Life Assumptions	We have reviewed a number of our asset lifecycles by inspecting the condition of the existing assets and checking these against historical construction and renewals information. This has allowed us to improve accuracy in our asset lives and extend the default lives of some of assets based on network data.
Sealed road maintenance and renewals	We optimise our maintenance and renewals programme based on dTIMS modelling and our prioritisation of Forward Works fully incorporate the ONRC classifications. This modelling is informed by annual roughness surveys, high-speed data surveys completed every three years, and Falling Weight Deflectometer (FWD) testing of the road pavements completed by an established local company.
Seal extension programme	Investment is planned for construction of the highest-priority seal extension in the Central Otago district during the 2021-24 AMP cycle. The use of lower cost Eco-sealing as an alternative to oiling for dust suppression is proving cost effective with lives in excess of 9 years being achieved.
Unsealed roads metal lifecycles	The lifecycles for gravel roads are currently optimised and have not been changed for the 2021-24 AMP cycle. We are now basing our re-metalling programme on the dTIMS Unsealed Roads Network Performance Modelling Tool which will allow us to review the in-service lives of our roads in much greater detail over the next three years. Our modelling now allows us to determine when additional grading of a road may continue to provide our expected Levels of Service without programming re-metalling work, potentially further extending service lives. This however presents a higher level of risk for accessibility issues during extended freeze thaw periods, or as a result of extreme weather events, on some roads.
Unsealed roads aggregate sources	Our network-wide modelling of the unsealed roads renewals programme has been extended for 20 years to gauge the long-term aggregate demand for maintaining our unsealed roads. This is based on data which allows us to confidently assign each road in the District to a pit source which provides an optimal cost and performance balance. Work to complete this analysis of aggregate sources and develop a strategy to enable the council to potentially secure the best-value options for unsealed road materials will form a key part of the roading team's work in the 2021-24 AMP cycle.

Existing Cost Efficiency Drivers	
Unsealed roads metal costs	We focus metalling in different areas each year to reduce establishment costs and increase productivity. The contractor has implemented more efficient work practises regarding the ratio of trucks to loading and spreading equipment. The costs of load, cart, and spreading of gravel have been maintained at similar levels for six years.
Unsealed roads grading programme	<p>We optimise our maintenance grading programme based on dTIMS modelling and our prioritisation of Forward Works fully incorporate the ONRC classifications. We are able to test the performance of each road when a fixed number of grades are programmed each year. Our modelling now allows us to determine when additional grading of a road may continue to provide our expected Levels of Service without programming re-metalling work. This modelling is informed by annual roughness surveys, good quality network information and material testing from our gravel pit sources, completed by an established local company.</p> <p>We develop annual cyclic grading programs to ensure the most efficient use of limited grading resources, while meeting the variable demands for grading of different classes of roads in different geographical areas of the network. Grading programs are reviewed at least annually to ensure an efficient split of grading hours between the three full time graders on the network.</p>
LED Streetlighting	Central Otago District Council completed the upgrade of all the streetlights which were economically viable to replace between 2017-2019. LED lighting provides a huge energy saving when compared with traditional lighting. These savings are directly reflected in reduced electricity costs and the enhanced funding subsidy provided by NZTA to complete the work in the 2018-21 AMP cycle.
Footpaths maintenance and renewals programme	<p>NZTA have co-funded footpath maintenance and renewals since September 2018. Central Otago District Council now collect data on the condition of all of its footpaths every 1-2 years using a mobility scooter. The data collection tool used records roughness levels and photographs of every surveyed footpath.</p> <p>We optimise our footpath maintenance and renewals programme based on dTIMS modelling and our prioritisation of Forward Works is grouped within township areas and work types. The bulk of footpath renewals are programmed for the winter months, when construction crews are not able to work on sealed and unsealed roads maintenance.</p>

Existing Cost Efficiency Drivers	
Evidence base – traffic counts	<p>An in-house staff member is responsible for carrying out the traffic count programme. This minimises costs, streamlines processes and provides accurate recording of data in RAMM as the foundation for many aspects of our decision making. In 2016 staff carried-out a complete review of traffic volume estimates (ADT) and vehicle kilometres travelled (VKT) for the network, based on the historic data and local knowledge. These estimates have been maintained over the last four years and have enabled Central Otago District Council to successfully complete the NZTA moderation of it's ONRC network classifications in 2020.</p> <p>This supports more complex decision-making processes such as dTIMS, network-planning models, targeted maintenance/renewals regimes, and provides inputs for national performance benchmarking and Smooth Travel Exposure measurement. It also enables immediate factual, data-based responses to be provided to customers and elected members and reduces the risk of losing local knowledge through staff attrition.</p>
Emergency works	<p>We work closely with our contractor to deliver proactive maintenance as a cost- effective way of minimising emergency work requirements. Our contract model provides the same rates for emergency works as routine work. In an event such as a heavy snowfall, graders are re-directed from maintenance grading to snow clearing at the same rates. This reduces the cost impacts of these events.</p> <p>The infrastructure team have also completed the Infrastructure Resilience Plan and Infrastructure Response Plan to enable better decision-making regarding maintenance and renewals investment, where work could cost-effectively incorporate preventative maintenance elements.</p>
Corridor access	<p>We provide streamlined internal processes to provide access to the transport corridors by utility providers, with the time to issue consent for access averaging 1-2 days, against the target of 5 working days.</p>

Table 2.31 Transportation Work Areas and Cost Efficiency Measures

How will we make further Cost Efficiency Improvements?

We continue to seek new cost efficiencies to improve value for money. The pressures, state and our proposed programme of responses is summarised below:

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
Shoulder maintenance on sealed roads	Mowing of rural sealed road verges has resulted in high shoulder maintenance costs and poor drainage that decreases surface and pavement lives.	<p>Replace mowing of rural sealed road verges with spraying in the Maniototo, Manuherikia, Tarras, Queensberry and Roxburgh areas to reduce shoulder maintenance costs and increase surface and pavement lives.</p> <p>Roads in Cromwell and Earnsclough will be individually considered for spraying, and will be mowed where they are beside vineyards, or residents are maintaining the verges.</p>	Increase targeted rural drainage work and Environmental Maintenance budget
Drainage programme	<p>Inadequate proactive drainage maintenance has been undertaken on existing culverts on rural roads.</p> <p>Historically rural drainage assets have been replaced early as opposed to maintenance to extend life.</p>	We undertake proactive drainage maintenance and renewals to extend the lives of sealed and unsealed assets. We will be working during the 2021-24 AMP cycle to target drainage work at the highest priority locations and to deliver preventative maintenance that supports resilience to achieve greater efficiencies.	Maintain the split of drainage maintenance and drainage renewals investment.
Sealed road damage from tree roots	Tree roots from adjacent private properties are causing seal damage.	Enforce new policy requiring adjoining landowners to be responsible for damage to sealed roads as a result of trees roots.	Internal and Contract staff resources.
Adoption of the new ONRC	The ONRC moderation for Central Otago District	Monitor our maintenance cost data and	This change will be cost

Level of Service Required or Identified Risk	Problem	Response	Proposed Investment
moderation classifications for our road network	was completed in July 2020. This results in a 5% increase in road lengths classified as Collector and Access roads, with a corresponding 10% decrease in the length of Low Volume Access roads.	programmed works delivery to ensure that the financial implications of any change in service levels are minimised.	neutral, with the planned programme of maintenance and renewals able to deliver any work needed to lift service levels on particular roads.

Table 2.32 Planned Improvements Included in the 10 Year Plan

Section 3

Demand and Growth

3.1 Introduction

This section identifies growth forecasts and other factors that influence demand, population forecasts, the impact of these changes in demand on the transportation network, and how Council proposes to deal with these.

Factors that influence customer demand on the transportation network include:

- Population growth and decline
- Dwelling growth
- Demographic change
- Visitor numbers
- Change in land use
- Economic growth and decline
- Modal change
- Development of recreational areas
- Future customer expectations

Detailed growth projections of the Central Otago District were first developed by Rationale Limited and adopted by Council in 2008. These projections were updated by Rationale Limited in 2011, 2014, and 2017. The 2020 Growth Projections were developed during the initial response across New Zealand to the COVID-19 global pandemic. The projections took account of the changing understanding of growth impacts associated with COVID-19.

The main purpose of the 2020 review was to provide population, visitor, dwelling and rating unit projections covering 30 years (to 2050/51) for the Council's relevant geographic areas. The projections take into account elements such as historical and current trends, relevant land-use policies, disruptive changes and relevant national, regional and local level drivers.

The growth projections outputs are listed below:

- Usually resident population, by five-year age groups and average household size.
- Visitors on both the peak and average day in the following groups, visitors staying in commercial accommodation and those in private residences, plus day visitors.
- Dwellings by type – occupied and unoccupied.
- Rating units by type – according to the Council's current rating categories, with the inclusion of Dairy Farming.

A growth model has been built to allow multiple scenarios to be considered. This model is a significant update of the analysis undertaken by Rationale in 2013.

The growth model uses the Statistics New Zealand population projections as the basis for forecasting growth in the district. These were collected in the 2018 New Zealand census, and made available during 2019. Information on visitor numbers is also used from Qrious.

The underlying philosophy of the growth model is that people drive the growth in dwellings and rating units. An increase in people living, working or holidaying in the district will also result in an increase in both dwellings and rating units.

The scenarios included in this review are a range of resident population growth rates, both positive and negative. The change in population is based on the migration of people into or out of the district and the birth rates and mortality (death) rates. The birth and death rates differ for areas within the district (and wider) depending on the existing age structure. Although the resident population provides the base inputs, the approach still accounts for non-resident population drivers that can influence dwelling and rating unit growth.

The results for each scenario show the flow-on effect for dwelling and rating unit growth. The primary scenarios are:

- “Business-as-Usual”, with no effects of COVID-19 or constraints on growth
- Low population growth, typically a declining resident population further affected by COVID-19
- Medium population growth, typically a stable or a steady increase in resident population constrained by the availability of development land. The model assumes that some impacts of COVID-19 are felt between 2020 and 2025.
- High population growth, a significant increase in resident population constrained by the availability of development land. The model assumes a short down-turn and ‘bounce-back’ due to COVID-19.

The underlying assumptions required to convert population growth to dwelling and rating unit growth are maintained for each of the above scenarios. The 2020 review retains elements of a modified growth scenario that was developed in 2017. This includes individual population growth trends for each census area unit, as opposed to applying the same scenario for all census area units.

The high growth scenario is considered to be too aspirational and may lead to overstating the growth. Similarly, the low growth scenario is more of a worst-case scenario. While this provides a useful perspective, it is not considered appropriate for long term planning purposes. The “Business-as-Usual” scenario is used to make comparisons between the constraints included in the modelled growth projections.

The initial recommendation in June 2020 was that Council used Scenario 3 with six-monthly check-ins to monitor against current data to understand if the anticipated impacts of Covid-19 are occurring, and the progress of recovery. This has been undertaken in December 2020 using data from Data Ventures which is obtained from cell phones and shows that the anticipated drop in population from job-losses has not occurred. The recommended scenario has been amended to Scenario 1.

3.2 Population Growth

Central Otago has experienced a decade of exceptional population growth. Between the 2001 and 2013 censuses the resident population grew by 25.4% from 14,750 to 18,500.

As seen in the graph below, Council has far exceeded the growth expected when the last growth projections were completed in 2016. The previous projections were modelled using Statistics New Zealand projections as a starting point. However, due to the delayed release of the 2018 census data, the somewhat conservative nature of these projections, and their failure to predict the growth that occurred, a new methodology has been used for the 2020 growth projections. The 2020 projections have been developed using a bottom up approach. Individual growth drivers for each Statistical Area 2 (SA2), Alexandra and Cromwell have been developed using employment and job growth as the basis of the modelling.

Four growth scenarios have been modelled. These are

Scenario 1 – Business as Usual (Pre Covid-19) - Used as a baseline to compare the other three scenarios. It assumes that there has been no impact from Covid-19 and there is no limit on the number of dwellings that can be constructed.

Scenario 2 – High - Assumes that Covid-19 has a minimal impact on the district. While there are some job losses, the district recovers to a level above the business as usual scenario.

Migration drivers and assumptions are increase by 15% which means more people will move to Central Otago and less people will leave. There has been an allowance for currently zoned land to reach capacity.

Scenario 3 – Medium - Models the expected impact from Covid-19. This assumes that all parameters return to the business as usual prediction by 2025. There is an allowance for capacity constraints of the currently zoned land.

Scenario 4 – Low - models a situation in which Covid-19 has a higher than expected impact on the district, i.e. more job losses, and only recovers to 5% less than the business as usual scenario by 2025.

Migration drivers and assumptions are also reduced by 15% which means less people will move to Central Otago and more people will leave. There is an allowance for capacity constraints of the currently zoned land.

The initial recommendation in June 2020 was that Council used Scenario 3 with six-monthly check-ins to monitor against current data to understand if the anticipated impacts of Covid-19 are occurring, and the progress of recovery. This has been undertaken in December 2020 using data from Data Ventures which is obtained from cell phones and shows that the anticipated drop in population from job-losses has not occurred. The recommended scenario has been amended to Scenario 1.

Scenario 1 projects that the district population will increase by 55% from 22,200 usual resident people in 2018 to 34,474 people in 2050. This equates to an average annual growth rate of 1.3%. The average annual growth rate between 2006 and 2019 was 2.3%, and ranged from 0.6% in the Teviot Ward to 4.4% in the Cromwell Ward.

	2020 Usual Resident Population	2020 Peak Population	2050 Usual Resident Population	2050 Peak Population
District	23,528	45,696	34,474	65,591
Cromwell	9,036	17,375	15,350	27,173

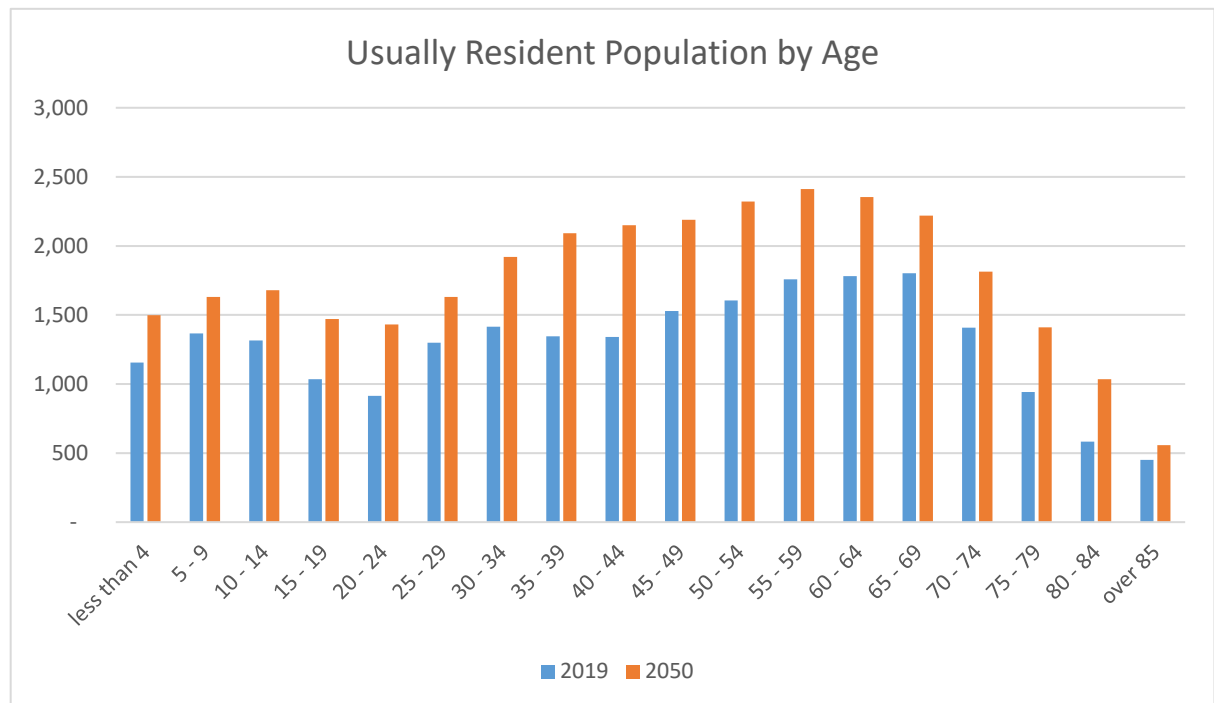
Maniototo	1,697	3,294	1,663	3,873
Teviot Valley	1,225	3,399	1,926	4,943
Vincent	10,938	20,996	15,536	29,604

Table 3.1 Key Results - Recommended Scenario 1

This information is also available at township and area level in the Growth Projections report.

3.3 Demographic Change

The projected demographic profile remains similar, although the cohort of younger people between 15 and 24 who leave the district for other opportunities such as education and employment is less pronounced. There is a high number of older population between 55 and 65 years that move to the area later in their career or for retirement. Elderly people (over 70) leave the area, possibly in search of better healthcare and assisted living options.



The increased older population will affect both the demands on our infrastructure and the affordability of our services to people on fixed incomes in the long-term. An older demographic requires higher levels of service for footpaths and infrastructure that supports accessibility for people with restricted mobility.

3.4 Subdivision Development

Central Otago District has experienced consistent subdivision growth over the last 18 years. Central Otago, like much of the country has seen property values increase sharply over the past 5 years. Average house values in Central Otago have doubled since 2008 and during the same time period, there has been a noticeable decrease in the average household size with there now being an average of 2.2 people per household.

There is currently no remaining urban zoned land available for development in Clyde, and very little in Cromwell and Alexandra. The lack of available land in Cromwell, Clyde and Alexandra is impacting on property prices. This is resulting in increased demand in Omakau and Roxburgh where property prices are more affordable.

This has resulted in numerous private plan changes being implemented. The outcome of this is that forecasting growth areas, and the subsequent infrastructure impacts, is difficult.

Council is currently reactive to development where it is proposed in areas it is not anticipated under the District Plan and in areas where the Council's knowledge of capacity constraints is still being developed. Currently these developments are modelled hydraulically on a case by case basis.

The District Plan is currently under review, and this will include provision of sufficient zoned land to meet the expected demand for the next 20 years.

Council adopted a spatial plan for Cromwell in 2019, and modelling for upgrades in Cromwell is including the planned zone changes, and associated housing density changes. A spatial plan is being developed for the Vincent area, and the ability of infrastructure to meet the different options proposed is being included as part of the spatial plan investigation process.

Some analysis has now been undertaken of historical growth in dwelling units and the impacts this has had on vesting of new road in Council. Analysis of historic dwelling increases and the associated subdivision growth indicated an average of 850 metres of new urban street were anticipated to be vested in Council every year from 2017 to meet the current growth projections for dwellings. In preparing the 2021-24 AMP, some analysis suggests that this estimate has been too low. The total length of sealed road vested in the council between the 2016/17 and 2019/20 Financial Years is 13 kilometres, of which 10 kilometres is located within urban areas, or on the outskirts of Alexandra and Cromwell.

3.5 Economic and Visitor Growth

According to a March 2016 report that Business and Economic Research Ltd (BERL), the Central Otago growth in employment and gross domestic product (GDP) to March 2015 was "phenomenal". During this time, GDP increased 8.4 per cent, GDP per capita increased by 6.4 per cent, and employment grew 7.7 per cent.

Over the last ten years the district averaged annual GDP growth of 2.1%.

The Central Otago economy is anchored in the primary sector, with construction, tourism, hydroelectricity, and professional services other significant contributors. Traditional sheep and beef industries are strong, we have a growing dairy industry, and thriving horticultural sector. Stone fruit, viticulture and apples are key horticultural growth areas.

Construction is the second largest sector and is currently driven by high demand for housing and industrial premises both in Central Otago and the neighbouring Queenstown Lakes area.

Manufacturing is dominated by the wine industry, which is predominantly located within the Cromwell and Vincent areas.

The professional, scientific, and technical sector is developing. Improved communication infrastructure and air services from Queenstown and Dunedin are enabling providers to service national and international clients while opting for the Central Otago lifestyle. Almost a quarter of Central Otago workers are self-employed, which is significantly higher than the national average.

The value of tourism in Central Otago has grown in 24% in a four-year period from \$145 million in 2012 to \$181 million in 2016. This is lower than the national average (+37%) and neighboring regions such as Queenstown (+70%), Wanaka (+63%), and Dunedin (+28%).

International visitors are expected to continue to increase significantly on the back of national marketing initiatives to get more tourists into the regions. Central Otago is implementing a new Tourism Strategy to leverage off national initiatives and encourage international visitors from



Queenstown to spend time in Central Otago. The proposed inland touring route is one local initiative to support this.

The upward trends in tourism, traffic, business activity, job growth and property prices in the region are all combining to put traffic pressure on our commercial precincts. This pressure is building through the recognition of problems around access, traffic management, parking and the need for improved use of public spaces.

The council has been working with Clyde businesses and residents on delivery of the planned work approved in the 2018-2028 LTP for improvements to the Clyde Town Centre and the Clyde Historic Precinct. Funding was included in the Low-Cost Low Risk Improvement investment approvals for roading work associated with this project.

The council has also completed significant development of the business cases which support the Cromwell Spatial Masterplan "Eye to the Future". The council have already prepared a spatial framework, parking assessment and baseline traffic model to enable a range of development options to be analysed and tested. Work to support the continued engagement with businesses and residents for improvements to roading in the Cromwell Town Centre

(Commercial Precinct) area will be a significant part of the council's work programmes during the 2021-30 LTP. Funding for commencing intersection upgrades, and the first stages of roading upgrades planned within the commercial precinct, has been included in the planning phases of the Long-Term Plan. This will be reviewed following development of business cases. Growth in Alexandra is resulting in pressures on state highway intersections at the northern extents of the town. Council has engaged with Waka Kotahi NZTA to make them aware of these pressures. As part of developing the evidence needed to support business case development, the council has now begun the community engagement stages of the Vincent Spatial Plan. This covers the growth aspirations for Alexandra, the Alexandra Basin area (Earnscliffe, Springvale, Dunstan Flat and Clyde) and much of the Manuherikia and Ida Valley area (including Omakau and Ophir). The business case to consider traffic flows and issues at the northern area of Alexandra will be progressed during the 2021-30 LTP.

3.6 Changes in Land Use in Rural Areas

Land use change can result in changes to traffic patterns, volumes, and type. Industries which result in increased heavy vehicle movements have a high impact on the lifecycle analysis of roads and bridges. Changes in zoning from rural to rural residential, development of visitor attractions, and changes to more labour-intensive activity such as viticulture also increase traffic volumes on rural roads.

The rural areas of Central Otago have traditionally been used for sheep farming and orchards. Some change to land use has occurred over the past decade which has resulted in significant residential development, as well as development of vineyards and associated wine tasting businesses on gravel roads which previously had extremely low traffic volumes.

There has been very little forestry activity within the District, but a large area above Roxburgh East in the Teviot Valley was planted around 2003. Some forestry activity is occurring as small farm blocks are logged. These areas are relatively small, and logging of these has a short-term impact on the local roads.

Dairy activity is occurring within the Maniototo, Manuherikia and Roxburgh areas, with potential for significant growth in this sector, particularly if further irrigation water becomes available.

Changes in pastoral farming practices and more efficient use of irrigation allocations is resulting in increased heavy vehicles as a result of increased stock and fertiliser movements. This includes increased heavy vehicles to bring dairy cows from other regions to Central Otago for wintering, and to bring lambs from outside the District for fattening.

Higher tussock land areas are being converted into pasture with more intensive farming occurring. This is resulting in heavy vehicle movements occurring year-round on roads which have traditionally provided a very low, dry weather, back country level of service access. These roads have been classed as Tracks within Council's hierarchy and are graded one to two times a year. Council currently has funding available to undertake limited renewal on a total length of 10 kilometres of track per annum, based on 30% of this length being re-metalled (spot metalling) on a 17-year cycle. As a result, they are not meeting the accessibility needs for these landowners. Significant levels of additional investment, totalling \$360,000 per year for 2021/22, 2022/23 and 2023/24, are planned to address this widening level of service gap.

Responding to Level of Service and Extent of Network Needs from Change in Land Use

Council has applied the One Network Road Classification to the Central Otago Network. Levels of service are aligned with the ONRC performance framework, as far as possible, within the current level of investment.

Council also has a roading hierarchy for gravel roads that sits under the ONRC, where a further classification is determined based on what the road is used for. The width of these roads varies depending on this hierarchy classification. When traffic use on a road changes significantly, the road classification will be changed. Grading programmes are adjusted as soon as is practical after making changes to the network hierarchies. Wider gravel roads are then provided for classifications with higher traffic volumes when these fall due for re-metalling. The level of accessibility provided on many of the Tracks in the District does not meet the level defined as fit for purpose under the One Network Road Classification for any uses other than recreational access. Reviewing the level of service for the council's Tracks forms part of the 2021-24 AMP Improvement Plan. Ensuring that additional investment is available to deliver level of service outcomes on priority low volume roads around the District is included in the 2021-24 National Land Transport Plan investment bid.

The ONRC moderation for Central Otago District was completed in July 2020. This results in a 5% increase in road lengths classified as Collector and Access roads, with a corresponding 10% decrease in the length of Low Volume Access roads. Adoption of the new ONRC moderation classifications for our road network will be completed in 2020/21. The council intends to manage these changes within existing investment levels. The roading team will monitor our maintenance cost data and programmed works delivery to ensure that the financial implications of the changes in service levels are minimised.

No additional investment has been provided in the financial forecasts for extending Council maintenance onto other roads.



Increased Pavement Loading from Changes in Land Use

Road pavement strength testing using a Falling Weight Deflectometer was undertaken on the sealed network in 2014. This identified that all rural sealed roads except Patearoa Road between Orangapai Road and Waipiata have at least 25 years of life remaining under current traffic loading.

Patearoa Road is classified as a Low Volume Access road under the One Network Road Classification. The annual average daily traffic volumes are less than 50 vehicles per day, and as such the road will not qualify for NZTA subsidy for widening or reconstruction. The lifecycle strategy for this road is therefore to continue to undertake sealed maintenance and resurfacing work up to the point where this is no longer economical to do so. It is expected the road will then convert to a gravel road, and no investment has been provided in the forecasts for the sealed road to be reconstructed.

The dTIMS pavement modelling that has been undertaken has been based on maintained heavy vehicle counts. A small rehabilitation programme has been provided for in the financial forecasts to address accelerated pavement failure in urban areas as a result of heavy vehicle growth and pavement aging. This forecast will be reviewed every three years to incorporate further changes in land use and heavy vehicle traffic patterns and numbers.

Traffic Growth from Changes in Land Use

It is expected that most improvements that are required as a result of increased traffic, cyclist and pedestrian use will be addressed through the Low-Cost/Low Risk Improvement Program. The exception to this is the need to address ongoing dust suppression requirements on unsealed roads.

Up until 2012, Central Otago District Council had a seal extension program which was largely required to address the impacts of growth of residential properties on unsealed roads. The cost of sealing roads, and the future renewal costs of sealed roads when compared to unsealed roads, are significant. There is minimal investment for further seal extension work provided in the financial forecasts.

Dust issues at specific locations will be addressed through Council's dust suppression policy. This provides for Eco Star sealing (OTTA sealing) of 100m sections of road where a residence is located within 100m of a road. Eco-sealing is undertaken following re-metalling. This work is prioritised within the gravel road renewals investment allocation.

3.7 Development of Recreational Areas

Development of recreational areas such as conservation estates can result in increased pressure on Council to undertake maintenance on roads which have previously been maintained by landowners for their own use.

There are 20 Conservation Estates in Central Otago which cover a large expanse of high country. This area of land is promoted for public recreation. Many of the legal roads which provide access to the conservation areas are not maintained by Council, and there is growing pressure from affected landowners for Council to maintain these roads.

Council, Department of Conservation, and Search and Rescue have agreed to work together to identify potential locations and management solutions where access to recreational areas on unmaintained legal roads is creating safety issues or damaging the environment.



3.8 Modal Change

The Otago Central Rail Trail, Roxburgh Gorge Trail, Clutha Gold Trail, and the Alexandra to Clyde River Track are all well-established New Zealand Cycle Trails located within our District. These enable recreational cycling and associated cycle tourism on high-quality routes across Central Otago.

During 2020, the opening of sections of the Lake Dunstan Cycle Trail will have completed connections between Pisa Moorings, north of Cromwell, and Clyde. The continued development of the New Zealand Cycle Trail route within Central Otago will result in an ongoing growth in cycle tourism and cyclists on the Central Otago Road network. The new trails will eventually provide over 500 kilometres of “destination” off-road cycle trails that connect Queenstown, Wanaka and Cromwell with the existing Central Otago trail network at Clyde.

Local Road improvements to provide safe and attractive linkages from the New Zealand Cycle Trail network to commercial areas are required to ensure the district can benefit from the economic growth that the Government expects from its investment in these trails. These have been funded between Central Otago District Council, Waka Kotahi NZTA and the Central Otago Queenstown Trail Network Trust.

Where appropriate, improvements to better accommodate pedestrians and cyclists are included in routine renewals work. Other improvements are undertaken within the Low-Cost/Low Risk Improvement Program. These projects are prioritised in accordance with Council’s policy for determining the works that receive funding.

The council is currently engaging with stakeholders to ensure that appropriate provisions for cyclists can be made within the Clyde township in response to the anticipated demand that will be generated from new cycling infrastructure. Rapid consenting, funding and construction of the Lake Dunstan Cycle Trail between Pisa Moorings, Cromwell and the Clyde Dam has meant that the trail will be operational during the summer of 2020. The council has already completed work at the Bannockburn Bridge and on accesses into Cromwell to improve cyclist and pedestrian safety on one of our busiest rural Collector roads. The currently identified needs are to provide appropriate linkages between:

- the Clyde Historic Precinct, the end of the new Lake Dunstan Cycle Trail north of the Clyde Dam and the State Highway 8 underpass connecting the end of the Otago

Central Rail Trail with Clyde township. This includes a number of new or upgraded cycle paths/shared facilities connecting the possible crossing points of Lake Dunstan with the township, and upgrading existing infrastructure to provide “cycle-friendly” arrangements to link the trails to the Clyde Historic Precinct

- the Cromwell township/Cromwell Old Town sections of the new Lake Dunstan Cycle Trail and the Cromwell Town Centre. The preferred option is to provide a linkage into the Cromwell ‘Greenway’ network, constructing a new shared facility between the Alpha Street Reserve, adjacent to Neplusultra Street and through existing greenway corridors to link with the pedestrian crossing facility at Barry Avenue and The Mall.
- the Alexandra township, the Otago Central Rail Trail and the end of the Roxburgh Gorge trail, which formally ends at the southern side of the Mata-au/Clutha River and is not connected with Alexandra township or the wider Central Otago cycle network with dedicated cycling infrastructure. Previous public desire to see the linkage of the wider network (Otago Central Rail Trail and Lake Dunstan Trail) through walking and cycling upgrades and provision of a clip-on bridge structure at the existing Alexandra bridge has been historically identified. The clip-on cycle bridge is now the preferred option, as a dedicated bridge at the old Alexandra bridge site – using the historic schist piers - has now been discounted.



3.9 Change in Customer Expectations

Some people believe that sealing a gravel road will result in less future cost to Council as the road will not need grading. In fact, the maintenance and renewals costs for sealed roads are significantly higher than those for low volume gravel roads.

From 2015, Council has taken a more proactive role in providing information to the customers regarding the levels of service provided for transportation activities and the associated costs of delivering these.

3.10 Traffic Counting

In 2012 Council bought traffic counting functions back in-house in order to streamline this process and improve the recording of traffic data in RAMM. Council has five Metro-Count traffic counters which record speed, vehicle type, travel direction, and number of vehicles. Information from the counters is able to be directly uploaded into RAMM.

The council has developed a traffic count programme that enables roading staff to put the counters out, collect the data, input data into the RAMM database, and maintain the counters. This change has resulted in an improvement to the quality and extent of data that is recorded, and provided significant cost efficiencies. Counting is typically programmed for around 40 weeks throughout the year, enabling around 150 7-day counts to be completed and validated (approximately 5% of the total road network each year).

A complete review of Traffic Estimates (referred to as Average Daily Traffic, or ADT) has been completed by Council staff in 2016, ensuring robust traffic numbers are now entered into RAMM for the whole of the Central Otago District roading network. Traffic estimates were updated for all carriageway sections in 2017, 2018 and 2019 using actual count data and local knowledge regarding traffic flows and seasonality.

This has been used to assist with our asset management processes and improve the quality of our benchmarking and reporting through the ONRC.

While there has been a significant increase in the number of counts undertaken this work needs to continue, to enable:

- The remaining gaps in traffic data to be filled.
- Annual traffic monitoring of our busiest roads to be completed, in-line with national performance measures standards.
- The continued provision of robust data to support decision making and advanced asset management.
- Monitoring and responding to the challenges presented by the growth occurring in the District, through the correct classification of our roading network.

3.11 Traffic Growth Sensitivity

Application of the One Network Road Classification to the Central Otago network has identified that Central Otago roads almost entirely fall within the bottom four hierarchy levels of the eight One Network Road Classifications, with 89% of the roads in the Access and Low Volume Access classifications. This reduces to 87% as a result of the 2020 ONRC Moderation.

The relatively low traffic volumes, and the standard to which the roads were constructed, demonstrates that capacity exists on the wider network to handle significant growth in vehicle numbers. Of greater concern is change in land use (which generates higher numbers of heavy vehicles) and growth in our urban centres (placing traffic pressures on intersections, parking and the numbers of pedestrians, cycles, cars and heavy vehicles sharing the road).

Assumptions which have been made for forecasting changes in demand will be reviewed on a 3-yearly cycle.

Safety deficiencies and improvements to address demographic change and growth are expected to be undertaken within the Low Cost-Low Risk Improvements Programme. Work within this program will be prioritised and programmed, as investment permits.

The cost of changes in level of service due to traffic growth on the gravel road network are expected to be accommodated within the cost escalation provisions in the 30-year plan. Where practical, non-asset solutions will be utilised for managing recreational growth, and changes in customer expectations.

3.12 Investment for Road Safety, Demand and Growth Opportunities

The Low-Cost/Low Risk Improvement Program (previously referred to as the Minor Improvements Program by Waka Kotahi NZTA) is an investment in the construction of small projects, which is subsidised by NZTA. The limit of investment was raised from \$300,000 to \$1,000,000 per project, from 1 July 2018. From 1 September 2021, this is potentially being increased to \$2,000,000 per project. The Financial Assistance Rate for the NZTA share of the investment remains unchanged at 51% for qualifying activities, which means that additional local funding is required to support the total cost of projects which are valued above the previous threshold.

The Low-Cost/Low Risk Improvement Program is used for small isolated geometric road and intersection improvements, traffic calming measures, road surface treatments (targeting the safety outcomes identified in the Government's Road to Zero strategy), installation of new traffic signs and road markings, walking or cycling facility improvements, stock underpasses, small bridge replacements, specific works to address resilience issues and other improvement projects up to \$2,000,000.

Council has a Low-Cost/Low Risk Improvement Policy which identifies how these improvement projects will be prioritised. The policy was updated in 2017 to address both the council's and the NZTA's requirements for funding these works.

The process for prioritising projects requires all projects in the programme to be scored for their importance in addressing a level of service gap or roading issue against Customer Outcomes. The criteria used are Resilience, Safety, Accessibility, Aesthetics & Comfort, and Value for Money outcomes. This uses the same framework as Council's Infrastructure Strategy and provides a good fit with the NZTA's assessment criteria.

Many of the issues which arise as a result of growth and changes in demand are addressed from within this investment allocation. The current projects which are being put forward for investment over the next 30-year period are show shown in Table 3.2.

Project	Problem	Preferred Option	Principal Alternatives	Capital Expenditure Split	2020 Cost (\$ Million)	Year	Cost (\$ Million)
Cromwell Town Centre Intersection Upgrades	Growth in population and visitors is placing pressure on key intersections. Safety issues due to intersection alignment are exacerbated by increased traffic	Construct roundabouts or separated turning lanes with dedicated pedestrian and cyclist provisions	Install traffic lights	81% Level of Service 19% Growth			
		<i>Roundabout at Sargood Road/Illes Street/Murray Terrace</i>			\$2.00	2022-2025	<u>\$6.74</u>
		<i>Re-alignment of Murray Terrace at Sargood Road (approximately 135m of new road and traffic calming)</i>			\$1.70		
		<i>Intersection/traffic calming at Barry Avenue/Murray Terrace</i>			\$0.40		
		<i>Intersection at Waenga Drive/Murray Terrace</i>			\$0.40		
		<i>Urban Roundabout at Barry Avenue/Waenga Drive</i>			\$1.50		

Project	Problem	Preferred Option	Principal Alternatives	Capital Expenditure Split	2020 Cost (\$ Million)	Year	Cost (\$ Million)
Cromwell Town Centre Intersection Upgrades	Growth in population and visitors is placing pressure on key intersections. Safety issues due to intersection alignment are exacerbated by increased traffic	<i>"Link Lane" constructed to facilitate development and provide service and emergency vehicle access between sections of Waenga Drive and Murray Terrace</i>	<i>Upgrade existing car park "through-routes"</i>	81% Level of Service 19% Growth	\$0.74	2022-2025	
Cromwell Town Centre 'Greenway' – Lake Dunstan Cycle Trail	Construction of new greenway shared path to connect Alpha Street and the Lake Dunstan Trail to the Cromwell Town Centre. Retention of the existing plan intents and service levels afforded by the greenway network.	2.2km greenway shared facility and road crossing upgrades within existing road reserves.	On-road cycling facilities	81% Level of Service 19% Growth	\$0.90	2022	<u>\$0.90</u>
Seal extension Sandflat Road	Growth in traffic volumes resulting in excessive maintenance costs and safety issues due to dust.	Seal extension <i>Seal extension for 1.20km</i>	More frequent maintenance and renewal, use of dust suppression products	81% Level of Service 19% Growth	\$0.41	2024-	<u>\$0.41</u>

Project	Problem	Preferred Option	Principal Alternatives	Capital Expenditure Split	2020 Cost (\$ Million)	Year	Cost (\$ Million)
Alexandra intersection upgrades	Growth in population and visitors is placing pressure on key intersections. Safety issues due to intersection alignment are exacerbated by increased traffic	Construct roundabouts or separated turning lanes <i>Roundabout at SH8</i> <i>At-grade separated turning lanes at SH8</i> <i>At-grade intersection at Dunstan Road</i>	Install traffic lights	81% Level of Service 19% Growth	\$1.70 \$0.49 \$0.28	2025-	<u>\$2.47</u>
Construction of Alexandra northern access road	Access to residential and industrial development will result in a new road being built to provide access from SH8. There will be a gap between the developers projects across Council reserve land which will be funded by Council	Construct approximately 300m of new road <i>Construct approximately 370m of new road between Dunstan Road and State Highway 8.</i> <i>Construct approximately 310m of new road between MacLean Road and State Highway 8 – including raising ground over existing gully.</i>	Don't construct road and limit industrial traffic to Boundary Road only. Upgrade Boundary Road/SH 8 intersection	81% Level of Service 19% Growth	\$1.56 \$3.15	2025-	<u>\$4.71</u>

Project	Problem	Preferred Option	Principal Alternatives	Capital Expenditure Split	2020 Cost (\$ Million)	Year	Cost (\$ Million)
Clyde township cycle facility improvements	Connectivity between the completed Lake Dunstan Cycle Trail and the Otago Central Rail Trail will require upgrades to ensure safe cycle routes are provided to link the two Great Rides with Clyde township.	Provide access to the north-western end of Clyde Historic Precinct via the Clyde Dam and Sunderland Street. Improve cycling connections between Clyde Town Centre, the Clyde "greenway" and the State Highway 8 underpass.	Provide access to the south-eastern end of the Clyde Historic Precinct via the Clyde Bridge	81% Level of Service 19% Growth	\$1.40	2021-2024	<u>\$1.40</u>
Clyde Historic Precinct – Road upgrades	Growth is resulting in increased demand for parking, and use of public spaces, eroding the experience for visitors and locals, and creating safety issues.	Clyde Historic Precinct Streetscape Improvements Lodge Lane urban streetscape improvements, Holloway Street traffic calming, walking and cycling improvements Fache Street, Sunderland Street and Naylor Street urban streetscape improvements and traffic engineering to deliver low-speed road environment	Addressing parking by improving access to car parking beside river, reducing speed on Sunderland Street.	81% Level of Service 19% Growth	\$1.37 \$1.60	2021-2023	<u>\$2.97</u>

Project	Problem	Preferred Option	Principal Alternatives	Capital Expenditure Split	2020 Cost (\$ Million)	Year	Cost (\$ Million)
Pedestrian and cycle path on side of Alexandra Bridge	Roxburgh Gorge NZ cycle trail ends at the southern side of the Clutha River/Mata-au. Linkage with other cycle trails and townships require a linkage to cross this bridge, increasing pedestrian and cycle traffic significantly.	Construct a clip-on pathway onto side of bridge	Separate bridge is constructed for cyclists and pedestrians, or they share the existing road across the bridge with traffic	81% Level of Service 19% Growth	\$2.00	2024-	<u>\$2.00</u>
Replacement of small bridges	Minor bridges coming to the end of their economic life	replace with washover culverts where possible and where alternative route exists, or concrete box culverts	Replace like with like	20% Level of Service 60% Renewal 20% Growth	\$9.00 (approx. \$0.3/annum)	2021-2050	<u>\$13.1</u>
Omakau Bridge Replacement	Settlement is occurring in the piers. The single lane bridge is not wide enough to take farm vehicles. The existing structure is nearing the end of its economic life.	Construction of a new concrete bridge	Jacking of existing piers, and widening of existing deck	28% Level of Service 65% Renewal 7% Growth	\$2.35	2029-2031	<u>\$2.35</u>
Little Valley Road Bridge Replacement	Timber decked railway bridge on concrete abutments is nearing the end of its economic life. Substandard seismic performance.		Replacement of structural components, and seismic strengthening	20% Level of Service 60% Renewal 20% Growth	\$4.00	2043-2045	<u>\$4.00</u>

Project	Problem	Preferred Option	Principal Alternatives	Capital Expenditure Split	2020 Cost (\$ Million)	Year	Cost (\$ Million)
Rural Intersection Upgrade - Ranfurly Patearoa Rd/Barneys Rd	Rural intersection with identified crash history and high DSI benefits for appropriate interventions.	Rural Intersection Advance Warning Signage, short seal extensions to minor gravel roads at intersection and signage/markings to enforce priority controls		81% Level of Service 19% Growth	\$0.35	2026	<u>\$0.35</u>
Seal extension Maori Point Road	Growth in traffic volumes resulting in excessive maintenance costs and safety issues due to dust.	Seal extension <i>Seal extension for 5.85km</i>	More frequent maintenance and renewal, use of dust suppression products	81% Level of Service 19% Growth	\$2.17	2031-	<u>\$2.17</u>
Minor Safety Work	Growth in traffic volumes and network usage is resulting in some minor deficiencies in roading geometry, intersections and surfacing presenting an increased risk to road users	Construction of reconfigured intersections and minor geometric improvements, in conjunction with short sections of sealing.	Existing Levels of Service are maintained.	81% Level of Service 19% Growth	\$6.0 <i>(0.20/annum)</i>	2021-2050	<u>\$6.00</u>
New Footpaths and new Dropped Kerb/Tactile Crossings	Growth, aging demographic and Increased traffic exacerbates safety issues where there are gaps in the existing footpath network	Construction of new footpaths and cycle ways, in conjunction with providing compliant crossing facilities	Vulnerable users share the road with vehicles or walk on road verges.	81% Level of Service 19% Growth	\$4.5 <i>(0.15/annum)</i>	2021-2050	<u>\$4.50</u>

Table 3.2 Roading Improvement Projects 2021 – 2030 LTP

3.13 Investment for Network Resilience

The Infrastructure Resilience Plan identifies mitigation work for three-waters and roading. This will be scoped, priced and prioritised for inclusion in the 2021-2030 Long Term Plan, 30-year Infrastructure Strategy, and activity management plans.

Mitigations can include investing in work to either reduce or eliminate the risk of a hazard to assets or developing monitoring and mitigation plans to minimise the consequences of asset failures. The Infrastructure Resilience Plan provides information on specific transport assets - and areas within the District - that are being investigated to improve infrastructure resilience.

The process for prioritising projects requires all projects in the programme to be scored for their importance in addressing a level of service gap or resilience issue which is impacting on Customer Outcomes. Typically, these projects will align with Resilience, Safety, Accessibility and Cost Efficiency outcomes. Projects developed from the Resilience Plan programme of interventions are likely to be either addressed from within the Low-Cost Low Risk Improvement investment allocation, or from targeted capital renewals investment. Increased budgets for unsealed road metalling and drainage renewals, and the allocation of existing levels of investment from Low-Cost Low Risk Improvements to targeted small bridge renewals are included in the 2021-24 National Land Transport Plan investment bid.

Section 4

Assumptions, Negative Effects & Risks

4.1 Introduction

This section details the significant assumptions and uncertainties, negative effects and risks. Assumptions regarding investment and financial forecasting are contained in Section 7.

4.2 Assumptions

Growth Forecasts

Growth forecasts are inherently uncertain and involve many assumptions. The Central Otago District is expected to continue to experience growth, and issues are expected not just from the growth in resident population, but more directly from the increase in peak visitor numbers.

Growth related work is largely limited to projects which are undertaken within the Low-Cost/Low Risk Improvements programme.

The forecasts for income from Development Contributions will vary if the growth that occurs is different to that forecast. In some cases the work in the Low-Cost/Low Risk Improvement program will need to be delivered before the growth component is collected. This results in the development contributions account being deficit. Council is changing the management process for development contributions to improve monitoring of the timing of work versus the timing of contribution collection.

Demand Forecasting

Demand forecasting is also inherently uncertain and involves many assumptions. Expectations regarding change in demand as a result of demographic change are based on robust information. Information regarding growth in visitor numbers is more uncertain as this is affected by global financial impacts. Data regarding visitor number is becoming more robust due to the use of cell phone information (Qrious). Council also has access to a range of tailored economic growth, demand and population statistics through Infometrics datasets.

Assumptions regarding demand changes as a result in change in land use are sensitive, and have a high degree of uncertainty associated with them. Management of changes in demand involves non-asset solutions, Low-Cost/Low Risk Improvement projects, changes to the renewal lives, and financial impacts from an increased asset base.

Climate Change

Council has commissioned a Climate Change Report from Bodeker Scientific which has been used to project possible climate change implications for Central Otago.

There are many possible futures regarding global climate. Exactly which one we follow will depend on many factors that are themselves unpredictable. As a result, there is no way to make a reliable prediction on what the future climate may look like. Projections have been made based on a set of assumptions. That set of assumptions, together with the simulated outcomes, is referred to as a scenario. Three scenarios were modelled, a best case, a worst case, and a

middle scenario which are considered possible depending on the quantities of greenhouse gases emitted over the 21st century. The report provided outlines implications for the worst case and middle scenarios which are considered most likely.

For this study, a number of indices were sourced from the Expert Team on Climate Change Detection and Indices to quantify and communicate estimates of the impacts of climate change which would be of interest to Central Otago. These were compared to historic trends and modelled with a regional climate model to generate daily fields of temperature and precipitation at 5 km x 5 km resolution.

All of these assumptions have been factored into investment planning for the 2021-24 AMP.

4.3 Political and Legal Assumptions

Government Policy Statement

Investment priorities for Waka Kotahi NZTA are set based on the Government Policy Statement (GPS), and the Investment Decision-Making Framework. NZTA have also developed a ten-year plan – Arataki – which details priorities at a strategic, national and regional level. This plan has been prepared with consideration of giving effect to the 2018 GPS and the Draft 2021 GPS. The transportation priorities of the Labour/New Zealand First/Green Party Coalition Government form the basis of preparing the council's 2021 roading maintenance, operations, renewals and improvements programmes. Historically changes in Government have resulted in significant changes in priority for Government funding, with the results of the October 2020 General Election not yet known.

Changes in Legislation

This plan does not specifically provide for future changes in legislation, although national and regional changes in the regulatory environment for transportation services since the adoption of the 2018-21 AMP and 2018-28 LTP have been identified and included.

4.4 Negative Effects

The negative effects associated with providing and operating the transportation system are identified below:

Noise

Noise from traffic can cause a negative environmental effect. The local road network typically has relatively low traffic volumes and noise complaints are restricted to heavy vehicles using local streets at night, and service covers making noise when vehicles travel over them. Council monitors heavy vehicle use on main urban streets using traffic counters and considers traffic calming and legislative tools to restrict heavy vehicle use when this is appropriate.

Street Lighting

In residential areas light spill from street lighting can have a detrimental effect on some properties, and impact on the night sky. The renewal of the council's street lighting with LED lights is completed for all existing council-owned assets, which were assessed as economically viable to replace. LED lighting has reduced power consumption for the street lighting network by 50-60%. It also provides safety benefits from the quality of light and results in far less upwards light spill. LED lights can have a low cost "shield" attachment fitted (where required) to reduce spill into adjoining property.

Air Quality

Vehicle emissions are not considered a significant negative effect due to the low traffic volumes within Central Otago. The impact of dust (and specifically the PM₁₀ particulate content) on residences near unsealed roads is of greater significance, and Council addresses this by undertaking dust suppression of a 100m length of road when there is a house located within 100m of the road.

Dust Suppression

Dust suppression has historically been undertaken by applying oil to sections of unsealed roads, at the request of adjacent property owners. This has negative environmental effects and has been progressively phased out by undertaking a low whole-of-life cost alternative (Eco-sealing) at these locations, completed in conjunction with routine road re-metalling. From the start of the 2020/21 financial year, road oiling using traditional “waste oil” products is no longer a permitted activity under the Otago Regional Council’s “Regional Plan: Water for Otago”. An alternative product, used successfully elsewhere on gravel roads in the South Island, is being trialled. The aim is to provide all dust suppression required for residential properties by using Eco-sealing during the 2021-24 AMP cycle. This will be managed in conjunction with a review of the council’s “Dust Suppression” Roothing Policy for the requirements on developers of new residential properties adjacent to gravel roads.

Crashes

Crashes on the District road network are a significant negative effect. Council manages this by undertaking an integrated safety management approach to activities on the network. This includes addressing maintenance defects, providing information to road users, providing a community road safety education and awareness program, and undertaking a prioritised site-specific safety improvement program where known risks exist. Excessive speeds are a key cause of serious road crashes, and Council is completing a Speed Limit Review in accordance with the new Waka Kotahi NZTA Speed Management Framework within the 2018-21 AMP period. A new Speed Limit Bylaw will be enacted following public consultation, with implementation costs budgeted for within the 2021-24 Activity Management Plan.

4.5 Emergency Management

Civil Defence and Emergency Management is undertaken collaboratively across the Otago Region. Emergency management staff are employed by the Otago Regional Council. Otago Civil Defence Emergency Management provide emergency management planning, systems, and training. Two Emergency Management officers are dedicated to the Central Otago District area.

The 2018-28 Otago CDEM Group Plan defines the civil defence emergency management structure and systems necessary to manage hazards, including arrangements for declaring a state of emergency. The Group Plan is the primary instrument where the community identifies and assesses its hazards and risk and decides on the acceptable level of risk and how it is to be managed. Community Response Plans are being prepared for the individual Central Otago Communities by Otago Emergency Management.

The Civil Defence Emergency Management (CDEM) Act 2002 requires Local Authorities to co-ordinate plans, programmes and activities related to CDEM across aspects of risk reduction, readiness, response, and recovery. It also encourages co-operation and joint action within regional groups.

The Otago Lifelines Group was re-established in 2017, currently supported by a steering committee structure chaired by the Mayor of Queenstown Lakes District Council. The Lifelines Group has a programme of work in place which is being delivered collaboratively and will be able to provide improved response and intelligence in a major event.

Otago Civil Defence Emergency Management and the Lifelines group are specifically considering impacts, response plans, and mitigation requirements for the anticipated Magnitude 8 earthquake on the Alpine Fault. Training and information sessions for this are run at a regional level.

Infrastructure Resilience and Event Response

Central Otago District Council has completed both an Infrastructure Resilience Plan and Infrastructure Response Plan for transport assets, have been prepared to ensure that information is available to:

- manage response for a range of scenarios that will impact on infrastructure assets and services
- undertake hazard assessment - such as overlaying hazard maps with asset maps to identify which assets are most exposed to these hazards;
- identify assets which are most critical to service delivery and need to be inspected and restored as a priority in an event. This includes an initial assessment of options for backup or maintaining a minimum level of service.

The potential risks and vulnerabilities to infrastructure services that could arise from a range of natural disasters is now documented. This includes identifying where critical asset failures could occur and possible future challenges such as climate change.

Information has also been developed to support the response to emergency events which impact infrastructure assets. The Infrastructure Response Plan and supporting information can be used by staff across the organisation and by Civil Defence Emergency Management personnel. The plans will be circulated to operational staff, Emergency Management Otago, and the Otago Lifelines Group.

More details of these plans are discussed under Section 2.7 “Resilience”, above.

4.6 Risks

A Risk Register and Treatment Plan have been developed in alignment with AS/NZS ISO 31000:2009 Risk Management, the Central Otago District Council Corporate Risk Policy, and the RIMS Best Practise Guideline for Risk Management on Road Networks.

Risks are monitored and reported on in accordance with the Central Otago District Council Risk Policy.

Council have reviewed and updated the previous risk register in 2017 in consultation with their contractor. The complete risk register is shown in Appendix 1.

STAGE 1 - RISK IDENTIFICATION					STAGE 2 - ANALYSIS OF UNCONTROLLED RISK							STAGE 3 - RISK CONTROLS AND ANALYSIS OF CONTROLLED (RESIDUAL) RISK							STAGE 4 - RECOMMENDED ACTIONS						
Risk ID	Risks			Risk Owner	Consequence Score						Un-controlled risk			Current Controls (Mitigations)	Consequence Score						Controlled Risk	Future Controls (Mitigations)			
	Description	Date risk entered/ latest revision date	Causal Factor		Outcome/Result	Assigned to	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)		Likelihood Score (2016)	Level of Risk (2016)	Control (Mitigations)	Reputational	Financial	Injury / Harm			Property/Assets Damage/Failure	Operational (LOS)	Environmental
1	Health and safety - Non-compliance with current legislation and legal requirements.	1-Oct-16	Unsafe practices, culture, lack of commitment, incorrect plant operation, etc.	Death & serious injury to: council staff, contractor working on council owned sites, consultant, member of the public.	CEO	4	3	5				5	Moderate	Very High	Sites being compliant, culture change, processes, sitewise accreditation	4	3	5				5	Unlikely	High	

STAGE 1 - RISK IDENTIFICATION					STAGE 2 - ANALYSIS OF UNCONTROLLED RISK						STAGE 3 - RISK CONTROLS AND ANALYSIS OF CONTROLLED (RESIDUAL) RISK						STAGE 4 - RECOMMENDED ACTIONS							
Risk ID	Risks			Risk Owner	Consequence Score					Un-controlled risk			Current Controls (Mitigations)	Consequence Score					Controlled Risk	Future Controls (Mitigations)				
	Description	Date risk entered/ latest revision date	Causal Factor	Outcome/Result	Assigned to	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)	Level of Risk (2016)	Control (Mitigations)	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)	Level of Risk (2016)
3	Service levels - Inadequate or inappropriately defined and delivery of levels of service expectations.	1-Oct-16	Misalignment between stakeholder expectations and delivery.	Service failure; over or under expenditure; community dissatisfaction.	Executive Manager Infrastructure Services	3	3				3	Likely	High		3	3					3	Likely	High	Normal AMP process along with integration of ONRC parameters.

		STAGE 1 - RISK IDENTIFICATION				STAGE 2 - ANALYSIS OF UNCONTROLLED RISK						STAGE 3 - RISK CONTROLS AND ANALYSIS OF CONTROLLED (RESIDUAL) RISK						STAGE 4 - RECOMMENDED ACTIONS							
		Risks			Risk Owner	Consequence Score					Un-controlled risk		Current Controls (Mitigations)	Consequence Score					Controlled Risk	Future Controls (Mitigations)					
Risk ID	Description	Date risk entered/ latest revision date	Causal Factor	Outcome/Result	Assigned to	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)	Level of Risk (2016)	Control (Mitigations)	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)	Level of Risk (2016)	Planned Mitigations
9	Human resources - lack of / loss of staff resources.	1-Oct-16	Shortage in the sector, comparatively remote location, staff retention	Workforce that is not capable and/or with enough capacity to deliver.	Executive Manager Infrastructure Services	2	3			3		3	Almost Certain	High		2	3			3		3	Almost Certain	High	HR Policy, training career development, salaries, avoid resignations, council values.

STAGE 1 - RISK IDENTIFICATION					STAGE 2 - ANALYSIS OF UNCONTROLLED RISK							STAGE 3 - RISK CONTROLS AND ANALYSIS OF CONTROLLED (RESIDUAL) RISK							STAGE 4 - RECOMMENDED ACTIONS				
Risk ID	Description	Date risk entered/ latest revision date	Causal Factor	Outcome/Result	Risk Owner	Consequence Score					Un-controlled risk			Current Controls (Mitigations)	Consequence Score					Controlled Risk			Future Controls (Mitigations)
						Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)		Level of Risk (2016)	Control (Mitigations)	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	
13	Gravel Supplies - Diminishing Gravel Supplies (Availability, cost, ownership, H&S management)	1-Oct-16	Carting gravel long distances or use crushed gravel.	Significant funding requirement for metalling programme and/or reduction in service levels. Risk of not managing sites (H&S).	Executive Manager Infrastructure Services	3	4	5			5	Likely	Very High							5	Likely	Very High	Council purchase quarry
15	Procurement - Procurement being inefficient and ineffective.	1-Oct-16	Procurement strategy and practices don't meet NZTA requirements. NZTA withdraw funding. Not using optimal procurement options, resulting inefficient and ineffective procurement.	Poor value for money; excessive demands on staff time; delays. Increased Health and Safety risks due to legislative changes. Needed to meet NZTA funding obligations.	Executive Manager Infrastructure Services	3	4	1	3		4	Moderate	High							4	Moderate	High	Procurement Policy in place and effective, but overdue for review.
16	Consultants - Not having the right skills / capacity / experience for the job.	1-Oct-16	Good people are unavailable or staff with the wrong skills are available.	Bad outcomes, loss of value.	Executive Manager Infrastructure Services	2	3				3	Likely	High	Procurement Policy						3	Unlikely	Medium	

STAGE 1 - RISK IDENTIFICATION					STAGE 2 - ANALYSIS OF UNCONTROLLED RISK							STAGE 3 - RISK CONTROLS AND ANALYSIS OF CONTROLLED (RESIDUAL) RISK							STAGE 4 - RECOMMENDED ACTIONS							
Risk ID	Description	Date risk entered/ latest revision date	Risks	Risk Owner	Consequence Score						Un-controlled risk			Current Controls (Mitigations)	Consequence Score						Controlled Risk	Future Controls (Mitigations)				
					Assigned to	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)		Level of Risk (2016)	Control (Mitigations)	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure			Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)
17	Project Management - Project management of one off projects (\$300K+).	1-Oct-16	Staff being overcommitted and not delivering the required project management.	Executive Manager Infrastructure Services	2	3			2			3	Likely	High	BBC - Management case	2	3			2			3	Moderate	Medium	
18	Contractor - Not delivering contract objectives.	1-Oct-16	Under-priced, lack skills, lack resources, inability to retain/attract staff, poor contract management.	Roading Manager	3	3			3	3	1	3	Likely	High	Normal management processes.	3	3			3	3	1	3	Likely	High	
19	Road Maintenance - Oiling Of Roads	1-Oct-16	Environmentally Unacceptable	Roading Manager	3						4	4	Almost Certain	Very High		3					4	4	4	Almost Certain	Very High	In compliance with ORC Requirements. Moving away from oiling to other products
23	Asset Failure - Critical and high risk asset failure. Bridges, key routes, structures.	1-Oct-16	Loss of access, serious and fatal injuries to users.	Roading Manager	4	4	5					5	Unlikely	High		4	4	5				5	Unlikely	High	Mobile cameras to monitor noncompliance with postings.	
24	Low Volume Access Roads - Condition.	1-Oct-16	Lack of access for farmer stock trucks. Use by inappropriate vehicles directed by GPS, Navigation.	Roading Manager	3	3			2			3	Almost Certain	High	High risk routes closed in winter. Sign posted.	3	3		2			3	Likely	High		
26	Natural Disaster - Flooding	1-Oct-16	Transportation asset damage. Roads, bridges, structures.	Roading Manager	4	3	4	4	4	3		4	Moderate	High	Knowledge of hot spots. Early weather warnings. ORC river level monitoring.	4	3	4	4	4	3	4	4	Moderate	High	

STAGE 1 - RISK IDENTIFICATION					STAGE 2 - ANALYSIS OF UNCONTROLLED RISK							STAGE 3 - RISK CONTROLS AND ANALYSIS OF CONTROLLED (RESIDUAL) RISK							STAGE 4 - RECOMMENDED ACTIONS						
Risk ID	Description	Date risk entered/ latest revision date	Risks	Outcome/Result	Risk Owner	Consequence Score					Un-controlled risk			Current Controls (Mitigations)	Consequence Score					Controlled Risk			Future Controls (Mitigations)		
						Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental	Consequence Score (2016)	Likelihood Score (2016)		Level of Risk (2016)	Control (Mitigations)	Reputational	Financial	Injury / Harm	Property/Assets Damage/Failure	Operational (LOS)	Environmental		Consequence Score (2016)	Likelihood Score (2016)
27	Natural Disaster - Landslides	1-Oct-16	Landslip effecting transportation asset damage. Loss of life. Loss of access and route resilience.	Transportation asset damage, opportunity cost of economic activity.	Roading Manager	4	3	5	4	4	3	5	Moderate	Very High	Specific site risk plans. Inspect during rainfall events.	4	3	5	4	3	3	5	Unlikely	High	
28	Natural Disaster - Severe Ice/Snow	1-Oct-16	Access and Travel Time risk.	District wide event with significant snow and severe cold temperatures.	Roading Manager	3	3	4	2	2	1	4	Moderate	High	Severe weather warnings observed. Winter preparations. Communications plan. CIMS training undertaken. Registers of sub-contractor equipment and local volunteers. Winter Operation Plan in place.	2	3	3	2	1	1	3	Moderate	Medium	
29	Natural Disaster - Trees on Road Reserve	1-Oct-16	Trees on road reserves blowing over and or cause fires. Sight line risks. Root damage to asset, and creating surface hazards.	Death by falling tree and/or firestorm.	Roading Manager	4	3	5	3	2	2	5	Unlikely	High	High risk trees identified but not implemented due to budget constraints.	3	3	3	3	2	2	3	Unlikely	Medium	
30	Programme Delivery - Failure to deliver programmes.	1-Oct-16	Not having evidence based programmes.	We don't deliver, we don't know what we are doing, projects not well scoped.	Executive Manager Infrastructure Services	3	3			2		3	Likely	High		3	3			2		3	Likely	High	BBC implementation, more focus on LT planning, proactive programmes, more contractor engagement.

Table 4.1 Identified Risks with Remaining "High" Rating - Transportation

Section 5

Central Otago's Assets

5.1 Introduction

This section provides an overview of asset information regarding the individual asset groups within the Transportation Activity.

Council uses the Roding Assessment and Maintenance Management (RAMM) asset management software to record information regarding the roading assets. A high-level summary of the transportation assets is shown in Table 5.1. The change in asset quantities has been shown as a high-level comparison

Asset Details	Quantity	Change (%)
Total Length of Road	1,935 km	+1.1%
Length of sealed road	527 km	+2.9%
Length of unsealed road	1,407 km	+0.7%
Number of bridges *	179 *	-
Length of footpaths	179 km	+7.2%
Number of streetlights	2,144 **	-
Number of signs	8,510 ***	+4.8%
Number of culverts, mudtanks and soakpits	8,285 ****	+7.3%
Length of constructed kerb and channels	215 km	+5.4%
Length of surface water channel	3,255 km	-

* Includes 5 footbridges managed by CODC

** Streetlight inventory completely re-assessed between 2017 and 2019 as part of the LED upgrade programme

*** Excludes assets recorded as Waka Kotahi NZTA signs - or privately-owned signs - within RAMM sign data

**** Excludes assets recorded as Waka Kotahi NZTA culverts - or privately-owned drainage assets - within RAMM drainage data

Table 5.1 Summary of the Transportation Assets (2020)

Visual Condition Inspections

Visual condition rating has been undertaken on all of the asset groups above, except culverts and surface water channels, in the last three Financial Years (2017/18 to 2019/20). Sealed roads have been condition rated in 2019 by an experienced local Consultant who holds a current NZTA rating certificate. Sealed roads, unsealed roads and footpaths have also all been assessed in detail as part of Central Otago's Asset Management modelling of these asset classes, using data collected in 2019 and 2020.

Table 5.2 has been used by Council Officers to ensure consistency in the definition of condition of bridges, footpaths, signs, and drainage assets. This is read in conjunction with the Visual Assessment Guides contained in Appendix 2, including the first version of the ONRC Road Maintenance Visual Guide. These are used for both condition rating and routine inspection purposes.

Condition Rating	Individual Defect Description	Description of Defect Scale	Maintenance Required
Excellent	As new, no defects	As new, no defects	No maintenance required
Good	Looks fine, only minor superficial defects	Looks fine, only a small number of isolated defects	Crack sealing and minor patching Routine grading cycle Minor repairs that align with other works in the vicinity
Fair	Starting to show signs of deterioration but not enough to affect level of service	A greater number of isolated defects but not enough to affect level of service	Minor components or isolated sections need repair or replacement Potential to increase grading cycle
Poor	Advanced deterioration requiring maintenance to remain operational	More significant larger defects, requiring maintenance to remain operational	Substantial repair work required Renewal work included in programmes, but able to be optimised to support cost-effective network management
Very Poor	Failed or close to failure	Completely failed over length of section	Reconstruction or replacement required urgently

Table 5.2 Condition Rating Descriptions

Value of the Transportation Assets

The replacement value of our transport assets has been re-assessed in 2020 at \$653.6 million. These assets are depreciating at the rate of \$6.1 million per annum (including bridges and district-maintained car parks).

Figure 5.1 shows the relative value of the assets. This excludes the cost of road formation, which accounts for 51% of the total gross replacement cost of the roading valuation. Formation is not depreciated or managed as a separate asset (such as land) and is therefore not included on the graph. It also excludes the estimated replacement value of \$2.1 million dollars for the Alexandra Airport assets. These are included in the Property Portfolio.

While unsealed roads make up 72% of the District's roads, they make up only 5% of the Gross Replacement Cost. Sealed roads (combining the replacement value of both the surface and the pavement structure) and bridges are the most valuable assets, at 17% and 13% of the total replacement cost respectively.

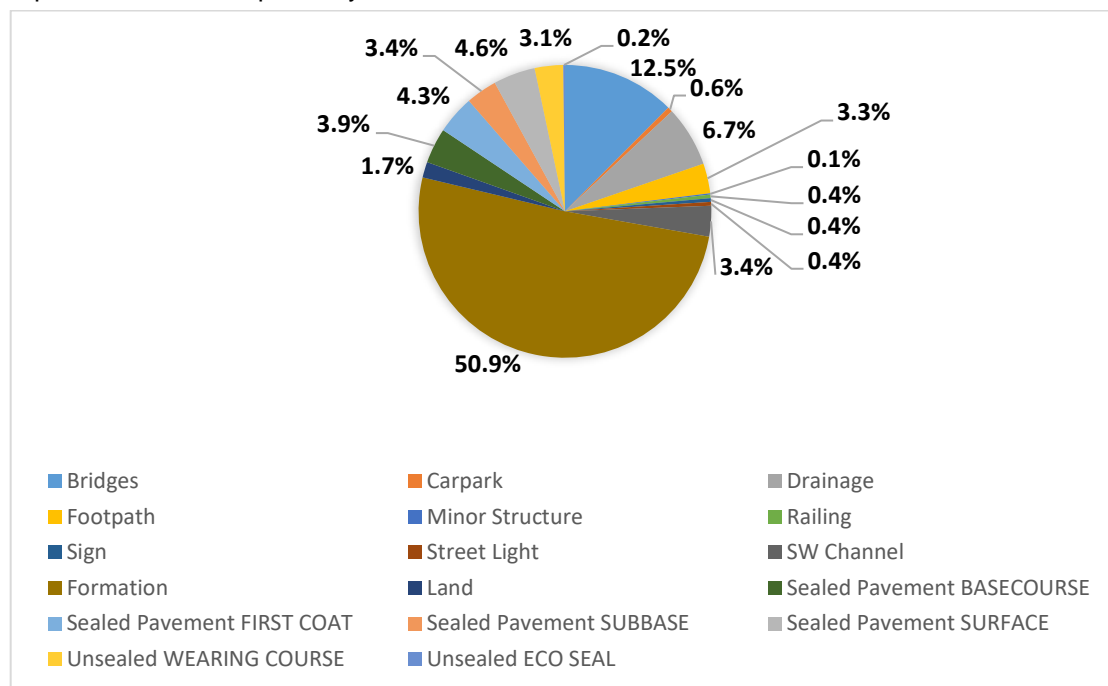


Figure 5.1 Gross Replacement Cost

Figure 5.2 shows the relative calculated annual depreciation amounts for the assets which are depreciable. While unsealed roads and the surfacing component of sealed roads make up relatively small proportions of the gross replacement cost, they are a higher proportion of the total annual depreciation provision due to their relatively short lives. In contrast, bridges make up a smaller proportion of the annual depreciation due to their relatively long lives.

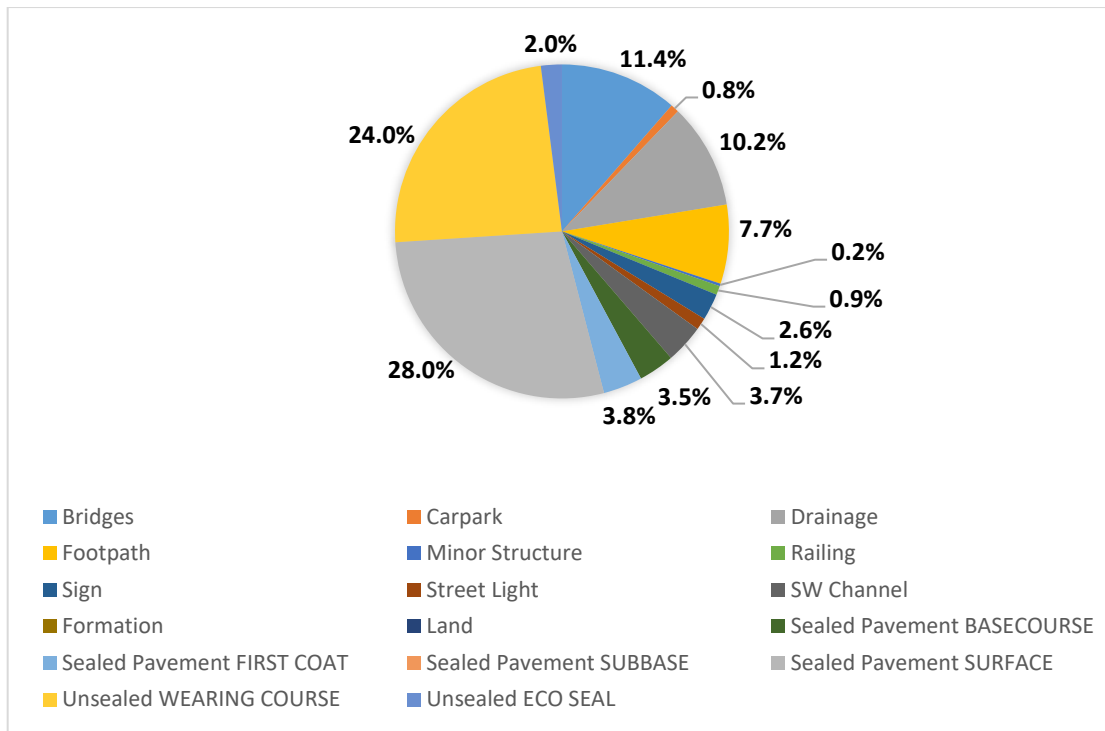


Figure 5.2 Annual Depreciation

Data Assessment and Validation

Central Otago District Council have been heavily involved in the work of the Road Efficiency Group, from the formation of the Road Maintenance Task Force in 2011 onwards.

The council's Assets team was established in 2018/19, with part of the work programme including the development of 'Advanced' Asset Management processes and procedures. Part of this process includes the systems and processes required to reliably record and report data for performance measurement and benchmarking of the Roding activities managed by the council (covering New Zealand Transport Agency, Department of Internal Affairs and Road Efficiency Group reporting). This is also documented as part of the council's Asset Management Policy and Asset Management Maturity Assessment.

Roding has established Asset Data Quality and Asset Management Performance Measures, developed by the Road Efficiency Group. These have gone through several years of testing and improvement to arrive at a point where the first significant release of national data was made available in 2017/18. Analysis of the second and third full financial year of data for 2018/19 and 2019/20 – incorporating reporting on the One Network Road Classification Performance Measures and Outcomes - forms a key part of this Activity Management Plan. The council's Asset Engineer has had the opportunity to work with these Performance Measures and support their use as an external measure of our service delivery.

Table 5.3 and Figure 5.3 demonstrates that the improvement projects and work of the Assets team have delivered measurable improvements in Asset Management Data Quality for Roding over the course of the 2018-21 AMP cycle. Central Otago District Council remain well-placed for Transportation Asset Management Planning over the course of 2021-24.

Benefit	Performance Measures	Central Otago District Council Target	Annual Reporting
Data is fit for purpose in supporting optimal Activity Management Plan development and decision-making	ONRC Performance Measures – Data Quality Metrics	Increasing overall assessment score, with targeted improvements reflected in individual Performance Measures	2017/18 Result: 71 2018/19 Result: 77 2019/20 Result: 76
Data is fit for purpose in supporting optimal 'Advanced' Asset Management delivery and decision-making	ONRC Asset Management Data Quality Metrics	Increasing overall assessment score, with targeted improvements reflected in individual Quality Metrics	2017/18 Result: 62 2018/19 Result: 74 2019/20 Result: 76

Table 5.3 Asset Management Data Quality and ONRC Data Quality Metrics

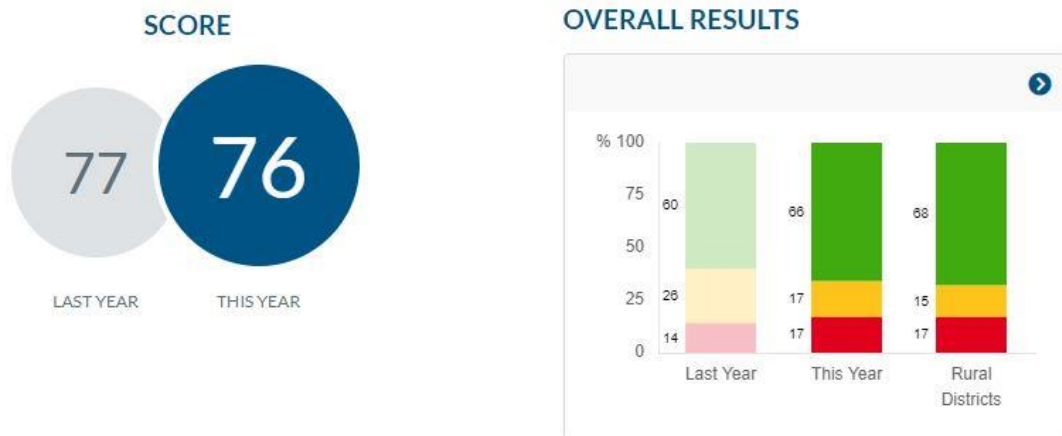


Figure 5.3 Asset Management Data Quality – Central Otago and Rural Peer Group

In the above metric, green denotes data meeting all expected standards, yellow indicates minor discrepancies and red identifies data which should be prioritised in improvement programmes. The 2021-24 AMP includes key Improvement Plan items directly targeting data quality.

5.2 Sealed Roads

Central Otago has a relatively small sealed road network, with only 28% (527 km) of the network sealed. This network length has grown by 13 kilometres (with 10.1 kilometres constructed and vested in the council in urban areas) since 2017.

One Network Road Classification and CODC Roding Hierarchy

The ONRC classifications are used for the Central Otago District sealed road network, as illustrated in Table 5.4.

One Network Road Classification	Traffic Volume (AADT)	Length (km)	Total Length (km)
Arterial	Urban > 5000	2.4	2.4
Primary Collector	Urban > 3000	7.8	25.4
	Rural > 1000	17.6	
Secondary Collector	Urban > 1000	25.5	186.0
	Rural > 200	160.5	
Access Road	Urban > 200	64.4	231.5
	Rural > 50 vpd	167.1	
Access Road Low Volume	Urban < 200	48.8	71.6
	Rural <50 vpd	32.2	
Total Urban Sealed Roads			149.4
Total Rural Sealed Roads			378.0
Total Sealed Roads			527.4

Table 5.4 Sealed Road length by One Network Road Classification

Sealed Surface Materials

The sealed network is constructed from materials as shown on Table 5.5:

Material	Urban Length (km)	Rural Length (km)
Asphalt	9.3	0.7
Slurry Seal	4.1	0.0
Pavers	0.8	0.0
Chipseal	135.0	376.8
Concrete	0.2	0.5
Total	149.4	378.0

Table 5.5 Sealed Surface Material

Age of the Sealed Roads

All District sealed road data is stored in RAMM. In 2009 Council staff reviewed the payment schedules in the archived reseal contracts and compared these to the surfacing ages in RAMM. In 2013 the archived reports, seal extension and rehabilitation contracts were compared to the pavement ages in RAMM.

From this baseline work, accurate data capture and validation processes have been maintained and strengthened. The data validation of all sealed road data – at both an asset and Treatment Length level – are critical to support robust dTIMS modelling. The council now has a high level of confidence in the sealed surface and pavement age data contained in RAMM.

The older first and second coat seals that currently exist are roads which were constructed as part of the Clyde Power project and have large grade chip sizes. First coat seals with a surface age of greater than 15 years are a small number of surfaces described as 'Prime and Seal' construction, from the early 1990's.

Figures 5.4 and 5.5 illustrate sealed pavement surfacing and basecourse ages.

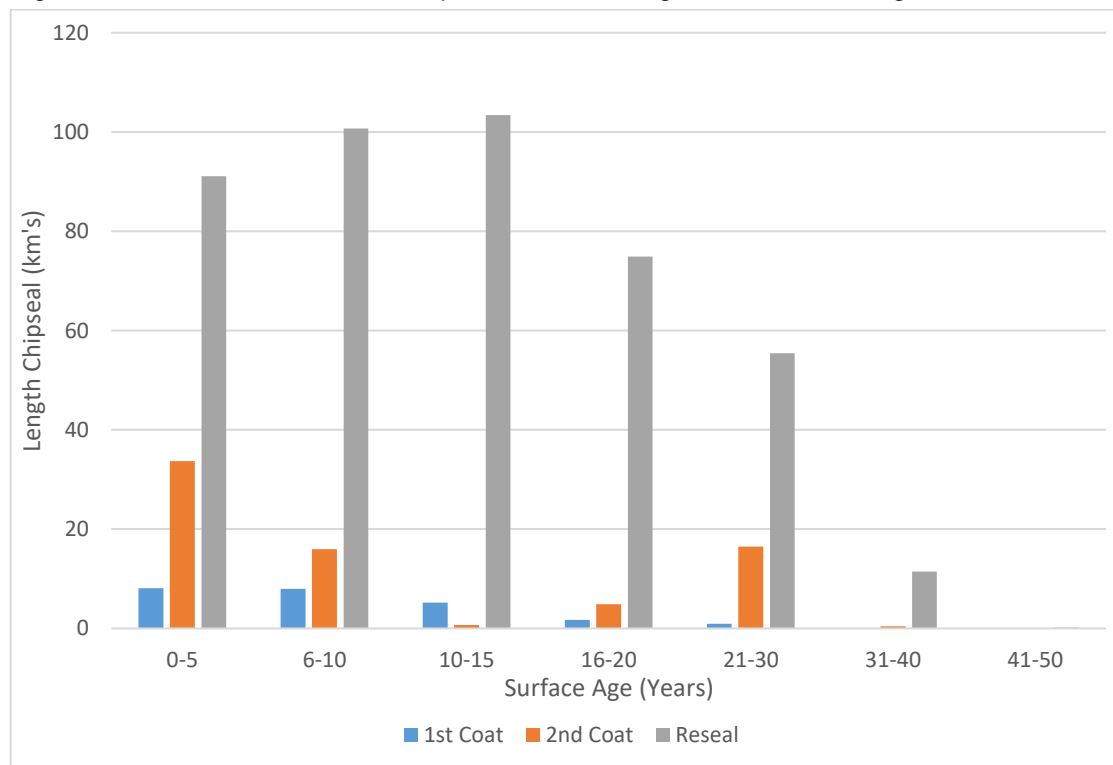


Figure 5.4 Chipseal Surfacing Ages

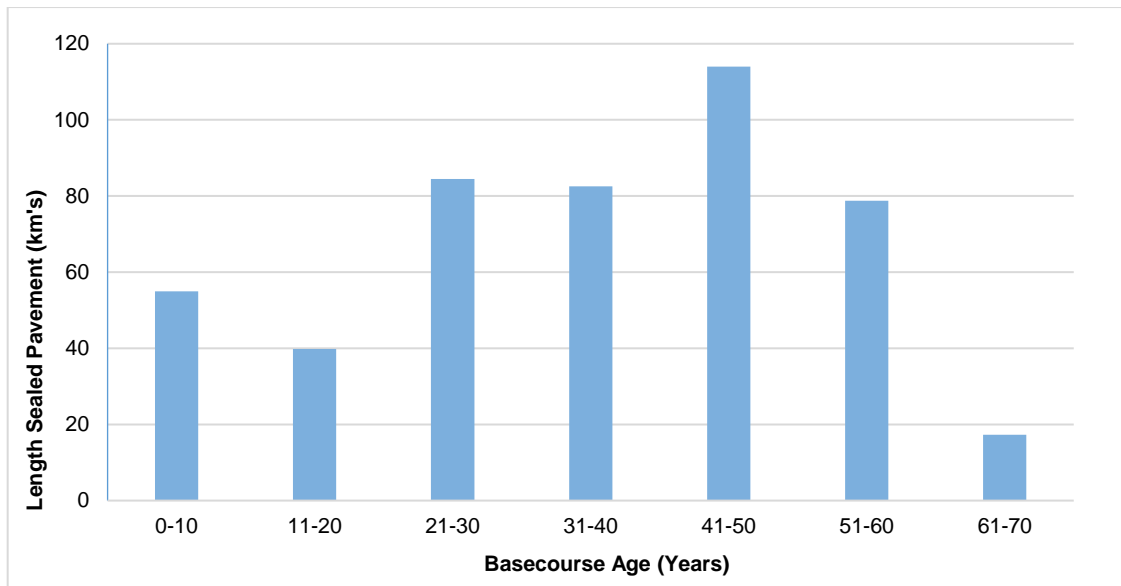


Figure 5.5 Sealed Pavement Ages (Basecourse Layer)

Condition of the Sealed Roads

Condition rating surveys are undertaken on the sealed road network at three yearly intervals. This was last completed in February 2019. Sealed roads rating requires an external certified assessor to record and document specific fault types according to a standard New Zealand methodology. Central Otago District Council can currently use a local assessor with huge experience of the region's roading networks.

In 2019, this rating work was then followed-up by undertaking an 'all faults' inspection using council and Roading Physical Works Contract staff.

Sealed road roughness surveys are undertaken annually. The latest survey was undertaken in April 2019. Annual roughness surveys are carried-out by external specialists with the equipment and vehicle required to collect the data and process the information into Central Otago's RAMM database.

High-Speed Data (HSD) surveys measure roughness, skid resistance, and horizontal profile. It is able to capture a highly-detailed range of data for sealed roads, using a highly specialised survey vehicle which travels almost all of New Zealand's sealed road network. These surveys were carried out on half the rural network in May 2008, and the remaining half of the rural network and all accessible urban areas in March 2009. Primary and Secondary Collector roads were surveyed again in 2014, with a further prioritised list of approximately 40% of sealed roads surveyed in 2016 and 2018.

Falling Weight Deflectometer (FWD) Testing was undertaken on 20% of the sealed road network in 2014. All rural Collector Roads - and a sample of roads that were showing visual signs of deterioration - were tested. Central Otago District Council were able to take advantage of the availability of the specialist consultants who collect and interpret this data (GeoSolve, based in Cromwell) in conducting trials of a revised method referred to as Multi-Speed Deflectometer (MSD) Testing in 2019. This new method required correlation with the previous surveys and has proven to be both cost-effective and reliable. One benefit of MSD testing is the ability to collect data at a range of vehicle speeds, allowing far greater network coverage. Previously this has not been possible as the speed of the survey vehicle is critical and not suited to testing all roads. We anticipate that use of MSD survey will be undertaken in the next AMP period (2021-24).

Where FWD or MSD information is being collected purely for pavement life analysis, the schedule of survey frequencies shown on Table 5.6 will be followed.

Centreline Length	FWD Test Spacing based on Field Calculation of Residual Life	
	Life > 15 years	Life < 15 years
0 m – 200 m	5 Tests (3 in IRP lane, 2 in DRP lane)	
200 m – 500 m	5 Tests per 200m (3 in IRP lane, 2 in DRP lane)	
500 m – 2 km	10 tests in IRP lane only	10 tests in each lane
2 km – 5 km	200 m intervals in IRP lane only	200m intervals in each lane
>5 km	200 m intervals in each lane, or 400 m intervals if geologically uniform terrain	

Table 5.6 Falling Weight Deflectometer Testing Frequency

New applications and data collection methods are being continually developed for this data. Work to enable predictive drainage condition modelling and detailed pavement design in New Zealand now require network level surveys to be based on 5 tests per 200m. Depending on the results obtained in the field, surveying frequencies can be adjusted during data collection to include fewer survey points in one road lane only. It is anticipated that surveys will also be undertaken in 2020/21 for the sections of road identified for rehabilitation the 2021-24 Activity Management Plan period.

Survey Results

The results of the condition rating, 'all-faults' inspections, sealed road roughness, High-Speed Data and pavement Deflectometer (FWD/MSD) surveys are stored in RAMM and used for a range of Asset Management activities. All of these data sources are used in dTIMS modelling of the sealed road optimal work programmes, described in Section 6. The council has also increased its capability to manage the processing of road roughness, High-Speed Data and FWD/MSD data into RAMM in-house during the previous AMP cycle. This will continue in 2021-24.

Waka Kotahi NZTA and the Road Efficiency Group analyse this data to benchmark sealed road networks across New Zealand.

Sealed Road Roughness

Roughness is a measure of the longitudinal profile of the road and is measured using specialised equipment carried in vehicles which travel on our sealed road network. The NAASRA count is the commonly used unit for the measurement of roughness. A higher NAASRA count indicates a rougher road.

Figures 5.6 and 5.7 show that the highest roughness levels of Central Otago District roads, within each classification, are generally lower than the roughness levels of our peer group. The roughest 15% of Councils' roads also have roughness levels of less than half the national peak roughness levels. This data should be read in alongside the Amenity Customer Outcome Measures reported in Section 2. This indicates that sealed roads in Central Otago are typically smoother than elsewhere in New Zealand.

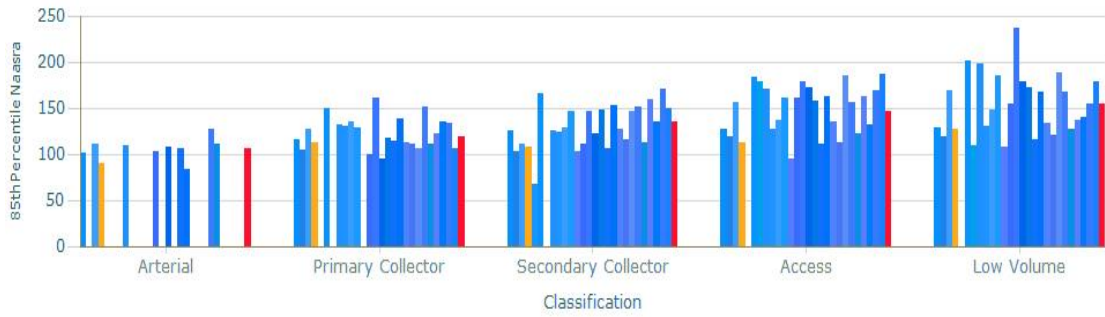


Figure 5.6 Urban Peak Sealed Road Roughness for Central Otago District and Rural TLA Peer Group

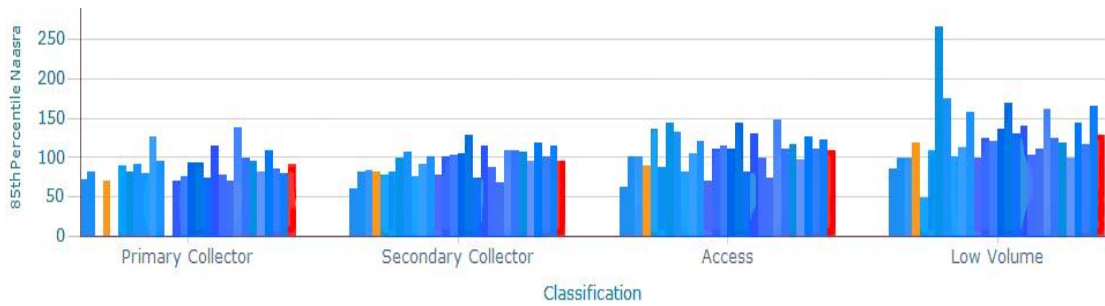


Figure 5.7 Rural Sealed Road Roughness for Central Otago District and Rural TLA Peer Group

Smooth Travel Exposure for Sealed Roads

The ONRC Amenity Customer Outcome measures for network performance include comparisons of Smooth Travel Exposure (STE) across New Zealand sealed roads. This measure reports the overall traffic volumes using roads of different roughness levels. This means that if the roads which have the highest traffic volumes are the smoothest on the network then there will be a higher smooth travel exposure figure, than if the roads with the least traffic volumes are the smoothest.

This measure is commonly used to compare the comfort of travelling on road networks across the country. Figure 5.8 shows that the percentage of motorists who are exposed to rough roads in Central Otago is minimal (100% ratings for this measure would indicate all journeys made on roads within a classification did not include any unacceptably rough sections). Central Otago District Council roads are compared to both our peer group and overall national STE levels.

This data should be read in alongside the Amenity Customer Outcome Measures reported in Section 2.

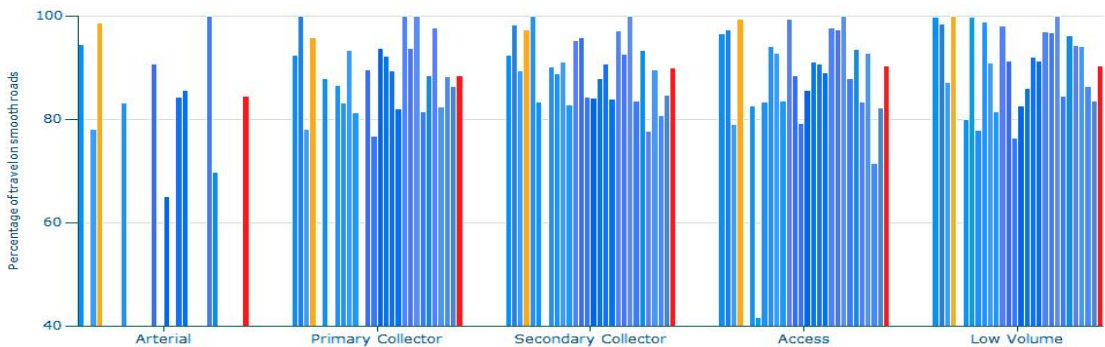


Figure 5.8 Smooth Travel Exposure for Central Otago District and Rural TLA Peer Group

Surface and Pavement Condition

Condition rating involves a visual inspection where defects are measured and recorded in a standard and objective manner. Condition rating is undertaken on the road network with a 10% sample measured every 500m. This information is reported as the Surface Condition Index, used to monitor trends in the network condition and compare against the all New Zealand average. A lower value of Surface Condition Index indicates a better overall condition.

It is important to note that all the Condition Indices plotted are well within the parameters indicating acceptable road conditions.

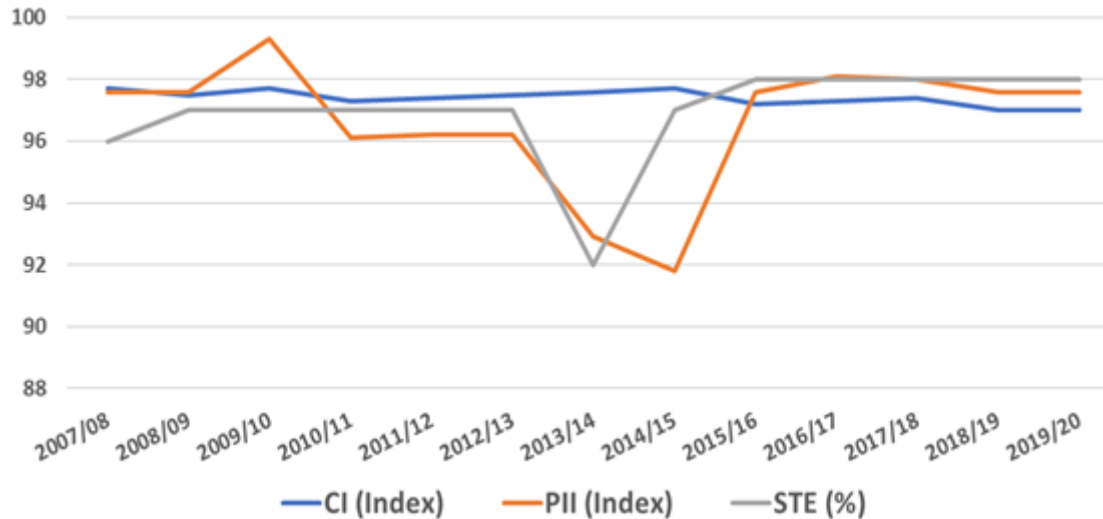


Figure 5.9 Condition Index, Pavement Integrity Index and Smooth Travel Exposure for all Sealed Roads – Central Otago District

5.3 Unsealed Roads

Central Otago has a large unsealed road network by New Zealand standards, making up 1,407 km (or 72%) of the district's roading network. This is the total length of all maintained unsealed roads, and includes roads classified as Tracks. Figure 5.10 illustrates the lengths of unsealed roads by ward.

One Network Road Classification and CODC Roding Hierarchy

The unsealed road network falls into two One Network Road Classifications:

- Access Roads which have an average daily traffic volume of between 50 and 200 vehicles per day; and
- Low Volume Access Roads that have less than 50 vehicles per day.

To enable effective day-to-day management of the extensive network that fall within these two classifications, the unsealed roads are further split into five CODC Hierarchy classifications as demonstrated in Table 5.7. The council uses these hierarchy classifications for programming of grading, priority of response in emergency events, priority of renewals work, and the width of the formed road.

One Network Road Classification	Traffic Volume	CODC Roding Hierarchy		Total Unsealed Length (km)
		Sub-Classification	Length (km)	
Access Road	>50 vpd	Major	54.1km	221.8 km
		Intermediate	167.7km	
Access Road - Low Volume	<50 vpd	Minor	559.3km	1,184.9km
		Lane	183.0km	
		Track	442.6km	

Table 5.7 Length of Unsealed Road by Classification

Major Unsealed Roads

Major unsealed roads are roads, which have an AADT of more than 50 vehicles per day. They also have a higher than normal percentage of heavy vehicles, and experience higher use as an alternative through-route. Roads categorised as Major unsealed roads are:

- Crawford Hills Road
- Lower Gimmerburn Road (Part)
- Maniototo Road (Part)
- Maori Point Road
- Patearoa Road
- Puketoi Road
- Wilson Road

Intermediate Unsealed Roads

Intermediate unsealed roads are through roads, forming part of a route which services a community. These roads service significant horticultural, farming or industrial activities, are higher volume gravel roads in lifestyle block areas, are part of school bus routes, or other activities of importance to the community. These roads have an AADT of more than 50 vehicles per day.

Minor Unsealed Roads

Minor unsealed roads are roads that provide access to more than three houses or can be used as an alternative through route by a number of properties. This is our largest grouping of unsealed roads within the CODC Hierarchy, servicing rural residential, commercial and agricultural land use.

Lanes

Lanes are unsealed roads, which provide access to three or less houses. While these roads may be a through-route, there are alternative higher classification routes available. They are generally for use as access to farmland or by residents.

Back Country Tracks

Back Country Tracks service land use beyond dwellings and buildings and provide high country access.

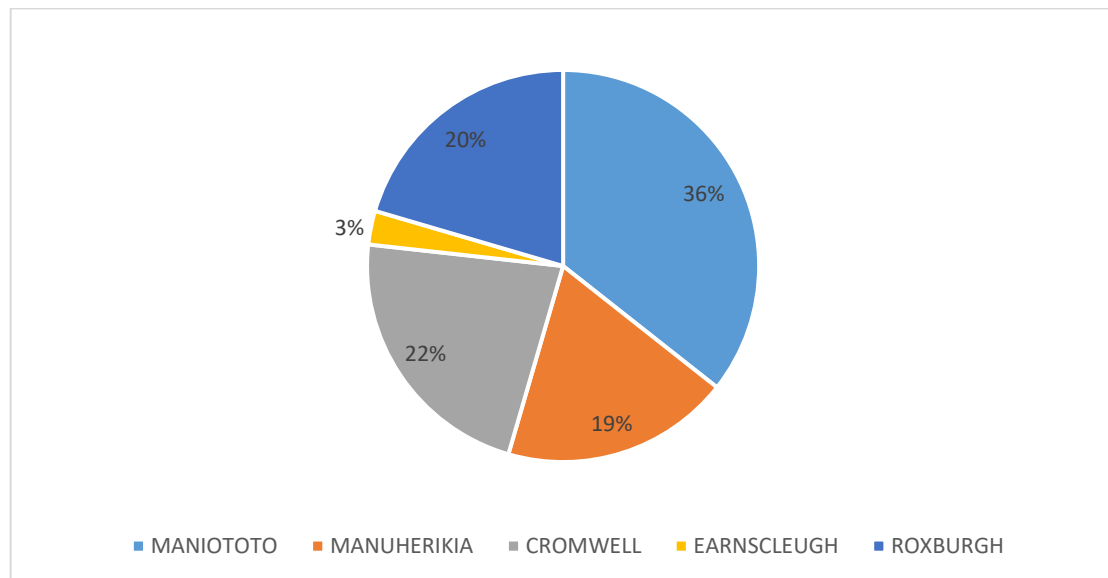


Figure 5.10 Unsealed Road Location (by Ward)

Central Otago District Council has historically accepted a significantly reduced level of service on these tracks, with the council reviewing both the traffic volumes, traffic composition and adjacent land use periodically. More information on the management of these service levels are included in Sections 2 and 3.

Collecting performance data for modelling the tracks is an improvement item in the 2021-24 AMP cycle. Our current assessment suggests that a programme of track re-metalling equating to 41 kilometres a year would provide a level of service equal to that of the Low Volume – Lane sub-classification over time. Due to the remote nature of the tracks, work on these assets is significantly more expensive in most cases, and the council's re-gravelling programmes are not able to support this volume of work.

Age of the Unsealed Roads

The re-metalling dates of unsealed roads in the District have been recorded in RAMM for the past 20 years, Figure 5.11 shows the historic metalling lengths.

Prior to the implementation of Systems Thinking in 2008, the method of payment for metalling was by a unit rate of \$/m³/km cart. Performance measures were then related to the annual quantity (volume) of gravel laid on the roads. This resulted in roads at the extremities of the network not being metalled for many years due to the higher cost of undertaking this work. The reduction in metalling length for unsealed roads of 9-12 years in age reflects the period over which the roads at the extremities of the network were then metalled. Due to the high cost of metalling these roads the length of work undertaken between 2008/09 and 2012/13 was reduced to meet budget constraints.

From this baseline work, accurate data capture and validation processes have been maintained and strengthened. The data validation of all sealed road data – at both an asset and Treatment Length level – are critical to support robust dTIMS modelling. The council now has a high level of confidence in the sealed surface and pavement age data contained in RAMM.

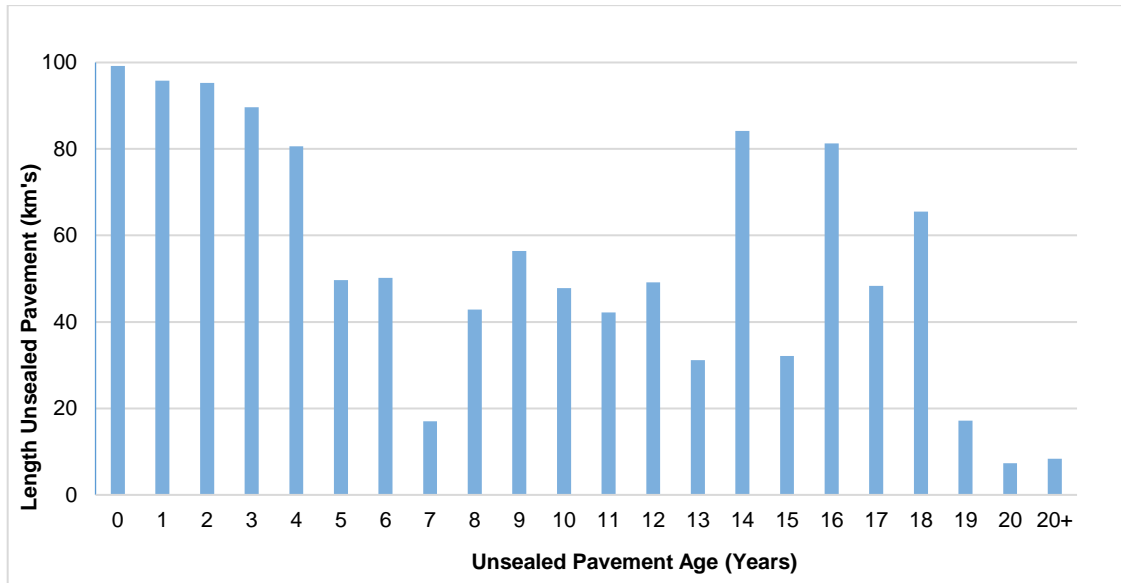


Figure 5.4 Surfacing Age on Unsealed Roads (excluding Tracks)

Condition of Unsealed Roads

While there are several technical measures which are used to compare the condition of sealed road networks across New Zealand, there is currently no technical measure for measuring the condition of gravel road networks within the One Road Network Classification.

The condition of Central Otago unsealed roads is highly variable throughout the year depending on weather. The District experiences an extreme range of weather conditions. As such, it is particularly challenging to provide unsealed roads that provide an appropriate Level of Service year-round. Hot, dry spells and periods of high winds can result in dust and corrugations. Winter conditions (principally freeze/thaw) result in roads becoming wet and slippery when thawing. There is no roading aggregate material used for unsealed pavements that will be perfect in all conditions. Roads that have insufficient metal on them become soft and slippery during wet and freeze/thaw conditions. In a worst-case situation sections of road may become impassable to heavy trucks and 2-wheel drive vehicles. To manage safety during these periods speed restrictions and warning signs are used. Where accessibility is severely affected then costly spot metalling with large, clean material is required.

Peak IRI	Condition (network condition assessment)	Condition (visual condition assessment equivalent rating)	Percentile of assets by peak IRI (network condition assessment)
< 2	Low (1)	Very Good (1) *	15th
2 - <4		Good (2)	25th
4 - <6	Medium (2)	Average (3)	50th
6 - 9.5		Poor (4)	85th
>9.5	High (3)	Very Poor (5)	95th

Table 5.8 Condition Rating Grades and Roughness Indicators

Summarising the roughness survey data has provided the following insights into our network management decision making:

- Increased peak IRI influenced more road users to complain
- High average IRI does not correlate with more complaints, but triggers investigation of road condition
- Setting the intervention IRI at 9.5 provides the basis of a tactical unsealed road maintenance plan, aimed to keep roughness below a level that results in complaints.

Survey Results

The backlog of metalling required is an indicator to the condition of the gravel roads. The inspections to determine metalling priorities are completed annually in Autumn. In May 2014 all roads excluding Tracks were assessed for metalling, and 290km of metalling was identified. 89km of re-metalling was completed by the end of June 2014, allowing the final “backlog” to be assessed as being 201km. In May 2017 the identified metalling lengths totalled 251km, with a corresponding backlog of 139km at the end of 2016-17. This reduction is largely due to the metalling of 105km and 112km in 2016 and 2017 respectively, where additional local, low-cost metal sources from construction of irrigation dams enabled extra roads to be completed at the end of the season.

The need for metalling is identified as high, where the condition of the road is such that accessibility failure is occurring in wet conditions, medium where the condition of the road will be affecting safety and speed in extreme weather, and low, where the road has sections of road which are bare of gravel but not yet affecting accessibility.

Figure 5.12 shows the relative priority of the backlog.

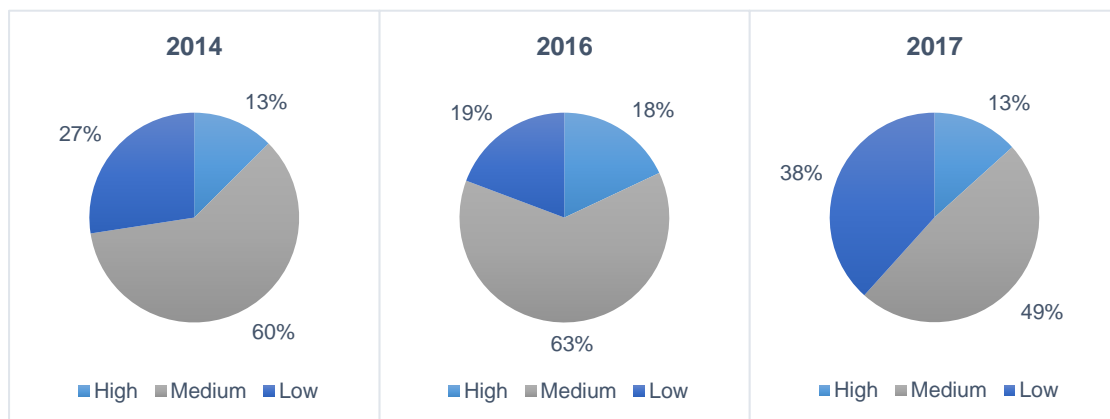


Figure 5.5 Urgency for Metalling 2014, 2016 and 2017

Current dTIMS modelling, generated from the Unsealed Roads Network Performance Modelling Tool developed by Central Otago District Council and Infrastructure Decision Support, quantifies the annual optimised re-gravelling programme at 84km per annum. The model has currently been used to report a five-year programme to meet the annual deterioration requirements and keep the network at the same overall level of service. Backlog assessment using the dTIMS model suggests that the ‘optimal’ long-term re-metalling programme would result in an average backlog of re-metalling of 99km a year (excluding tracks). However, this programme would potentially enable the council to complete work to metal all of the high and medium condition roads by the end of 2024/25.

The existing backlog is evident in the number of public calls received where roads are identified as requiring gravel but are unable to be programmed due to funding constraints.

Roughness Surveys

The council has been undertaking whole-of-network roughness surveys of all gravel roads excluding Tracks in either the autumn or spring period since 2012/13. The roads have been measured using a roughometer developed by the Australian Roads Research Board (ARRB) that measures the International Roughness Indicator (IRI). This data is collected in-house by the roading team and uploaded to the RAMM database. This provides the key annual network condition trends information used in the dTIMS Unsealed Roads Network Performance Modelling Tool.

The dataset has already been used to target some of the unsealed road maintenance work within the District. Fourth-year Bachelor of Engineering students from the University of Auckland have also been given access to the full dataset to investigate methods of using the data to predict potential triggers for the Level of Service decreasing to a point where public calls regarding the road condition may result.

Although the surface condition of gravel road networks is variable, unsealed road Roughometer data quantifies the roughness triggers for intervention. This can be one of the inputs into tactical planning - aligning maintenance works with the influences of roughness on public complaints. Continuing with these annual surveys will allow for further data analysis to be undertaken at network and ONRC classification level for our unsealed roads over time. More information is provided in Section 2.7, "Amenity".

5.4 Structures

Bridges

Council's structures include bridges, footbridges and retaining walls. Large culvert structures with a waterway area of at least 3.5m² are classed as bridges. Central Otago District currently has 179 maintained bridges, with three of these being footbridges.

The number of bridges located in each ward are as follows:

- Cromwell 18
- Earnsclough/Alexandra 16
- Manuherikia 57
- Maniototo 58
- Roxburgh 30

The bridge stock includes an extensive range of sizes from 3m long concrete box culverts to the 176m long Millers Flat Bridge.

Bridges range in age from a 12-year old contemporary "double-T" hollow core concrete structure to a 137-year old timber decked steel and concrete rail bridge.

Condition of the Bridge Assets

Inspections and condition rating were undertaken on all of the bridges in 2014. Quality of the councils' bridges by condition as illustrated in Figure 5.13. Condition rating was undertaken to component level.

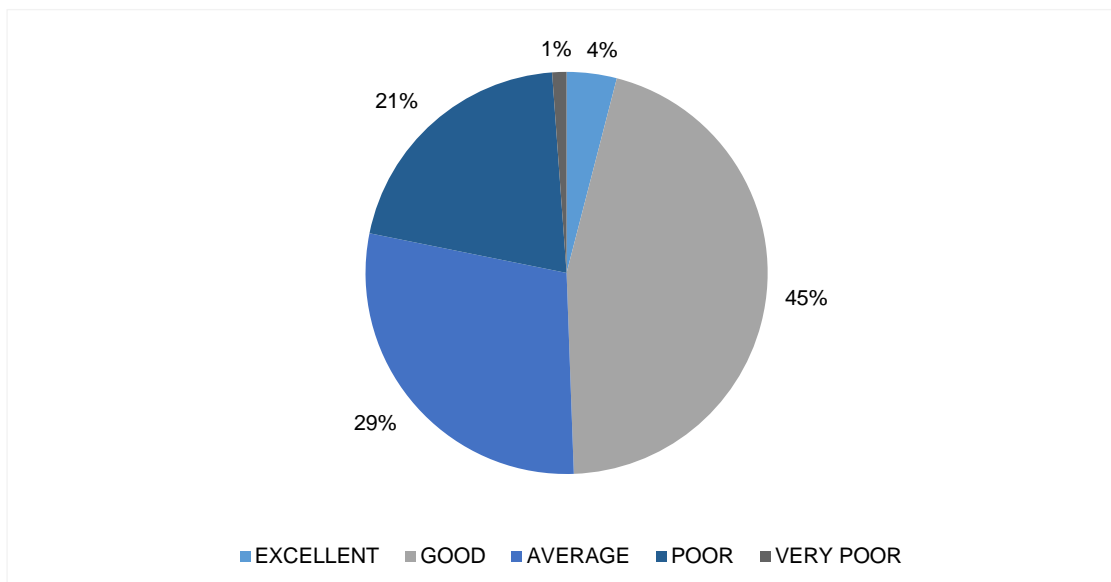


Figure 5.6 Bridge Condition 2014

Central Otago District Council also completed a non-structural condition survey and visual rating of 160 bridges in 2018. This data was used to inform routine maintenance programmes and ensure that the results of the Vehicle Dimensions and Mass screening assessments, completed in December 2017, were representative of the current bridge asset condition.

The bridge assets are grouped into different types based on the construction materials of the deck and beams on Tables 5.9 to 5.15. For each type, the number of bridges with the same span configuration (single or multiple) are shown separately, along with the primary construction materials used for the abutment, pier, beams and deck. The average age of these bridges is shown, along with the oldest and estimated average total useful life for each group. The estimated total useful life is the life that is used for depreciation calculations.

A graph of the condition of the bridges in each group is provided, along with a brief summary of the condition.

A number of bridges are currently older than the estimated total useful life. This is typically because these bridges have had significant structural component renewal work undertaken which is resulting in a prolonged life. The lifecycle management strategies for bridges is provided in Section 6.

Council is undertaking further structural, investigations to enable community consultation regarding affordability and need for retaining the bridge network in its current form. This will include options for route and bridge optimisation and will evaluate options for replacing essential bridges, installation of wash over culverts, and retiring some bridges.

Spans	Abutment	Piers	Beams	Deck	No. of Bridges	Average Age	Single Oldest	Total Useful Life
Multiple	Concrete	Concrete	Concrete	Concrete	17	52	80	115
Single	Concrete		Concrete	Concrete	44	53	107	115

Generally the concrete bridge stock is in good condition. In most cases the issues with concrete bridges involve bed degradation and scour causing undermining of the piers or abutments. This in turn creates instability, settlement and cracking. This is monitored in the short term however if it continues, can result expensive long term remedial work.

An example of this is the 85 year old Omakau Bridge. While the bridge itself may appear robust and in good condition and robust, it has previously had issues with pier settlement and remedial work was carried out in the 1990's.

A submission to the 2009/19 LTCCP requested that the Omakau Bridge be upgraded to a double-lane bridge and equipped with pedestrian/cyclist facilities on either side. A feasibility report has been prepared and has again highlighted some deficiencies with the foundations when the bridge is subjected to further scour, eccentric loading and seismic activity.

One single-span concrete bridge on the Central Otago roading network has been replaced in the 2018-21 AMP period. Bridge 94 on St Bathans Loop Road had been previously damaged by several flood events, documented over the last 25 years. After the 2017 and 2018 flooding events the progressive damage was economically unfeasible to repair. A new bridge was constructed and opened in August 2019.

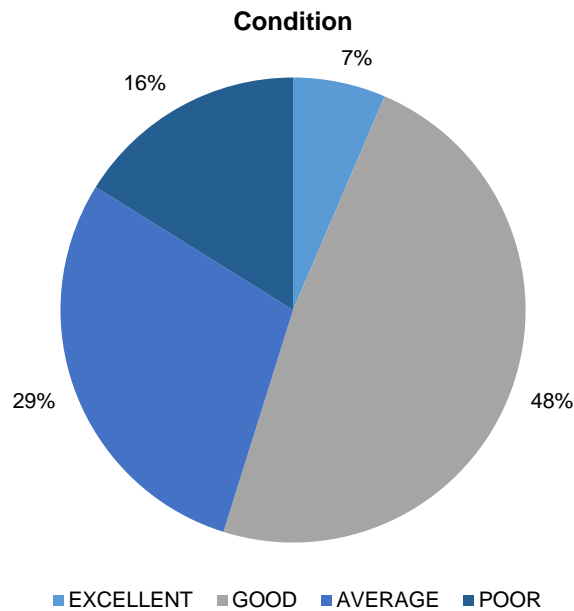


Table 5.9 Concrete Bridges (single and multiple span)

Spans	Abutment	Piers	Beams	Deck	No. of Bridges	Average Age	Single Oldest	Total Useful Life
Multiple	Concrete/ Masonry	Concrete/ Masonry	Steel	Concrete	11	63	119	100
Single	Concrete		Steel	Concrete	9	51	62	100

The multiple span bridges in this category fare worse than the single span types.

Issues include concrete spalling, deck joint issues and undermining of piers and abutments.

Almost all of the multiple span bridges exhibit at least one of these issues. In contrast, the single span bridges appear to be in very good condition with the only expensive maintenance requirement being painting of the steel beams.

However, due to the dry inland climate of Central Otago, most of the steel painting previously identified has been deferred to beyond 2023.

The Millers Flat Bridge is 140 years old and has had significant component renewals work undertaken which is resulting in a prolonged life. A structural assessment of this bridge confirmed that it could have the posting removed – and be opened to heavy vehicles (excluding those requiring special Overweight Permits) – in 2019.

The Jedburgh Street bridge at Roxburgh is much younger, being only 45 years old. This bridge had a significant issue with movement identified 6 years ago, and a major structural component replacement project was completed in 2018/19 to strengthen the western abutment and enable the bridge to be operated without any heavy vehicle restrictions.

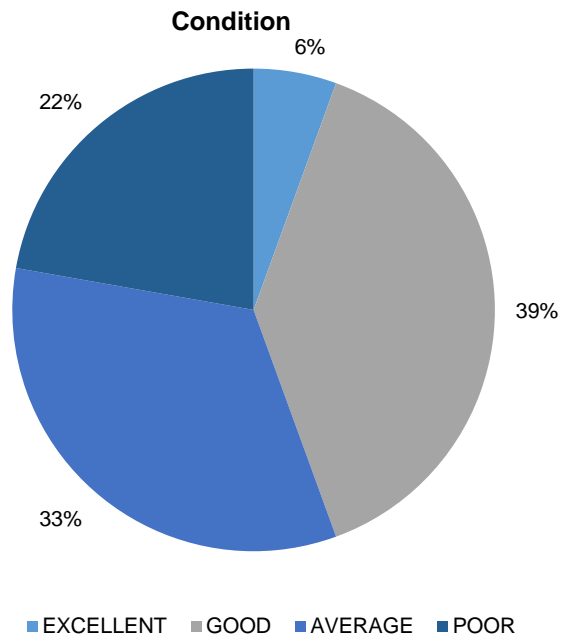


Table 5.10 Concrete Deck and Steel Beam Bridges

Spans	Abutment	Piers	Beams	Deck	No. of Bridges	Average Age	Single Oldest	Total Useful Life
Multiple	Concrete	Concrete	Steel	Timber	8	86	137	90
Multiple	Concrete	Steel	Steel	Timber	1	57	57	90
Multiple	Steel	Steel	Steel	Timber	2	104	111	90
Single	Concrete		Steel	Timber	9	78	117	90
Single	Timber		Steel	Timber	2	107	107	100
Single	Masonry		Steel	Timber	2	102	117	90
Single	Masonry	Suspension bridge	Steel	Timber	1	137	137	170

Council maintains a total of 25 bridges where the structure is made up of both timber and steel. The multiple span bridges in this category are generally in good to average condition. Three have recently had major works upgrading beams from timber to steel and replacing decks etc.

Most of the single span bridges have issues with cracking or undermining to abutments or poor stonework to wing walls.

The multiple span bridge which is 137 years old is Kearneys Bridge which is on a road that is not maintained by Council and is at the end of its life.

The single span suspension bridge is the Daniel O'Connell suspension bridge at Ophir.

A number of these bridges have had significant structural component replacements undertaken which is resulting in prolonged lives.

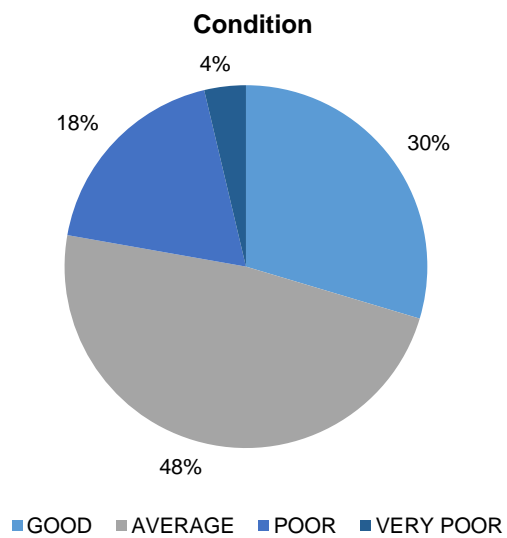


Table 5.11 Timber Deck and Steel Beam Bridges

Spans	Abutment	Piers	Beams	Deck	No. of Bridges	Average Age	Single Oldest	Total Useful Life
Multiple	Concrete	Timber	Timber	Timber	1	47	47	100
Multiple	Steel	Steel	Timber	Timber	2	48	58	80
Multiple	Timber	Timber	Timber	Timber	6	70	97	80
Single	Concrete		Timber	Timber	7	78	107	110
Single	Timber		Timber	Timber	3	71	77	80
Single	Masonry		Timber	Timber	3	69	87	90

Multiple span timber bridges are typically relatively old. They suffer from various issues and require heavy maintenance to keep them operational.

Three bridges of this type are already formally closed to all traffic. These are all on Low Volume roads and alternative access arrangements suitable for this roading hierarchy have been put in place.

Disposal or replacement options for a number of these bridges will be required between 2021 and 2030.

The general condition of these bridges is poor.

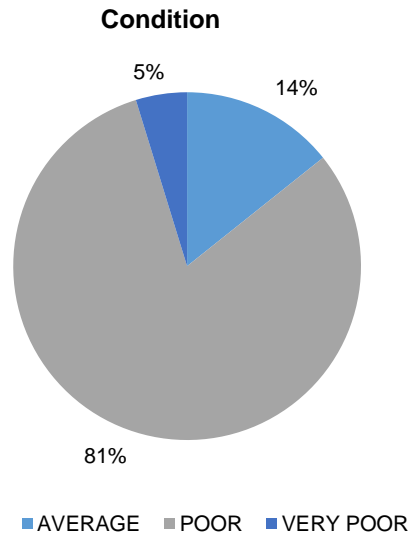


Table 5.4 Timber Bridges

	No. of Bridges	Average Age	Single Oldest	Total Useful Life
Concrete Pipe / Arch Culvert (Non Box)	13	49	77	80
Concrete Box Culvert (Single and twin)	22	33	72	80
<p>Most of Central Otago's concrete culverts are in good condition. The pre-cast style concrete box culverts are typically young structures (the oldest being 34 years old) and aren't exhibiting many issues.</p> <p>Similarly, the older cast in-situ culverts and pipe culverts appear to be lasting well. The most expensive issue identified recently with concrete culverts is abrasion to the culvert inverts, requiring re-lining with concrete to protect exposed reinforcing steel.</p>	<p style="text-align: center;">Condition</p> <p style="text-align: center;"> ■ EXCELLENT ■ GOOD ■ AVERAGE ■ POOR </p>			

Table 5.5 Concrete Culverts with a Waterway of at Least 3.5m² (Concrete Box and Pipe Culverts)

	No. of Bridges	Average Age	Single Oldest	Total Useful Life
Woodstave Culvert(s)	3	31	32	40
<p>The woodstave culverts are now between 30 and 32 years old. Two are in reasonably good condition with one three barrel culvert in a poor state requiring replacement due to scour failure.</p>				

Table 5.6 Timber Culverts (Wood Stave Culvert)

	No. of Bridges	Average Age	Single Oldest	Total Useful Life
Armco Pipe Arch (single / Twin)	8	33	42	50
<p>The Armco culverts are typically in good condition. Some are exhibiting rusting of the inverts although just one is showing some loss of section at this stage. Monitoring of this is the key issue for these structures</p>				

Table 5.7 Armco Culverts

Footbridges

Central Otago has five footbridges, two of which are significant historical swing bridges. These are the Horseshoe Bend Bridge across the Clutha River between Millers Flat and Beaumont, and the Shaky Bridge across the Manuherikia River at Alexandra. The other three are small footbridges located in Roxburgh and Cromwell.

Bridge Postings

Table 5.16 provides a summary of the December 2015 postings of CODC bridges. For some of these bridges heavy vehicles are able to use a ford during low flows, or there is an alternative route available. However, in some cases, there are no fording opportunities available. Some of these structures also have no viable detour, which increases the risk of overloading on the bridge. The postings are in force due to the condition and calculated capacity of the structure. Three bridges which currently remain as Council assets are closed to all traffic. Two of these are on back-country roads with ford crossings available (Bridge 4 on Gibbston (Coal Pit) Road and Bridge 80 on Hawkdun Runs Road). Bridge 171 on McCunn Road is now bypassed with an alternative route available, where the road alignment has been changed to improve safety at the intersection with State Highway 8 near Raes Junction.

Detailed structural review and assessments of Bridge 140 on Patearoa Road, Bridge 175 on Millers Flat Bridge Road and Bridge 186 on Jedburgh Street commenced in 2016/17. Structural engineers and bridging specialists have completed investigation of all three bridges. The work required to strengthen Bridge 175 and Bridge 186, to permit HPMV and 50Max vehicles to use them, is completed.

The design for structural upgrades required to permit HPMV and 50Max access to Bridge 140 is also complete, but the work has been deferred as part of completing the District Bridge Strategy in the 2021-24 AMP period.

Bridge No	Name of Road	Name of Waterway Bridge	Maximum Weight On Any One Axle	Gross Weight (Max Sum of Axle Weights)	Max Speed Limit	Ford	Detour
2	"Craigroy" (off Nevis Road)	Coal Creek	4,000kg	6,000kg		No	No
16	Cluden Road	Lindis River	4,300kg			Yes	No
25	Matau Street	Clutha River	6,100kg	90% Class I	20km/h	No	Yes
55	Neville Lane	Moa Creek		90% Class I		No	No
65	Ophir Bridge Road	Daniel O'Connell	5,000kg	30,000kg		No	Yes
72	Mawhinney Road	Thompsons Creek		40% Class I		No	No
83	Shepherds Flat Road	Shepherds Creek		90% Class I		No	No
89	Mee Road	Becks Creek		60% Class I		No	Yes
90	Lauder Flat Road	Brown Creek		70% Class I		No	Yes
92	St Bathans Downs Road	Manuherikia River	2,500kg	6,000kg	10km/h	No	Yes
96	Auripo Road	Idaburn		3,000kg		Yes	Yes
101	Agnew Road	Idaburn		60% Class I		No	Yes
105	Hills Creek Road	Idaburn		80% Class I		No	Yes
121	Scott Lane	Kyeburn	3,500kg	30% Class I		No	Yes
127	Devenney Road	Wetherburn		80% Class I		No	Yes
134	"Kearneys" (off Ranfurly Patearoa Road)	Ewe Burn		50% Class I		Yes	No
140	Patearoa Road	Tairei River "Green Bridge"	No HPMV No Overloads	100% Class I		No	Yes
145	Maniototo	Taieri River Halls Ford	2,000kg	4,000kg		No	Yes
146	Duffy Lane	Sow Burn		40% Class I		No	Yes
151	Chirnside Tce	Sow Burn No 1		40% Class I		No	Yes
155	Patearoa Paerau	Taieri River Paerau	7,000kg			No	No
160	Linnburn Runs	Taieri River Loop Bridge	3,000kg	50% Class I		No	Yes
175	Millers Flat Bridge Road*	Clutha River	No Overloads			No	Yes
186	Jedburgh Street*	Clutha River	No Overloads			No	Yes
192	Lake Onslow Road	Teviot River	3,000kg	50% Class I		Yes	No

* Posting on structure removed during the 2018-2021 AMP period

Table 5.86 Bridge Postings (Revised Schedule, December 2015)

Bridge Access for 50 Max and High-Productivity Motor Vehicles (HPMV)

The use of 50 Max and High Productivity Motor Vehicles (HPMV) within Central Otago is important for the economic prosperity of the District. Council has approved access to 50 Max vehicles over the whole of the Central Otago District road network. The only limitations for these vehicles is the capacity of some bridges. A list of bridges (largely based on the existing Posted bridges) was prepared in February 2016 as part of the NZTA's requirements in administering the changes to The Vehicle Dimensions and Mass (VDaM) Rule 2016 (see Section 2.7, "Accessibility").

The NZTA and their approved bridging consultant completed a screening assessment of the existing bridge restrictions, and other bridges identified by specific criteria at the end of 2017.

Retaining Walls

The asset data for retaining structures is not complete. The Contractor and Council staff will be undertaking a review of the asset data and condition rating retaining walls in the 2021-24 AMP period.

5.5 Drainage Assets

Drainage assets include culverts, surface water channels such as kerb and channel, sumps or mudtanks, soakpits, and side drains.

Condition rating was undertaken on all mudtanks, and a 20% sample of culverts and kerb and channel in 2014. 100% of the district's kerb and channel assets were re-assessed in 2017.

Mudtank condition assessments are completed annually.

Asset data including age and condition of drainage assets is recorded in RAMM.

Culverts

Central Otago has 5326 culverts which are owned and maintained by Council. This has increased from a total of 5096 maintained culverts, assessed in 2017. A further 487 are classed as irrigation culverts which are the responsibility of either irrigation companies or private landowners. 42 culverts have been removed from the culvert data (all 1500mm diameter or greater) where they have already been counted within the bridging assets.

The most common material used is concrete and most of the culverts are below 400mm in diameter. Table 5.17 shows the size of all of the culverts and the material they are constructed from.

Diameter (mm)	Armco	Concrete	Earthenware	Natural Ground	PVC	Steel	Aluminium	Stone	Timber	Asbestos	Polyethyl
<300	5	931	5	43	599	52	0	2	0	5	15
300 - 375	52	1969	27	14	143	147	0	10	5	12	20
400- 475	6	244	41	10	34	20	8	1	0	0	13
500- 975	3	437	0	10	7	26	1	4	5	0	0
1000- 1850	3	127	0	0	0	5	0	3	2	0	0
2000- 3700	7	21	0	0	0	0	0	0	2	0	0
Total	76	3729	73	77	783	250	9	20	14	17	48

Table 5.9 Culvert Size and Materials

Condition rating was undertaken on a 20% random sample of the culverts and this indicates that the condition of the sample was typically average or better. The culverts on the Tracks were not included in this sample, and it is expected that the condition of culverts on Tracks will be in the average to poor range due to limited maintenance being completed on these assets (typically reactive maintenance only).

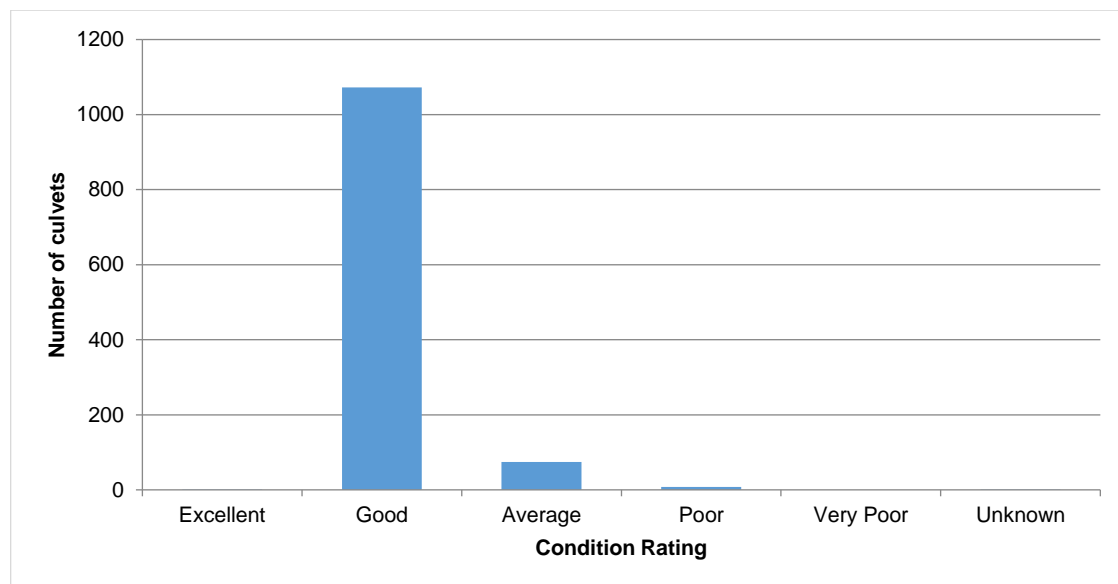


Figure 5.7 Condition of Culverts - 2014 (20% Sample)

Mudtanks, Soakpits, Sumps and Drains

Soakpits are the only source of storm water disposal for streets in Clyde. Soakpits are also widely used in other parts of the District where there are free draining gravels. Asset data regarding the number and location of soakpits was improved in 2014 by reviewing the location of mudtanks relative to stormwater reticulation pipes.

A soakpit has been added for locations where there is a mudtank and no stormwater reticulation. Where there are mudtanks on both sides of the road it has been assumed that both mudtanks will be connected to one soakpit. This has resulted in 288 soakpits being added to the asset register in 2014. Table 5.16 shows that approximately 25% of the mudtanks are connected to soakpits. The remainder connect to stormwater reticulation pipes (in some cases this connection has been assumed). The table below also excludes side drains and subsoil drains from the number of assets recorded.

The increases in mudtank and soak pit numbers in 2017 are due to subdivision growth within the Central Otago District, with new drainage assets being vested in the council. This high level of growth has continued between 2017 and 2020. The increase in urban drainage structures, including a range of mudtank types and a significant number of soakwells (drilled structures to allow stormwater to freely drain to ground) has changed the overall make-up of the asset inventory, necessitating additional work programmes to manage these assets.

It is also likely that the Three Waters Reform process will result in an increased number of stormwater drainage assets being managed and maintained by the council's Roading team. The work to identify and agree this change in operational processes will be worked-through during the 2021-24 AMP cycle.

Asset	Number
Mudtanks	2285 (2133)*
Soakpits	608 (486)*
Manholes	8 (8)*
Debris Catching Grids	5 (4)**
Drop Chambers	2 (3)**

* Numbers shown in brackets are as reported in the 2018-21 AMP

** Data improvement for drainage assets completed during 2019/20

Table 5.10 Drainage Assets recorded in RAMM as at 1 July 2020

Condition of Mudtanks and Soakpits

Condition rating of mudtanks was undertaken in 2011-12, and again in 2014. The standard life for a mudtank is 80 years. Figure 5.15 shows that the condition of most of the mudtanks is average or better and suggests that there is no imminent need for significant investment in mudtank renewals.

Faults have been identified on our network where a significant number of mudtanks that are approximately 30 years old require renewal of the gratings and concrete surrounds. The construction methods employed to construct many of these mudtanks have been shown to be sub-standard (timber boards, and not mortar or cement, have been used to support the mudtank grating frames). Inspection work has been completed to determine how many of the 621 mudtanks which have an age of between 25 and 35 years old may be affected. Priority sites, where the safety of pedestrians and cyclists may be impacted, are being addressed.

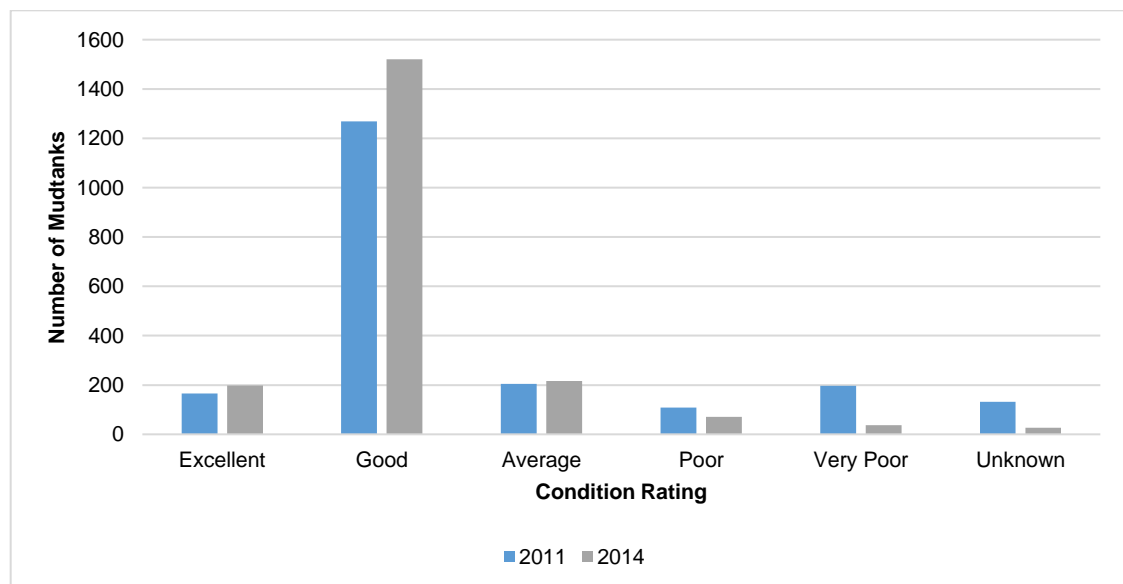


Figure 5.8 Condition of Mudtanks

Age of Culverts and Drainage Infrastructure

There is a high degree of uncertainty regarding the age of 61% of the culverts. The age of 739 is unknown and a further 2189 have been assigned a default construction date of 1980. Therefore, a spike in the number of culvert assets recorded within the 30 to 39-year age range is shown.

Drainage works in the 2015-18 AMP cycle have prioritised the renewal of a number of rural culverts where they coincide with programmed resealing or re-metalling works. This work has typically resulted in the replacement of older concrete culverts with modern PVC or PE pipework.

Figure 5.16 shows that the age of most the mudtanks is relatively young. Only 7% of the district's soakpits historically had a construction date recorded in the asset register. This information was reviewed and improved during the 2018-21 AMP period, by:

- checking kerb and channel and subdivision construction dates from 2002 onwards
- adopting the best-practice asset management and data quality processes, promoted by the Road Efficiency Group, for recording all new assets

Construction dates are recorded for 77% of the mudtanks.

A review of the ages, to be completed in conjunction with a further condition rating programme, is due to be undertaken in the 2021-24 AMP period.

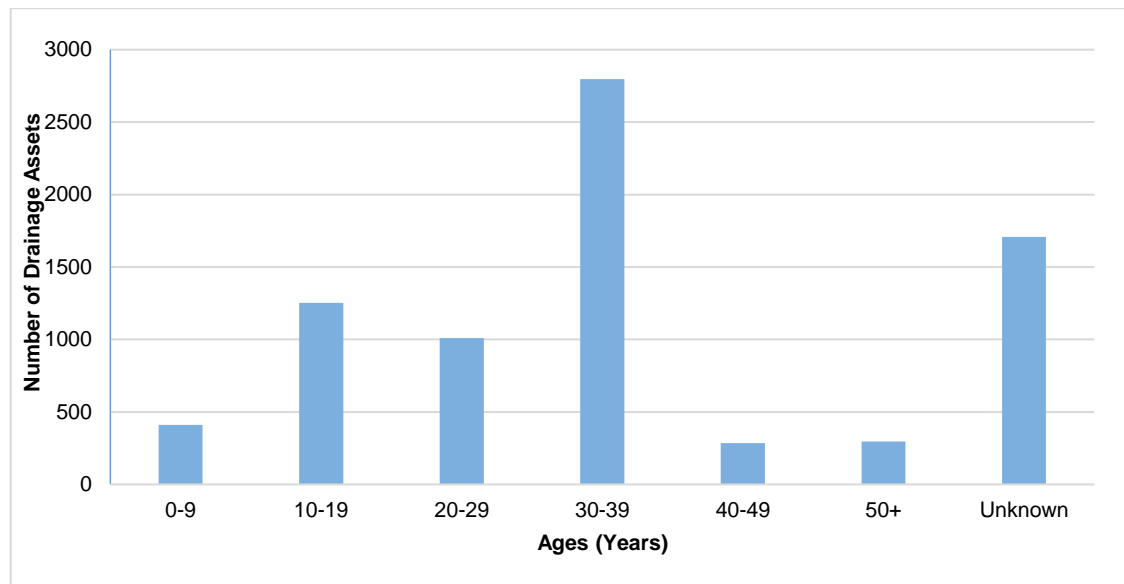


Figure 5.9 Drainage Asset Ages Recorded in RAMM

Surface Water Drainage Channels

Surface water channels that consist of a construction material such as concrete or asphalt are recorded in RAMM, along with some natural earth storm water channels in urban areas. All of these channel structures require routine maintenance to remain effective in urban areas.

Rural surface water channels (or table drains) are considered a part of the formation of the road. The RAMM database records 3,255 kilometres of surface water channel on the Central Otago roading network, which aligns well with the current lengths of rural carriageways (1,785 kilometres) and local knowledge of the network, where formal surface drainage has not been provided historically.

Natural earth surface water channels, which are alongside some urban roads, are not recorded in RAMM. These assets have historically been managed by both Water Services and Roding teams at the council – dependant on their location in the district. It is likely that the Three Waters Reform process will result in an increased number of stormwater drainage assets being managed and maintained by the council's Roding team. The work to identify and agree this change in operational processes will be worked-through during the 2021-24 AMP cycle.

Table 5.19 shows that 96% of the urban storm water channels are concrete kerb and channel.

Type of Kerb	Length (m)
Asphalt Dished Channel	44
Concrete Dished Channel	2,262
Sealed Dish Channel	956
Concrete Kerb and Channel	163,548*
Stone Kerb and Channel	987*
Concrete Kerb only	3,133
Stone Kerb only	30
Mountable Concrete Kerb and Channel	41,521*
Mountable Kerb only	1,612*
Total	214,881
Natural Earth (Urban Channels only)	17,500 **

* Data improvement for drainage assets completed during 2019/20

** Length of urban channels are approximate, based on Roding and Water Services data assessed as having a medium level of confidence

Table 5.19 Length of Surface Water Channel by Material Type

Age of Surface Water Channels

The expected standard age of surface water channels varies between 60 and 100 years depending on the construction material. Figure 5.17 shows that most of the surface water channels are still well within the expected standard life. Given that 96% are concrete kerb and channel which has a standard life of 100 years then no significant renewal programmes are expected in the next 30 years.

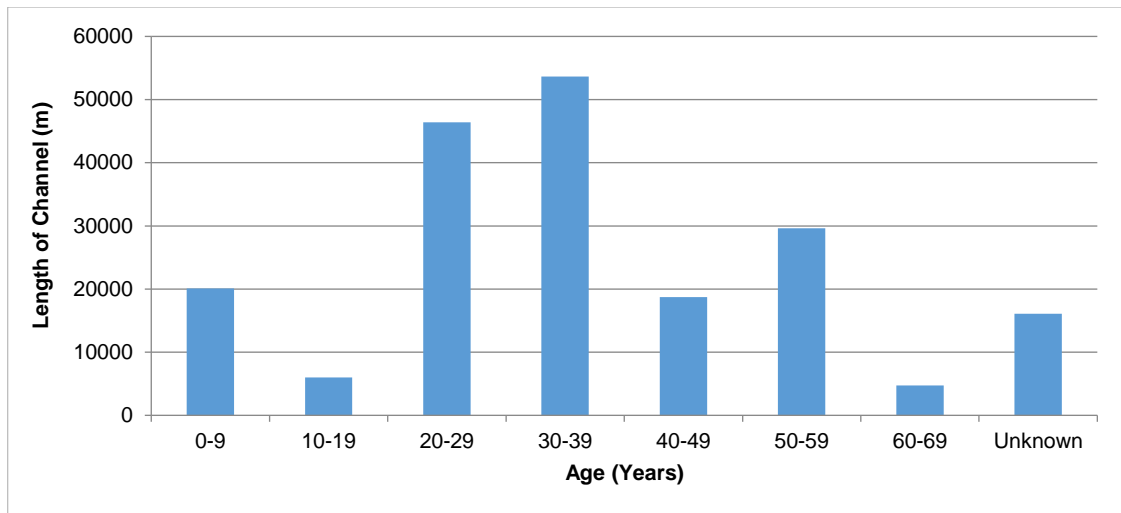


Figure 5.10 Age of Surface Water Channels

5.6 Signs, Markings, Guardrails and Railings

Overview of the Assets

Signs and road markings located at intersections of State Highways, with the exception of road name signs, are the responsibility of Waka Kotahi NZTA. This includes the 'Give Way' and 'STOP' controls on the side roads, road name, directional, tourist, and motorist information signs. Council is responsible for the installation of street name, parking and amenity signs on State Highways in urban areas.

In November 2014 there were 8,132 signs recorded on Councils' RAMM database. Council also maintains and replaces edge markers, culvert markers, and road markings on sealed roads. Edge markers, culvert markers and road markings are not recorded in RAMM.

The signs information in RAMM was updated in May 2011. This involved inspecting all of the roads on the network and resulted in 1,235 additional signs located and added into RAMM. Sign assets are managed using RAMM Contractor, with changes to asset data as a result of maintenance, renewals or operational inspections completed automatically as part of work. A further network inspection of road signs has been completed in 2020, with 8,510 sign assets, owned and maintained by the council, now recorded. Council now have a high degree of confidence in the sign asset data.

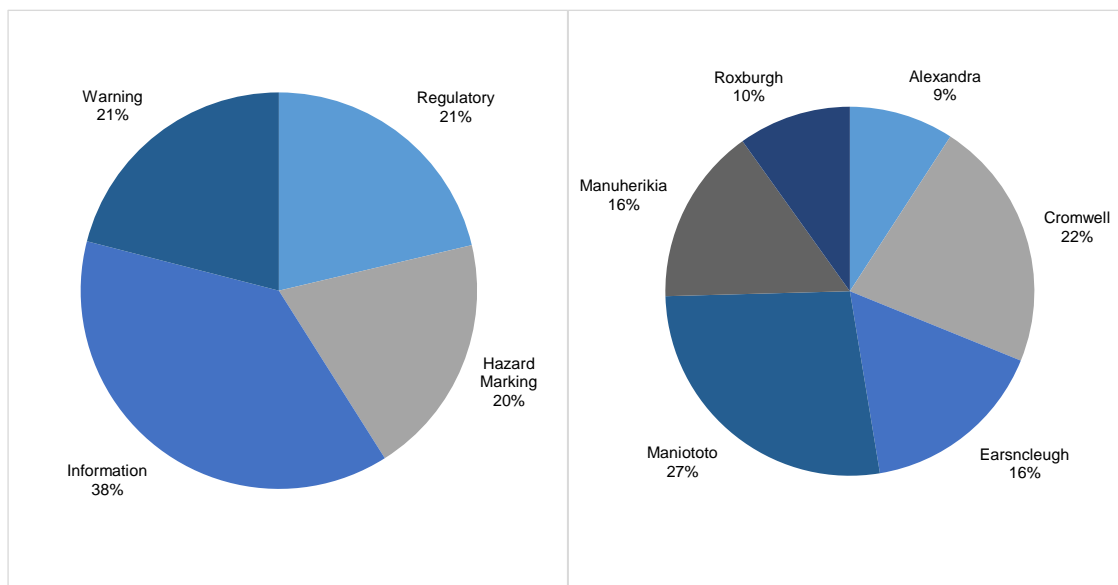


Figure 5.11 Function of Signs

Figure 5.19 Location of Signs

Railings are also recorded in RAMM, with information on the type and material of each railing along with their age, length and where they are located. Railings and guardrails were fully inspected in 2017/18, with the asset data updated by the end of 2018. This resulted in a far more representative inventory for these assets, in which the council has a high level of confidence. The length of guardrails, handrails and sight rails recorded in the 2017/18 inspections increased from 12.7 km to 16.8 km, mostly as a result of a number of railings on bridges only being recorded on one side of the structure. The length of each type of railing recorded is shown on the Table 5.20.

Function	Length(m)
Guard rail	433
Hand rail	5,359
Sight rail (timber)	3,044
W section guardrail (*)	7,935
Total length	16,771

* Includes 102 metres of THRIE-beam guard railing

Table 5.11 Length of Railings by Type

Condition of Signs and Railings

A random selection of 20% of signs were condition rated in 2014, as an update exercise following the whole-of-network inspection in 2011. Figure 5.20 shows the condition of the signs as recorded in the RAMM database in November 2014. This indicated that 45% of the signs in the sample were due for replacement, and sign renewals on the network were increased in response to this.

The whole-of-network inspection completed in 2020 is still being analysed, but conditions now recorded in RAMM suggest a very significant improvement in sign conditions. Over half the signs have an installation date of 2007 or later, putting most signs within the expected Total Useful Life of 13 years. Around 40% of signs have no installation date – or an unvalidated installation date – recorded. However, very few signs have been recorded as being in ‘poor’ or ‘very poor’ condition. This suggests that the overall renewal programmes of signs on the network are providing the required level of service. Signs in ‘poor’ or ‘very poor’ condition will be programmed for replacement.

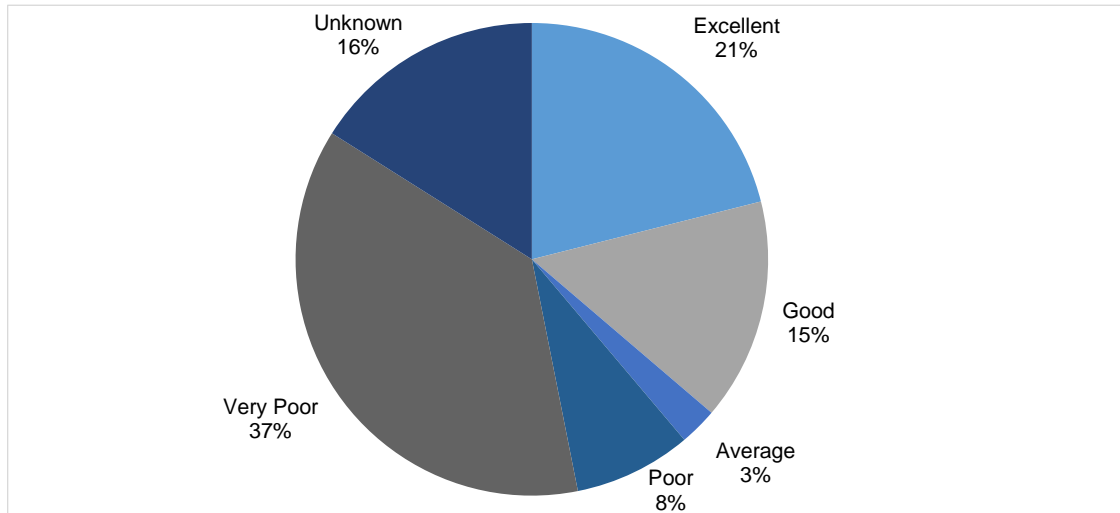


Figure 5.20 Condition of Signs (2014; 20% sample)

A condition assessment was undertaken on railings by qualified Central Otago District Council staff during 2018, using the network inspection data gathered in the field. RAMM datasets and condition information (including faults with the existing railings that required maintenance) was completed in the 2018-21 AMP period. This has been incorporated in the contractor’s cyclic work programming when resources are available.

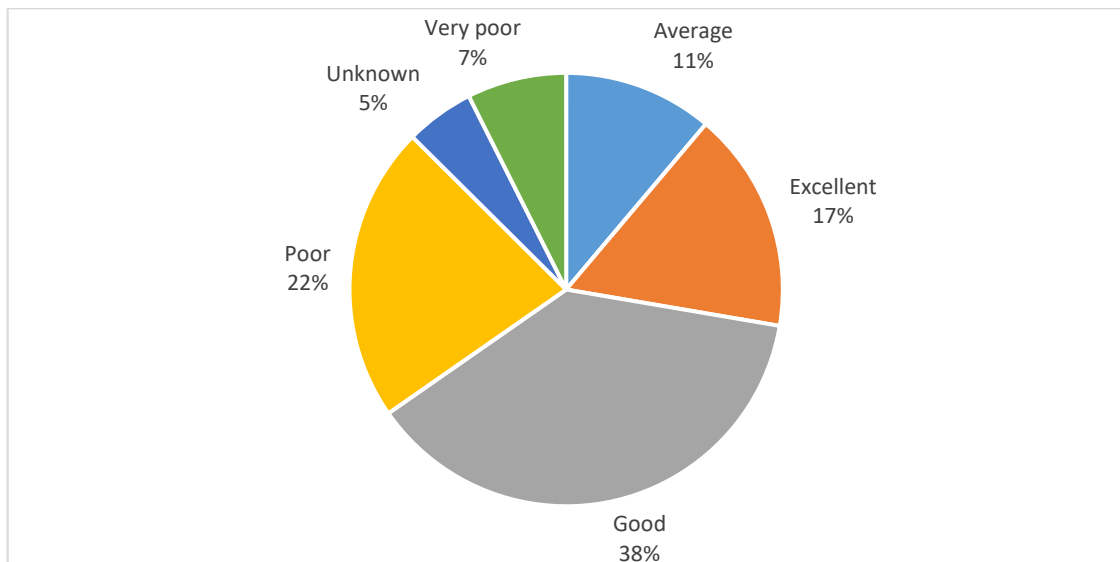


Figure 5.21 Condition of Railings (2018)

Age of Signs and Railings

The installation date of many signs and railings are recorded in RAMM, however there are 4,146 signs that do not have their installation date recorded following the 2020 sign inventory inspection.

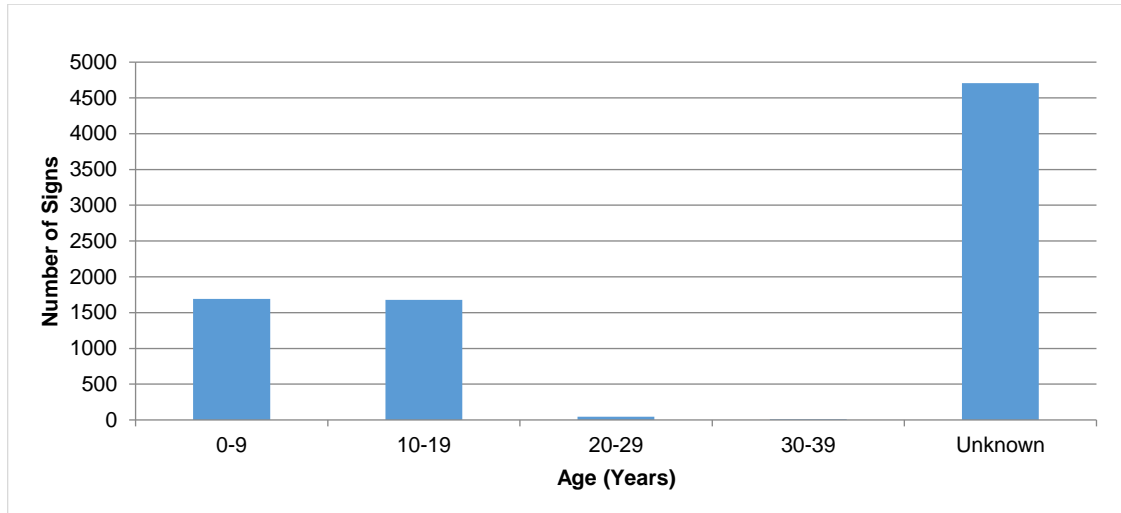


Figure 5.12 Age of Signs

All railing ages have been estimated as part of the 2018 inspections. Where no information is readily available, some installation dates have been estimated from the bridge construction date that the railings are attached to. This has resulted in railing assets classified as 'hand rails' having an older average age than other railing types (40-55 years old, as opposed to an average of 25-35 years old for other guardrails).

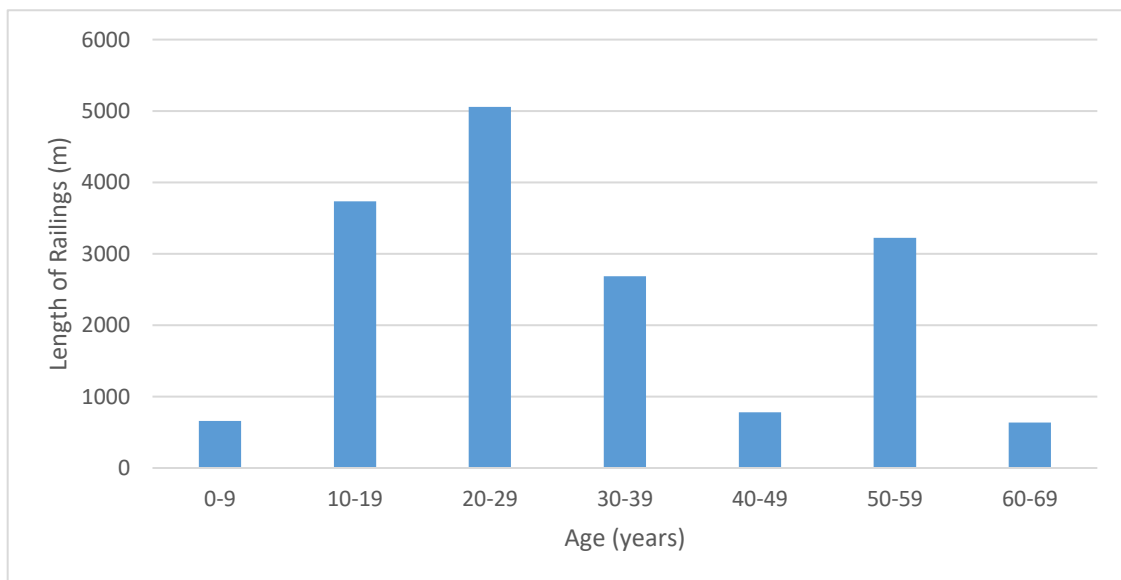


Figure 5.13 Age of Railings

5.7 Footpaths

The total length of footpaths managed and maintained by Roading in Central Otago is 179 km. The footpath network is split into six geographical areas, as part of Central Otago District Council's four Wards:

- Cromwell
- Alexandra, Earnsclough (Clyde) and Manuherikia (Omakau/Ophir) –the Vincent Ward
- Maniototo
- Roxburgh (including Etrick and Millers Flat) – the Teviot Valley Ward

The graph below shows the percentage of footpaths in each area by length.

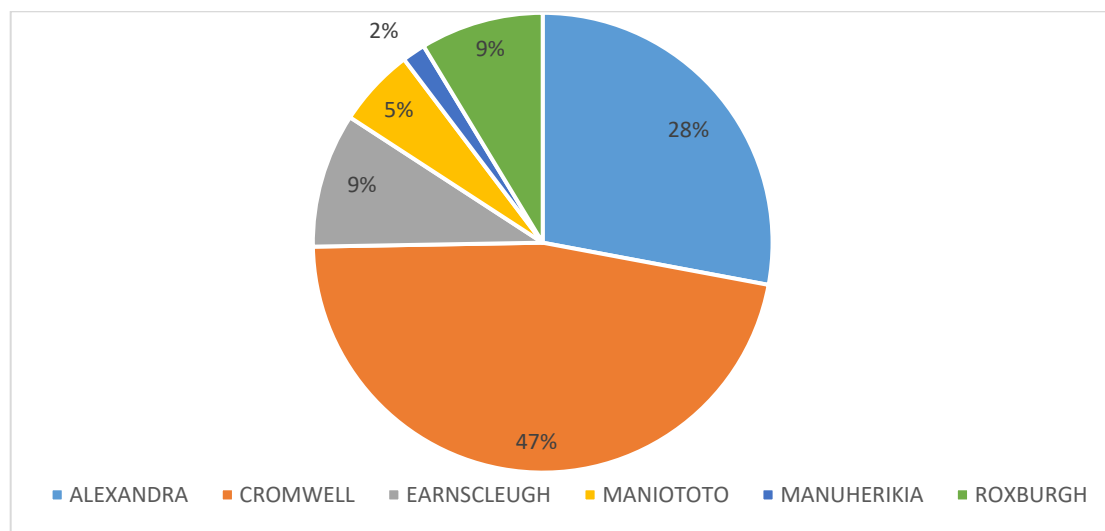


Figure 5.14 Percentage of Footpath in Each Ward/Geographic Area

The level of service for residential streets states that there shall be a footpath on one side of the road. The current level of service in Cromwell is much higher with many residential streets having footpaths on both sides of the road, in addition to the “Greenway” network. As a result, the length of footpath in Cromwell is high when compared with Alexandra.

	Asphalt	Concrete	Blocks	Gravel	Seal	Other	Total
Cromwell	77,618	1,635	97	1,197	211	27	80,785
Alexandra (*)	29,721	16,088	419	314	2,222		48,764
Earnsclough (*)	1,452	15,009	1,691	888	767		19,807
Manuherikia (*)	357	2,638	0	0	40	2	3,037
Maniototo	8,631	817	39	1,250	255	5	10,997
Roxburgh	2,026	13,836	0	0	0	0	15,862
Total	119,805	50,023	2,246	3,649	3,495	34	179,252

* Alexandra, Earnsclough and Manuherikia make up the Vincent Ward

Table 5.12 Length of Footpath by Material Type in Each Area

The expectations of the level of service provided by footpaths in Central Otago has also rapidly increased over the recent period of high growth. This has resulted in most new sub-divisions, with assets vested in Central Otago District Council, being constructed with footpaths on both sides of the road. Many Cromwell sub-divisions are also being planned and constructed with connections to the “Greenways”. This single demand driver has resulted in overall lengths of footpath assets increasing from 168km in 2017 to 179km in 2020. By geographical area, the network has seen a 12.3% increase in footpath lengths in Cromwell, a 4.8% increase in Alexandra and a 1.2% increase in the rest of the Vincent ward.

Footpath Asset / Activity Management Plan

As part of successfully completing the Institute of Public Works Australasia Professional Certificate in Asset Management Planning, the council’s Asset Engineer developed a full Footpath Asset and Activity Management Plan in December 2018. The plan is provided in Appendix 3 of this AMP.

Footpaths are one of Central Otago District Council’s fastest-growing asset groups, with a growing expectation of increasing levels of service from our communities.

Age of Footpaths

The date of installation of the footpaths is recorded in RAMM. Footpaths which had an unknown construction date were given a default date of 1990 when RAMM was populated. Between 2012 and 2015, council staff identified which paths were more than 30 years old. The remaining paths with an unknown installation date were then populated when completing the Footpath Asset Management Plan. Most of these assets with missing data are believed to be between 25 and 30 years of age.

A large percentage of the paths in Cromwell were built during a short period of the early to mid-1990’s, as part of the Clyde Power Project. The total length of footpaths classified by material, and the proportion of asphalt paths located in the Cromwell ward, is shown in Figure 5.25. As these footpaths were largely constructed between 1988 and 1994, they are all a similar overall condition and age.

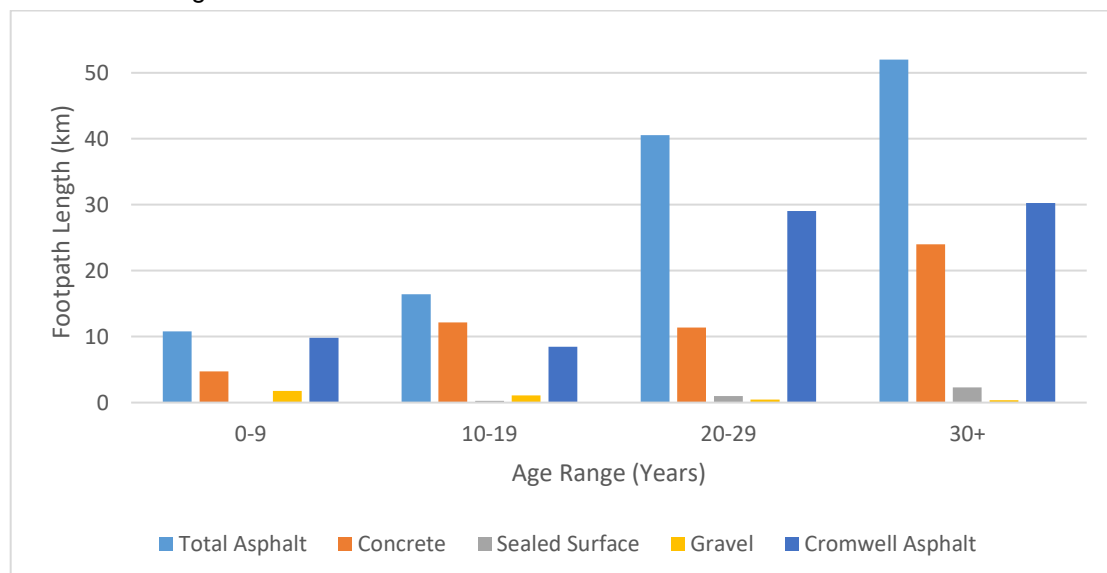


Figure 5.15 Age of Footpaths

Condition of Footpaths

Asphalt footpaths have a life expectancy of 30 years. As part of the Asset and Activity Management Plan prepared in 2018, roading staff assessed the potential maintenance and renewals liabilities faced by the council where 67% of the assets were either at, or approaching, the end of their lives.

All footpaths in the district were inspected in 2014 to develop the 2015-18 Long Term Plan forward works programmes. Any faults were identified and recorded in RAMM. These faults were assigned a priority within available resource and budgets, based on a subjective assessment of the tripping hazard risk a fault presented to footpath users.

Footpath condition rating was completed on most paths across the District in 2016/17 using a roughness measuring device and mobility scooter as an alternative to visual inspections completed on foot. This was then re-assessed on a sample of the surveyed footpath lengths by the start of the 2018/19 Financial Year. From this information, Central Otago District Council set-up the first modelling of footpath asset condition. The survey was then repeated between December 2019 and February 2020 on approximately 75% of the footpath assets, by length. This has

IRI	Condition (visual condition assessment equivalent rating)	Percentage of footpath assets (asset condition rating)	Percentage of footpath assets (condition grade/function)
< 2	Excellent/Very Good (1) *	7.45%	55%
2.0 - < 4.5	Good (2)	47.80%	
4.5 - < 7.5	Fair (3)	29.23%	29%
7.5 - < 9.5	Poor (4)	9.22%	16%
> 9.5	Very Poor (5)	6.30%	

* Includes newly constructed/contributed assets

Table 5.22 Roughness levels and Equivalent Condition Rating

Council has completed the survey work to enable assessment of the whole footpath network, at a District level. The work has provided data we use as an alternative to traditional Condition Rating. It also allows a detailed comparison of footpath performance between different geographic areas. The results of the detailed asset modelling current being used to plan for footpath Forward Works Programmes are included in Section 6.

5.8 Streetlights

Streetlight data has been completely re-created in RAMM as part of the LED replacement programme for the Central Otago district. The council's streetlight inventory was made up-to-date and accurate by 30 June 2019, with all the LED replacement programme data completed. Lights which were not replaced as part of the LED upgrade, where this was deemed to be either technically or economically unfeasible, were also validated in the field to ensure the information stored was as accurate as possible.

Pole information is less complete. The default installation year chosen for poles is 1993. An improvement opportunity exists to improve this data by reviewing in the field, working with the electricity distribution companies (who retain ownership of many of the pole assets) and comparing to subdivision construction dates. Table 5.23 lists the total number of streetlights in each community recorded in the Council's asset inventory, as at 30 June 2019.

The lighting inventory excludes some streetlighting assets:

- Some specialist heritage installations, or community-owned lighting schemes, in Alexandra, Ranfurly, Naseby and Pisa Moorings.
- Some Parks & Reserves lighting, including those mounted on structures.
- Some lighting owned and maintained by Council's Property assets team (e.g. Cromwell Mall)

It also does not include the street lighting installed on State Highways, owned and maintained by Waka Kotahi New Zealand Transport Agency.

Township Area	Number of Council-owned Streetlights
Alexandra	520(*)
Bannockburn	31
Clyde	170
Cromwell	828(*)
Ettrick	3(*)
Millers Flat	30
Naseby	64
Omakau	31(*)
Oturehua and Poolburn	5
Patearoa	16
Waipiata	6
Pisa Moorings	122
Ranfurly	121(*)
Roxburgh	107(*)
St Bathans	4
Total	2,058

* Excludes all State Highway owned and maintained streetlights in these townships

Table 5.13 Number of Council-owned Lights (as at 30 June 2019)

Section 6

Management

6.1 Introduction

This section provides detailed information regarding the individual asset groups under the Transportation Activity.

This includes:

- How work is undertaken and managed
- The expected life of the assets

In order to present this information in a logical manner, the transportation activities have been split up into asset or activity groups. The information above is then provided under each asset or activity. These groups have been based on NZTA funding categories as much as possible and are:

- Sealed Roads
- Unsealed Roads
- Drainage
- Bridges and Structures
- Environmental Maintenance
- Signs, Markings and Railings
- Streetlights
- Road Safety
- Footpaths and Cycleways
- Carparks
- Corridor Management

Information is also provided on Council's management structure and contractual arrangements for undertaking transportation work.

6.2 NZTA Technical Audit

The last technical audit of the Central Otago Roothing network was undertaken the Waka Kotahi NZTA Investment Assurance audit team in October 2020.

The Land Transport Management Act 2003 section 95(1)(e)(ii), requires the New Zealand Transport Agency to audit the performance of approved organisations in relation to activities approved by the Transport Agency:

“The Agency has the following functions: e) to manage funding of the land transport system, including (but not limited to)— ii) auditing the performance of approved organisations in relation to activities approved by the Agency and the operation of the land transport disbursement accounts of approved organisations.

Technical “investment audits provide assurance over approved organisations’ ... activity management planning, adequacy of data used to assess network quality, value for money, and safety and network management.”

The following recommendations regarding the management of the road network were identified in the Audit Review Technical Report.

- That Council review its staff establishment and resource in road asset management
Council employed an additional Roothing Engineer following the Technical Audit. Two entry-level positions were added, with one commencing in January 2017, and the other in November 2017.
- Establish a policy for permissible content and location of tourist signs at intersections
CODC Discretionary Signs Policy for tourist destination ‘finger board’ signs was ratified by Council in June 2017.
- Check that speed limits comply with all relevant legislation
Council’s speed limit bylaw was set in 2005 and reviewed in 2007. It is required to be reviewed by 2020. Council delayed changes to the speed limit bylaw until after the Road to Zero – Safer Speeds changes were implemented by Government in 2017. The Speed Limit Review in the Central Otago District commenced in 2018 and has followed the new processes included within the Waka Kotahi NZTA Speed Management Framework.
- Investigate corridor management in other established and developing dairy farm areas and establish policies in light of those investigations
Council adopted its Roothing Policies in February 2014, which contains 29 individual policies relating to management of activities within the road corridor. The Roothing Bylaw became operational on 1 July 2015 to provide enforcement ability for these policies. These have been reviewed in 2020.

6.3 Contracting Arrangements

Roading Physical Works Contract

The physical works contract is a relationship-based model (conducted as a simple partnership and not an alliance model). The first full term of this form of contract ran from 2010-2016. The second iteration of this form of contract was retendered and awarded in 2016 and commenced on 1 January 2017. The Contract ran for an initial three year term and has been extended for a further two years to 1 January 2022. It may be extended for further two year intervals, up to a maximum of nine years. The new contract was changed use the NZ Standards for Term Maintenance Contracts (NZS3915:2013) and to consolidate the way we deliver work to meet the Customer Outcomes of the ONRC.

The payment structure is cost reimbursement-based, plus an agreed profit and overhead margin. The flexibility of this arrangement allows Council and the Contractor to vary the type, amount and method of the work. This enables Council to achieve on-going cost efficiencies and improved productivity in managing the life of the assets. The contract gives all parties the ability to introduce new working practices, promote the use of new technologies and enables programming and grouping work to reduce establishment costs.

The Contractor and the council's roading Business Unit staff work together to invest for the best possible outcome. The work is managed at officer level within the Contractor and council organisations. The council has a fixed budget and work is only undertaken to the extent the budget allows.

Council's Roothing Physical Works Contract covers delivery of the maintenance, renewals programme of Council's roading assets, and some improvement works. This includes:

- Sealed road maintenance, resurfacing and rehabilitations
- Unsealed road maintenance and remetalling
- Drainage maintenance and renewals
- Street cleaning
- Bridge maintenance and minor bridge renewals
- Vegetation control
- Snow and ice control
- Emergency work
- Maintenance and renewal of signs, pavement marking and traffic facilities and railings
- Low Cost/Low Risk improvement projects
- Footpath maintenance, resurfacing and extensions
- Carpark maintenance, resurfacing and improvements
- Joint network management with Council

Potential exclusions include:

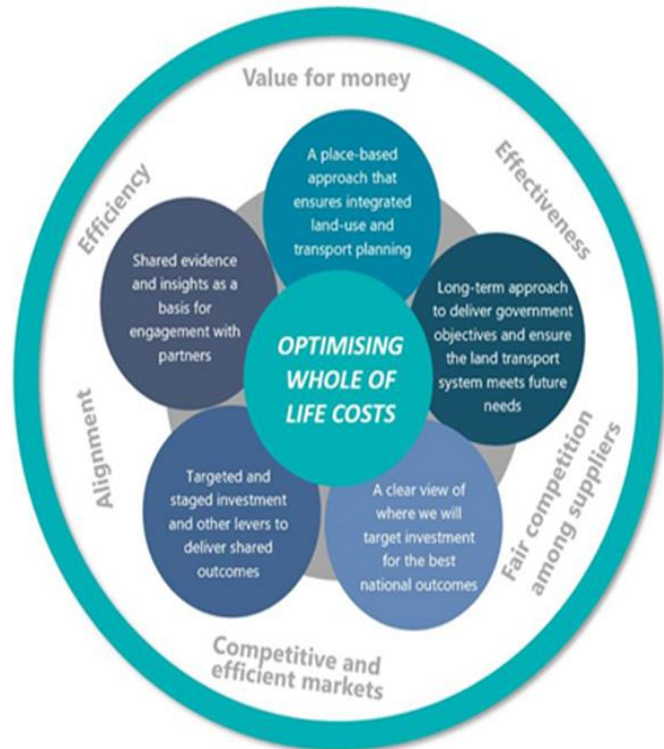
- Bridge renewals where specialist services are required.
- Painting of large steel bridges
- Capital improvement works where specialist input is required
- Street lighting
- Specialist design and advice

Excluded work may be included within the Rooding Physical Works contract with the agreement of the Contractor, where this is shown to provide best value for money and will provide the best outcome to customers. If the work is subsidised by NZTA then it must meet NZTA procurement requirements. The council's Rooding team ensured that a council approved and Waka Kotahi NZTA endorsed Procurement Strategy for Transportation Activities was in-place for Central Otago District Council prior to July 2020.

Contracting arrangements for Council's transportation activities – including tendering, awarding of contracts and Contract Management - are undertaken in accordance with the council's Procurement Strategy, the Procurement Strategy for Transportation Activities and Waka Kotahi NZTA procurement rules.

Specialist Design and Professional Services

Specialist design and advice is procured when it is required in accordance with Councils' procurement strategy. In many instances these are small amounts of work which occur on an infrequent basis, such as geotechnical advice or surveying.



6.4 Programming

Work Prioritisation

Table 6.1 defines the categorised priority that we use for programming work maintenance and renewal work across all asset types. Field staff assign the priority during inspections, or from information provided from public calls.

Priority	Description
Priority 1 – Urgent Needs to be addressed within one week	This is where a level of service failure is currently occurring. It is an immediate safety issue where someone could be hurt, or the repair will become a larger job if left.
Priority 2- Routine can be programmed over the next few months	This is where a level of service failure is highly likely to occur if not addressed. This work is routine in nature, not an immediate safety issue, and should be undertaken when the equipment is in the area, or the weather is suitable for this type of work.
Priority 3 – Programmed can be tied in with a future renewal	This is work that is likely to result in a level of service failure in the future and: <ul style="list-style-type: none"> • Could be undertaken efficiently if it was tied in with other work but won't result in a larger repair if left. • May be a small safety improvement that would be desirable to do if the equipment was on site for other work. • Should be done before a renewal to prolong the life of renewal work. For example, asphalt leveling that should be complete before a reseal is undertaken.
Priority 4 – monitor nice to do but not essential	This is where we have identified an emerging issue, but it is not causing any immediate problems. For example, it could be Eco sealing the approaches to a cattlestop, bridge or taking out a tree out to improve a line of sight along a road.

Table 6.1 Assigning Priority to Work Programmes

Annual Cyclic Maintenance Programme

Table 6.2 details the 'high-level' annual programme used as the basis for supporting the council's staff and Roading Physical Works contractor (and sub-contractors). The programme supports our cost-efficiency outcomes in delivery of "the right work, in the right time, at the right place".

This programme is kept under review and has remained broadly unchanged for the duration of the current Roading Physical Works contract. Changes in the climatic conditions and weather patterns in Central Otago have continued to demonstrate the importance of managing and resourcing adequately to be able to deliver works to this schedule. A clear example of this in the 2018-21 AMP cycle has been the management of roadside vegetation under Environmental Maintenance.

	Winter		Spring				Summer		Autumn			Winter
	July	August	September	October	November	December	January	February	March	April	May	June
Sealed Road												
Sealed road Maintenance	Cyclic mtce		Pre-reveal repairs - Ind. P1 & P2 non-pre-reveals: Cyclic maintenance				Any additional repairs required: Cyclic maintenance		Cyclic Mtce		Cyclic mtce	Cyclic mtce
		Culvert Cleaning Waterabling High shoulder removal Low shoulder repair	Edgebreak repairs Pothole repairs Asphalt leveling Rattle: Static Covers Spray Lichen Spray Shrubbers as req.		Stabilising repairs Texturing A/C patches Rip & Sewak repairs Digout repairs Crack sealing as req. Accessways							
Annual Programme Location												
Grub & Channel - Mtce, Renewals	Pre-pave Grub & Channel - Mtce, Renewals											
Sealed Road Renewals	Annual Sealed Programme											
Annual Programme Location	Chip Crushing Cart to Stabilise											
Road Markings	Alex Urban	Earnsleigh Rural/Urban	Roxburgh Urban/Rural	Cromwell Rural/Urban	Maniototo Urban/Rural	Manuhirika Urban/Rural						
Unsealed Road												
Unsealed Roads Maintenance			Pre-metalling works/Mark Waterabling/Binding Culvert Renewals New Culverts Culvert cleaning				Pre-metalling works/Mark Waterabling/Binding Culvert Renewals New Culverts Culvert cleaning				Pre-metalling	
Annual Programme Location												
Unsealed Roads Renewals	Metalling Renewals											
Annual Programme Location	Metalling Renewals											
ECOSstars	ECOSstars follow metalling											
Grading	Grading											
Manuhirika	Wedderburn	Ida Valley/Lauder	Omakau	Ida Valley/St Bathans	Lauder/Omakau/Wedderburn	Ida Valley	Omakau	Lauder/St Bathans	Ida Valley/Omakau/Wedderburn	Ida Valley/St Bathans	Lauder/Omakau/Wedderburn	Grading St Bathans
Maniototo	Naseby/Waipata/ Patearoa	Gimmerburn/Puketoi	Waipata/Patearoa	Puketoi	Gimmerburn/Patearoa/Puketoi	Waipata/Wedderburn	Gimmerburn/Puketoi/Siya	Gimmerburn/Naseby/ Patearoa/Waipata/ Wedderburn	Puketoi/Siya	Gimmerburn/Naseby/ Patearoa/Waipata/ Wedderburn	Naseby/Patearoa/Waipata/ Wedderburn	Gimmerburn/Puketoi/ Siya
Western	Earnsleigh	Roxburgh	Roxburgh/Earnsleigh	Cromwell	Roxburgh/Earnsleigh	Cromwell	Roxburgh/Earnsleigh	Cromwell	Roxburgh/Earnsleigh	Cromwell/Earnsleigh	Roxburgh	Cromwell
Oiling	Oiling											
Routine Drainage												
Culvert Cleaning - Routine	As programmed											
Waterabling - Routine	As programmed											
Bridges												
Bridge Maintenance	As Required											
Bridge Renewals	As required											
Street Cleaning												
Annual Mustank Clean	Annual Mustank Clean											
Bi-annual full ker & channel clean	Full K&C clean											
Leaf Clearing												
Commercial Street Cleaning	Cromwell/Clyde Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk	Cromwell/Clyde Alexandra 2 x per wk
	Omakau/Naseby/ Ourewha/Diphi											
Grit Clearing	Grit Clearing											
Rural Sweeping	Rough rural sweeping: eritrous, eabranours, attention											
Vegetation												
Vegetation - Trees works	Tree works if funding available											
Spray Lichen	Pre-sal Lichen spray											
Vegetation - Post Plant Spraying	Cromwell Earnsleigh/Start Maniototo Maniototo Maniototo Manuhirika Roxburgh											
Vegetation - Urban Spraying	Urban Spraying - Round 1											
Annual Programme Location	Diphi/Alex/Earns/Manuhirika Cromwell/Maniototo/Roxburgh Diphi/Alex/Earns/Manuhirika Cromwell/Maniototo/Roxburgh											
Vegetation - Rural Roadside Spraying	Roxburgh Alex/Earns/Crom/Mani/Manu Areas requiring attention - Rats/Bridge ends etc											
Vegetation - Rural Shoulder Spraying	Roxburgh Manuhirika/Maniototo											
Vegetation - mowing	Mowing - Round 1											
Annual Programme Location	Alex/Earns/Crom Mowing - Round 2 (As required) Alex/Earns/Crom											
Traffic Services												
Railings & Guardrails	Repair, paint, remove, replace and new											
Signs - Mtce/Renewals	Routine maintenance, Replace and New Signs											
Winter maintenance	Winter maintenance - Ice/Grit/EMA/Snow Clearing											
Minor Improvements	Minor Improvements/widening/seal extensions/safety improvements											
Annual Programme Location	Minor Improvements/widening/seal extensions/safety improvements											
Road Management	Full inspections											
Footpaths/carparks	Footpath & Carpark mtce & renewals											
Annual Programme Location	Footpath & Carpark mtce & renewals											

Table 6.2 High-Level Annual Maintenance Programme – Roding Physical Works

6.5 Sealed Roads

The sealed road carriageways are managed to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Amenity – ride comfort
- Safety – surface faults and surface friction
- Effectiveness – optimal programmes which are efficient and affordable

Council ensures this is done efficiently by:

1. Using dTIMS to identify the minimum amount of investment required before the network becomes unstable.
2. Only intervening with a renewal when it is the most cost-effective intervention and undertaking heavy maintenance and drainage work prior to resurfacing to extend the lives of the pavements.
3. Using Contractor, Council and specialist expertise to jointly agree the most cost-effective long-term surfacing treatment required, including the consideration of technically innovative treatments.
4. Being prepared to take risk with the surfacing treatments selected.
5. Programming maintenance repairs to be undertaken in the most cost-effective method when equipment is operating within the area to reduce establishment costs and improve productivity. This means that Council is willing to accept a longer response time on non-urgent repairs to gain efficiency than may be accepted on traditional unit rate and lump sum contract.

Figures 5.3 to 5.8 included within the “Assets” section, show that Central Otago’s sealed roads are in good condition.

Modelling is undertaken using dTIMS on the sealed roads during each three-year LTP cycle to identify the minimum level of investment to maintain the network’s stability. In 2014, the model recommended:

- A reduction in renewals expenditure of \$353,000 per annum (based on a target length of 20 km resurfacing on the network); and
- An increase in maintenance budgets of \$119,000 per annum to offset an expected increase in maintenance issues resulting from reduced renewals inputs.

The 2017 modelling demonstrated that the sealed road maintenance budget levels remained sustainable (and were slightly decreased), but that an increase in investment for our sealed road renewals programmes was provided for, as follows:

- An increase in renewals expenditure of \$140,000 per annum (based on resurfacing a target length of 22 km)
- Introduction of targeted pavement rehabilitation work from 2019-20, requiring an investment of \$240,000 per annum.

A portion of the increase in resurfacing budgets was provided due to sub-division growth within the District, based on estimating that an additional 850 metres a year of new roads would require their second-coat seals to be completed within 6 years of construction. This additional resurfacing requirement due to growth is not part of dTIMS forecasting.

Council is proposing to increase the expenditure on sealed roads maintenance and renewals activities by 8.6% in the 2021-2024 period. This retains the council’s managed risk approach to the renewals program. It provides funding for both the renewal quantities required from the council’s 2020 dTIMS modelling (described in more detail below) and the continued high levels of growth in sealed roads resulting from sub-division (Section 3.4).

The dTIMS outputs are validated in the field by two experienced staff before the recommendations are adopted by Council, through the Long Term Plan process. In 2017, the sites were largely the same as those identified as requiring work during physical inspections, and there is a high-level of confidence in the suggested timing of the work from the dTIMS modelling. The sites identified for rehabilitation in the next five years - which are typically on urban streets where utilities trenching has impacted on the roughness and condition rating results – have remained consistent in the modelling.

The expected percentage length of network above the ONRC roughness targets in three years has also been considered. This shows that there will be no change in maximum roughness on rural roads and an improvement in maximum roughness on all urban streets except for those classified as Low Volume Access where there will be a continued, managed deterioration. The overall network condition, measured in terms of the Surface Condition Index, will be reduced over the 25-year modelling period from the current level of 2.4 in 2020, to 4.5 in 2045.

Further efficiencies in the delivery of sealed road activities introduced in the 2018-21 AMP period have been successful and are now embedded in both maintenance and operational business-as-usual. The council have ensured that funding is available to support the following activities in conjunction with our optimised sealed roads investment:

- Improving drainage maintenance programme and renewals, which will result in slowing pavement deterioration.
- Spraying of sealed road shoulders instead of mowing which will result in less high shoulder repair being required.
- Requiring adjoining landowners to be responsible for damage to sealed roads as a result of tree roots from adjoining property affecting pavements.

Council's optimised sealed road renewal program requires both roading staff and the contractor to manage minor repairs, high shoulders, roadside drainage and damage from trees effectively in order to achieve the extended surfacing lives delivered on the Central Otago sealed road network.



Sealed Road Maintenance and Renewals Programme

The programme for Council's sealed road maintenance and renewals work is developed initially from the dTIMS modelling optimised for the network. The New Zealand Sealed Roads Pavement Performance Framework model reporting forms the basis of the council's investment decision-making for maintenance, renewals and pavement rehabilitation works, including options testing for cost efficiency. For the 2021-30 LTP dTIMS modelling, this work has been managed in-house by the Central Otago District Council Asset Engineer. The modeller who has completed Central Otago District Council's two previous sealed road deterioration models in 2014 and 2017 has provided technical support and training to the Asset Engineer throughout the development and reporting processes of this latest model.

For previous AMPs, the modelling report produced by external consultants has been appended to the Activity Management Plan. For this 2021-24 AMP, the information is now included within the relevant AMP sections. Technical detailed outputs are then still provided in Appendix 3.

Network Renewal Rate Recommendations

Based on the model outputs, the following is the recommend minimum sealed road centreline length of renewal work to be undertaken for the Central Otago district roading network.

	Average Annual Quantity (km / Yr)	Annual % Network / Yr	Increase % Network / Yr
Rehabilitation	0.3 to 0.5	0.1%	0.0%
Chip Resurfacing	22 to 24	4.3% - 4.6%	+0.4%
Thin AC Resurfacing	0.1 to 0.2	0.0%	0.0%

Table 6.3 2020 dTIMS programme recommendations

This recommendation is based on recalculated maintenance and renewals construction rates, using 2016/17 – 2018/19 Financial Year "maintenance cost" data. An update of analysis for resealing costs from the 2012/13 to 2018/19 has also been completed.

The renewal rate recommended above represents a 10% increase in the capital expenditure for sealed roads renewals, but this can be offset by a reduction in the maintenance budgets for pre-reseal and routine repairs on the sealed roads across the District.

The network-wide improvement of surface condition directly results in a reduction in reactive maintenance quantities and managed rates of pavement deterioration.

Network Return in Condition

Based on the recommended renewal quantities, the long-term (25 year) return in condition are shown below. This is compared to any increase or reduction in funding levels.

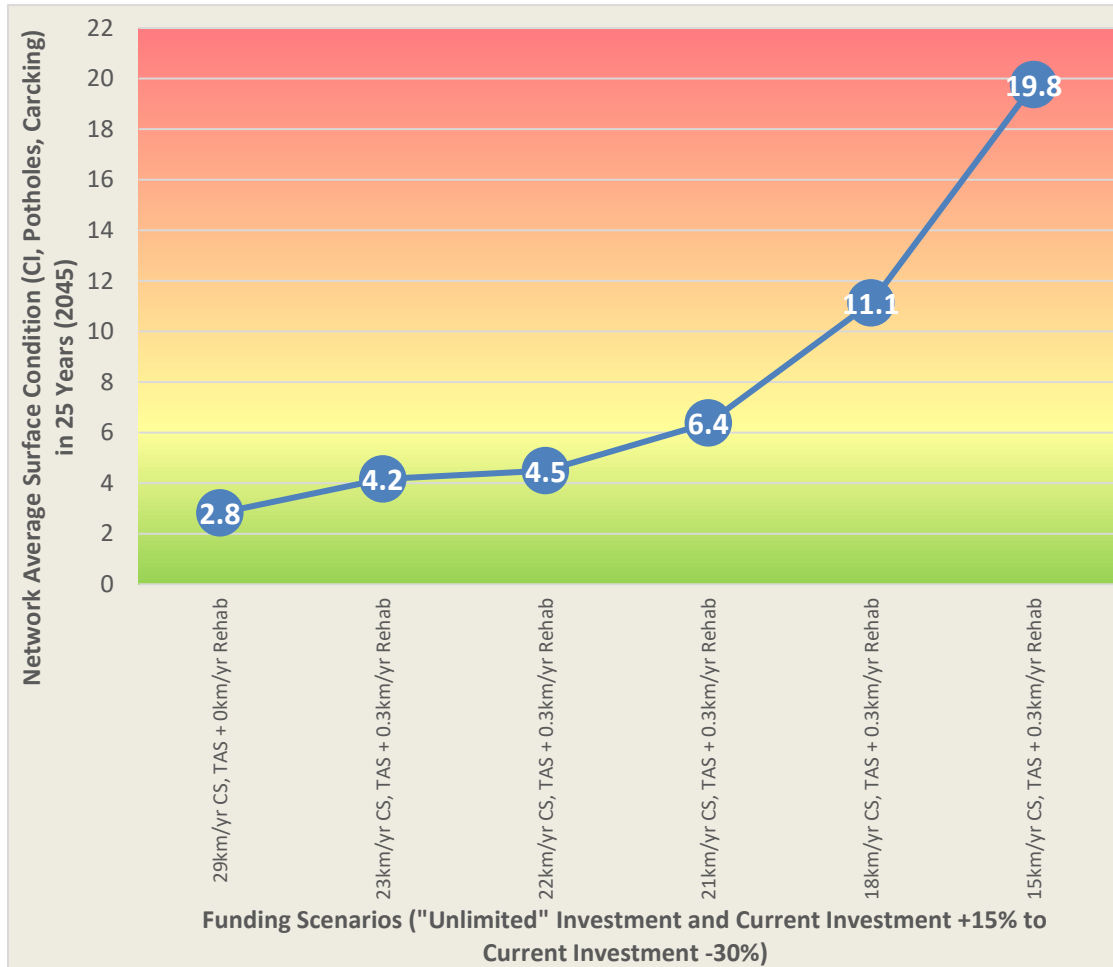


Figure 6.1 Network Condition Return (2019/20-2044/45)

Over the long-term, pavement condition provides a key performance indicator for the overall effectiveness of the proposed work programmes supported by the investment scenarios. A sustained increase in the renewals investment of around 10% per annum (from current levels) delivers an appropriate return in pavement condition. Central Otago District Council can continue to manage:

- The existing strategy of modest deterioration in our sealed roads which are amongst the highest-performing in New Zealand. The current Average Surface Condition (CI) is 2.4 in 2019/20
- The impacts of growth in our sealed road assets, which have increased by 13km centreline length between 2016/17 and 2019/20

Budget Scenarios for Network Investment

The modelled funding requirements for annual investment in the sealed roads maintenance and renewals programme are shown below. In this instance the “unlimited” budget scenario is not shown. By comparing and refining the budget scenarios, it has been possible to look for the best opportunity for ‘optimal’ investment in the Central Otago sealed road network.

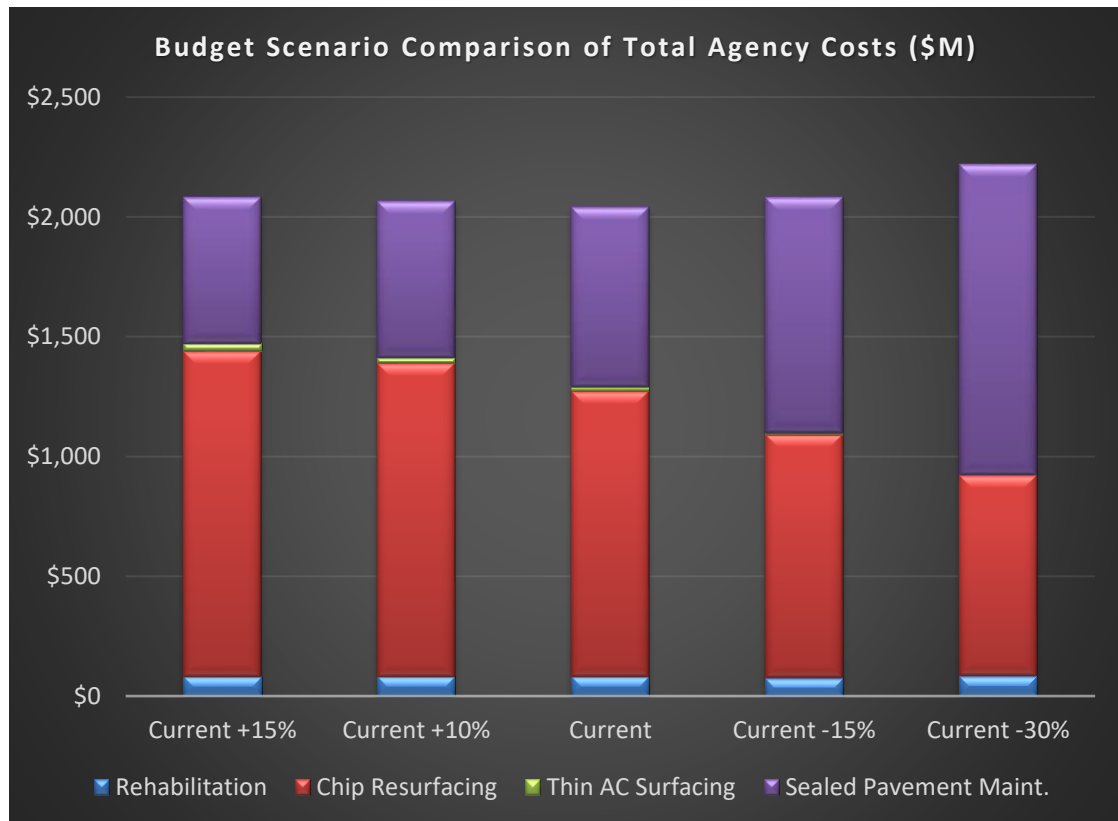


Figure 6.2 Budget Scenario Comparisons for Sealed Roads Maintenance and Renewals

Annual investment of \$1.58 million in our renewals programme (\$2021), which comprises of chip seal resurfacing, asphalt resurfacing in high demand areas and pavement rehabilitation work (where layers of the road below the surface also require reconstruction) provides an optimised scenario where the investment required in operational and reactive maintenance can be minimised.

The recommendations are provided as guidance only, to assist with development of the Long-Term Plan 2021-30 requirements. The model developments are based on benefits associated with the current network and return in condition over the long-term. The model does not directly cater for asset growth, inflation or cost increases. However, the comparison between the 2014, 2017 and 2020 models allows the impact of growth to be evaluated against the optimal length of resealing work recommended within each model. It also does not make direct predictions for intangible benefits on the network (an example of this would be improved safety through reduced crash numbers).

New Zealand Sealed Roads Pavement Performance Model

The following provides a brief background to the methods and approach taken in development of this summary of the model outputs from the dTIMS model developed for the Central Otago District Council. The key objectives for undertaking this work were to:

- Determine the optimal maintenance expenditure and renewal work quantities in order to achieve the desired level of service outcomes for the network
- Align the modelled network performance with the One Network Road Classification customer and technical outcomes
- Assess the possible consequences of various maintenance strategies on the long-term condition of the network

To achieve these objectives Deighton Associates dTIMS software, utilising the IDS New Zealand pavement performance modelling framework for sealed roads, has been used. This model framework has been applied for the previous network forecasts undertaken on behalf of CODC in 2014 and 2017.

The model inputs are built upon a comprehensive data review process. This work is then used in populating a standard model template developed for analysis of New Zealand's sealed roads. A summary of the work undertaken as part of this task includes:

- Cleaning of the council's sealed surface, sealed roads pavement layers and sealed road treatment length data in preparing the model
- Data validation and cleansing between RAMM and dTIMS
- Building the model input files
- Verification of the council's current maintenance, operations and renewals budgets, including changes over the previous nine years
- Establishing the council's recorded maintenance costs and resurfacing rates to be used in analysis
- Incorporating treatment interventions (triggers) aligned with the One Network Road Classification (ONRC) requirements
- Running the models, and optimising to various funding scenarios
- Summarising the findings aligned with the ONRC performance measures

This report contains the summary of the key ONRC performance measures, forecasted by the models. The ONRC measures provided for reporting are:

- Customer Outcome Measures:
 - Amenity Customer Outcome 1 – Smooth Travel Exposure (STE, %) by ONRC hierarchy
 - Amenity Customer Outcome 2 – Sealed Road peak roughness (target NAASRA, 95th %-ile NAASRA) by ONRC hierarchy for both urban and rural roads
- Technical Output Measures:
 - Amenity Technical Output 1 – Sealed Road average roughness (median NAASRA) by ONRC hierarchy
 - Technical Output 2 – Aesthetic Faults (aligned with overall Condition Index)
- Cost Efficiency Measures:
 - Cost Efficiency 2 – Chipseal Resurfacing quantity (centreline length/lane kilometres and surface area, m²)
 - Cost Efficiency 3 – Asphalt Resurfacing quantity (centreline length/lane kilometres and surface area, m²)

More detail on Central Otago District Council's performance against level of service delivery illustrated by these measures is included in Section 2.

Current Sealed Road Network Performance and ONRC Targets

The RAMM (and RAMM Contractor) data baseline for the sealed roads network, the reporting available from RAMM to support the Annual Achievement Return submissions to Waka Kotahi NZTA, the Maintenance Cost dataset from RAMM and the reporting generated by the ONRC Performance Measures Reporting Tool indicate that the Central Otago district roading network is aligned with the requirements of the ONRC, whereby the investment is targeted to the appropriate road classes.

Before each iteration of the dTIMS model (2014, 2017 and 2020) the renewal interventions have been determined from calibrating the triggers from both the Performance Measures results and local data to ensure a robust model which reflects our local network.

For specific details on the ONRC performance, we refer to the Performance Measures Reporting Tool which references CODC's roading carriageway data. Technical analysis of our roading network – which includes dTIMS modelling and Maintenance Cost data – uses RAMM Treatment Length (TL) data. Treatment Lengths sub-divide the roading network into sections which are grouped by engineering criteria, as opposed to carriageways which are established by distances between intersections or other physically visible measurements. For this reason, some minor variance can occur between RAMM and dTIMS from the standard ONRC performance measures reporting summaries.

Our predominately rural low volume road network classifies 53% of the rural sealed network and 76% of sealed urban roads as Access or Low Volume Access roads. The model parameters that have been used for the CODC network have taken this into consideration. Based on the distribution of condition, as below, the interventions are aligned to maintain the network with the current condition state. We continue to maintain higher classification roads to be a better standard (in terms of roughness) than the lower classification roads and are managing a planned increase in roughness on local sealed roads with the least traffic.

Data Review

This section provides a general overview of the data improvements made to the model inputs to ensure a realistic representation of the CODC sealed road network was modelled.

A modelling template for use by dTIMS is populated by 'unloading' the key information held in the RAMM database for the Central Otago District Council network and running this through a validity checking exercise. The results from this work are then input directly into dTIMS (referred to as the dTAG table). The following provides a summary of the key parameters and overall data quality within the RAMM database, and should be read in conjunction with the information included in Section 5.2:

Parameter		Number	% Total
Network Length (km)		524.4	99.4%
Number of TL Sections (Count)		2,125	>99.9%
Traffic	Missing	2	<0.1%
Traffic Composition	Missing	2	<0.1%
	Incorrect	71	3.3%
Surface Details	Missing	34	1.6%
	Incorrect	39	1.8%
Road Condition	Visual (Rating)	16	0.8%
	Missing		
	Roughness Missing	38	1.8%
High-Speed Data Validation	Roughness Missing	620	-
Pavement Details	Missing	33	1.6%
Pavement Strength	SNP Missing	1087	51.2%
	Deflection Missing	1087	51.2%
ONRC Classification	Missing	0	0.0 %
Maintenance Activities			Yes

Table 6.4 Central Otago District Council Road Network Data Validation Summary

These results represent a good level of data improvement from the previous model iteration in 2017. Modelling work is now completed in-house by the council's staff and the processes used to populate the remaining missing data will form part of the Improvement Plan. For the 2020 modelling, the methods used for populating the missing data were explained in detail as part of the model training provided to Central Otago District Council. These processes analyse a combination of our network averages and data from adjoining Treatment Length sections to populate a representative value for missing or incorrect information. The use of common tools and nationally accepted approaches have been used where possible.

Parameter	Data Check	Methodology
Traffic	Missing	Review of adjoining sections traffic count, or use of the Network Average values by Road Class
Traffic Composition	Missing	Use of the Network Average values by Road Class, and input from the CDOC Roding Engineer for unique situations in Cromwell.
	Incorrect	Update the Percentage Cars value to ensure the total equates to 100%
Surface Details	Missing	Review with the CODC Roding Engineer to populate
	Incorrect	Review of the RAMM database and update the appropriate date
Road Condition	Visual	Update to a default value of 0 (good condition)
	Roughness	Update with the network average, based on traffic use groupings
Pavement Details	Missing	Determine based on number of seal layers, expected surface life and date of current surface
Pavement Strength (Structural Pavement Number – SNP)	Missing	Update based on 2 methods: <ol style="list-style-type: none"> 1. Where there is current data, create a network length-weighted average based on the carriageway areas and road class 2. Where there is no data, use the default SNP method where pavement design principles are followed. This is based on: <ul style="list-style-type: none"> • a functional grouping determined by the geographic area and locality 'sub area' of the carriageway • traffic use • pavement age
Pavement Strength (Deflection)	Missing	Updated based on the standard calculation linked with the SNP value determined
ONRC Classification		No population of missing data required
Maintenance Activities		No population of missing data required

Table 6.5 Method for Populating Missing Data

A key part of undertaking modelling based on Treatment Lengths, is the section lengths used within Central Otago District Council. Previous experience has shown that the most appropriate length for sections to be used in modelling should range between 50m and not greater than 2,000 metres. Central Otago District Council still has a small percentage of rural roads split into treatment lengths of 2,000-3,000 metres, based on historic road management processes. Longer treatment lengths are a potential concern, as the condition parameters used in the model are averaged for the length of road, and hence the longer the section, the less likely the average condition is representative of the section. This is not currently believed to be a big risk on Central Otago's district roading network. However, reviewing and updating the Treatment Lengths from the improved data available for the 2019/20 dTIMS modelling is an item in the AMP Improvement Plan.

Model Budgets / Long Term Plan Funding Levels

To enable the optimisation of the network based on the various budget scenarios, the base funding level was aligned with the LTP 2018-28. We initially modelled five budget scenarios:

- A 30% reduction in the current renewal budgets. This is effectively the “Do Minimum” option
- A 15% reduction in the renewal budgets
- Retaining the “Status Quo” and continuing with current renewal budgets
- A 15% increase in the current renewal budgets
- A 30% increase in the current renewal budgets

The model has been aligned to the current budget split for the CODC network into the different Waka Kotahi NZTA work categories for sealed roads maintenance and renewals.

This is not aligned with the standard approach of using a single budget for the optimisation. The purpose of the single budget level is to allow the model to determine the best use of the funds, given the overall benefit to the network, and aligned with the ONRC targets. This is referred to as the “Unlimited” budget scenario. The results for the single budget approach are provided for reference only – but identify all the ‘optimal’ pavement rehabilitation and asphalt resurfacing forecast for the Central Otago District Council network, with no funding caps.

The five budget scenarios are then set for the total sealed roads renewals investment proposed by the council, whilst ensuring that ‘optimal’ pavement rehabilitation and asphalt surfacing renewals are funded from within this allocation. Pavement Rehabilitation treatments were re-introduced on the Central Otago District Council sealed road network from 2019/20.

Whilst configuring the model, it became apparent that the ‘optimal’ investment levels for the Central Otago District Council could be targeted within a range between the current funding allocation and a 15% increase in renewals investment. By running a more sensitive set of budget models the final analysis utilises the following five scenarios:

- A 30% reduction from the annual 2018-21 renewal budgets
- A 15% reduction from the annual 2018-21 renewal budgets
- Retaining the current annual renewal budgets
- A 10% increase in annual 2021-24 renewal budgets from current levels
- A 15% increase in annual 2021-24 renewal budgets from current levels

Budget Categories	Budget Levels used in Optimisation (\$,000) – Annual Average				
	Current + 15%	Current + 10%	Current	Current - 15%	Current - 30%
Sealed Pavement Renewals*	\$1,553	\$1,485	\$1,350	\$1,148	\$945
Sealed Pavement Maintenance	\$623.5	\$665.8	\$765.4	\$1,009.4	\$1,326.9

Table 6.6 Method for Populating Missing Data Modelling Optimisation Funding Levels Used

* Includes rehabilitation investment, but excludes increased investment due to growth

Sealed Road Maintenance

Council's Roading Engineer and Roading Contractor undertake joint inspections of all sealed roads to identify any maintenance work required. The contractor also undertakes more frequent cyclic inspections with pothole repairs undertaken at this time or as an urgent activity if reported by members of the public.

Table 6.7 shows the frequency of inspections based on road classification. All faults which need to be programmed due to an existing, or likely performance failure are recorded and assigned a priority at this time.

One Network Road Classification	Joint Inspection Frequency	Cyclic Inspections
Arterial	Annual	Monthly
Primary Collector	Annual	Monthly
Secondary Collector	Annual	Quarterly
Access Road	Every 2 years	Annual
Access Road Low Volume	Every 2 years	Annual
Reseal Sites	Annual	N/A

Table 6.7 Sealed Road Inspection Frequency

All work is programmed depending on the assigned priority (see Table 6.1), renewals programs, and similar work being co-ordinated within different areas of the District.

Programmed maintenance work is dependent on weather conditions and is undertaken between September and April.

Sealed Road Maintenance Budget

Figure 6.3 shows the last 10 years expenditure on sealed road maintenance and operations, and the proposed budget for the next 10 years. The maintenance budget increases from 2015/16 reflect optimisation between maintenance and renewals budgets, as a result of the dTIMS modelling.

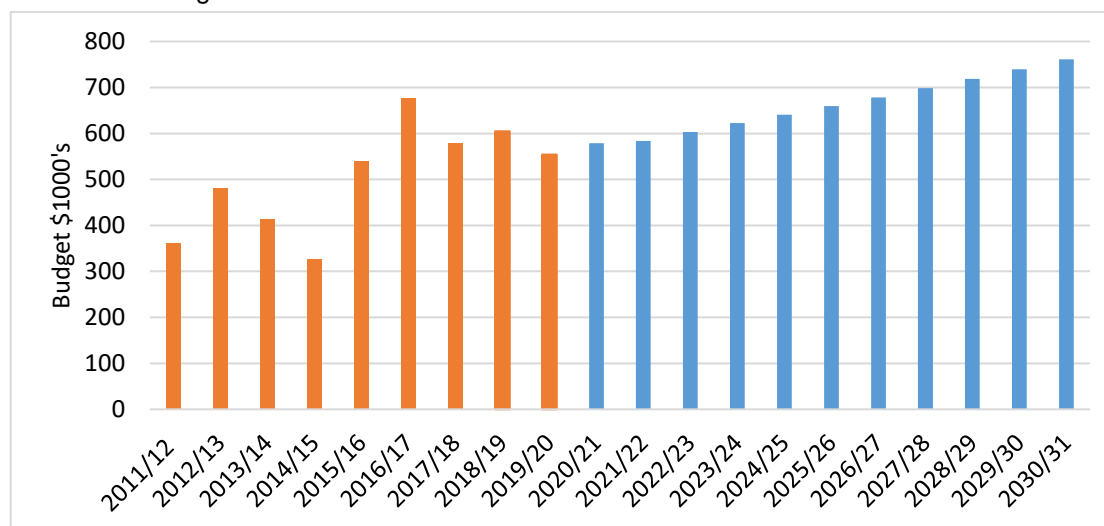


Figure 6.3 Sealed Road Maintenance Budget

Sealed Surface Lifecycle Analysis

The age of surfaces resealed in the past 6 years are reviewed to identify the average seal life used for different category roads and seal types. These are shown in Table 6.8(a) and 6.8(b). Previous assessment was undertaken prior to the application of the One Network Road Classification hierarchy across Central Otago District Council's sealed roads. Work undertaken as part of the Long Term Plan in 2017 identified achieved sealed surface lives by roading classification.

Average Daily Traffic (ADT) Sealed Roads	Prime and Seal	Racked in Grade 3	Reseal grade 3	Reseal grade 4	Reseal grade 5 & 6	Second Coat Grade 3	Second Coat Grade 4	Second Coat Grade 5	Two coat reseal 2 or 3	Two coat reseal 2 or 3	Asphalt
< 100	27	14	15	14	13	16	15	14	15	14	21
100 - 500	24	14	14	13	12	15	14	13	14	13	20
500 - 4000	25	13	13	12	11	14	13	12	13	12	19

Table 6.8(a) Standard Seal Lives

One Network Road Classification	Traffic Volume (AADT)	Achieved Surface Lives (years)		
		Reseals and Second Coat Seals	First Coat Seals	Asphaltic Concrete Surfacing
Arterial	Urban > 5000	18	<8	19
Primary Collector	Urban > 3000	18	<8	19
	Rural > 1000	18	<8	19
Secondary Collector	Urban > 1000	15	<8	20
	Rural > 200	15	<8	20
Access Road	Urban > 200	14	<8	21
	Rural > 50 vpd	14	<8	21
Access Road Low Volume	Urban < 200	14	<8	21
	Rural <50 vpd	14	<8	21

Table 6.8(b) Standard Seal Lives by One Network Road Classification

Sealed Surface Renewals

Resurfacing includes resealing chip seals, asphalt, and slurry seals. The use of Asphalt surfacing is restricted to high stress urban areas only, typically where heavy vehicles are turning at intersections in industrial areas and cul-de-sac heads. Slurry is used in commercial areas where a chip seal is not suitable due to a high risk of bleeding and there is limited heavy vehicle turning or breaking. In these locations, slurry provides a cost-effective alternative to asphalt.

Detailed resurfacing programmes are prepared for each 3-year Activity Management Plan period. This provides the opportunity for a long lead in time between pre-reseal repairs and resealing to enable diluents to evaporate and reduces the risk of surface failures in the reseal.

Resurfacing treatments are agreed by the council's Roading staff and contractor, and reseal designs are prepared by the roading contractor and reviewed by the Roading Engineer or an external specialist.

Short and long term economics of the pavement surfacing, as well as wider aspects such as amenity factors, stress on cul-de sac heads and intersections, whole of life costs are considered in the design.

Resealing any surface which has a large texture depth (small sand circle Diameter) can require high binder application rates which are expensive and can lead to extensive bleeding in Central Otago summers. Texturising is considered in this situation.

All seal extensions constructed as a result of Council funded work and by Developers in the past thirteen years have been required to be two coat seals, or asphaltic concrete. These provide a more durable, waterproof surface and have a longer initial life than a single coat. The two-coat first coat surfaces are lasting between 6-9 years depending on traffic volumes and location. Figure 6.2 highlights a steady increase in requirement for chip sealing over the next ten years, in part to address second coat seals in need of renewal.

The sealed road resurfacing program recommended by dTIMS is shown on Figure 6.2. The recommended program is higher over the long term than the predicted program to ensure the surface age and condition remains stable.

The recommended rate of reseals is the same as the average of the predicted rate of reseals for the next 6 years. The predicted rate is lower than the recommended rate for the period beyond 6 years.

The level of confidence regarding the model predictions for the next 6 years is high, beyond this the level of confidence is lower. A consistent rate of reseals has therefore been recommended for the 30-year Infrastructure Strategy period to limit risk for the longer term. This will be reviewed for the 2024-27 Activity Management Plan and will be adjusted if the actual level of deterioration on the network is consistent with the model predictions over the next six years.

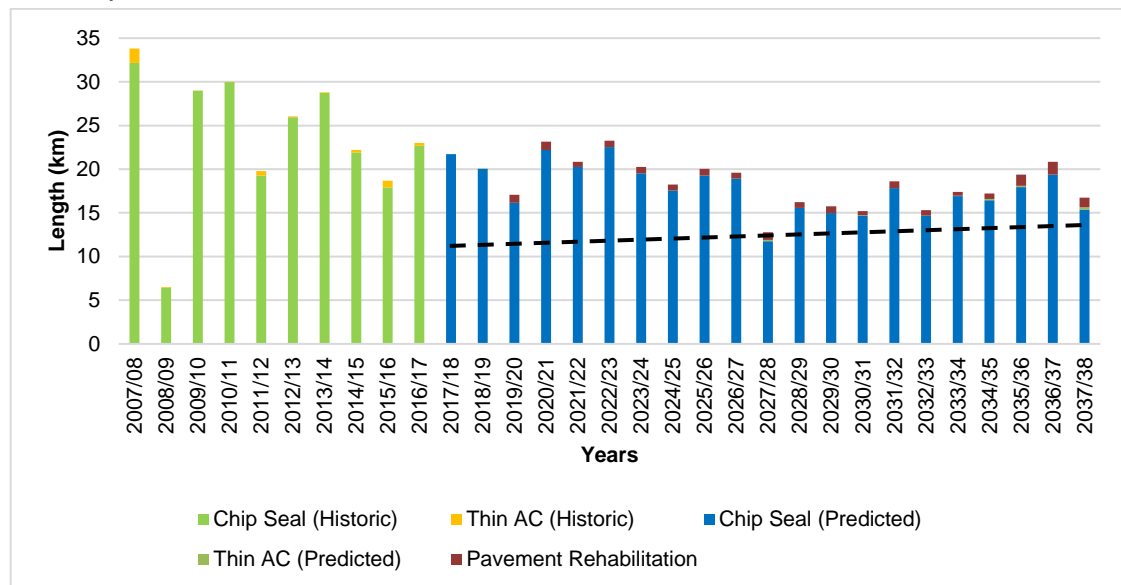


Figure 6.4 Historic, Forecasted and Recommended Annual Chip Seal and Thin AC Resurfacing Quantities

Pavement Lifecycle Analysis

An average pavement life of 120 years has been used for lifecycle analysis. The oldest sealed roads in Central Otago are between 60 – 67 years old. Falling Weight Deflectometer (FWD) testing in Central Otago has been correlated with modelling of Regional Pavement Performance Precedents results. This provides evidence that Central Otago pavements have an expected life of 120 years based on existing age and remaining pavement strength.

Data collected in 2018/19 using the new Multi-Speed Deflectometer (MSD) testing methods continue to support this assessment of expected pavement lives.

Pavement Renewals

Many of the sealed roads constructed in Central Otago prior to the 1990's were sealed directly on top of the existing gravel road. Provided these pavements are well drained, are not shaded, and do not carry significant heavy vehicles they perform adequately. This is validated by the condition rating, high speed data survey, and FWD test information.

Waka Kotahi NZTA subsidy for pavement rehabilitation is only provided where projects can be shown to be the long term least cost option, calculated in terms of present value. Within Central Otago it is rare for large areas of pavement to require complete reconstruction, and as a result the least cost option is usually to undertake localised maintenance repairs, and resealing. In the past fifteen years Council has only received NZTA funding for one pavement rehabilitation project on 1km of Letts Gully Road.

There has been no pavement rehabilitation work completed on the CODC sealed road network over the past ten years. Council's pavement management strategy is to proactively address drainage deficiencies and prioritise removal of trees which shade sealed roads, with early maintenance intervention of surface and pavement failures. In 2008/09 the reseal programme was reduced during the systems thinking review. This was due to sufficient remaining life in the surfaces, enabling these to be deferred. The proposed reseal funding was reallocated to drainage maintenance and renewals to achieve an improved whole of life outcome for some of the sealed road pavements. This strategy has been monitored over the last six years and has informed the works programming developed from the 2017 and 2020 dTIMS models.

A modest programme of renewals has been included to address issues on a small number of urban streets from year two (2019-20). This is indicated within the optimised dTIMS modelling and has formed part of Central Otago's sealed road renewals strategy from the 2012-15 LTP period. The rehabilitation sites identified are located in urban areas where utilities trenching has affected the pavement integrity, or where drainage improvements have already been completed. Forecasted annual renewal quantities are included in Figure 6.2, with budget to complete a targeted 300m/annum of urban pavement rehabilitation from 2019/20 onwards.

The pavement management strategy for sealed rural Low Volume Access roads is for these roads to be maintained as sealed roads while they can be cost effectively managed by repairs and resealing. Short sections of seal on rural Low Volume Access roads at intersections and bridge approaches will be retained for safety reasons.

Sealed Road Renewal Budget

Figure 6.3 shows the last 10 years expenditure on sealed road resurfacing and pavement rehabilitations, and the proposed budget for the next 10 years. The resurfacing budget variances seen in the 2012-15 and 2015-18 AMP cycles reflect optimisation of the geographical areas where crews have been mobilised. The dTIMS modelling continues to be reviewed every three years to ensure the most efficient establishment between maintenance, surfacing and rehabilitations. The pavement rehabilitation programme commenced in 2019/20 but was impacted by the Level 4 COVID-19 restrictions. Physical work on the first two planned rehabilitations have been programmed for 2020/21.

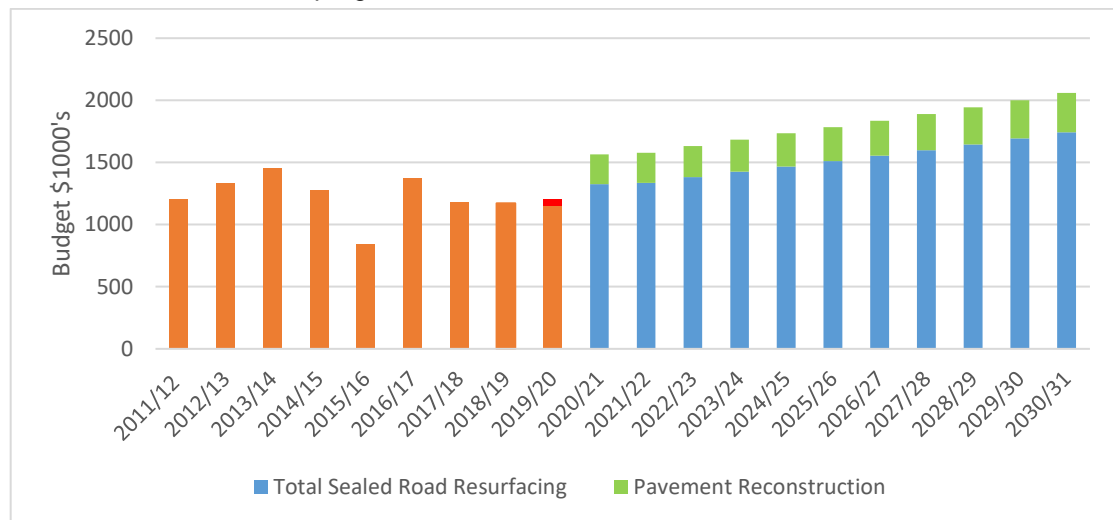


Figure 6.5 Sealed Road Renewals Budget

6.6 Unsealed Roads

Unsealed Road Management

Unsealed road carriageways are managed to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Accessibility – the physical state of the network
- Amenity – ride comfort
- Safety – surface faults (including slippery roads in wet conditions)
- Resilience – to restore roads following weather events
- Cost-Efficiency – optimal programmes which are efficient and affordable

Council will ensure this is done efficiently by:

1. Continuing to develop and utilise the Unsealed Roads Network Performance Modelling Tool. This is a new framework and system for managing the gravel road network, created through collaboration between the University of Auckland, Infrastructure Decision Support and Central Otago District Council. The system provides optimised data for both grading requirements and re-metalling programmes on our unsealed road assets.
2. Preparing annual cyclic grading programs which ensure the most efficient use of limited grading resources, while meeting the variable demands for grading of different classes of roads in different geographical areas of the network.
3. Undertaking proactive drainage work to reduce road scouring, with additional resources to enable this work to also be carried-out on our 'Tracks'.
4. Completing the programme of cost-effective Eco sealing as the council's dust suppression solution for council-maintained gravel roads within 100 metres of residential property. Oiling of roads, which provides a costly and short term solution, is no longer permitted under Otago Regional Council and Ministry for the Environment policies. Eco sealing, including renewal of assets reaching the end of their useful lives, is co-ordinated around the re-metalling program to reduce establishment costs and improve productivity.
5. Managing the location of re-metalling within each financial year to reduce establishment costs and improve productivity. This ensures a greater length of metalling can be done within each three-year program.
6. Undertaking re-metalling when there is a performance failure relating to accessibility, resilience, or safety. Optimal timing of this work is supported by the Unsealed Roads Network Performance Modelling Tool.

Work is also undertaken for environmental reasons to mitigate the impacts of dust on residences. The extent of this is managed by Council's Roding Policy which provides for 100m of dust suppression where a house is within 100m of the road.

Gravel Road maintenance investment has been increased by 26% over the 2021-24 AMP period, based on our current costs and resourcing enabling delivery of our modelled optimised grading. We will continue to carefully manage the grading program to ensure that the work being completed is in-line with our hierarchy and annual grading cycles.

Council has increased the renewals investment for unsealed roads by 16% to set budgets which account for increased costs in delivery of our current level of service. The additional investment will enable Council to meet the increasing costs of gravel royalties, and the annual replenishment requirements to maintain accessibility at the current levels. The increase does allow for a targeted improvement of road conditions on priority 'Tracks' in 2021-24.

Council has not increased the renewal funding in the 2021 LTP to address a backlog of unsealed road renewals work. This can result in accessibility failures in wet and freeze/thaw conditions. It can also result in some renewals work being held-back and reprioritised to ensure programmes can be delivered within available resourcing and budgets.

Further efficiencies are expected to be achieved from:

- Undertaking additional traffic counts on the unsealed network to confirm ONRC and hierarchy sub-classifications which ensure fit for purpose service delivery.
- Ensuring that the ONRC and unsealed road hierarchy sub-classifications are aligned with the 2020 ONRC Moderation (See Section 1.10) to support fit for purpose service delivery.
- Managing the grading frequencies to ensure intervention is not occurring too soon and are in-line with the modelled grading programme outputs.
- Continuing to undertake grading in a cost-effective planned manner rather than as a reactive activity.
- Phasing out oiling.
- Continuing to develop the Central Otago District Council ten-year aggregate resourcing plan, ensuring the council's access to a sustainable supply of gravel from District pits to complete re-metalling programmes in the short and medium-term.

Unsealed Road Maintenance

Maintenance of unsealed roads involves grading to remove surface defects, restore shape, maintain cutouts, oiling and spot metalling. Spot metalling is limited to repairs following extreme weather events, mitigating slippery surfaces on some priority roads or isolated failures caused by other environmental or natural hazards. Roads that are becoming bare due to normal use are managed under the renewals program.

Careful management of grading programs is required in order to meet expected levels of service relating to ride comfort within the funding available. Failure to do this results in a relatively high number of customer complaints and dissatisfaction.

Three graders operate across the network. The areas allocated to each of the three graders were historically unbalanced, with one grader required to meet 43% of the grading requirements. A light grading technique had been adopted in this area to enable the grader to get around all of the roads.

Grading areas have been set to ensure that there is an equitable split of grading hours allocated to each area, dependent on the length of grading required in each area, the establishment time between roads, and the difficulty of the terrain that is being graded.

The grading technique has been changed to undertake heavy cutting of roads where defects exist. Additional time is spent on the transitions through intersections, accessways, and reforming cut outs.

Graders have been fitted with roller attachments to enable compaction of the road following deep cutting. This provides an improved level of service immediately following grading.

Grading frequency for each road is set depending on the CODC Hierarchy Classification of the road. An annual grading program is prepared that balances the demands for grading different classes of roads at different frequencies against cost effective resource establishment. Establishment occurs within each area on a two-month cycle which enables the higher demand roads to be graded more frequently, with the lower demand roads programmed around these to achieve a more balanced program across the year.

The program is reviewed annually to accommodate changes required due to:

- Re-metalling programs
- Changes in traffic volume or numbers of heavy vehicles
- Known changes in land use or access requirements
- A need to address issues raised by the public.

Council uses an Australian Roads Research Board Roughometer to measure the roughness of gravel roads. This measures the consistency of the level of service provided across the District.

The base line grading bands for each hierarchy classification are shown on Table 6.6. Adjustment is made for roads which are within rolling, hilly or mountainous terrain. Adjustments can also be made for roads which have been recently re-metalled or are due for metalling.



ONRC Classification	Traffic Volume	Sub-classification	Planning/Sub-classification description	Expected Life-Cycle (years)	Typical Grading Cycle (grades per annum)
Access Road	> 50 vpd	Major	<ul style="list-style-type: none"> •high percentage of heavy vehicles •Provide alternative through route, in regular use 	8	8
		Intermediate	<ul style="list-style-type: none"> •through roads, serving local traffic •significant horticultural, farming or industrial activities •higher volume gravel roads in lifestyle block areas •most school bus routes 	10	5
Access Road Low Volume	< 50 vpd	Minor	<ul style="list-style-type: none"> •access to more than three houses •servicing rural residential, commercial and agricultural land use 	12	3
		Lane	<ul style="list-style-type: none"> •access to three or fewer houses •access to farmland or by residents 	13	2
		Track	<ul style="list-style-type: none"> •service land use beyond dwellings and buildings •provide high country access •Recreational use roads 	17	1

Table 6.9 Grading Frequencies

Historically, Tracks which have a higher use were provided an additional grade. Grading of Tracks was reduced within the 2012-15 period due to budget limitations, with only one grade having been provided in the 2013-15 period. This had a detrimental effect on the condition of those Tracks which is slowly being rectified through scheduled grading, which commenced in the 2015-16 financial year. Work as part of the Unsealed Roads Network Performance Modelling Tool is allowing us to see the high need for additional grades on some of our Tracks. Additional investment is being provided in the 2021-24 AMP cycle to ensure the work to close this level of service gap can be undertaken.

Unsealed Road Grading Programme

An analysis of grading was undertaken for the 2012 AMP. The public calls that had been received over a 30-month period, historic grading frequencies on roads, length of time taken to grade each road, and grading techniques were reviewed. This review found that the frequency of grading in each area was too long to address the demand for grading on the higher demand roads which was resulting in high numbers of public calls.

The grading programmes originally developed and tested through the 2012-2015 AMP cycle were refined in 2016 and 2017. A further split of resourcing across the three grading areas was undertaken in 2017/18, with additional overlap between the Manuherikia and Maniototo grading areas introduced into Wedderburn.

Graded Road Length (km)	MANIOTOTO	MANUHERIKIA	EARNSCLEUGH	CROMWELL	ROXBURGH	Grand Total
ACCESS MAJOR -	27.78		14.515	5.91		48.205
ACCESS INTERMEDIATE -	99.155	19.221	22.784	13.609	13.411	168.18
LOW VOLUME - MINOR	265.987	154.973	13.943	61.159	57.643	553.7
LOW VOLUME - LANE	60.97	55.412	9.032	25.491	32.423	183.328
LOW VOLUME - TRACK	191.849	87.755	10.879	76.703	86.588	453.674
Total	645.741	317.361	71.153	182.872	190.065	1407.092

Table 6.10 Grading Resource Splits

	MANIOTOTO			MANUHERIKIA			EARNSCLEUGH			CROMWELL			ROXBURGH		
	Grading Cycle Length (km)	Grading Frequency	Grading Cost (\$)	Grading Cycle Length (km)	Grading Frequency	Grading Cost (\$)	Grading Cycle Length (km)	Grading Frequency	Grading Cost (\$)	Grading Cycle Length (km)	Grading Frequency	Grading Cost (\$)	Grading Cycle Length (km)	Grading Frequency	Grading Cost (\$)
ACCESS - MAJOR	250.127	7	31800	0	0	0	47.28	8	10400	154.06	7	39400	0	0	0
Grading Programme	186.388			0			47.28			70.06			0		
Extra Grading	63.739			0			0			84			0		
ACCESS - INTERMEDIATE	647.76	5	83200	116.68	4	20000	88.587	5	20500	55.21	4	15000	46.41	4	11100
Grading Programme	480.413			85.708			69.651			49.57			43.455		
Extra Grading	167.347			30.972			18.936			5.64			2.955		
LOW VOLUME - MINOR	1355.249	4	178400	472.831	3	86300	82.433	3	19200	41.916	3	9300	123.16	3	27700
Grading Programme	1159.344			410.243			81.007			40.743			107.917		
Extra Grading	195.905			62.588			1.426			1.173			15.243		
LOW VOLUME - LANE	212.71	2	29300	143.13	2	28200	62.706	2	15200	13.059	2	2900	132.81	2	29400
Grading Programme	159.891			117.48			54.005			12.339			100.92		
Extra Grading	52.819			25.65			8.701			0.72			31.89		
LOW VOLUME - TRACK	268.942	2	37800	112.533	1	19800	209.558	2	47900	24.353	2	6000	104.589	1	23100
Grading Programme	262.942			112.533			182.558			23.32			104.589		
Extra Grading	6			0			27			1.033			0		
TOTALS	2734.788		360500	845.174		154300	490.564		113200	288.598		72600	406.969		91300

Table 6.11 Unsealed Roads Performance Network Modelling Tool Grading Quantities for 'Steady-State' Network

Total grading length where variance of actual grading frequency (2012-2019) is more or less than the "Number of Grades" by hierarchy sub-classification by at least two grades can be reviewed in the model as being 308.2km. This represents approximately 6% of the total grading on the network. Work to reduce this level of variance will be addressed by the additional investment in resource allocations.

Unsealed Road Maintenance Budget

Figure 6.6 shows the last 10 years expenditure on unsealed road maintenance, and the proposed budget for the next 10 years

The unsealed roads maintenance budget provides for grading, spot metalling, and dust suppression. Additional investment is being provided to deliver the current grading requirements across the network, including additional grading for Low Volume Tracks to close existing level of service gaps. Oiling is being phased-out in conjunction with the metalling program.

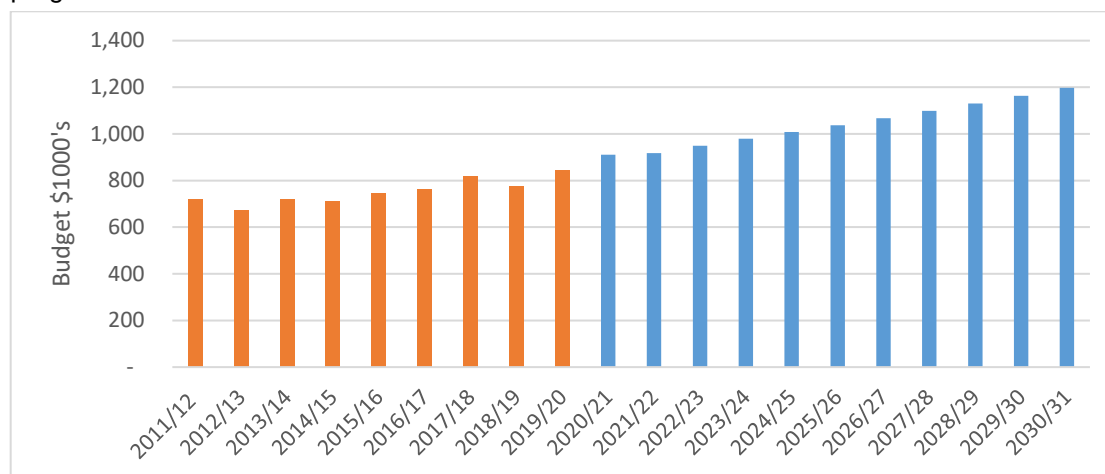


Figure 6.6 Unsealed Road Maintenance Budget

Unsealed Roads Lifecycle Analysis

In depth lifecycle analysis was undertaken for the 2015 AMP by reviewing metalling records over the previous 12 years to identify average metalling cycles. This has been reviewed with data from the 2014 to 2017 period. This review supported the 2014 lifecycle assessment.

The lifecycles for the different road classifications are shown in Table 6.12.

ONRC	Access Road		Low Volume Access Road		
CODC Hierarchy	Major	Intermediate	Minor	Lanes	Tracks
Lifecycle (years)	8	10	12	13	17

Table 6.12 Standard Gravel Road Surface Lives

While roads with a steep topography require metalling more frequently than those which are flat, the percentage of roads with steep topography is minimal and is not considered material to analyse the entire network.

Currently one 'Access Road - Major' classification unsealed road, Maori Point Road, is re-metalled on a modelled lifecycle of 4 years. This is due to the type of road gravel readily available and the construction methodology used on this 5.9 kilometre section. This road is re-metalled with a thin (50mm thickness) capping layer – requiring more frequent renewal.

A review of the level of service for individual Tracks is included as an action in the Improvement Plan.

Unsealed Road Renewals

Roads are required to be re-metalled to replenish the gradual loss of material over time from vehicle use, dust, water run-off, scouring, and grading.

Materials

Central Otago uses locally available pit run materials for metalling of unsealed roads. This material is typically laid directly from the pit, without screening or crushing.

Ideally material should have a largest stone size of less than 65mm, but in some cases this can be up to 100mm. This determines the depth of metalling, which should be two times the depth of the largest stone to ensure that the larger stones are adequately buried within the pavement.

Metalling trials were undertaken in 1998 on Kelliher Lane, Tucker Lane and Fraser Dam Road with material laid at 1.5 times the size of the larger stone. This did not bury the larger material adequately and residents were highly dissatisfied, resulting in the roads having to be rolled and re-metalled within five years.

Where there are small quantities of exceptionally large rocks, these are graded onto the shoulder and manually removed during metalling operations.

In 1996 crushed material was used on Auripo Road, with the road requiring re-metalling again in 1998 due to complaints. The crushed material caused punctures, and corrugations occurred at more frequent intervals during summer due to a lack of clay in the material. This also occurred when crushed gravel from the Teviot cattle yards pit was used in the Roxburgh ward in 1997 and 1998, with these roads being re-gravelled with pit run material within 4 years. While crushed river material performs well in coastal areas where there is a higher rainfall, it corrugates rapidly during the hot dry summers in Central Otago.

In 2003 material was used from Smiths pit in the Maniototo. This metal breaks when on the road, leaving sharp edges that puncture tyres. Within four years all roads which were metalled using this material had to be capped with another gravel to address this problem.

In addition to consideration of the sharpness of the broken stone, the clay content of gravel is critical in the selection of material. If there is not enough clay then the road “unravels” during dry periods and becomes exceptionally corrugated. If there is too much clay, then the road become extremely soft and slippery during freeze/thaw periods.

This means there is no material which perfectly meets the extremes of temperature and climate within Central Otago.

Past experience of road failure during freeze/thaw periods has identified that pit run aggregate used for re-metalling and pavement construction should have a minimum of 5% silt/clay content, and a maximum of 8%. Clay is defined as the material passing the 0.075mm sieve. The CBR (a measure of the load bearing capacity of the material of the pavement) should be greater than 20%, and the material size grading should have a uniformity coefficient of 3-4.



Material laid at a lesser depth as a running course, or as a capping material used for surfacing should be less than 40mm maximum size and may contain 12-14% clay/silt fraction, with a CBR greater than 15%. It should also have a well graded material size as above.

As these materials are sourced locally, compromise is often required based on location, cost of cartage, size of material and clay content. When it is required and practical, materials are blended to achieve a more optimal material.

Cleaner materials (with less clay content) are selected for areas where there are prolonged winter conditions and frequent snow, such as the Lindis, Danseys Pass and Styx areas. These materials perform better than higher clay content materials in extreme winter conditions, and the residents in these areas are prepared to have rougher roads in the summer to ensure accessibility during winter.

Central Otago District Council has completed classification of all the known aggregate sources in developing the Unsealed Roads Network Performance Modelling Tool using the Paige-Green methodology. This has enabled the council to determine the engineering performance of sources. Aggregate with test results placing it in Groups 7 – 11 are classified as “Good” aggregate sources, whereas gravel in Groups 2 and 3 are classified as “Acceptable”.

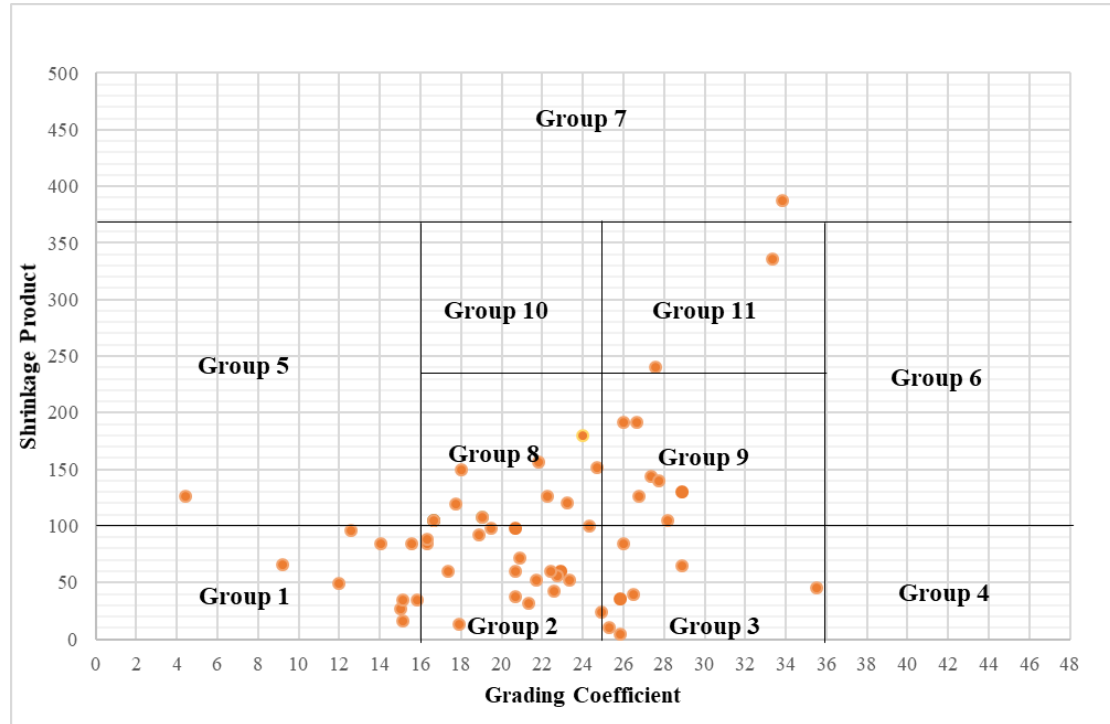


Figure 6.7 Central Otago District Council Aggregate Sources

Crushed material has been used as a running course on roads in more remote locations (e.g Goodger Road) where there is no locally suitable pit run material. Local materials with a low clay content have also been used as a basecourse in the Tarras area, with a capping of material from Springvale to provide a smoother and more durable running surface.

A running course of scalpings was applied to the heavy vehicle routes of Lower Gimmerburn, Maniototo, Wilson and Puketoi Roads when this was metalled in 2009. This increased the renewal cost significantly, and there is no evidence to suggest that this has reduced on-going maintenance costs. Other roads in this area, which have been metalled using only the underlying pit run, are performing adequately and meet customer expectations. The use of a separate running course on an acceptable pit run material is therefore not considered to be a cost-effective methodology.

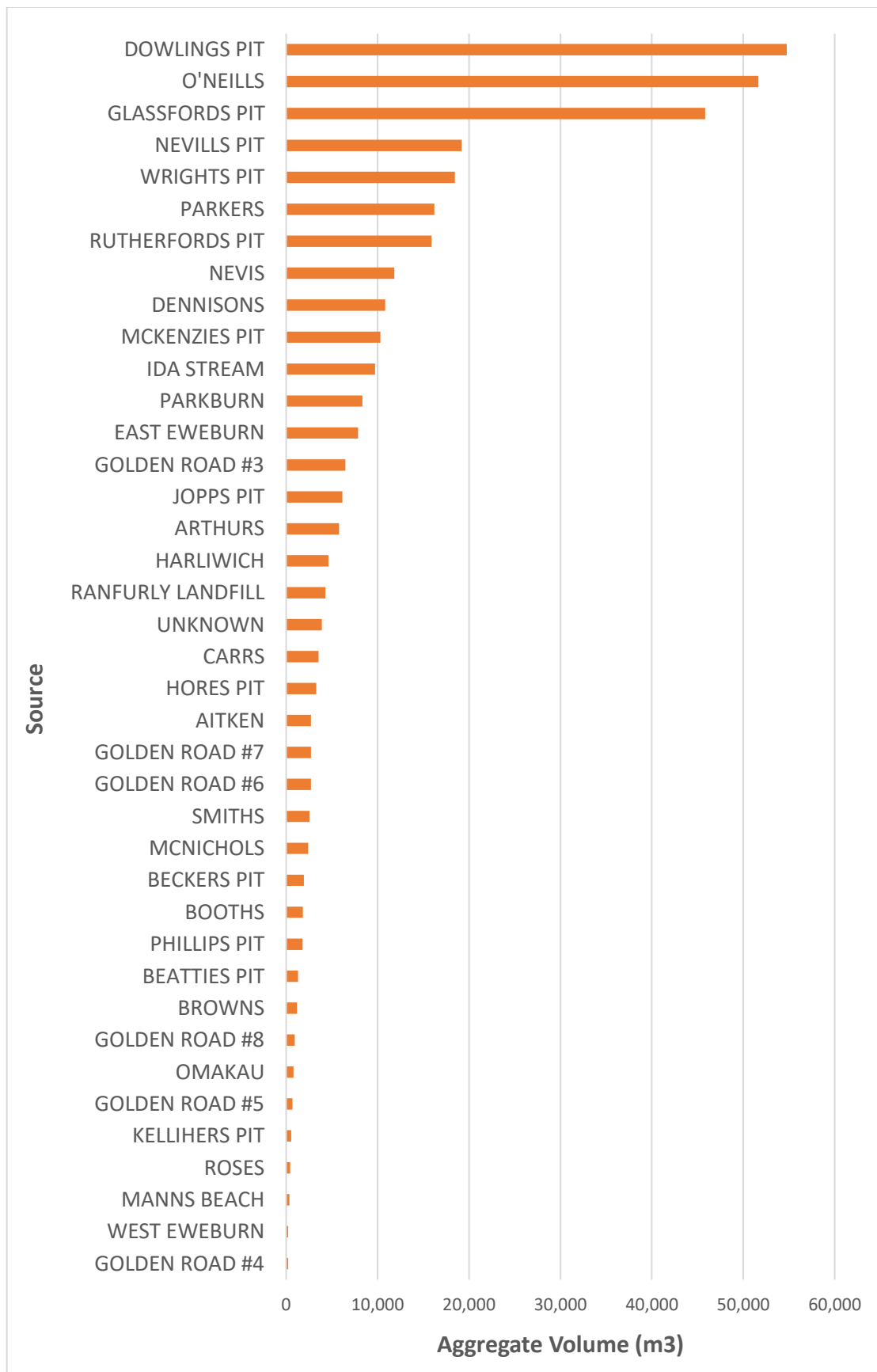


Figure 6.8 Unsealed Road Aggregate Demand for 2020-2025

An action has been included in the Improvement Plan to complete the ten-year Aggregate Study for the council to consider options for securing future access to critical gravel quarries as the potential loss of access to quality local materials presents a risk to Council.

Renewal Prioritisation

Following reduction of the funding requested from NZTA in 2012, a renewals prioritisation process was adopted by Council to provide staff with a robust and transparent means of prioritising metalling programs. Roads are inspected by staff and rated across three different outcome areas as shown on Table 6.12.

Consideration	Score		
	High (3)	Medium (2)	Low (1)
Strategic Importance	Major, Intermediate	Minor	Lane
Inspected Asset Condition/ Traffic rated gravel loss	Most of the road has sub-base showing through with evidence of loss of traction & sub-surface deformation	Significant sections of the road have sub-base showing through	Patches have sub-base showing through
Access and Safety (Topography)	Mountainous topography or rolling/or winding topography and lack of gravel resulting in loss of control	Rolling or winding topography	Flat and straight
Additional grading	On-going need for additional grading	Only isolated during weather events	None
Customer complaints / Routine Maintenance	More than 2 complaints per km per year	More than 1 complaint per km/ per year	None

Table 6.12 Unsealed Road Metalling Prioritisation

Each element is scored 1 to 3, and the total for each road summed to give a priority ranking. The metalling program is then prepared with consideration to which areas have the highest number of high scoring roads. Metalling is limited to 3-4 pit establishments per annum to enable cost effective establishment and higher productivity rates to be achieved. Consideration is given to the size of the program in each area, and how long until the next establishment is likely. This ensures the most cost effective outcome and enables a greater length of road to be metalled within each three year LTP period.

This framework is directly replicated in the Unsealed Roads

In some cases a road of lower priority may be metalled sooner due to the cost effectiveness of including this within an existing establishment, if metalling is not due in this area again for some years.

Metalling of Tracks

Metalling of Tracks has been considered the lowest priority, and little metalling of Tracks has been programmed or undertaken within the past eight years due to the need to address the backlog of metalling on higher volume roads.

The level of service that was previously provided (prior to the 2015-18 LTP) had been that 20% of the length of tracks is metalled on a 17 year cycle - which equates to an average of 5 km per annum. There are 453 kilometres of Track in the roading network maintained by Council. Under the current management framework only 83 km is expected to have a metal surface and the remaining length is expected to be natural ground. Access issues are then addressed, where necessary, by spot metalling on the worst sections, or hill sections.

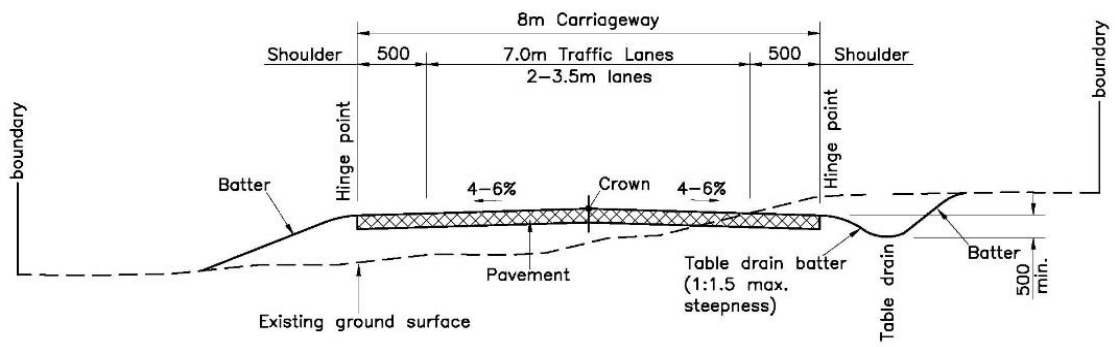
The budget was increased in the 2015-18 LTP to allow 30% of the length of tracks is metalled on a 17 year cycle. An increase in the proportion of track lengths to be re-metalled, from 20% to 30%, was included as part of the 2015-18 LTP, allowing for approximately 9 km per annum. This has still not made a significant impact on addressing the level of service gaps on our lowest volume roads, and additional investment is planned for 2021-24 to enable up to 15 km of Track re-metalling per annum. This quantity allows for longer Tracks on the Central Otago District Council network to be re-metalled on the basis of 30% of the length being treated – enabling cost-effective programming and establishment for longer routes.

Renewal Standards

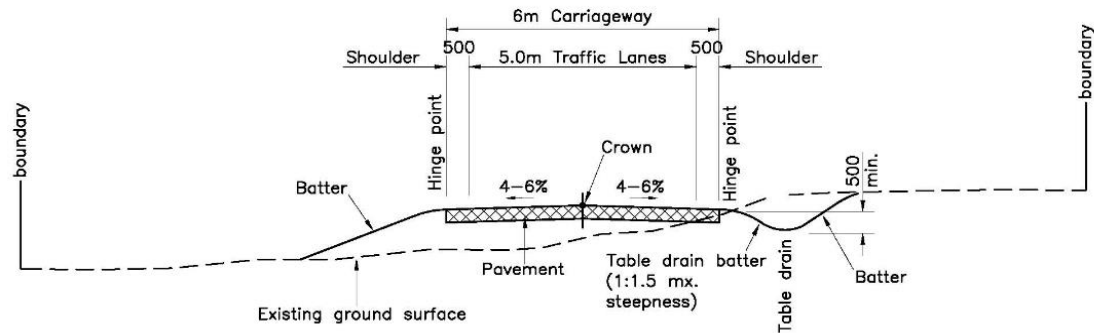
The width of unsealed roads has a significant impact on the cost of renewals. Over time unsealed roads can become wider through grading, and it is necessary for Council to define the width of road for different classifications to ensure that a consistent and appropriate level of service is provided across the District.

The widths are set based on traffic volumes and heavy vehicle use. Roads which carry larger numbers of heavy vehicles are classified as Major and the width of these roads has been set to enable two trucks to comfortably pass. Lower classification roads which have lower numbers of heavy vehicles have a narrower width due to the expectation that trucks will infrequently pass on these roads.

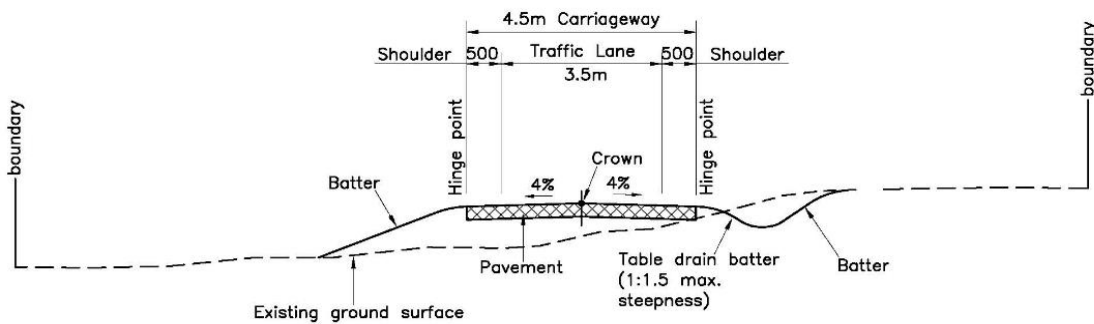
The standard CODC Hierarchy road widths for gravel roads are shown on Figure 6.9.



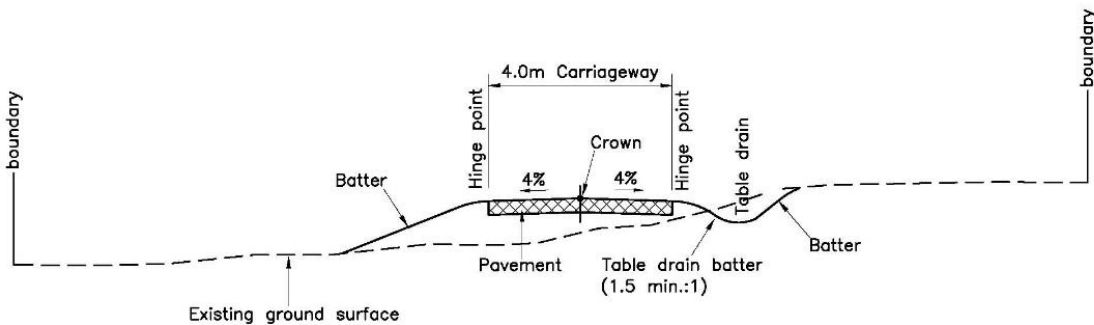
MAJOR GRAVEL ROADS
(Heavy Vehicle Routes)



INTERMEDIATE GRAVEL ROADS



MINOR GRAVEL ROADS



TRACKS

Figure 6.9 Unsealed Road Metalling Widths

Unsealed Road Renewals Programme

In developing the proposed programme options for Council's unsealed road renewals strategy, the following scenarios have been investigated:

- Option 1– Maintaining the “Status Quo”, in delivering the same metal replenishment quantities, track maintenance and dust suppression works based on the 2018-21 programme. Additional costs due to increased royalties for materials were included. No allowance was made for additional replenishment quantities to address the backlog of metalling. The additional cost to maintain the programme currently delivered is \$150,000/annum.
- Option 2 – Optimisation of the 2021-24 programme to deliver the same level of service for 2018-21, based on current ONRC hierarchy and CODC gravel road sub-classifications. Delivery of the same metal replenishment quantities and track maintenance works compared with the 2015-18 programme. Additional costs for dust suppression works due to growth in rural residential development compared with the 2018-21 programme were included. Additional costs due to increased royalties for materials were included. No allowance was made for additional replenishment quantities to address the backlog of metalling. The investment required to deliver Council's optimised programme is an additional \$200,000/annum.
- Option 3 – Increasing the level of service delivered under the 2018-21 programme, based on current ONRC hierarchy and CODC gravel road sub-classifications. Delivery of a 12 km/annum increase in metal replenishment quantities compared with the 2018-21 programme to address the metalling backlog over six years. Delivery of an increased track maintenance and dust suppression works compared with the 2018-21 programme to ensure levels of service gaps are narrowed. Additional costs due to increased royalties for materials were included. Delivery of this core programme of unsealed road renewals would require an additional \$390,000/annum investment.
- Option 4 – Changing the methodology for delivering the unsealed roads renewals programme, using a crushed maintenance aggregate to deliver the 2021-24 programme and maintain current levels of service, based on current ONRC hierarchy and CODC gravel road sub-classifications. Replenishment quantities were adjusted to take account of anticipated thinner pavement layer construction and reduced lifecycles. An estimate of the additional investment required to adopt this renewals option is \$795,000/annum, excluding royalty costs.

Council is currently recommending Option 3 to address the gaps in levels of service for the unsealed network, whilst remaining affordable.

Unsealed Road Renewal Budget

Figure 6.10 shows the last 10 years expenditure on unsealed road renewals, and the proposed budget for the next 10 years

Prior to Council undertaking a systems thinking review of roading activities, metalling was paid on a \$/m³/km cart rate, and had a performance measure of quantity of metal placed/annum. This contributed to perverse behaviour occurring, where roads close to gravel pits were metalled at a low cost and the more costly roads at the extremities of the network were not metalled.

In 2008/09 Council redirected part of the funding allocated for sealed road resurfacing to unsealed road renewals to address level of service issues that existed on heavy vehicle routes and roads at the extremities of the network.

Based on the programme work, described above, an increased level of investment has been provided in the 2021 Long Term Plan to address:

- Maintaining the required level of service in allowing for both royalty cost increases and changes to the ONRC and CODC unsealed roads hierarchy to reflect land use changes and traffic growth (an increase of \$160,000/annum)
- Increasing the investment in unsealed road renewals to deliver the minimum target lengths of 84km of re-metalling work each year, and allow cost-effective programming of prioritised Tracks re-metalling (an increase of \$185,000/annum)
- Maintaining investment in dust suppression on unsealed roads in accordance with Council's policy (ring-fencing budget of \$150,000/annum).

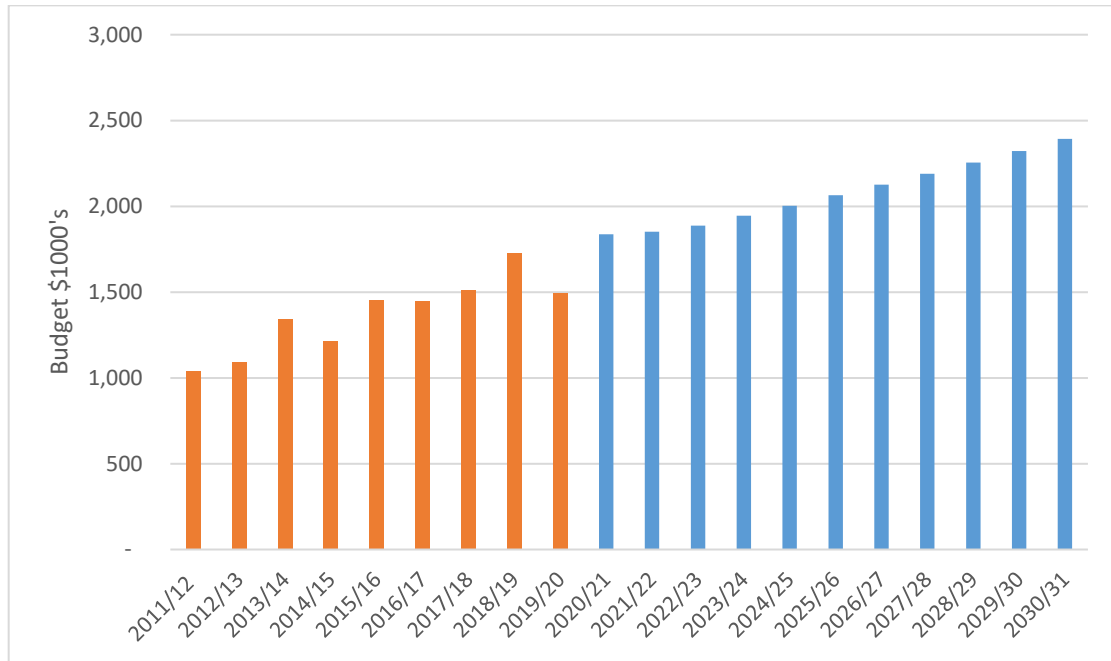


Figure 6.10 Unsealed Road Renewal Budget

6.7 Bridges

Bridge Management

Central Otago's bridges are managed to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Resilience – planning for resilience and alternative routes, and proactive maintenance
- Accessibility – the proportion of the network accessible to Class 1 and 50 max heavy vehicles
- Safety – hazards presented by bridge structures, guardrail and barriers, surface faults, and surface friction
- Effectiveness – optimal programmes which are efficient and affordable

Council is forecasting a significant amount of bridging work will be required from year four onwards. Council is proposing to undertake separate community engagement during the 2018-21 period to identify an affordable longer-term strategy for providing the level of accessibility and resilience required to meet the needs of the community.

Bridge Program Development

A review was undertaken in 2013 of the process that has historically been followed to develop the long-term bridge programs. This identified a number of issues with the previous method, and that opportunity existed to improve this process to enable programs to be developed that:

- Consider the most cost effective solution for providing fit for purpose accessibility
- Focus on work which is essential
- Consider the context of the wider bridge network and criticality of the bridge for accessibility
- Consider co-ordination and efficient programming of work
- Include threat assessment of the surrounding area
- Ensure data reflects the assets which exist

Figure 6.11 outlines the information which was considered as part of the 2014 Bridge Inspections and recording information for either direct action, input into the long term plan, or for further investigation.

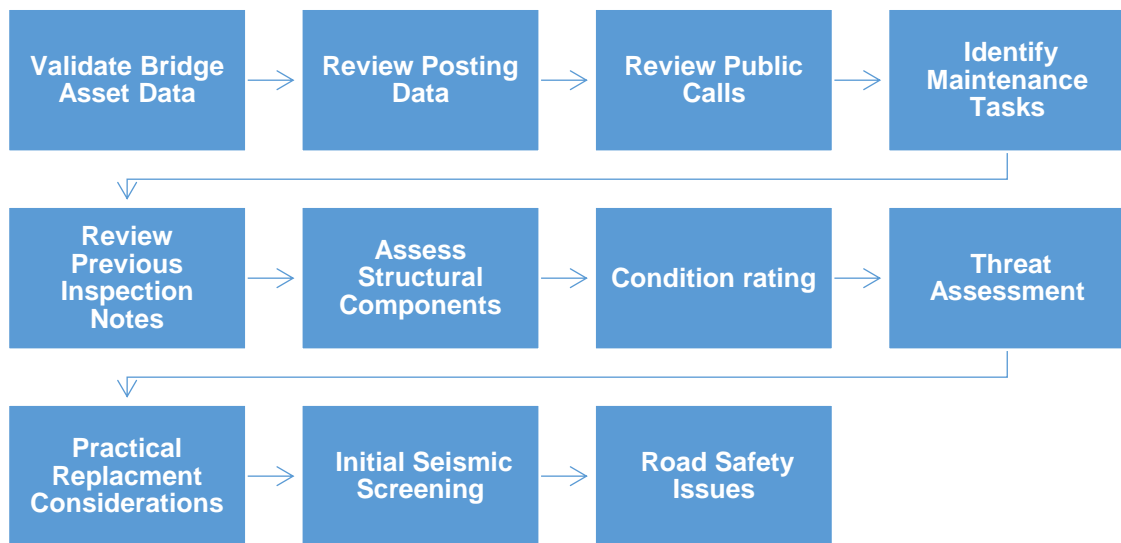


Figure 6.11 Bridge Inspection Considerations

Information from the inspections is collated in a desktop analysis to provide the outputs shown in Figure 6.12.

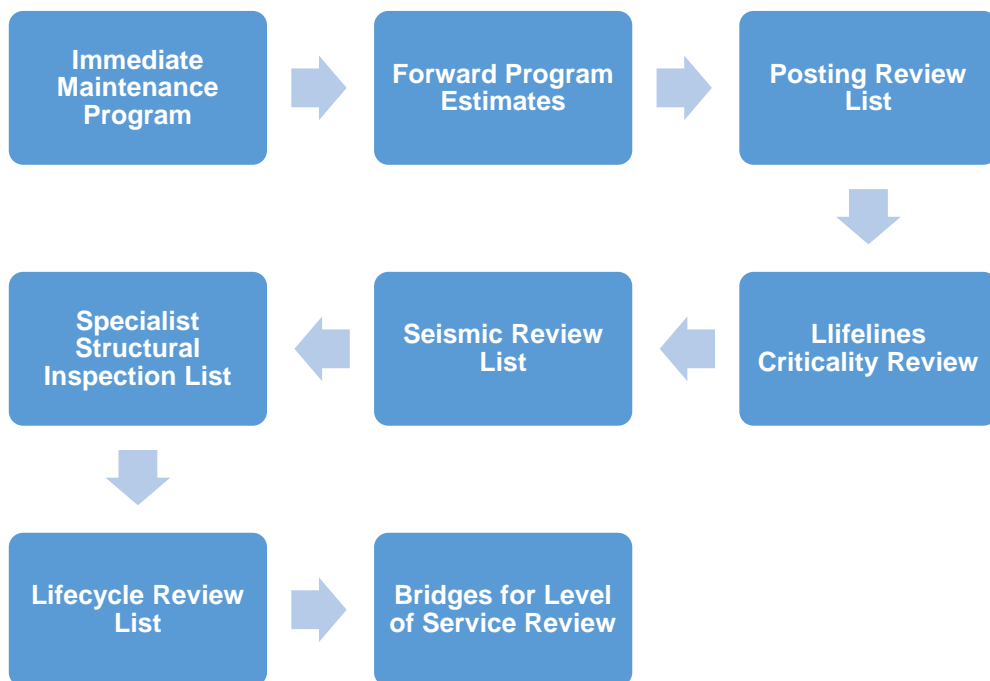


Figure 6.12 Bridge Inspection Outputs

Posted Bridges

MWH New Zealand Ltd carried out a Bridge Posting Evaluation in 2007. A review of some of these Bridge Postings was undertaken in 2014/15, with a revised list of bridge postings in-place from 2015 (see Section 5.4).

Postings currently restrict access across Council's bridges to either:

- A maximum weight on any single axle
- A maximum Gross weight
- A maximum Gross weight expressed as a percentage of "Class I" maximum legal vehicle weight
- A maximum speed of travel across a structure
- No crossing by either HPMV or overweight vehicles (both vehicle types require permits to travel on the CODC roading network)

In 2020 there are 26 posted bridges in Central Otago, with an additional three bridges closed to all vehicular traffic.

There are on-going costs associated with imposing posting limits on bridges. This includes the costs of regular structural reviews of the bridge and the posting, as well as the economic impacts on farms and landowners from having a load restriction in place.

The risk of limits not being observed on bridges on low volume back country roads is relatively high. These bridges are generally in poor condition and have relatively high on-going maintenance costs.

Alternatives to posting have been investigated in more detail in 2014. This includes identifying where small timber bridges in poor condition can be cost effectively replaced with box culverts or wash over culverts/fords, speed restrictions imposed instead of posting limits, and upgrading of the bridge to avoid posting. Eight posted bridges have been identified that could potentially be replaced with a box culvert or a wash-over ford.

New Legal Vehicle Weights and 50Max Restrictions

The new Vehicle Dimensions and Mass (VDaM) Rule 2016 has been phased-in from February 2017, with the principle change being an increase in the legal maximum Gross weight of vehicles to 46 tonnes. All councils are required to have plans in-place to enable the new maximum legal weight vehicles to travel on New Zealand's District road networks from December 2017.

The NZTA fully-funded a high-level screening of Central Otago's bridges, which was completed in December 2017, to supply the following information:

- Confirmation that all existing Posted structures remain prohibited to heavy vehicles.
- Identify any additional structures that should have a temporary prohibition on heavy vehicles imposed as a result of the screening process. These bridges will then require further investigation to determine the management strategy and confirm a formal Posted restriction.
- Bridges which have an existing Posting expressed as a percentage of "Class I Limits" may need to have new signage made and installed to cover the changes to the new maximum (100% Class I) weight restriction.
- Detailed structural review and assessments of Bridge 140 on Patearoa Road, Bridge 175 on Millers Flat Bridge Road and Bridge 186 on Jedburgh Street commenced in 2016/17. Structural engineers and bridging specialists have completed investigation of all three bridges. The work required to strengthen Bridge 175 and Bridge 186, to permit HPMV and 50Max vehicles to use them, is completed.

Structural investigation of Bridge number 155 on Paerau Road will be undertaken during the 2021-24 AMP period, alongside any recommended reviews following completion of the screening work.

50Max vehicles are currently unable to cross any Posted structures. Council is working to identify where strengthening works would enable all vehicle restrictions to be lifted from particular bridges.

Lifelines and Seismic Screening

Seismic screening commenced in 2015/16 using the NZTA SAGS system. Specialist input will be required to complete this process.

The process used by Hastings District Council in the Road Efficiency Group Best Practice case study is being used to identify key lifeline routes. This will assist Council to determine criticality with respect to the bridge stock.

Guardrails and Railings

Guardrail maintenance is funded from Structures budgets. Guardrail assets are inspected annually, and an inspection checklist is completed. General maintenance is carried out during the inspection, including tightening of bolts and cables. Damage to guardrails is prioritised based on the classification of the road, and the risk at the site, and are repaired as soon as possible within the available funding.

Railings are inspected during routine maintenance inspections, and work required is programmed according to priority and funding availability.

Structures Maintenance Budget

Inspections were undertaken of all bridges in 2013/14 with maintenance actions recorded in RAMM. A backlog of maintenance work was identified which was unable to immediately addressed due to funding constraints. This work has been prioritised and programmed over five years from 2013/14 to 2017/18. The impact of deferring essential maintenance work will be shortened lives or more costly renewals work required.

A non-structural inspection of most of the council's bridges were completed in 2018/19.

Average annual investment in Central Otago District Council's roading structures maintenance budgets have been increased - based on the backlog of work that exists - to \$210,000 or approximately \$1,200 per bridge per annum. These budgets include an allowance for railings maintenance on the District's bridges.



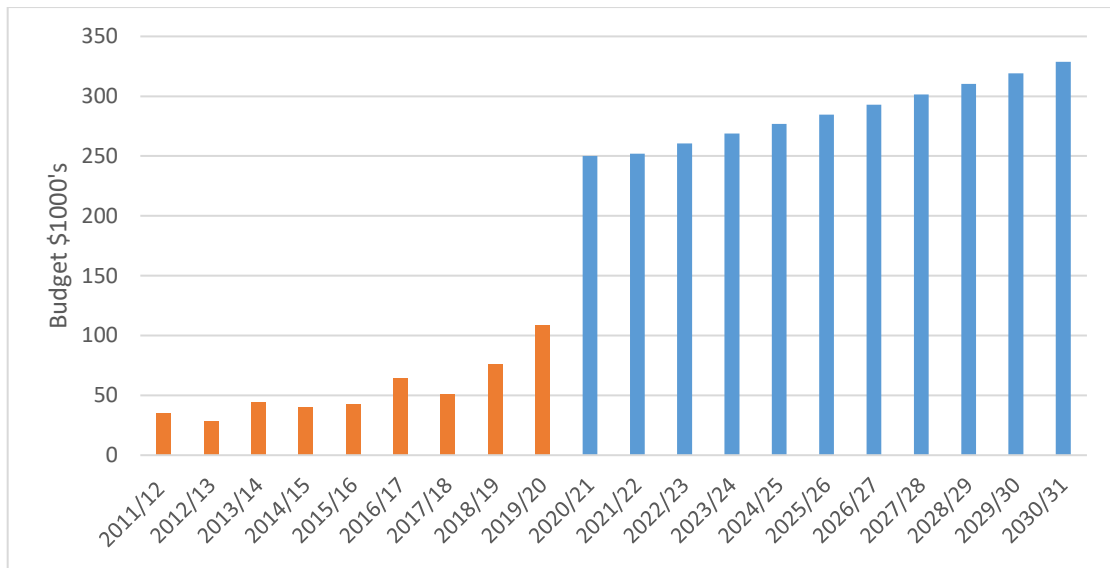


Figure 6.13 Structures Maintenance Budget

Bridge Lifecycle Analysis

A detailed review of the ages of each type of bridge structure in the CODC network was undertaken in 2014.

The review grouped bridges into specific types based on whether they were single or multiple span and the materials used in construction of piles, beams and decks. Each of these groups were analysed to try and provide a more meaningful estimated Total Useful Life (TUL) for a given structure within the CODC network. TUL is an adjusted value of Remaining Useful Life (RUL). The calculation increases (or reduces) the RUL by applying an overall change to each bridge's estimated lifespan based on ranking the following criteria:

Ranking	Design	Construction Quality	Material Quality	Operational Stresses	Maintenance History	Working Environment	External Stresses
1	5.00%	12.50%	7.50%	10.00%	10.00%	5.00%	5.00%
2	2.50%	5.00%	2.50%	2.50%	5.00%	-5.00%	-5.00%
3	0.00%	-5.00%	-2.50%	-2.50%	-2.50%	-10.00%	-5.00%
4	-2.50%	-17.50%	-5.00%	-5.00%	-10.00%	-15.00%	-7.50%
5	-5.00%	-25.00%	-7.50%	-17.50%	-15.00%	-20.00%	-10.00%
0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 6.13 Bridge Life Adjustment Factors

Consideration was given to the:

- Single oldest bridge of that type
- Average age of all bridges of that type
- Extent of previous structural component replacement
- Defects and forward work identified

It became apparent during the analysis that the TUL was sometimes dictated by the life of the weakest component, or alternatively, did not take into account the life of the weakest component. A more accurate way of predicting renewals would be to assess individual bridge components and provide estimated lives for these. For example, a timber deck may be given 40 years and steel beams may be assigned 160 years.

Bridge abutments and wing-walls have not been considered as being individual bridge components, however the behaviour and durability of these directly impact on the maintenance cost and expected life of the structure.

More work on assessing TUL for individual bridge components has been included in the improvement plan for 2021-24, as part of the Central Otago District Council Bridging Strategy. A large number of the bridges in Central Otago are coming to the end of their useful lives in the next 30 years. Two of these are major bridges.

The Optimised scenario allows for some bridges:

- To be replaced with washover culverts, or circular/box culverts, where appropriate
- Not to be replaced (closed or removed)
- Reduced level of service (e.g. a reduced maximum vehicle weight Posting)
- To be strengthened and address a level of service gap

The optimised option has been based on initial inspections undertaken in 2014. Additional specialist investment has been programmed in the 2021-24 AMP cycle, to provide more definitive information for the preparation of the 2024 LTP.

Optimising bridge renewals has resulted in a 40% reduction in the proposed budget over the next 30 years compared to replacement of all bridges and retaining a fully accessible level of service.

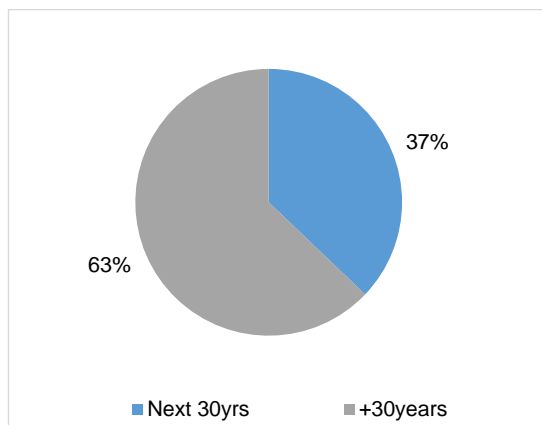


Figure 6.14 Bridges at the End of Remaining Useful Life

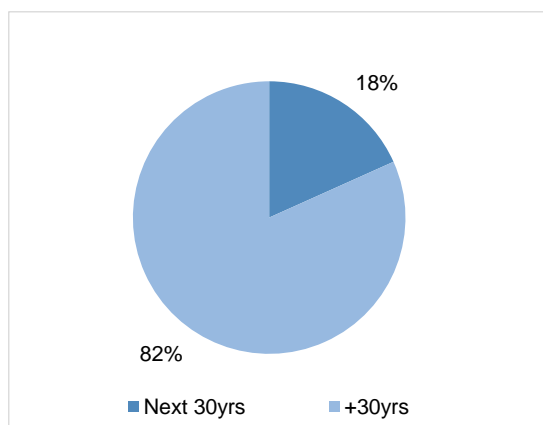


Figure 6.15 Optimised Bridge Replacements

Bridges Potentially Excluded from Renewals Programmes

Five bridges which are not on Council maintained roads are listed in Table 6.14. Options for divesting some of these bridges will be investigated in the 2021-24 LTP period. For budgeting purposes the assumption has been made that no work will be undertaken on these bridges and that they will be replaced with a washover ford and then divested in the 2024 LTP period.

Bridge No.	Name
2	Craigroy (off Nevis Road)
107	Old SH85 RS 92
108	Old SH85 RS 92 (Railway overbridge – crossing the Central Otago Rail Trail)
134	Kearneys (off Ranfurly Patearoa Road)
104	Side Road off Hills Creek Road

Table 6.14 Bridges Not on Council Maintained Road Network

There are seven bridges on very low use Council maintained roads which will have a high replacement cost. These are listed in Table 6.15. Replacement of these bridges will be difficult to justify at the end of their lives and are unlikely to meet the requirements for NZTA funding. Consultation with the community will be undertaken regarding options, funding the full replacement cost of these bridges as an unsubsidised activity, or alternatively dispose of them.

Bridge No.	Name
92	Rua Hores/St Bathans Downs Road (Manuherikia)
121	Scott Lane (Kyeburn)
145	Halls Ford/Maniototo Road (Taieri)
160	Blackball/Linnburn Runs Road (Taieri)
171	McCunn Road (Closed to all traffic; alternative route available)
80	Hawkdun Runs Road (Closed to all traffic; ford at Manuherikia available)
4	Doolans/Coal Pit Road (Gibbston/Nevis) (Closed to all traffic; ford available)

Table 6.15 Bridges Not Being Considered For Replacement (2017)

Bridge Renewals Budget

Bridge component renewals and bridge replacements have been identified and indicatively programmed across the 30-year period covered by Council's Infrastructure Strategy. Estimates and intervention timing has been included in the budget based on current and past estimates, reports, and bridge valuations. Central Otago District Council is now proposing to invest in small bridge renewals under this category – in accordance with changes in the Waka Kotahi NZTA Investment Decision-Making Framework. Larger items of renewal work have been deferred beyond 2023-24 to allow for the District Bridge Strategy to be prepared and consultation undertaken. Funding is included within the Network Management budget to continue the investigation work required to inform Council's detailed options for management of the bridging stock. The optimised investment has been included in the 2021 Long Term Plan, which does not provide for all bridges to be replaced with like structures.

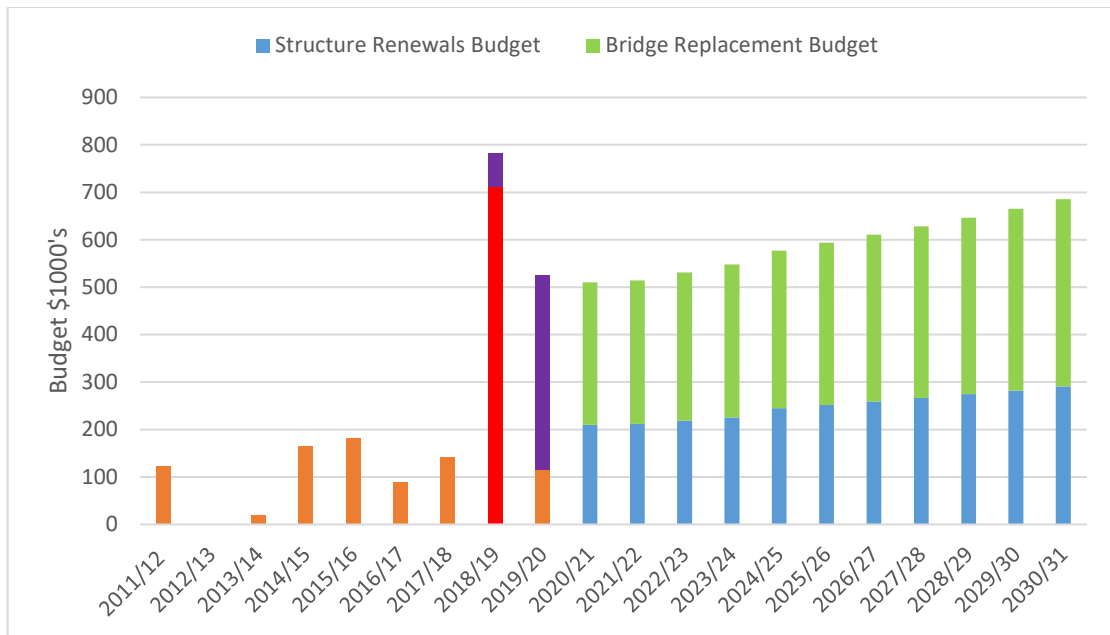


Figure 6.16 Structure Renewal Budget

The budget adjustments shown in 2018/19 and 2019/20 are both related to significant structural renewals required on the Central Otago District Council network. 2018/19 includes the \$655,000 expenditure to repair the Jedburgh Street Bridge at Roxburgh and the work to replace the Reservoir Creek footbridge following the Roxburgh floods in 2017. 2019/20 includes the replacement of Bridge 94, damaged beyond economic repair as a result of flooding in 2017 and 2018.

Walls and Retaining Structures

Stacked stone walls which act as retaining structures on Central Otago roads are eligible for NZTA subsidy for repair work. A backlog of repairs exists with sections of wall having collapsed on Conroys Road and Crawford Hills Road. A budget of \$10,000/annum has been allowed for renewals of retaining structures.

Cattle Stops

Cleaning of cattlestops has been removed from the budgets, with the new policy shifting the responsibility for funding of cattle stop maintenance to the adjacent landowner who benefits from having a cattlestop instead of fencing.

6.8 Drainage

Drainage Management

Drainage work is undertaken to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Accessibility – physical state of the network is maintained in an economically sensible manner
- Safety – surface faults
- Amenity – aesthetic faults
- Resilience – proactive maintenance
- Effectiveness – optimal programmes which are efficient and affordable

The way we will ensure work is done efficiently is:

1. By undertaking drainage maintenance in a planned and cost-effective manner and not as a more costly reactive response.
2. By undertaking proactive drainage maintenance to delay sealed road pavement deterioration. Council does not have a rural sealed road rehabilitation program, and proactive drainage renewals are essential to prolonging the pavement life.
3. Ensuring culvert inspections are completed at sites where other renewals work is programmed, and cleaning of the culvert inlets and outlets prioritised as part of maintenance works.
4. By continuing the reduced frequency of cleaning kerbs only once a year on all residential streets classified as Low Volume Access roads.
5. Council staff inspecting all mudtanks annually and record cleaning requirements in RAMM. The sweeper truck then targets these locations which results in cost efficient use of plant.
6. A history of mudtanks which have been blocked each year has been developed and maintained, and these locations are inspected more frequently in an attempt to reduce reactive responses.
7. Focus is placed on resolving the cause of the blockages as well as dealing with the effects. This reduces the number of public calls and number of reactive responses.



Drainage Maintenance

Urban Areas

Drainage maintenance activities in urban areas consists of cleaning kerbs, mud tanks (or catch pits), mud tank laterals, and soak pits. NZTA fund 30% of the total cost of these activities at the maintenance subsidy rate. This effectively means that the subsidy rate is 15.3%.

Council undertakes drainage maintenance on urban State Highways and then invoices the NZTA State Highway Network Operations Group for 30% of the cost of this work. This is in line with NZTA requirements.

Over the past five years the frequency of kerb and channel clearing has been varied in order to manage expenditure. This then caused an increase in surface flooding as a result of mudtanks blocking, resulting in more expensive reactive work being required.

Alignment of the road network to the ONRC classifications has resulted in the urban sealed road network being spread across five classifications instead of the previous two. The frequency of kerb cleaning has been reduced to once a year on streets classified as Low Volume Access from 2015 to enable more proactive targeted cleaning to be undertaken in known problem areas. The frequency of all street cleaning activities is shown on Table 6.16.

Frequency of Street Cleaning					
		Primary Collector	Secondary Collector	Access Road	Low Volume Access Road
Commercial Kerb Cleaning	Precinct	2 x per week	4 x per annum	4 x per annum	n/a
Residential Cleaning	Kerb	2 x per annum			Annual
Mudtank Clean	Inspection &	Annual			

Table 6.16 Frequency of Kerb and Mudtank Cleaning

Urban Drainage Maintenance Budgets

Figure 6.17 shows the last 10 years expenditure on urban drainage maintenance, and the proposed budget for the next 10 years. This work includes kerb and mudtank cleaning on both Council managed roads and urban State Highways. Drainage maintenance investment variances reflect the changes that have been made to maintenance practises and cleaning frequencies to improve efficiency.

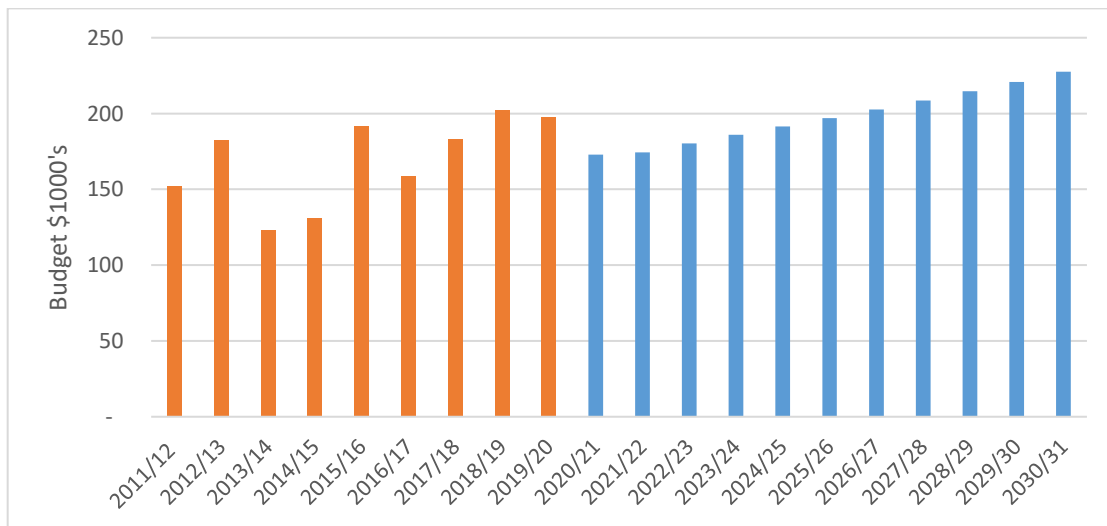


Figure 6.17 Urban Drainage Maintenance Budget

Rural Areas

Drainage maintenance in rural areas consists of cleaning or clearing culverts and surface water channels (or side drains or water tables).

A revised cyclic maintenance regime for culverts was established in the 2012 AMP. This regime proposed increased proactive inspections and maintenance on assets which have a higher risk of failure than on those with a low risk. This cleaning cycle was unable to be implemented due to funding constraints, and culvert cleaning in the 2012-15 period was reduced to reactive cleaning when failure occurred.

Increased funding was provided in the 2015 LTP to address this, which has been reviewed in preparing the 2021-24 AMP. An increase of 13% in rural drainage maintenance budgets has been included to meet the delivery costs of the maintenance programme. There is also an increase of 19% for investment in drainage renewals.

A more effective maintenance programme will result in less proactive reinstatement work being required following high intensity rain events. This increase in focus on maintenance of rural drainage is a response to climate change impacts.

Table 6.17 defines the inspection and cleaning frequency that is considered necessary to achieve the assessed least whole-of-life costs:

Location	Topography	Frequency
Rural Sealed Roads	Flat	Once every 3 years
Rural Sealed Roads	Rolling or Mountainous	Every 12 months
Urban areas	All	Every 6 months
Major Gravel Roads	All	Every 12 months
Other Gravel Roads	All	Every 2 years
Sealed Road Renewals Sites	All	Annual programmes
Unsealed Road Renewals Sites	All	Annual programmes

Table 6.17 Frequency of Culvert Inspection and Clearing

Historically there has been no routine maintenance program for surface water channels, and these have not been sprayed. On sealed roads, these are identified for clearing and reforming with an excavator with reseals when necessary.

Provision was made in the 2015 LTP environmental maintenance budgets to spray sealed rural road shoulders instead of mowing. More cost-effective maintenance of culverts by spraying inlets and outlets and spraying of surface water channels will occur by combining this work. Council will continue to apply this strategy through the 2021-24 AMP cycle.

Surface water channels on gravel roads are not sprayed, and shallow side drains and cut-outs are maintained as part of grading operations. Deeper drains are reformed as a drainage renewal where necessary as part of the preparation for re-metalling of gravel roads.

Rural Drainage Maintenance Budgets

Figure 6.18 shows the last 10 years expenditure on rural drainage maintenance, and the proposed budget for the next 10 years. The council will continue its proactive approach to rural drainage maintenance.

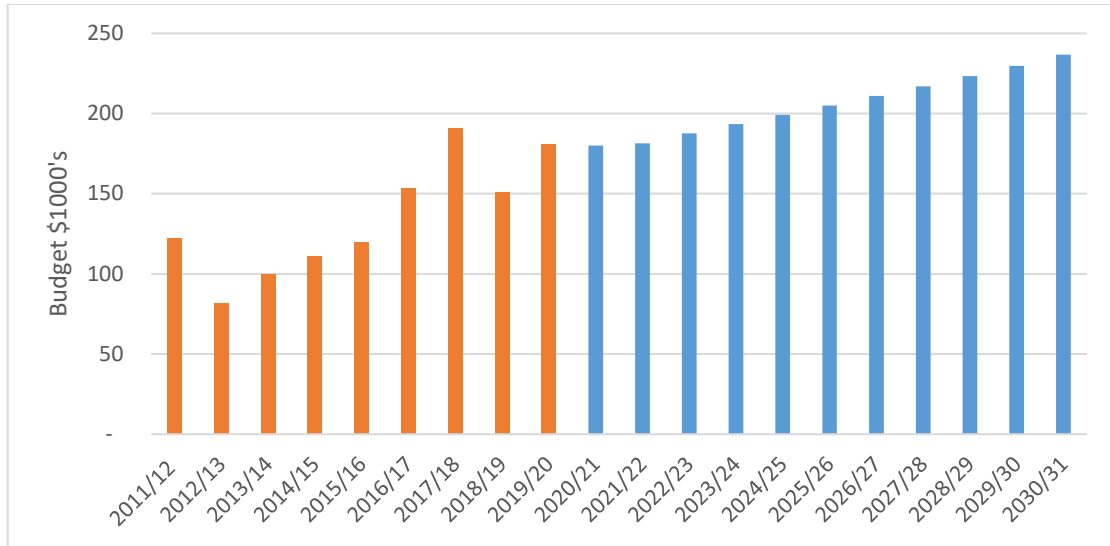


Figure 6.18 Rural Drainage Maintenance Budget

Drainage Lifecycle Analysis

An analysis of lifecycle data has been carried out, giving consideration to:

- 2016 Valuation standard lives
- The average age of assets recorded in RAMM
- The percentage of assets that exceed their life expectation
- Assessment by staff.

No assets were found to have exceeded their standard life expectancy. Standard and average lives for culverts, soakpits and mudtanks are shown on Table 6.18.

Average ages of the surface water channels varied between 10 and 50 years for different asset types. 49% of sealed dish channels were found to have exceeded their standard life expectancy. This was considered unrealistic based on actual condition and performance and consequently lives for these assets were extended from 50 to 60 years. The standard lives for the surface water channels are shown in Table 6.19.

Asset	Average Age	Standard Life
Culverts	between 22 and 33 years old	80
Soakpits	16 years old	25
Mudtanks	between 19 and 27 years old	80

Table 6.18 Standard and Average Lives for Culverts, Soakpits and Mudtanks

Type of Kerb	Standard Life
Asphalt Dished Channel	60
Concrete Dished Channel	70
Half Pipe Dished Channel	60
Sealed Dish Channel	60
Concrete Kerb and Channel	100
Stone Kerb and Channel	100
Concrete kerb only	80
Stone Kerb only	80
Mountable Kerb and Channel	90
Mountable kerb only	70

Table 6.19 Standard Lives for Surface Water Channels

Drainage Renewals

Culverts, kerb and channel, mudtanks and other drainage structures are considered for replacement or upgrade prior to reseals, unsealed road metalling and footpath renewals. Kerb crossings are upgraded to provide improved accessibility from the either Low Cost/Low Risk Improvement or unsubsidised renewals budgets prior to reseals or footpath resurfacing.

Mudtank, laterals, and soakpit renewals are also considered prior to resurfacing, but are generally only programmed once they have failed. Failure only occurs during heavy rainfall events that result in localised flooding on streets.

Drainage Renewals Budget

Figure 6.19 shows the last 10 years expenditure on rural drainage renewals, and the proposed budget for the next 10 years.

In 2008/09 Council redirected part of the funding allocated for sealed road resurfacing to drainage renewals to improve side drainage on sealed roads in order to extend the pavement life.

Metalling funding was redirected to drainage renewals in 2014/15 to enable drainage work to be undertaken in preparation for metalling in 2015/16 when metalling was unable to be undertaken. This was due to delays in issuing of resource consents for access to gravel.

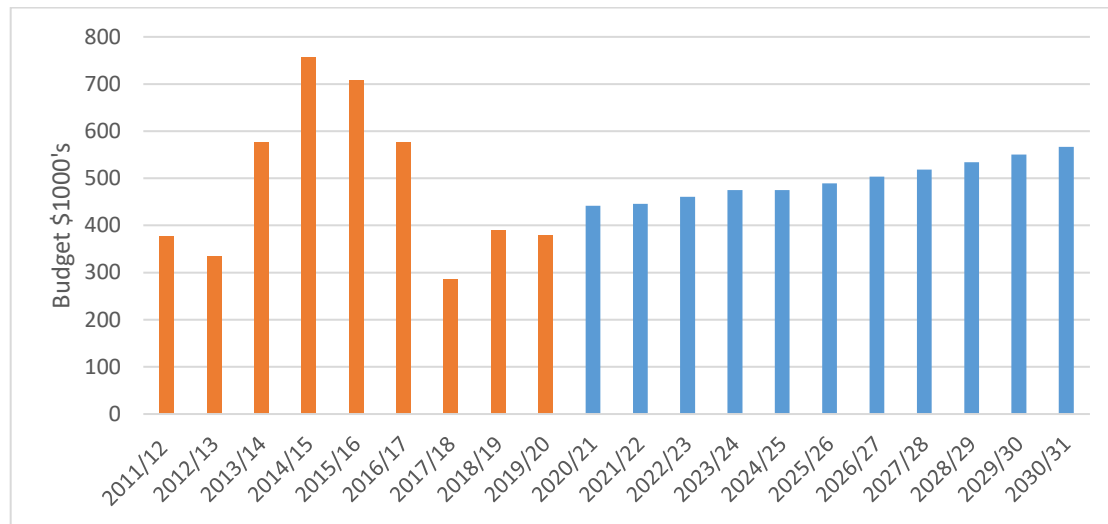


Figure 6.19 Drainage Renewals Budget

Drainage Improvements

Drainage improvements have previously been undertaken prior to reseals and metalling when these meet NZTA funding requirements from the associated improvements work category. These are only undertaken when it can be demonstrated that they are necessary to protect adjacent property from stormwater run-off from the road surface, or to protect the pavement.

The associated improvements work category has been removed from NZTA works from 2015. This work is now included within the drainage renewals budget.

Other improvement projects such as kerb and channel extensions are undertaken if requested by the public. These projects are prioritised within the Low Cost/Low Risk Improvements programme. These typically rank very low unless there is an associated property flooding or safety issue.

There is currently one drainage improvement project identified in Ophir. This work is largely cosmetic rather than to manage flooding of the carriageway or property. This includes extending the existing schist kerbing, treating the shoulders to reduce gravel run off into the existing historic kerbing, and replacing the piped kerb access points. The Ophir Community is considering alternative funding options for undertaking this work.

6.9 Signs and Road Markings

Signs and Road Markings Management

Signs and road markings management is undertaken to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Safety – hazards are identified and mitigated in a consistent and fit for purpose manner
- Accessibility – signage and guidance, priorities at intersections,
- Amenity – aesthetic faults
- Resilience – providing route information on route
- Effectiveness – optimal programmes which are efficient and affordable

The way Council ensures this is done efficiently is by:

1. Undertaking cyclic inspections and maintenance on signs at frequencies which are risk based for different classifications and routes. This results in less reactive work being required.
2. Ensuring delineation and signage is fit for purpose, meets the levels of service defined in section 2, and only exceeds this where there is a proven safety risk.
3. Using pre-drilled signs to enable bolting to posts where possible. This is to reduce the incidence of signs slipping on the posts

Signs, Markers and Railing Lifecycle Analysis

An analysis of lifecycle data has been carried out, giving consideration to:

- Previous valuation standard lives
- The average age of assets recorded in RAMM
- The percentage of life expired assets
- the replacement age of signs that were replaced between January 2009 and April 2011
- Assessment by staff.

Work to develop signage renewal programmes using the asset data collected in the whole-of-network signs inventory and condition assessment, completed in 2020, will form an Improvement action for the 2021-24 AMP cycle.

Table 6.20 identifies the standard lives which have been assigned to the signs, guardrails and railing assets.

Type of Sign Asset	Standard Life (years)
All signs	16
Raised reflectorized Pavement Markers (RRPM'S)	6
Culvert Pipe Markers	10
Edge marker pegs (metal)	10
Edge marker pegs (plastic)	10
Wooden sign posts	16
Steel/Aluminium sign posts	25
Guardrail	50
Sight rail	30

Table 6.20 Standard Lives for Signs, Guardrails and Railings

Signs Maintenance and Renewals

Signs are inspected and proactively maintained as a cyclic activity. The frequency of inspections is shown in Table 6.21. More frequent weekly inspections are undertaken of known hotspot locations for sign vandalism in Cromwell and Alexandra.

Signs are programmed for renewal when they are faded, damaged, or missing. Priority of sign renewals is assessed depending on the purpose and the legibility of the sign.

Signs which are required for safety reasons are programmed as urgent, and road name signs and information signs are programmed as routine work.

Repairs, including straightening posts, reattaching or tightening connections, painting posts, and cleaning are undertaken during the cyclic inspection. Standard signs such as give ways, bridge end markers and new posts are carried and installed if necessary during the inspection.

Missing signs and maintenance faults are also identified when staff are undertaking other work in urban areas and by the public. Signs on gravel roads are inspected during cyclic grading operations. Faults are recorded by the grader operators for the cyclic maintenance crew to action.

Council has used strapping to attach signs to posts, but this is prone to slipping on posts and use of pre drilled signs to enable bolting to posts is the preferred fixing method.



ONRC Hierarchy	Frequency of Inspection
Urban Regional, Arterial and Primary Collector (State Highways)	Monthly
Arterial and Primary Collector	Monthly
Secondary Collector	Quarterly
Access	Six-monthly
Low Volume Access	Annually

Table 6.21 Frequency of Inspection for Signs

Central Otago Standard for Road and Destination Signs

Rural road name signs are a maximum length of 1.2m with 120mm series D capital case. The standard sign depth is 240mm but this is increased for longer road names to allow for hyphenated names to be placed on two lines. Longer signs with were previously used but these are more costly, and often require more than one post.

Urban street names have a white legend on a blue background. Lettering is 100mm series D in title case. The sign is rectangular with no point.

Destination fingerboard signs are 1.2m long and 240mm deep and have a black legend on a yellow background. Lettering is 120mm Series D capital case. These signs are shaped to a point on one end.

Tourist fingerboard signs are 1.2m long and 240mm deep with white reflectorised lettering on a brown background. Lettering is 120mm Series D capital case. These signs are shaped to a point on one end. Tourist fingerboard signs are used for commercial activities, and places of interest which are not Towns, and may only be installed for activities which comply with the Visitor Signs Policy.

High intensity reflective materials are used for all regulatory, permanent warning, directional, destination and road name signs.

Road Marking

Road remarking is undertaken on an annual basis. The need for remarking is assessed by field staff who undertake retroreflectivity tests and assess the depth of the remaining paint. To ensure the reflectivity of markings meets the required standard a sample of retroreflectivity tests are carried out in accordance with the Manual of Traffic Signs and Markings (MOTSAM).

Programmes are adjusted if reseals are to be undertaken in a ward to allow co-ordination of the reseal markings and the remarking.

Fire hydrants and blue RRPMS are remarked and renewed on a three yearly cycle. If any issues are picked up in this area while doing the network remark they are dealt with at the time. The proposed cycle for fire hydrant remarking in the next three years is:

2020/21	Maniototo and Roxburgh
2021/22	Alexandra, Clyde and Manuherikia
2022/23	Cromwell

A high performance waterborne acrylic paint is used on the network (currently Linaro Linaqua QL 90 or Aqua 98).

Edge Markers

Edge markers are inspected and maintained as a cyclic activity and repairs and replacements are undertaken during the inspection. During summer months damaged or missing edge markers are replaced by the operator of the pilot vehicle during mowing and spraying operations.

Signs and Markings Budgets

Figure 6.20 shows the last 10 years expenditure on signs and road markings maintenance, and the proposed budget for the next 10 years.

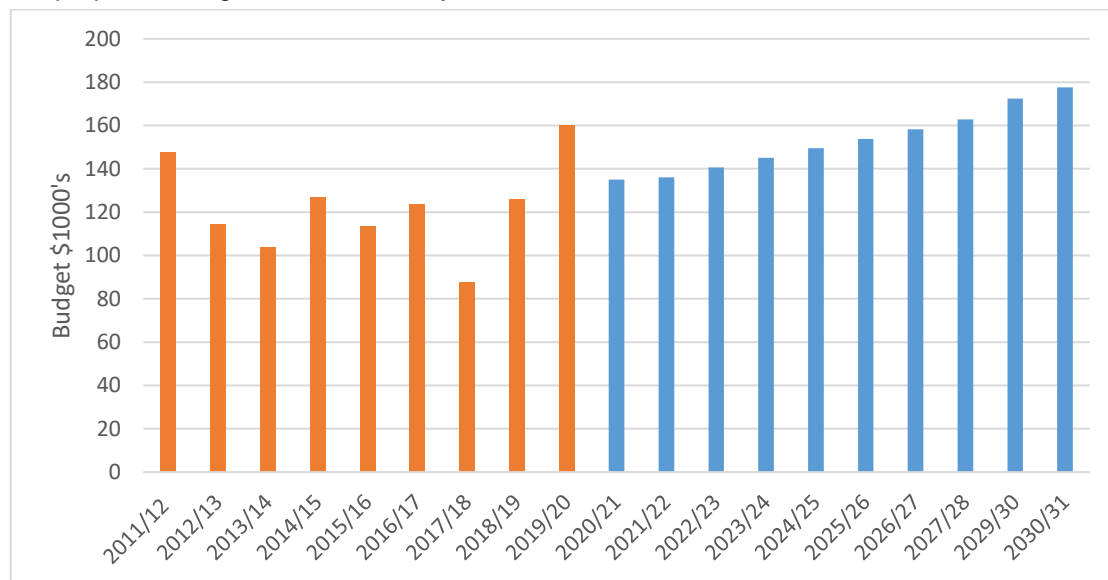


Figure 6.20 Signs and Railings Maintenance Budget

Figure 6.21 shows the last 10 years expenditure on signs renewals, and the proposed budget for the next 10 years. Guardrailing renewals are included in the Structures renewals budgets in accordance with NZTA requirements.

Signs renewals budgets have been increased by \$80,000 per annum to enable greater consistency in the signage of road hazards across the network.

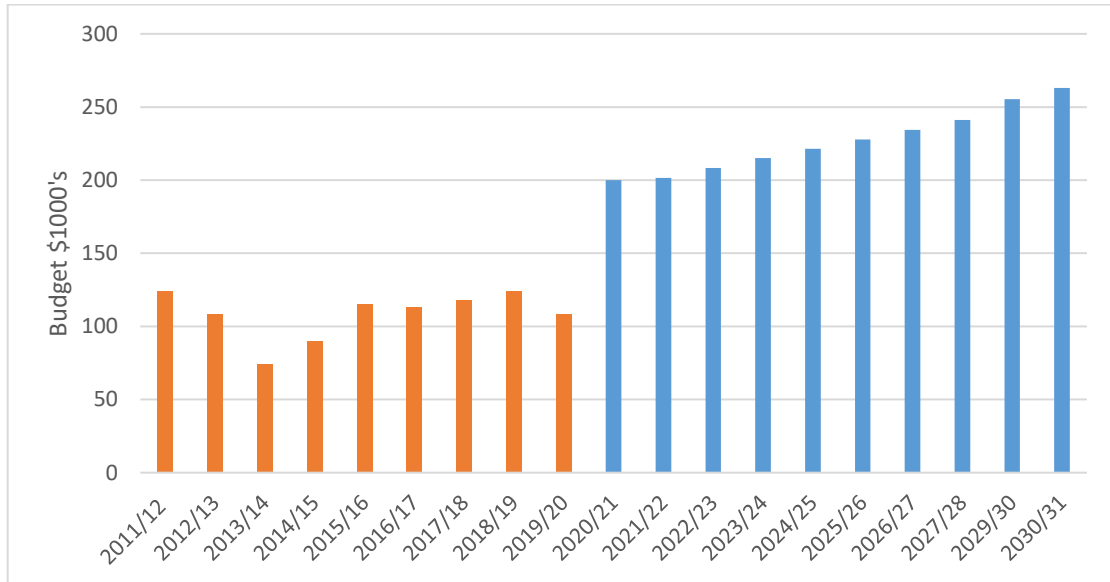


Figure 6.21 Signs Renewals Budget

6.10 Street Lighting

Street lighting is provided to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Safety – lighting is provided and maintained in a consistent and fit for purpose manner to facilitate safe movement and personal security
- Amenity – to provide confidence for active road users to travel at night
- Effectiveness – optimal programmes which are efficient and affordable

There is considerable opportunity to improve the efficiency of the current service delivery arrangements and energy efficiency for street lighting, and these are discussed under lighting maintenance and renewals below.

Arrangements for street light maintenance, which were in place prior to Electricity Reforms have continued due to issues regarding ownership of some of the lights. There are no written contracts in place with these companies for maintenance of the lights.

In 2016 Council purchased all the lights which were on Aurora Energy poles. A full replacement of all mercury vapour, fluorescent, and high-pressure sodium lights with LED luminaires is now underway. This work was completed by 30 June 2019.

During the 2021-24 AMP cycle, formal arrangements (either a maintenance contract or service agreement) will be implemented for management and maintenance of the Central Otago District Council street lighting network.

Electricity for street lighting is included in Council's bulk supply agreement, which is procured via competitive tender. Contact Energy commenced the current supply contract in September 2020.

Significant reductions in energy use and luminaire maintenance will result in reduced costs for street lighting.

Council is installing warmer light (3000 Kelvin) LED luminaires rather than the slightly more efficient colder (4000 Kelvin) luminaires being installed in most other districts. The warmer lights meet the criteria required for communities to become accredited by the International Dark Sky Association. In Naseby the dimming will commence at 10.00pm.

An automatic dimming feature has also been installed in the LED luminaires to further reduce energy use and increase the dark sky attributes. Over most of the district, lights will use 40% less energy between midnight and 5am. In Naseby the dimming will commence at 10.00pm. Dark sky accreditation will provide economic benefit to communities as they take advantage of the growing Dark Sky tourism market.

The upgrade programme will only replace inefficient old technology luminaires with more effective LED luminaires. It will not significantly change the amount of lighting.

Developers of new subdivisions are being required to install LED street lights. They are required to use the same luminaires that the Council is installing.

Street Light Maintenance and Operating Budget

Figure 6.22 shows the last 10 years expenditure on light maintenance and operating costs, and the proposed budget for the next 10 years.

Lighting costs have reduced as anticipated from 2018/19 due to the change to more energy efficient lights and tendering of maintenance. In addition to this Council has secured a very competitive electricity contract which has seen costs reduce. The total costs in 2019/20 include the rebate received for the reduced electricity usage of our LED street lighting assets.

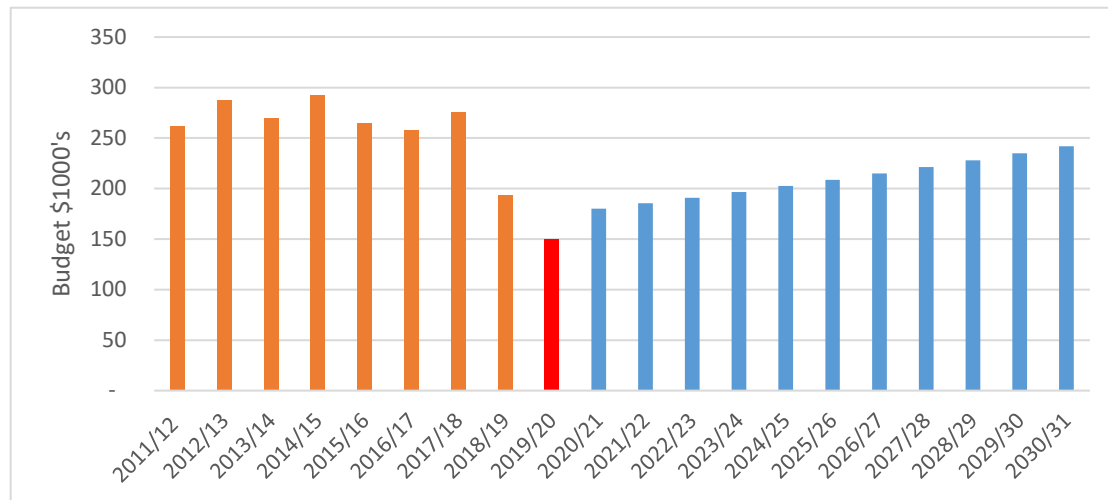


Figure 6.22 Lighting Maintenance Budget

Lifecycle Analysis

Table 6.22 identifies the standard lives which have been assigned to the lighting assets.

Type Asset	Standard Life (years)
Poles	50
Lights	25

Table 6.22 Standard Lives for Street Lights and Poles

Light Renewals

Financial analysis was undertaken in 2015 on options for replacing the existing streetlight luminaires with LED luminaires.

Phasing the lights in over four years was shown to result in a significant long term saving, with whole of life savings of \$3.4 million over 30 years and payback on investment within seven years. Several factors have actually improved the benefits provided by the upgrade beyond those assumed. These include;

- Significant reduction in the cost of LED luminaires
- Installation cost less than expected
- Enhanced financial assistance rate provided by NZTA allowing an accelerated upgrade programme

Replacement of all the lights within a 3-year window will result in bow-waves of renewals for lights within the 30-year Infrastructure Strategy. In-line with the current expectations for asset lives, the renewal of 90% of Central Otago District Council's street lights are budgeted for over the 2042-2045 period.

6.11 Environmental and Winter Maintenance

Environmental Maintenance Management

Council's environmental maintenance programme is undertaken to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Safety – hazards are identified and mitigated in a fit for purpose manner, vegetation is managed so that road and sign visibility, or carriageway area are not impacted.
- Road conditions are monitored throughout the winter and operations focus on maintaining road and footpath surfaces safe for travel. Road restrictions and closures are implemented in a timely manner, as required
- Accessibility – vegetation is managed so that it does not obstruct vehicles, cyclists, or pedestrians. Winter maintenance activities are undertaken to mitigate ice and clear snow. Small landslides, rocks and slips are cleared from roads.
- Amenity –timely clean-up of litter within the carriageway
- Resilience – ensuring roadside vegetation does not impact on the level of service provided by roads and structures. Snow, small landslides, and slips are cleared.
- Effectiveness – optimal programmes which are efficient and affordable

The way Council ensures this is done efficiently is by:

1. Undertaking cyclic inspections and maintenance programmes to control roadside vegetation within the legal road reserve, at frequencies which are risk-based for different classifications and routes. This results in less reactive work being required.
2. Developing optimised programmes which consider the most effective method for vegetation control within budget constraints.
3. Ensuring that roads, footpaths and cycleways maintained by Council remain fit for purpose and meets the levels of service defined in Section 2. This is done by addressing overgrown or encroaching vegetation. This includes engaging with third-parties who have responsibility for vegetation on adjoining land.
4. Undertaking the clean-up of rubbish and slips efficiently, where material in the road corridor impacts on the level of service.

Council also administers a “no spray” register, where property frontages can be omitted from roadside spraying programmes on application. These property owners are then responsible for vegetation control on these areas. Spraying is not undertaken within 7 kilometres of viticultural activity.



Vegetation Maintenance

Roadside vegetation is inspected and proactively maintained as a cyclic activity. The scheduling of Council's roadside spraying, mowing and vegetation removal programmes is shown in Table 6.23. Council promotes roadside spraying as the most cost-effective method of vegetation control, with a reduced mowing programme in spray sensitive areas.

Vegetation is identified and programmed during routine cyclic inspections, or from public calls. Faults are recorded for follow-up inspections, or for the cyclic maintenance crew to action.

Trees and vegetation which are identified as requiring trimming or removal through inspections are entered-into a provisional programme. Priority of vegetation removal is assessed depending on the classification of the road and the effect on levels of service. Removal of vegetation is completed when budget allows.

Vegetation removal required for safety reasons – for example, where visibility at an intersection is affected or where overhanging vegetation forces road users to leave their lane or the footpath to avoid it - are programmed as urgent.

Some vegetation inspections and works are included within the structures maintenance programmes, where trees or overgrown vegetation impacts on road structures or waterways at bridges and culverts.

During summer months damaged or missing edge markers are replaced by the operator of the pilot vehicle during mowing and spraying operations.

Season	Work Programme
Spring	Tree and vegetation removal as funding permits Urban Spraying (Round 1) Rural Spraying Pest Plant Spraying (Cromwell, Vincent, Teviot) Mowing (Round 1)
Summer	Pest Plant Spraying (Manuherikia, Maniototo)
Autumn	Urban Spraying (Round 2) Mowing (Round 2) *
Winter	Tree and vegetation removal as funding permits Vegetation removal at identified sites (railings, guardrails, bridges, signage)

* Second round of mowing is undertaken as required.

Table 6.23 Vegetation Maintenance Programme

Winter Management

Central Otago experiences harsh winter conditions. These can have a significant impact on parts of Council's network, and may result in road closures and event response programmes being instigated in the worst winter storms. Council's winter maintenance programme is typically operational from mid-May to September with peak work during June, July and early August.

A significant length of Council's maintained roading network is sited between 500m and 1000m above sea level (approximately 650 kilometres). These are made up of Access and Low Volume Access classification roads, including a total of 23.7 kilometres of sealed roads. 10 kilometres of the sealed network above 500m include the Naseby and Saint Bathans township roads.

Approximately 60 kilometres of the District's high-country 'Tracks' are located more than 1000m above sea level. These roads are not suitable for winter access and are located on sections which are closed between from June to September inclusive.

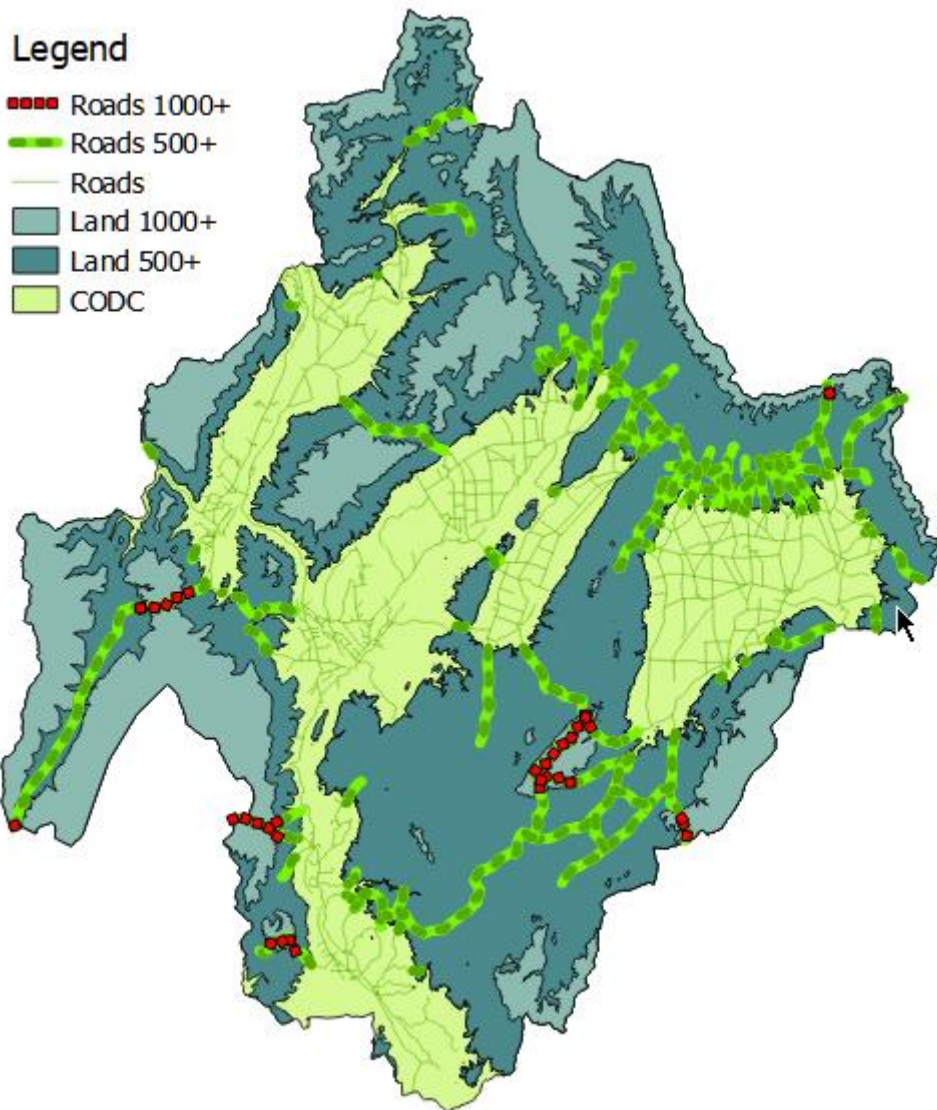


Figure 6.23 CODC Road Network at High Altitude

Gritting of roads and footpaths, application of CMA, snow clearance, and winter condition reporting and patrols are all carried-out as part of winter maintenance activities. Where response to a significant winter storm event is required, Council and the contractor collaboratively manage the event to close roads as required, clear routes and restore access. Formalising these operational activities formed part of developing Council's Emergency Response Plan, completed in the 2018-21 AMP cycle.

Periods of road closures due to winter conditions make up a significant proportion of the impacted journeys reported on the Central Otago District Council roading network. These are reported under the Accessibility heading under Section 2.

Environmental and Winter Maintenance Operating Budget

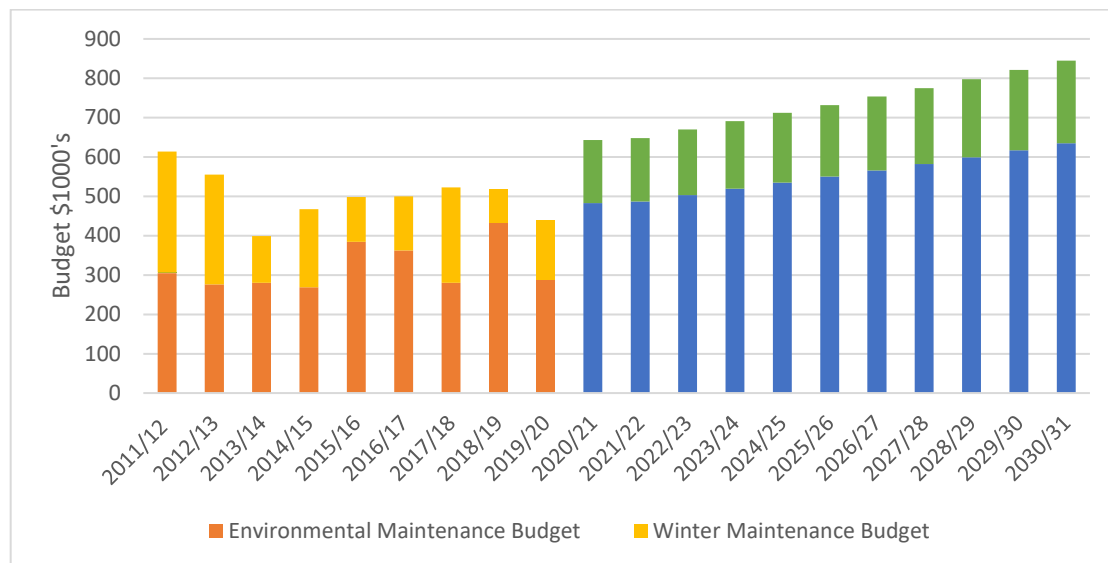


Figure 6.24 Environmental and Winter Maintenance Budget

Increased winter maintenance expenditure in 2011/12 and 2012/13 are due to the harsher winter conditions experienced across parts of the District in 2012.

The funding provided in the 2018-28 Long Term Plan flat-lined environmental maintenance investment. The Roding team and the council's maintenance contractor have managed these tensioned budgets over the 2018-21 AMP cycle. However, the recent climatic changes in Central Otago have seen a huge increase in the growth of roadside vegetation, when compared with previous seasons. This is directly impacting on level of service outcomes on the roading network. Investment has therefore been increased to enable the delivery of an increased environmental maintenance programme. This will be reviewed against level of service outcomes during the 2021-24 AMP period.

Winter maintenance investment was increased as a proportion of the total funding, based on assessment of average expenditure to manage the network during winter over the last nine years. This level of investment is believed to be sustainable.

Council also anticipates the need to continue to fund significant winter storm events, which may cause more disruption as a result of climate change impacts.

Council invests \$50,000 per annum into an emergency fund for roading. This is used to provide the local share funding for reinstatement following a significant event. This fund accumulates in years when there are no significant events.

6.12 Footpaths and Carparks

Footpath and Carpark Management

Footpaths and carparks are provided to ensure delivery of the One Network Road Classification level of service outcomes relating to:

- Safety – reduce the likelihood of injuries occurring, including risks to vulnerable road users
- Accessibility – The network will be accessible for everyone, including active road users and those with disabilities
- Effectiveness – optimal programmes which are efficient and affordable

The way we ensure this is done efficiently is by:

1. Grouping small quantities of proactive work in towns into one year of every three period to reduce establishment costs and improve productivity.
2. Co-ordinating footpath and carpark renewal work with kerb and drainage renewals.
3. Co-ordinating carpark reseals with carriageway resurfacing to reduce establishment costs and improve productivity.

Footpaths and carparks were Ward-funded until the end of the 2015/16 financial year, with the Community Boards approving the funding levels for maintenance, renewals and improvement projects. This changed to District-wide funding, from July 2016.

Footpath Maintenance and Renewals Financial Assistance

From September 2018, the New Zealand Transport Agency are co-funding Footpath Maintenance and Renewals works in the Central Otago. This work, previously fully-funded from local rates, now qualifies for the 51% Financial Assistance Rate that the New Zealand Transport Agency agrees to pay for most approved roading maintenance, operations and renewals activities.

Council have put in-place the necessary changes to ensure that works carried-out as part of planned maintenance and renewals are receiving this additional funding. Footpath programmes and lifecycle assessment are currently under review, with an optimised works programme being developed to maximise the benefit of the new funding available.

Footpath and Carpark Lifecycle Analysis

The construction dates for footpaths were populated in RAMM for the 2008 roading valuation, based on the age of the surrounding pavements. A review of this data quality, and work to improve the footpath data managed by council, has been completed as part of the 2018-21 AMP cycle

An analysis of lifecycle data has been carried out, giving consideration to:

- Previous Valuation standard lives
- The average age of assets recorded in RAMM
- The percentage of life expired assets
- Condition Assessments by staff.

Table 6.24 identifies the standard lives which have been assigned to the footpath assets. Carpark assets are assigned the same lives as sealed surfaces, sealed pavement structure, and unsealed roads.

Footpath Material	Standard Life (years)
Asphalt	30
Concrete	60
Pavement Blocks	60
Sealed	25
Unsealed	25

Table 6.24 Standard Lives for Footpaths

Footpath, Footbridge and Carpark Maintenance

Footpaths and carparks are inspected by Council every three years, with defects recorded and prioritised in RAMM. A new method of measuring footpath roughness is used in Central Otago, collecting footpath roughness network data annually. More information on this process is described in Section 5.7. Work programs are then prepared using this information.

Trip hazards due to joint displacement of concrete footpath slabs are repaired by grinding. A program of work is collated for one year in each three year period, and specialist equipment is then brought in to do this work. This provides a more cost-effective repair option than removing and reconstructing sections of concrete slab. Where sections of concrete path are broken then these are reconstructed under the renewals program.

There are five footbridges, maintained under council unsubsidised, roading budgets within Central Otago. These are:

- Shaky Bridge across the Manuherikia River in the Alexandra ward;
- Horseshoe Bend footbridge across the Clutha River in the Teviot Valley ward;
- The footbridge on State Highway 8 at Roxburgh in the Teviot Valley ward;
- The Cheviot Street/Reservoir Creek footbridge at Roxburgh in the Teviot Valley ward. This structure was replaced following the flood event in Roxburgh in 2017;
- The Waenga Drive/Antimony Crescent 'greenway' footbridge in Cromwell, which was placed under Roding's ownership as a result of the re-tendering of the Parks and Reserves physical works contract in 2019.

Footpath and Carpark Renewals

Renewal requirements are identified during three yearly inspections. Renewals work in the smaller towns are undertaken in one year of each three year period to reduce establishment costs and improve productivity.

Cromwell has a significant bow wave of footpath and carpark renewals commencing in 2018/19. Many residential streets in Cromwell have a footpath on both sides of the road, providing a higher level of service than specified. The 30-year program allows for all of the existing paths to be renewed. This will be reconsidered following further public consultation.

In Section 5, Figure 5.25 shows that 29km of a total of 68km of asphalt paths in the Cromwell ward are aged between 20 and 29 years. The age of a further 22km is unknown, but they are expected to be older than 24 years. This indicates that 75% of the asphalt paths, or 51km will need to be replaced within the next 10 years. This assumption has been supported by visual condition assessment of the Cromwell paths in 2014.

The footpath and carpark renewal programs are consistent with the depreciation funding collected for these activities.

District Footpaths Funding

Figures 6.25 and 6.26 show the last 10 years expenditure on footpath maintenance and renewals for the whole District, which was previously managed on a ward-by-ward basis between 2008/09 and 2015/16. Proposed budgets for the next 10 years include for work to address significant footpath renewal requirements in Cromwell, due to a large number of footpaths and sealed surfaces coming to the end of their lifecycle.

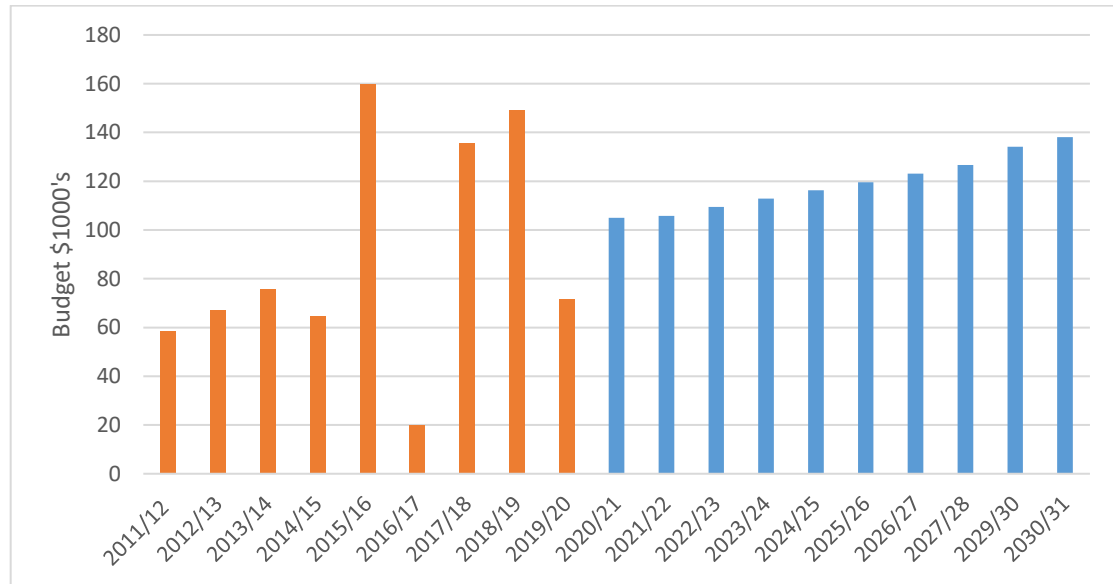


Figure 6.25 District-wide Footpath Maintenance Budgets

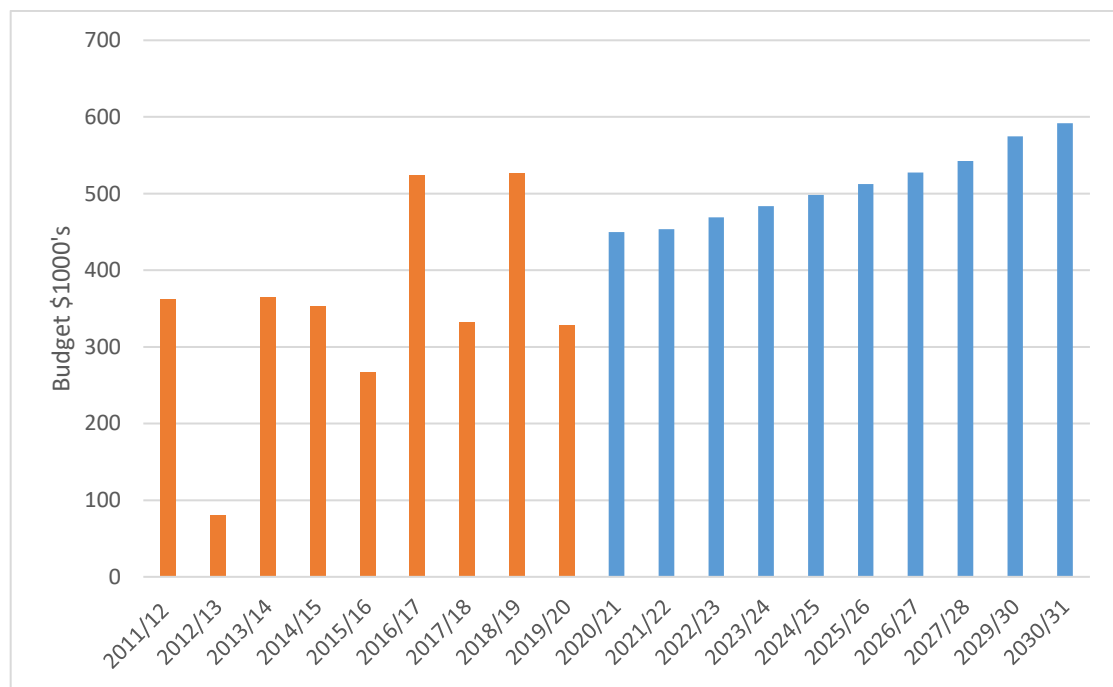


Figure 6.26 District-wide Footpath Renewals Budgets

Footpath and Carpark Improvements

Car park and footpath improvement projects that have been requested through submissions to Council plans, public calls, Community Plans, or by Community Boards are investigated. Estimates for each project are considered and were prioritised by the Community Boards as part of the development of the 2018 Long Term Plan. All remaining projects from the LTP have been included and prioritised in the future Low Cost/Low Risk Improvement Programme. More information regarding the projects Council has prioritised for investment as part of District roading improvements is included in Section 3.12 of the Activity Management Plan.

6.13 Road Safety

Road safety is integrated across the infrastructure, education and enforcement activities of the council.

Road safety is a key element across all the transportation activities, including:

- Road maintenance and renewal programmes
- Minor improvement programme
- Community road safety programme
- Corridor management activities.

Corridor management includes setting speed limits and bylaws. It also includes management of activities on the road which are detrimental to road safety such as overhanging trees, dairy crossings and consenting power pole locations.

The development of a Road Safety Action Plan which documents how Central Otago District Council, Waka Kotahi NZ Transport Agency, NZ Police and other key stakeholders will collaboratively address road safety issues in Central Otago was completed for the 2015-18 AMP period. Reviewing and updating this document is included in the improvement plan. ACC will also be consulted with to identify where their activities can contribute to these issues.

Road to Zero Road Safety Strategy

The safe system approach to road safety is identified as a key mechanism to delivering the safety objectives identified in the Government's Road to Zero Road Safety Strategy and action plan.

The safe system approach views the road transport system holistically by addressing the interaction between the road user, the road and roadside, speed, and the vehicle.

This means working across all elements of the road system to move towards the following:

- Safe roads and roadsides – that are predictable and forgiving of mistakes. Their design encourages safe travel speeds.
- Safe speeds – that suit the function, design, safety and use of the road. People drive to the nature of the road and the conditions, and they understand and comply with the speed limits.
- Safe vehicles – that prevent crashes and protect road users, including pedestrians and cyclists, in the event of a crash.
- Safe road use – by road users who are skilled and competent, alert and unimpaired. They comply with the road rules, take steps to improve safety, and demand and expect safety improvements.

Council's involvement in road safety and delivery of the safe system approach involves the following components of the safe system:

- Leadership and capability
- Education and information
- Understanding crashes and risks
- Innovation
- Legislation and enforcement

Community Education Program

Council provides community education to encourage and promote safe travel behaviour. The objectives of this program are to:

- Reduce the number of crashes which occur on both state highways and local roads within the District
- Reduce injuries and deaths resulting from crashes
- Ensure that people feel safe when using roads for all types of transport modes
- Provide information of events (weather, road works, community events) which will affect travel plans
- Ensure that children feel safe travelling to school using active transport modes.

Delivery of Community Road Safety activities, road safety education projects and local road safety advertising will be managed using a combination of council staff resources and developing a partnership with Central Otago REAP.



These activities include meetings with Community Boards, Community Groups and providing a Community Road Safety presence at local events to raise awareness of the road safety issues being targeted throughout the Central Otago District.

Central Otago Safety Issues

Road Safety issues are identified and managed by reviewing NZTA statistical data, fatal and serious injury crash reports, ONRC Performance Measures data and supporting information published by the NZTA and partner agencies. Local crash statistics are included in Quarterly Council Reports and are used to develop the local community road safety programmes. Additional data and initiatives from the combined Otago/Southland Regional Council Transportation Group, and the NZTA Communities at Risk Register, also form a key component of programme development.

Descriptions of the priorities for the Community Road Safety programme in the 2021-24 AMP period are included in Section 2, under Safety: Safe Road Use.

Our road safety program has an integrated safety management approach that addresses maintenance defects, provides information to road users, provides a community road safety education and awareness program, and undertakes a prioritised site-specific safety improvement program where known risks exist.

Combining the priorities under Road to Zero, the 'above-average' and 'medium' priorities from the NZTA Communities at Risk Register and the areas of concern from the 2015-21 Otago/Southland Regional Council Land Transport Plan eight priorities to be addressed by safety programs have been identified. These include:

From the NZTA Communities at Risk Register:

- Young drivers (High priority)
- Distracted drivers (previously a Medium priority, trending upwards)
- Motorcycles (Above-average priority)
- Rural loss of control (Medium priority)
- Fatigued drivers (Medium priority, potentially upward trend)
- Intersections (previously a Medium priority, trending downwards)

Areas of concern from Otago/Southland Regional Council Land Transport Plan:

- Safe speeds
- Impaired drivers
- Visiting drivers

Cyclists are identified as a "Medium" priority measure for Central Otago District within the Communities at Risk Register. The methodology used for collecting data is based on ACC/hospital admissions rather than CAS crash data. Cyclists are not identified as a significant risk group from the CAS data. As the District experiences a high level of recreational off-road cycle use, this data is not thought to be representative of a wider Road Safety issue.

Specific drivers of planned road safety programmes within the Central Otago District are:

Young Drivers: Young Drivers are a "High" priority measure in the NZTA Communities at Risk Register 2019. The success of the "Young Driver" programme has ensured awareness and engagement with young drivers to remain safe on Central Otago's roads is high.

Motorcycles: Defined as an "Above-average" priority measure in NZTA Communities at Risk Register 2019. Deaths and serious injury crashes involving motorcycles in the last five years are trending upwards, and now make up an average of 40% of all deaths and serious injury crashes. Provisional crash data for 2016-17 indicates that the majority of deaths and serious injury crashes on Central Otago District roads (in both rural and urban areas) have involved motorcyclists. Defined at-risk age group remains male riders 40+.

Safe roads and roadsides: Defined as a "Medium Priority" measure in NZTA Communities at Risk Register 2019. Evidence from CAS data suggests that the 10-year trend for the number of deaths and serious injury crashes of this type is relatively steady, but these crashes make up a greater proportion (40%) of total deaths and serious injury crashes on Central Otago roads.

Secondary Collector Roads in Central Otago have an above-average collective risk rating when compared with our peer group. Many of the loss of control crashes involved a driver pulling too far to the left and losing control on an unsealed shoulder.

Safe speeds: Crash statistics show that speed crashes are trending down but in 11% of serious and fatal and 10% of all crashes in 2013 the speed was inappropriate for the conditions. Speeds on Central Otago roads are not considered a key factor



in deaths and serious injury crashes on Council's roading network, but may contribute to the severity of crashes within priority areas. The need to reduce travel speeds on some gravel roads and across the network during poor/winter weather ("Drive to the Conditions") remains a focus within the District.

Fatigued drivers: Fatigue is not identified as a key factor in deaths and serious injury crashes on the local network, but the District is classified as having a personal risk level of >0 for crashes where driver fatigue is a causal factor. Travel on District roads during peak holiday periods shows a significant increase in traffic volumes.

Impaired drivers: Impairment through alcohol and drugs on Central Otago's roads are not identified as a key factor in deaths and serious injury crashes on our network, but may contribute to the severity of crashes within priority areas. There is some provisional evidence from the 2016 and 2017 CAS records of deaths and serious injury crashes that alcohol impairment has been suspected in the vast majority of the fatal and serious injury crashes on local roads.

Visiting drivers: While visitors to the area do feature highly in the statistics, only 11% were from overseas. Visitors from other parts of New Zealand are at fault in 31% of serious and fatal crashes. The Central Otago Visiting Drivers project continues to endorse the Visiting Drivers “Signature Project” as part of Road to Zero 2016-2020, being undertaken by the NZ Transport Agency.

Local Community road safety programs are being developed to target each of the areas of concern.

Community Road Safety Budgets

The budget for projects and advertising have been calculated based on the Community Road Safety programmes for 2021-24. Funding for projects to address issues where Central Otago has a rankings of ‘above the mean’ or ‘medium’ on the Communities at Risk Register are shown on Table 6.25.

Area of Concern	Allocation of road safety costs in year 1	Community at Risk Register level of concern
Motorcycles		
Young Drivers		
Rural Roads - Loss of Control		
Fatigued Drivers		

Table 6.25 Projects to Address Communities at Risk Register Rankings

Funding allocated to projects which are strategic priorities and identified issues under the Road to Zero Strategy and Region Land Transport Plan are shown on Table 6.26.

Area of Concern	Allocation of road safety costs in year 1
Safer Speeds	
Safer Roads and Roadsides	
Impaired Drivers	
Visiting Drivers	

Table 6.26 Projects to Address Road to Zero Strategic Priorities and Emerging Issues

In 2006 Central Otago District Council and Queenstown Lakes District Council developed a collaborative arrangement where Central Otago provided all Community Road Safety Programs on behalf of Queenstown Lakes District Council. This changed in 2010/11 with Community Road Safety being delivered separately by the respective Councils.

In 2012 the NZTA subsidy rate for Community Road Safety changed from 75% to 60%. The size of the program was adjusted to manage the impact of the subsidy reduction on rates costs. The subsidy rate was changed from 60% to 51% in July 2015.

Section 7

What will it Cost and How will we Pay for it?

7.1 Introduction

This section provides information regarding the investment and funding required for the Transportation Activities. This includes

- Forecasting assumptions
- Revenue and Financing Policy
- The value of the assets
- Depreciation costs
- Development contributions
- The apportionment of cost of capital works as a result of routine renewals, increase in level of service, and development
- Historic and proposed maintenance costs
- Historic and proposed renewal costs
- Planned improvement costs

Information regarding budget calculations and assumptions for individual asset groups is contained in Section 6.

7.2 Financial Management Systems

Council uses the MagiQ Enterprise and MagiQ Performance system for financial management. Asset, contract and project financial management is undertaken using RAMM.

7.3 Financial Management and One Network Road Classification

Consideration has been given to reporting historic expenditure and financial forecasts by the ONRC Customer Outcomes: resilience, travel time reliability, accessibility, amenity, safety and efficiency to provide a more transparent link between investment and customer outcomes.

The council currently collects job cost data at an input level using the NZTA work category framework, as this aligns Council's financial system with the NZTA system and streamlines accounting activities.

Council can report costs by classification. The value added in being able to report to outcome level is not considered to be high enough to warrant a complete overhaul of the financial structure for roading. This would also result in much of the historic cost information contained in this AMP no longer being able to be compared to future forecasts.

7.4 Investment Scenarios

Three high level funding scenarios have been considered.

These options were:

- Flat-lined funding with a minor increase every three years – this had a high level of service and asset risk.
- Budget fully escalated to BERL forecasts, with most demands for increased level of service included, and low risk asset renewal and maintenance strategies.
- An optimised program, where budgets have been fully escalated to BERL forecasts. Service levels have been assessed based on historic expenditure, backlogs of work, customer satisfaction with level of service, and asset analysis and evidence. Detailed modelling of our unsealed road, sealed road and footpath assets have allowed the roading team to put forward a programme of targeted increases in investment to manage an acceptable level of risk for our asset renewal and maintenance strategies.

Council agreed to adopt the optimised program based on a review of existing programs, costs and performance. This profile includes allowances for all current costs, or an estimate of future needs for some activities where changes have been identified as appropriate to meet levels of service requirements, manage risk, or ensure cost effective work practices. This includes increases in expenditure for:

- sealed roads renewals and sealed pavement rehabilitation
- unsealed roads maintenance and unsealed roads renewals
- drainage maintenance and renewals
- environmental maintenance

The optimised option also includes allowances for some identified efficiencies in work practises across the council's roading programmes – with changes in the management of both drainage renewals and environmental maintenance. A managed level of service reduction in some lower risk areas (where existing performance is currently at a high level) will continue through the 2021-24 AMP cycle. This reduction in investment will usually be targeted to fall within the lowest classification of roads (except for surface renewal work on tracks). Opportunities identified for dis-investment in activities include:

- sealed roads maintenance (offset by optimised investment in renewals)
- footpath maintenance (offset by optimised investment in renewals)
- network services maintenance (reducing maintenance and operating costs for the council's streetlighting network)
- road safety promotion (developing alternative programmes and delivery of community road safety projects, in-line with staff changes and the team's capabilities and capacity)

The investment bid submission to Waka Kotahi NZTA also includes an increase in the network management budgets, covering the costs of the council's roading business unit, staffing costs, and the costs of professional services and external specialist support for specific projects (such as geotechnical engineering, transport planning or structural engineering services). Much of the increase in the funding request for this work category has included the potential increases in staffing costs as a result of the strategic pay reviews being conducted by the Central Otago District Council.

It also allows for replacement of some bridge assets with more cost-effective options, which will be developed further as part of the council's bridging strategy during the 2021-24 period.

7.5 Overview of Financial Forecasts

A review of the total District funded expenditure for the past 10 years and the forecast for the next 30-year infrastructure strategy period is shown in Figure 7.1 and Figure 7.2. Future peaks in expenditure in 2030/31 and 2044/45 are driven by replacement of the Omakau and Little Valley Road bridges. Increased capital expenditure forecast under the Low-Cost/Low Risk Improvements programme for the next 10 years are linked to the improvements proposed for the transportation network in the Clyde Historic Precinct and Cromwell Commercial Centre to manage the growth in these townships.

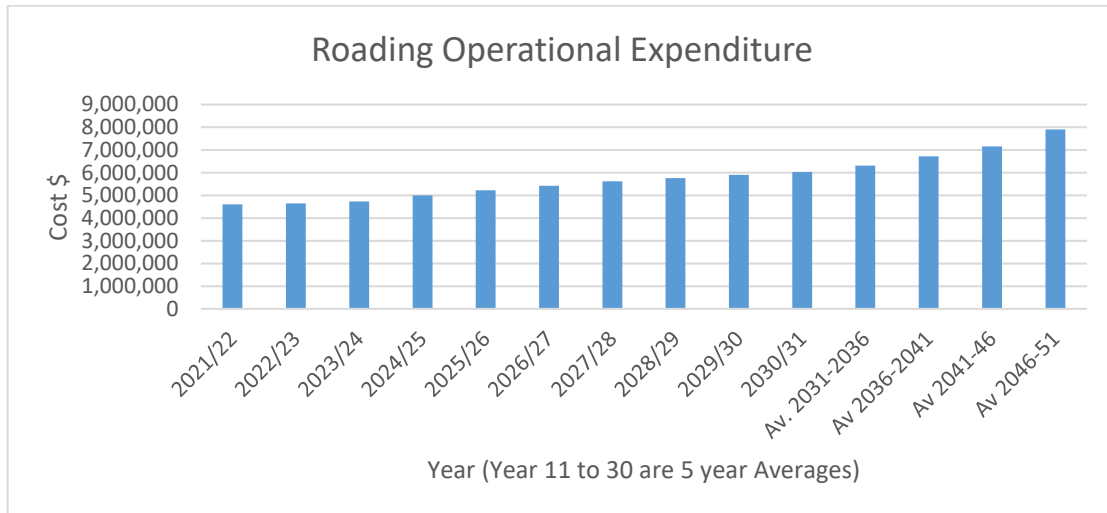


Figure 7.1 Roothing operating expenditure for the next 30 years

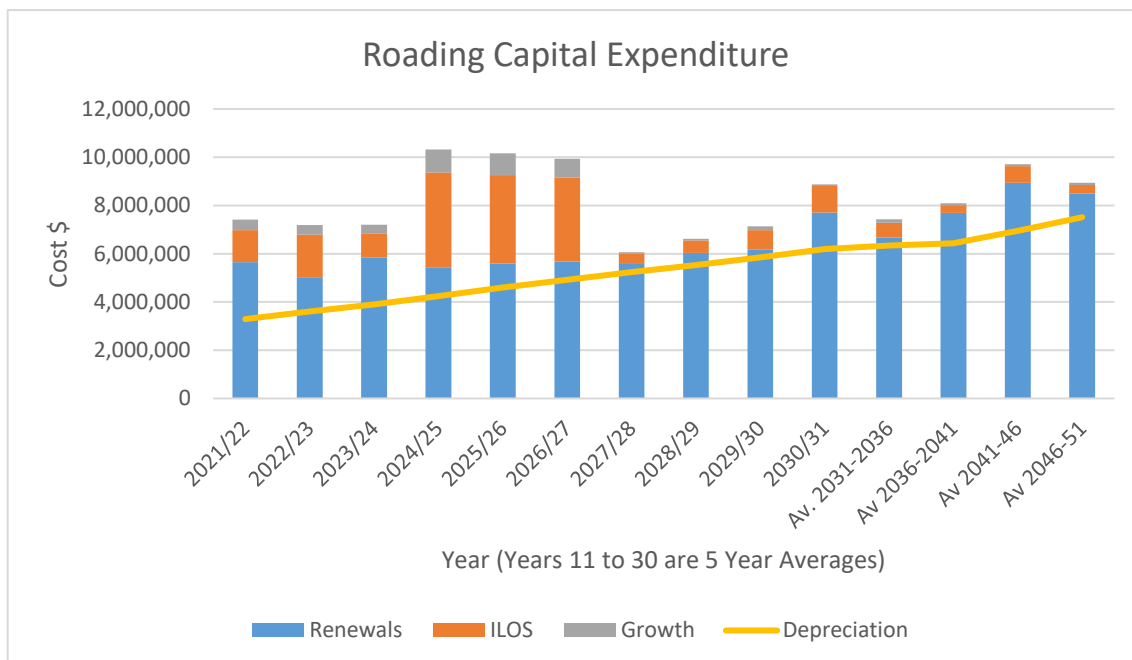


Figure 7.2 Roothing capital expenditure for the next 30 years

Central Otago District Council Proposed Investment Programme 2021-2024

Our proposed investment in our subsidised Maintenance and Renewals programmes is detailed in the table below.

Programme Work Category	2018-21 LTP Approved	2021-24 LTP Requested	Difference (\$ Actual - \$ Requested)	% change	Comment
Sealed Road Maintenance	2,651,482 (*)	1,809,375		1.4%	Expenditure adjusted in 2018-21 AMP period. Programme maintained at current levels.
Gravel Road Maintenance	2,366,967 (*)	2,846,875		26.7%	Expenditure adjusted in 2018-21 AMP period. Increased levels of investment in grading programme to ensure target lengths for all roads are delivered. A focus on re-instating and maintaining a minimum Level of Service on 'Tracks'.
Drainage Maintenance	635,877	724,688		12.6%	All drainage maintenance remains the same except for rural culvert clearing. This is a modest increase to enable more proactive drainage maintenance on rural roads.
Structures Maintenance (including bridges, retaining walls and minor structures)	285,166	781,250		160.4%	Increased by \$100,000p.a. due to greater maintenance needs on our aging bridge network, and being addressed as a direct result of NZTA Technical Audit
Environmental Maintenance	1,483,439	2,009,375		27.6%	Increased by \$80,000p.a. due to greater vegetation control requirements on our rural network, and being addressed as a direct result of NZTA Technical Audit
Traffic Services (including signs, guardrail and streetlighting operations and maintenance)	879,743	890,625		0.6%	Energy and maintenance cost savings from LED light installations
Footpath Maintenance	400,500	328,125		-18.1%	Maintenance expenditure reduced in delivering optimised Asset Management programme.
Network Management (including Road safety promotion and transport planning investment)	3,374,894	5,702,803		70.0%	Increased by approximately \$900,000p.a. to more appropriately reflect the percentage of business unit costs that is eligible for Waka Kotahi NZTA co-funding support. Year 2 of our program includes additional funding for specialist data collection to enable robust programming using dTIMS.
Subtotal Maintenance	\$12,078,068	\$15,322,769		33.4 %	

Programme Work Category	2018-21 LTP Approved	2021-24 LTP Requested	Difference (\$ Actual - \$ Requested)	% change	Comment
Unsealed Road Renewals	4,203,549	5,684,507		16.3%	Increased by approximately \$400,000p.a. to meet the rising costs of gravel royalties, and the annual replenishment requirements to maintain accessibility for all classifications of the council's Roading Hierarchy.
Sealed Road Resurfacing	3,635,089	4,144,688		5.7%	Alignment with dTIMS modelling, and growth in asset base.
Drainage Renewals	1,155,569	1,381,250		19.3%	Increased focus on maintaining to achieve asset life rather than replacement.
Pavement Reconstruction	288,314	750,000		56.3%	Alignment with dTIMS modelling, and growth in asset base.
Structures component replacement (including bridges, retaining walls and minor structures)	1,037,373	656,250		-53.3%	Increased to enable component replacement on our aging bridge network and manage risks of bridge failure due to inappropriate use or condition.
Small bridge renewals	900,000 (***)	937,500		-	New category for 2021-24. \$300,000p.a. investment re-allocated from Low-Cost Low Risk Improvements Programme.
Traffic services renewals (including signs & guardrail renewals)	351,163	625,000		75.1%	Increased by \$80,000p.a. due to an identified need to address consistency of road signs, markings and delineation as a direct result of NZTA Technical Audit.
Footpath renewals	1,272,082	1,406,250		2.5%	Alignment with dTIMS modelling, and growth in asset base.
Subtotal Renewals	\$12,843,139	\$15,585,445		7.6 %	Includes \$300,000p.a. previously budgeted in Low-Cost Low Risk Improvement Programmes (new Small bridge renewals Work Category)
Total Subsidised Maintenance, Renewals and Operations	\$24,921,207	\$30,908,214		19.0 %	Delivery of Core programmes to maintain existing Level of Service and Customer Outcome expectations. Includes investment in all identified issues from Waka Kotahi NZTA Technical Audit (October 2020).

Table 7.1 Central Otago District Council Proposed Investment Programme 2021-2024

7.6 Revenue and Financing Policy

The Revenue and Financing Policy sets out the District Council's policies in respect to funding operating and capital expenditure. This policy forms part of Council's LTP and has considered the principles of our Financial Strategy.

Council has reviewed each individual activity with a view to determining an equitable funding policy. In doing so Council considered the nature of the service and the benefits and beneficiaries for each service. Items taken into account during that deliberation were:

- Community outcomes to which an activity contributes
- The distribution of benefits between the community as a whole, identifiable parts of the community and individuals
- The period during which the benefits are expected to occur
- The extent to which actions, or inactions, of individuals or groups contribute to the need to undertake the activity
- Costs and benefits of funding the activity distinctly from other activities

The revenue and financing policy is not just an aggregation of policies for the individual activities Council carries out. It also a means for Council to consider the overall impact of any allocation of liability for revenue needs on the current and future social, economic, environmental and cultural well-being of the community.

Council's overall approach is that, where practicable, areas that directly benefit, fund the service/activity, or bundle of services in that area. Council implements this philosophy through the use of distinct ward rating areas.

7.7 Funding of Operating Expenditure

A balanced budget is achieved when total revenue (less revaluations, Developers' Contributions and vested assets) is greater than operating expenditure. This plan does not have a balanced budget for the first two years of the plan. The main reason relates to non-funding of some of council's depreciation. Most roading capital expenditure attracts a government subsidy therefore there is no need to fully fund depreciation for that portion which is subsidised. A similar approach is taken for some community buildings that are likely to attract outside grants when they need replacing. The unbalanced budget was signalled in the previous 10-year plan.

Council must also give consideration to the equitable allocation of responsibility for funding the provision and maintenance of assets and facilities throughout their useful life.

Council's operational roading expenditure is funded through the general rate and \$60 (incl. GST) per rating unit of the uniform annual general charge (UAGC). This operational expenditure includes the funding of depreciation on assets. Where an asset attracts external funding such as a subsidy Council does not fund this portion of the depreciation.

Rate funding of depreciation provides resources to pay for the renewal of the asset at the end of its useful life or for renewal related debt repayment.

Council reviews the effects on ratepayers of fully rate funding increased depreciation from the revaluation of assets. Council considers each revaluation and may in fact choose to not fully rate fund an increase in depreciation or to introduce an increase in funding of depreciation required over time.

Council funds the non-subsidised portion of depreciation for all roading assets excluding bridges. Depreciation funding commenced in 1999 and was initially used to fund any capital expenditure that was undertaken by Council. Since 2006 the depreciation funding for roading

assets has only been used to fund capital expenditure on roading. Because this expenditure has also included level of service or growth-related improvements, the annual capital program has exceeded the annual depreciation funding and there is currently no accumulated depreciation fund.

Within the 2015-18 period Council undertook a review of the financial strategy and continued the decision not to fund bridge depreciation at that time. This will enable further consultation work to be undertaken on Council's bridge strategy throughout the 2021-24 LTP period, which will identify the long-term management strategies for the current bridge inventory.

It is unlikely that replacement of the bridge inventory in its current form will be affordable for the community and alternative options to optimise the bridge network, and provide the outcomes required by a more cost effective means, will be identified and consulted on in the 2021-24 period. The council's final Bridge Strategy will then feed into future review of the financial strategy.

Council Overhead

This includes the Chief Executive's functions, finance, information services and rating functions, service centres, administrative functions, customer services and agency functions such as petroleum tax administration.

Information services costs are allocated based on the number of computers allocated to each activity. The remaining overhead costs are allocated based on expenditure in each cost centre.

There are also activity-specific allocations of management costs.

Overheads are funded as an operating expense.

7.8 Funding of Capital Expenditure

Council categorises capital expenditure into three main areas being:

- Renewal of existing assets at the end of their useful lives
- Growth related assets
- Expenditure on assets that are an improvement or addition to the asset including expenditure on assets driven by statutory requirement. This expenditure is seen as an increase in the level of service provided and intergenerational by nature.

Council's use of funding mechanisms to fund capital expenditure is as follows:

Council will first apply any relevant subsidies, for example relevant Waka Kotahi NZ Transport Agency subsidies, and Development Contributions for any growth related assets.

It is intended that Council will get to the point where asset renewals are being met from operating rates revenue through depreciation, except for assets where the Council's policy is not to fund depreciation. To ensure the Council achieves value for money, there will be times where Council group works in one year, but equalize the rate take over a period of years.

Borrowing will be applied to new capital works subject to the preceding statement on the use of rates. The Council views debt as a smoothing mechanism and a means of achieving generational equity. However, the Council does not have an unlimited capacity to borrow and the community does not have unlimited capacity to service those loans into the future. Therefore, the Council adopts a prudent approach to debt and its capital programme to ensure that the burden of debt and the interest cost does not place an impossible burden on the community. In doing so the Council is conscious of its use of internal funds as a source of borrowing.

Council does not currently have any debt, which is forecast to continue for the term of the Plan. Any projects that are to be loan funded will utilise cash reserves in the first instance.

Proceeds from asset sales may be used to fund capital works or repay debt. This method is favoured due to its transparency and the neutral effect it has on rating.

7.9 Overview of Funding Mechanisms Used

Council will make use of a mix of revenue sources to meet operating expenses.

The extent to which the provision of a service by the Council is a public or private good will largely determine the extent to which rates and fees and charges become the funding source. The income from fees and charges and subsidies may vary based on economic circumstances. A summary of the Revenue and Funding Policy is shown on Table 7.3.

General Rate

General rates are used to fund activities where it is not possible to clearly identify customers or users. The general rate is calculated based on land value also used to fund activities where, for reasons of fairness and equity, consideration of the wider community good indicates that this is the most appropriate way to fund an activity.

Differentials detailed in the Schedule of Rates regarding Dams are applied to this rate.

General rates are used to fund the costs of functions not delegated to a Community Board and not covered by any other rate or charge. Included are housing, district grants, regional identity, roading (other than the uniform charge contribution), noxious plant control, public toilets (district funded), airports and other.

Uniform Annual Charge

The Council has a uniform annual charge on every rating unit, levied per property. The uniform annual charge is used to fund democracy, roading (\$60 of the charge), and other amenities controlled by the Council.

Targeted Rates

Targeted rates are used where an activity benefits an easily identifiable group of ratepayers and where it is appropriate that only this group be targeted to pay for some or all of a particular service, for example, water supply. Differentials detailed in the Schedule of Rates are applied to this rate.

Unsubsidised roading activities such as footpaths and the provision and management of car parking are funded through a targeted rate. This rate is the district works and public toilets rate and is set on the basis of capital value across the district. The choice of funding these assets through capital value reflects a greater level of benefit to urban ratepayers.

Fees and Charges

These are direct charges to individuals or organisations who use certain activities. Details of charges levied by Council for certain services and activities are included as part of the 2021-30 Long Term Plan.

Other Sources of Funding

Other sources of funding received by Council include dividends, interest, proceeds from asset sales and income from external agencies. These are used to support the funding of Council's activities.

This would include the Financial Assistance Rates (FAR) of co-investment by the New Zealand Transport Agency for Council's qualifying Transportation activities. Typically, this FAR subsidy is set at 51% of the Maintenance, Operations, Renewals and subsidised Improvement activities on Central Otago District roads.

Specific activities can attract either increased or decreased levels of co-funding from Waka Kotahi NZTA, dependant on their 2021-24 NLTP policies. This is covered in more detail in Section 7.10.

ACTIVITY GROUP AND COMMUNITY OUTCOME	RATIONALE FOR ALLOCATION	FUNDING SOURCE						FEES AND CHARGES
		GENERAL RATE		TARGETED RATE				
		LAND VALUE	UAGC	FIXED CHARGE	CAPITAL VALUE	LAND VALUE	OTHER	
Roading	Subsidised Roading – A core service for the public providing roads, bridges, roadmarking, signage, lighting, road safety and transport planning. The public benefits from our roading network by enabling economic activity throughout the district. The NZTA subsidises 51% of expenditure. This subsidy is funded through fuel taxes, road user charges, etc. and reflects the private benefit received.	Minority general rate, assessed differentially	Minority uniform annual general charge					Majority subsidy and fuel tax
		This is funded by a rate on capital value to reflect the fact that all ratepayers derive a benefit from this activity but that the extent of benefit is more urban than rural.						
	Non-Subsidised Transportation – The provision of infrastructure and service such as footpaths, car parks, vehicle crossings, access ways and corridor gardens benefits all ratepayers.				Majority district-wide rate set on capital value			Minority funded by inspection fees
		This is funded by a rate on capital value to reflect the fact that all ratepayers derive a benefit from this activity but that the extent of benefit is more urban than rural.						

Table 7.2 Revenue and Funding Policy for Transportation Activities

7.10 Overall Forecasting Assumptions

Escalation

Budgets have been prepared based on July 2020 rates and costs, with BERL escalation forecasts applied from 2021/22 to 2030/2031. Escalation of 2% per annum has been applied for years 11 to 30 of the Infrastructure Strategy.

Waka Kotahi New Zealand Transport Agency Co-investment

NZTA approve co-investment on a three-year cycle to tie in with the Council long term plan cycle. The NZTA co-investment rate is 51% for funding in the 2021-24 AMP programme, except for:

- Emergency Works, which may attract a higher subsidy dependant on qualifying criteria.
- State Highway street cleaning and some components of the urban drainage maintenance programme, which are subsidised at a co-investment rate of 30%.

The program of work and the financial plan to fund this work have been prepared based on the 2021 Government Policy Statement. This recognises that NZTA is operating in a constrained funding environment. The maintenance and renewals programs have been held at minimum levels and linked to the One Network Roding Classification levels of service to reduce the risk of work not being funded by Waka Kotahi NZTA. For the 2021-24 NLTP investment bid, increased funding has been requested for work specifically targeting some of our lowest classification “Tracks”, where we have identified a specific need to increase spending to deliver appropriate levels of service in both the short-term and in future.

The only improvements that have been included within planned investments are a modest Low-Cost/Low Risk Improvements Programme as it is recognised that other projects will not meet current criteria for co-investment.

The level of funding proposed by Council was adjusted by NZTA for 2015/16, 2016/17, and 2017/18 as shown in Table 7.4.

NZTA Work Category		2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Work Category 1	CODC Requested	\$3,521,519	\$3,579,439	\$3,550,222	\$3,741,800	\$3,838,900	\$3,795,000
	NZTA Approved	\$3,511,000	\$3,514,000	\$3,456,000	\$4,049,161	\$4,144,314	\$4,099,532
	Difference	\$10,519	\$65,439	\$94,222	-\$307,361	-\$305,414	-\$304,532
		-0.3%	-1.8%	-2.7%	8.2%	8.0%	8.0%
Work Category 2	CODC Requested	\$3,237,839	\$3,259,517	\$3,220,080	\$4,425,500	\$3,891,000	\$3,891,000
	NZTA Approved	\$3,227,000	\$3,216,000	\$3,162,000	\$4,425,500	\$3,891,000	\$3,891,000
	Difference	\$10,839	\$43,517	\$58,080	-	-	-
		-0.3%	-1.3%	-1.8%	-	-	-

Table 7.3 Difference in the Subsidised Program Requested by Council and Approved by NZTA

Work Category 1 is used by the NZTA to describe Council’s Maintenance and Operational expenditure, with Work Category 2 comprising of all of Council’s road Renewals activities. Subsidised Capital Improvements are budgeted for under Work Category 3.

An additional \$774,500 was included within Work Category 2 funding, after September 2018, for the structural work agreed at the Jedburgh Street bridge.

Asset Data Knowledge

While Council has a comprehensive asset register (RAMM) for roading assets, there are gaps and inaccuracies within this data which could influence financial forecasts.

These gaps have been identified in Section 5 of this AMP and actions to correct these are included in the improvement plan.

In general, the gaps in asset data are of low significance and will not impact significantly on the financial forecasts in this plan.

Asset Life

Assumptions have been made regarding the expected life of the assets.

The lives have been assessed by reviewing the condition of the existing assets, and historical construction and renewals information. Several changes were made to the asset lives for the 2019 valuation, which have remained applicable for the 1 July 2020 re-valuations.

Programming of Work

The financial forecasts have been prepared on the assumption that similar work within the different areas of the network will be undertaken at the same time where this is financially prudent, to reduce establishment costs. If work is programmed at different times for other reasons, then this will affect the cost estimates for work.

Accuracy of Cost Estimates

Cost estimates have been based on historic and current costs for undertaking similar work. In developing the 2021-30 Long Term Plan and 30-year Infrastructure Strategy rough order costings, the council have been applying a multiplier of 1.3 (30% increase) to all estimates. Experience of the current market conditions has suggested that previous costings developed in the 2015-2018 AMP cycle (and included as part of the 2018-28 LTP) need to be increased by this amount to remain representative. Contingencies have not been included in the estimates.

7.11 The Value of the Assets

Council's roading assets were most recently valued as at 1 July 2020. The results of this valuation are summarised in the table below. A full valuation report was prepared and is available from Council.

These are considered to be the fair value for the highest and best use.

Asset Group/Sub-group	Gross Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Bridges	\$81,275,530	\$37,562,618	(*) \$695,042
Carparks	\$3,649,480	\$2,635,994	(*) \$49,891
Drainage	\$43,620,970	\$24,972,769	\$621,210
Footpaths	\$21,496,363	\$11,464,756	\$466,476
Minor Structures	\$924,722	\$350,361	\$14,977
Railings	\$2,539,460	\$1,225,164	\$53,094
Signs	\$2,649,483	\$827,567	\$157,356
Street Lights	\$2,775,312	\$1,948,502	\$71,011
SW Channel	\$22,084,043	\$13,832,010	\$228,267
Treatment Length			
Formation	\$331,888,786	\$331,888,786	\$0
Land	\$11,269,305	\$11,269,305	\$0
Sealed Pavement BASECOURSE	\$25,402,808	\$17,820,225	\$211,726
Sealed Pavement FIRST COAT	\$27,732,669	\$19,422,587	\$231,095
Sealed Pavement SUBBASE	\$22,369,655	\$22,369,655	\$0
Sealed Pavement SURFACE	\$30,119,758	\$7,109,693	\$1,707,623
Unsealed Pavement SUBBASE	\$0	\$0	\$0
Unsealed WEARING COURSE	\$20,515,033	\$8,410,980	\$1,463,340
Unsealed ECO SEAL	\$1,199,696	\$604,495	\$123,466
Total	\$653,628,645	\$515,184,583	\$6,126,936

NOTE: Alexandra Airport asset valuations excluded from table

* Depreciation of Bridges and Carparks has historically not been funded by the council.

Table 7.4 2020 Valuation Data (as at 1 July 2020)

Successive valuation results are shown in the tables and graph below.

Asset Description	Gross Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
% Increase on last valuation (2019-2020)	1.5%	2.1%	0.8%
2020 (*)	\$653,628,645	\$515,184,583	\$6,126,936
2019 (*)	\$641,823,562	\$503,005,439	\$6,018,390
2016 (*)	\$546,662,812	\$439,300,318	\$4,737,852
2015 (*)	\$544,042,000	\$441,435,000	\$4,757,100
2014 (*)	\$520,164,673	\$428,640,939	\$4,272,517
2012	\$513,709,528	\$420,662,739	\$4,368,757
2011	\$501,003,724	\$413,609,199	\$4,303,513
2008	\$485,506,025	\$413,469,374	\$3,822,038

* Alexandra Airport asset valuations (2014-2020) excluded from table

Table 7.5 Difference in Successive Roding Valuation Amounts

Figure 7.3 Difference in Successive Roding Valuation Amounts

Asset Description	Gross Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
% Increase on last valuation (2014-2016)	0.1%	6.7%	-23.8%
2016	\$1,498,386	\$1,087,227	\$15,811
2015	\$1,498,000	\$1,095,000	\$15,900
2014	\$1,497,287	\$1,013,853	\$19,571

Table 7.6 Difference in Successive Transportation Assets Valuation – Alexandra Airport

Although the overall movement in the valuation is only slight, the increases and decreases within individual asset classes are more significant.

Asset additions and data improvements, inflation and unit rates resulted in an increase in value of the assets. Revision of unit rates for some activities and review of the standard lives, to more accurately reflect the costs and lives being achieved, resulted in the change in annual depreciation.

7.12 Development Contributions

It is mandatory under the Local Government Act 2002 for Council to have a Development and Financial Contributions Policy. This Policy is reviewed every three years.

Development Contributions pay for the growth-related costs of new development. These are charged to developers and property owners undertaking work as part of Resource Consents or Building Consents.

Financial Contributions pay for the assessed environmental costs of development, and do not apply to funding roading in the District.

The level of Developer Contributions charged is set by Council. It is calculated to fairly distribute the costs of new or upgraded roading, split between developers and ratepayers.

7.13 Development Contribution History

Council implemented a Development and Financial Contribution Policy in 2004.

Initially the Policy was amended regularly, based on feedback from elected members and stakeholders. From 2009 onwards, the Policy has been updated once every three years, at the same time as the Long Term Plan.

The policy has been reviewed for the 2018-21 LTP. The key change for roading Development Contributions is that funding caps that applied to some commercial schemes have been removed, so that 100% of the growth-related costs will be funded. This policy change is in response to investment in renewals and improvements being funded from across the whole District.

7.14 Income from Roothing Development Contributions

Figure 7.7 shows the revenue that has historically been received from Development Contributions for roading, over the last ten years of the Policy being adopted. The data includes forecast income for 2017-18 to 2027-28.

Figure 7.4 Development Contribution Revenue and Forecast Income

7.15 Capital Works Cost Apportionment

The capital works cost apportionment provides information to guide the setting of development contributions. The portions of the capital work which is programmed to meet routine renewal needs and changes to levels of service are calculated. The remaining portion resulting from development is then identified.

The following table provides the apportionment that has been assigned to the 2018-21 AMP Transportation capital works budgets.

Capital Expenditure - Project	Growth %	Level of Service %	Renewal %
Waka Kotahi NZTA Subsidised			
Unsealed Roads Renewals	3	0	97
Sealed Roads Renewals	15	1	84
Pavement Reconstruction	18	10	72
Drainage Renewals	2	20	78
Structural Renewals	20	20	60
Traffic Services Renewals	6	0	94
Low Cost Low Risk Improvements	19	81	0
Staffing/Overhead Allocations	10	3	87
Non-subsidised			
Unsubsidised District Renewals (Car Parks and District-funded Works)	14	33	53
Unsubsidised District Improvements (Car Parks and District-funded Works)	19	81	0

Table 7.7 Capital Works Apportionment for Development Contributions

7.16 30 Year Funding Provisions

Tables below provide the proposed 30-year Transportation Investment which has been included in the council's 30-Year Infrastructure Strategy, and 2021-30 Long Term Plan.

Full Code	2021/22 Year1	2022/23 Year2	2023/24 Year3	2024/25 Year4	2025/26 Year5	2026/27 Year6	2027/28 Year7	2028/29 Year8	2029/30 Year9	2030/31 Year10	2031/32 Year11	2032/33 Year12	2033/34 Year13	2034/35 Year14	2035/36 Year15
1710. Revenue - Roading															
Income	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17101010. RevenueRoading - Rates	208,000	208,000	208,000	212,160	217,568	222,560	227,968	233,584	239,408	245,648	250,640	255,653	260,770	265,990	271,315
17101270. RevenueRoading - Fuel taxes	(208,000)	(208,000)	(208,000)	(212,160)	(217,568)	(222,560)	(227,968)	(233,584)	(239,408)	(245,648)	(250,640)	(255,653)	(260,770)	(265,990)	(271,315)
1710. Revenue - Roading															
Income	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17101010. RevenueRoading - Rates	276,744	282,277	287,914	293,675	299,541	305,531	311,646	317,886	324,251	330,741	337,355	344,094	350,979	365,248	365,248
17101270. RevenueRoading - Fuel taxes	(276,744)	(282,277)	(287,914)	(293,675)	(299,541)	(305,531)	(311,646)	(317,886)	(324,251)	(330,741)	(337,355)	(344,094)	(350,979)	(365,248)	(365,248)

Full Code	2021/22 Year1	2022/23 Year2	2023/24 Year3	2024/25 Year4	2025/26 Year5	2026/27 Year6	2027/28 Year7	2028/29 Year8	2029/30 Year9	2030/31 Year10	2031/32 Year11	2032/33 Year12	2033/34 Year13	2034/35 Year14	2035/36 Year15
1717. Roading Maintenance and Operations															
Income	(5,216,276)	(5,264,803)	(5,329,386)	(5,490,313)	(5,669,466)	(5,840,306)	(6,010,575)	(6,174,152)	(6,351,660)	(6,533,427)	(5,377,827)	(5,482,233)	(5,586,980)	(5,683,415)	(5,785,137)
17171010. RdgMaintOps - Rates	(2,583,785)	(2,632,312)	(2,696,895)	(2,779,374)	(2,880,342)	(2,970,364)	(3,057,183)	(3,135,204)	(3,224,524)	(3,313,100)	(2,296,373)	(2,310,926)	(2,323,126)	(2,324,321)	(2,328,110)
17171040. RdgMaintOps - Govt grants & subsidies	(2,632,491)	(2,632,491)	(2,632,491)	(2,710,939)	(2,789,124)	(2,869,942)	(2,953,392)	(3,038,948)	(3,127,136)	(3,220,326)	(3,081,454)	(3,171,308)	(3,263,854)	(3,359,094)	(3,457,026)
Expenditure	5,216,276	5,264,803	5,329,386	5,490,313	5,669,466	5,840,306	6,010,575	6,174,152	6,351,660	6,533,427	5,377,827	5,482,233	5,586,980	5,683,415	5,785,137
17172606. RdgMaintOps - Investment A/c Interest	5,860	5,860	6,104	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156
1717264111. RdgMaintOps - Sealed Pavement Mn	579,000	579,000	579,000	590,580	605,634	619,530	634,584	650,217	666,429	683,799	697,695	711,649	725,892	740,425	755,248
1717264112. RdgMaintOps - Unsealed Pavement	911,000	911,000	911,000	929,220	952,906	974,770	998,456	1,023,053	1,048,561	1,075,891	1,097,755	1,119,710	1,142,121	1,164,987	1,188,308
1717264113. RdgMaintOps - Drainage Mntnce	180,000	180,000	180,000	183,600	188,280	192,600	197,280	202,140	207,180	212,580	216,900	221,238	225,666	230,184	234,792
17172641131. RdgMaintOps - Drainage Urban	173,000	173,000	173,000	176,460	180,958	185,110	189,608	194,279	199,123	204,313	208,465	212,634	216,890	221,232	225,661
1717264114. RdgMaintOps - Structure Mntnce	250,000	250,000	250,000	255,000	261,500	267,500	274,000	280,750	287,750	295,250	301,250	307,275	313,425	319,700	326,100
1717264121. RdgMaintOps - Environmental Mntn	643,000	643,000	643,000	655,860	672,578	688,010	704,728	722,089	740,093	759,383	774,815	790,311	806,129	822,268	838,729
1717264122. RdgMaintOps - Traffic Sves - Lig	180,000	180,000	180,000	183,600	188,280	192,600	197,280	202,140	207,180	212,580	216,900	221,238	225,666	230,184	234,792
17172641221. RdgMaintOps - Traffic Sves - Oth	135,000	135,000	135,000	137,700	141,210	144,450	147,960	151,605	155,385	159,435	162,675	165,929	169,250	172,638	176,094
1717264125. RdgMaintOps - Subsidised Footpath Maint	105,000	105,000	105,000	107,100	109,830	112,350	115,080	117,915	120,855	124,005	126,525	129,056	131,639	134,274	136,962
1717315151. RdgMaintOps - Network & Asset Management	293,800	293,800	293,800	299,676	307,315	314,366	322,005	329,937	338,164	346,978	354,029	361,110	368,337	375,711	383,233
17174902. RdgMaintOps - Tfr costs	1,374,619	1,413,454	1,462,496	1,531,238	1,602,220	1,666,089	1,720,245	1,766,231	1,814,420	1,860,979	1,208,564	1,229,830	1,251,261	1,262,655	1,276,062
17174987. RdgMaintOps - Finance Charge	385,998	395,689	410,987	431,124	449,600	473,775	500,193	524,639	557,364	589,078	3,099	3,099	1,549	0	0
Full Code	2036/37 Year16	2037/38 Year17	2038/39 Year18	2039/40 Year19	2040/41 Year20	2041/42 Year21	2042/43 Year22	2043/44 Year23	2044/45 Year24	2045/46 Year25	2046/47 Year26	2047/48 Year27	2048/49 Year28	2049/50 Year29	2050/51 Year30
1717. Roading Maintenance and Operations															
Income	(5,899,923)	(6,008,576)	(6,121,033)	(6,243,212)	(6,366,281)	(6,437,528)	(6,563,802)	(6,693,987)	(6,828,095)	(6,964,074)	(7,099,843)	(7,237,974)	(7,382,129)	(7,650,218)	(7,663,606)
17171010. RdgMaintOps - Rates	(2,342,026)	(2,346,870)	(2,352,580)	(2,364,830)	(2,374,786)	(2,329,493)	(2,336,045)	(2,923,576)	(2,981,786)	(3,041,867)	(3,099,290)	(3,156,626)	(3,219,987)	(3,404,833)	(3,332,530)
17171040. RdgMaintOps - Govt grants & subsidies	(3,557,897)	(3,661,706)	(3,768,453)	(3,878,382)	(3,991,494)	(4,108,034)	(4,227,757)	(3,770,411)	(3,846,309)	(3,922,207)	(4,000,553)	(4,081,348)	(4,162,142)	(4,245,385)	(4,331,076)
Expenditure	5,899,923	6,008,576	6,121,033	6,243,212	6,366,281	6,437,528	6,563,802	6,693,987	6,828,095	6,964,074	7,099,843	7,237,974	7,382,129	7,650,218	7,663,606
17172606. RdgMaintOps - Investment A/c Interest	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156	9,156
1717264111. RdgMaintOps - Sealed Pavement Mn	770,360	785,761	801,452	817,490	833,818	850,493	867,516	884,886	902,603	920,668	939,080	957,840	977,005	1,016,724	1,016,724
1717264112. RdgMaintOps - Unsealed Pavement	1,212,086	1,236,318	1,261,006	1,286,241	1,311,931	1,338,168	1,364,951	1,392,281	1,420,158	1,448,581	1,477,551	1,507,067	1,537,221	1,599,716	1,599,716
1717264113. RdgMaintOps - Drainage Mntnce	239,490	244,278	249,156	254,142	259,218	264,402	269,694	275,094	280,602	286,218	291,942	297,774	303,732	316,080	316,080
17172641131. RdgMaintOps - Drainage Urban	230,177	234,778	239,467	244,259	249,137	254,120	259,206	264,396	269,690	275,087	280,589	286,194	291,920	303,788	303,788
1717264114. RdgMaintOps - Structure Mntnce	332,625	339,275	346,050	352,975	360,025	367,225	374,575	382,075	389,725	397,525	405,475	413,575	421,850	439,000	439,000
1717264121. RdgMaintOps - Environmental Mntn	855,512	872,615	890,041	907,852	925,984	944,503	963,407	982,697	1,002,373	1,022,434	1,042,882	1,063,715	1,084,998	1,129,108	1,129,108
1717264122. RdgMaintOps - Traffic Sves - Lig	239,490	244,278	249,156	254,142	259,218	264,402	269,694	275,094	280,602	286,218	291,942	297,774	303,732	316,080	316,080
17172641221. RdgMaintOps - Traffic Sves - Oth	179,618	183,209	186,867	190,607	194,414	198,302	202,271	206,321	210,452	214,664	218,957	223,331	227,799	237,060	237,060
1717264125. RdgMaintOps - Subsidised Footpath Maint	139,703	142,496	145,341	148,250	151,211	154,235	157,322	160,472	163,685	166,961	170,300	173,702	177,177	184,380	184,380
1717315151. RdgMaintOps - Network & Asset Management	390,901	398,716	406,678	414,816	423,101	431,563	440,201	449,015	458,005	467,171	476,514	486,033	495,758	515,913	515,913
17174902. RdgMaintOps - Tfr costs	1,300,809	1,317,697	1,336,664	1,363,284	1,389,068	1,360,961	1,385,811	1,412,503	1,441,046	1,469,392	1,495,457	1,521,814	1,551,781	1,583,213	1,596,602
17174987. RdgMaintOps - Finance Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Full Code	2021/22 Year1	2022/23 Year2	2023/24 Year3	2024/25 Year4	2025/26 Year5	2026/27 Year6	2027/28 Year7	2028/29 Year8	2029/30 Year9	2030/31 Year10	2031/32 Year11	2032/33 Year12	2033/34 Year13	2034/35 Year14	2035/36 Year15
1718. Transport Planning															
Income	(469)	(469)	(489)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)
17181010. TransportPlanning - Rates	(469)	(469)	(489)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)
17181040. TransportPlanning - Govt grants & subsidies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Expenditure	469	469	489	733	733	733	733	733	733	733	733	733	733	733	733
17182606. TransportPlanning - Investment A/c Interest	469	469	489	733	733	733	733	733	733	733	733	733	733	733	733

Full Code	2036/37 Year16	2037/38 Year17	2038/39 Year18	2039/40 Year19	2040/41 Year20	2041/42 Year21	2042/43 Year22	2043/44 Year23	2044/45 Year24	2045/46 Year25	2046/47 Year26	2047/48 Year27	2048/49 Year28	2049/50 Year29	2050/51 Year30
1718. Transport Planning															
Income	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)
17181010. TransportPlanning - Rates	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)	(733)
17181040. TransportPlanning - Govt grants & subsidies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Expenditure	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733
17182606. TransportPlanning - Investment A/c Interest	733	733	733	733	733	733	733	733	733	733	733	733	733	733	733

Full Code	2021/22 Year1	2022/23 Year2	2023/24 Year3	2024/25 Year4	2025/26 Year5	2026/27 Year6	2027/28 Year7	2028/29 Year8	2029/30 Year9	2030/31 Year10	2031/32 Year11	2032/33 Year12	2033/34 Year13	2034/35 Year14	2035/36 Year15
1719. Renewal Local Roads															
Income	(3,234,852)	(3,530,788)	(3,870,264)	(4,338,434)	(4,721,249)	(5,109,395)	(5,503,771)	(5,901,819)	(6,304,263)	(6,713,396)	(7,127,599)	(7,279,582)	(7,512,822)	(7,765,774)	(7,916,207)
17191010. RenewLocRds - Rates	(911,764)	(1,207,700)	(1,547,175)	(1,946,117)	(2,259,937)	(2,576,764)	(2,897,498)	(3,220,046)	(3,544,666)	(3,871,561)	(4,203,760)	(4,270,486)	(4,415,913)	(4,578,496)	(4,636,006)
17191040. RenewLocRds - Govt grants & subsidies	(2,323,089)	(2,323,089)	(2,323,089)	(2,392,317)	(2,461,313)	(2,532,631)	(2,606,273)	(2,681,774)	(2,759,597)	(2,841,834)	(2,923,840)	(3,009,097)	(3,096,910)	(3,187,278)	(3,280,201)
17191066. RenewLocRds - Investment A/c Interest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Expenditure	1,339,276	1,626,736	1,929,878	2,322,789	2,631,245	2,941,377	3,253,228	3,566,858	3,882,303	4,199,752	4,519,219	4,392,924	4,556,271	4,686,594	4,598,183
17192280. RenewLocRds - Depreciation	1,216,821	1,486,994	1,757,167	2,031,303	2,313,540	2,603,936	2,902,761	3,210,259	3,526,673	3,852,394	4,187,665	4,084,834	4,270,723	4,426,875	4,367,083
17192606. RenewLocRds - Investment A/c Interest	122,455	139,742	172,710	291,486	317,705	337,442	350,466	356,599	355,630	347,358	331,554	308,090	285,548	259,719	231,100
Asset Additions/Sales	5,005,076	5,005,076	5,005,076	5,154,227	5,302,878	5,456,534	5,615,195	5,777,860	5,945,530	6,122,709	6,299,389	6,483,075	6,672,267	6,866,964	7,067,167
1719771211. RenewLocRds - Unsealed Metalli	1,836,776	1,836,776	1,836,776	1,891,512	1,946,064	2,002,453	2,060,679	2,120,374	2,181,906	2,246,928	2,311,766	2,379,176	2,448,606	2,520,057	2,593,528
1719771212. RenewLocRds - Sealed Resurfaci	1,326,300	1,326,300	1,326,300	1,365,824	1,405,215	1,445,932	1,487,976	1,531,081	1,575,512	1,622,463	1,669,281	1,717,956	1,768,091	1,819,684	1,872,736
1719771213. RenewLocRds - Drainage Renewal	442,000	442,000	442,000	455,172	468,299	481,868	495,880	510,245	525,052	540,699	556,301	572,523	589,230	606,424	624,104
1719771215. RenewLocRds - Structures Comp	510,000	510,000	510,000	525,198	540,345	556,002	572,169	588,744	605,829	623,883	641,886	660,603	679,881	699,720	720,120
1719771216. RenewLocRds - Pavement Recons	240,000	240,000	240,000	247,152	254,280	261,648	269,256	277,056	285,096	293,592	302,064	310,872	319,944	329,280	338,880
1719771222. RenewLocRds - Traffic Sves Ren	200,000	200,000	200,000	205,960	211,900	218,040	224,380	230,880	237,580	244,660	251,720	259,060	266,620	274,400	282,400
1719771225. RenewLocRds - Subsidised Footpath Renewals	450,000	450,000	450,000	463,410	476,775	490,590	504,855	519,480	534,555	550,485	566,370	582,885	599,895	617,400	635,400

Full Code	2036/37 Year16	2037/38 Year17	2038/39 Year18	2039/40 Year19	2040/41 Year20	2041/42 Year21	2042/43 Year22	2043/44 Year23	2044/45 Year24	2045/46 Year25	2046/47 Year26	2047/48 Year27	2048/49 Year28	2049/50 Year29	2050/51 Year30
1719. Renewal Local Roads															
Income	(8,178,337)	(8,405,040)	(8,639,389)	(8,882,322)	(9,129,632)	(9,377,503)	(9,647,660)	(9,408,408)	(9,664,766)	(9,923,996)	(10,188,357)	(10,457,877)	(10,730,139)	(11,007,384)	(11,289,586)
17191010. RenewLocRds - Rates	(4,802,425)	(4,930,628)	(5,063,690)	(5,202,317)	(5,342,300)	(5,479,592)	(5,626,002)	(5,778,667)	(5,901,389)	(6,023,733)	(6,145,549)	(6,266,855)	(6,387,546)	(6,507,456)	(6,626,554)
17191040. RenewLocRds - Govt grants & subsidies	(3,375,913)	(3,474,412)	(3,575,698)	(3,680,005)	(3,787,332)	(3,897,911)	(4,011,510)	(3,577,557)	(3,649,572)	(3,721,588)	(3,795,927)	(3,872,589)	(3,949,251)	(4,028,236)	(4,109,544)
17191066. RenewLocRds - Investment A/c Interest	0	0	0	0	0	0	(10,148)	(52,184)	(113,805)	(178,675)	(246,881)	(318,433)	(393,342)	(471,692)	(553,488)
Expenditure	4,760,784	4,885,865	5,015,677	5,150,909	5,287,433	5,420,308	5,559,668	5,709,339	5,829,655	5,949,600	6,069,028	6,187,955	6,306,279	6,423,838	6,540,601
17192280. RenewLocRds - Depreciation	4,557,944	4,714,094	4,876,633	5,046,358	5,219,266	5,390,416	5,559,668	5,709,339	5,829,655	5,949,600	6,069,028	6,187,955	6,306,279	6,423,838	6,540,601
17192606. RenewLocRds - Investment A/c Interest	202,840	171,771	139,044	104,550	68,167	29,892	0	0	0	0	0	0	0	0	0
Asset Additions/Sales	7,273,376	7,485,592	7,703,813	7,928,541	8,159,775	8,398,017	8,642,765	7,707,817	7,862,974	8,018,132	8,178,294	8,343,462	8,508,629	8,678,802	8,853,979
1719771211. RenewLocRds - Unsealed Metalli	2,669,203	2,747,082	2,827,166	2,909,637	2,994,496	3,081,926	3,171,745	2,828,635	2,885,575	2,942,515	3,001,292	3,061,906	3,122,519	3,184,970	3,249,257
1719771212. RenewLocRds - Sealed Resurfaci	1,927,379	1,983,614	2,041,441	2,100,992	2,162,267	2,225,399	2,290,255	2,042,502	2,083,617	2,124,733	2,167,174	2,210,942	2,254,710	2,299,804	2,346,225
1719771213. RenewLocRds - Drainage Renewal	642,314	661,055	680,326	700,172	720,593	741,632	763,246	680,680	694,382	708,084	722,228	736,814	751,400	766,428	781,898

1719771215. RenewLocRds - Structures Comp	741,132	762,756	784,992	807,891	831,453	855,729	880,668	785,400	801,210	817,020	833,340	850,170	867,000	884,340	902,190
1719771216. RenewLocRds - Pavement Recons	348,768	358,944	369,408	380,184	391,272	402,696	414,432	369,600	377,040	384,480	392,160	400,080	408,000	416,160	424,560
1719771222. RenewLocRds - Traffic Sves Ren	290,640	299,120	307,840	316,820	326,060	335,580	345,360	308,000	314,200	320,400	326,800	333,400	340,000	346,800	353,800
1719771225. RenewLocRds - Subsidised Footpath Renewals	653,940	673,020	692,640	712,845	733,635	755,055	777,060	693,000	706,950	720,900	735,300	750,150	765,000	780,300	796,050

Full Code	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36
	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14	Year15
1723. Subsidised Improvements															
Income	(1,325,220)	(1,263,834)	(1,218,714)	(2,925,695)	(2,898,275)	(2,723,780)	(857,213)	(1,071,296)	(1,125,178)	(2,153,919)	(1,942,681)	(925,641)	(921,263)	(921,365)	(921,689)
17231010. Subslmprove - Rates	(119,070)	(173,964)	(224,214)	(316,512)	(450,513)	(574,832)	(656,954)	(659,175)	(670,807)	(694,032)	(755,192)	(793,521)	(785,286)	(781,421)	(777,665)
17231040. Subslmprove - Govt grants & subsidies	(1,206,150)	(1,089,870)	(994,500)	(2,609,184)	(2,447,763)	(2,148,948)	(200,259)	(412,121)	(454,372)	(1,459,886)	(1,187,489)	(132,121)	(135,976)	(139,944)	(144,024)
Expenditure	2,496,793	2,322,556	2,181,286	5,438,622	5,254,609	4,791,509	1,051,780	1,469,200	1,563,360	3,557,564	3,083,385	1,051,683	1,054,672	1,058,465	1,062,584
17232280. Subslmprove - Depreciation	111,276	154,014	180,408	222,783	286,566	347,277	376,894	384,368	395,277	416,597	446,928	463,751	469,191	475,278	481,542
17232606. Subslmprove - Investment A/c Interest	20,517	31,542	50,878	99,792	168,509	230,609	282,222	276,752	277,158	278,445	308,047	328,872	318,861	308,788	298,642
Asset Additions/Sales															
1723769341. Subslmprove - Minor Improvements	2,365,000	2,137,000	1,950,000	5,116,046	4,799,535	4,213,623	392,665	808,080	890,925	2,862,522	2,328,410	259,060	266,620	274,400	282,400

Full Code	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50	2050/51
	Year16	Year17	Year18	Year19	Year20	Year21	Year22	Year23	Year24	Year25	Year26	Year27	Year28	Year29	Year30
1723. Subsidised Improvements															
Income	(922,248)	(915,076)	(908,384)	(910,155)	(912,185)	(904,288)	(1,341,700)	(896,827)	(3,727,696)	(1,031,097)	(1,029,141)	(1,027,308)	(1,025,495)	(1,023,804)	(1,022,236)
17231010. Subslmprove - Rates	(774,021)	(762,525)	(751,386)	(748,577)	(745,895)	(733,142)	(725,232)	(739,747)	(763,219)	(867,693)	(862,473)	(857,274)	(852,095)	(846,936)	(841,798)
17231040. Subslmprove - Govt grants & subsidies	(148,226)	(152,551)	(156,998)	(161,578)	(166,291)	(171,146)	(616,468)	(157,080)	(2,964,477)	(163,404)	(166,668)	(170,034)	(173,400)	(176,868)	(180,438)
Expenditure	776,411	764,938	753,819	750,870	748,043	735,341	727,392	741,678	764,479	868,261	862,895	857,547	852,217	846,903	841,608
17232280. Subslmprove - Depreciation	487,988	486,811	485,826	492,854	500,086	497,530	499,507	510,945	544,489	579,121	586,402	593,829	601,405	609,131	617,013
17232606. Subslmprove - Investment A/c Interest	288,423	278,127	267,993	258,016	247,957	237,811	227,885	230,733	219,990	289,140	276,493	263,718	250,812	237,772	224,595
Asset Additions/Sales	290,640	299,120	307,840	316,820	326,060	335,580	1,208,760	308,000	5,812,700	320,400	326,800	333,400	340,000	346,800	353,800
1723769341. Subslmprove - Minor Improvements	290,640	299,120	307,840	316,820	326,060	335,580	1,208,760	308,000	5,812,700	320,400	326,800	333,400	340,000	346,800	353,800

Full Code	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36
	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14	Year15
1733. Bridge Renewals Rooding															
Income	(188,019)	(189,524)	(194,356)	(193,980)	(193,622)	(193,453)	(193,472)	(193,472)	(193,472)	(193,472)	(193,622)	(193,453)	(191,780)	(191,780)	(191,780)
17331010. BridgeRenewRdg - Rates	(188,019)	(189,524)	(194,356)	(193,980)	(193,622)	(193,453)	(193,472)	(193,472)	(193,472)	(193,472)	(193,622)	(193,453)	(191,780)	(191,780)	(191,780)
Expenditure	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713
17332280. BridgeRenewRdg - Depreciation	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713

Full Code	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50	2050/51
	Year16	Year17	Year18	Year19	Year20	Year21	Year22	Year23	Year24	Year25	Year26	Year27	Year28	Year29	Year30
1733. Bridge Renewals Rooding															
Income	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)
17331010. BridgeRenewRdg - Rates	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)	(191,780)
Expenditure	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713
17332280. BridgeRenewRdg - Depreciation	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713	383,713

Full Code	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36
	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14	Year15
1747. Road Safety Co-ordinator															
Income	(40,000)	(40,000)	(40,000)	(40,800)	(41,840)	(42,800)	(43,840)	(44,920)	(46,040)	(47,240)	(48,200)	(49,164)	(50,148)	(51,152)	(52,176)
17471010. RdSafetyCoOrd - Rates	(2,521)	(2,521)	(2,521)	(2,204)	(2,131)	(1,940)	(1,792)	(1,654)	(1,519)	(1,392)	(1,029)	(617)	(185)	269	744
17471040. RdSafetyCoOrd - Govt grants & subsidies	(37,479)	(37,479)	(37,479)	(38,596)	(39,709)	(40,860)	(42,048)	(43,266)	(44,521)	(45,848)	(47,171)	(48,547)	(49,963)	(51,421)	(52,920)
Expenditure	40,000	40,000	40,000	40,800	41,840	42,800	43,840	44,920	46,040	47,240	48,200	49,164	50,148	51,152	52,176
17473016. RdSafetyCoOrd - Projects	40,000	40,000	40,000	40,800	41,840	42,800	43,840	44,920	46,040	47,240	48,200	49,164	50,148	51,152	52,176

Full Code	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50	2050/51
	Year16	Year17	Year18	Year19	Year20	Year21	Year22	Year23	Year24	Year25	Year26	Year27	Year28	Year29	Year30
1747. Road Safety Co-ordinator															
Income	(53,220)	(54,284)	(55,368)	(56,476)	(57,604)	(58,756)	(59,932)	(61,132)	(62,356)	(63,604)	(64,876)	(66,172)	(67,496)	(70,240)	(70,240)
17471010. RdSafetyCoOrd - Rates	1,244	1,770	2,320	2,894	3,498	4,130	4,787	(3,414)	(3,476)	(3,563)	(3,635)	(3,695)	(3,782)	(5,251)	(3,940)
17471040. RdSafetyCoOrd - Govt grants & subsidies	(54,464)	(56,054)	(57,688)	(59,370)	(61,102)	(62,886)	(64,719)	(57,718)	(58,880)	(60,041)	(61,241)	(62,477)	(63,714)	(64,989)	(66,300)
Expenditure	53,220	54,284	55,368	56,476	57,604	58,756	59,932	61,132	62,356	63,604	64,876	66,172	67,496	70,240	70,240
17473016. RdSafetyCoOrd - Projects	53,220	54,284	55,368	56,476	57,604	58,756	59,932	61,132	62,356	63,604	64,876	66,172	67,496	70,240	70,240

Full Code	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36
	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14	Year15
1750. Emergency Work															
Income	(54,778)	(54,254)	(53,364)	(52,551)	(52,735)	(54,315)	(55,945)	(57,623)	(59,352)	(61,133)	(12,968)	(13,355)	(13,739)	(14,152)	(14,576)
17501010. EmergWk - Rates	(4,778)	(4,254)	(3,364)	(2,551)	(1,863)	(1,862)	(1,862)	(1,862)	(1,862)	(1,862)	(1,863)	(1,862)	(1,846)	(1,846)	(1,846)
17501014. EmergWk - Rates Adj - Invest A/c	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	0	0	0	0	0
17501066. EmergWk - Investment A/c Interest	0	0	0	0	(872)	(2,454)	(4,083)	(5,761)	(7,490)	(9,271)	(11,105)	(11,494)	(11,894)	(12,306)	(12,731)
17501320. EmergWk - Other income	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Expenditure	6,661	6,122	5,186	4,377	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693
17502280. Emerg work roading - Depreciation	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693
17502606. EmergWk - Investment A/c Interest	2,969	2,430	1,494	684	0	0	0	0	0	0	0	0	0	0	0

Full Code	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50	2050/51
	Year16	Year17	Year18	Year19	Year20	Year21	Year22	Year23	Year24	Year25	Year26	Year27	Year28	Year29	Year30
1750. Emergency Work															
Income	(15,013)	(15,464)	(15,928)	(16,406)	(16,898)	(17,405)	(17,927)	(18,465)	(19,019)	(19,589)	(20,177)	(20,782)	(21,406)	(22,048)	(22,709)
17501010. EmergWk - Rates	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)	(1,846)
17501014. EmergWk - Rates Adj - Invest A/c	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17501066. EmergWk - Investment A/c Interest	(13,168)	(13,618)	(14,082)	(14,560)	(15,052)	(15,559)	(16,081)	(16,619)	(17,173)	(17,744)	(18,331)	(18,936)	(19,560)	(20,202)	(20,864)
17501320. EmergWk - Other income	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Expenditure	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693
17502280. Emerg work roading - Depreciation	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693	3,693
17502606. EmergWk - Investment A/c Interest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Full Code	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36
	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14	Year15
1762. Rooding Administration Management Unsubsidised															
Income	(39,420)	(39,435)	(39,523)	(41,081)	(42,139)	(43,123)	(44,185)	(45,287)	(46,429)	(47,650)	(48,645)	(49,646)	(50,669)	(51,714)	(52,780)
17621010. RdgAdminMgmt Unsubsidised - Rates	(18,018)	(18,018)	(18,019)	(18,379)	(18,847)	(19,279)	(19,747)	(20,233)	(20,737)	(21,277)	(21,709)	(22,142)	(22,585)	(23,037)	(23,498)
17621066. RdgAdminMgmt Unsubsidised - Investment A/c Interest	(1,402)	(1,417)	(1,505)	(2,303)	(2,372)	(2,444)	(2,518)	(2,594)	(2,672)	(2,753)	(2,836)	(2,922)	(3,010)	(3,101)	(3,195)
17621360. RdgAdminMgmt Unsubsidised - Other Sales	(20,000)	(20,000)	(20,000)	(20,400)	(20,920)	(21,400)	(21,920)	(22,460)	(23,020)	(23,620)	(24,100)	(24,582)	(25,074)	(25,576)	(26,088)
Expenditure	38,037	38,037	38,037	38,797	39,785	40,697	41,685	42,711	43,775	44,915	45,827	46,743	47,677	48,631	49,604
17622280. RdgAdminMgmt Unsubsidised - Depreciation	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
17623170. RdgAdminMgmt Unsubsidised - Legal fees	8,000	8,000	8,000	8,160	8,368	8,560	8,768	8,984	9,208	9,448	9,640	9,833	10,030	10,230	10,435
17623220. RdgAdminMgmt Unsubsidised - Road Stopping costs	30,000	30,000	30,000	30,600	31,380	32,100	32,880	33,690	34,530	35,430	36,150	36,873	37,611	38,364	39,132
Full Code	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50	2050/51
	Year16	Year17	Year18	Year19	Year20	Year21	Year22	Year23	Year24	Year25	Year26	Year27	Year28	Year29	Year30
1762. Rooding Administration Management Unsubsidised															
Income	(53,868)	(54,979)	(56,111)	(57,269)	(58,449)	(59,655)	(60,887)	(62,146)	(63,431)	(64,742)	(66,080)	(67,444)	(68,840)	(71,588)	(71,734)
17621010. RdgAdminMgmt Unsubsidised - Rates	(23,967)	(24,446)	(24,934)	(25,433)	(25,940)	(26,459)	(26,988)	(27,528)	(28,079)	(28,640)	(29,213)	(29,796)	(30,392)	(31,626)	(31,626)
17621066. RdgAdminMgmt Unsubsidised - Investment A/c Interest	(3,291)	(3,390)	(3,493)	(3,598)	(3,706)	(3,818)	(3,933)	(4,052)	(4,174)	(4,300)	(4,429)	(4,563)	(4,700)	(4,842)	(4,987)
17621360. RdgAdminMgmt Unsubsidised - Other Sales	(26,610)	(27,142)	(27,684)	(28,238)	(28,802)	(29,378)	(29,966)	(30,566)	(31,178)	(31,802)	(32,438)	(33,086)	(33,748)	(35,120)	(35,120)
Expenditure	50,596	51,607	52,636	53,689	54,761	55,855	56,972	58,112	59,275	60,461	61,669	62,900	64,158	66,765	66,765
17622280. RdgAdminMgmt Unsubsidised - Depreciation	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
17623170. RdgAdminMgmt Unsubsidised - Legal fees	10,644	10,857	11,074	11,295	11,521	11,751	11,986	12,226	12,471	12,721	12,975	13,234	13,499	14,048	14,048
17623220. RdgAdminMgmt Unsubsidised - Road Stopping costs	39,915	40,713	41,526	42,357	43,203	44,067	44,949	45,849	46,767	47,703	48,657	49,629	50,622	52,680	52,680
Full Code	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36
	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14	Year15
1771. Rooding															
Income	(805,783)	(812,230)	(832,938)	(831,327)	(829,796)	(829,070)	(829,151)	(829,151)	(829,151)	(829,151)	(829,796)	(770,209)	(751,964)	(726,074)	(597,727)
17711010. Rooding - Rates	(805,783)	(812,230)	(832,938)	(831,327)	(829,796)	(829,070)	(829,151)	(829,151)	(829,151)	(829,151)	(829,796)	(770,209)	(751,964)	(726,074)	(597,727)
Expenditure	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,518,729	1,495,553	1,443,753	1,186,957
17712280. Rooding - Depreciation	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,635,480	1,518,729	1,495,553	1,443,753	1,186,957
Full Code	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50	2050/51
	Year16	Year17	Year18	Year19	Year20	Year21	Year22	Year23	Year24	Year25	Year26	Year27	Year28	Year29	Year30
1771. Rooding															
Income	(597,727)	(597,727)	(597,727)	(597,727)	(596,736)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)
17711010. Rooding - Rates	(597,727)	(597,727)	(597,727)	(597,727)	(596,736)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)	(593,084)
Expenditure	1,186,957	1,186,957	1,186,957	1,186,957	1,184,973	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666
17712280. Rooding - Depreciation	1,186,957	1,186,957	1,186,957	1,186,957	1,184,973	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666	1,177,666

Full Code	2021/22 Year1	2022/23 Year2	2023/24 Year3	2024/25 Year4	2025/26 Year5	2026/27 Year6	2027/28 Year7	2028/29 Year8	2029/30 Year9	2030/31 Year10	2031/32 Year11	2032/33 Year12	2033/34 Year13	2034/35 Year14	2035/36 Year15
1775. Roading Unit															
Income	(2,737)	(2,885)	(3,301)	(3,553)	(4,103)	(15,771)	(16,137)	(16,520)	(16,916)	(17,336)	(17,724)	(18,065)	(18,145)	(18,354)	(18,569)
17751010. RdgUnit - Rates	11,263	11,115	10,699	10,727	10,541	(791)	(793)	(798)	(802)	(802)	(854)	(858)	(594)	(450)	(307)
17751066. RdgUnit - Investment A/c Interest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17751320. RdgUnit - Other income	(14,000)	(14,000)	(14,000)	(14,280)	(14,644)	(14,980)	(15,344)	(15,722)	(16,114)	(16,534)	(16,870)	(17,207)	(17,552)	(17,903)	(18,262)
Expenditure	14,000	14,000	14,000	14,280	14,644	14,980	15,344	15,722	16,114	16,534	16,870	17,207	17,552	17,903	18,262
17752240. RdgUnit - Training (all costs)	15,267	15,267	15,267	15,884	16,704	17,479	18,339	19,253	20,226	21,294	21,726	22,161	22,604	23,057	23,519
17752260. RdgUnit - Travel (not training)	4,000	4,000	4,000	4,080	4,184	4,280	4,384	4,492	4,604	4,724	4,820	4,916	5,015	5,115	5,218
17752280. RdgUnit - Depreciation	11,263	18,184	25,196	25,196	31,851	27,362	27,362	27,508	27,655	27,655	28,668	29,682	29,682	22,523	15,364
17752606. RdgUnit - Investment A/c Interest	0	0	1,538	1,873	1,440	3,201	2,357	1,512	3,240	2,387	1,532	3,413	2,505	1,596	907
17752660. RdgUnit - Advertising	2,500	2,500	2,500	2,550	2,615	2,675	2,740	2,808	2,878	2,953	3,013	3,073	3,134	3,197	3,261
17752663. RdgUnit - Administration (RRC)	3,500	3,500	3,500	3,570	3,661	3,745	3,836	3,931	4,029	4,134	4,218	4,302	4,388	4,476	4,565
17753207. RdgUnit - Recoverable Prof Fees	2,200	1,800	1,800	1,836	1,883	1,926	1,973	2,021	2,072	2,126	2,169	2,212	2,257	2,302	2,348
17753260. RdgUnit - Staff ACC	3,736	3,859	3,993	4,137	4,297	4,469	4,653	4,853	5,034	5,135	5,219	5,332	5,450	5,568	5,690
17753300. RdgUnit - Staff remuneration	622,686	643,181	665,516	689,574	716,194	744,816	775,446	808,833	838,932	855,753	869,782	888,720	908,361	928,001	948,343
17753305. RdgUnit - Staff Kiwisaver ER cont	18,681	19,295	19,965	20,687	21,486	22,345	23,263	24,265	25,168	25,673	26,093	26,662	27,251	27,840	28,450
17754800. RdgUnit - Vehicle expenses	5,000	5,000	5,000	5,100	5,230	5,350	5,480	5,615	5,755	5,905	6,025	6,146	6,269	6,394	6,522
17754801. RdgUnit - Vehicle Fuel	10,000	10,000	10,000	10,200	10,460	10,700	10,960	11,230	11,510	11,810	12,050	12,291	12,537	12,788	13,044
17754870. RdgUnit - Inf Policy Recharge	205,135	206,517	211,170	225,572	238,162	248,907	254,336	257,927	260,840	270,440	161,177	161,356	163,212	163,099	163,215
17754899. RdgUnit - Vehicles internal hire	1,000	1,000	1,000	1,040	1,094	1,145	1,201	1,261	1,325	1,395	1,423	1,452	1,481	1,510	1,540
17754902. RdgUnit - Trf LTNZ ex 1717	(1,374,619)	(1,413,454)	(1,462,496)	(1,531,238)	(1,602,220)	(1,666,089)	(1,720,245)	(1,766,231)	(1,814,420)	(1,860,979)	(1,208,564)	(1,229,830)	(1,251,261)	(1,262,655)	(1,276,062)
17754986. RdgUnit - Management Charges	51,042	54,379	55,402	55,871	57,102	57,996	58,597	59,890	60,886	61,569	1,049	1,074	733	733	366
17754987. RdgUnit - Finance Charge	58,657	60,129	62,454	65,514	68,322	71,995	76,010	79,725	84,697	89,517	471	471	235	0	0
17754988. RdgUnit - IS Overhead Charges	343,427	348,491	356,048	373,970	388,333	403,558	415,447	417,297	422,195	435,521	49,311	47,476	48,227	47,919	48,314
17754995. RdgUnit - Overheads Allocated	30,526	30,352	32,147	38,864	43,847	49,120	49,206	49,533	49,490	49,525	26,688	26,299	25,474	24,440	23,657
Asset Additions/Sales	0	84,150	0	0	80,019	0	0	85,910	0	0	92,183	0	0	0	0
17757591. RdgUnit - Motor cars & utes	0	84,150	0	0	80,019	0	0	85,910	0	0	92,183	0	0	0	0
Full Code	2036/37 Year16	2037/38 Year17	2038/39 Year18	2039/40 Year19	2040/41 Year20	2041/42 Year21	2042/43 Year22	2043/44 Year23	2044/45 Year24	2045/46 Year25	2046/47 Year26	2047/48 Year27	2048/49 Year28	2049/50 Year29	2050/51 Year30
1775. Roading Unit															
Income	(18,934)	(19,219)	(19,917)	(20,321)	(20,733)	(21,153)	(21,582)	(22,021)	(22,468)	(22,924)	(23,389)	(23,863)	(24,347)	(25,329)	(25,352)
17751010. RdgUnit - Rates	(307)	(187)	(269)	(277)	(286)	(294)	(303)	(312)	(322)	(331)	(341)	(351)	(362)	(373)	(384)
17751066. RdgUnit - Investment A/c Interest	0	(33)	(269)	(277)	(286)	(294)	(303)	(312)	(322)	(331)	(341)	(351)	(362)	(373)	(384)
17751320. RdgUnit - Other income	(18,627)	(18,999)	(19,379)	(19,767)	(20,161)	(20,565)	(20,976)	(21,396)	(21,825)	(22,261)	(22,707)	(23,160)	(23,624)	(24,584)	(24,584)
Expenditure	18,627	19,033	19,648	20,044	20,447	20,859	21,279	21,708	22,146	22,593	23,048	23,512	23,985	24,957	24,968
17752240. RdgUnit - Training (all costs)	23,989	24,469	24,957	25,457	25,965	26,484	27,015	27,555	28,107	28,670	29,243	29,827	30,424	31,661	31,661
17752260. RdgUnit - Travel (not training)	5,322	5,428	5,537	5,648	5,760	5,876	5,993	6,113	6,236	6,360	6,488	6,617	6,750	7,024	7,024
17752280. RdgUnit - Depreciation	15,364	7,682	0	0	0	0	0	0	0	0	0	0	0	0	0
17752606. RdgUnit - Investment A/c Interest	437	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17752660. RdgUnit - Advertising	3,326	3,393	3,461	3,530	3,600	3,672	3,746	3,821	3,897	3,975	4,055	4,136	4,219	4,390	4,390
17752663. RdgUnit - Administration (RRC)	4,657	4,750	4,845	4,942	5,040	5,141	5,244	5,349	5,456	5,565	5,677	5,790	5,906	6,146	6,146
17753207. RdgUnit - Recoverable Prof Fees	2,395	2,443	2,492	2,541	2,592	2,644	2,697	2,751	2,806	2,862	2,919	2,978	3,037	3,161	3,161
17753260. RdgUnit - Staff ACC	5,812	5,938	6,069	6,199	6,334	6,468	6,601	6,738	6,878	7,021	7,167	7,316	7,468	7,625	7,695
17753300. RdgUnit - Staff remuneration	968,684	989,727	1,011,472	1,033,216	1,055,662	1,031,252	1,051,875	1,072,918	1,094,382	1,116,266	1,138,572	1,161,369	1,184,586	1,208,295	1,232,495
17753305. RdgUnit - Staff Kiwisaver ER cont	29,061	29,692	30,344	30,997	31,670	30,938	31,556	32,188	32,831	33,488	34,157	34,841	35,538	36,249	36,975
17754800. RdgUnit - Vehicle expenses	6,653	6,786	6,921	7,060	7,201	7,345	7,492	7,642	7,795	7,951	8,110	8,272	8,437	8,780	8,780
17754801. RdgUnit - Vehicle Fuel	13,305	13,571	13,842	14,119	14,401	14,689	14,983	15,283	15,589	15,901	16,219	16,543	16,874	17,560	17,560
17754870. RdgUnit - Inf Policy Recharge	165,502	167,832	170,491	173,269	175,977	173,904	176,613	179,489	182,535	185,606	188,491	191,413	194,673	198,877	199,869
17754899. RdgUnit - Vehicles internal hire	1,571	1,603	1,635	1,667	1,701	1,735	1,769	1,805	1,841	1,878	1,915	1,954	1,993	2,074	2,074
17754902. RdgUnit - Trf LTNZ ex 1717	(1,300,809)	(1,317,697)	(1,336,664)	(1,363,284)	(1,389,068)	(1,360,961)	(1,385,811)	(1,412,503)	(1,441,046)	(1,469,392)	(1,495,457)	(1,521,814)	(1,551,781)	(1,583,213)	(1,596,602)

17754986. RdgUnit - Management Charges	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17754987. RdgUnit - Finance Charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17754988. RdgUnit - IS Overhead Charges	50,574	51,741	53,285	54,096	53,407	52,052	52,095	53,371	55,886	57,689	56,934	55,911	57,705	58,380	45,914
17754995. RdgUnit - Overheads Allocated	22,785	21,675	20,963	20,588	20,205	19,900	19,702	19,489	19,266	19,075	18,893	18,707	18,517	18,324	18,127
Asset Additions/Sales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17757591. RdgUnit - Motor cars & utes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Full Code	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36
	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14	Year15
1780. District Unsubsidised Rooding															
Income	(280,482)	(283,698)	(293,054)	(314,949)	(322,715)	(330,652)	(332,581)	(341,121)	(349,959)	(352,080)	(360,000)	(329,742)	(335,300)	(342,326)	(349,483)
17801010. DisUnsubsRdg - Rates	(225,712)	(227,334)	(231,918)	(233,244)	(235,045)	(236,939)	(239,206)	(241,597)	(244,147)	(246,947)	(248,617)	(211,991)	(212,224)	(213,831)	(215,470)
17801066. DisUnsubsRdg - Investment A/c Interest	(36,170)	(37,764)	(42,535)	(62,733)	(68,214)	(73,811)	(72,989)	(78,636)	(84,403)	(83,166)	(88,970)	(94,890)	(99,758)	(104,709)	(109,751)
17801185. DisUnsubsRdg - Infringement Fines	(7,500)	(7,500)	(7,500)	(7,650)	(7,845)	(8,025)	(8,220)	(8,423)	(8,633)	(8,858)	(9,038)	(9,218)	(9,403)	(9,591)	(9,783)
17801320. DisUnsubsRdg - Other Income	(11,100)	(11,100)	(11,100)	(11,322)	(11,611)	(11,877)	(12,166)	(12,465)	(12,776)	(13,109)	(13,376)	(13,643)	(13,916)	(14,195)	(14,479)
Expenditure	384,376	384,666	384,971	387,002	389,602	392,093	394,827	397,720	400,791	404,149	406,133	332,735	334,419	336,493	338,608
17802280. DisUnsubsRdg - Depreciation	306,572	306,572	306,572	306,572	306,572	306,572	306,572	306,565	306,559	306,559	306,559	231,171	230,821	230,821	230,821
17802640. DisUnsubsRdg - Physical works contract	25,000	25,000	25,000	25,500	26,150	26,750	27,400	28,075	28,775	29,525	30,125	30,728	31,343	31,970	32,610
17802642. DisUnsubsRdg - Work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17802643. DisUnsubsRdg - SH Cleaning	37,000	37,000	37,000	37,740	38,702	39,590	40,552	41,551	42,587	43,697	44,585	45,477	46,387	47,316	48,263
17802650. DisUnsubsRdg - Infringement Notices	10,000	10,000	10,000	10,200	10,460	10,700	10,960	11,230	11,510	11,810	12,050	12,291	12,537	12,788	13,044
17803250. DisUnsubsRdg - Rates expense	5,804	6,094	6,399	6,990	7,719	8,481	9,343	10,299	11,360	12,558	12,813	13,070	13,331	13,598	13,870
Asset Additions/Sales	50,000	50,000	250,000	51,490	52,975	272,550	56,095	57,720	296,975	61,165	62,930	64,765	66,655	68,600	70,600
17807718. DisUnsubsRdg - Footpaths & Pedestrian Rnwls	50,000	50,000	250,000	51,490	52,975	272,550	56,095	57,720	296,975	61,165	62,930	64,765	66,655	68,600	70,600

Full Code	2036/37	2037/38	2038/39	2039/40	2040/41	2041/42	2042/43	2043/44	2044/45	2045/46	2046/47	2047/48	2048/49	2049/50	2050/51
	Year16	Year17	Year18	Year19	Year20	Year21	Year22	Year23	Year24	Year25	Year26	Year27	Year28	Year29	Year30
1780. District Unsubsidised Rooding															
Income	(356,772)	(364,196)	(371,695)	(379,359)	(387,194)	(395,174)	(403,300)	(411,564)	(420,326)	(429,293)	(438,455)	(447,814)	(457,382)	(470,039)	(477,187)
17801010. DisUnsubsRdg - Rates	(217,141)	(218,845)	(220,522)	(222,260)	(224,066)	(225,910)	(227,793)	(229,704)	(231,649)	(233,647)	(235,683)	(237,758)	(239,877)	(244,270)	(244,270)
17801066. DisUnsubsRdg - Investment A/c Interest	(114,884)	(120,109)	(125,427)	(130,838)	(136,342)	(141,942)	(147,639)	(153,434)	(159,682)	(166,071)	(172,605)	(179,287)	(186,120)	(193,108)	(200,255)
17801185. DisUnsubsRdg - Infringement Fines	(9,979)	(10,178)	(10,382)	(10,589)	(10,801)	(11,017)	(11,237)	(11,462)	(11,692)	(11,926)	(12,164)	(12,407)	(12,656)	(13,170)	(13,170)
17801320. DisUnsubsRdg - Other Income	(14,769)	(15,064)	(15,365)	(15,672)	(15,985)	(16,305)	(16,631)	(16,964)	(17,304)	(17,650)	(18,003)	(18,363)	(18,730)	(19,492)	(19,492)
Expenditure	340,765	342,963	345,145	347,400	349,730	352,110	354,539	357,008	359,523	362,101	364,729	367,406	370,141	375,810	375,810
17802280. DisUnsubsRdg - Depreciation	230,821	230,821	230,764	230,729	230,729	230,729	230,729	230,720	230,706	230,706	230,706	230,706	230,706	230,706	230,706
17802640. DisUnsubsRdg - Physical works contract	33,263	33,928	34,605	35,298	36,003	36,723	37,458	38,208	38,973	39,753	40,548	41,358	42,185	43,900	43,900
17802642. DisUnsubsRdg - Work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17802643. DisUnsubsRdg - SH Cleaning	49,229	50,213	51,215	52,240	53,284	54,349	55,437	56,547	57,679	58,834	60,010	61,209	62,434	64,972	64,972
17802650. DisUnsubsRdg - Infringement Notices	13,305	13,571	13,842	14,119	14,401	14,689	14,983	15,283	15,589	15,901	16,219	16,543	16,874	17,560	17,560
17803250. DisUnsubsRdg - Rates expense	14,148	14,431	14,719	15,013	15,313	15,620	15,932	16,251	16,577	16,908	17,246	17,591	17,943	18,672	18,672
Asset Additions/Sales	72,660	74,780	76,960	79,205	81,515	83,895	86,340	77,000	78,550	80,100	81,700	83,350	85,000	86,700	88,450
17807718. DisUnsubsRdg - Footpaths & Pedestrian Rnwls	72,660	74,780	76,960	79,205	81,515	83,895	86,340	77,000	78,550	80,100	81,700	83,350	85,000	86,700	88,450

Full Code	2021/22 Year1	2022/23 Year2	2023/24 Year3	2024/25 Year4	2025/26 Year5	2026/27 Year6	2027/28 Year7	2028/29 Year8	2029/30 Year9	2030/31 Year10	2031/32 Year11	2032/33 Year12	2033/34 Year13	2034/35 Year14	2035/36 Year15
3753. Unsubsidised Roading Cromwell															
Income	(278)	(278)	(290)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)
37531010. Unsub Rdg Crom - Rates	(278)	(278)	(290)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)
Expenditure	278	278	290	435	435	435	435	435	435	435	435	435	435	435	435
37532606. Unsub Rdg Crom - Investment A/c Interest	278	278	290	435	435	435	435	435	435	435	435	435	435	435	435
Full Code	2036/37 Year16	2037/38 Year17	2038/39 Year18	2039/40 Year19	2040/41 Year20	2041/42 Year21	2042/43 Year22	2043/44 Year23	2044/45 Year24	2045/46 Year25	2046/47 Year26	2047/48 Year27	2048/49 Year28	2049/50 Year29	2050/51 Year30
3753. Unsubsidised Roading Cromwell															
Income	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)
37531010. Unsub Rdg Crom - Rates	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)	(435)
Expenditure	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435
37532606. Unsub Rdg Crom - Investment A/c Interest	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435

Section 8

Improvement Plan

The following tables summarise the improvements that are proposed to this activity management plan and practises over the next 3 years. The plan will be revised by 1 December 2020 to align with Council and NZTA 3-year planning cycles.

Section 2: The Service We Provide

Clause	Action Required	Due Date
	Adoption of the new ONRC moderation classifications for the Central Otago District Council road network.	July 2021
	Preparation of a ten-year aggregate resourcing plan, ensuring the council's access to a sustainable supply of gravel from District pits to complete re-metalling programmes in the short and medium-term.	
	Complete work identifying structures requiring new, or revised, restrictions due to the changes in the Vehicle Dimensions and Mass Rule (2016).	
	Progress the structures maintenance programme based on planned funding levels.	
	Complete the draft District roads Speed Limit Bylaw, using the new Speed Management Framework. Develop and deliver the programme of improvements required to support the Bylaw, once adopted.	
	Undertaking network inspections on rural Primary Collector, Secondary Collector and identified Access/Low Volume Access sealed roads to develop three-year programmes for targeted Safety, Resilience, Accessibility and Amenity Level of Service outcomes.	
	Undertaking network inspections on identified Access/Low Volume Access unsealed roads to develop three-year programmes for targeted Safety, Resilience, Accessibility and Amenity Level of Service outcomes.	
	Complete surfacing work at the current sites identified for ECO sealing and ECO seal renewals under the council's Dust Suppression Roading policy. Review the future policy once current sites are constructed.	
	Prioritise targeted shoulder maintenance work in-line with site inspections and NZTA Technical Audit findings.	

Section 3: Demand and Growth

Clause	Action Required	Due Date
3.2, 3.3	Review growth forecasts on a 3-year cycle.	
3.6	Undertake land use and roading survey on the council's gravel road hierarchy. The results will inform potential changes in road uses, which may require adjustments to future maintenance and renewals programmes.	
3.6, 3.7	Include the public access points to conservation areas in the review the of method to establish the value of individual rural roads to the wider community, the level of service on rural Low Volume Access roads and the criteria for determining which roads will be maintained by Council.	
3.10, 3.11	Continue the traffic count program implementation to address gaps and provide robust up to date traffic estimates.	Ongoing
3.12	Develop preliminary assessment and Business Cases in support of "Road to Zero" Road Safety Strategy and Speed Management Framework (Low Cost Low Risk Improvement) projects for Transportation	
3.12	<p>Continue to develop evidence, assessment and Business Cases required for the following major Capital projects for Transportation:</p> <p>Clyde Precinct Development – looking at the potential Traffic Engineering and planning requirements to manage the peak traffic in the centre of the township. We are focussing on the issues of parking, intersection safety and the use of the precinct areas by a range of vehicles, cyclists and pedestrian traffic.</p> <p>Cromwell Town Centre – Analysis of the future requirements for area-wide traffic calming and Intersection improvements at Sargood Road, Barry Avenue, Murray Terrace and Waenga Drive. With continued growth in Cromwell, monitoring of the performance and safety on this section of the network may result in prioritising a programme of Improvements at these locations.</p> <p>Alexandra 'northern link road' - Analysis of the future requirements for a new road to take increased traffic from Boundary Road and Dunstan Road to State Highway 8, in conjunction with intersection improvements. The initial investigation will need to involve Transportation Engineering inputs to evaluate the potential traffic impacts of future development.</p> <p>Infrastructure that supports mode shift away from private cars for local traffic and recreational users is considered a high priority as the development and linkages of the cycle trail network across Central Otago is developed. This forms a key component of all three major growth projects.</p>	
3.13	Develop preliminary assessment and Business Cases in support of Resilience Plan (Low Cost Low Risk Improvement) projects for Transportation	

Section 4: Risk

The improvement plan includes the mitigations identified in the Risk Register in section 4. These actions have not been reproduced in this section.

Section 5: Central Otago's Assets

Clause	Action Required	Due Date
5.1	Annually review and update the remaining lives stored in RAMM, and used for valuation purposes, to ensure consistent network management decision-making.	Ongoing
5.3	Undertake a condition inspection of all unsealed roads in the council's 'Tracks' sub-classification.	
5.3	Undertake a condition inspection and develop an Asset Management strategy for the council's Eco-seal surfacing assets.	
5.4	Preparation of the council's District Bridging Strategy, ensuring the council's bridging asset maintenance, renewals and replacement programme remains "fit for purpose" and affordable in the short and medium-term.	
5.4	Undertake inventory collection for minor structures and retaining wall asset data.	
5.5	Undertake an updated condition assessment on drainage assets, to include a review of culvert and soakpit age data recorded in RAMM.	

Section 6: Management

Clause	Action Required	Due Date
6.2	Develop methodology for measuring and reporting the council's performance in addressing Improvement Plan and audit issues.	
6.6	Annual review of grading program	Annually
6.7	Complete bridge analysis and prepare District Bridge Strategy	
6.10	Review street light maintenance contract or service agreement arrangements.	
6.13	Review the Road Safety Action Plan developed for the 2016-18 period, and update as required for the 2020-2030 Road to Zero strategy.	

Section 7: - What Will it cost and How Will We Pay For It?

Clause	Action Required	Due Date
7.7	Undertake a review of the financial strategy	

APPENDIX 1 – RISK REGISTER

Planning Risks																
Risk Element					Risk Analysis & Evaluation						Risk Treatment Plan					
Number	Primary ONRC Outcome/ Impact	Risk Description	Outcome/ Result	Example consequence	Consequence	Likelihood	Risk Rating	Existing Practices and Strategies (Controls)	Consequence	Likelihood	Risk Rating	Action/Resource Requirement	Year	Owner	Indicator	Reporting Method
1	Safety	Non-compliance with legislation and legal requirements - Health and Safety	Inability or failure to comply with Health and Safety changes.	No traffic management audits undertaken due to under-resourcing. No health and safety audits. Changes to legislation makes Council and staff liable up to \$3m. Council decisions with staff liable.	High	High	High	Requirement for contractor OSH compliance, but not actively monitored due to resource constraints.	High	High	High	Council investigating a dedicated Health & Safety resource. Seek funding for additional roading resource (cadet level).	Late 2015	MIS	Resources approved and recruited	Audit Report
2	Cost Efficiency	Ineffective district and corporate planning to deliver community outcomes. Community planning targeting needs.	Lack of integration between council units; pursuing conflicting objectives; causing council-wide issues related to District Planning or funding issues	Inefficient expenditure; Unsustainable development.	Medium	Medium	Medium	Nil	Medium	Medium	Medium	Update community outcomes. Strategic vision necessary for Council. District Plan review to include input from service providers.	Ongoing	RM	Good audit report on integrated planning.	Audit Report
3	Cost Efficiency	Inadequate or inappropriately defined and delivery of levels of service expectations.	Misalignment between stakeholder expectations and delivery.	Service failure; over or under expenditure; community dissatisfaction.	Medium	Very High	Critical	Normal AMP process along with integration of ONRC parameters.	High	Low	Medium	Roading network plan to assist decision makers and stakeholders on service levels.	2015-18	RM	Robustness of evidence base	AMP / LTP
4	Cost Efficiency	Inadequate bylaws/policy or inability to comply with council's strategy, policy, bylaws.	Not meeting council standards; ineffective decision making	Inefficient work practice, reputational damage.	Medium	Medium	Medium	Bylaw with Council for approval (Dec 2014)	Medium	Very Low	Low	Retain existing controls	2014	RM	Bylaw enacted.	Council documentation.
5	Cost Efficiency	Political influence determines organisational behaviour	Long term strategic focus limited by 3 year electoral cycle.	Poor decision making; low support for staff decision making.	Low	Medium	Medium	Staff / Political Leadership and Interface	Low	Low	Low	Retain existing controls	Ongoing	RM	Planning documents approved and upheld.	Council documentation.
6	Cost Efficiency	Inadequate asset management/ infrastructure strategy planning including embedding the ONRC.	Planning of inadequate quality or timing; not being up to date or the processes and outputs being of insufficient quality. Growth forecasts or lifecycle modelling inaccurate.	Inappropriate financial and asset provision due to not embedding the ONRC into decision making.	High	Low	Medium	ONRC Transition Plan under development. ONRC is included within the 2015-25 LTP.	Low	Low	Low	Fully embedding the ONRC.	2015-18	RM	Investment received	2018 RLTP and LTP.
7	Cost Efficiency	Under or over estimating the effects of climate change	Inadequate council readiness or overly conservative design and excessive use of funds. Planned works is deferred when events occur as they take priority.	Flooding, storms.	High	Very Low	Low	Monitor and review cost associated with emergency / reactive works, related to weather events.	High	Very Low	Low	Continue to monitor costs of events, and failure modes to update intervention strategy.	Ongoing	RM	ONRC Resilience Measure (OM1) and Cost Efficiency	Audit Report and ONRC
8	Cost Efficiency. Accessibility	Inaccurate traffic demand planning and management	Unanticipated increase in demand reduces life of roads; higher than expected maintenance and renewal costs; insufficient investment to rehabilitate assets	Unforeseen or unbudgeted maintenance and renewal requirements.	Low	Very Low	Negligible	Deterioration modelling in place.	Low	Very Low	Negligible	Accurate road user rating system to observe land use change and forecasting. Review funding tools.	2015-18	RM	Robustness of evidence base	AMP / LTP

Management Risks																
Risk Element				Risk Analysis & Evaluation									Risk Treatment Plan			
Primary ONRC Outcome/ Impact	Risk Description	Outcome/ Result	Example consequence	Consequence	Likelihood	Risk Rating	Existing Practices and Strategies (Controls)	Consequence	Likelihood	Risk Rating	Action/Resource Requirement	Year	Owner	Indicator	Reporting Method	
9	All outcomes	Failure of internal and external culture and collaborative relationships	Dysfunctional relationships between departments, officers, co-investor, contractors, consultants, neighbouring networks.	Inefficient management and service delivery, lack of confidence in investment. Reputational damage	Medium	High	High	Ongoing focus on working relationships.	Medium	High	High	Alignment of culture and values with all partners. Specific intervention where needed to ensure alignment.	Ongoing.	MIS	Intervention carried out where needed	Internal documentation
10	All outcomes	Lack of / loss of staff resources	Inability to attract key staff and/or retain skilled staff. Reputational risk. Financial risks from loss of ability to fund the right things.	Loss of Knowledge, Lost Relationships. Delivery of agreed levels of service at an operational level.	High	Very High	Critical	HR Policy, training career development, salaries, avoid resignations,	Medium	High	High	Review the current resourcing level to enable succession planning and knowledge transfer of systems / processes.	Ongoing.	MIS	To be developed	Risk and Audit Committee
10	Safety. Resilience. Cost efficiency.	Inadequate asset knowledge	Unanticipated Asset Failure	Bridge Failure	Medium	Low	Medium	Inspections, RAMM, AM, collaborative RAPT reviews.	Medium	Very Low	Low	Implementation of dTIMS Improved structural monitoring. New funding provisions made in 2015 LTP.	2015	RM	Robustness of evidence base	AMP / LTP
11	Safety. Resilience. Cost efficiency.	Loss of system knowledge	Loss of asset data or institutional knowledge; inadequate systems in place to manage data/information, regarding asset performance and condition; information technology failure.	Loss of asset data leading to unforeseen asset failure.	Medium	Very Low	Low	Normal management processes, data backup, document control.	Medium	Very Low	Low	Retain existing controls	Ongoing	RM	Robustness of evidence base	AMP / LTP
12	Cost Efficiency	Liability	Exposure to financial consequences	Significant Financial Burden from disaster or failure	High	Low	Medium	Maintain Risk Register and undertake necessary actions. Manage liability through Insurance Cover or Council acceptance of exposure.	High	Very Low	Low	Retain existing controls	Ongoing	RM	Compliance with Council Risk Strategy	Risk and Audit Committee
13	Cost Efficiency	Failure of investment or funding strategy	Misalignment between LOS, delivery and co-investment partner, leading to failure to acquire appropriate investment.	Gap between expectation and ability to deliver widens. Unable to deliver the desired/minimum level of service.	Medium	Medium	Medium	Financial Planning, Analysis and Reporting. Linkages with ONRC and RNP. Close relationship with P&I.	Medium	Low	Medium	Prepare a prudent financial strategy with the support of Council and NZTA.	Ongoing	RM	Investment received	2018 RLTP and LTP.
14	All outcomes	Diminishing funding availability	Reduction in co-investment by NZTA or through decrease in rates funding.	Inability to maintain levels of service; degradation of assets over time due to insufficient reinvestment.	Medium	Medium	Medium	Proactively optimising expenditure to avoid programme reduction. Assurance of FWP through collaborative RAPT process.	Medium	Low	Medium	Retain existing controls	Ongoing	RM	Investment received	2018 RLTP and LTP.
15	Cost Efficiency	Diminishing Gravel Supplies (Availability, cost, ownership)	Carting gravel long distances or use crushed gravel.	Significant funding requirement for metalling programme and/or reduction in service levels.	Medium	Medium	Medium	Nil	Medium	Medium	Medium	Investigate gravel costs, sources and procurement policy.	2015	RM	Procurement costs contained	Report to Council.
16	Cost Efficiency	Oil Price increases beyond expectation	Significant increase in material costs.	Inability to maintain levels of service; degradation of assets over time due to insufficient reinvestment.	Medium	Medium	Medium	BERL forecasting assumptions.	Medium	Low	Medium	Review of levels of service and extent of network if necessary	Ongoing	RM	To be developed as needed	Report to Council.
17	All outcomes	ORC Consent Renewal	CMA, bridges and drainage works.	No renewal. Loss of generic consenting.	Medium	Low	Medium	Register of consents.	Medium	Low	Medium	Renew consents. Ensure monitoring/reporting on consents is completed.	Ongoing	RM	Consents in place	Council documentation.
18	Cost Efficiency	External economic influences	Economic downturn leading to reduction of employment/money in local economy; pressure to reduce rates.	Inability to maintain levels of service; degradation of assets over time due to insufficient reinvestment.	Very Low	Low	Negligible	Nil	Very Low	Low	Negligible	Review of levels of service and extent of network if necessary	Ongoing	RM	To be developed as needed	Report to Council.

Delivery Risks																
Risk Element					Risk Analysis & Evaluation							Risk Treatment Plan				
Primary ONRC Outcome/ Impact	Risk Description	Outcome/ Result	Example consequence	Consequence	Likelihood	Risk Rating	Existing Practices and Strategies (Controls)	Consequence	Likelihood	Risk Rating	Action/Resource Requirement	Year	Owner	Indicator	Reporting Method	
19	Cost Efficiency	Inadequate procurement strategy and practices	Not using optimal procurement options, resulting inefficient and ineffective procurement.	Poor value for money; excessive demands on staff time; delays. Increased Health and Safety risks due to legislative changes. Needed to meet NZTA funding obligations.	Medium	High	High	Procurement Policy in place and effective, but overdue for review.	Medium	High	High	Undertake corporate review of Procurement Policy.	2014/15	CE	Procurement Policy in place	Council documentation.
20	Amenity	Contractor creates unacceptable environmental impact.	Degradation of the physical environment	Environmental, cost and reputational impacts.	Medium	Low	Medium	Contractor (FH) Environmental Management Planning, Training, Consents, PI, PL Insurance	Medium	Very Low	Low	Retain existing controls	Ongoing	RM	ONRC Amenity Outcomes	ONRC Reporting.
21	Cost Efficiency	Consultant(s) difficult / expensive to retain	Reduction on availability of consultants; competition between consultants (possibly due to change of NZTA contract model).	Ineffective use of financial resources.	Low	Medium	Medium	Procurement Policy	Low	Low	Low	Closer project management/monitoring or service outcomes. Attribute based procurement being more rigorous.	Ongoing	RM	ONRC Cost Effectiveness Outcomes	ONRC Reporting.
22	All outcomes	Inadequate project management	Projects inadequately scoped, budgeted, managed, documented, and reviewed/inadequate consultation with owners/resource consent issues	Project delays; increased cost; reputational damage	Low	Medium	Medium	Normal management processes.	Low	Low	Low	Retain existing controls	Ongoing	RM	ONRC Cost Effectiveness Outcomes	ONRC Reporting.
23	Cost Efficiency	Inadequate maintenance contract management	Poor contractor performance; unnecessary or excessive costs and/or insufficient output or quality	Ineffective utilisation of financial resources	Medium	Medium	Medium	Normal management processes.	Medium	Low	Medium	Retain existing controls	Ongoing	RM	ONRC Cost Effectiveness Outcomes	ONRC Reporting.
24	Amenity	Oiling Of Roads	Environmentally Unacceptable	Unacceptable. CODC negative image. Oil into waterways and/or adjacent land. Vehicle damage.	Low	Very High	High	In compliance with ORC Requirements.	Low	Very Low	Negligible	Phasing out, based on metalling and eco-sealing programme.	2015-2018	RM	ONRC Amenity Outcomes	ONRC Reporting.
25	All outcomes	Loss of contractor and shortage of suitable alternatives	Contractor relocates or goes out of business; lack of alternative suppliers.	Interruption to programmed work. Loss of knowledge and resources.	Low	Very Low	Negligible	Providing consistent, balanced forward works programme to ensure sustainable cashflows.	Low	Very Low	Negligible	Retain existing controls	Ongoing	RM	ONRC Cost Effectiveness Outcomes	ONRC Reporting.
26	All outcomes	Poor representation in local media	Lack of public information / debate	Poor perception. Poor reporting. Poor Relationships.	Very Low	Medium	Low	Media training and relationship management. Experienced people working with media.	Very Low	Low	Negligible	Retain existing controls	Ongoing	RM	Positive customer satisfaction	Customer satisfaction surveys
27	All outcomes	Undue influence from Lobby Groups	Lobby groups (Developers, Recreational, Business Groups etc) exert pressure on council and/or staff.	Distraction from strategic focus; reputational damage.	Very Low	Medium	Low	Normal management processes.	Very Low	Low	Negligible	Implement a communications programme to provide good information on the lobby issues.	Ongoing	RM	To be developed	To be developed
28	All outcomes	Inadequate public relations management	Public misunderstanding of infrastructure problems, projects and programmes	Reputational damage; lack of public support; impact on staff morale.	Very Low	Medium	Low	Communication plans on large improvement projects.	Very Low	Low	Negligible	Implement a communications programme to provide good information on day to day activities.	Ongoing	RM	Positive customer satisfaction	Customer satisfaction surveys
29	All outcomes.	Unsatisfactory working relationships with utilities	Power, telecommunications, council water and waste, etc.	Delays to projects and negative impacts on service levels/ coordinating work programmes	Low	Low	Low	Normal management processes. Close attention to managing CAR's.	Low	Very Low	Negligible	Retain existing controls	Ongoing	RM	CAR's Issued and time to do so	ONRC Reporting.

Risk Element				Risk Analysis & Evaluation									Risk Treatment Plan				
				Total Inherent Risk (without controls)			Existing Practices and Strategies (Controls)	Current Risk (after applying existing controls)			Treatment Plan (CE = Chief Executive, MIS = Manager Infrastructure Services, RM = Roading Mnager, RE = Roading Engineer)						
Primary ONRC Outcome/ Impact	Risk Description	Outcome/ Result	Example consequence	Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating	Action/Resource Requirement	Year	Owner	Indicator	Reporting Method		
Physical Asset Risks																	
30	Safety. Access. Resilience. Cost Efficiency.	Critical and high risk asset failure. Bridges, key routes, structures.	Loss of access, Fatal and Serious Injuries to users.	Bridges - unpermitted activity overloading bridge and causing collapse. Life, damage, fiscal impacts.	Very High	Medium	High	Mobile cameras to monitor noncompliance with postings.	Very High	Medium	High	Analysis of structural integrity of bridges where unpermitted activity, but also investigating how we can provide access.	Ongoing	MIS	ONRC Resilience Measures	ONRC Reporting	
31	Access.	LV Access roads condition.	Lack of access for farmer stock trucks. Use by innappropriate vehicles directed by GPS, Navigation.	Hawkesburn Road being used by tourists. Farmers being asked to rescue people stuck. Land use changes increasing demand.	Medium	Very High	Critical	High risk routes closed in winter. Sign posted.	Medium	High	High	Enhanced drainage and grading on critical routes.	Ongoing	MIS	ONRC Accessibility Measures	ONRC Reporting	
32	All outcomes.	Major Earthquake	Transportation asset damage.	Major Fault Rupture with substantial transportation asset damage.	Very High	Very Low	Medium	Lifelines work. Emergency response training.	Very High	Very Low	Medium	Minimise consequence: Resilience analysis of lifeline assets, particularly bridges. Emergency Response and Procedures Plan to be developed. Consider Insurance options.	Ongoing	RE	Plan is in place and operational. (ONRC Resilience Measure)	ONRC Reporting	
33	Cost Efficiency. Resilience. Safety.	Flooding	Transportation asset damage. Roads, bridges, structures.	Cost to reinstate assets. Temporary loss of accessibility.	High	Medium	High	Knowledge of hot spots. Early weather warnings. ORC river level monitoring.	Medium	Medium	Medium	Lifelines work. Structural inspections and targeted planned maintenance on assets. Resilience Plan and Response procedures. Risk targeted renewals programmes within asset management strategies.	Ongoing	RM	ONRC Resilience Measure (OM1)	ONRC Reporting	
34	Cost Efficiency. Resilience. Safety.	Landslides	Landslip effecting transportation asset damage. Loss of life. Loss of access and route resilience.	Transportation asset damage, opportunity cost of economic activity.	Medium	Medium	Medium	Know high risk sites. Inspect during rainfall events.	Medium	Medium	Medium	Staff and budget necessary to mitigate likelihood via proactive inspections.	Ongoing	RM	ONRC Resilience Measure (OM1)	ONRC Reporting	
35	Resilience. Safety.	Severe Ice/Snow	Access and Travel Time risk.	District wide event with significant snow and severe cold temperatures.	Medium	Medium	Medium	Severe weather warnings observed. Winter preparations. Communications plan. CIMS training undertaken. Registers of sub-contractor equipment and local volunteers. Winter Operation Plan in place.	Low	Medium	Medium	Retain existing controls. Capture key learnings for continuous improvement.	Ongoing	RM	ONRC Resilience Measure (OM1)	ONRC Reporting	
36	Safety. Resilience. Cost Efficiency.	Trees on Road Reserve	Trees on road reserves blowing over and or cause fires. Sight line risks. Root damage to asset, and creating surface hazards.	Death by falling tree and/or firestorm.	Medium	Low	Medium	High risk trees identified but not implemented due to budget constraints.	Medium	Low	Medium	Analysis of tree risk during maintenance inspections. Seek investment for high risk tree removal. Proactive maintenance.	Ongoing	RE	ONRC Sight Lines, Hazards, Roadside obstructions	ONRC Reporting	

APPENDIX 2 – VISUAL CONDITION RATING GUIDE

Condition-Rating	Mudtanks	Culverts	Kerb-and-Channel	Footpaths
Excellent				
Good				
Average				
Poor				
Very-Poor				

REG. 7 THE ROAD EFFICIENCY GROUP
ONE NETWORK ROAD CLASSIFICATION

ROAD MAINTENANCE VISUAL GUIDE



Road Maintenance Visual Guide: Introduction

The One Network Road Classification (ONRC) was born from the opportunity for a better and more transparent way to plan and invest in maintaining and operating New Zealand’s road networks.

The ONRC classifies networks across New Zealand in terms of usage, and groups Customer Outcomes as Access, Amenity, Resilience, Safety or Travel Time Reliability.

This guide provides assistance with five of the performance measures; four safety measures, and one amenity measure.

Each of these measures requires a sample of the network to be inspected and the level of compliance recorded. The data should be entered into the ONRC Performance Reporting Tool. This will enable consideration of the performance levels with other performance measures or outcome measures, as well as similar road networks

It is intended to provide guidance and direction for:

- a. Anyone involved in managing a state highway and/or local authority roading network.
- b. Anyone involved in developing road maintenance contract documents and/or operational performance measures for a local authority.

The guide is not intended to cover every asset, condition or situation that may arise on the network. It is intended to be used as a guide to ensure a consistent interpretation of what is deemed acceptable, marginal and unacceptable with regards to the performance measures requiring auditing in the field. Marginal items could require further site-specific analysis.

This is a living document that will be updated periodically.

If you have any feedback regarding this guide, or you have photos that will help improve this guide, please feel free to contact roadefficiencygroup@nzta.govt.nz



Safety (How road users experience the safety of the Journey)

ACCEPTABLE		MARGINAL	UNACCEPTABLE	
				
Sight distance well maintained through vegetation control	Sight distance to sign slightly obscured by overgrown vegetation, however sign still visible and legible	Sight distance to sign slightly obscured by overgrown vegetation, however sign mainly visible and legible	Sight distance to sign obscured by overgrown vegetation	Sight distance around curve and to edge marker post obscured by overgrown vegetation
				
Sight distance well maintained through verge mowing	Reasonably long verge grass although sight distance not affected. Long vegetation growing on sight	Long vegetation growing on sight bench affecting forward sight distance around curve	Sight distance to sign obscured by overgrown vegetation	Sight distance to sign obscured by overgrown vegetation
				
Sight distance maintained through vegetation growth on sight bench	Reasonably long verge grass although sight distance not affected	Sight distance to edge marker post slightly obscured by overgrown vegetation	Sight distance to sign obscured by overgrown vegetation	Sight distance to sign obscured by overgrown vegetation

Technical Output Performance Measure 3: Sight Distances

Sight distance (including hazard warning devices) are not obscured by vegetation or by unauthorised obstructions (advertising signage, etc)

Measured by an inspection of the network annually; the target is 100% compliance.

Safety (How road users experience the safety of the Journey)

ACCEPTABLE		MARGINAL	UNACCEPTABLE	
				
Small potholes on a straight, will not affect driver behaviour	Isolated small pothole, unlikely to affect driver behaviour	Medium size pothole, approx. 150mm in diameter. May affect driver behaviour	Large potholes near wheel path, will affect driver behaviour	Large pothole in wheel path near curve exit. Will result in driver taking evasive action
				
Small pavement deformation on a straight, will not affect driver behaviour	Isolated pavement deformation on a straight, unlikely to affect driver behaviour	Medium size pothole, approx. 30mm in height. May affect driver behaviour depending on location	Large pavement deformation in high speed environment, will affect driver behaviour	Large pavement deformation at approach to intersection, will affect driver behaviour
				
Slight edge break into sealed shoulder, will not affect driver behaviour	Significant edge break, confined to sealed shoulder. Unlikely to affect driver behaviour	Edge break encroaching into the edge line. May affect driver behaviour	Edge break encroaching into the trafficked lane. Highly likely to affect driver behaviour	Edge break encroaching into the trafficked lane. Will affect driver behaviour

Technical Output Performance Measure 7: Surface Faults

(page 1 of 2)

Number of maintenance related faults (such as rutting / depressions, shoving, potholes, corrugated length, edge break (in lane), and ponding water) that are likely to affect driver behaviour, e.g. requiring a reduction in speed or evasion

Measured by an inspection of 10% the network as part of sealed roads Condition Rating, with the number of deficient locations recorded per 50m.

Safety (How road users experience the safety of the Journey)

Technical Output Performance Measure 7: Surface Faults

(page 2 of 2)

ACCEPTABLE		MARGINAL		UNACCEPTABLE	
					
Small potholes in low speed environment. Highly unlikely to affect driver behaviour	Potholes in low speed environment. Unlikely to affect driver behaviour	Potholes in mid-speed environment. May affect driver behaviour	Potholes in reasonably high speed environment. Likely to affect driver behaviour	Large potholes in high speed environment. Will affect driver behaviour	
					
Minor ponding water in urban (low speed) environment. Will not affect driver behaviour	Water running across road. Unlikely to affect driver behaviour	Small area of ponding water. May affect driver behaviour depending on location	Water ponding in wheel path in high speed area. Likely to affect driver behaviour	Water ponding in lane at approach to intersection. Will affect driver/cyclist behaviour	
					
Small corrugations in low speed environment. Highly unlikely to affect driver behaviour	Corrugations in low speed environment. Unlikely to affect driver behaviour	Corrugations in mid-speed environment. May affect driver behaviour	Corrugations in reasonably high speed environment. Likely to affect driver behaviour	Corrugations in high speed environment. Will affect driver behaviour	

Number of maintenance related faults (such as rutting / depressions, shoving, potholes, corrugated length, edge break (in lane), and ponding water) that are likely to affect driver behaviour, e.g. requiring a reduction in speed or evasion

Measured by an inspection of 10% the network as part of sealed roads Condition Rating, with the number of deficient locations recorded per 50m. Unsealed roads measured by an inspection of the network annually; the target is 100% compliance.

Safety (How road users experience the safety of the Journey)

ACCEPTABLE		MARGINAL	UNACCEPTABLE	
				
Guardrail in effective operating condition	Guardrail superficially damaged but still in effective operating condition	Guardrail damaged, needs inspection to determine if in effective operating condition	Guardrail damaged, not in effective operating condition	Guardrail significantly damaged, not in effective operating condition
				
Slight damage to bridge rail, still in effective operating condition	Damage to bridge rail, still in effective operating condition	Guardrail not attached to block out post, although may still be in effective operating condition	Guardrail missing block out. Unlikely to be in effective operating condition	Guardrail damaged, not in effective operating condition
				
Bridge rail in effective operating condition	Damage to bridge rail, still in effective operating condition	Guardrail damaged, needs inspection to determine if in effective operating condition	Guardrail damaged, not in effective operating condition	Bridge rail damaged, not in effective operating condition

Good Practice (not a formal performance measure): Guardrails and Barriers
















All traffic restraining devices such as bridge side rails, guardrails, wire rope barriers and crash cushions are maintained in an effective operating condition.

Measured by an inspection of 100% the network, the target is 100% compliance.

Note – this is indicative and to be used as a guide only. Guardrails, wire rope barriers and crash cushions should be installed and maintained as per the manufacturers standards

Safety (How road users experience the safety of the Journey)

Technical Output Performance Measure 10: Roadside Obstructions

ACCEPTABLE		MARGINAL	UNACCEPTABLE	
				
Roadside maintained free from obstructions	Roadside maintained free from obstructions	Small, unauthorised signs at intersection. May be an obstruction	Sapling allowed to grow, will become an obstruction in the future	Car abandoned beside road
				
Roadside maintained free from obstructions	Roadside maintained free from obstructions	Excess aggregate left in roadside verge. May be an obstruction	Car abandoned beside road	Sapling allowed to grow, will become an obstruction in the future
				
Roadside maintained free from obstructions	Roadside maintained free from obstructions	Saplings allowed to grow, may become obstructions in the future	Large unauthorised sign beside road	Installation of new power pole close to road

Roadside safety zones are maintained free from unauthorised obstructions and the development of new hazards

Measured by an inspection of 100% the network, the target is 100% compliance.

Amenity (How road users experience the aesthetic aspects of the Journey)

Technical Output Performance Measure 2: Aesthetic Faults

No more than X defects per 5 kilometre sample length of aesthetic maintenance related faults (such as litter, damaged or non-functioning equipment or furniture, graffiti, vegetation, etc.) that are likely to detract from the customer's experience

ACCEPTABLE		MARGINAL	UNACCEPTABLE	
				
Rest area furniture in good condition. Nothing that will detract from the customer's experience	Random sticker on traffic sign. Unlikely to detract from the customer's experience	Rest area table in good condition, however grass marginal. May detract from the customer's experience	Graffiti on bridge end. Likely to detract from the customer's experience	Graffiti on traffic sign. Likely to detract from the customer's experience
				
Rest area furniture in good condition, vegetation well maintained. Nothing that will detract from the customer's experience	Litter within road reserve, however is not visible to motorists. Will not detract from the customer's experience	Rest area table in marginal condition, minor visible litter. May detract from the customer's experience	Damaged rest area table. Likely to detract from the customer's experience	Graffiti on traffic sign. Likely to detract from the customer's experience
				
No litter, graffiti, overgrown vegetation. Nothing that will detract from the customer's experience	Well maintained roadside landscaped area. Nothing that will detract from the customer's experience	Minor items of litter visible to motorist. May detract from the customer's experience	Multiple items of visible litter. Likely to detract from the customer's experience	Multiple large items of visible litter. Will detract from the customer's experience

Measured by an inspection of the network and reported on number of defects assessed by sample length. This covers activities such as graffiti, vegetation control, rest area facilities etc. The compliance target differs by road classification.

APPENDIX 3 – DTIMS DETAILED OUTPUTS

APPENDIX 4 – FOOTPATH ACTIVITY MANAGEMENT PLAN

Central Otago District Council





Footpath Assets

Asset Management Plan (Concise)



Version 2

November 2018

Document Control		Central Otago District Council Footpath Assets Asset Management Plan				 IPWEA <small>INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA</small>	 JRA
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NAMS.PLUS Asset Management Plan Templates

NAMS.Plus offers two Asset Management Plan templates – ‘Concise’ and ‘Comprehensive’.

The Concise template is appropriate for those entities who wish to present their data and information clearly and in as few words as possible whilst complying with the ISO 55000 Standards approach and guidance contained in the International Infrastructure Management Manual.

The Comprehensive template is appropriate for those entities who wish to present their asset management plan and information in a more detailed manner.

The entity can choose either template to write/update their plan regardless of their level of asset management maturity and in some cases may even choose to use only the Executive Summary.

The illustrated content is suggested only and users should feel free to omit content as preferred (e.g. where info not currently available).

The concise Asset Management Plan may be used as a supporting document to inform an overarching Strategic Asset Management Plan.

This is the **Concise** Asset Management Plan template.

DISCLAIMER: This draft report has been prepared for educational purposes only as part of undertaking a Professional Certificate in Asset Management Planning. The data and conclusions have not been reviewed for accuracy nor endorsed or adopted by the organization.

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TABLE OF CONTENTS

<u>1</u>	<u>EXECUTIVE SUMMARY</u>	1
	<u>1.1 The Purpose of the Plan</u>	1
	<u>1.2 Asset Description</u>	1
	<u>1.3 Levels of Service</u>	1
	<u>1.4 Future Demand</u>	2
	<u>1.5 Lifecycle Management Plan</u>	2
	<u>1.6 Financial Summary</u>	2
	<u>1.7 Asset Management Practices</u>	4
	<u>1.8 Monitoring and Improvement Program</u>	4
<u>2.</u>	<u>INTRODUCTION</u>	2
	<u>2.1 Background</u>	2
	<u>2.2 Goals and Objectives of Asset Ownership</u>	2
	<u>2.3 Core and Advanced Asset Management</u>	3
<u>3.</u>	<u>LEVELS OF SERVICE</u>	3
	<u>3.1 Customer Research and Expectations</u>	3
	<u>3.2 Strategic and Corporate Goals</u>	4
	<u>3.3 Legislative Requirements</u>	10
	<u>3.4 Customer Levels of Service</u>	11
	<u>3.5 Technical Levels of Service</u>	18
<u>4.</u>	<u>FUTURE DEMAND</u>	21
	<u>4.1 Demand Drivers and Demand Forecasts</u>	21
	<u>4.2 Demand Impact on Assets</u>	21
	<u>4.4 Demand Management Plan</u>	22
	<u>4.5 Asset Programs to meet Demand</u>	23
<u>5.</u>	<u>LIFECYCLE MANAGEMENT PLAN</u>	25
	<u>5.1 Background Data</u>	25
	<u>5.2 Operations and Maintenance Plan</u>	29
	<u>5.3 Renewal/Replacement Plan</u>	31
	<u>5.4 Creation/Acquisition/Upgrade Plan</u>	34
	<u>5.5 Summary of asset expenditure requirements</u>	36
	<u>5.6 Disposal Plan</u>	39
<u>6.</u>	<u>RISK MANAGEMENT PLAN</u>	40
	<u>6.1 Critical Assets</u>	40
	<u>6.2 Risk Assessment</u>	40
	<u>6.3 Infrastructure Resilience Approach</u>	43
	<u>6.4 Service and Risk Trade-Offs</u>	44
<u>7.</u>	<u>FINANCIAL SUMMARY</u>	46
	<u>7.1 Financial Statements and Projections</u>	46
	<u>7.2 Funding Strategy</u>	49
	<u>7.3 Valuation Forecasts</u>	49
	<u>7.4 Key Assumptions Made in Financial Forecasts</u>	50
	<u>7.5 Forecast Reliability and Confidence</u>	51
<u>8.</u>	<u>PLAN IMPROVEMENT AND MONITORING</u>	51
	<u>8.1 Status of Asset Management Practices</u>	51
	<u>8.2 Improvement Plan</u>	52
	<u>8.3 Monitoring and Review Procedures</u>	53
	<u>8.4 Performance Measures</u>	53
<u>9.</u>	<u>REFERENCES</u>	53

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1 EXECUTIVE SUMMARY

• 1.1 The Purpose of the Plan

Asset management planning is a comprehensive process to ensure delivery of services from infrastructure is provided in a financially sustainable manner.

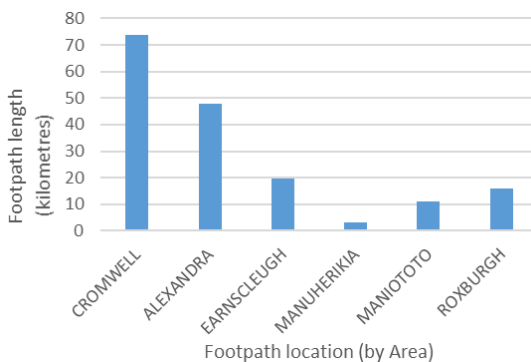
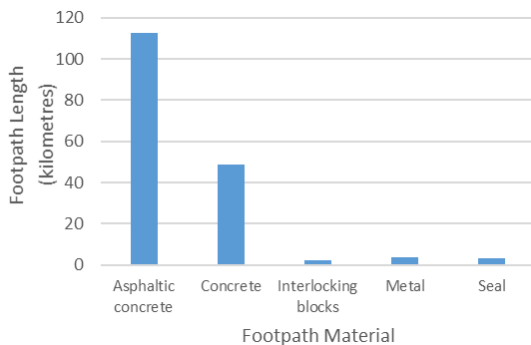
This asset management plan details information about **council's footpath assets**. It describes the actions required to provide an agreed level of service in the most cost effective manner, while outlining associated risks. The plan defines:

- the services to be provided;
- how these services are provided; and
- funds which are required to provide the services, over a 20-year planning period.

• 1.2 Asset Description

The Central Otago District footpath network measures **172 kilometres**. These infrastructure assets have significant value estimated at **\$19 million**.

The construction types and locations are as follows:



Cromwell's 75 kilometres of footpaths include the network of off-road sealed paths, referred to as 'greenways'. A significant proportion of Cromwell's footpath network is now 30 years old, and provides a level of service higher than other areas of the District.

Central Otago's assets include a number of recreational walking/cycling tracks, one pedestrian underpass at State Highway 8 at Clyde, and four off-road footbridges, which are not included in this Asset Management Plan.

• 1.3 Levels of Service

Our present funding levels are **insufficient** to continue to provide existing levels of service for council's network of footpaths at current levels in the medium term.

The main services consequences are:

- More existing footpaths – at, or nearing the end of their Useful Lives - potentially deteriorating to a condition where customer expectations are not met, resulting in reduced accessibility and increased complaints;
- Increased risks of poor footpath surfaces potentially causing personal injury, through trips and falls;
- Increased costs to renew failing assets (due to reduced maintenance) in the medium term; and
- A possible need to close or remove footpaths, which become either unsafe and/or uneconomic to repair.

These will be managed through funded programmes to maintain, renew and upgrade existing assets. In some cases, solutions to manage demand on the existing networks may provide cost-effective and acceptable levels of service to the community.

Performance Measures

Footpath services are currently reported under two targeted performance measures:

- Percentage of footpaths that meet our service standard for footpath condition (from up to 100% of the network surveyed); and
- Customer satisfaction with footpaths, included in council's Resident Opinion Survey.

Both measures are indicating acceptable performance, as follows:

Performance Measure	2017 Result	2018 Result
Percentage of footpaths condition rated as "Fair" or better.	81%	85%
Customer satisfaction with footpath services	82%	79%

• **1.4 Future Demand**

The main demands for new services are created by:

- Unprecedented growth in Central Otago’s main townships. This is resulting in high levels of new residential and commercial development where footpaths are provided. Additional services, such as schools and medical centres to support this growth, also significantly influence demand;
- District-wide population growth increasing local demand;
- Changes in population demographics, with significant increases projected in the number of elderly residents. This group, and younger children, are more dependent on footpath services; and
- Increased expectations for levels of service. This includes requests for footpaths, which have not always been provided in all residential and commercial developments.

Providing new assets to meet demand is managed through both council’s improvement programmes and contributed assets from development.

Demand management practices include non-asset solutions, insuring against risks and managing failures. Some currently being considered by council include:

- Removal of street trees, where footpath assets are experiencing reduced in-service lives due to root damage;
- Demolishing some lengths of footpath where the service provision is above the agreed level set by council;
- Achieving greater efficiency across council assets, by aligning footpath renewals with Water Services renewal works; and
- Closing or managing access to some footpaths where surface conditions are very poor, and alternative provisions exist.

• **1.5 Lifecycle Management Plan**

What does it Cost?

The projected outlays necessary to provide the services covered by this Asset Management Plan (Asset management plan) includes operations, maintenance, renewal, upgrade and new assets over the 10-year planning period is \$12.6million (or **\$1.26m on average per year**).

• **1.6 Financial Summary**

What we will do

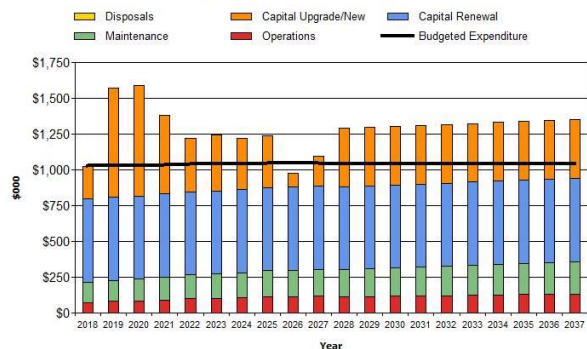
Estimated available funding for this **10-year period (2018/19 – 2027/28 financial years)** is **\$1.04m on average per year** as per the long term financial plan. This is **83%** of the cost to sustain the current level of service at the lowest lifecycle cost.

Executive Summary - What does it cost? (\$'000)

10 year total cost (Operations, Maintenance, Renewal & Upgrade projected expenditure)	\$12,560
10 year average cost	\$1,256
10 year total LTFP budget (Operations, Maintenance, Renewal & Upgrade Long-Term Financial Plan budgets)	\$10,397
10 year average LTFP budget	\$1,040
10 year Asset Management financial indicator	83%
10 year average funding shortfall	\$-216

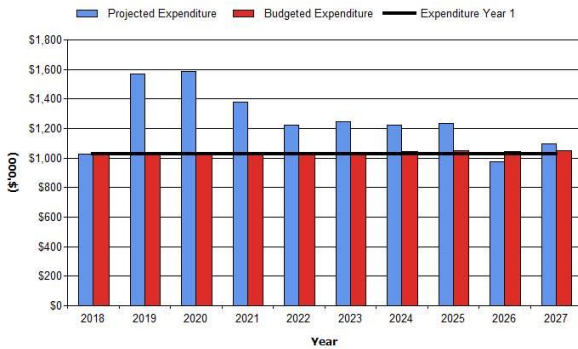
The infrastructure reality is that only what is funded in the long term financial plan can be provided. The emphasis of the Asset Management Plan is to communicate the consequences that this will have on the service provided and risks, so that decision making is “informed”.

Otago DC - Projected Operating and Capital Expenditure (Footpaths_S2_V4)



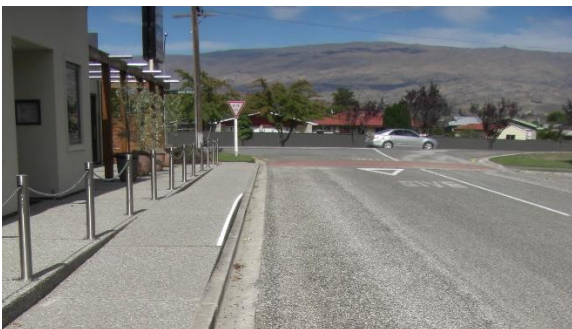
The allocated funding leaves a shortfall of **\$216,000** on average per year. This is the difference between the Budgeted Expenditure required to provide services in the asset management plan, compared with planned expenditure currently included in the long term financial plan. Figure values are in current (real) dollars.

Otago DC - Projected and Budget Expenditure for (Footpaths_S2_V4)



We plan to provide footpath services delivering:

- Operation, maintenance, renewal and upgrade programmes of footpaths and ‘greenways’ to maintain service levels, as set by annual budgets.
- Renewals and upgrades within the 10-year planning period to begin to address gaps in levels of service, identified locally across areas of the District and (more significantly) in the Pisa Moorings development.
- Upgrades to develop several streetscape schemes within the 10-year planning period, providing significant level of footpath service improvements in Clyde, Roxburgh and Ophir.
- Upgrades to address vulnerable road user safety and accessibility, including the renewal of existing pram crossings and the provision of new pedestrian crossing points.
- Upgrades to service new development, including the provision of a pedestrian underpass at State Highway 8B in Cromwell and potential upgrades to footpaths servicing the commercial precinct.



What we cannot do

We currently do **not** allocate enough funding to sustain these services at the desired standard or to provide all new services being sought. Works and services that cannot be provided under present funding levels are:

- Renewal programmes based on a funding level set to match annual depreciation costs of council’s footpath assets.
- Renewal programmes based on replacing all assets, which are coming to the end of their standard lives.
- All requested improvements and upgrades, which provide improvements to footpath levels of service in high-demand areas (for example, additional footpaths on routes near schools or upgrades to all pedestrian crossing points).

We will potentially **not** undertake some planned works over the 10-year planning period, determined by present funding levels:

- Identifying and deferring lower priority renewals and improvements, as part of a managed works programme, in years 4 to 10 of the long term financial plan. Current renewals budgets will be maintained at \$448,000 per year for the 10-year long-term financial period, leaving a shortfall in footpath renewals expenditure of \$133,000 each year.
- Deferring or reducing the extent and scope of footpath upgrades in Pisa Moorings, therefore not addressing all level of service gaps. Potentially only \$440,000 of funding - meeting approximately 50% of demand - will be provided in the ten-year plan.

Managing the Risks

Our present funding levels are **insufficient** to continue to manage all risks in the medium term.

The main risk consequences are:

- Service levels not met - Inadequate delivery of levels of service expectations. This could include; service failure, under-expenditure in works programmes, community dissatisfaction.
- Asset Failure - Critical and high-risk asset failure could result in loss of access, increased risk of injury to users, physical and reputational damage and fiscal impacts (increased whole-of-life costs and/or emergency repairs).
- Council/Contractor Systems - Not delivering contract objectives, and poor technical/contract management, will result in; disgruntled customers, decrease in level of service and poor asset management (asset degradation and asset failure inappropriately addressed).
- Procurement being inefficient and ineffective, which could result in under-priced and poor quality work, poor value for money, excessive demands on resourcing and delays.

We will endeavour to manage these risks within available funding by:

- Development and use of a best practice Asset Management Plan process.
- Consistently using good quality business, operational and project management processes.
- Procurement Policy in-place and effective.

• **1.7 Asset Management Practices**

Our systems to manage assets follow a “systems thinking” approach to delivery of services, and include:

- A completed and maintained Asset Management Plan which meets best practice standards and principles (IPWEA International Infrastructure Management Manual).
- Evaluating and reporting performance measures, which directly reflect footpath condition and customer satisfaction with the service level.
- A Fixed Asset Register providing annual and long-term financial planning of funding footpath asset renewals and upgrades.
- Footpath Asset Register (asset inventory) maintained and managed by council’s Assets team in RAMM and dTIMS software.
- Detailed condition and asset life information, regularly maintained as part of the asset inventory, with a high degree of confidence in the information.
- Footpath Condition Rating of up to 100% of the network completed annually, using visual assessment and surface roughness measurements.
- Physical Works maintenance Contract arrangements allowing staff to identify, record and prioritise maintenance works across the entire network.
- Combined asset condition, programme and funding analysis using NAMS.PLUS3 models.

Within the first year of the 10-year planning period, council will also be using a new footpath deterioration model to develop forward work programmes.

Assets requiring renewal/replacement are identified from a combination of three methods provided in the NAMS.PLUS3 ‘Expenditure Template’:

- Scenario 1 uses the full, current footpath Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year;
- Scenario 2 uses capital renewal expenditure projections from council’s planned works programme, condition rating and modelling systems; and

- Scenario 3 is a development of Scenario 2. It uses a combination of known average network renewals and upgrade costs (made by identified programme adjustments), plus council’s operations and maintenance activities projected expenditure to develop an optimised investment strategy.

Method (Scenario) 2 is used for budget forecasting used in this Asset Management Plan, with Method (Scenario) 3 analysis presented in Section 6.

• **1.8 Monitoring and Improvement Program**

The next steps resulting from this asset management plan to improve asset management practices are:

1. Complete development and support the adoption of the Asset Management Policy by council.
2. Complete assessment and adopt the results of the current Asset Maturity assessment, continuing towards developing an “Advanced” asset management system for council.
3. Complete review of council’s footpath asset inventory for completeness, working towards an International Infrastructure Management Manual data confidence level A – “Highly Reliable”:
 - Focus on validation of ‘greenway’ lengths.
4. Undertake a “Useful Life Improvement” assessment of council’s footpath assets. This will improve confidence levels in using Asset Register inventory data to determine renewal/replacement work (Method 1).
5. Continue to undertake annual footpath roughness surveys across 100% of the network assets.
6. Continue to evaluate and report footpath performance measures. Include full footpath programme within the “percentage of budgeted capital works completed” measure.
7. Complete the new footpath deterioration model and use it to validate renewal programmes in years 2 and 3. Use model as the basis for long-term financial planning for current years 4-10.
8. Develop preliminary assessment and Business Cases for the following major upgrades:
 - Clyde Precinct Development; and
 - Cromwell Town Centre
9. Re-establish good working systems and relationship between council and maintenance Contract staff adopting “systems thinking” principles. This will assist in planning and delivering best-value footpath renewals, upgrades and improvements.

• 2. INTRODUCTION

• 2.1 Background

This asset management plan communicates the actions required for the responsive management of assets (and services provided from assets), compliance with regulatory requirements, and funding needed to provide the required levels of service over a 10-year long-term financial planning period. **It directly informs council's Infrastructure Strategy, providing analysis and projections for 30-year funding requirements.**

The asset management plan is part of council's strategic planning documents. This should include the Asset Management Policy and Asset Management Strategy, where these have been developed and adopted. **It provides detailed supporting information for the current Annual Plan and council's Long Term Plan, published every three years.** Other documents which are to be read in conjunction with this plan are:

- Central Otago District Council Annual Plan 2018-19
- Central Otago District Council Long-Term Plan 2018-28
- Central Otago District Council Infrastructure Strategy 2018-48
- Central Otago District Council Transportation Activity Management Plan 2018-21
- New Zealand Government Policy Statement on Land Transport 2018
- The Otago Regional Land Transport Plan (Otago Regional Council) 2015-21
- New Zealand Transport Agency 2018-21 National Land Transport Programme
- The Road Efficiency Group: One Network Road Classification "Customer Levels of Service" and "Performance Measures"

The **footpath** assets covered by this asset management plan are shown in Table 2.1. These assets:

- Provide a network of formed footpaths, which meet the needs of users and the community;
- Provide for access to the road corridor for the location of services such as electricity, telecommunications, water and wastewater;
- Managing the impacts and access from adjoining land;
- Influencing road user behaviour and choices.

Table 2.1: Assets covered by this Plan

Asset type (Footpath Material)	Length (kilometres)	Replacement Value (\$000)
Asphaltic concrete	101.8	\$11,235
Concrete	48.7	\$5,713
Interlocking blocks	2.2	\$452
Metal	3.7	\$151
Seal	3.3	\$86
Greenway' Asphaltic concrete (*)	11.1 (*)	\$1,295 (*)
TOTAL	170.8 (*)	\$18,932 (*)

(*) Excludes assessment of approximately 1.6 kilometres of 'greenway' not reported from asset inventory

• 2.2 Goals and Objectives of Asset Ownership

Our goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance;

- Managing the impact of growth through demand management and infrastructure investment;
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service;
- Identifying, assessing and appropriately controlling risks;
- Linking to a long-term financial plan, which identifies required, affordable expenditure; and
- Management of how funds will be allocated to deliver outcomes.

Other references to the benefits, fundamental principles and objectives of asset management, used in the development of this plan, are documented in the International Infrastructure Management Manual 2015 ¹

• 2.3 Core and Advanced Asset Management

This asset management plan is prepared as a ‘core’ asset management plan over a 20-year planning period in accordance with the International Infrastructure Management Manual ². Core asset management is a ‘top down’ approach where analysis is applied at the system or network level. An ‘advanced’ asset management approach uses a ‘bottom up’ approach for gathering detailed asset information for individual assets.

Central Otago District Council assessed the Asset Management Maturity, and established targets, across the Transportation assets in 2017. A full Asset Management Maturity audit is underway, expected to inform development of the 2021-24 asset management planning (years 4 – 10):

Activity Management Plans	Data and Systems	Levels of Service	Demand Forecasting	Risk Management	Operations Management	Investment Decisions
Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate

Financial Forecasts	Asset Valuations	Improvement Planning	AM Teams	Service Delivery Models	Quality Management
Intermediate	Intermediate	Intermediate	Core	Intermediate	Core

• 3. LEVELS OF SERVICE

• 3.1 Customer Research and Expectations

This ‘core’ asset management plan is prepared to facilitate consultation prior to adoption by the Central Otago District Council. Future revisions of the asset management plan will incorporate community consultation on service levels and costs of providing the service. This will assist the council and stakeholders in matching the level of service required, service risks and consequences with the community’s ability and willingness to pay for the service.

Currently the community consultation is for significant upgrade proposals only, as part of the Long Term Plan process. Council have adopted the current Transportation Activity Management Plan 2018-21, which details the current long-term financial plan for all Transportation assets.

¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² IPWEA, 2015, IIMM.

As part of council’s “systems thinking” approach, all public calls to Council regarding transportation are recorded and trends are monitored quarterly. A review of public calls in 2017 confirmed that the vision and core values remain current. As Council has improved its workflow and processes over the past eight years, the number of calls on what matters to our customers has shifted from efficient work practises and quality outcomes to timely intervention and informed customers. This reflects where our effort has been placed in the past.

The numbers of calls are tracked, with an objective of reducing the number of calls over time. A reducing trend indicates that Council is delivering the vision and meeting the core values. A reduction in the number of calls also assists to improve efficiency, as work can be undertaken in a more co-ordinated, proactive manner rather than in a reactive manner. Cumulative annual calls numbers had remained at a largely steady level over three of the last four years, but increased in the last 12-month period. Public calls relating to footpath complaints have tracked at between 4.3% (2016/17) and 7.9% (2015/16) as a percentage of total calls received.

Table 3.1: Community Satisfaction Survey Indicators

Performance Measure	2016 Result	2017 Result	2018 Result	Target
Number of public calls categorised under “Footpath” fault types (number in brackets is %age of total public calls)	43 (8%)	25 (4%)	41 (6%)	≤600 (100%)*
Customer satisfaction with footpath services	87%	82%	79%	≥70%

* Central Otago District Council does not currently have targets for individual asset types within public calls

Community satisfaction information is used in developing the Infrastructure Strategy for council, and in the allocation of resources in the long-term financial plan.

● 3.2 Strategic and Corporate Goals

Council’s Long Term Plan and Annual Plan identify Central Otago’s vision for the Transportation activity as:

“to ensure an efficient, fully accessible, safe roading network”

In delivering this vision, the following five core values are defined in the Long Term Plan:

- Timely intervention
- Informed customers
- Quick response
- Efficient work practises
- Quality outcomes

3.2.1 One Network Road Classification

In 2014 the One Network Road Classification (ONRC) was introduced in New Zealand to standardise data and create a classification system which identifies the level of service, function and use of road networks and state highways.

The ONRC involves categorising roads based on the functions they perform as part of an integrated national network. This reflects a more customer-focussed approach to service delivery. The ONRC also provides national standards and a performance measures framework, in a step towards ensuring equity and consistency. Initially focussed on sealed roads, the ONRC now provides performance targets and service level across roading asset types.

Once a road – and the associated assets - classified under the ONRC, it should be maintained to the Customer Level of Service expected for roads of its type. The Customer Level of Service are defined by seven Customer Outcomes:

- Accessibility (land access and road network connectivity)
- Amenity (travel comfort and aesthetics)
- Resilience
- Safety
- Travel time reliability

3.2.2 Linkages between National, Regional and Local Outcomes

How council have established the linkages between the Council’s Transport Vision and the Values driving good customer outcomes alongside the Government Policy Statement, the One Network Road Classification, the Otago Regional Land Transport Plan and the Community Outcomes are demonstrated in Table 3.2.

Table 3.2: Goals and how these are addressed in this Plan

Central Government		National	Regional	District	Activity
Government Policy Statement		One Network Road Classification Customer Outcomes	Regional Land Transport Policy	Infrastructure Strategy	Transportation Vision
<p>Economic growth and productivity:</p> <p>A land transport system that addresses current and future demand for access to economic and social opportunities</p> <p>A land transport system that is resilient</p> <p>A land transport system that provides appropriate</p>		<p>Reliability:</p> <p>The consistency of travel times that road users can expect.</p> <p>Resilience:</p> <p>The availability (and restoration) of service to users of each road when there is a weather or emergency event, whether there is an alternative route available and the information provided to the road user.</p>	<p>A transport system that supports economic activity and productivity.</p> <p>A transport system that provides appropriate transport choices.</p>	<p>Reliability:</p> <p>The consistency of our services, and managing the impact of planned interruptions.</p> <p>Resilience:</p> <p>Our preparedness for emergency or weather events, and the availability and restoration of service when there is an event.</p> <p>Accessibility:</p> <p>The ability and ease of</p>	<p>Provide a fully <u>accessible</u> roading network.</p>

Central Government		National	Regional	District	Activity
Government Policy Statement		One Network Road Classification Customer Outcomes	Regional Land Transport Policy	Infrastructure Strategy	Transportation Vision
transport choice		<p>Accessibility:</p> <p>The ease with which people are able to reach key destinations and the transport networks available to them, including land use access and network connectivity.</p>		accessing our networks.	
<p>Road safety</p> <p>A land transport system that is a safe system, increasingly</p>		<p>Safety:</p> <p>How road users experience the safety of the road.</p>	A transport system that is safe.	<p>Safety:</p> <p>Managing the safety of the public and workers on our networks by</p>	Provide a <u>safe</u> roading network.

Central Government		National	Regional	District	Activity
Government Policy Statement		One Network Road Classification Customer Outcomes	Regional Land Transport Policy	Infrastructure Strategy	Transportation Vision
<p>free of death and serious injuries.</p> <p>A land transport system that increasingly mitigates the effects of land transport on the environment</p>		<p>Optimal Speeds:</p> <p>Indicates the optimal speed for each road. The optimal speed is the speed that is appropriate for road function (classification), design (including safety) and use. Optimal speeds support both safety and economic productivity.</p>		<p>adopting a risk based approach.</p> <p>Aesthetics and comfort:</p> <p>The look, taste, smell, and feel of our services, and the impacts they have on the environment.</p> <p>Services will be delivered in a manner which balances the current and</p>	

Central Government		National	Regional	District	Activity
Government Policy Statement		One Network Road Classification Customer Outcomes	Regional Land Transport Policy	Infrastructure Strategy	Transportation Vision
		<p>Amenity:</p> <p>The level of travel comfort experienced by the road user and the aesthetic aspects of the road environment (e.g. cleanliness, comfort, convenience, security) that impact on the travel experience of road users in the road corridor.</p>		<p>future impact on the environment, and makes use of sustainable practices.</p>	

Central Government		National	Regional	District	Activity
Government Policy Statement		One Network Road Classification Customer Outcomes	Regional Land Transport Policy	Infrastructure Strategy	Transportation Vision
<p>Value for money:</p> <p>A land transport system that delivers the right infrastructure and services to the right level at the best cost</p>		<p>Cost Efficiency:</p> <p>Value for money and whole of life cost will be optimised in the delivery of affordable customer levels of service.</p>	<p>A transport system that delivers appropriate levels of service.</p>	<p>Overarching Principles:</p> <p>An integrated district network which offers an increasingly consistent, fit for purpose level of service for users.</p> <p>Value for money and whole of life cost will be considered to deliver affordable levels of service.</p> <p>We will look for new ways and innovative practices to enable us to cost effectively deliver our services.</p>	<p>Provide an <u>efficient</u> roading network.</p> <p>Timely intervention,</p> <p>Informed customers,</p> <p>Quick response,</p> <p>Efficient work practises,</p> <p>Quality outcomes</p>

• 3.3 Legislative Requirements

3.3.1 Legal Authority

The Local Government Act 1974, sections 316, 317 and 319, vests the property in roads and control of roads in the District, excluding state highways, with Council. **This includes all formed, council-maintained footpaths in the Central Otago District.**

As such, Council is required to control activities on roads and ensure the unhindered passage of the public along any road. While Council may choose the level at which it will maintain road assets and provide services, it must take sufficient precautions to protect the general safety of the public, traffic and workmen on or near any road.

3.3.2 Relationship with other Documents

This asset management plan provides the link between key Council strategic documents that detail council's activities, and how the council intends to deliver these activities within the legislative requirements of:

- The Land Transport Management Act 2003
- The Land Transport Management Amendment Act 2013
- The Local Government Act 1974, and Local Government Act 2002
- The Local Government Act 2002 Amendment Act 2015
- The Health and Safety at Work Act 2015
- Central Otago District Council Roading Policies (2015)
- Central Otago District Council Roading Bylaws (2015)

• 3.4 Customer Levels of Service

Service levels are classified in two categories, **customer** levels of service and **organisational** levels of service. These are part of measures designed to quantify delivery of footpath services against the outcomes stated by Central Otago District Council.



Customer Levels of Service measure how the customer receives the service, and if value to the customer is provided.

Customer levels of service measures used in the asset management plan are:

Quality	How good is the service ... <i>what is the condition or quality of the service?</i>
Function	Is it suitable for its intended purpose <i>Is it the right service?</i>
Capacity/Use	Is the service over or under used ... <i>do we need more or less of these assets?</i>

The level of service customers can expect for each road classification under each of the ONRC outcome areas. Council has completed this assessment across all transportation assets, with Table 3.4 (i) detailing outcomes specifically applying to footpath assets. Colour coding, as defined in the Key below, demonstrates our assessment of our current service delivery against target Levels of Service.

Key

	Council believes it is currently delivering to the ONRC Customer Levels of Service
	Council is delivering to a higher level of service, but this has no cost impact
	Over-delivery in the level of service with potential for dis-investment
	Under-delivery of Customer Levels of Service with a need for additional investment to close this gap

The current and expected levels of service are detailed in Tables 3.4 (i) and 3.4 (ii). Table 3.4 (ii) shows the expected levels of service based on resource levels in the current long-term financial plan.

Table 3.4 (i): Customer Level of Service and Gaps in Customer Outcomes (Footpath Assets)

ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
Accessibility	Clearance of incidents affecting road users will have a high priority .	Clearance of incidents affecting road users will have a moderate priority .		Clearance of incidents affecting road users will have a lower priority .	Clearance of incidents affecting road users will have the lowest priority .
	Road users may be advised of issues and incidents.			Road user information will have a lower priority .	Road user information will have the lowest priority .
Accessibility Amenity	Some land use access restrictions for road users, both urban and rural.	Land use access for road users generally permitted but some restrictions may apply.		Access to all adjacent properties for road users.	
	Some separation of road space for active road users in urban areas to provide network access and journey continuity. Extra care required around activity centres	Active road users should expect mixed-use environments with some variability in the road environment, including vehicle speed.			
	Access for all modes and facilities for mobility impaired at activity centres, and some shared spaces.			Enhanced accessibility via 'share the road' philosophy (active road users, mobility impaired and drivers).	
	Provision of quality information relevant to Arterial road user needs.	Provision of quality information relevant to Collector road user needs.		Provision of quality information.	
Amenity	Good level of comfort, occasional areas of roughness.	Moderate comfort, some areas of roughness.	Moderate comfort, longer areas of roughness.	Lowest level of comfort, may include extended areas of roughness and unsealed surfaces (on rural roads).	
	Aesthetics of adjacent road environment reflects journey	Aesthetics of adjacent road environment reflects journey experience needs		Aesthetics of adjacent road environment strongly	

ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
Amenity	experience needs of both road users and land use.	of all road users and adjacent land use.		reflects land use and place function.	
	Urban roads reflect urban fabric and contribute to local character.				
	Some separation of road space for active road users for amenity outcomes in urban areas.	Specific provision where active road users present.		Strong shared space philosophy between active road users (if present) and vehicular traffic. Active road users expect environment appropriate to their needs.	
	Clean and secure [lighting, good cycle numbers, cycle park facilities, and weather protection for PT users].	Clean, safe and secure [lighting, reasonable cycle numbers, accessible parking facilities].		Urban areas clean, safe [low vehicle speed] and secure [lighting].	
Safety	Higher speeds depending on assessed level of risk. Lower if mixed use, high intersection density, schools, shopping, concentrations of active road users. In urban areas travel speeds depend on assessed level of risk and recognise mixed use, schools, shopping strips and concentrations of active road users.	Travel speeds depend on assessed level of risk and recognise mixed use, intersection density, schools, shopping strips and concentrations of active road users.		As for Collector roads but also recognise access and use values.	
Efficiency (Cost-effectiveness)	Some separation of road space for active road users in urban areas.	Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed.		All road users should expect mixed use environments with some variability in the road environment, including vehicle speed.	

ONRC Outcome area	Arterial	Primary Collector	Secondary Collector	Access	Low Volume Access
	Efficiency measures are required to provide assurance that the work we do is necessary, is co-ordinated and is delivering value for money. We will improve efficiency by ensuring the work we do is programmed and completed at the right time, i.e. it is not done too early, nor is it done too late.				

Table 3.4 (ii): Customer Level of Service

	Expectation	Performance Measure Used	Current Performance	Expected Position in 10 Years based on the current budget.
Customer Outcome: Accessibility / Amenity				
Quality	Footpath roughness and surface condition does not impact on users	Roughness survey; Condition Rating	High	High
Quality	Response to remove obstructions within footpaths are timely: - overhanging vegetation; - encroaching objects; and - improper use	Public call numbers; Public call response times (<10 days).	Medium	High
Quality	Footpaths are not impacted by excessive surface water ponding	Roughness survey; Network faults; inspections/Forward Works planning; Public call numbers; Public call response times (<10 days).	High	High
Function	Footpath asset provision meets the requirements of users on the network	Public requests for new footpaths; Visual assessment (berm damage by pedestrian use)	Medium	High
Capacity and Use	Footpaths not closed to pedestrians for unacceptable length of time. Suitable alternative routes provided for all users	Corridor Access Request/Traffic Management Plan requirements; Public call numbers; Public call response times (urgent priority).	High	High

	Expectation	Performance Measure Used	Current Performance	Expected Position in 10 Years based on the current budget.
Customer Outcome: Safety				
Quality	Trip hazards within footpaths are repaired within acceptable timescales: - very poor surface condition; - tree roots damaging surface; - level changes (5-10mm and 10mm+ at concrete slab joints)	Reported trips/falls; Condition rating; Network faults; Inspections/Forward Works planning; Public call numbers; Public call response times (<10 days).	Medium	High
Quality	Response to treat slippery surfaces in icy conditions	Public call numbers; Public call response times (urgent priority).	Low	Medium
Function	Pram crossing points as part of footpath asset provision meets the requirements of users on the network	Public requests for new footpaths; Inspections/Forward Works planning.	Low	High
Function/ Capacity and Use	Lack of footpaths forcing pedestrians to use carriageway on higher volume roads	Public requests for new footpaths; Inspections/Forward Works planning.	Medium	High
Customer Outcome: Efficiency (Cost-effectiveness)				
Capacity and Use	Footpaths provided on one side of the road in urban areas and rural settlements (Arterial to Access Road classifications)	Inspections/Forward Works planning; Percentage of footpath capital works completed within budget.	Medium	Medium
Capacity and Use	Footpaths provided on both sides of the road in high-use urban areas (Arterial road classification and on routes to services)	Inspections/Forward Works planning; Percentage of footpath capital works completed within budget.	Medium	High
Confidence levels			Medium	Medium

Organisational measures for council’s footpath level of service provide factual assessment related to the service delivery outcome e.g. total lengths of footpath with condition rated percentages of “Very Poor”, “Poor”, “Average”, “Good”, “Very Good” and “Excellent”.

Council uses a roughness measuring device mounted on a mobility scooter to measure the roughness of footpaths. This presents roughness as an approximate International Roughness Index (IRI). This is then given an asset condition rating equivalent.

Table 3.4 (iii) International Roughness Index (IRI) and the asset condition rating (2017/18 survey)

IRI	Condition (visual condition assessment equivalent rating)	Percentage of footpath assets (asset condition rating)	Percentage of footpath assets (condition grade/function)
< 1.1	Very Good (1) *	10.0%	52.2%
1.1 - < 1.5	Good (2)	41.8%	
1.5 - < 2.3	Average (3)	34.4%	39.0%
2.3 - < 2.7	Poor (4)	6.5%	8.8%
> 2.7	Very Poor (5)	7.3%	

* Includes newly constructed/contributed assets

The condition grade and function ratings are taken from Central Otago’s current footpaths asset inventory – and show there is a High degree of confidence in the correlation between the various organisational condition scores. This is discussed further in Section 5.

These measures provide a balance in comparison to the customer perception that may be more subjective. Central Otago District Council uses a small number of organisational measures as part of managing footpath assets, detailed in Table 3.4 (iv).

Table 3.4 (iv): Organisational Performance Measures

Performance Measure	2017 Result	2018 Result	Target
Percentage of footpaths that meet council’s level of service standard for footpath condition (rated “Average” or better)	81%	85%	≥70%
Number of service requests from customers responded to within 10 days	93%	91%	≥90%
Percentage of budgeted capital works completed annually	100%	94%	≥100%

• 3.5 Technical Levels of Service

Technical Levels of Service - Supporting the customer service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- Operations – the regular activities to provide services (e.g. cleaning, environmental maintenance, ice-gritting, enforcement activities, inspections, etc.)
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. footpath patching, levelling minor surface defects, edging repairs)
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. footpath resurfacing and sub-base reconstruction, sections of replacement where asset has failed)
- Upgrade/New – the activities to provide a higher level of service (e.g. widening footpaths, surfacing an unsealed footpath) or provision of new footpaths that did not exist previously.

Service and asset managers plan, implement and control technical service levels to influence the customer service levels.³

Table 3.5 shows the technical levels of service provided under this asset management plan. The 'Desired' position in the table documents the position being recommended in this asset management plan. The 'Desired for Optimum Lifecycle Cost' has been calculated by taking the **20-year average** of the figures in Table 7.1.2: Projected Expenditures for Long Term Financial Plan.

The 10 year long-term financial plan funding requirements have been modelled in more detail as part of methods (scenarios) 1 to 3, used to advise on affordability of the proposed programmes, and service/risk trade offs:

Table 3.5: Technical Levels of Service

Service Attribute	Service Activity Objective	Current Performance *	Desired for Optimum Lifecycle Cost **
Operations			
	Annual footpath roughness inspections of 100% of network	Acceptable. Continuous improvement process.	Footpath roughness survey provides key inputs for deterioration modelling
	Response to public calls and network inspections identifying issues	Acceptable. Continuous improvement process.	Continuous improvement process.
	Asset information and data confidence for footpaths is reviewed and maintained	Acceptable. Continuous improvement process.	Data confidence rating "B" achieved.
	Budget (\$'000)	85	85 (85)
Maintenance			

³ IPWEA, 2015, IIMM, p 2|28.

Service Attribute	Service Activity Objective	Current Performance *	Desired for Optimum Lifecycle Cost **
	Three-year maintenance programme – prioritised through network inspection - is delivered	Acceptable. Continuous improvement process.	Footpath roughness survey provides information to support fault identification and proactive repairs
	Response to public calls and network inspections identifying faults	Acceptable. Continuous improvement process.	Reduction in public calls and reactive fault repairs through better asset management
	Budget	143	143 (143)
Renewal			
	Three-year renewals programme – prioritised through network inspection – is programmed and delivered to agreed budgets	Renewals funding, based on current modelling, are insufficient to maintain network performance.	Asset information improved to inform advanced asset management. Renewals funding levels reviewed and increased to meet optimised Forward Works programme
	Footpath renewals are programmed to optimise efficiencies for works across all of council's asset management activity.	Work programmes reviewed and aligned where identified.	Continuous improvement process. Improved Forward Works planning across council's asset management activities implemented.
Renewal (continued)			
	Programme to identify footpaths where levels of service are exceeded: - Renewals work deferred - Footpaths removed	Not progressed.	Low cost-benefit for implementing footpath removals. Continue to review.
	Budget	448	581 (561)
Upgrade/New			
	Current provision of footpaths are consistent with community expectations of levels of service	Upgrade/New funding, based on current modelling, are insufficient to meet all community expectations. Planned works to be partially deferred.	Future community engagement to identify footpath costs and funding in detail over long-term financial plan period.

Service Attribute	Service Activity Objective	Current Performance *	Desired for Optimum Lifecycle Cost **
	Current high growth in Central Otago increasing stock of footpath assets contributed to council (approx. 1.4km per year)	Acceptable. Continuous improvement process.	Ensure engineering standards and specification provide for resilient infrastructure, where maintenance and renewals costs are minimal for current long-term financial plan.
	Programme of new footpaths over planning period is programmed and delivered to agreed budgets	Upgrade/New funding, based on current modelling, are insufficient to meet all community expectations. Works planned to be partially deferred.	Upgrade/New funding levels reviewed to match desired Improvements programme.
	Budget	364	410 (403)
	TOTAL	1,040	1,219 (1,192)

Note: * Currently funded activities and costs – Scenario 2
 ** Desired activities and costs to sustain current service levels and achieve minimum life cycle costs (not currently funded – Scenario 3)

Budget figure values are in current (real) dollars. They show the **average funding level per year** over the 20-year planning period, for the modelled Scenario.

It is important to monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology, and customer priorities will change over time. Review and establishment of the agreed position, which achieves the best balance between service, risk and cost is essential.

● 4. FUTURE DEMAND

● 4.1 Demand Drivers and Demand Forecasts

Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

The present position and projections for demand drivers that may impact future service delivery and use of assets were identified and are documented in Table 4.2.

● 4.2 Demand Impact on Assets

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 4.2.

Table 4.2: Demand Drivers, Projections and Impact on Services

Demand drivers	Present position	Projection	Impact on services
Population Growth	20,460 residents (2018 projection from 2013 data) ⁴	22,230 residents (2028 projection) ⁴	1% annual growth in assets over 10-year planning period
Demographic Change ('vulnerable' road users)	17% of population ≤14 years of age 22% of population ≥ 65 years of age (2018 projection) ⁴	15-17% of population ≤14 years of age >30% of population ≥ 65 years of age (2028 projection) ⁴	Potential greater need for footpaths providing increased levels of service
Subdivision Development	14,490 rating units (2018 projection from 2013 data)	17,240 rating units (2028 projection)	1% growth in assets per year (estimated at 1.4km footpath length). Additional footpaths potentially required to facilitate links to services within existing networks
Economic and Visitor Growth	"phenomenal" growth in employment/GDP ⁵ 6,290 Peak Visitors per day (2018 projection)	Average growth in GDP >2.1% annually. 8,420 Peak Visitors per day (2028 projection)	Increased level of service expectations for community and visitors. Additional footpaths potentially required to facilitate links to services within existing networks
Land Use, Level of Service and Extents of Network Changes	Some rural residential development on Low Volume roads not serviced by footpaths	Increased rural residential development, including higher-density sub-division development	Potential greater need for footpaths providing increased levels of service
Pedestrian user growth	Capacity/Use expectations met in most cases (Medium/High rated)	Capacity/Use expectations increased	Potential greater need for footpaths providing increased levels of service

⁴ Growth Projections to 2048 - Resident Population, Dwellings and Rating Units, Rationale Ltd (2017)

⁵ Business and Economic Research Ltd (BERL), March 2016.

Demand drivers	Present position	Projection	Impact on services
Development of recreational facilities/Modal change	Walking/cycle trails in Central Otago District principally managed by DoC and community trusts	Increased provision of trails, tracks and walkway/cycleway access – with increased council funding support	Potential new assets and maintenance/renewals requirements
Investment for Demand and Growth Opportunities	NZTA providing Financial Assistance Rate of 51% for footpath maintenance, renewals and improvement activities (September 2018)	NZTA providing up to 76% Targeted Enhanced Financial Assistance Rate for walking, cycling and safety improvements and programmes meeting National Priority Programme criteria	Ability to potentially fund and deliver more projects increasing asset base and levels of service. Increase in community expectation in levels of service.
Climate Change impacts	Modelled scenarios reported to council suggest effects on service delivery ⁶	Likelihood of increased pressure on footpath network due to climate change impacts (e.g. more events where surface water impacts accessibility)	Potential greater need for footpaths providing increased levels of service

• 4.4 Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this asset management plan.

⁶ The past, present and future climate of Central Otago: Implications for the District, Bodeker Scientific (August 2017)

Table 4.3: Demand Management Plan Summary

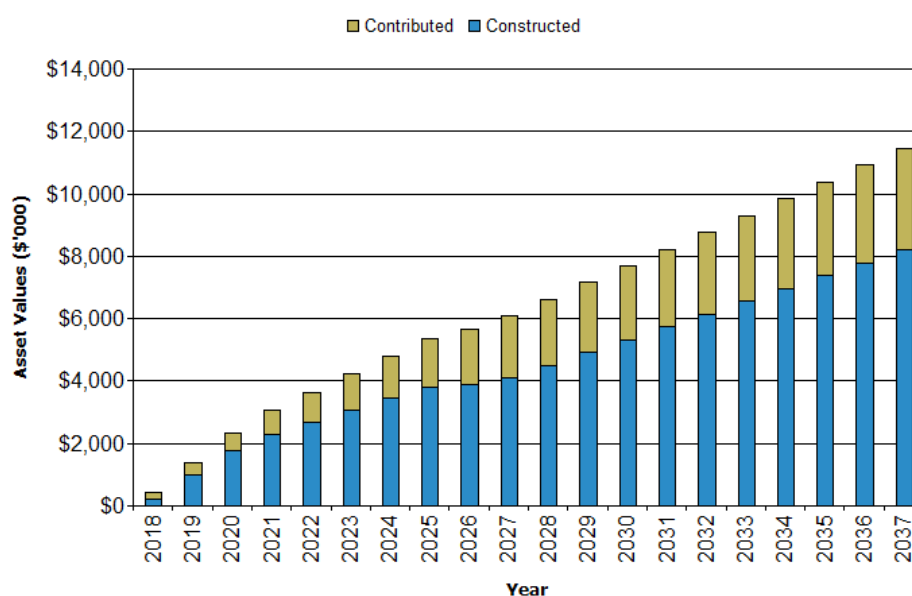
Demand Driver	Impact on Services	Demand Management Plan
Removal of existing footpaths where levels of service are exceeded in Cromwell.	Renewals work for approximately 10km of Cromwell’s aging footpath network deferred. Plan for footpath removal scoped and costed.	Low cost-benefit for implementing footpath removals. Continue to review.
Footpath upgrades in Pisa Moorings required to meet level of service gaps.	Community requests for urban township level of service requires construction of approximately 4km of new footpaths	Potentially only \$440,000 of funding - meeting approximately 50% of demand - will be provided in the ten-year plan.
Growth in footpath asset inventory through contributed assets	Additional 1.4km of footpath contributed annually to council’s assets	Ensure Engineering specifications and Standards for development are fit-for-purpose (currently under review). Greater interaction between council’s Planning and Infrastructure teams.

4.5 Asset Programs to meet Demand

The new assets required to meet demand can be acquired, donated or constructed. Additional assets are discussed in Section 5.5. The summary of the cumulative value of additional asset is shown in Figure 1. Figure Values are in current (real) dollars.

Figure 1: Upgrade and New Assets to meet Demand – (Cumulative)

Otago DC - Upgrade & New Assets to meet Demand (Footpaths_S2_V4)



Acquiring these new assets will commit ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion



in the long term financial plan further in Section 5.

The current high levels of growth in Central Otago, estimated at 1% per year for the next ten years, and reducing to 0.6% in years 11-20, could result in the footpath network increasing by 30-40% by length (well exceeding 200km by 2037). Funding of this significant increase in the asset inventory in the longer term will require improved management in the future, to remain sustainable.

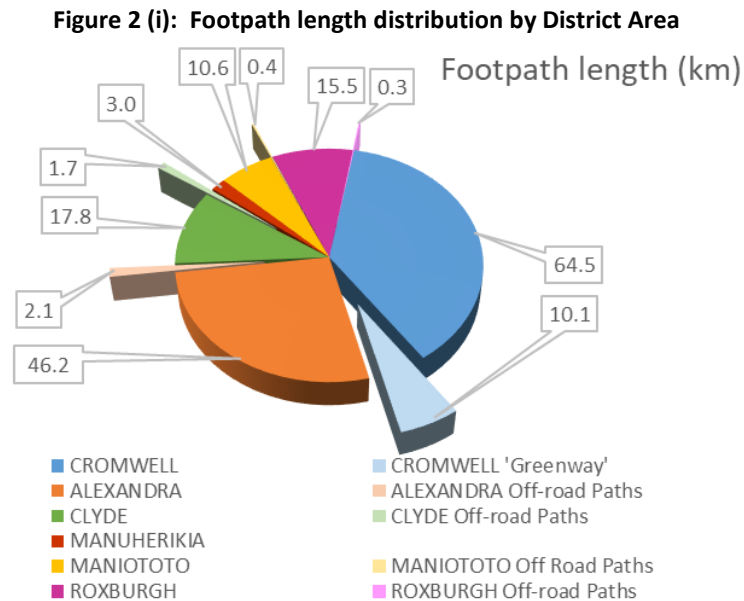
• 5. LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Central Otago District Council plans to manage and operate footpath assets at the agreed levels of service (defined in Section 3) while managing life cycle costs.

• 5.1 Background Data

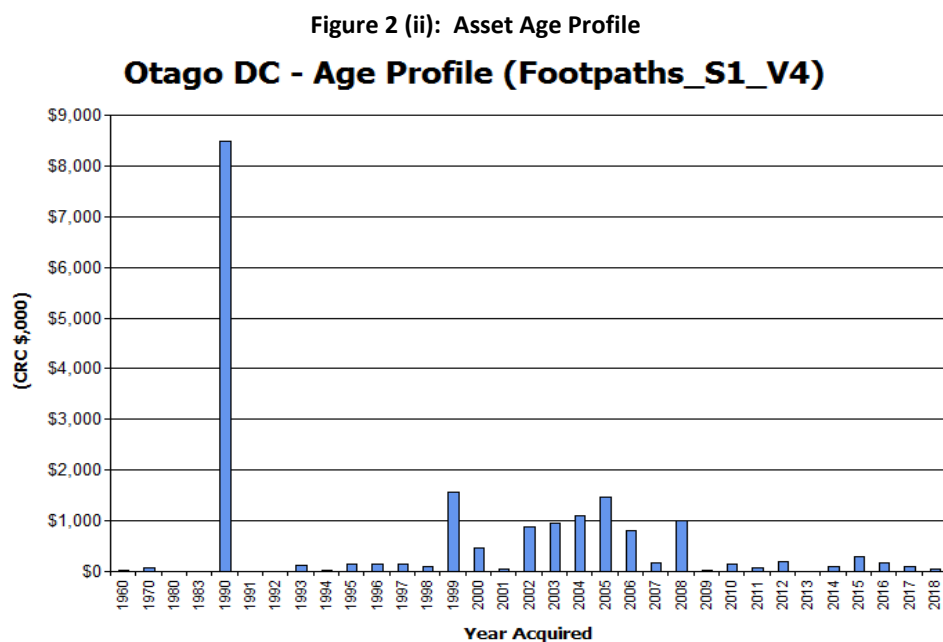
5.1.1 Physical parameters

The assets covered by this asset management plan are shown in Table 2.1.



Footpath assets are concentrated in Cromwell and Alexandra, with Cromwell's 'Greenway' network accounting for almost 15% of the township's footpaths.

The age profile of the assets included in this Asset management plan are shown in Figure 2. Figure Values are in current (real) dollars.



Central Otago’s footpath network is considered young, in terms of asset ages. The large cluster of assets shown with a construction date of 1990 is created by three asset inventory factors:

1. A large proportion of the network was constructed over a short period between 1988 and 1992 - especially in Cromwell and Alexandra. This was during the Clyde Dam construction;
2. Unknown construction dates have typically been assigned as 1st January 1990 in the asset inventory, with a medium level of confidence; and
3. Concrete footpaths with unknown construction dates, but with Remaining Useful Lives assigned based on 50% of Total Useful Life consumed, are also now assigned with construction dates of 1st January 1990.

78.2 kilometres of footpaths (45% of the footpath network, by length) falls into this category. These assets have a total Replacement Cost of \$8.49 million, with nearly \$6 million falling due in 2020.

Figure 2 (iii): Asset Age Profile by Material

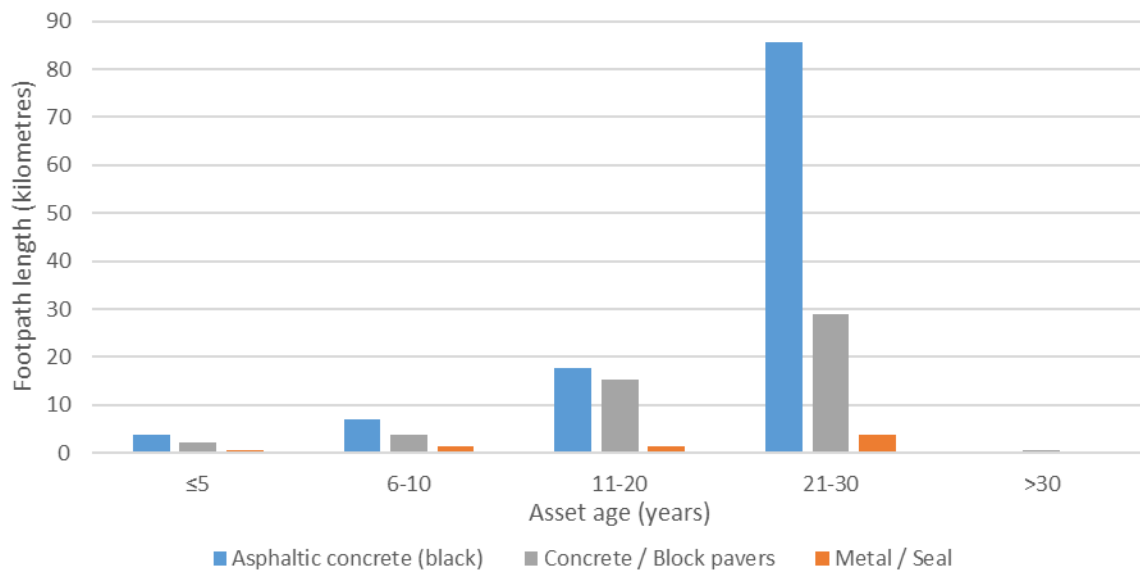
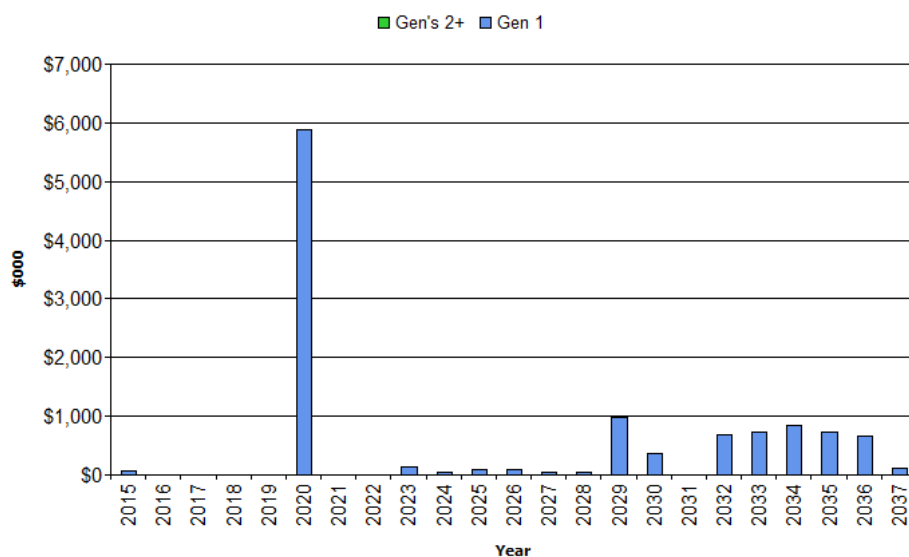


Figure 2 (iii): Projected Capital Renewal Expenditure (Scenario 1)

Otago DC - Projected Capital Renewal Expenditure (Footpaths_S1_V4)



Only 7.8 kilometres of these footpaths are currently condition rated “Poor” or “Very Poor” - requiring more significant short-term investment. On this basis, Method/Scenario 1 has not been considered appropriate for analysis of Central Otago’s footpath asset management, although data confidence in the physical extent of the network is still considered Reliable.

5.1.2 Asset capacity and performance

The level of service criteria for Central Otago’s residential streets is that there shall be a footpath on one side of the road. The current level of service in Cromwell is much higher with many residential streets having footpaths on both sides of the road, in addition to the “Greenway” network. As a result, the length of footpath in Cromwell is disproportionately high.

The District’s footpaths generally meet minimum service needs, with newer paths provided to design Standards (where these are available). Due to the young age of the network, and the factors influencing footpath construction, Central Otago does not have a widespread issue with narrow footpaths.

Clyde does have approximately 35% of its footpaths (by length) which are narrow for comfortable use by some mobility-impaired users.

Alexandra has a high proportion of concrete footpaths (by length) which are condition rated “Poor” or “Very Poor”.

Locations where deficiencies in service performance are known are detailed in Table 5.1.(i):

Table 5.1 (i): Known Service Performance Deficiencies

Location	Service Deficiency
Clyde (Earnsclough)	6.8km of footpath is narrow (1.2 – 1.4 metres width)
Alexandra (Urban area)	6.9km of concrete footpath is condition rated “Poor” or “Very Poor”. 61% (4.2km) of these assets are located in Alexandra
Pisa Moorings (Cromwell)	Significant proportion of this residential development has no footpaths. Approximately 4.5km required to meet council’s level of service
District-wide	6.8km of asphalt footpath is condition rated “Poor” or “Very Poor”. 5.2km of these assets have an assumed construction date
District-wide	Some pram crossings are not constructed to a standard providing full accessibility to mobility-impaired users

The above service deficiencies were identified from the Central Otago District Council asset inventory for Footpaths, stored in the RAMM (Roading and Maintenance Management) database.

5.1.3 Asset condition

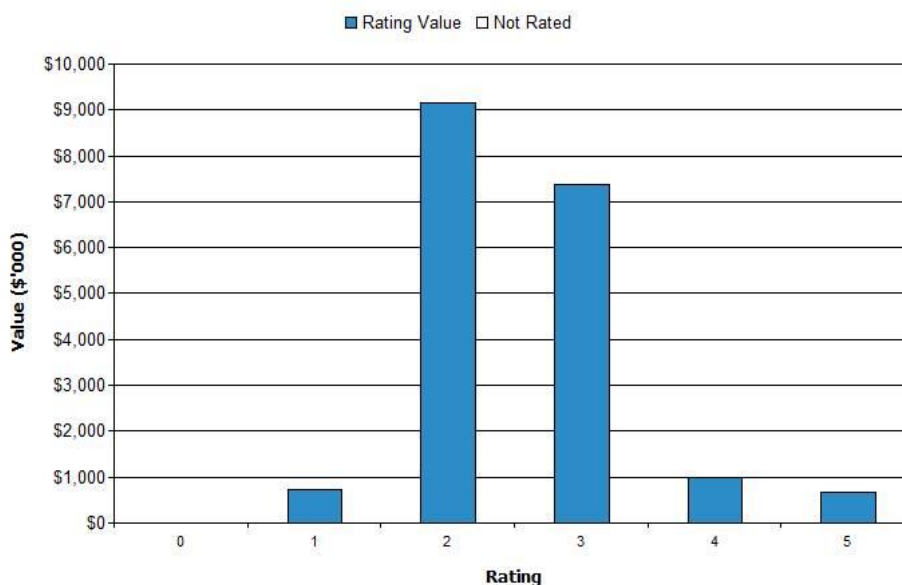
All footpaths in the district were inspected in 2017/18 to develop the 2018-21 Forward Works programmes. Any maintenance faults were identified and recorded in RAMM Contractor. These faults have been assigned a priority based on the assessed trip hazard:

- ≤5mm level difference - low priority;
- ≤10mm level difference - medium priority; and
- >10mm level difference - high priority

Footpath condition rating was completed on most paths across the District in the summer of 2016/17, and again in 2017/18 using a roughness measuring device. Council has completed the survey work to enable assessment of the whole footpath network, at a District level. The work has provided data council can use as an alternative to traditional Condition Rating.

Table 3.4 (iii) details the current results and condition rating equivalent across the footpath network from the 2017/18 survey. The condition profile of our assets is shown in Figure 3. Figure Values are in current (real) dollars. **Figure 3 (i): Asset Condition Profile**

Otago DC - Condition Profile (Footpaths_S1_V4)



Condition is measured using a 1 – 5 grading system⁷ as detailed in Table 5.1 (ii)

Table 5.1 (ii): Simple Condition Grading Model

Condition Grading	Description of Condition
1	Excellent/Very Good: minimal planned maintenance required (e.g. weed spraying)
2	Good: minor maintenance required plus planned maintenance
3	Average/Fair: regular planned and reactive maintenance required
4	Poor: significant maintenance required; potential renewal/reconstruction
5	Very Poor: physically unsound, requiring renewal/reconstruction in current programme

Council and roading Physical Works contract staff refer to a ‘Visual Condition Rating Guide’, incorporated within the Transportation activity management plan, to provide guidance in the assessment of asset condition. Footpaths are included within this guide, shown in Table 5.1 (iii)

Table 5.1 (iii): Visual Condition Rating Guide - Footpaths

Excellent/Very Good	Good	Average/Fair	Poor	Very Poor

⁷ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Council has a recently collected and maintained condition rating for asset condition grading, function and capacity across 100% of the recorded footpath assets. The percentage of assets within each condition grading (from the asset inventory) are shown in Figure 3 (ii).

Figure 3 (ii): State of the Assets (Scenario 1)

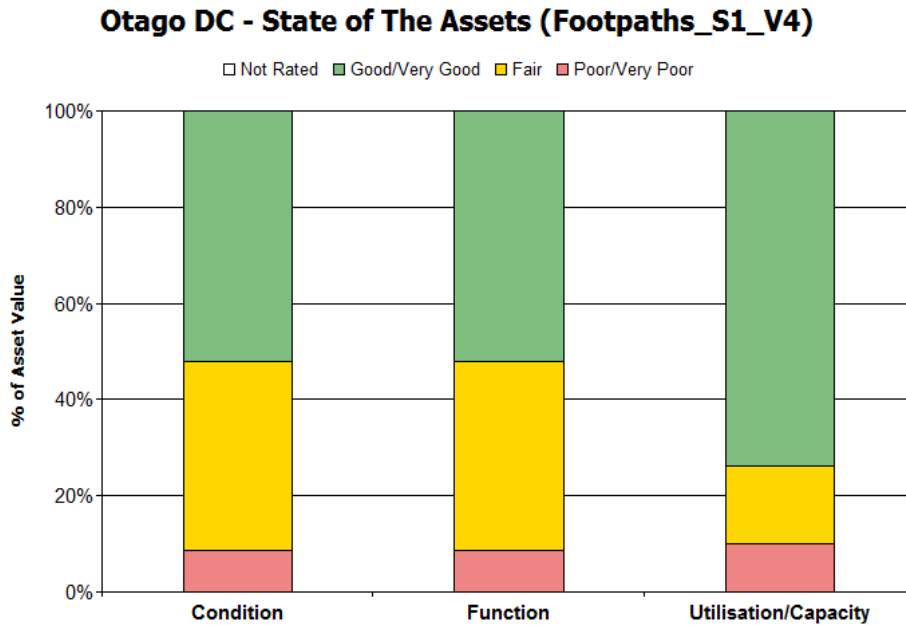


Figure 3 (iii): Sample Condition Grading (Cromwell)



● **5.2 Operations and Maintenance Plan**

Operations include regular activities to provide services such as public health, safety and amenity, e.g. cleaning, environmental maintenance, ice-gritting, enforcement activities, inspections, etc.

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again, e.g. footpath patching, levelling minor slumping/ponding issues.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. This includes repairs to footpath surfaces and edgings, grinding or levelling trip hazards and utilities patching. Maintenance expenditure is shown in Table 5.2 (i):

Table 5.2 (i): Maintenance Expenditure Trends

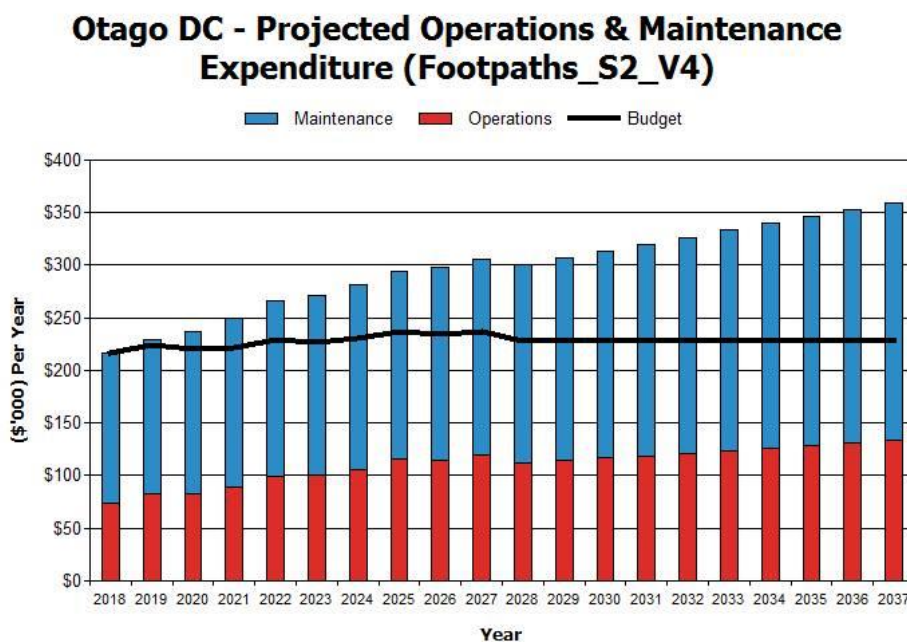
Year	Maintenance Budget \$
2017	\$182,000 *
2018	\$133,500
2019	\$133,500

Maintenance expenditure levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance expenditure levels are such that they will result in a lesser level of service, the service consequences and service risks have been identified and highlighted in this Asset management plan and service risks considered in the Infrastructure Risk Management Plan.

Summary of future operations and maintenance expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figure 4. Note that all costs are shown in current 2018 dollar values (i.e. real values).

Figure 4: Projected Operations and Maintenance Expenditure



Deferred maintenance, i.e. works that are identified for maintenance and unable to be funded are to be included in the risk assessment and analysis in the infrastructure risk management plan.

Maintenance is funded from the operating budget where available. This is further discussed in Section 7.

• 5.3 Renewal/Replacement Plan

Renewal and replacement expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an upgrade/expansion or new work expenditure resulting in additional future operations and maintenance costs.

Assets requiring renewal/replacement are identified from one of three methods provided in the 'Expenditure Template':

- Method (Scenario) 1 uses Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year, or
- Method (Scenario) 2 uses capital renewal expenditure projections from external condition modelling systems (such as Pavement Management Systems), or
- Method (Scenario) 3 uses a combination of average network renewals plus defect repairs in the Renewal Plan and Defect Repair Plan worksheets on the 'Expenditure template'.

Method 2 is used for this asset management plan. Assessment of deferred renewals and replacements using Method 3 has also been modelled, but not used as the basis for the funding decision-making presented.

5.3.1 Renewal ranking criteria

Asset renewal and replacement is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. footpaths with a smooth, even walking surface which is wide enough to accommodate user requirements); or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. roughness of a footpath surface not affecting overall customer experience).⁸

It is possible to get some indication of capital renewal and replacement priorities by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be greatest,
- Have a total value representing the greatest net value,
- Have the highest average age relative to their expected lives,
- Are identified in the Asset management plan as key cost factors,
- Have high operational or maintenance costs, and
- Have replacement with a modern equivalent asset that would provide the equivalent service at a savings.⁹

⁸ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

⁹ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

The ranking used to determine priority of identified renewal and replacement proposals is shown in Table 5.3 (i):

Table 5.3 (i): Renewal and Replacement Priority Ranking Criteria

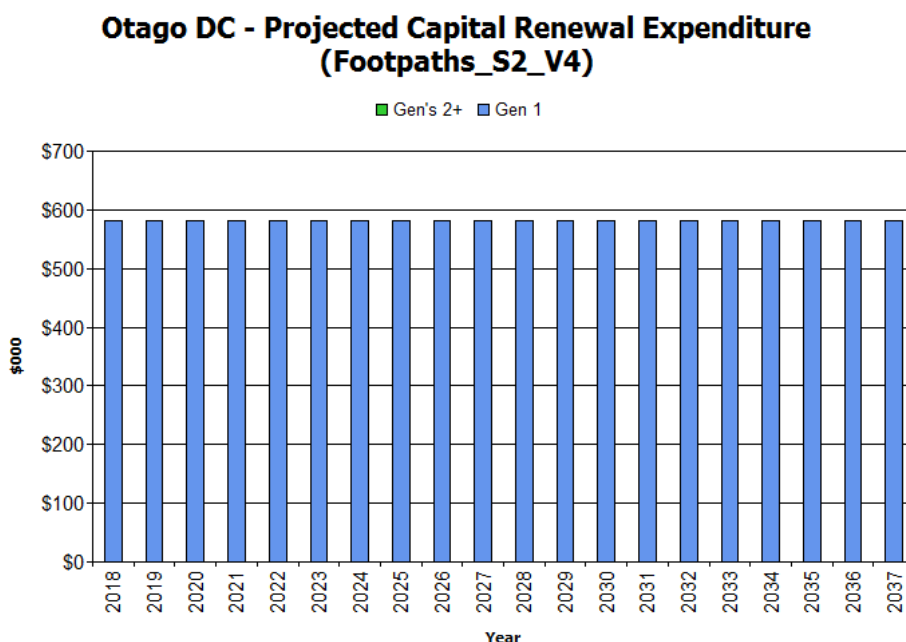
Criteria	Weighting
Condition – Visual and Roughness Assessment	33.3%
Function – Remaining Useful Life as a percentage of the asset Expected Life	33.3%
Capacity/Utilisation – Level of demand/use experienced by the asset	33.3%
Total	100%

5.3.2 Summary of future renewal and replacement expenditure

Projected future renewal and replacement expenditures are forecast to increase over time when the asset stock increases. The expenditure that is required is shown in Figures 5 (i) and 5 (ii). Note that all amounts are shown in current (real) dollars.

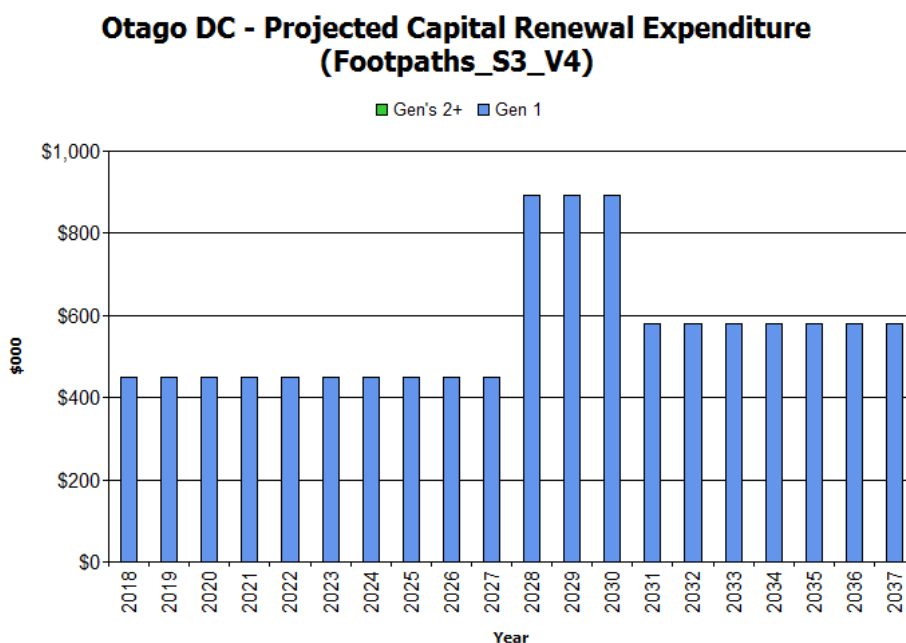
The projected capital renewal and replacement program is shown in Appendix A.

Figure 5 (i): Projected Capital Renewal and Replacement Expenditure



Deferred renewal and replacement, i.e. those assets identified for renewal and/or replacement and not scheduled in capital works programs are to be included in the risk analysis process in the risk management plan.

Figure 5 (ii): Deferred Capital Renewal and Replacement Expenditure (Scenario 3)



Figures 5 (i) and 5 (ii) illustrate the modelled renewal expenditure requirement in today's dollars, and the renewals funding 'backlog' that would be potentially built-up with renewals funding remaining at the planned \$448,000 per year for the first ten years of the long term financial plan. The renewals and replacement expenditure in the capital works program accommodated in the long term financial plan is further discussed in Section 7.

• 5.4 Creation/Acquisition/Upgrade Plan

New works are those that create a new asset that did not previously exist, or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost. These additional assets are considered in Section 4.4.

5.4.1 Selection criteria

New footpath assets and upgrade/expansion of existing assets are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Candidate proposals are inspected to verify need and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in **council's improvement** programmes. The priority ranking criteria is detailed below.

Table 5.4 (i): New Assets Priority Ranking Criteria

Criteria	Score Range
Resilience	0 to 5
Safety	0 to 5
Accessibility	0 to 5
Aesthetics and comfort	1 to 5
Public Approval	1 to 5
Value for Money	1 to 5
Project Total	30 or less

Projects are ranked in descending order, where the highest score is the highest priority. Where projects have the same total score, they are then prioritised using two key criteria scores:

- Safety (scored on assessment of the last fifteen year's crash history, or from public/staff observations and perceptions); then
- Value for Money (scored according to total cost of the project)

Council's Roding Committee will confirm that the criteria score applied to each project is appropriate. The Committee will also confirm their acceptance of programme prioritisation adjustments recommended to co-ordinate with other Council and District activities on the network.

The Roding Committee are able to adjust the scoring or ranking of the improvement projects where the Committee assesses a greater need for a particular scheme, in responding to extenuating circumstances, to include projects already identified in Transportation activity management plans, to include projects already identified in long term plan programmes, or to meet other District priorities.

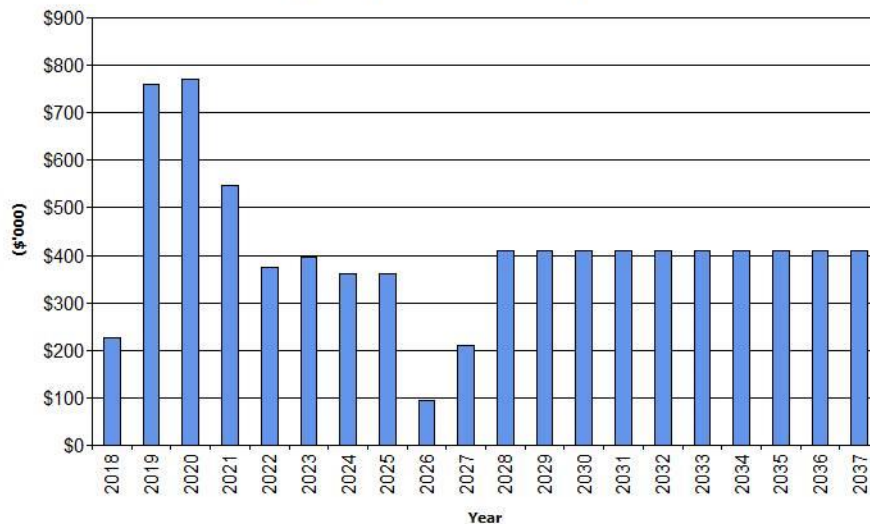
Footpath upgrades and improvements are funded from council's overall budget for road improvements and are prioritised within the full programme.

5.4.2 Summary of future upgrade/new assets expenditure

Projected upgrade/new asset expenditures are summarised in Figure 6 (i) and 6 (ii). The projected upgrade/new capital works program is shown in Appendix B. All amounts are shown in real values.

Figure 6 (i): Projected Capital Upgrade/New Asset Expenditure

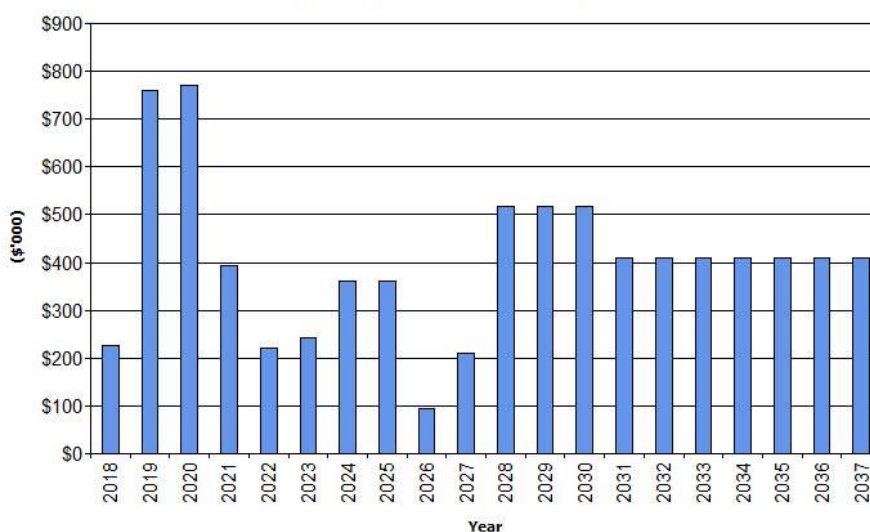
Otago DC - Projected Capital Upgrade/New Expenditure (Footpaths_S2_V4)



Expenditure on new assets and services in the capital works program will be accommodated in the long term financial plan, but only to the extent of the available funds. Scenario 3 models the deferment of \$440,000 of improvements – by reducing the scope of the Pisa Moorings footpath upgrades planned for years 3-6 of the asset management plan.

Figure 6 (ii): Deferred Capital Upgrade/New Asset Expenditure (Scenario 3)

Otago DC - Projected Capital Upgrade/New Expenditure (Footpaths_S3_V4)



Over time these new assets will add to council's overall funding commitments for footpath maintenance, operations and – eventually – renewals. This is shown in Section 4.5, Figure 1.

• **5.5 Summary of asset expenditure requirements**

The financial projections from this asset plan are shown in Figure 7 (i) and 7 (ii) for projected operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets). Note that all costs are shown in real values.

The bars in the graphs represent the anticipated budget needs required to achieve lowest lifecycle costs, the budget line indicates what is currently available. The gap between these informs the discussion on achieving the balance between services, costs and risk to achieve the best value outcome.

Figure 7 (i): Projected Operating and Capital Expenditure

Otago DC - Projected Operating and Capital Expenditure (Footpaths_S2_V4)

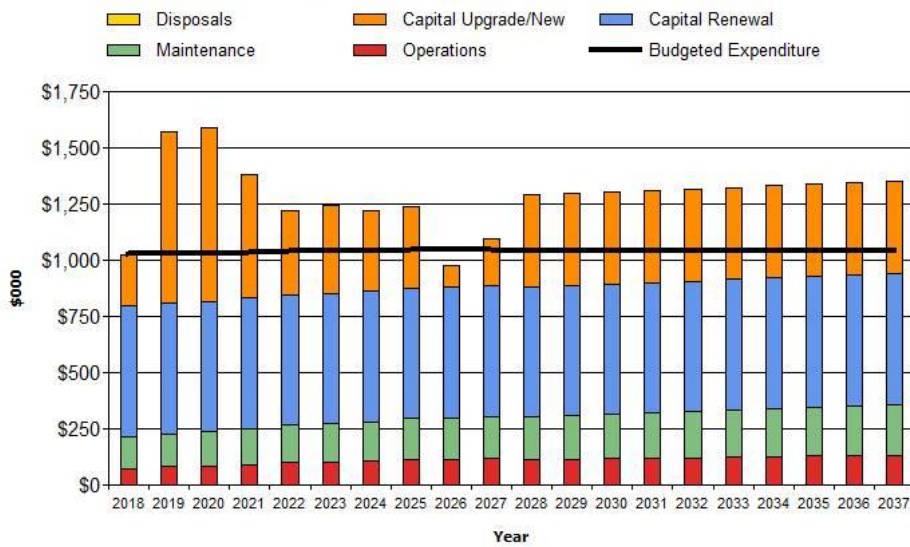
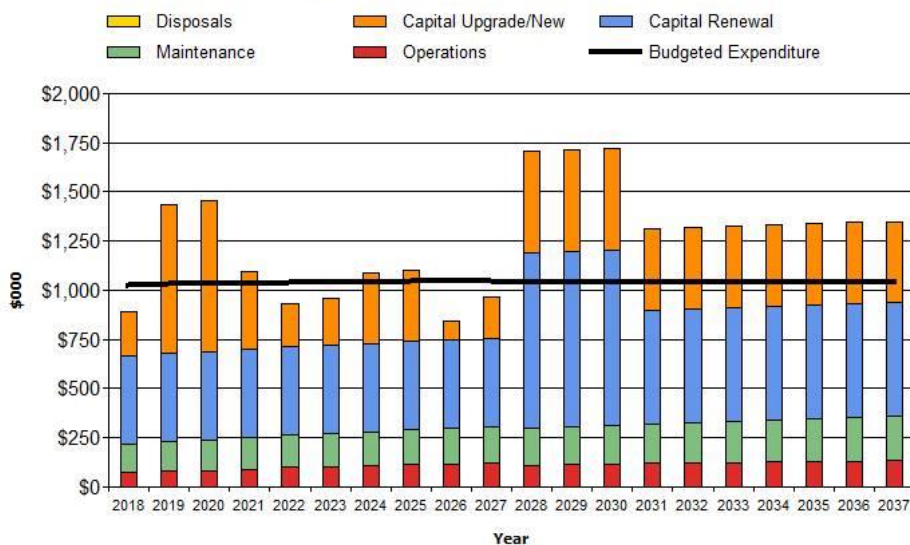


Figure 7 (ii): Projected Operating and Capital Expenditure (Scenario 3)

Otago DC - Projected Operating and Capital Expenditure (Footpaths_S3_V4)



Tables 5.4 (ii) and 5.4 (iii) and Figures 8 (i) and 8 (ii) show the relative affordability of the Scenario 2 modelling of council’s footpath operations, maintenance, renewals and upgrades programmes. Scenario 3 demonstrates that deferment of the modelled renewals programme to the agreed budgets in years 1-10 (\$448,000 per year) – reducing the planned renewals programme by \$133,000 per year - and reducing the scope of the Pisa Moorings new footpath programme can deliver a high level of affordability.

Table 5.4 (ii) Method (Scenario 2) Planned Operating and Capital Expenditure

Footpaths_S2_V4	
Executive Summary - What does it cost?	(\$'000)
10 year total cost (Operations, Maintenance, Renewal & Upgrade projected expenditure)	\$12,560
10 year average cost	\$1,256
10 year total LTFP budget (Operations, Maintenance, Renewal & Upgrade Long-Term Financial Plan budget)	\$10,397
10 year average LTFP budget	\$1,040
10 year AM financial indicator	83%
10 year average funding shortfall	\$-216

Figure 8 (i): Asset Management Financial Sustainability

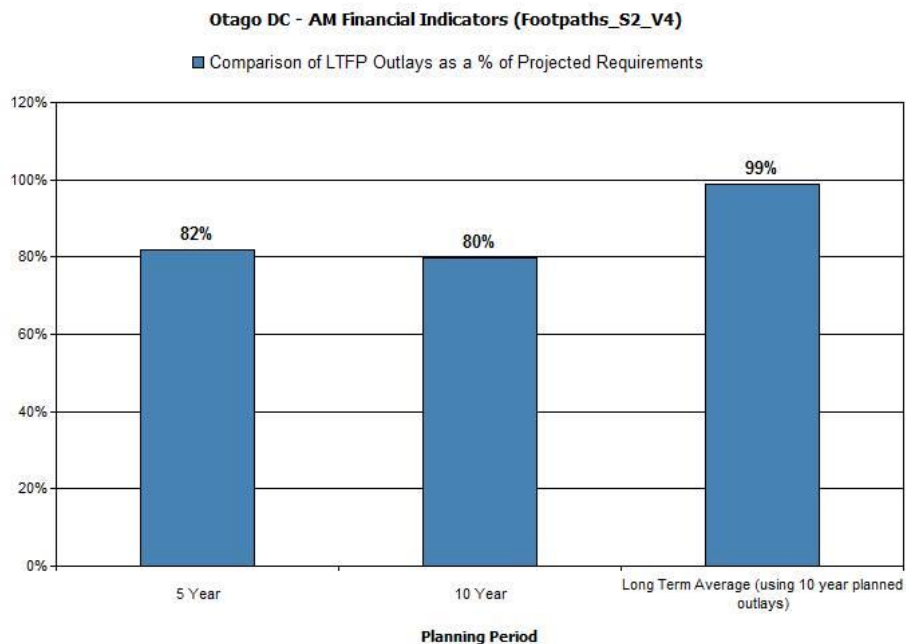
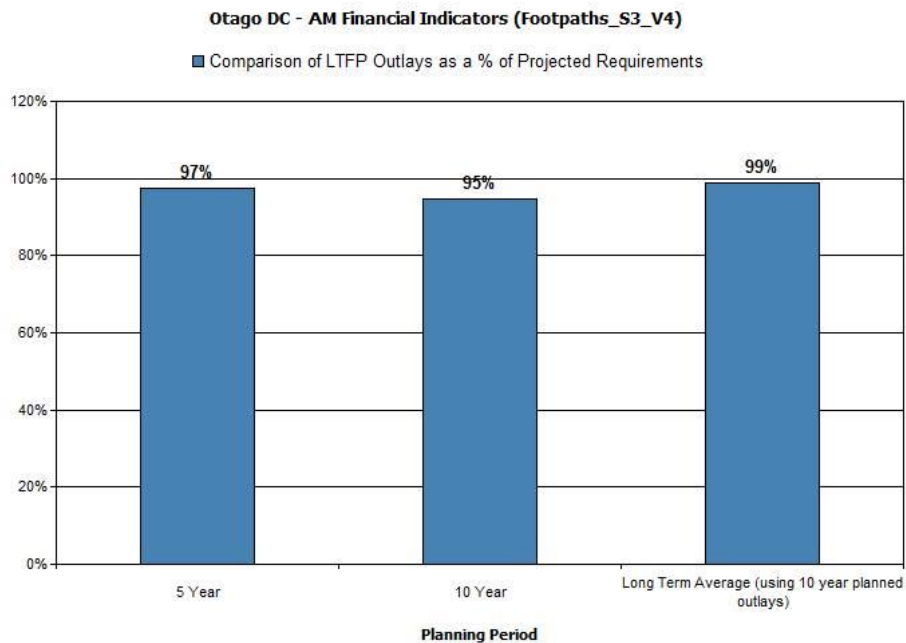


Table 5.4 (iii) Method (Scenario) 3 Deferred Operating and Capital Expenditure

Footpaths_S3_V4

Executive Summary - What does it cost?	(\$'000)
10 year total cost (Operations, Maintenance, Renewal & Upgrade projected expenditure)	\$10,769
10 year average cost	\$1,077
10 year total LTFP budget (Operations, Maintenance, Renewal & Upgrade Long-Term Financial Plan budget)	\$10,397
10 year average LTFP budget	\$1,040
10 year AM financial indicator	97%
10 year average funding shortfall	\$-37

Figure 8 (ii): Method (Scenario) 3 Asset Management Financial Sustainability



Asset management staff cannot currently measure the impacts of reducing the planned renewals programme by 23% with a high level of confidence – therefore Scenario 2 is recommended as council’s preferred strategy. Work to develop an optimised renewals/replacement programme to meet more sustainable funding levels (Scenario 3) will be prioritised by council’s asset management staff.

• 5.6 Disposal Plan

Council’s asset management staff have investigated the impacts of a planned programme to dispose of 9.4 kilometres of footpaths in Cromwell - which exceed District-wide levels of service. These footpaths must meet the following criteria to be considered for disposal:

- Footpath is currently provided on both sides of the road;
- Likely demand can be accommodated by reducing footpath provision to one side of the road;
- Footpath on one side of the road has a lower condition rating and has a greater deferred maintenance requirement; and
- Footpath is not likely to meet assessment requirements for the increased levels of service in the medium term.

Disposal includes any activity associated with the decommissioned asset including demolition and subsequent reinstatement. Assets which had been identified for possible decommissioning and disposal are shown in Table 5.5, together with estimated annual savings from not having to fund operations and maintenance of the assets.

Table 5.5: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Expenditure	Estimated Reduction in Depreciated Replacement Cost
1.85km footpath Cromwell	Exceeds level of service provision	2023	\$166,000	\$75,000
1.85km footpath Cromwell	Exceeds level of service provision	2024	\$166,000	\$75,000
1.85km footpath Cromwell	Exceeds level of service provision	2025	\$166,000	\$75,000
1.95km footpath Cromwell	Exceeds level of service provision	2026	\$166,000	\$75,000
2.0km footpath Cromwell	Exceeds level of service provision	2027	\$166,000	\$75,000

Asset management staff have assessed the impact of investment in the disposals plan outlined, and believe it has a negligible impact on affordability (increasing the asset management financial indicator percentage from 79% to 81% for Method 1) over the ten year long-term planning period. However, this small change does include accounting for the actual costs of disposal in years 6-10 (estimated at \$830,000 in current dollar values).

The potential for disposals to result in increased savings will be kept under review. The assets identified – at, or near the end of their Useful Lives - continue to deteriorate over the duration of the long-term financial plan, requiring further investment. The estimated reduction in Depreciated Replacement Costs, and the associated reduction in maintenance costs, could result in savings of approximately \$84,000 per annum from years 11-20 of the plan.

• 6. RISK MANAGEMENT PLAN

The purpose of infrastructure risk management is to document the results and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2009 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2009 as: ‘coordinated activities to direct and control with regard to risk’¹⁰.

An assessment of risks¹¹ associated with service delivery from infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a ‘financial shock’. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

• 6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Similarly, critical failure modes are those which have the highest consequences.

Currently, no footpaths are considered to be critical assets. Some road corridors, which include footpath assets, may be considered critical. The footbridges and pedestrian underpass not included in the footpath assets management plan are also not considered critical assets.

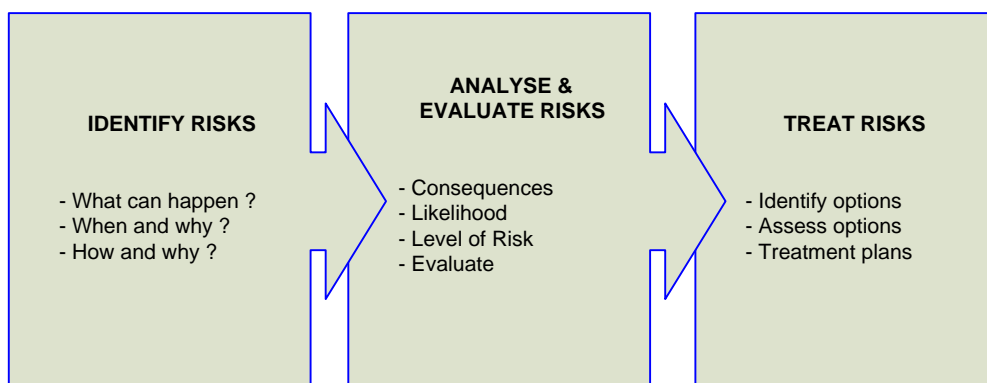
• 6.2 Risk Assessment

The risk management process used in this project is shown in Figure 9 below.

It is an analysis and problem solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of the ISO risk assessment standard ISO 31000:2009.

Figure 9: Risk Management Process – Abridged



¹⁰ ISO 31000:2009, p 2

^{11,12} Central Otago District Council Corporate Risk Policy (Draft)

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

An assessment of risks¹² associated with service delivery from infrastructure assets has identified the critical risks that will result in significant loss, 'financial shock', or a reduction in service.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment cost after the selected treatment plan is implemented is shown in Table 6.2. These risks and costs are reported to the Executive and Council through the Audit and Risk Committee.

Table 6.2: Critical Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (Very High/ High)	Risk Treatment Plan	Residual Risk *	Planned Risk Treatments
Health and safety - Non-compliance with current legislation and legal requirements. Poor site Traffic Management.	Death & serious injury to: council staff, or contractor working on council owned sites, consultant, member of the public.	Very High	Sites being compliant, Traffic Management meeting standards, culture change, processes, SiteWise accreditation	High	<u>Covered within planned Operational budgets</u>
Service levels - Inadequate or inappropriately defined and delivery of levels of service expectations.	Service failure; over or under expenditure; community dissatisfaction.	High		High	Normal AMP process along with integration of ONRC parameters. <u>Covered within planned Operational budgets</u>
Procurement - Procurement being inefficient and ineffective.	Poor value for money; excessive demands on staff time; delays. Increased Health and Safety risks due to legislative changes. Needed to meet NZTA funding obligations.	High		High	Procurement Policy in place and effective, but overdue for review. <u>Covered within planned Operational budgets</u>
Programme Delivery - Failure to deliver programmes.	We don't deliver, we don't know what we are doing, projects not well scoped.	High		High	BBC implementation, more focus on LT planning, proactive programmes, more contractor engagement. <u>Increased Operation, Maintenance, Renewals and Upgrades costs</u>

¹² Central Otago District Council Corporate Risk Policy (Draft)

Service or Asset at Risk	What can Happen	Risk Rating (Very High/ High)	Risk Treatment Plan	Residual Risk *	Planned Risk Treatments
Contractor - Not delivering contract objectives.	Disgruntled customers, decrease in level of service, asset degradation, asset failure, poor asset management.	High	Normal management processes.	High	<u>Covered within planned Operation, Maintenance, Renewals and Upgrades budgets</u>
Service/Asset Failure - Critical and high risk footpath asset failure. Poor management and construction of contributed assets.	Risks of serious injury, property damage, reputational damage and fiscal impacts.	High	Continuous improvement of asset management practices. Engineering specifications and Standards applied for both constructed and contributed assets.	High	<u>Covered within planned Operational budgets</u>
Natural Disaster - Flooding	Cost to reinstate assets. Temporary loss of accessibility.	High	Knowledge of 'hot-spots'. Early weather warnings. ORC river level monitoring.	High	<u>Covered within planned Operational budgets. Increased Maintenance costs</u>
Natural Disaster - Landslides	Transportation asset damage, opportunity cost of economic activity.	Very High	Specific site risk plans. Inspect during rainfall events.	High	<u>Increased Operational and Maintenance costs</u>
Human resources - lack of / loss of staff resources.	Workforce that is not capable and/or with enough capacity to deliver.	High		High	HR Policy, training career development, salaries, avoid resignations, council values. <u>Increased Operational costs over long term financial planning period</u>
Consultants - Not having the right skills / capacity / experience for the job.	Bad outcomes, loss of value.	High	Procurement Policy	Medium	<u>Increased Operational costs over long term financial planning period</u>
Project Management - Project management of one off projects (\$300K+).	Project fails to deliver the project, increased cost, not delivering the project on time.	High	BBC - Management case	Medium	<u>Covered within planned Operational budgets</u>

Service or Asset at Risk	What can Happen	Risk Rating (Very High/High)	Risk Treatment Plan	Residual Risk *	Planned Risk Treatments
Natural Disaster - Severe Ice/Snow	District wide event with significant snow and severe cold temperatures.	High	Severe weather warnings observed. Winter preparations. Communications plan. CIMS training undertaken. Registers of sub-contractor equipment and local volunteers. Winter Operation Plan in place.	Medium	<u>Increased Operational and Maintenance costs</u>
Natural Disaster - Trees on Road Reserve	Death by falling tree and/or firestorm.	High	High risk trees identified but not implemented due to budget constraints.	Medium	<u>Increased Operational and Maintenance costs</u>

Note * The residual risk is the risk remaining after the selected risk treatment plan is operational.

• 6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to our customers and the services we provide. To adapt to changing conditions and grow over time we need to understand our capacity to respond to possible disruptions and be positioned to absorb disturbance and act effectively in a crisis to ensure continuity of service.

Resilience is built on aspects such as response and recovery planning, financial capacity and crisis leadership.

Table 6.3: Resilience

Threat/Hazard	Resilience (L/M/H)	Improvements/Interventions
Service/Asset Failure - Critical and high risk footpath asset failure	M	Improvement to modelling and Forward Works programming to minimise risk of asset failure occurring.
Health and safety – Fatality or serious injury in the course of council's works	H	Continuous improvement in procedures and policy. Ensuring compliance with legislation and best practice.
Natural Disaster - Landslides	H	Low number of assets potentially impacted. Geotechnical advice readily available to council, including incident response.
Natural Disaster - Severe Ice/Snow	H	Winter Operations management plan established. Periodically reviewed/updated.
Natural Disaster - Trees on Road Reserve	M	Street tree condition ratings now available in council's data. Working with Parks and Reserves staff.
Natural Disaster - Flooding	M	Known sites of surface water flooding impacting footpaths and adjacent property. Programme of mitigations and improvements to be developed.

Council staff are currently developing a comprehensive Resilience Plan, as part of the Improvement Plans documented within council's Activity Management Plans and Infrastructure Strategy. Some

• 6.4 Service and Risk Trade-Offs

The decisions made in adopting this Asset management plan are based on the objective to achieve the optimum benefits from the available resources. Current proposals demonstrate a funding shortfall, discussed further in Section 7.1.1: Asset Renewal Funding Ratio.

This shortfall has been incorporated into the assessment of likely impacts to the service levels, shown in Table 3.4 (ii) and Table 3.5. There is an expectation that service levels will be maintained at current levels in the future, but this is at a higher risk and the improvement plan – how are you going to address this.

6.4.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years. These include:

- Increasing operations and maintenance funding from current levels to provide all identified improvements to council’s asset management processes and procedures, which cannot be met through changes to existing systems and re-allocation of existing funding. The areas identified are council’s internal and external asset management activities, and increasing operational budgets to mitigate the impacts of natural disasters.
- Identified ‘lower priority’ renewals and improvements, as part of a managed works programme, in years 4 to 10 of the long term financial plan. Current renewals budgets will be maintained at \$448,000 per year for the 10-year long-term financial period, leaving a shortfall in the modelled requirements for footpath renewals expenditure of \$133,000 each year.
- Deferring or reducing the extent and scope of footpath upgrades in Pisa Moorings, therefore not addressing all level of service gaps. Potentially only \$440,000 of funding - meeting approximately 50% of demand - will be provided in the ten-year plan.

6.4.2 Service trade-off

Operations and maintenance activities and capital projects that cannot be undertaken will maintain or create service consequences for users. Current funding levels in the long-term financial plan are lower than potentially required to address service level gaps, with an expectation that service levels will be lower in the future. Service impacts to council’s footpath network may include:

- A managed deterioration in the condition of footpaths across the District over time, potentially resulting in an increase in the percentage of footpaths rated as “Poor” or “Very Poor”. This may reduce accessibility, amenity and comfort. Customer satisfaction levels may decrease.
- Closing, demolishing or restricting access to footpaths where surface conditions deteriorate to very poor service levels, and alternative provisions exist. Accessibility and amenity will be reduced, potentially resulting in customer satisfaction levels decreasing.
- Increased expectations for levels of service – through additional maintenance and renewals – may not be provided. This includes requests for footpaths, which have not always been provided in all residential and commercial developments. More customer complaints and increased customer dissatisfaction are likely.
- All requested improvements and upgrades, which could also include improvements to footpath levels of service in high-demand areas (for example, additional footpaths on routes near schools or upgrades to all pedestrian crossing points) may not be provided within existing funding/project prioritisation constraints.
- Level of service increases potentially driven by growth, land use change and population demographics may not be provided, resulting in reduced accessibility to the network for some users.
- Unprecedented growth in Central Otago’s main townships, resulting in high levels of new residential and commercial development - and services, such as schools and medical centres - may not be linked to the existing footpath network due to insufficient funding for increased levels of service.

6.4.3 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may maintain or create risk consequences. These include:

- Service levels not met - Inadequate delivery of levels of service expectations. This could include; service failure, under-expenditure in works programmes, community dissatisfaction.
- Asset Failure - Critical and high-risk asset failure could result in loss of access, increased risk of injury to users, physical and reputational damage and fiscal impacts (increased whole-of-life costs and/or emergency repairs).
- Council/Contractor Systems - Not delivering contract objectives, and poor technical/contract management, will result in; disgruntled customers, decrease in level of service and poor asset management (asset degradation and asset failure inappropriately addressed).
- Procurement being inefficient and ineffective, which could result in under-priced and poor quality work, poor value for money, excessive demands on resourcing and delays.

These actions and expenditures are considered in the projected expenditures, and where developed are included in the Risk Management Plan.

• 7. FINANCIAL SUMMARY

This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan. The financial projections will be improved as further information becomes available on desired levels of service and current and projected future asset performance.

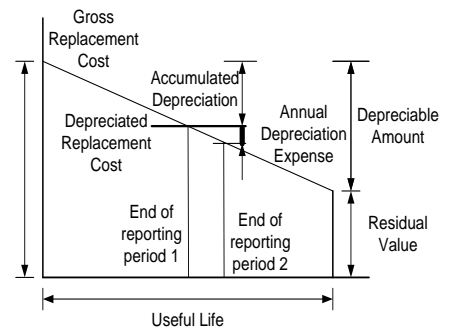
• 7.1 Financial Statements and Projections

7.1.1 Asset valuations

The best available estimate of the value of assets included in this Asset Management Plan are shown below. These have been calculated directly from the asset inventory used for Method 1 analysis.

Footpaths_S1_V4

Value	(\$'000)
Current Replacement Cost	\$18,932
Depreciable Amount	\$18,932
Depreciated Replacement Cost	\$10,348
Annual Depreciation Expense	\$419



Council's infrastructure assets are valued on the basis of Optimised Depreciated Replacement Cost (ODRC), with the last effective valuation date of 1st July 2015, adopted by the Council in June 2016¹³. This report signed-off footpath assets valued at a Gross Replacement Cost of \$17,698,000, suggesting a high degree of correlation between the current asset management plan and the formal Valuation.

7.1.2 Sustainability of service delivery

Two key indicators for service delivery sustainability that have been considered in the analysis of the services provided by this asset category, these being the:

- asset renewal funding ratio, and medium term budgeted expenditures/projected expenditure (over 10 years of the planning period).

Asset Renewal Funding Ratio

The Asset Renewal Funding Ratio is the most important indicator and indicates that over the next 10 years of the forecasting that we expect to have **83%** of the funds required for the optimal renewal and replacement of assets, taken from NAMS.PLUS3 expenditure modelling.

Table 7.1.2 (i): Footpath Asset Renewal Funding Ratios for Methods (Scenarios) 1 to 3

Criteria	Scenario 1 (Asset Register)	Scenario 2 (capital renewal expenditure forecast)	Scenario 3 (modified expenditure)
Asset Renewal Funding Ratio ¹⁴	79%	83%	97%

¹³ Central Otago District Council Roadway Asset Valuation 1 July 2015, Rationale (May 2016)

¹⁴ AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

Table 7.1.2 (ii): Footpath Asset Funding Sustainability for Methods (Scenarios) 2 and 3

Footpaths_S2_V4

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio	77%
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Long Term - Life Cycle Costs

Life Cycle Cost [average 10 years projected ops, maint exp and deprn.]	\$684
Life Cycle Exp [average 10 years LTFP budget ops, maint & capital renewal exp]	\$676
Life Cycle Gap [life cycle expenditure – life cycle cost (-ve = gap)]	\$-8
Life Cycle Indicator [life cycle expenditure / life cycle cost]	99%

Medium Term - 10 year financial planning period

10 yr Ops, Maint & Renewal Projected Expenditure	\$846
10 yr Ops, Maint & Renewal LTFP Budget Exp	\$676
10 year financing shortfall [10 yr proj exp - LTFP Budget exp]	\$-170
10 year financing indicator [LTFP Budget exp / 10 yr proj exp]	80%

Medium Term – 5 year financial planning period

5 yr Ops, Maint & Renewal Projected Expenditure	\$821
5 yr Ops, Maint & Renewal LTFP Budget Exp	\$670
5 year financing shortfall [5 yr proj exp - LTFP Budget exp]	\$-150
5 year financing indicator [LTFP Budget exp / 5 yr proj exp]	82%

Footpaths_S3_V4

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio	100%
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Long Term - Life Cycle Costs

Life Cycle Cost [average 10 years projected ops, maint exp and deprn.]	\$684
Life Cycle Exp [average 10 years LTFP budget ops, maint & capital renewal exp]	\$676
Life Cycle Gap [life cycle expenditure – life cycle cost (-ve = gap)]	\$-8
Life Cycle Indicator [life cycle expenditure / life cycle cost]	99%

Medium Term - 10 year financial planning period

10 yr Ops, Maint & Renewal Projected Expenditure	\$713
10 yr Ops, Maint & Renewal LTFP Budget Exp	\$676
10 year financing shortfall [10 yr proj exp - LTFP Budget exp]	\$-37
10 year financing indicator [LTFP Budget exp / 10 yr proj exp]	95%

Medium Term – 5 year financial planning period

5 yr Ops, Maint & Renewal Projected Expenditure	\$688
5 yr Ops, Maint & Renewal LTFP Budget Exp	\$670
5 year financing shortfall [5 yr proj exp - LTFP Budget exp]	\$-17
5 year financing indicator [LTFP Budget exp / 5 yr proj exp]	97%

The reductions in short and medium-term investment for the footpath assets modelled in Scenario 3 present a very high level of affordability, based on current budgets. However, the risks in reducing renewals investment to these levels are not considered sustainable.

Whilst recommending that investment is provided to meet the projected expenditure requirements of Scenario 2, detailed analysis by engineering staff will be undertaken as a priority to establish if deferred renewals investment will be sustainable in the medium-term.

Further information supporting these recommended funding levels within this asset management plan are included in Section 5.5.

Medium term – 10 year financial planning period

This asset management plan identifies the projected operations, maintenance and capital renewal expenditures required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

These projected expenditures may be compared to budgeted expenditures in the 10 year period to identify any funding shortfall. **In the case of Central Otago District Council’s footpath asset management plan, the gap is due to:**

- **45% of the assets reaching the end of their Useful Lives from the asset inventory data, although only 10% of these aging assets are in a condition where increasing asset renewal requirements are anticipated; and**
- **A large increase in planned Capital upgrades, driven by District-wide growth.**

Footpaths_S1_V4

Value

Rate of Annual Asset Consumption	2.2%
Rate of Annual Asset Renewal	2.4%
Rate of Annual Asset Upgrade	1.2%
Rate of Asset Upgrade (Including Contributed Assets)	2.2%
Asset renewals as percentage of consumption	106.9%
Percentage Increase in asset stock	2.2%

The projected operations, maintenance and capital renewal expenditure required over the 10 year planning period is **\$1,256,000** on average per year for Scenario 2. Scenario 3 modelling reduces this expenditure to **\$1,077,000**, with deferred renewals and upgrades proposed within this model

Estimated (budget) operations, maintenance, capital renewal and capital upgrades funding is **\$1,040,000** on average per year giving a 10 year funding shortfall of **\$216,000** per year. This indicates **83%** of the projected expenditures needed are budgeted, to provide the services documented in the asset management plan. **Scenario 3 suggests a projected expenditure to budget ratio of 97%, but with higher risks, detailed in Sections 5 and 6.**

Providing services from infrastructure in a sustainable manner requires the matching and managing of service levels, risks, projected expenditures and financing to achieve a financial indicator of approximately 100% for the first years of the asset management plan and ideally over the 10-year life of the Long Term Financial Plan.

7.1.3 Projected expenditures for long term financial plan

Table 7.1.3 shows the projected expenditures for the 10 year long term financial plan.

Expenditure projections are in 2018 real dollar values.

Table 7.1.3: Projected Expenditures for Long Term Financial Plan (\$000)

Year	Operations (\$'000)	Maintenance (\$'000)	Projected Capital Renewal (\$'000)	Capital Upgrade/ New (\$'000)	Disposals (\$'000)
2018	\$74	\$143	\$581	\$227	\$0
2019	\$83	\$146	\$581	\$761	\$0
2020	\$83	\$153	\$581	\$770	\$0
2021	\$89	\$161	\$581	\$548	\$0
2022	\$100	\$166	\$581	\$375	\$0
2023	\$100	\$171	\$581	\$395	\$0
2024	\$106	\$175	\$581	\$360	\$0
2025	\$115	\$179	\$581	\$360	\$0
2026	\$115	\$184	\$581	\$95	\$0
2027	\$119	\$186	\$581	\$210	\$0

• 7.2 Funding Strategy

Funding for assets is provided from the budget and long term financial plan.

The financial strategy of the entity determines how funding will be provided, whereas the asset management plan communicates how and when this will be spent, along with the service and risk consequences of differing options.

• 7.3 Valuation Forecasts

Asset values are forecast to **increase** as additional assets are **added** to the footpath network. Figure 11 shows the financial impact of Central Otago District Council's current capital growth and upgrade requirements through the modelled Depreciated Replacement Cost over a 20-year period. The constant value for the depreciated replacement cost against renewals illustrates that the organisation is maintaining its infrastructure capital for existing assets, with predicted asset depreciation replacement costs rising due to new additions.

Figure 11: Projected Depreciated Replacement Cost

Otago DC - Projected Depreciated Replacement Cost (Footpaths_S1_V4)



Additional assets will generally add to the operations and maintenance needs in the longer term, as well as the need for future renewal. Additional assets will also add to future depreciation forecasts.

Council will need to undertake additional modelling of the anticipated asset inventory growth due to projected footpath assets being constructed or contributed to council over the longer term. The 30-year Infrastructure Strategy will need to reflect the potential additional costs of maintenance and renewals of the asset stock increasing by an average of 2.2% per year for the long term financial plan period.

• 7.4 Key Assumptions Made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this asset management plan. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this asset management plan are the valuation of existing assets and the proposed Forward Works costs. These are shown in Table 7.4, assuming:

- Current footpath asset in-service Standard Lives are correct;
- Current footpath asset Gross Replacement Costs (by m² unit rates) are appropriate; and
- Current real costs (2018 dollar values) provide a representative financial baseline.

Table 7.4: Standard Lives and Unit Rate Costs for Footpaths (September 2018)

Footpath Material	Standard Life (years)	Approx. Unit Rate (\$/m ²)
Asphalt	30	67
Concrete	60	82
Pavement Blocks	60	115
Sealed (surfacing only)	25	16
Unsealed (wearing surface only)	25	25

• 7.5 Forecast Reliability and Confidence

The expenditure and valuations projections in this Asset management plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale¹⁵ in accordance with Table 7.5.

Table 7.5: Data Confidence Grading System

Confidence Grade	Description
A Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C Uncertain	Data based on sound records, procedures, investigations and analysis, which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this Asset management plan is considered to be **grade B "Reliable"**.

• 8. PLAN IMPROVEMENT AND MONITORING

• 8.1 Status of Asset Management Practices¹⁶

8.1.1 Accounting and financial data sources

- Current and forward works budget information taken from the Central Otago District Council Long Term Plan 2018-28, Transportation Activity Management Plan 2018-21 and financial data submitted to the New Zealand Transport Agency through the Transportation Investment Online (TIO) portal.
- Current and forward works expenditure analysis has been completed using the tools and templates that are supplied as part of the IPWEA NAMS.PLUS3 Asset Management system.
- Roding valuation data taken from Central Otago District Council datasets and formal Registered Valuer review and sign-off (Rationale)

8.1.2 Asset management data sources

- Roding Carriageway and Footpath asset datasets, taken from RAMM database.
- Footpath Roughness survey data for 2016/17 and 2017/18, collected and stored within RAMM.

¹⁵ IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

¹⁶ ISO 55000 Refers to this the Asset Management System

• 8.2Improvement Plan

The activity management Improvement Plan for footpaths, generated from this asset management plan is shown in Table 8.1.

Table 8.1: Improvement Plan

Task No	Task	Responsibility	Additional Resources Required	Timeline
1	Complete development and support the adoption of the Asset Management Policy by council.	Infrastructure Teams Executive Manager Council	No	2019
2	Complete assessment and adopt the results of the current Asset Maturity assessment, continuing towards developing an “Advanced” asset management system for council.	Infrastructure Teams Executive Manager	No	March 2019
3	Complete review of council’s footpath asset inventory for completeness, working towards an International Infrastructure Management Manual data confidence level A – “Highly Reliable” <ul style="list-style-type: none"> Focus on validation of ‘greenway’ lengths. 	Roading/Asset Teams Contract Staff	Yes	February – June 2019
4	Undertake a “Useful Life Improvement” assessment of council’s footpath assets. This will improve confidence levels in using Asset Register inventory data to determine renewal/replacement work (Method 1) and Valuations.	Roading/Asset Teams Contract Staff Rationale	Yes	May - August 2019
5	Continue to undertake annual footpath roughness surveys across 100% of the network assets.	Roading Team Contract Staff	Yes (Planned)	February – June 2019
6	Continue to evaluate and report footpath performance measures. Include full footpath programme within the “percentage of budgeted capital works completed” measure.	Asset Team Executive Manager	No	Ongoing
7	Complete the new footpath deterioration model and use it to validate renewal programmes in years 2 and 3. Use model as the basis for long-term financial planning for current years 4-10.	Asset Team dTIMS Modeller Executive Manager	Yes (Planned)	2019
8	Develop preliminary assessment and Business Cases for the following major upgrades: <ul style="list-style-type: none"> Clyde Precinct Development; and Cromwell Town Centre 	Asset Team Rationale Executive Manager	Yes	2019 - 2020
9	Re-establish good working systems and relationship between council and maintenance Contract staff adopting “systems thinking” principles. This will assist in planning and delivering best-value footpath renewals, upgrades and improvements.	Infrastructure Teams Executive Manager Contract Staff	No	Ongoing
10	Develop Council’s Network Resilience Plan for Infrastructure assets, in conjunction with formalising the Emergency Response Plan.	Infrastructure Teams Executive Manager Council	No	February – April 2019

● 8.3 Monitoring and Review Procedures

This asset management plan will be reviewed during annual budget planning processes and amended to show any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

The Asset management plan will be updated annually to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrade/new and asset disposal expenditures and projected expenditure values incorporated into the long term financial plan.

The Asset management plan has a life of 3 years and is due for complete revision and updating, for adoption by Central Otago District Council on 1st July 2021.

● 8.4 Performance Measures

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into the long term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the asset management plan,
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the target of 100% (1.0) for sustainable investment.

● 9. REFERENCES

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- Central Otago District Council Corporate Risk Policy (Draft)
- Central Otago District Council Long Term Plan 2018-28
- Central Otago District Council Transportation Activity Management Plan 2018-21