Land Transport Asset Management Plan 2021-31

PART C: ASSET MANAGEMENT PLAN

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Prepared by: Roading Unit
Waitaki District Council

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Rev.	Details
1.0	Pre-consultation draft for 2021-24 NLTP planning period
2.0	Final Draft

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PART C: ASSET MANAGEMENT PLAN / DETAILED BUSINESS CASE

1 Introduction

1.1 Policy Implementation

This AMP gives effect to WDC's corporate AM Policy. The AM Policy defines the agreed level of AM practice that will be applied to managing the assets. Assessing and adopting an appropriate AMP level allows Council to identify what is "Appropriate Best Practice" for Waitaki District, and therefore focus resources accordingly to enhance prudent management of the community infrastructure.

The level is based on a range of parameters:

- District and Community Populations
- Issues affecting the district and each activity
- The cost and benefits to the community;
- Legislative requirements;
- The size, condition and complexity of the assets;
- The risk associated with failures;
- The skills and resources available to the organisation;
- Customer expectation

Having considered these factors, the Council agreed AM level for the transportation service is "Core Plus".

This means that the plan level represents a transition between Core (basic) practice and Comprehensive/Advanced practice accounting for all lifecycle elements. Additional emphasis in the Transportation plan is required in the following practice areas:

- Description of Assets
- Managing Growth/ Demand
- Lifecycle Decision Making
- Financial Forecasts

1.2 AM System

WDC's asset management system is comprised of the practices, processes, tools, documents and resources used to manage the service:

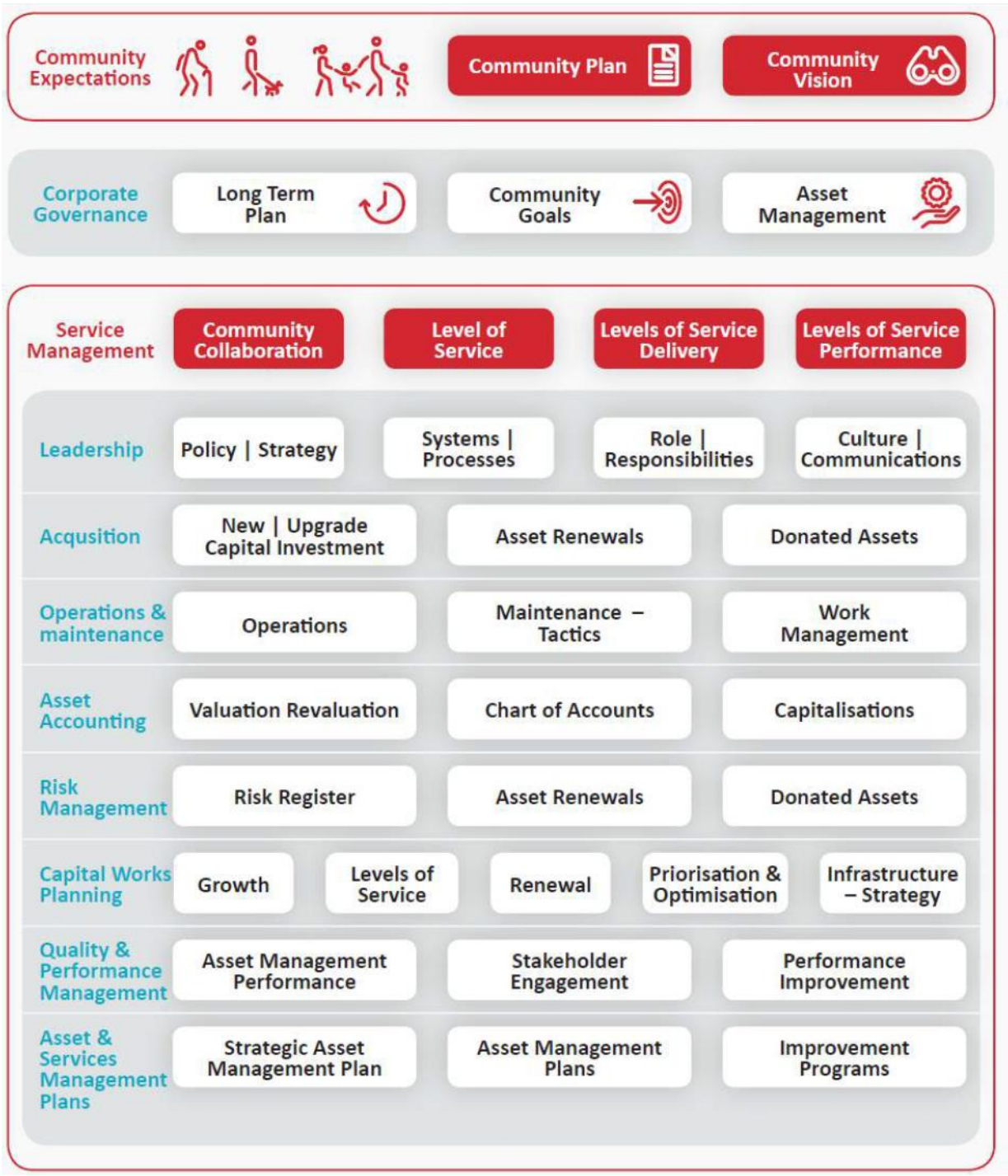


Figure 1: WDC's Asset Management System

2 Asset Management Tools, Data & Attribute Information

Data and information is the foundation of robust, reliable and evidence based decision making. Data is therefore a critical asset for WDC and the tools and controls around data management are rigorous. We employ specialist service providers to assist with this task.

WDC has a dedicated asset and maintenance register, RAMM (Road Assessment and Maintenance Management). RAMM stores assets along with attributes such as condition, performance and dimensions. RAMM links to other council systems, policies and programmes through the use of bespoke tools, generally spreadsheets. WDC also use dedicated tools for modelling asset deterioration i.e. the RAMM treatment selection algorithm and dTIMS. This uses asset condition and performance from RAMM, to forecast future asset condition and pavement renewal programmes:

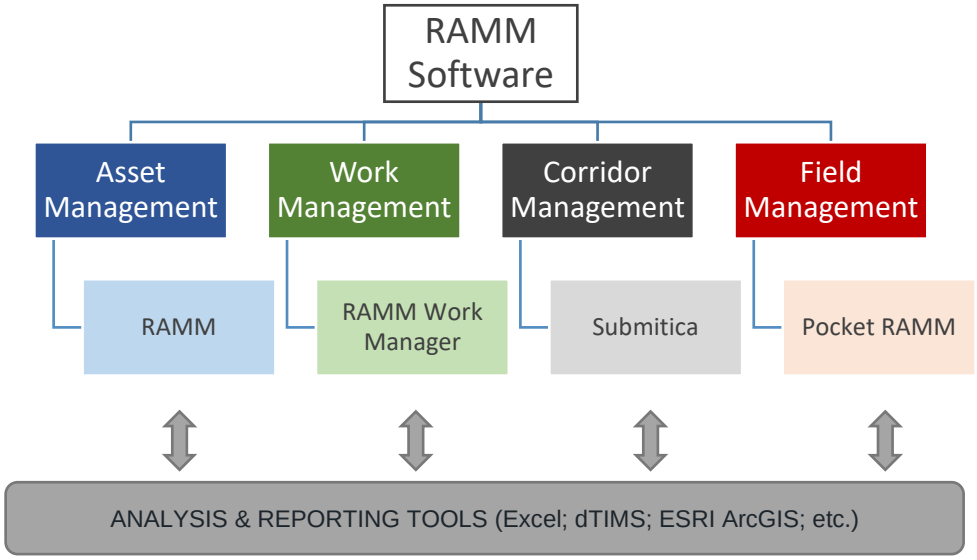


Figure 2: RAMM and Analysis Tools

2.1.1 RAMM Software

The core asset register used by the Council is RAMM (Road Assessment and Maintenance Management) which is hosted and managed by RAMM Ltd under the direction of the NZTA to ensure systems adhere to NAMS requirements. RAMM is used nationally to manage state highway and local authority roading networks, thus allowing direct benchmarking of road condition, location, hierarchy, traffic volume and roughness. The ONRC performance framework includes measures drawn from RAMM e.g. ONRC and Asset Management Data Quality that can be analysed on an annual basis.

Figure 3: RAMM Annual Cycle

The use of RAMM data for obtaining Government financially assisted investment is preferred by the NZTA but is not mandatory. RAMM is commonly used throughout New Zealand including Waitaki and is updated by WDC's Network Manager (internal staff) and Maintenance contractor for input into the lifecycle asset management process.

Table 1: Aspects of RAMM

RAMM Inventory	The RAMM inventory includes the following functionality: • **Asset register** - inventory of roading network, bridges, footpath, signage, streetlights, drainage and associated assets; • **Condition database** - recording of roading condition and roughness surveys; • **Treatment Selection Algorithm (TSA)** – generated annually, this determines the optimum or best treatment for a particular section of road based on current activity and condition information; • **Priority formulation** - ranking of treatment options based on cost benefit calculations; • **Input for dTIMS** - predictive deterioration modelling (see below); • **Asset Valuation** – using asset age alongside deterioration modelling, Council utilises the RAMM Asset Valuation Module and the information is stored in RAMM. Bridge information is stored in a dedicated platform called OBIS but the valuation is currently undertaken in a spreadsheet. • **Crash Data** – Crash Analysis System (CAS) data is stored in NZTA's database but a simplified version can also be accessed through RAMM. RAMM provides a range of standard reports and has a strong user defined report writing capability. Additionally, WDC utilises user-dedicated versions of RAMM.
RAMM Work Management	RAMM Work Management (formerly RAMM Contractor) allows accurate records of job dispatches, work status, crew productivity, updating asset records and income and is used for verification and signoff of claims for payment. This is the preferred software for use by the maintenance contractor and has been in force since the new roading maintenance contract in 2017.
Pocket RAMM	Council staff and contractors use this software on Notebooks or Tablets to retrieve information on current and programmed jobs, all road maintenance in the contract and all street lighting including LED upgrade. Includes date, age and condition of assets. The use of Pocket RAMM allows on site verification of data entry and will over time, improve data accuracy. Pocket RAMM is a valuable tool for entering data and updating inventory in the field. The continued use of Pocket RAMM by Council staff and the contractor will contribute to improving the overall quality of RAMM information.
Submitica & Submitica Control	Utility operators, their contractors, or other applicants such as event organisers, use Submitica to request access to the road reserve or corridor. Submitica Control allows WDC to evaluate and manage requests for access to road reserves. The workflow system is GIS based and integrated with other RAMM tools.

2.1.2 Other Inventory, Analysis & Reporting Tools

In addition to RAMM, WDC has various analytical tools and systems that support asset decision making:

Table 2: WDC's Various Analytical Tools

Transportation Tools & Systems	
dTIMS	The main predictive analysis tool used by the Roading team for renewals is the software from Deighton Associates. This is a deterioration modelling system used to predict pavement deterioration and from this Council can develop forward expenditure profiles for various user-defined scenarios. A dTIMS model has been developed to establish Council's renewals and rehabilitation forward works programme i.e. carriageway resurfacing and pavement renewals.
OBIS	OBIS is a software tool used to manage Council's bridge assets.
Other Available Records	• Hardcopy Plans • Bridge Files • Investigative Reports • Contract Files • Project Register and Files • Standards and Guidelines • Shared Services • Quality Assurance Processes
NZTA Systems	
Transport Investment Online (TIO)	Transport Investment Online is a web-based system managed by NZTA and used by approved organisations to create and submit Council's Regional Land Transport Plan (RLTP) to the NZTA and Ministry of Transport (MoT).
CAS	Crash Analysis System (CAS) is the Agency-controlled database which records reported crashes. The associated Traffic Crash Reports (TCRs) need to be read to help understand the location and cause when undertaking detailed analysis, as there are limitations on location accuracy. There can be a delay of up to 6 months after a crash for data to become available in CAS; therefore, local knowledge needs to be considered when reviewing crash history. CAS data is used in Exceptions analysis and at times to help justify renewal or safety improvements works. RAMM also has a Crash data table which is updated by NZTA. This data is more readily available for Asset Managers to access and use. Crash Statistics are now also available through the ONRC Performance Reporting Tools developed by the Roading Efficiency Group.
PMRT	The Performance Measures Reporting Tool (PMRT) is used to measure the One Network Road Classification (ONRC) performance measures which were developed by the Road Efficiency Group (REG) – a collaboration between Local Government New Zealand and the NZ Transport Agency.
REG Reports	The Road Efficiency Group (REG) produce several reports to measure, monitor and benchmark road controlling authorities across New Zealand. This includes data quality reports that are produced annually.
Corporate Systems	
Customer Request Management System	This is a customer services system module within Civica's Authority financial system where all enquiries relating to Council activities including transport are recorded. Officers and Asset Managers are notified of customer requests electronically via email. The data is used for performance monitoring of Customer Requests and records complaints, requests and unplanned maintenance requirements.

Geographical Information System (GIS)	Schematic representations of assets exist in Council's GIS system. GPS locations of carriageways and maintenance repairs are routinely recorded and entered into RAMM and the GIS as a contract requirement. Mobile Road is now also available and gives the user a visual map of the inventory.
Accounting / Financial Systems	Council's Accounting and Financial systems are based on Civica's Authority software and GAAP Guidelines. Long term financial decisions are based on the development of 10-year financial plans as part of the Local Government LTP process. These 10-year plans are updated every three years on a cycle linked to the development of this AMP. The 10-year forecasts developed in this Plan correspond to the latest financial projections presented to Council and consulted on through the LTP process.

2.2 Data Quality Management

Data is seen by Council as increasingly important in underpinning its approach to consistent levels of service, asset management and investment decision making.

The Road Efficiency Group (REG) has an established data quality framework which consists of a suite of metrics that are applied to Council's data to establish quality in terms of accuracy, completeness and timeliness. These metrics are intended to provide an indicator of confidence in the ability of the data to support measurement of ONRC Performance Measures and Council's asset management decision-making processes.

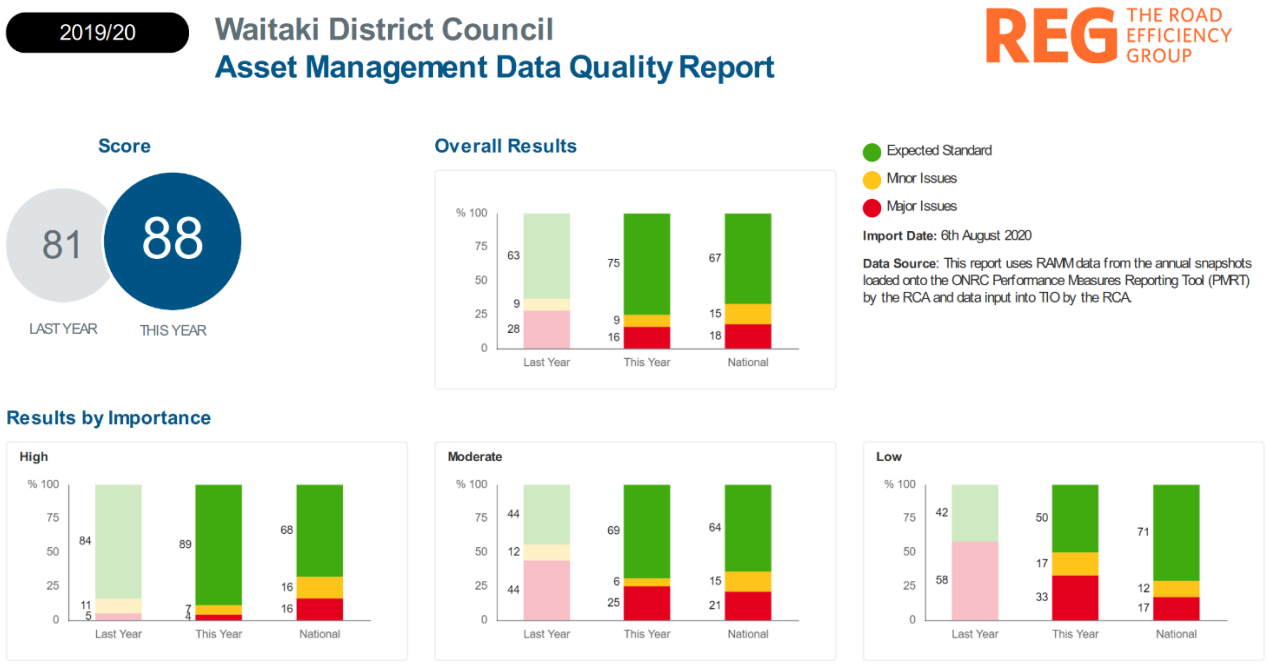


Figure 4: 2019/20 REG Data Quality – OVERALL Performance

The overall results shown in Figure 4 illustrate a year-on-year improvement which has led to data quality better than the national average for data of high importance (and overall).

Figure 5 illustrates a year-on-year improvement across all three areas (accuracy, completeness and timeliness) and better achievement than the national average.

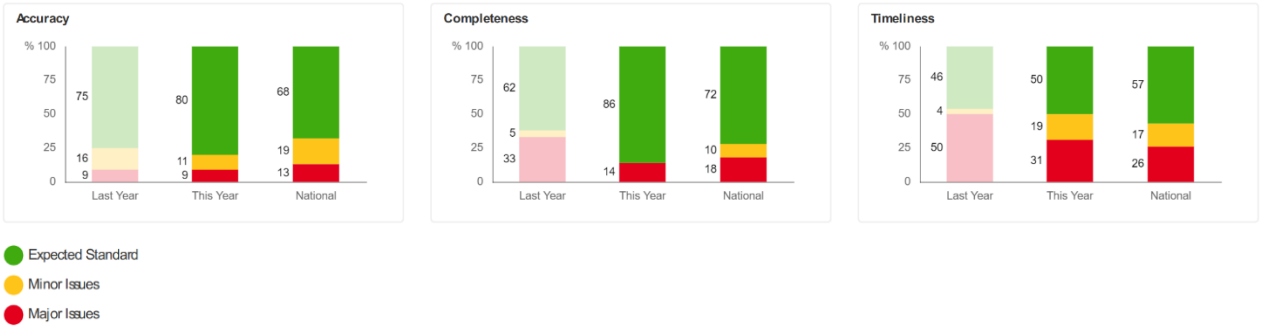


Figure 5: 2019/20 REG Data Quality – Results by Quality Dimension

Figure 6 is produced based on an assessment of different data types used to underpin asset management decision-making. The charts show a year-on-year improvement across most areas and performance exceeds the national average for all types except Asset Inventory. The improved quality reflects the targeted effort that Council has put in to improving asset data.

Figure 6: 2019/20 REG Data Quality - Asset Management

Council has developed a draft Roading Information Management Plan which identifies roles, allocates responsibilities and establishes data quality management processes. These include a monthly continuous improvement process where data quality metrics are measured to track improvements between annual reports. This has resulted in significant improvements in data quality. It is particularly important to maintain data and periodically update it to ensure it is still relevant – the timeliness metric is used as an indicator in this regard.

The areas where data was assessed as incomplete (major issues related to completeness) in the 2019/20 REG Data Quality Report include:

- Known asset data (valid dimension, material, construction date and/or condition data) – this reflects gaps in the asset register for a range of asset types, including surface water channels, signs and guardrails. There are improvements since the 2018/19 report for footpaths, culverts and retaining walls – these are known shown at the expected standard.

3 Risk Management

3.1 WDC Risk Management Policy and Framework

WDC uses asset information and level of service performance data from operational practices to assess the risks of not achieving the required levels of service. A risk-based approach allows WDC to identify the importance of different assets in supporting the delivery of services (asset criticality) and provides the ability to consider the likelihood of asset failure and the associated consequences into decision making.

WDC will apply proven risk management practices in the decision-making process by:

- Understanding the criticality of the individual components of WDC's infrastructure.
- Using objective, repeatable methodologies, based on robust quantifications and understanding of probability and impact, allowing an understanding of the risk of each asset, and adjusting interventions accordingly.
- Producing robust forecasts of the changes in the risk profile of its asset base over time, enabling the Council to determine the optimum level of capital and operational investments needed to sustain assets.
- Identifying the risks that will impede the achievement of WDC's Asset Management Objectives and levels of service and develop appropriate strategies to ensure that these goals and objectives can be met.

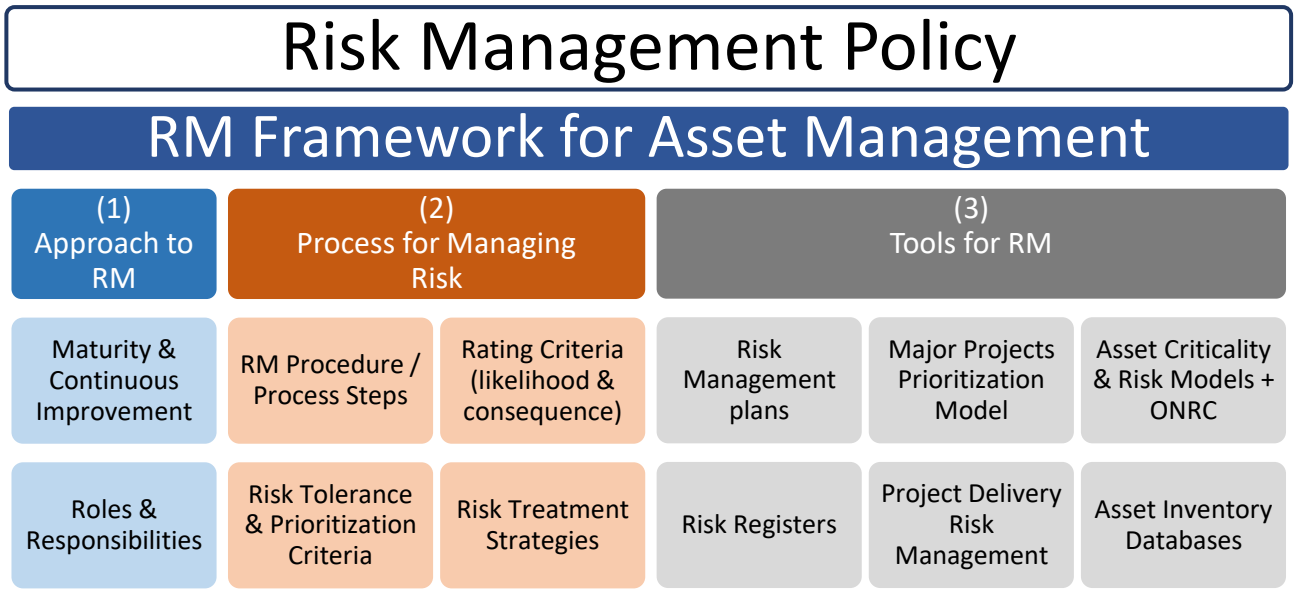


Figure 7: WDC Risk Management Framework

In giving effect to this policy, the transportation risk management strategy is to:

- Manage risks within a tolerable level to meet service level expectations;
- Introduce incremental changes to the risk process and continuously build upon existing risk management activities;
- Apply a consistent approach to managing risk across each service area; and
- Balance the cost and control of a risk within the Asset Management Plans to ensure the greatest value to WDC.

3.2 Our Approach to Risk Management

Our approach to risk management in service delivery is adapted from the ISO 31000 Risk Management Guidelines and based on the following hierarchical structure and generalised process:

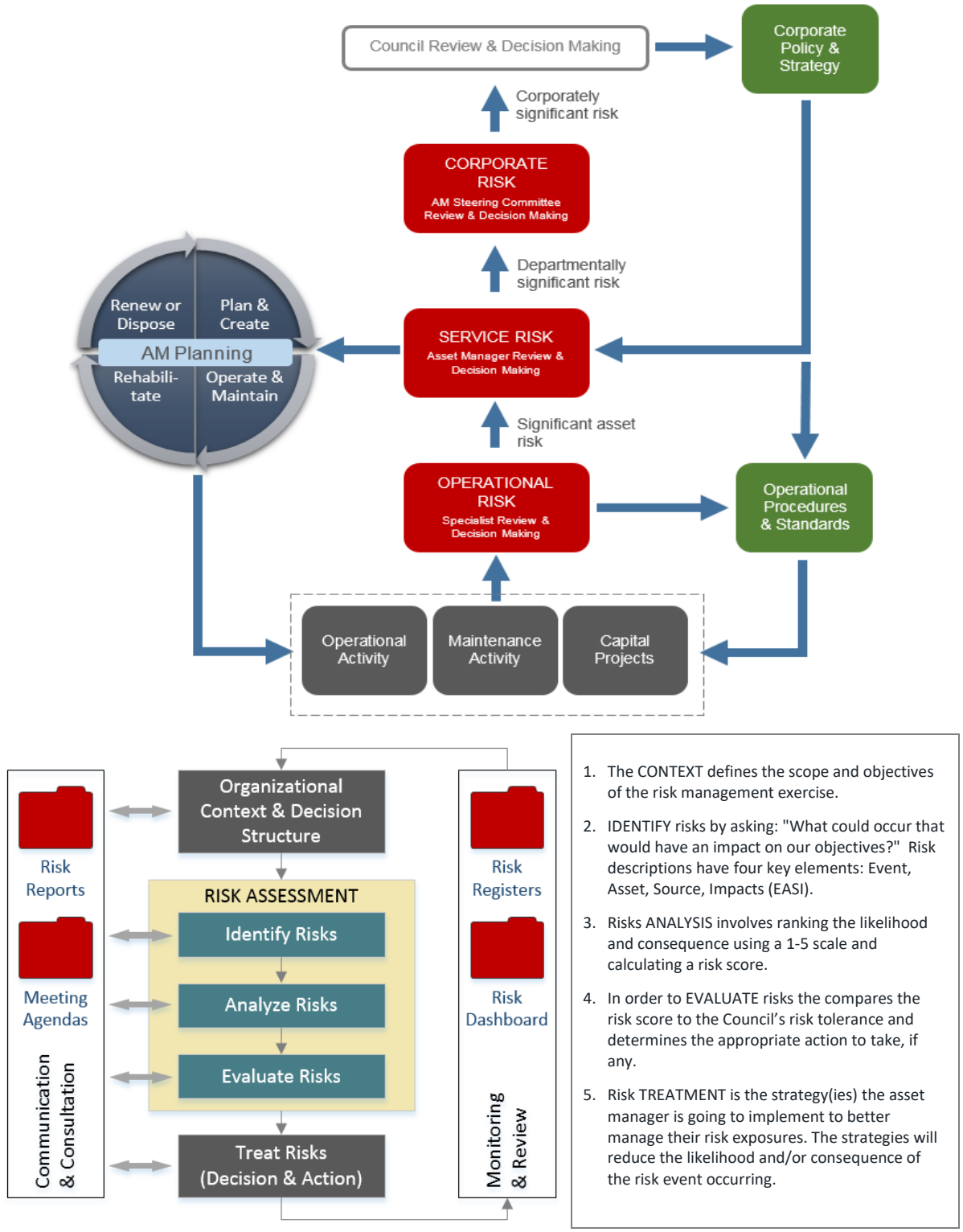


Figure 8: WDC Risk Management Hierarchy & Process

3.3 Strategies for Managing Risk

Strategies for managing risk are guided by Council's appetite for risk, and the nature of the risk:

Table 3: Strategies for Managing Risk

Risk Grade		Appetite	Action / Strategy
5	Extreme	Unacceptable risk. Immediate action required to avoid the risk. Requires continuous review.	• Management of this risk is critical to the success of the Council in meeting its goals and avoiding negative outcomes. • Requires detailed research, planning and decision making at senior levels of management, may require attention from the Senior Management Team. • SMT should be kept informed. • Treatment should be within the scope of the next annual plan.
4	High	Unacceptable risk. Urgent action required to minimise risk.	
3	Moderate	Tolerable risk. Prioritized action required to minimise risk. Frequent review of risk level required.	• Management of this risk is very important but not critical to the success of Council in meeting its goals. • Improving the risk mitigation should be programmed (on the 3yr plan). • Department manager's attention and action needed.
2	Low	Tolerable risk. Prioritised action required to mitigate or transfer risk. Periodic review of risk level required.	• Management of this risk (if reasonably practical) will contribute to Council meeting its goals. • Standard processes & procedures should be in place for controlling these risks.
1	Negligible	Acceptable risk and no further action required if the risk has been minimised as far as possible. Risk should be monitored periodically.	• Management of this risk is not material to the success of Council in meeting its goals and avoiding negative outcomes. • Improving the risk mitigation is not required. • Can be managed by routine controls and procedures.

Asset Managers should use the following diagram to guide selection of appropriate monitoring and review strategies (based on the net risk score):

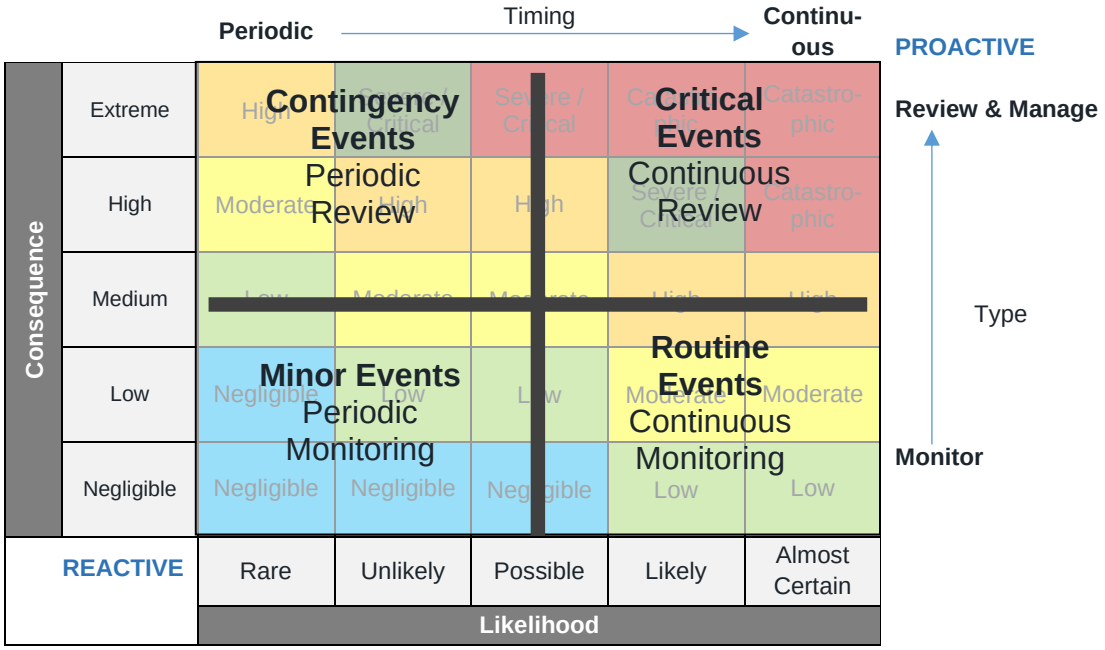


Figure 9: Application of Risk across WDC's Transportation Asset Management Program

The source (likelihood) and impact (consequence) attributes of each risk are used to provide a focus and prioritisation for risk review and decision on the appropriate level of response:

- **High Risk** provides a focus and prioritization for action, including: investment planning, works programs, and consultation strategies.
- **High Likelihood** provides a focus and prioritisation for prevention strategies.
- **High Consequence** provides a focus for increasing factors of safety, and prioritizing mitigation and response strategies.
- **High Criticality** provides a focus for implementing system reliability, resiliency, robustness, and redundancy strategies.

3.4 Transportation Risk Management Plan

Risk management is integrated throughout delivery of the transportation service through various processes and activities:

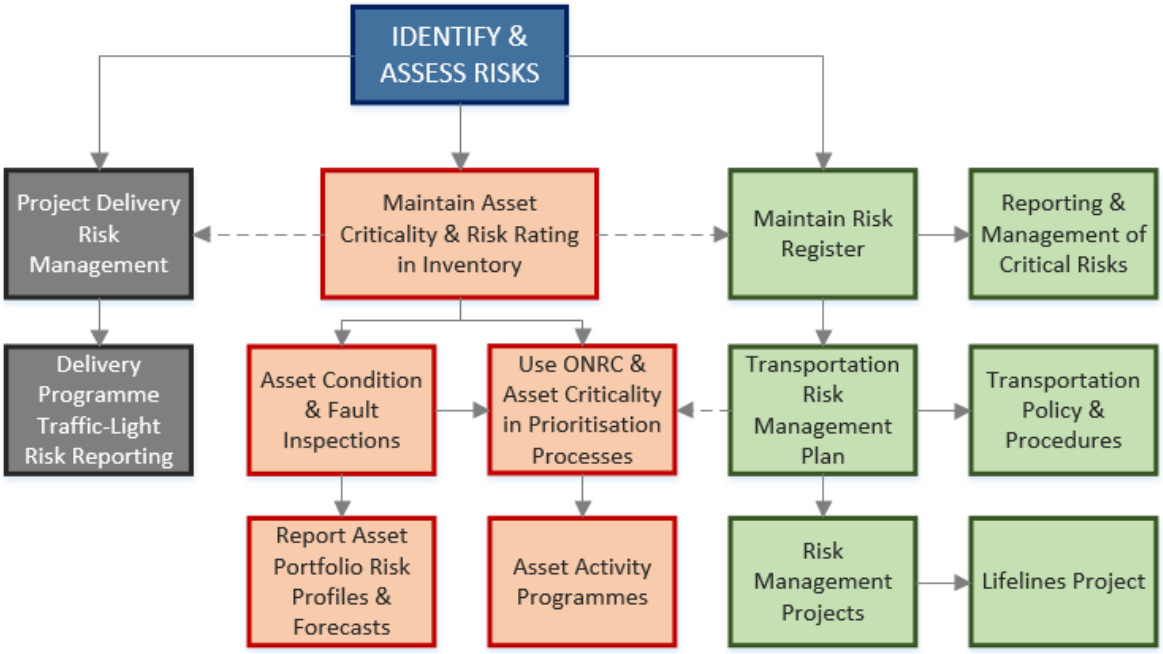


Figure 10: Application of Risk across WDC's Transportation Asset Management Program

A high-level overview of the risk management landscape, including critical risks and management tools/processes is shown in the following figure. The risk levels (coloured indicator) are in line with those listed in section 3.3 above and were assessed under Council's risk framework.

Table 4: Risk Management Landscape

RISk Category	Risk Area	Risk Level	Critical Risk Management Tools & Processes
Planning Risks	Regulatory Changes		Asset management Plan
	Changing Demographics		District Transportation Plan
	Demand & Growth		NZTA policies & standards
	Changing LoS Expectations		Management structure, poistion descriptions
	Changing Strategic Direction & Priorities		LTP & Annual Planning Processes
	Stakeholder engagement & relationships		Annual achievement & DIA reporting
	Climate Change		Business Case
Management Risks	Staff skill & knowledge		Internal procedural audits
	Funding		Global resource conents
	Missing corporate processes		Disaster Recovery fund/reserves
	Staff retention / replacement		Depreciation reserves; Council is self insured
	Debt position		Financial Reports
	Supplier capacity		Procurement Strategy
	Financial control		As-built records
	Procurement		Procurement Strategy
			Business Continuity Plan
			People Management framework
Network Management Risks	3rd Party access to the corridor		Corridor access control (Submitca)
	Event Management		Bylaws, Policies & Procedures
	Crash/Incident Management		Maintenance contracts
	TTM controls & safety		Industry tools and benchmarking
			Safety Deficiency Database
Programme Delivery Risks	System Monitoring & Record Keeping		Programme Strategy
	Contracts Management		Project Risk Management Framework
	Cost Escalations / volatility		Project management Framework
	Health & Safety		
	Programme delivery		
	Consultation		
Physical Asset Risks	System design, age & capacity		Engineering code of practice;
	Material failures		NZTA policies & standards
	Process failures		District Plan
	Structural failures		Asset management Plan
	LoS Failures		Safety deficiency database
Hazard Risks	System Security		Maintenance contracts
	Terrorism		Lifelines Strategy
	Pandemic		Resilience Strategy
	Civil Unrest / Protest		Asset management Plan
	Flood		Business Continuity Plan
	Drought		
	Snow/Ice		
	Wind/Storm		
	Ground Stability		
	Earthquake/Tsunami		
	Storm Surge		

3.5 Critical Assets Assessment Process and Outcomes

It is important to identify critical assets. These will be the assets that may cause catastrophic failure and have the greatest effect on the network's primary function, thereby impacting on the customer should they fail or not be available. There may be different approaches to managing these assets to ensure that they do not fail, or to limit the effect of a failure. One of the principal objectives of a good AMP is to prevent the deterioration of critical assets to "very poor" condition where major and urgent replacement is required. Critical assets should be actively managed under "poor" condition to allow service continuity and minimise disruption costs.

In broad terms, critical assets are bridges and lifeline routes (roads that provide key links or have high traffic). Critical failure modes have been assessed as: coastal erosion, flooding, landslips, seismic, wind, and wildfire – in that order.

WDC takes a structured approach to resilience planning, using a criticality framework that incorporates three elements (the detailed framework is included in Appendix A):

Table 5: Route Criticality Framework

Criteria	Comment / Rationale	Scoring	Data source
ONRC	The ONRC provides an established functional classification covering traffic volumes, economic criteria, accessibility, connectivity etc.	4 – National or high volume 3 – Regional or arterial 2 – Primary or secondary collector 1 – Local or access	ONRC assessment
Access to Lifeline utilities, or a lifeline evacuation route.	For a region to recover from any natural hazard event it is important for the various key utilities such as water, wastewater, power and telecoms to be able to access their assets to inspect and undertake repairs. This category includes physical utility assets such as substations that require access to maintain continuity of service to the public and also access to critical transport hubs such as ports and airports. This also includes any routes which are considered themselves as essential for evacuation.	Based on total number of utilities on a route, criticality of utility. 4 – More than 5 locally-significant utility assets, more than 3 regionally significant assets, or 1 or more nationally-significant assets. 3 – Three or four locally-significant utility assets, 1 or more regionally significant assets, or an essential evacuation route. 2 – One or two locally-significant utility assets. 1 – No access for utilities.	Utility asset information Otago Lifelines Project
Access to essential services	These are essential services which would be required for response and recovery during a natural hazard event. There are 6 priority areas proposed including: hospitals and large age-care facilities, ambulance, fire, police and emergency ops centres, major utility control centres, welfare centres, key retail outlets – hardware stores, construction resources and supermarkets, schools and sector posts and major industry	Based on the total 'priority score' calculated based on all the priority services accessed by a given route. 4 – Score of more than 5 3 – Score of three or four 2 – Score of one or two 1 – Less than	Essential service asset information Otago Lifelines Project SH Detour Routes

Table 6: Implementation of Criticality to Resilience Planning

Item	Impact	Action
Roads to be scored in line with items discussed through this report	Identifies location, roads and priority score	Complete
User Defined Table to be established in RAMM for 'Network Resilience'	Enables access to priority data through RAMM	Complete
Develop prioritisation framework & decision models	Enables consistent application of criticality and risk in decision making	Confirm approach and ensure method and application is agreed & documented
Training Workshop with team	Team is informed and trained in the application of risk & criticality	Arrange training

Council is developing an earthquake-prone buildings policy and bridges deemed to have a special post-disaster recovery function have been identified as a priority for seismic screening and identifying structures at risk of inundation in a major tsunami.

3.6 Managing Risk Through ONRC

A risk-based approach is taken to optimise activity across the different ONRC. On higher classification roads, a lower risk approach will be taken i.e. earlier intervention with renewal treatments and robust maintenance repairs. For lower classification roads, more risk may be taken by deferring renewals where possible and using holding repairs. For unsealed roads, this may affect grading cycles as well as where structural overlays are completed. It is important to note that safety will not be compromised through this process, and intervention with routine maintenance will be completed as necessary to keep the roads safe.

By accepting greater risks on lower classification roads, a higher percentage of work will be reactive compared to the preventative and planned strategies on higher classification roads. This risk based approach has been implemented at all levels of maintenance and renewals delivery, including through:

- Maintenance Contract Specifications
- Strategy and planning development – e.g. Maintenance Intervention Strategy, traffic count programme etc
- Forward Work Programming of renewals prioritisation
- Network inspections
- Development of all maintenance programmes

3.7 Specific Activity Risks and Mitigation

3.7.1 Incident Response & Disaster Recovery

The road network is a lifelines service and subject to various incidents and events that can cause serious harm, including fatal crashes, and natural events/disasters. WDC operates an incident escalation framework that is reflected in our position descriptions, competencies, and maintenance contracts:

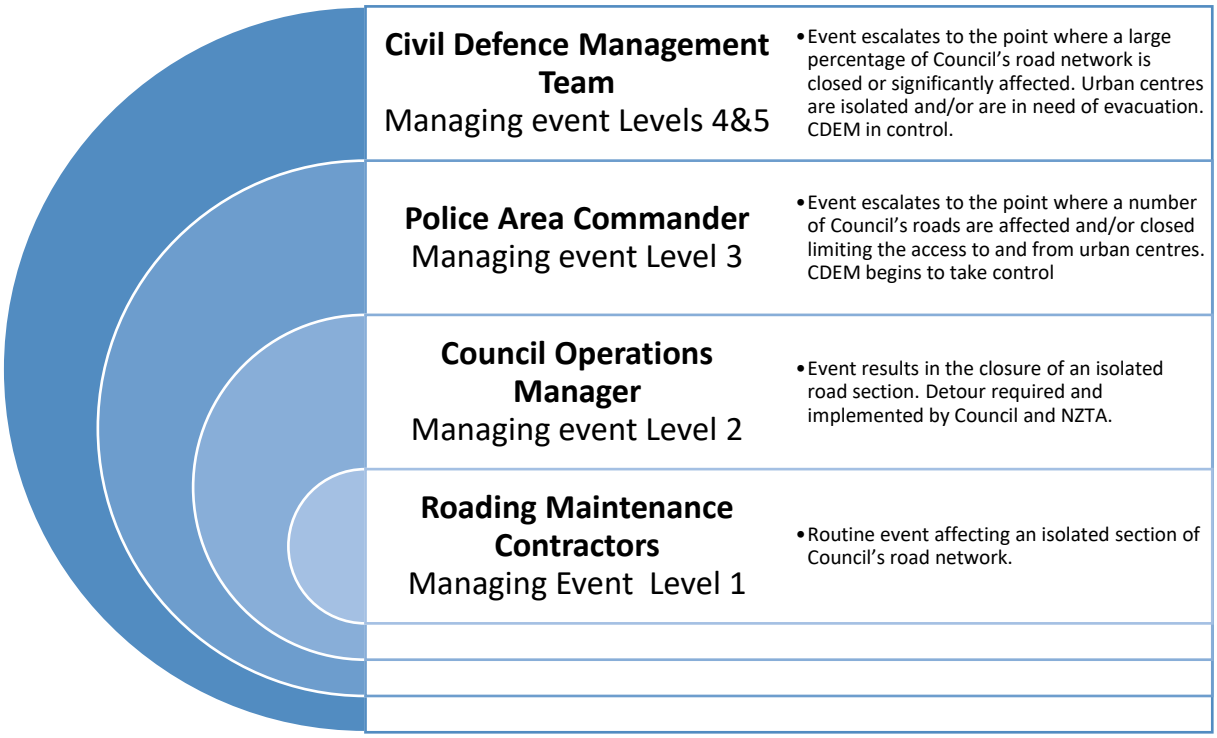


Figure 11: Response Protocol for Emergency Event Escalation

3.7.2 Environmental & Cultural Risks

Failure to comply with the District Plan and RMA for several high-impact activities is a risk to Council with potential adverse effects to land habitat, waterways and archaeological sites, including associated litigation consequences. High-risk activities include:

- Earthworks & gravel extraction
- Working within or above waterways & coastal margins (e.g. culvert renewals, bridge maintenance)
- Herbicide application/spraying

To manage these risks, Council holds global maintenance consents and complies with the District Plan for volume thresholds and restricted seasons that apply. In addition, Council planning rule checks for potentially sensitive activities.

To manage any unforeseen disturbance of archaeological sites and to respect the cultural well-being of our community, Council has a Protocol for the Accidental Discovery of Archaeological Sites and includes this in earthworks contracts.

3.7.3 Risks from 3rd Party Activities in the Corridor

Risks may result from 3rd party activities in the road corridor including:

- Excavation activity:-
  - Digging, drilling, resurfacing, or any other activity that will alter, or cause to be altered, the surface of the road corridor.
  - Placing any pipe, duct, pole, cabinet or other structure below, on or above the road corridor.
  - Building a new driveway or installing a new stormwater drain that leads into the road corridor.
  - Building a new fence where the work site or equipment encroaches onto the road corridor.
  - Near or opening manhole access covers.

- Non-excavation activity:-
  - Placing a skip/bin or container.
  - Putting up temporary scaffolding (mobile or fixed).
  - Using or parking machinery such as cranes, cherry pickers and water blasters.
  - Full or partial road or footpath closure to carry out work on or above the road.
  - Accessing manholes, pits or any above ground assets.

To manage risks resulting from these activities, Council uses a Corridor Access Request process which typically includes the requirement for an approved Traffic Management Plan (TMP).

3.7.4 Road Safety Risks

The Road Safety Action Plan (RSAP) identifies the main themes of:

- Fatigue,
- Safety for everyone at intersections,
- Safe walking and cycling,
- Increasing the safety of younger drivers, and
- Reducing alcohol and drug impaired driving.

The RSAP and actions are discussed further in the Capital Improvements section and risk analysis will be developed further as the RSAP is completed and rolled out.

3.7.5 Asset Failures

Asset failure is a risk to Council. The Lifecycle Management Plan section outlines key strategies to mitigate this risk including data collection/monitoring, maintenance and renewal strategies, processes and decision-making criteria.

3.8 Risk Register

A template has been developed within the framework described in this section but it is yet to be populated. This is an improvement item.

4 Demand Management

4.1 Overview

In the last few years Waitaki district's population and building activity has grown at a faster rate than assumed in strategic planning. In the case of the resident population, this increase comes after periods of much lower growth.

Waitaki's economy is driven by primary production and tourism. Output from these sectors have all increased considerably since 2000, most noticeably the mining, tourism and agriculture sectors.

4.1.1 Tourism

The traffic growth on roads to key tourist destinations is shown in the figure below.

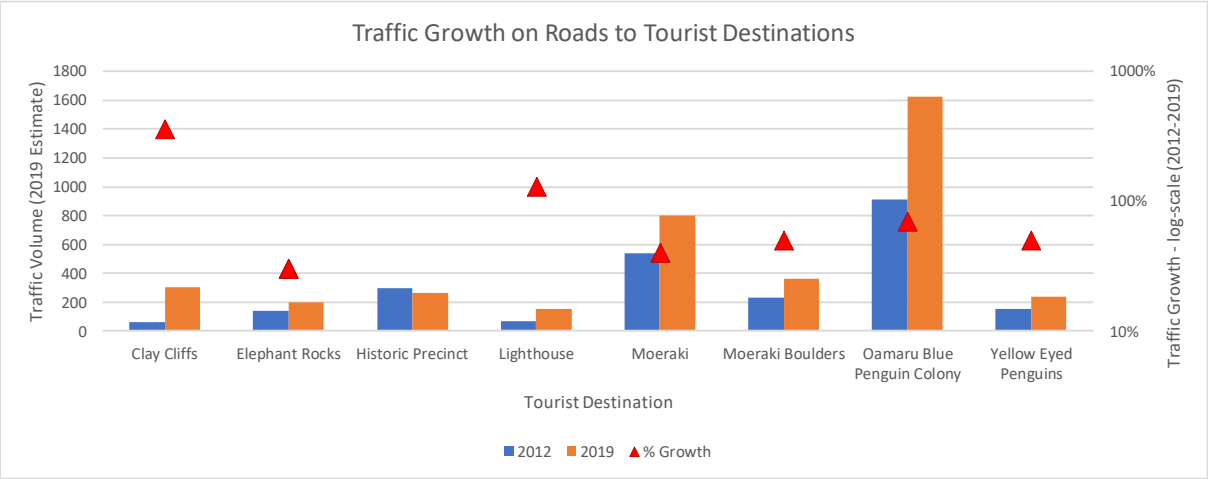


Figure 12: Traffic growth on roads to key tourist destinations

Whilst traffic volumes remain relatively low at many of the key destinations shown, most destinations experienced significant growth over the 7-year period analysed. This is shown on a logarithmic scale to the right of the chart and as listed below:

- Clay Cliffs: 360% growth
- Elephant Rocks: 30%
- Historic Precinct: negligible
- Lighthouse: 130%
- Moeraki: 40%
- Moeraki Boulders: 50%
- Oamaru Blue Penguins: 70%
- Yellow Eyed Penguins: 50%.

4.1.2 Primary Production

The North Otago Irrigation Company (NOIC) scheme is opening up more productive land for dairy use. This is leading to increases in HPMVs (high productivity motor vehicles, including 50MAX) and is placing additional demand on existing bridges, many of which need to be improved to carry additional loading.

4.1.3 Pedestrians

Pedestrian demand on the path network is thought to be an increasing risk due to a changing user profile (i.e. retirees). Future emphasis on mode neutrality and place, particularly in urban areas, will also place more emphasis on active modes. However, there is currently a knowledge gap and this area should be considered as a data collection and analysis opportunity.

4.2 Demand Forecasts

The historical traffic demand induced by the primary drivers mentioned earlier is shown in the figure below. A relatively steady increase can be seen over the majority of the last 10 years, except for 2013/14 and 2014/15 where there is a significant spike. This is understood to be a combination of urban demand from UFB activity and rural demand from the North Otago Irrigation Company (NOIC) scheme development.

The Vehicle Kilometres Travelled (VKT) in 2019/20 are approx. 108.4 million.

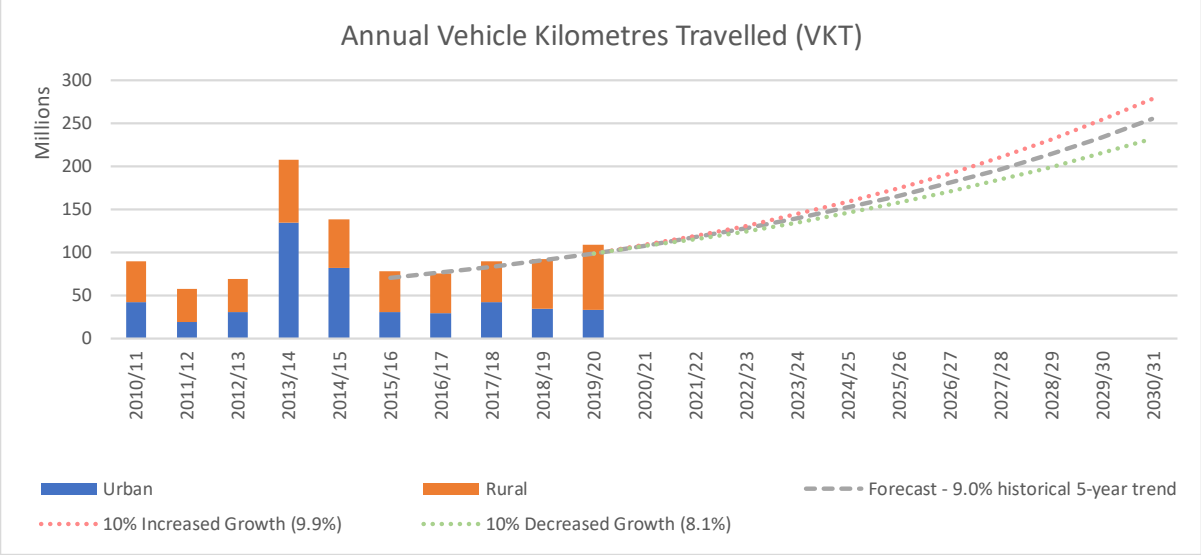


Figure 13: Annual Vehicle Kilometres Travelled

Over the last five years, an average traffic growth of 9.0% is observed. This has been projected forward for 10 years which results in a forecast VKT of approx. 255 million in 2030/31.

A consistent 10% additional traffic growth rate (9.9%) over the 10-year period results in a forecast VKT of 279 million, and a 10% reduction of the traffic growth rate to 8.1% results in a forecast VKT of 232 million.

4.2.1 Tourism

It is difficult to forecast demand to individual tourist destinations at this time due to the unknown future impacts of the COVID-19 pandemic and the subsequent recovery period. A v-shaped recovery may see tourist demand recover and historical trends resume, but a u-shaped recovery would mean a more prolonged downturn and sustained drop off in international tourism. Increased domestic tourism may offset some of the reduction.

4.2.2 Primary Production

The primary economic sectors in Waitaki are agriculture including irrigation and dairy conversions, food manufacturing, tourism and mining. These industry sectors are exporters and therefore importers of money to the district and are projected to grow more than any other in the district.

These key sectors are largely inland, rural based businesses. They depend on reliable and efficient transportation infrastructure to get their products and services to market. They are served primarily by heavy vehicles on low volume roads. Demand is strongly influenced by:

- Irrigation
- Dairy Conversions

Current threats to meeting Primary sector demand are bridge capacity for HPMV traffic, and continuous operation of the network during adverse events which are expected to increase in frequency. Managing both threats is vital to the economic prosperity of the region and reducing the carbon footprint of the transport system.

It is imperative that the opportunities within these economic sectors are realised through robust and efficient transportation infrastructure.

4.3 Managing Demand

High peak day demands place pressure on network capacity, and generally manifests as traffic congestion where constrained. Waitaki roads generally have a large capacity based on present demand and short-term traffic volume growth is unlikely to significantly alter this.

Our levels of service are considered to be representative of the present demands of the current community. As transport activity changes in response to economic drivers, the level of service provided on some individual routes may change. Travel demand management emphasises the movement of people and goods rather than vehicles and should give priority to travel methods which maximise the economic value and minimise the cost of each trip. Council will enable infrastructure investment that emphasises the economic benefit of moving people, goods and services.

Given the on-going uncertainty of the global economy, Council will also need to meet increased transport demand by working smarter and where possible utilising ‘non-asset’ solutions. Council will also need to ensure road safety remains a priority.

The following projects relate directly to enabling economic growth of the primary industries and to continually improve road safety:

- **Pavement Rehabilitation - (Primary Industries and Safety)** - Ensuring the condition of the transportation network remains robust in response to increased heavy vehicle traffic. This will take place by increasing total pavement rehabilitations while reducing pavement reseals to remain cost neutral.

- **Condition Monitoring (Primary Industries)** - Opportunities for efficiency and improvements exist through the use of better tools, such as dTIM’s deterioration modelling software and more reliable asset data (RAMM).

- **Roads of Economic Benefit – (Primary Industries) -** Prioritising investment that supports economic wealth. This will be further pursued by developing a hierarchy of ‘Roads of Economic Benefit’ within the district. The specific level of asset maintenance, renewal and investment will be further defined by this hierarchy. WDC has had the software called the Roading Network Plan developed for this purpose. One Network Road Classification has a road hierarchy which has revealed that the most significant portion of vehicle kilometres travelled in the district are on Secondary Collector roads.

- **Walking and Cycling - (Tourism and Modal Diversification)** - Providing for modal diversification into Walking and Cycling through improved footpath condition and dedicated tracks.

- **Oceana Gold Mine and the proposed Holcim Cement Works – (Mining and Safety)** - Providing the roading requirements for the existing Oceana Gold mine at Macraes which has been extended by 25 years of life. Also, the proposed Holcim Cement works which may or may

not go ahead in the future. WDC is ensuring available capacity and safety through increase heavy traffic.

- **Stock Crossings - (Agricultural and Safety)** - Council adopted a Stock Crossing Code of Practice in response to dairy growth and associated safety issues. Council funds the consent fees and percentage of underpass construction from the Low Cost Low Risk improvements programme allocation
- **Carriageway Widening (Agricultural and Safety)** – Widening projects are undertaken as prioritised within the WDC One Network Road Classification and are subject to NZTA subsidy through the Low Cost Low Risk improvements programme allocation. These projects are focussed on safety, particularly on heavy vehicle trafficked routes i.e. Secondary Collectors.
- **Road Safety Programme - (Safety)** –The programme aims to address safety concerns around Driver Distraction, Fatigue, Older Drivers, Youth, Straights, Bends and Intersections. The programme directly supports the Waitaki Road Safety Action Plan, Safer Journeys, and the Governments GPS 2018.
- **Oamaru Harbourside Projects (Tourism)** – Low Cost Low Risk Improvements will be used to enhance access and mobility in the harbourside. Harbour Development was out for consultation in November 2019.
- **Coastal Erosion (Tourism and Supporting Services)** – Council will submit to undertake preventative maintenance of economically justifiable sections of Beach and Waianakarua Roads.
- **Bridge Renewals - (Agriculture)** – Council has an ongoing programme of bridge replacements. Old, smaller bridges are replaced with culverts or washover structures where possible.

A more robust level of analysis to monitor and forecast network capacity would be beneficial. Particularly for urban areas and around critical routes. Development of a District Transportation Plan is an important project within the current LTP.

5 Lifecycle Management Plan

5.1 Introduction

This Lifecycle Management (LCM) section provides the broad strategies and work programmes required to achieve the goals and objectives set out in the Description of the Activity and Levels of Service sections of this plan.

This section covers the following asset groups/activities:

- Network & Asset Management
- Sealed Pavements
- Unsealed Pavements
- Drainage management
- Structures Management (Bridges, Guard- Rail, Retaining Walls, Stock Access Structures, Pedestrian Underpasses, geotechnical assets)
- Environmental Management (Safety, Aesthetic & Environmental Standards)
- Traffic Services Management (Road furniture, Markings, Carriageway & Pedestrian Lighting)
- Footpath & Cycleway Management
- Ownership or agreed use of land within road corridors

The structure of this section enables each asset group to be considered on a stand-alone basis. This makes each portion relevant for those involved in service delivery. The section structure for each asset group is as follows:

Table 7: Section Structure for each asset group

<table>
<tr><td colspan="2">Asset Type
Asset Description
a) Overview</td><td rowspan="2">[Asset data & SOI reporting]</td></tr>
<tr><td>b) Asset Condition
c) Asset Capacity</td><td>d) Critical Assets
e) Key Issues</td></tr>
<tr><td colspan="2">AM Processes and Practices
a) Inspections & Assessments
b) ONRC Performance Measures
c) Decision Criteria</td><td>[AM Processes & Practices diagrams / Tables]</td></tr>
<tr><td colspan="2">Lifecycle Management
a) Maintenance Strategy
b) Maintenance Programmes</td><td>[Maintenance strategy tables / charts]</td></tr>
<tr><td colspan="2">c) Renewal Strategy
d) Renewal Programmes</td><td>[Renewal strategy tables / charts]</td></tr>
<tr><td colspan="2">a) Development Plan</td><td>[Development strategy tables / charts]</td></tr>
<tr><td colspan="3">Alternative Options
a) Consequences of Reduced Investment
Procurement & Delivery
Risks, Issues, and Opportunities
a) Assumptions & Confidence Levels
b) Risks
c) Opportunities</td></tr>
</table>

5.1.1 Work Category Definitions

Expenditure on infrastructure assets can be categorised into four main areas, which are discussed below.

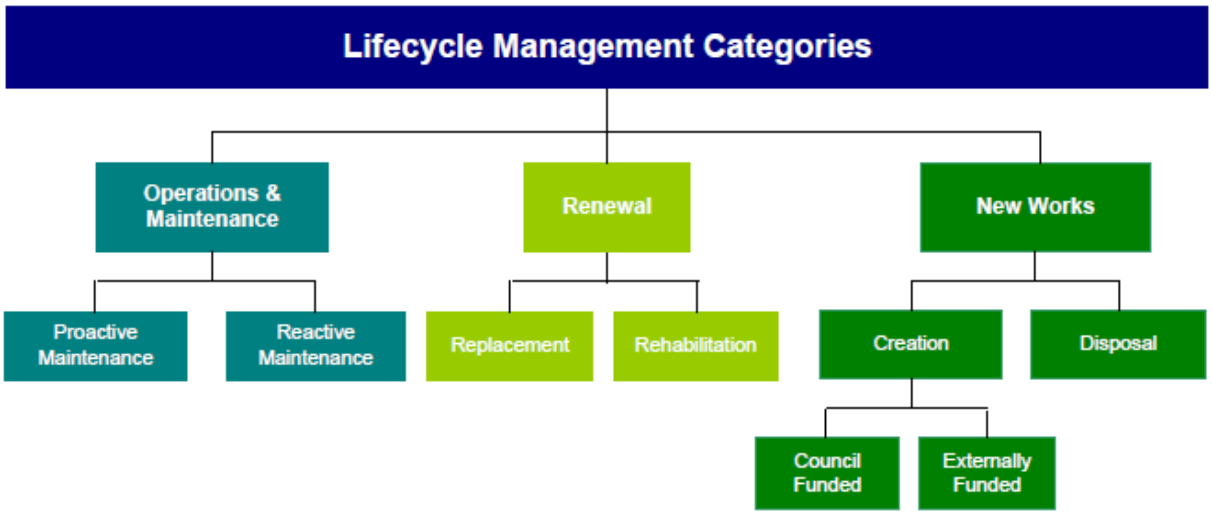


Figure 14: Life Cycle Management Strategies

Table 8: Expenditure on Infrastructure Assets

Operations & Maintenance	Operations and maintenance strategies cover the policies that will determine how the local roading network will be operated and maintained on a day-to-day basis to consistently achieve the optimum use of the asset. Routine maintenance is the regular ongoing day-to-day 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. This work falls into two broad categories as follows: • **Preventative**: Cyclic activities or proactive inspection and maintenance works planned to prevent asset failure. • **Reactive:** Reactive action to correct asset malfunctions and failures on an as required basis.
Replacement (Renewals)	Rehabilitation and replacement of assets to restore an asset to its original level of service, i.e. capacity or the required condition. Renewal strategies are designed to provide for the progressive replacement of individual assets that have reached the end of their useful life. Renewals can be proactive (prior to failure) or reactive (after failure). Our strategy is to achieve a lower risk of failure on critical assets (more proactive) and to allow non-critical assets to run to failure. For budgeting purposes, this programme is maintained at adequate levels to achieve target levels of service. Required levels of expenditure will vary from year to year, and will reflect: • The age profile of the assets. • The condition / performance profile of the assets. • The ongoing maintenance demands and cost. • The differing economic/useful lives of individual assets comprising the overall system of assets. • The ONRC (asset criticality)

New Works (Improvements)	Capital works (new works) involves the creation of new assets, or works, which upgrade or improve an existing asset beyond its current capacity or performance in response to changes in usage or customer expectations. Programming asset renewal and improvement works to occur simultaneously can yield significant financial savings, so we seek to integrate renewal and improvement programmes where possible. These works are either Council initiated or developer initiated due to: • **Growth** Any new asset (Council funded and development contributions) that is required due to growth. • **LoS** Any new asset that is required due to a change in service expectations • **Legislative** Any new asset required out of legislative change • **Vested** Assets created due to land development and vested to Council by developers
Disposals	Asset Disposal is the retirement or sale of assets whether surplus or superseded by new or improved systems. Assets may become surplus to requirements due to: • Under utilisation • Obsolescence • Provision exceeds required level of service • Assets replaced before its predicted economic life • Uneconomic to upgrade or operate • Policy changes • Service provided by other means (e.g. private sector involvement) • Potential risk of ownership (financial, environmental, legal, social, vandalism). Council currently has no plans to dispose of any of its roading assets.

5.2 Planning and Decision-Making Framework

5.2.1 Decision Process

The strategy for asset maintenance and renewal is to reduce overall network investment through reduced reactive maintenance costs for both sealed and unsealed carriageways. Programmes are prioritised using The Roading Network Plan and One Network Road Classification. Reallocation of budget occurs through the 3 years to ensure areas of greatest need and requirement is met. Note: TAM Plan means Transport Asset Management Plan (i.e. this document).

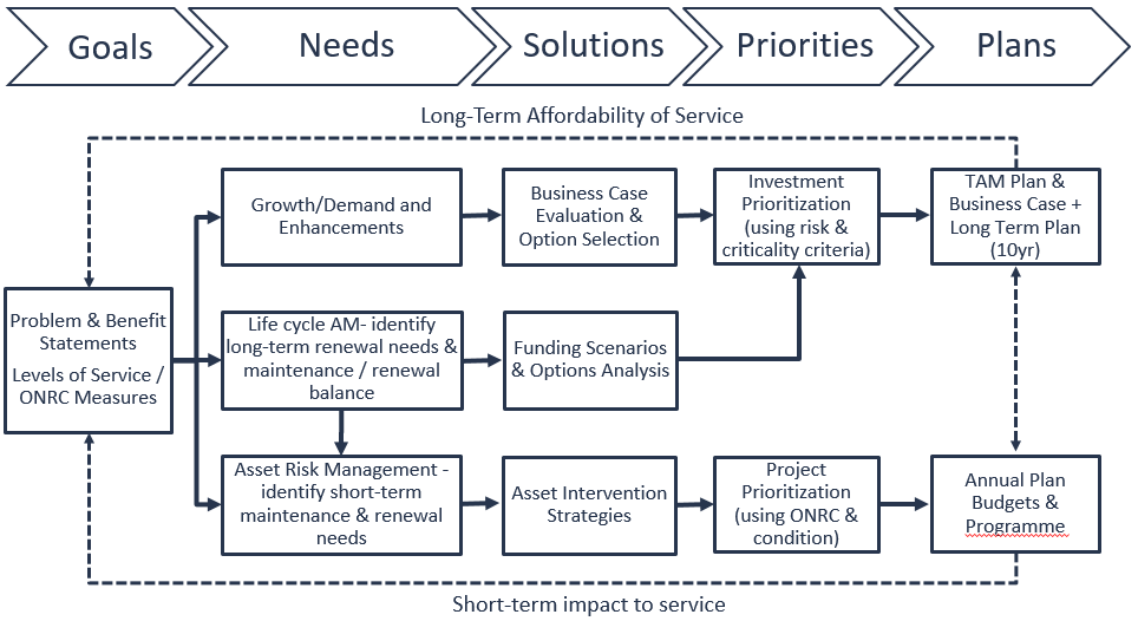


Figure 15: Decision Process

WDC does not have a consistent, documented method of investment decision making across the organisation. This makes it difficult for decision makers to objectively judge how best to balance needs and benefits and to assign appropriate funding. The current situation also makes it difficult for decision makers to know the long-term impacts of their funding choices.

One of the fundamental goals of WDC's asset management (AM) system is to support informed decision making that is based on the whole of life costs of delivering levels of service which support the organizational objectives. By following the Business Case approach, decision making in the roading service is directly linked to achievement of organizational objectives.

Below this, the roading team's current decision-making process uses simple decision criteria to prioritise intervention decisions (priority order):

Table 9: Roading Team's Decision-making Process

Maintenance Programs	Capital Renewal Programs	Capital New & Improvement Programs	New Programs & Services
1. Service continuance & risk 2. Fault extent & severity 3. Existing contract commitments 4. Asset criticality & condition (ONRC LoS) 5. Lifecycle strategies 6. Co-ordination with others	1. Public safety risk 2. LoS performance (ONRC LoS) 3. Critical resilience & asset related risks 4. Operating cost & efficiency 5. Proactive renewal targets / strategies 6. Adoption of a sustainable approach 7. Co-ordination with others	1. Legislative requirements 2. Committed / Phased projects 3. Serious threat to Public Health and Safety 4. Existing service gaps 5. Alignment to GPS & Council's strategic direction 6. Growth related projects	1. Legislative requirements 2. Alignment to GPS & Council's strategic direction 3. Growth adjustments 4. Cost savings or inherent efficiencies 5. Identified need with self-sustaining revenues available 6. Identified need with no corresponding revenue possibilities

Changing priorities and focus are a reality of long-term planning in a local government environment. Some rebalancing and reacting to changing demands and to successes or failures of existing plans may be required during each Council cycle. Despite this changing environment, some cornerstone priorities will remain unchanged. WDC staff will always consider the following priorities in the decision-making process:

- Public Safety
- Legislative Requirements
- Negative effects (serious harm)
- Managing the assets we have (realising value of previous investment)
- Opportunity to maximise benefits

5.2.2 Programme Validation, Review and Tensioning

Once programmes are developed they are validated, reviewed and tensioned through the process of preparing the business case iterations. This includes review of drafts and 6-weekly meetings with NZTA investment advisors to discuss rationale and issues. During delivery there are ongoing reviews with NZTA including quarterly updates of expenditure.

5.2.3 Asset Condition Rating

A good understanding of asset condition is critical to estimating time to asset failure and therefore effective decision making.

Condition rating programmes allow us to track change in condition over time and understand how condition relates to maintenance expenditure patterns and how best to apply management decisions regarding maintenance, and renewals.

We use a standard one to five condition rating system for all our asset types to ensure consistent understanding and application:

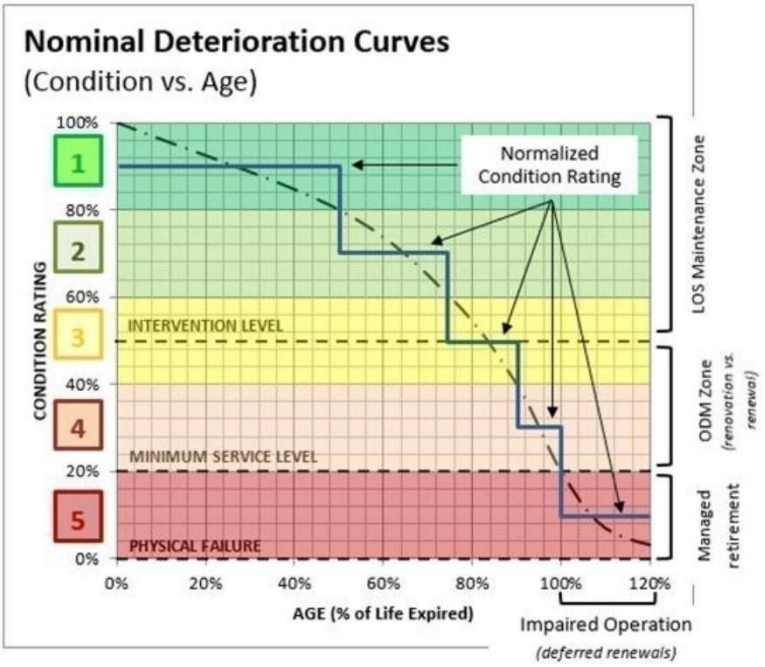


Figure 16: Nominal Deterioration Curves

Table 10: Condition Rating System

CONDITION GRADES		1	2	3	4	5
		GREEN	WHITE	YELLOW	AMBER	RED
		Very Good	Good	Fair	Poor	Very Poor
DESCRIPTION FROM DIFFERING PERSPECTIVES (*select worst*)	OPM	*Conforming Level*	*Conforming Level*	*Observation Level*	*Intervention Level*	*Non-Conforming Level*
	ENG.	New or near new (as installed)	Sound asset, some superficial wear & tear	Minor distress, fatigue starting to show. No serious faults, unlikely to deteriorate significantly in next 3 years	Significant deterioration and distress observed. Larger or extensive defects affecting critical components. Likely to deteriorate further over next 3yrs.	DEFECTIVE / badly damaged. Serious issues with significant components. Impaired operation.
	CUSTOMER	"Great"	"Good"	"Could Fix" Acceptable to most & generally fulfils purpose despite the fault. Most users unlikely to notice problems.	"Should Fix" **"I am not happy with this asset"** May be subject of user complaint. Unacceptable to sensitive users.	"Must Fix" **"Why has this not been fixed yet?"** Unacceptable to most.
	SAFETY	**"No Hazards"**	**"No Hazards"**	**"No Unexpected Hazards"** Considered safe under normal operating conditions.	**"Use with Caution"** Presents a problem or risk to vulnerable users.	**"Unacceptable"** Presents a risk to most users without specific mitigation.
	MIS	Routine maintenance	Preventative maintenance	Life extending treatments / Refurb	Holding maintenance	Deferred Replacement
	FWP	Routine Operations	Routine Operations	Replacement within the next 4-10 years should be considered.	Planned Replacement. Should be on the 1-3yr program	Should be in the annual plan.

5.2.4 Network Statistics

The Waitaki District covers 7,152 km^2 and is sparsely populated with about 23,000 residents. Our network is characterised as a rural, low volume network comprised predominantly of unsealed roads that provide effective access to properties and people.

- This network services a local economy based upon tourism and the production of processed and unprocessed agricultural products. These operations generate a high level of transport need.
- 90% of roads are rural (i.e. have a speed limit of more than 70 km/h)
- 59% of roads are unsealed
- Over 94% of roads have traffic volumes of less than 500 vehicles per day
- Over 85% of the roads within the District are owned and operated by Council, with the NZ Transport Agency operating the remaining 15% on state highways.
- Walking and cycling is a comparatively small mode of transport but is an increasingly important part of the urban transport network, especially as our population ages.

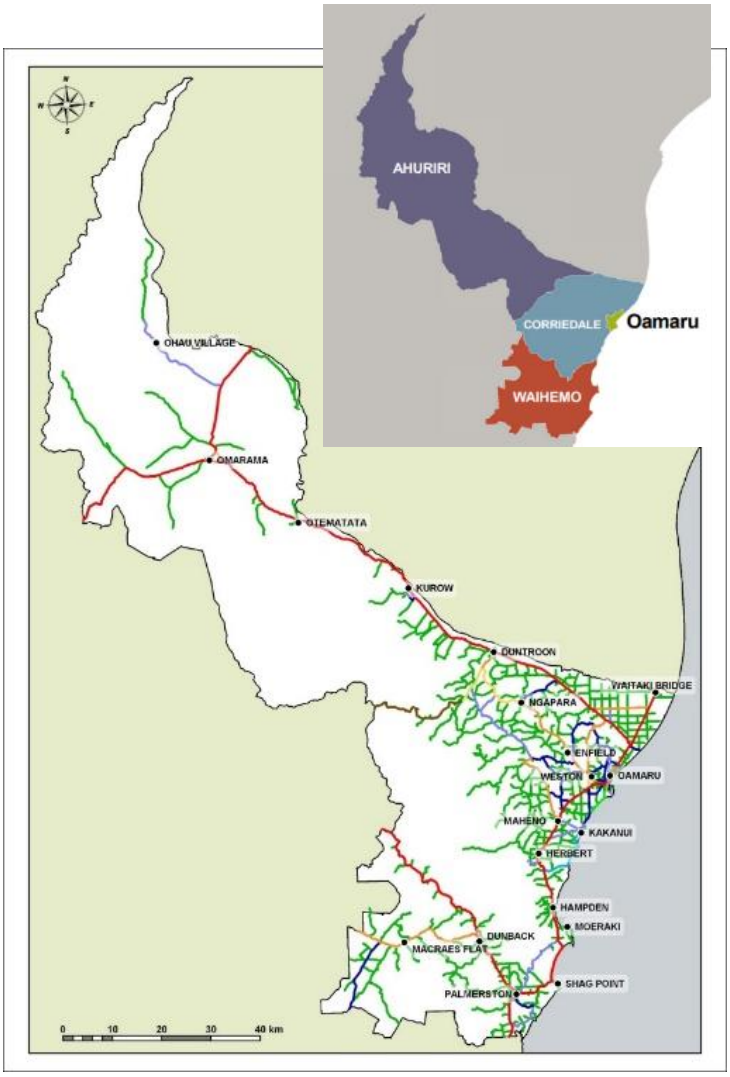


Figure 17: Waitaki District Council Road Network

2019/20 Network Statistics

ONRC	Urban (Km)	Rural (Km)	Total Length(Km)	Lane (Km)	Urban Journeys (M VKT)	Rural Journeys (M VKT)	Annual Total Journeys Travelled (M VKT)	Percentage of length
Primary Collector	7	13	20	39	7.7	3.4	11.2	1%
Secondary Collector	43	314	357	711	17.6	45.2	62.8	20%
Access	54	392	446	843	5.9	19.9	25.8	25%
Low Volume	68	909	977	1,625	1.5	7.1	8.5	54%
Not Required				1		0.1	0.1	0%
Unclassified								0%
TOTAL NETWORK	**172**	**1,628**	**1,800**	**3,218**	**32.7**	**75.6**	**108.4**	

Table 1: Network Statistics for network length (km) and journeys travelled (Million vehicle km) by ONRC Class

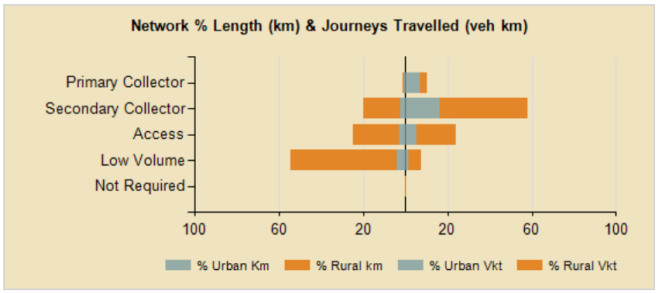


Figure 1: Network Percentage Length and Journeys Travelled

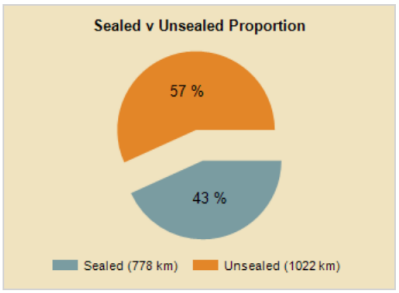


Figure 2: Sealed v Unsealed

Figure 18: 2019/20 Network Statistics

5.2.5 Asset Valuation Summary

An interim asset valuation has been undertaken as at 1 July 2020 using the RAMM Asset Valuation module for all assets except for bridges which have been valued in a spreadsheet. The total values are:

- Replacement Cost: $799.8 million
- Depreciated Replacement Cost: $612.8 million
- Annual Depreciation: $7.3 million

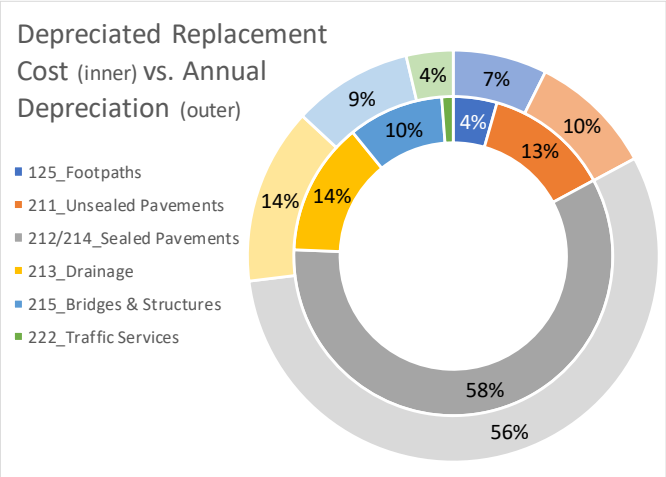


Figure 19: Depreciated Replacement Cost vs. Annual Depreciation

Overall confidence in the valuation has been assessed as Reliable, based on an assessment of quantity, unit cost, life and residual life inputs. Section 5.2.7 explains data confidence grades.

The charts to the left and below summarise the valuation by Work Category, and illustrate the proportional breakdown of asset value and annual depreciation across the portfolio. Road formation is a significant value but is not depreciated. When land and formation are excluded (as they are on the chart to the left), nearly 85% of the depreciated asset value is made up of pavements (sealed and unsealed) and drainage. These asset types also combine to form 80% of annual depreciation.

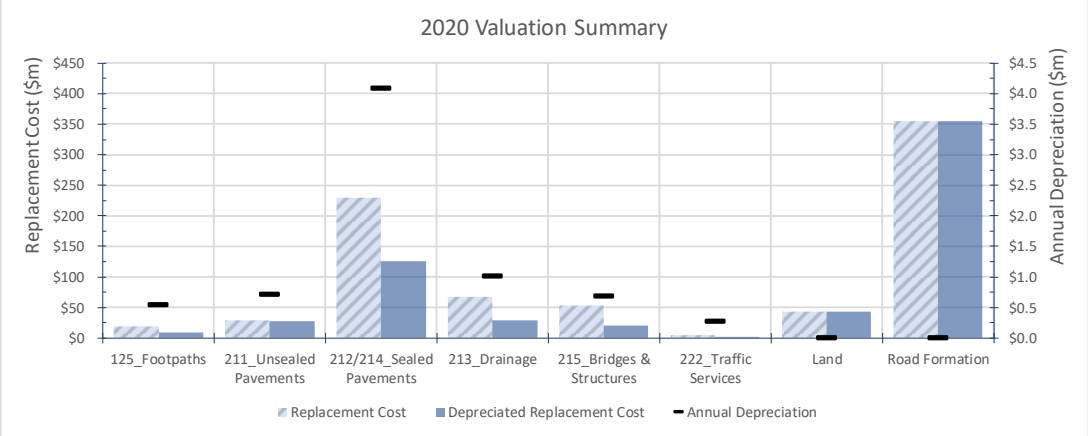


Figure 20: 2020 Valuation Summary

5.2.6 Lifecycle Management Issues & Strategies

The key issues relating to the management of the roading activities are as follows:

Table 11: Key Issues

Category	Key Lifecycle Management Issues	Strategies to Address Key Issues
Sealed Pavements	• Decreasing surfacing and pavement renewal quantities. • Average surface age increasing. • Significant increase in recorded maintenance.	• Increase reseal programme by 10%.to waterproof pavements and to cater for more expensive urban pavement renewals. • Increased focus on proactive renewals ahead of increased tourism and agricultural loading. • Smoothing programme on high volume urban roads.
Unsealed Pavements	• Drainage/resilience of unsealed roads. • Increasing maintenance requirements at unsealed intersections. • Quarry/aggregate availability within 25km radius (including consenting).	• Introduce enhanced crown to achieve better drainage and resilience. • Sealing or blending clay with aggregate at problematic intersections. • Council actively seeking to control/manage quarry provision.
Drainage	• Limited understanding of drainage asset condition which means there is uncertainty around drainage asset sustainability.	• Condition rating of drainage assets to be procured through the roading maintenance contract.
Streetlighting	• Compliance with lighting standards is variable due to historical spacing of power poles.	• Infill lighting will reduce the spacing and enhance standards on primary and secondary collectors with priority on intersections.
Traffic Services	• Signs and markings data has not historically been accurately recorded in RAMM.	• Inventory update – this has begun on the signs inventory with staff redeployment during the Covid-19 lockdown.

Category	Key Lifecycle Management Issues	Strategies to Address Key Issues
Footpath & Cycleways	• Annual condition sampling has identified potential uncertainty on asset condition.	• Footpath condition survey completed in late 2020.
Bridges & Structures	• Aging timber bridges are nearing the end of their lives. • Resilience, including capacity of existing bridges.	• Use of cost-effective repairs. • Use of alternatives such as fords for heavy vehicles where available/applicable. • 30-year bridge renewal strategy.
Guardrails & Barriers	• Limited understanding of guardrail assets which means there is uncertainty around asset sustainability and suitability.	• Undertake a condition and functionality rating exercise.
Environmental	• Climate change effects on vegetation, gritting requirements etc.	• Move to performance mowing to offset increased control requirements. • Increase frost gritting programme to manage safety.
Network & Asset Management	• Staffing levels – supervision/ auditing of maintenance contract & asset management (including data). • Some gaps in condition data.	• Increase resources (2 FTE). • Optimise condition rating strategies and decision models/ processes.
Parking & Street Furniture	• Vandalism.	• Continued maintenance funding.
Capital Improvements	• Road safety	• Increase resources (1 FTE).

5.2.7 Data Confidence and Reliability

The table below provides the confidence framework (NAMS IIMM) used to determine the confidence in the asset data used in this AMP:

Table 12: Confidence Framework (NAMS IIMM)

Grade	Description
Highly Reliable	Data based on records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment.
Reliable	Data based on records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example the data is old, some documentation is missing, and reliance is placed on unconfirmed reports or some extrapolation.
Uncertain	Data based on records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade highly reliable or reliable data is available.
Very Uncertain	Data based on unconfirmed verbal reports and/or cursory inspection and analysis.

Section 2.2 covers data quality management and a summary of the REG Data Quality framework. Detailed data quality information is presented in the REG Data Quality Report (Appendix A).

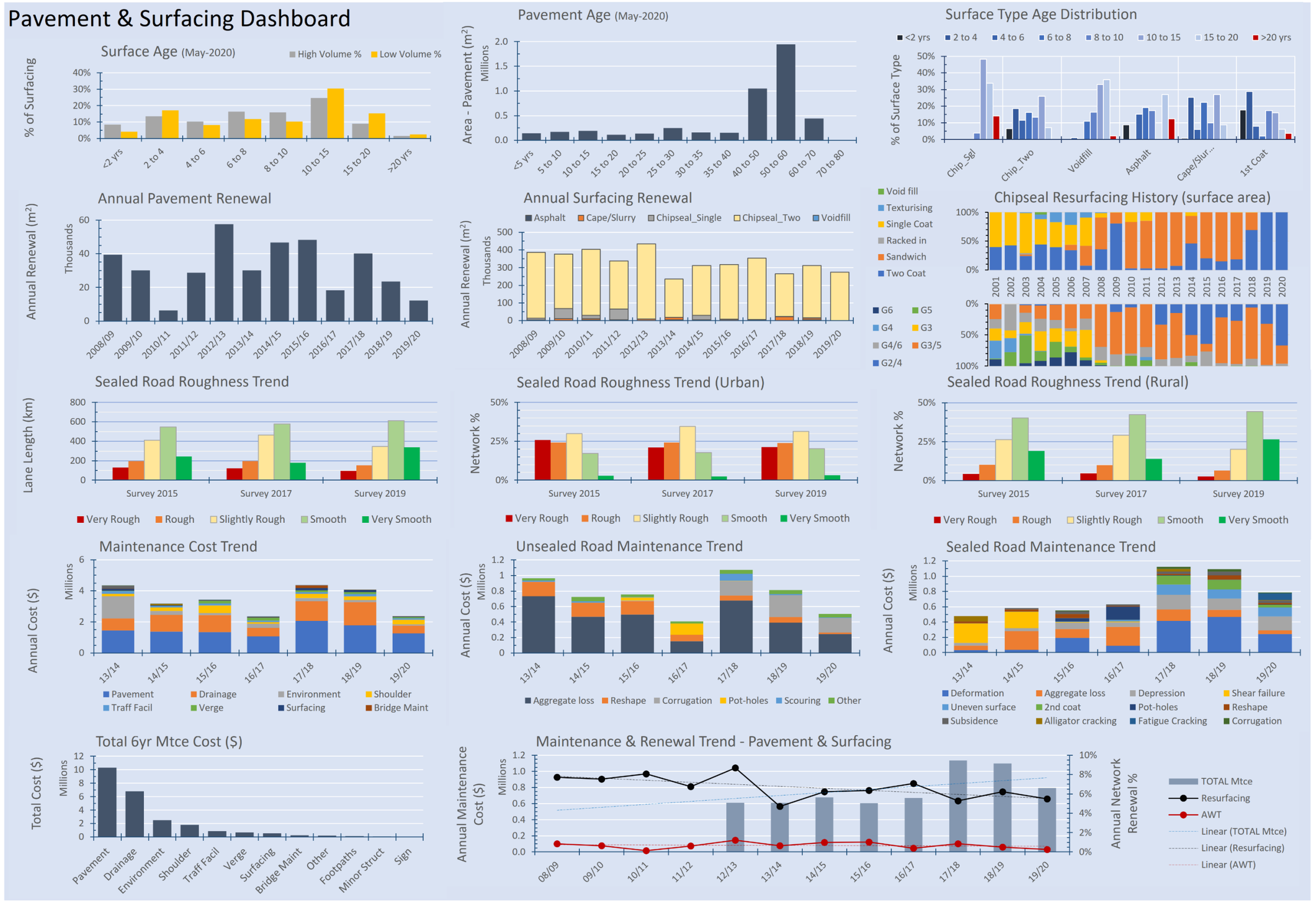
5.2.8 Pavement and Surfacing Dashboard

A dashboard has been developed (overleaf) to show key pavement and surfacing data.

The items shown are (left-to-right, row-by-row):

- Surface Age profile (split by high/low volume roads)
- Pavement Age profile
- Surface Type Age Distribution
- Annual Pavement Renewal quantities
- Annual Surfacing Renewal quantities
- Chipseal Resurfacing History for the last 20 years (by chip seal type, and by chip size)
- Sealed Road Roughness Trend (Total)
- Sealed Road Roughness Trend (Urban), noting higher roughness is expected on urban roads
- Sealed Road Roughness Trend (Rural)
- Maintenance Cost Trend (totals by asset type)
- Unsealed Pavement Maintenance Cost Trend (by fault type)
- Sealed Pavement Maintenance Cost Trend (by fault type)
- Total 6-Year Maintenance Costs (by asset type)
- Maintenance & Renewal Trend (Pavement & Surfacing)

Table 13: Pavement and Surfacing Dashboard



Note: 2019/20 maintenance figures represent a part year.

5.3 Sealed Pavements (WC111/212/214)

5.3.1 Asset Description

(a) Overview

Sealed pavements (including surfacing and the pavement structure) make up a total replacement cost of $229.0 million, with a depreciated replacement cost of $125.8 million and annual depreciation of $4.1 million.

The routine care of sealed pavements is important to maintain their structural integrity and serviceability. The surface is periodically renewed to ensure continued waterproofing and an adequate running surface for vehicles. The underlying pavements are replaced, strengthened or rehabilitated where other forms of maintenance and resurfacing are no longer economic.

(b) Asset Condition

The dashboard (previous page) illustrates an improving trend for roughness for both urban and rural parts of the network. Peak roughness (95th percentile), shown at right, is trending down slightly on Primary and Secondary Collector roads and upwards on Access and Low Volume roads. This means peak roughness may be slowly redistributing towards the general profile seen across ONRC classifications amongst peers nationally and in the Otago region.

Pavement performance modelling (using dTIMS) analysis identified that rural roughness is good relative to ONRC targets, with urban Secondary Collectors being most out-of-step with these targets – this corresponds with routine maintenance expenditure. The modelling outputs also indicate that roughness is likely to remain relatively stable with gradual increases under a range of budget scenarios due to the low traffic volumes on the network.

The pavement performance modelling also presents a composite Surface Condition Index (SCI) that is made up of age, cracking, potholes, patches and flushing. This index indicates that most surfacing on the network is generally in good condition, although it is also clear that there are areas where higher quantities of surface defects are present, including Golden Point Road.

(c) Asset Capacity

Resurfacing and pavement renewal quantities have been trending downward over the last 10 years. At the same time routine and reactive pavement maintenance costs have increased.

This now presents as an aging asset with reducing residual life.

(d) Critical Assets

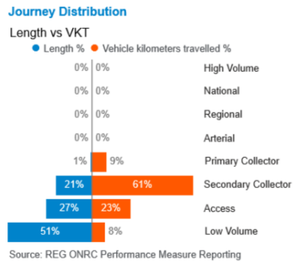


Figure 21: Journey Distribution

The following are lifeline or important Collector routes:

- Weston Road, Westview Drive and through Main Street in Weston
- Weston Ngapara Road, which is the busiest route into Corriedale
- Seven Mile Road, a link between SH1 and SH83
- Kakanui Valley Road, a resilience route for the state highway
- Prohibition Road, a link between SH83 and SH8.

Golden Point Road is also noteworthy as a rural Primary Collector with very high heavy vehicle loading due to its use as a mine road.

(e) Key Issues

Both surfacing and pavement renewal quantities have been decreasing over the long term. This has resulted in an aging asset and higher reactive maintenance costs.

The average surface age across the network has increased by two years in the last three-year period. In the same period there has been a significant increase in recorded maintenance, particularly related to depressions and deformation.

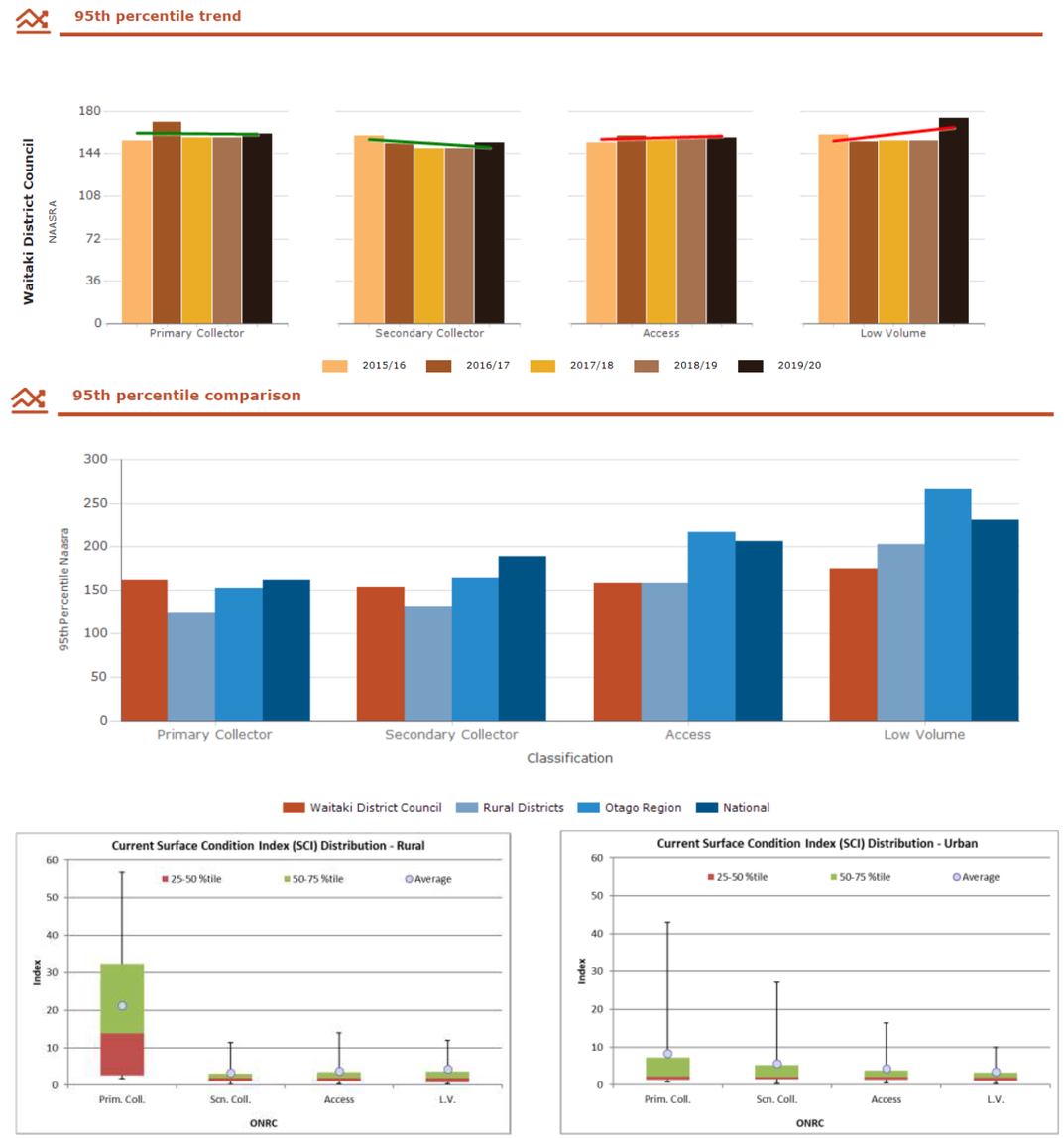


Figure 22: Sealed Pavement Statistics (1)

5.3.2 AM Processes and Practices

(a) Inspections & Assessments

Sealed road condition rating and roughness surveys are undertaken biennially. Roughness surveys are currently undertaken with a laser profilometer. However, regional High Speed Data surveys (collecting roughness and other parameters) will replace this survey within the next three years.

Pre-reseal repairs are identified and prioritised on roads in the resurfacing programme. However, there has been a rather ad-hoc approach to the remainder of sealed pavement maintenance in the past. An “all faults” inspection of the roading network is now being completed from which priorities for maintenance will be identified going forward.

10% audits of the contractor’s monthly claims are being selected using a random generator and undertaken with a particular focus on sealed pavement maintenance. Rework is identified if it has been completed inside the 12 months defects liability period.

(b) ONRC Performance Measures

The ONRC performance measures relevant to sealed pavement condition include Peak and Average Roughness, and Smooth Travel Exposure (STE). Peak roughness appears to be slowly redistributing towards the general profile seen across ONRC classifications amongst peers nationally and in the Otago region. With traffic volumes being relatively low for the majority of the network, a small number of roads can have a much larger influence on road users’ exposure to smooth travel. The STE indicator shows that the District has a higher proportion of smooth travel than other areas in the Region, but lags behind the Rural Districts peer group, particularly on Primary Collector roads.

Relevant cost efficiency measures include costs per km and achieved life of different treatments. Costs per km are consistently below that of other Rural Districts. The achieved life in the District is generally comparable or better than other Rural Districts and others in the Otago Region.

Trends from the sealed road condition rating surveys are also shown at right.

(c) Decision Criteria

Council commissions road condition rating surveys which are used as an input into Treatment Selection Analysis (TSA) and pavement performance modelling in dTIMS software. This modelling is undertaken using a range of criteria linked to ONRC classifications and a range of funding scenarios. The outputs are used as a key part of developing the renewals forward work programme.

The road maintenance contract allows for the contractor to identify solutions and repairs in collaboration with council engineers.

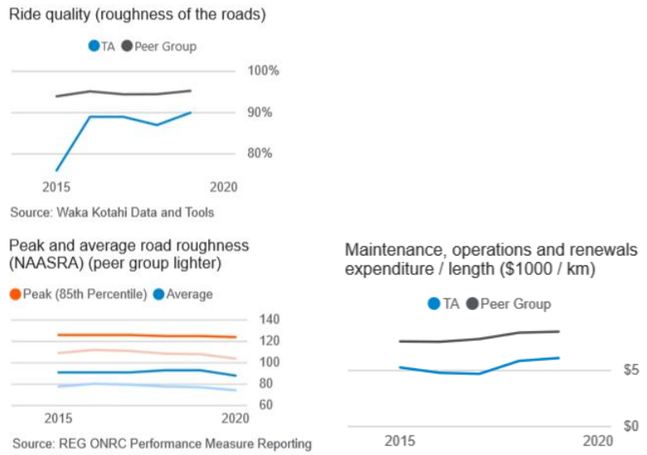


Figure 23: Sealed Pavement Statistics (2)

Table 14: Sealed Road Condition Trends 2010-2020

Sealed Road Condition Trends 2010-2020:

FAULT	OVERALL	URBAN	RURAL
Rutting	Decreasing	Decreasing	Decreasing
Shoving	Decreasing	Decreasing	*Constant*
Scabbing	Decreasing	Decreasing	Decreasing
Flushing	Decreasing	Decreasing	Decreasing
Alligator Cracking	Increasing	Increasing	Increasing
L & T Cracking	Increasing	Increasing	Increasing
Joint Cracking	Decreasing	Decreasing	*Constant*
Potholes	Decreasing	Decreasing	*Constant*
Pothole Patches	Increasing	Increasing	Increasing
Edgebreak	Increasing	Increasing	Increasing
Edgebreak Patches	Increasing	Increasing	Increasing

5.3.3 Data Quality

A selection of metrics from the 2019/20 annual REG Asset Management Data Quality Report are shown at right. These metrics are used to assess the RAMM data supporting asset management of sealed pavement assets.

The majority of metrics show that sealed pavement data is to the expected standard.

There are minor issues with the accuracy of sealed area dimensions, which has trended downwards but can be easily dealt with.

There are major issues shown with the quantity of pavement renewals entered into RAMM vs. that reported to NZTA as achieved for the financial year. This could have an impact on modelling outputs and forward works programming including analysis, annual achievement reporting and investment decision making. Some of the potential reasons for these issues include:

- Lack of, or poor process and trained personnel for recording correct work category in the pavement layer table for renewals work claimed under work category 214.
- Reported achieved quantity from different source than as-builted records in RAMM.
- Source data used for reporting achievement is not complete or up to date when needed.
- Uncertainty around the work category to assign the work to.

Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Treatment Length	TREAT1	Treatment Length dimensions match sealed area	Accuracy	High	AMENITY		86.5	▼	85 90 95 100
	TREAT2a	Treatment Lengths are generally not short	Accuracy	High	AMENITY	✓	90.7	–	80 85 90 95 100
	TREAT2b	Treatment Lengths are not too long	Accuracy	High	AMENITY	✓	82.4	–	75 80 85 90 95 100
	TREAT5	Treatment Lengths match renewals	Timeliness	High	AMENITY	✓	100.0	–	75 80 85 90 95 100
	TREAT3	Treatment Lengths match major surfaces	Accuracy	Moderate	AMENITY	✓	84.8	▼	80 85 90 95 100
Surfacing	SURF1a[4]	Achieved chipseal resurfacing renewal programme as-builted	Timeliness	High	COST EFFICIENCY		94.9	–	55 69 83 97 111 125
	SURF1b[4]	Achieved asphaltic concrete resurfacing renewal programme as-builted	Timeliness	High	COST EFFICIENCY		101.3	▲	0 56 112 168 224 280
	SURF2	Surface records have valid attribute data	Accuracy	High	COST EFFICIENCY		98.9	–	95 96 97 98 99 100
	SURF3	Surface records correctly located	Accuracy	High	COST EFFICIENCY	✓	100.0	–	85 90 95 100
	SURF4	Surface records with Original Cost	Completeness	High	COST EFFICIENCY	✓	100.0	–	40 52 64 76 88 100
	SURF5	Surface records with Work Origin	Completeness	High	COST EFFICIENCY	✓	100.0	▲	45 56 67 78 89 100
	SURF6	Surface records newer than pavement	Accuracy	Moderate	COST EFFICIENCY	✓	100.0	▲	65 70 75 80 85 90 95 100
Pavement	PAVE1[4]	Achieved pavement renewal programme as-builted	Timeliness	High			61.3	▼	0 25 50 75 100 125
	PAVE2[3]	Pavement layer records have valid attribute data	Accuracy	High			100.0	–	15 32 49 66 83 100
	PAVE3[3]	Pavement layer records with Work Origin	Completeness	High			100.0	–	10 28 46 64 82 100
Rating	RATING1	Road rating data current	Completeness	High			99.3	–	0 20 40 60 80 100
	RATING2[3]	Rating data locations valid	Accuracy	Moderate			100.0	–	95 96 97 98 99 100

Figure 24: Sealed Pavement Metrics REG Asset Management Data Quality

5.3.4 Lifecycle Management

(a) Maintenance Strategy

Repair of sealed road pavements is undertaken as preventative maintenance as well as on demand where required. This includes pothole and cracking repairs, edge break, surface defects and extends to and covers all emergency rainfall and snow events.

The figure to the right shows the cost of sealed pavement maintenance by Peer Group. The Waitaki District is just above the Peer Group average for cost per km and cost per lane km.

Maintenance has had to respond to growth in irrigation, dairying and industrial activity in rural areas in recent years.

Our pre-reseal repair strategy is to undertake this type of maintenance in an increasingly timely manner, with particular focus on primary and secondary collectors.

Our contractor is using cold-mix asphalt for temporary repairs of potholes so that their approach to long term repairs is more structured and efficient. Cold-mix asphalt has also been used as pre-levelling for reseals and this has proved cost effective with good results. The use of cold-mix has advantages and disadvantages; it is a good quick temporary repair material for potholes, edge break and pre-levelling but is significantly less effective as a second coat repair. It is quite porous, and during winter months, repairs of potholes are required continuously until a permanent repair can be completed. It is also a low strength solution so often the temporary repair will result in shoving. Going forward we will be seeking to use cold-mix in a more balanced manner where appropriate.

(b) Maintenance Programmes

Programming is an improvement item for Council; our aim is to shift our maintenance approach from reactive to proactive. This shift will need to be undertaken within funding constraints, such as the net present value economic analysis that is required for pavement renewals.

Planned expenditure for sealed pavement maintenance is shown at right.

An increase of $65k is requested to increase pre-seal repairs. Previous reducing spend has impacted on smooth travel exposure, particularly in urban areas.

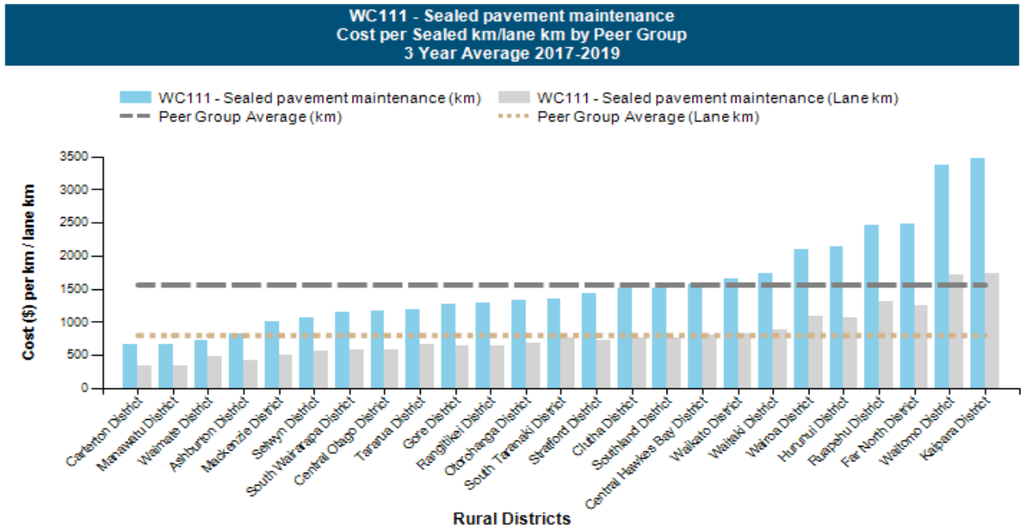


Figure 25: Cost of Sealed Pavement Maintenance by Peer Group

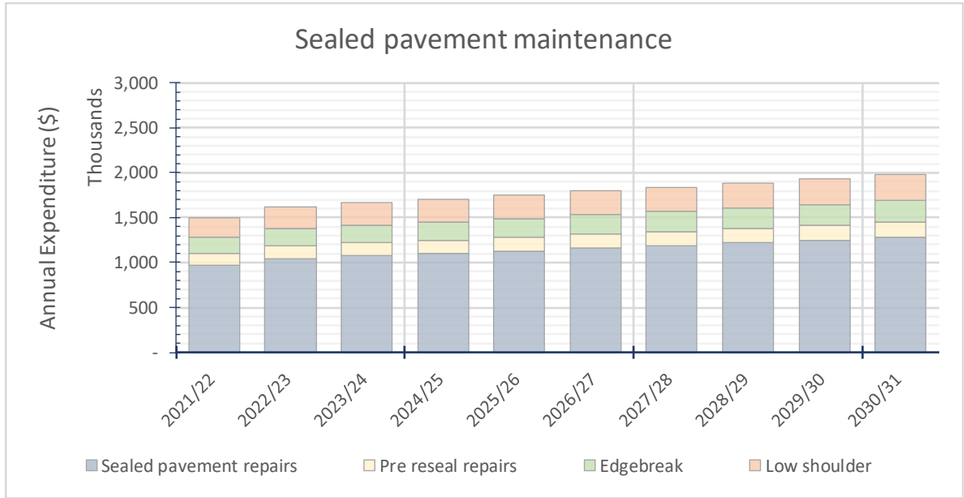


Figure 26: Sealed Pavement Maintenance

(c) Renewal Strategy

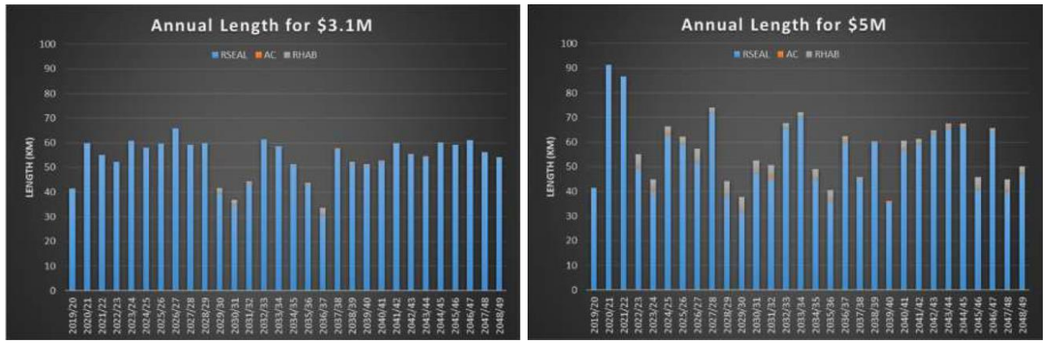
The pavement performance modelling (using dTIMS software) undertaken in 2019/20 reports a composite Surface Integrity Index (SII) that is made up of age, cracking, potholes, patches and flushing. This is forecast to remain relatively stable if reseal quantities are increased to cover 7.4% of the network per year (compared to historical coverage of 5.3% over the last 10 years). This equates to approx. 56km total reseal length per year.

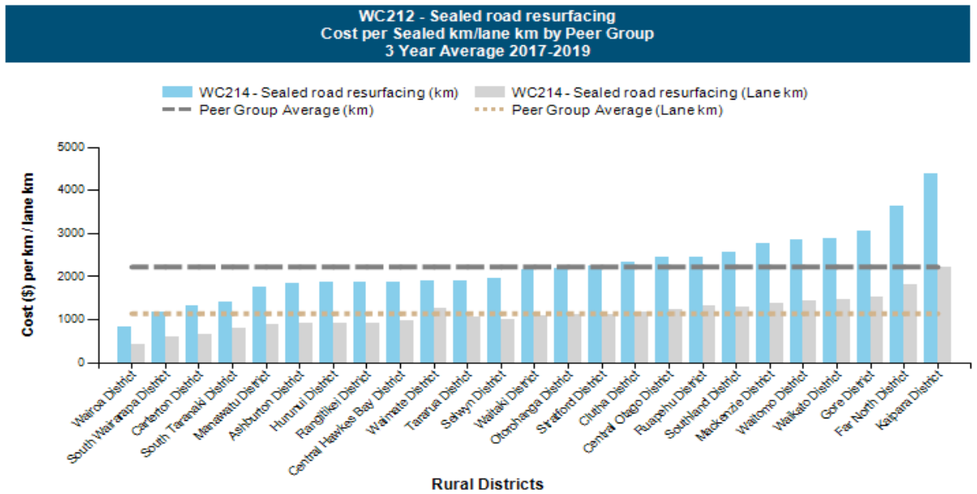
If achieved reseal quantity remains at the current level or reduces, the SII is forecast to get worse, reflecting a growing backlog of reseal work and an increasingly aged surface asset.

Modelled scenarios present outputs that deliver primarily reseal treatments to optimise long term value for money within the constraints set in the model. As illustrated in the charts at right, aside from an initial increase of length, the annual amount of reseal undertaken remains relatively similar even when funding is increased. This reflects that when additional funding is available, this is forecast to be invested in asphalt resurfacing and pavement rehabilitation treatments. The forecast long term surface condition is not significantly impacted by the amount of rehabilitation undertaken. However, the routine maintenance expenditure is forecast to increase or decrease in inverse proportion to this amount.

The figures to the right also show the cost per km and cost per lane km for sealed road resurfacing and pavement rehabilitation by Peer Group. For resurfacing, Waitaki District is at the Peer Group average for km and at the Peer Group average for lane km. For pavement rehabilitation, Waitaki District is slightly below the Peer Group average for km and below the Peer Group average for lane km.

The District's STE is lower than the Rural Districts Peer Group, Otago Region and National. It should increase by at least 1.2% per year with an estimate of 13 years to achieve an STE of 96% (Council's target).





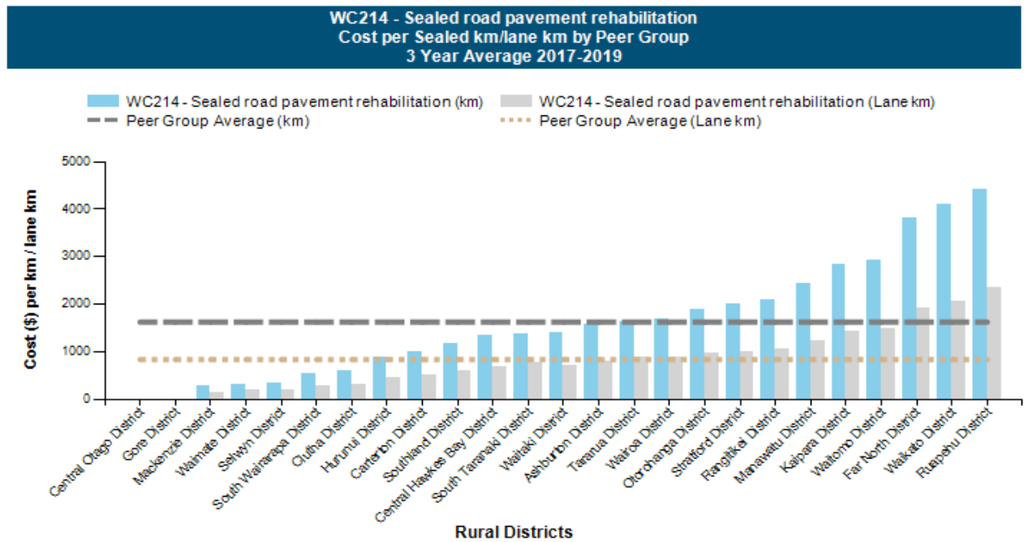


Figure 27: Sealed Pavement Renewal Statistics

(d) Renewal Programmes

Council's previous resurfacing contract was completed at the end of 2019/20 and a new contract was publicly tendered during the Covid-19 lockdown. The rates that Council received were very competitive and similar to the previous 4-year contract. This has allowed for delivery of a full 56km per annum programme as per the modelling recommendations within budget.

Planned ten-year expenditure for both sealed road resurfacing and pavement rehabilitation is shown to the right. It represents a 10% increase to the reseal programme to ensure achievement of DIA base preservation levels and dTIMS recommendations. An increased focus will be placed on proactive renewals ahead of increased tourism and agricultural loading. An asphalt smoothing programme has been included to address roughness trends on higher volume urban roads.

A second iteration of the pavement performance modelling (dTIMS) referred to above is due to be undertaken and will provide us with a refined 30-year programme using up-to-date costs. This will then be used to refine further into a pavement renewals programme for delivery over the timeframe of this plan.

Our aim is to confirm the annual programme early enough so that any required pavement design can be completed in good time for Council to tender and procure at the start of the financial year when contractors are looking for work.

$200,000 has been added to the programme for asphalt smoothing of urban secondary collectors.

$300,000 additional budget allows for an additional 598m of urban road rehabilitation to be completed which will improve STE by a minimum of 1.4%. This will be targeted on urban primary and secondary road pavement rehabilitation.

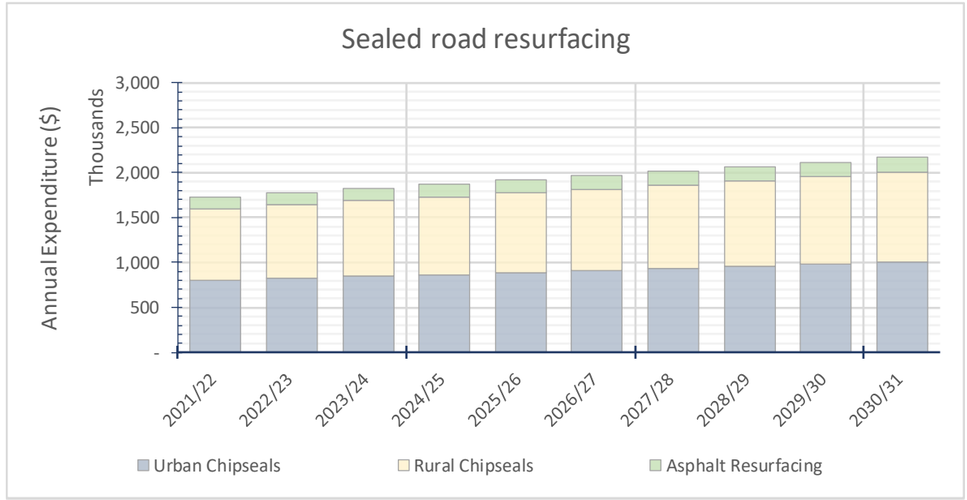


Figure 28: Sealed Road Resurfacing and Pavement Rehabilitations

(e) Development Plan

An "all faults" programme will be completed by the contractor with assistance from Council's professional services provider. This is a new initiative that will enable a shift to a more proactive maintenance approach.

A high speed condition survey will be completed in 2022/23 and will provide roughness and rutting condition data. Collection of skid resistance data will also be considered depending on value for money (cost vs. benefits).

Falling Weight Deflectometer (FWD) data will also be collected in the District on urban sealed roads in order to build up a dataset on pavement strength. This is being targeted as an area for investigation as ONRC smooth travel exposure is below acceptable limits in the urban areas. FWD data will be used to infer pavement strength and will be a key input into future iterations of dTIMS modelling.

5.3.5 Alternative Options

Table 15: Sealed Pavement Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Pavement renewals to focus on 56km of chip seal resurfacing and approximately 8km of pavement rehabilitation.	This is intended to reverse the trend of aging pavements in the roading network as well as providing waterproofing to those pavements showing significant signs of cracking.	3	Underway in 2020/21
LoS	Chip seal surfaces on all roads within the sealed road network with asphalt only applied on primary and secondary collectors in Oamaru's CBD where there is high traffic numbers and structural asphalt to combat turning stresses.	Council is to ensure that any upgrades in Level of Service are signed off to prevent cost implications for future generations; the price of asphalt in the new contract is 12 times higher than a sandwich seal.	2	Underway in 2020/21
Demand Management	There is demand for more sealed roads, particularly due to the effect of dust on health. However, it would cost in excess of $100M to seal all roads in the District (not including ongoing maintenance).	Council has budgeted for unsubsidised seal extensions in the current LTP but only if third parties provide a local share. Few customers have taken up this opportunity; however, it may become more popular with landowners as ORC drive a resolution to dust problems affecting health.	6	In 2018-28 LTP
Treatment Type	The use of polymers and different types of chip seal with slurry have provided good benefits – cape seals can be a good option as long as the pavement is strong.	dTIMS modelling predicts a decline in sealed road condition if the levels of investment are reduced – more reasonable treatments are required to reverse the trend.	5	Underway in 2020/21
Risk Profile	If the network age profile declines, it will be difficult to recover within the existing investment profile.	An increased level of investment will be required to reduce the overall age of the asset.	4	Underway in 2020/21
Policy	New policies are currently being developed and are to be finalised with the District Plan review. These include only surfacing of busy collector roads in Oamaru CBD with asphalt and remaining roads as chip seal.	This policy is intended to keep renewal of sealed roads sustainable over the long term. However, asphalt may still be needed for smoothing, pre-reseal levelling courses or edge break repairs.	1	Underway in 2019/20

5.3.6 Consequences of Reduced Investment

If achieved reseal quantity remains at the current level or reduces, the SII is forecast to get worse, reflecting a growing backlog of reseal work and an increasingly aged surface asset.

5.3.7 Procurement & Delivery

WDC's Urban and Road Maintenance Contract No. 642 is delivered by SouthRoads Limited and was awarded in March 2017 for 3+1+1 years, subject to satisfactory performance.

The contract includes all subsidised activities associated with maintaining the local road network including sealed and unsealed road maintenance and a provisional sum for pavement rehabilitation.

The contract excludes major road repairs, road resurfacing and capital improvement projects which WDC tenders separately in line with the WDC Procurement Strategy.

5.3.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

General confidence in the roading network is high. There are areas prone to weaknesses which tend to be as a result of ground conditions. There are issues with some aspects of asset data which are being progressively resolved. Planned data collection (FWD and other condition data) will continue to improve confidence in the data and the subsequent pavement performance (dTIMS) modelling outputs that underpin our programmes of work for sealed road pavements.

(b) Risks

Table 16: Sealed Pavement Risks

Risk Type	Description	Likeli-hood	Conseq-uence	Risk	Management Plan	Linked Programme
Age of pavements	The age profile of sealed pavements increases which will require increased investment to manage	Possible	Moderate	Medium	Focussed renewal programme	
Pre-reseal repairs	Repairs necessary prior to resurfacing may be inadequate	Unlikely	Moderate	Low	Focussed programme of pre-reseal repairs	
Strength of sealed pavements reducing	Sealed pavements experience increased volumes of heavy traffic, causing damage (cracking or potholing) allowing water ingress resulting in reduced pavement strength	Possible	Moderate	Medium	Focussed maintenance programme to ensure repairs are completed in a timely and effective manner	
Increased weather events	Roading network experiences increased storm events and damage which exacerbates a deterioration in condition	Possible	Major	High	Focussed maintenance programme to reduce damage experienced	

(c) Opportunities

Reverting sealed roads to unsealed has been discussed in the past. However, it is unlikely to occur other than on access or low volume roads in rural areas where the side effects are minimised.

Minimising costs within the sealed road network using non-asset or low-cost solutions. Alternatives to bitumen could also be considered but these are generally quite expensive.

5.4 Unsealed Pavements (WC112/211)

5.4.1 Asset Description

(a) Overview

58% of the District road network is unsealed. The total replacement cost is $28.8 million, with a depreciated replacement cost of $27.3 million and annual depreciation of $713,000.

The routine care of unsealed pavements is important to maintain their structural integrity and serviceability. Periodic renewal of pavement layers, including top surface metal, is also undertaken.

(b) Asset Condition

Unsealed pavements are generally in good condition but are disproportionately affected by storm events and other weather events. Therefore, drainage is particularly important to unsealed pavement condition. They are also especially vulnerable to changes in land use, particularly harvesting of forestry.

Annual Resident Surveys reveal a trend of poor satisfaction at 33% satisfied. This has increased by 5% for 2020. However, there is a large percentage of customers that are indifferent which skews the perception of the results.

Customer perception of unsealed road condition can also differ from a technical viewpoint. One reason for this is Council utilises a Walk 'n Roll for compaction of unsealed roads. This is pulled by the grader and provides a high level of compaction. Customers will call in saying that the road is slick and requires metalling as they may be used to seeing loose metal on unsealed roads.

(c) Asset Capacity

Many of the unsealed roads have been sufficiently strengthened to allow Class 1, 50MAX and HPMV traffic however there are locations in the network which are still prone to failure, particularly in wet weather or due to poor ground conditions.

(d) Critical Assets

Critical routes include those that need to cater for Class 1, 50MAX and HPMV traffic.

Smillies Road in the lower Waitaki Valley is one of the busiest unsealed secondary collectors as there are a significant number of dairy conversions in the area.

Taieri Peak and Mount Trotter Roads are busy with forestry harvesting and carting of logs out to the Port in Dunedin or Timaru.

Switchback Road in Waihemo is also a busy unsealed road as it has a significant size chicken farm.

(e) Key Issues

Unsealed intersections have had issues with corrugations being caused by trucks and some of the larger, more powerful utes (i.e. braking and accelerating stresses on approaches to and from intersections). This issue tends to be more problematic on the Waitaki Plains where roads are flat but is also experienced elsewhere. Some of the problematic intersections have been sealed but for other low volume roads, our contractor has blended clay into rotten rock. The use of this blend has been very successful in that it reduces the amount of corrugations and the amount of customer requests that are received.

Another issue is the availability of quarries with suitable aggregate for wearing course. The cost of cartage outside of a 25km radius is high.

Consenting of quarries by the regional and district council means it can be difficult to bring new quarries online, particularly for out of river aggregate. Council uses between 20-30,000 cubic metres per annum so finding sustainable sources is important.

Figure 29: Unsealed Road Maintenance Trend

Figure 30: Walk n' Roll pulled behind the grader

5.4.2 AM Processes and Practices

(a) Inspections & Assessments

There are 2 graders working on the roading network at least 4 days a week.

The grading programme is on Councils website and is updated quarterly. Any customer requests received regarding condition of the road are investigated by Council officers. The roughness is checked using an app similar to Roadroid that measures the IRI (International Roughness Index) which can be converted to NAASRA counts. This allows subjective assessments of grading quality to be balanced by a data-driven, evidence-based approach.

(b) ONRC Performance Measures

The ONRC performance measures relevant to unsealed pavements include the cost efficiency of unsealed road metalling. Refer to the lifecycle management section below for charts that illustrate this.

(c) Decision Criteria

Grader drivers have been empowered to make decisions on whether to grade roads. Generally, they will only grade the road if it is more than 10% out of spec. Cut-outs and removal of high shoulders is also completed, if necessary, to allow water to drain away from the pavement.

Grading will also be completed in summer if absolutely necessary. This can involve using the rippers on the grader to blend with the new material as well as using a watercart to ensure there is adequate moisture in the aggregate for compaction.

5.4.3 Data Quality

A selection of metrics from the 2019/20 annual REG Asset Management Data Quality Report are shown at right. These metrics are used to assess the RAMM data supporting asset management of pavement assets.

These metrics show that pavement data (including any records associated with either sealed or unsealed pavements) is to the expected standard.

Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Pavement	PAVE2[3]	Pavement layer records have valid attribute data	Accuracy	High			100.0	–	15 32 49 66 83 100
	PAVE3[3]	Pavement layer records with Work Origin	Completeness	High			100.0	–	10 28 46 64 82 100

Figure 31: Unsealed Pavements Metrics REG Asset Management Data Quality

5.4.4 Lifecycle Management

(a) Maintenance Strategy

Repair of unsealed road pavements is undertaken as preventative maintenance as well as on demand where required. This includes pavement repairs, drainage and grading as appropriate.

We have adopted a performance driven approach to maintaining our unsealed network in place of the previous cyclic programme. This allows more targeted spot metalling where problem areas are identified as safety and asset risks and has reduced the whole of life costs in conjunction with targeting renewals metalling to the 'right place' at the 'right time'.

Council will be exploring options for dust control and mitigation. In the past, it has been restricted to locations required by resource consent conditions. Blending of materials is seen as a good option for reducing dust going forward.

The figure to the right shows the cost of unsealed pavement maintenance by Peer Group. The Waitaki District is below half of the Peer Group average for both cost per km and cost per lane km.

(b) Maintenance Programmes

Resident satisfaction remains low at 33% despite the upward trend in grading. Therefore, a further increase in grading of approximately $150k is proposed and $150k is proposed for accelerating the current programme of crowning/crossfall increase to 6-8% as suggested for unsealed roads. This proposal for more grading and improved water shedding should increase the level of satisfaction.

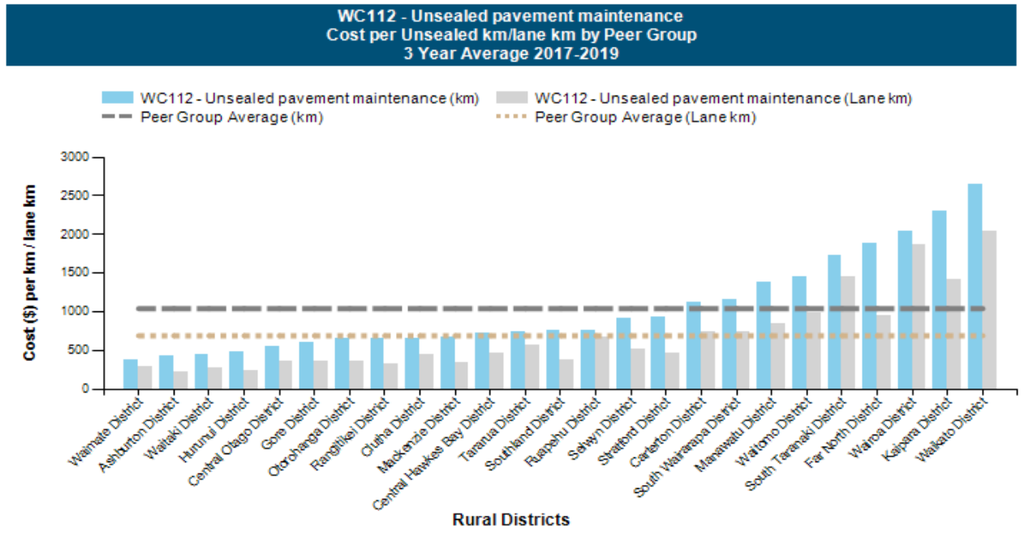


Figure 32: Cost of Unsealed Pavement Maintenance by Peer Group

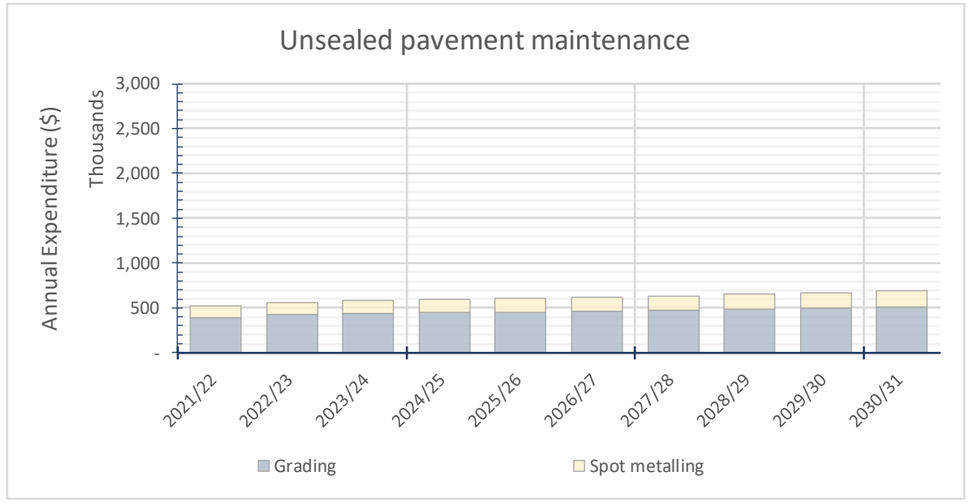


Figure 33: Unsealed Pavements Maintenance

(c) Renewal Strategy

The planned periodic renewal of pavement layers, including top surface of metal aggregate on unsealed roads is required for the purpose of either replacing wearing course aggregate or restoring pavement strength (NZTA W/C 211).

Council has increased the unsealed metalling budget significantly over the last 10 years, not only for wearing course replacement but also for strengthening of the pavement. Council has also increased the cross-fall on unsealed roads to 6%. This is in response to greater levels of heavy vehicle traffic levels and the need for improved drainage off the surface.

Metalling is targeted to heavily trafficked roads under a performance-based approach.

70% of metalling renewals are required to be completed by the end of November. This allows for application of the remaining 30% in the following autumn period to target roads in need of renewal before winter.

No performance modelling has been undertaken for the unsealed road network although a model has recently been developed nationally which will be implemented in future.

The figure to the right shows the cost of unsealed road metalling by Peer Group. The Waitaki District is well below the Peer Group average for both cost per km cost per lane km. This may be indicative of a reasonable price for supply of aggregate compared to others in the Peer Group (e.g. North Island districts with lower quality materials).

(d) Renewal Programmes

$100k is allocated to achieving cross-falls of 6-8% to ensure that good drainage is achieved so that damage due to water ingress is minimised.

The remainder of the forecast expenditure (shown at right) is made up of metalling renewals which includes increases to allow for the new maintenance contract and an additional $200,000 for enhanced level of service i.e. increased grader frequencies and general maintenance.

When delivering the programme, aggregate is applied to the road by using trucks with open tailgates using chain links for measurement of depth on the road applied at a certain speed; 1 bar or chain link will give 20mm depth, 2 bars is 40mm and 3 bars is 60mm depth.

(e) Development Plan

Input Measures for ONRC are to be developed, maintenance metal being the most important.

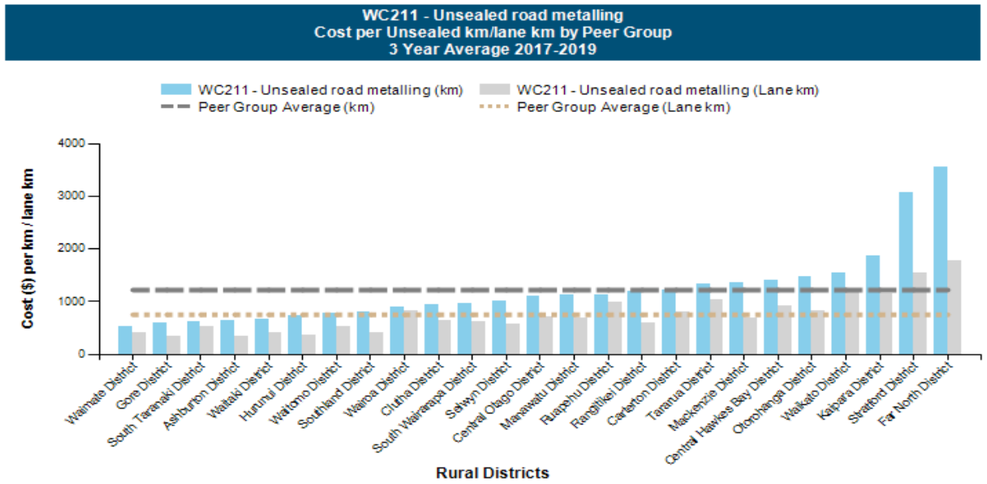


Figure 34: Cost of Unsealed Road Metalling by Peer Group

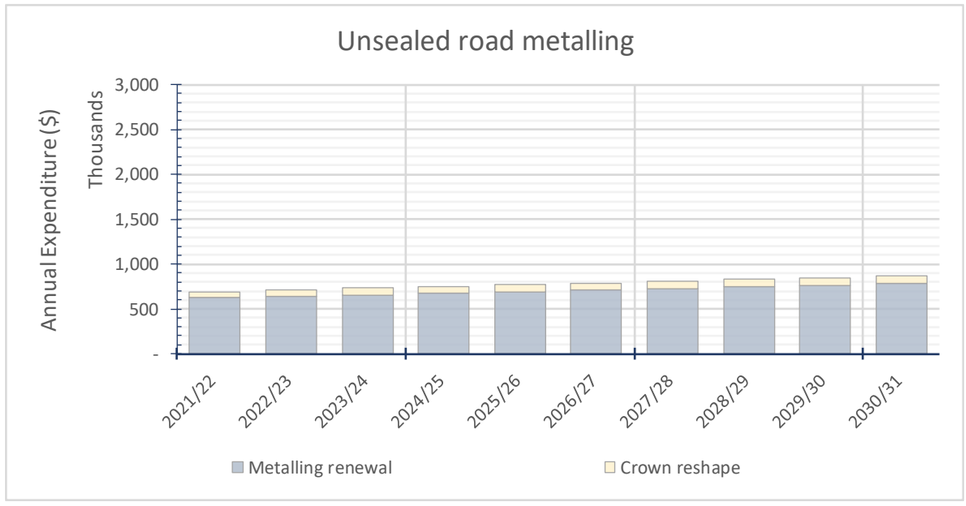


Figure 35: Unsealed Road Metalling

5.4.5 Alternative Options

Table 17: Unsealed Pavement Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Ensure that metalling renewals are applied before any clay is able to pump to the surface.	This will enable the levels of service to be achieved	4	Annual metalling programme
LoS	Change from cyclic grading and metalling to performance based.	There has been a minimal impact on customer levels of service outcomes but there has been an unexpected criticism from customers that we are not using 'the same old'.	3	Implemented in 2017/18
Demand Management	Council has explored owning its own quarries for resourcing of aggregates versus reliance on the incumbent roading maintenance contractor to assist in the procurement of aggregates within a 25km radius of sites to be renewed.	Affordable and sustainable metalling aggregates for the unsealed road network are becoming scarce and Council now has its own source of aggregates for running course, M4 and rockfill.	2	Implemented in 2017/18
Treatment Type	Grading is completed in 5 passes with walk 'n roll compaction.	Good results and smooth surface to drive on. However, when wet, it can become slick and customers complain that more aggregate is required.	5	Current practice
Risk Profile	Insufficient aggregate available / weather events causing damage.	Confirming aggregate supplies and ensuring good cross-falls to minimise damage.	6	Continuing programmes
Policy	Policy to be developed.	Consistent LoS to be achieved over the network determined by ONRC classification.	1	Underway

5.4.6 Consequences of Reduced Investment

Council has 1,123km of unsealed roads, of which most are low volume. Even though volumes are low they provide an important accessibility link for transport operators to move produce or livestock from farm gate to markets. Neglect of unsealed roads metalling or spot metalling programmes will be expensive to recover from. Current expenditure on unsealed roads is $1.186M and any reduction will have a significant impact on customer satisfaction.

5.4.7 Procurement & Delivery

WDC's Urban and Road Maintenance Contract No. 642 is delivered by SouthRoads Limited and was awarded in March 2017 for 3+1+1 years, subject to satisfactory performance.

The contract includes all subsidised activities associated with maintaining the local road network including sealed and unsealed road maintenance and a provisional sum for pavement rehabilitation.

The contract excludes major road repairs, road resurfacing and capital improvement projects which WDC tenders separately in line with the WDC Procurement Strategy.

Council currently provides aggregate to the contractor for use in metalling renewals. This provides improved long-term sustainability to remove contractor pricing constraints. Council has 2 active quarries, at Robs Crossing and Shark Hill in Waihemo, and is actively seeking new locations for quarries to provide aggregate that is compliant with the grading envelope. A 25km radius from quarries provides economic pricing as cartage and transport costs increase significantly beyond that range.

5.4.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

General confidence in the unsealed road network is high. However, there are locations in the network which are prone to failure, particularly in wet weather or due to poor ground conditions. No performance modelling is undertaken for unsealed roads at present but this may change in future as there is now a model available nationally. The output of this model could help improve confidence levels in the performance of the unsealed network.

(b) Risks

Table 18: Unsealed Pavement Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Aggregate supply	Unable to purchase or lease land for quarries with suitable aggregate	Unlikely	Major	Medium	Continued process for securing land working with Property Department	Metalling renewals
Aggregate supply	Resource consents for river or land quarries are difficult to obtain	Likely	Major	High	Continued process for resource consent applications	Metalling renewals
No compaction with grading	Poor or no compaction is achieved when grading	Rare	Major	Low	Walk 'n Roll providing good compaction in metalling renewals and during grading maintenance	Metalling renewals / maintenance
Grader drivers retiring	Grader drivers retire with no succession plan in place	Unlikely	Moderate	Low	Contractor training programme, succession planning for training of younger grader drivers	Unsealed maintenance

(c) Opportunities

More quarries could be identified within the district so that the 25km cart radius can be achieved. This is expected to lead to reduced costs.

5.5 Drainage (WC113/213)

5.5.1 Asset Description

(a) Overview

Drainage facilities include kerb and channel, sumps, cesspits, surface water channels, sub-soil drains and culverts (less than 3.4m^2 cross-sectional area). The total replacement cost of these assets is $67.0 million with a depreciated replacement cost of $29.0 million and annual depreciation of $1.0 million.

Routine care of these facilities is important for continued function, which includes keeping water away from the road pavement. Renewal of drainage facilities that is not routine in nature is undertaken where necessary, particularly where it will reduce future maintenance costs.

Table 19: Drainage Overview

Drainage Structures	Qty	Length (m)
Flume down batter	6	100
Ford	9	83
Culvert	6,348	60,312
Side drain	272	72,956
Soak Pit	31	-
Steel Culvert	1,675	14,900
Subsoil Drain	58	8,790
Sump CP1	1,127	-
Washover Structure	34	400
Water Race	77	1,767

Surface Water Channels	Qty	Length (m)
Dished Channel (Concrete)	15	2046
Dished Channel (Sealed)	36	8,477
Kerb and Channel (Concrete)	707	182,444
Kerb and Channel (Stone)	6	320
Mountable Kerb & Channel (Concrete)	3	278
Mountable Kerb only	2	36
Other and Unknown	7	861

(b) Asset Condition

Council does not complete any formal condition rating assessment and have requirements for inspections in the road maintenance contract. A formal condition rating assessment will be added to the next contract in July 2022.

A significant number of culverts were upgraded as part of the 2014 Rural Resilience Project.

(c) Asset Capacity

Many known capacity issues were addressed by the Rural Resilience Project between 2014-17. The project installed and upgraded culverts and wash-over pads (concrete apron on road surface) to allow excess water to over top the road without damage.

A storm event in July 2017 (>100-year return period) tested the outcomes of this project and whilst extensive repairs were still required, the road network was reopened sooner than in the past.

However, further work is required to maintain capacity for future weather events. Corriedale and Oamaru wards is where most of the damage occurs in large storm events.

(d) Critical Assets

Sumps and catchpits in urban areas, and culverts and wash over pads on lifeline and collector routes. These include the following routes;

- Weston Road and Westview Drive which is a main link between Oamaru and Weston
- Weston Ngapara Road, which is the busiest route into Corriedale
- Seven Mile Road, a link between SH1 and SH83
- Kakanui Valley Road, a secondary collector also through Corriedale and a resilience route for the state highway
- Prohibition Road, a link between SH83 and SH8.

(e) Key Issues

The topography of the District is generally rolling with flat expanses on the Waitaki Plains and from Duntroon up to Omarama in Ahuriri. On the Waitaki Plains, the flat terrain and narrow 10m wide road reserves mean it is difficult to achieve adequate outfalls and discharges. In areas of steep inclines, heavy scouring is a problem in the big storm events.

The Corriedale area in Waitaki has the largest percentage of dairy farming in the district. Lands have been flattened out over time and creeks and natural flow paths changed which has made it more difficult to discharge stormwater off the road.

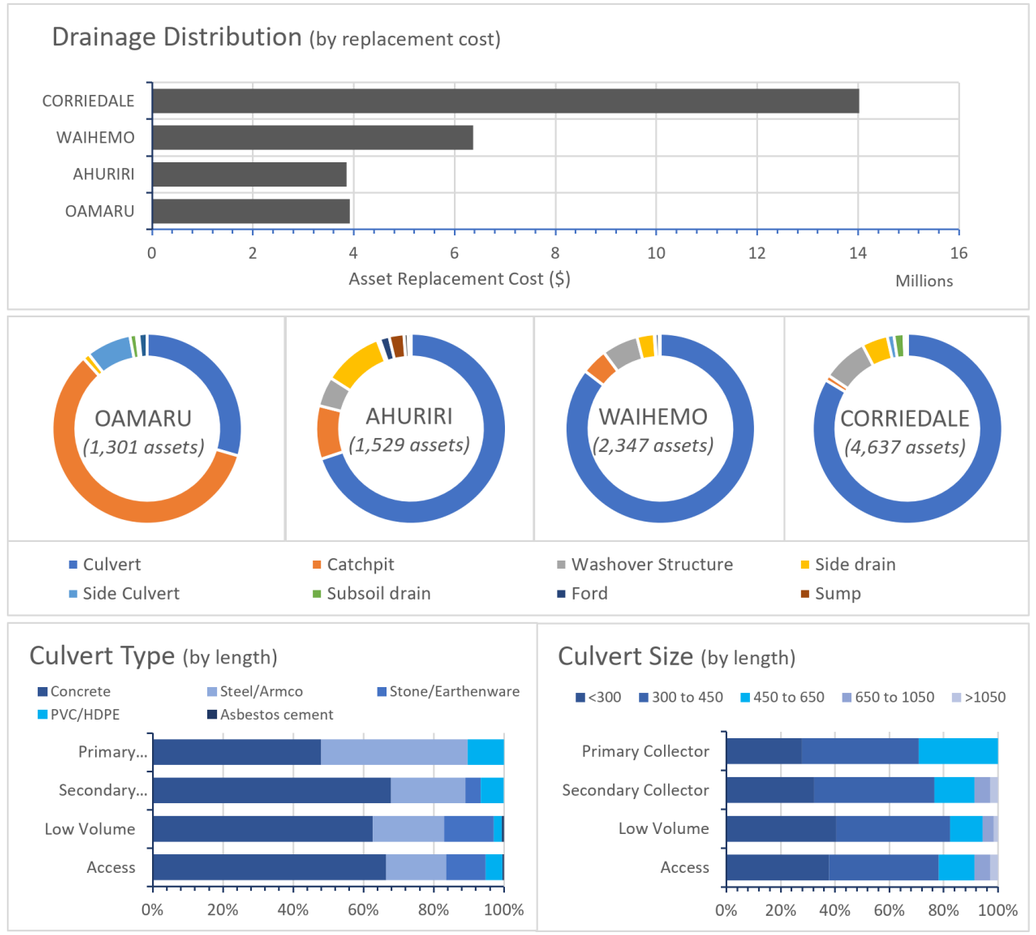


Figure 36: Drainage Statistics (1)

5.5.2 AM Processes and Practices

(a) Inspections & Assessments

The maintenance contractor is required to complete 300 culvert inspections per month over a 33-month period, totalling 9900. Any culverts that are not in RAMM are added to the database. These inspections are used to identify obstructions/debris at inlets, outlets and inside the pipe barrel.

Culverts known to block after heavy rainfall events are inspected within 24 hours of a heavy rainfall event and cleared.

(b) Decision Criteria

Maintenance and renewals are programmed as necessary, based on the following criteria.

All culvert/pipe inlets, outlets and barrels are to have no more than 10% of the pipe diameter filled with debris and the drainage channel shall be free from obstructions within 5.0m of the inlet or outlet.

All sumps, manholes or catchpits are to be debris free for at least 150mm below the invert of the outlet pipe (or inlet invert in the case of bubble-up sumps). Where the bottom of the structure is less than 150mm below the outlet invert level, then it shall be free of any debris.

Constructed fords and wash-over pads are to be kept trafficable at all times during normal water flow.

For sealed and unsealed water channels including kerb and channel, there should be no more than 5 total occurrences of blocked side drainage channel within any continuous 1 km length and includes back drains. A channel is considered blocked if water ponds and/or water does not readily flow to the outlet points.

5.5.3 Data Quality

A selection of metrics from the 2019/20 annual REG Asset Management Data Quality Report are shown at right. These metrics are used to assess the RAMM data supporting asset management of drainage assets.

The results show that there are major issues with surface water channel data. This has the potential to impact our renewal programme development, investment decision making, asset valuations and LoS delivery.

Work has been undertaken over the last year to improve the completeness of this data. This has been reflected in the culvert data standards and surface water channel data has also improved significantly (albeit with more work to do).

Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Drainage	DRAIN1	Culvert assets known	Completeness	Moderate			88.4	▲	20 36 52 68 84 100
Drainage	DRAIN2	Culvert asset records maintained	Timeliness	Low			1.1	▲	0 5 10 15
SW Channel	SWC1	SWC asset known	Completeness	Moderate			70.3	▲	5 24 43 62 81 100
SW Channel	SWC2	SWC asset records maintained	Timeliness	Low			0.1	▲	0 2 4 6 8 10

Figure 37: Drainage Metrics REG Asset Management Data Quality

5.5.4 Lifecycle Management

(a) Maintenance Strategy

Inspections and maintenance currently applies equally to all roads. With the next contract due 1 July 2022, response times by ONRC classification will be included to ensure that the busiest collector routes are getting the most attention.

Our informal policy is for replacement of steel and earthenware culverts under the road to be concrete and at least 375mm diameter. This will reduce cost of replacements in future so that investment can be diverted to other areas.

Cyclic maintenance is in accordance with inspections and assessments in 5.5.2.

The contractor uses an app to identify when storm events are approaching. They also get weather warnings from Council's Civil Defence.

The figure to the right shows the cost of routine drainage maintenance and renewals by Peer Group. The Waitaki District is below the Peer Group average for both cost per km and cost per lane km.

(b) Maintenance Programmes

Maintenance programmes consist of responses to Customer Requests but are also based on information that has been returned out of the inspections and assessments as outlined in 5.5.2.

Forecast expenditure over the term of the plan is shown at bottom right. Street sweeping/cleaning is funded to 30% through Work Category 113. Street sweeping costs have increased as waste is considered contaminated and must be disposed of appropriately.

Funding assistance for routine drainage maintenance:

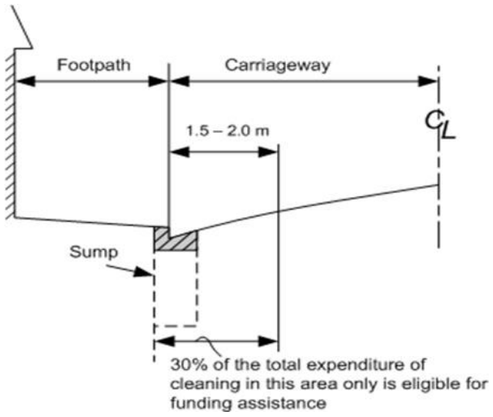


Figure 38: Funding Assistance for Routine Drainage Maintenance

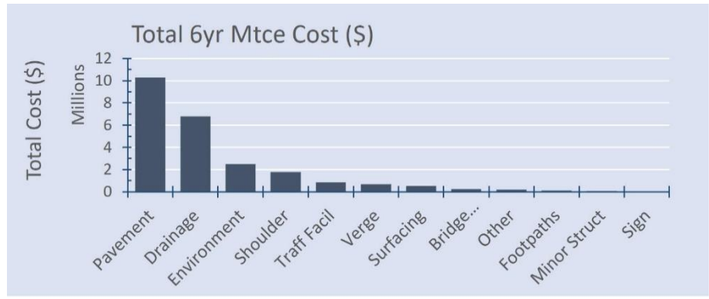


Figure 39: Total 6 year Maintenance Cost

The chart above shows that drainage maintenance is the second largest spend after pavement maintenance over the last 6 years

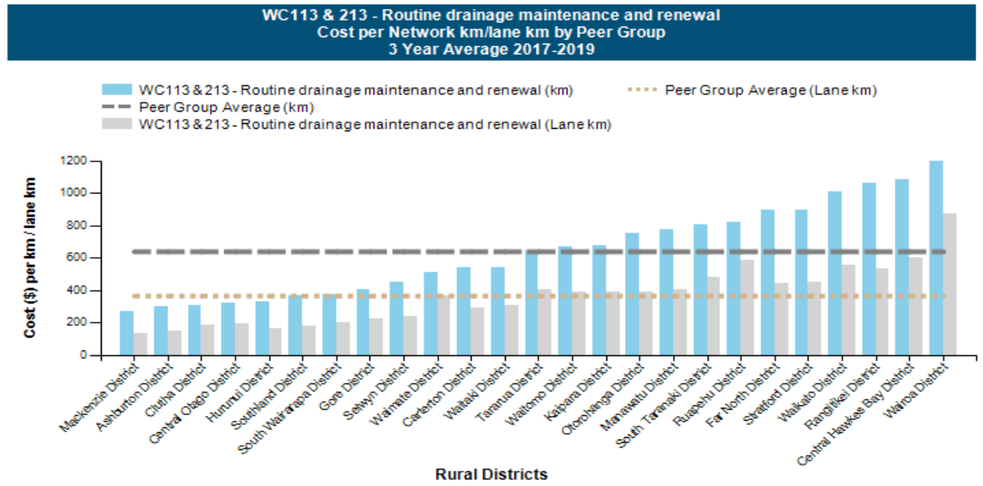


Figure 40: Cost of Routine Drainage Maintenance and Renewals by Peer Group

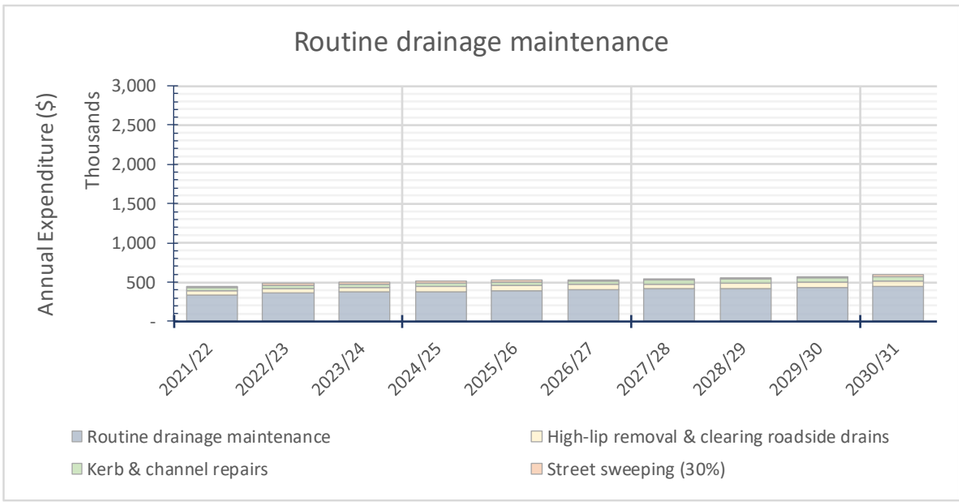


Figure 41: Routine Drainage Maintenance

(c) Renewal Strategy

Candidates for replacement of kerb and channel or of culverts are identified by the Contracts Engineer. These are conditional on economic analysis giving a positive net present value to gain financial assistance.

The Contractor may also identify candidate sites. The Engineer also looks to align the K&C programme with the footpath programme where applicable.

Other drainage renewals include renewal of side drains that either have been blocked up with vegetation, need cleaning or require improved longitudinal fall to ensure drains are functional.

A figure on the previous page shows the cost of both routine drainage maintenance and renewals by Peer Group. The Waitaki District is below the Peer Group average for both cost per km and cost per lane km.

Going forward we are looking to introduce more proactive drainage renewals, particularly on Lifelines routes.

(d) Renewal Programmes

Note: Annual Depreciation for drainage assets reported in the 2020 valuation as approx. $1.0 million. Further investigation of asset condition is necessary to verify the lower renewal budget vs. annual depreciation to confirm any risk to long term asset performance.

Table 20: Renewal Programmes

Work Category Name	Programme	Forecast 2021/22	Forecast 2022/23	Forecast 2023/24
213 - Drainage renewals	Culverts (m)	$269,737	$276,750	$284,499
213 - Drainage renewals	Kerb and channel (m)	$161,621	$165,823	$170,466
213 - Drainage renewals	Other drainage renewals (m)	$120,634	$ 123,770	$127,236
		$551,992	**$566,344**	**$582,201**

Drainage renewals budgets have been adjusted for cost escalations only – the previous Rural Resilience Project made significant inroads.

(e) Development Plan

Council's Rural Resilience Project replaced, upgraded or had new culverts and side drains installed. There is no specific development continuing. However, there is a continued focus in the area of drainage which may identify further work for completion.

As part of ongoing data improvement, Council is ensuring that RAMM is accurately updated with information from the field, including inspecting drainage and completing any necessary work when roads are prepared for resurfacing.

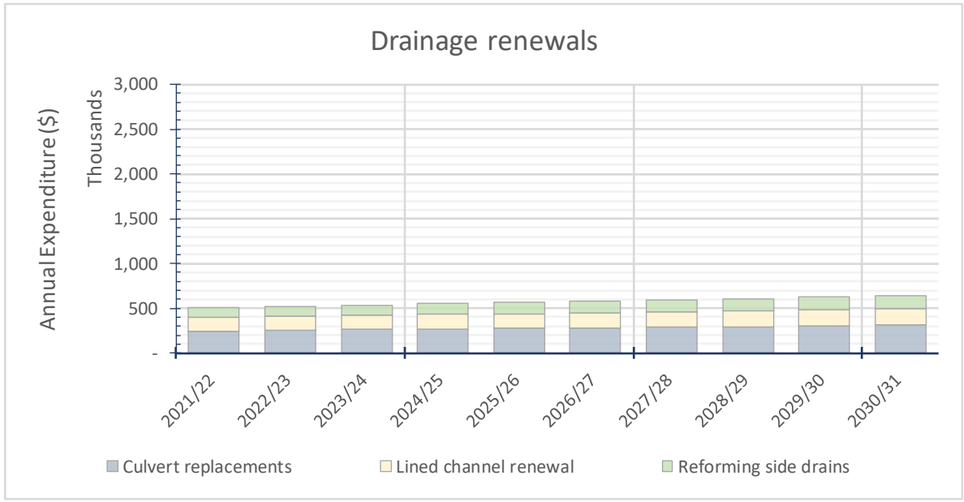


Figure 42: Drainage Renewals

5.5.5 Alternative Options

Table 21: Drainage Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Reduced investment or diversion of drainage maintenance after benefits of Rural Resilience Project	High impact if level of drainage maintenance is not continued	2	Contract management
LoS	Allow surface water to drain off sealed and unsealed roads without causing damage	High impact on roading network if drainage maintenance neglected	3	Contract management
Demand Management	CRM requests for diversion of surface water off private property	Trade-off between customer satisfaction versus drainage regulations	4	Contract management
Treatment Type	Spraying of roadside surface water drains rather than mechanical cleaning	Treatment most appropriate to effective surface water discharge	5	Contract management
Risk Profile	Reduced investment in drainage maintenance will increase risk of wet and weak pavements	High risk of weakened roading network incapable of carrying heavy vehicles	6	Network & asset management
Policy	Prepare roading policy and collect condition data through the next term maintenance contract.	This will allow a formal condition rating assessment to be analysed and risk to be better understood.	1	July 2022 onwards.

5.5.6 Consequences of Reduced Investment

More severe and regular storms, some with a return period exceeding 100 years, cause severe damage in places and limit access and travel time reliability. Below is a chart showing emergency works expenditure over a 10-year period amounting to $7.6M. This prompted Council to invest more than $3M in the Rural Resilience Project which has created additional capacity in the network as well as allowing roads to be re-opened a lot faster than in the past. It is essential that Council continues to focus on drainage across the network, particularly on the primary and secondary collectors which make up 22% by length and carry 68% of the total vehicle kilometres travelled (VKT) on the network.

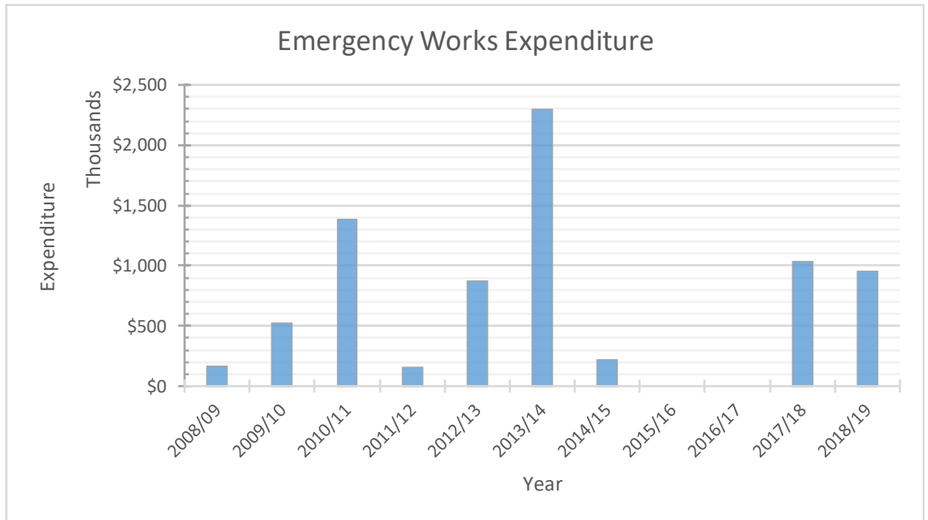


Figure 43: Emergency Works Expenditure

5.5.7 Procurement & Delivery

This has generally been within the maintenance contract. Construction of wash-over pads has been completed by alternative contractors.

5.5.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

Council's confidence level on drainage is high. Council is focussed on ensuring drainage is well-maintained and delivers a good level of service. This focus is demonstrated through the current implementation of a monthly programme of inspection and assessment of culverts (300 culverts inspected each month). To enhance confidence levels further, Council will invest in understanding the overall condition of the drainage network by including condition rating of culverts in the next maintenance contract in July 2022.

(b) Risks

Table 22: Drainage Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Management	Incomplete knowledge of drainage condition leads to poor decision making and unplanned failures.	Unlikely	Moderate	Low	Improve training for contractors and continue to invest in staff development. Include of condition rating in next maintenance contract.	Professional Development
Financial	The level of drainage renewal expenditure may not be enough to sustain the asset over the medium to long term (annual depreciation figures indicate expenditure may need to increase over the medium term).	Possible	Moderate	Medium	Ensure that investment is prioritised. Review expenditure levels.	Network & asset management
Service Level	Flooding affects roads due to under capacity, poorly located or blocked drainage assets causing inaccessibility or unsafe driving conditions.	Unlikely	Major	Medium	Continue focus on drainage maintenance following previous resilience work.	Contract management
Environmental	Surface water contamination during normal operation of the network caused by lack of environmental controls.	Unlikely	Moderate	Low	Seek investment for extra filtration and include in next contract.	Contract management

(c) Opportunities

Council is currently completing a stormwater assessment on the Oamaru Creek to assess how flooding affects Oamaru. It will also identify how stormwater capacity of the creek can be increased so that additional residential development can take place in Oamaru and Weston.

Continued investment will deliver enhanced resilience in the drainage system to minimise risk of damage in severe storm events.

5.6 Streetlighting (WC122/222)

5.6.1 Asset Description

(a) Overview

Streetlighting assets have a total replacement cost of $2.4 million, with a depreciated replacement cost of $1.7 million and annual depreciation of $87,000.

This activity includes operation, maintenance and power costs for carriageway and pedestrian crossing lighting (cycle path lighting includes in the cycle path work categories). Renewals can be of poles or replacement of lanterns at the end of their economic life with more efficient types.

Council has had a maintenance contract in place since 2003 which has facilitated an improved level of streetlighting service delivery. As shown to the right in the streetlight distribution, the majority of lights have been upgraded to LEDs in 2017-2019. The remaining lights are decorative high-pressure sodium lights in Thames Street, Oamaru or in the historic precinct.

(b) Asset Condition

The majority of Council's lights have recently been replaced with LEDs, so their condition is considered to be very good. As technology improves, upgrades of decorative lamps that haven't been switched to LED will be completed. They will either be retrofitted with LED or replaced with new LED lanterns at the end of their asset life.

A full condition rating survey has been completed in 2020/21 and the accuracy of information in the database has improved.

Pole renewals have been completed over the term 2018-21 and records have been updated. Pole renewals will continue into the 2021-24 period.

(c) Asset Capacity

Local Road streetlights generally comply with the P3 or P4 category within the standard AS/NZ 1158. Council has an annual project of $48,000 for infill lighting included in the Low Cost Low Risk Improvements category (intersections will be prioritised), and has a plan to upgrade the ONRC primary and secondary collector routes to an improved standard.

(d) Critical Assets

Critical routes for provision of lighting are primary and secondary collector routes within Oamaru, and access routes within residential areas. Additional critical locations for lighting are those intersections where crashes have resulted in fatalities or serious injuries.

(e) Key Issues

Historically the streetlighting network was based on using power poles to install lights. The spacings are variable from 50-90m which means the measured lumens do not always comply with the lighting standard. Infill lighting is required to rectify this.

The decorative lights on the Esplanade which light up the Harbourside walkway are situated in a harsh salt water environment which has extensively damaged the paint on the streetlight heads. This is more aesthetic rather than a functional issue at this stage. A cost-effective solution may be to remove powder coating where peeling and use aluminium primer and paint.

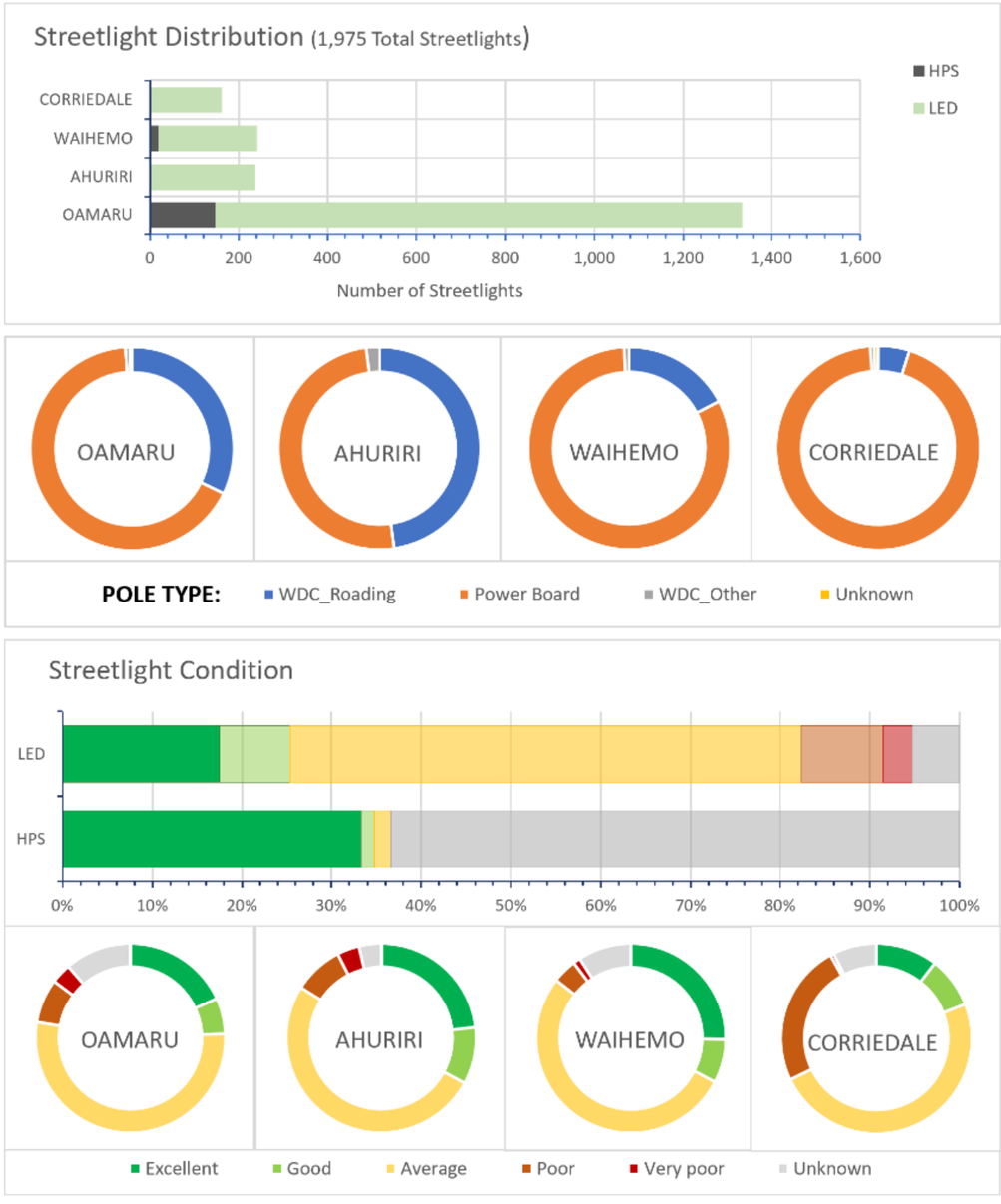


Figure 44: Streetlighting Statistics (1)

5.6.2 AM Processes and Practices

(a) Inspections & Assessments

Inspection requirements and response times are shown in the table to the right.

The service level on this contract is considered to be very high as few customer requests are received.

The implementation of the Central Management System in 2020/21 will reduce the cost of maintenance by enhancing reporting and control of the assets.

(b) Decision Criteria

The key decision criteria for streetlights is whether they work or not. The contractor is very efficient in repairing streetlight outages. Requirements will be reviewed and response times updated in the new contract to reflect all ONRC classifications as well as lighting at intersections.

Table 23: Inspections and Assessments

A: Overhead Street Lighting	Urban	Rural
(1) Secondary Collector and above Roads (lamp replacement)	48 hours	3 days
(2) All other lighting (lamp replacement)	5 days	10 days
(3) Inspection period - Secondary Collector and above Roads - All other roads	 3 months 6 months	 3 months 6 months
B: Lighting Columns	**Urban**	**Rural**
(1) Support critically damaged	8 hours to make safe 24 hours to complete	12 hours to make safe 24 hours to complete
(2) Inspection Period – shear bases/Ground Plant	6 months	6 months
(3) Inspection period – all other poles	12 months	12 months
C: Pedestrian Crossing Flood Lighting	**Secondary Collector and above Roads**	**All Other Roads**
(1) Flood not operating	24 hours	48 hours
(2) Flood light damaged	1 day	5 days
D: Amenity Lighting	**Lamp Replacement**	**Inspections**
(1) Off street car parks	5 days	6 months
(2) Recreation reserves	5 days	6 months

5.6.3 Data Quality

A selection of metrics from the 2019/20 annual REG Asset Management Data Quality Report are shown at right. These metrics are used to assess the RAMM data supporting asset management of streetlighting assets.

The results show that the completeness of asset data is to the expected standard, and assets are associated to roads.

There are issues indicated with timeliness of asset data updates. This is based on whether updates have been made within the last three years for streetlight pole replacements. If updates have not been made for pole replacements, this has the potential to impact our investment decision making, understanding of the effectiveness of investment and asset valuations.

The implementation of RAMM Work Management (formerly RAMM Contractor) for streetlights has improved the quality of information in the database, and ongoing improvements are expected.

Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Streetlights	LIGHTS1	Streetlights associated with a 'road'	Accuracy	Low			99.1	–	90 92 94 96 98 100
	LIGHTS2	Streetlights records have a light	Completeness	Low			99.2	–	95 96 97 98 99 100
	LIGHTS3	Streetlight replacement activity	Timeliness	Low			2.9	–	0 10 20 30 40 50

Figure 45: Streetlighting Metrics REG Asset Management Data Quality

5.6.4 Lifecycle Management

(a) Maintenance Strategy

The maintenance contract allows for normal daily maintenance of the street lighting network on local roads and the state highway network within the district. This generally includes lamp replacement and small repairs but also streetlight renewals where necessary.

Council invested over $500k p.a., over a two-year period, to replace all of the 2009 streetlights in the district with more energy efficient LED lighting. This project has reduced electricity costs on top of reduced lamp replacement and maintenance costs. LED technology improves cost efficiency without compromising light levels for the customer. Council now achieves $70,000 p.a. savings on electricity and maintenance compared to costs prior to the project was rolled out.

A warranty period of 10 years applies to the new LED street lights and limited maintenance is expected after that.

Accident damage is covered by this contract and WDC makes all endeavours to recover monies where possible. Under the NZTA delegations agreement with WDC, the contract has a component of maintenance and renewals of State Highway street lighting within the District for which WDC is fully compensated on a 6 monthly basis.

The figure to the right shows the cost of traffic services maintenance and renewals (which encompass streetlighting) by Peer Group. The Waitaki District is below the Peer Group average for both cost per km and cost per lane km.

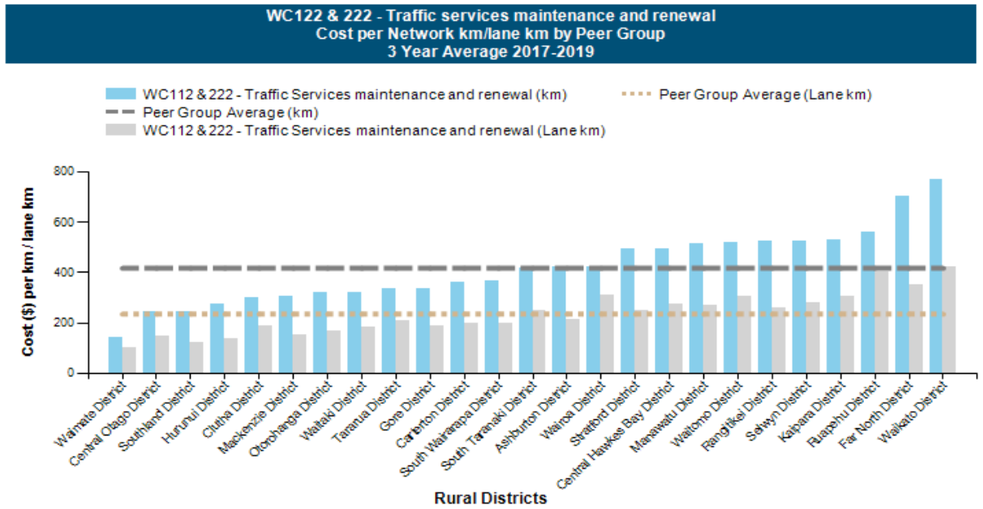


Figure 46: Cost of traffic services maintenance and renewals (which encompass streetlighting) by Peer Group

(b) Maintenance Programmes

Streetlighting maintenance and energy expenditure over the life of this plan are shown in the chart to the right.

The electricity budget has been increased as it was previously reduced too far with the LED upgrade. Heritage and ornamental street lights remain HPS until technology allows replacement.

Figure 47: Streetlighting Maintenance

(c) Renewal Strategy

Streetlighting renewals covers replacement of light fittings, poles, brackets and photo cells. Bulb replacements are treated as maintenance.

As described earlier, 2009 streetlights in the district were replaced with more energy efficient LED lighting. This LED lighting technology has an asset life of 20 years before needing replacement. Council set up the procurement of LED streetlights for Otago Southland, excluding Dunedin City, which allowed Council to receive the benefits of greater purchasing power and customer support at less cost. This was progressed in 2016/17 and the LED streetlight upgrade is now complete. Upgrade and new installations have also been completed on the state highways on behalf of NZTA.

Decorative HPS lanterns are an issue as they are very expensive to replace. Where retrofits are available for some lanterns, they will be renewed.

Pole renewals are approximately $10-18,000 dependant on location and complexity, and it is approximately $2,000 for a streetlight design on a new installation. Replacement of 750 poles is a cost of $1.5M over the 35-year lifetime of the poles i.e. $42,850 per year.

A figure on the previous page shows the cost of both traffic services maintenance and renewals (which encompass streetlighting) by Peer Group. The Waitaki District is below the Peer Group average for both cost per km and cost per lane km.

(d) Renewal Programmes

HPS decorative lighting will be renewed to LED as technology becomes available. One of the cycleway lights on the Esplanade has been replaced with a retrofit screw in LED bulb. This has been relatively successful and will be rolled out to the remainder. Rather than cool white, the lights should be replaced with warm white bulbs.

Approximately $100,000 per annum, increasing with inflation, is allocated for streetlight renewals.

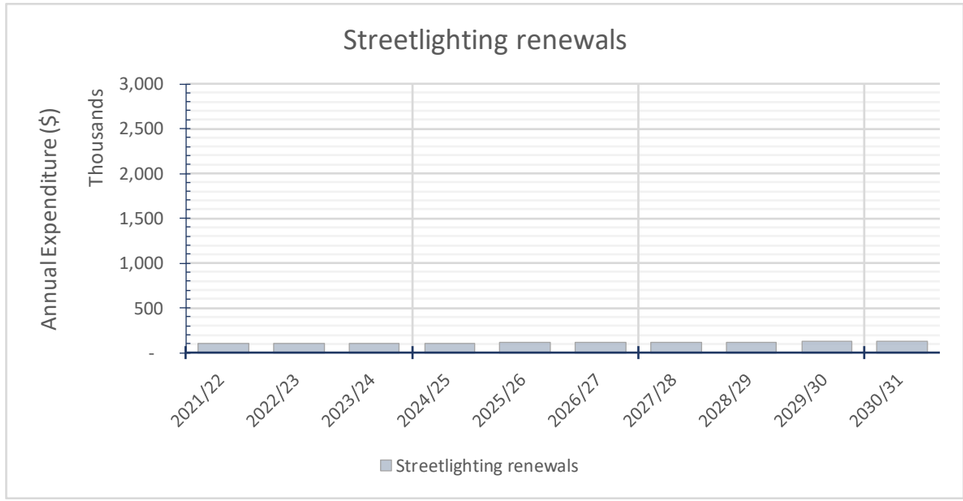


Figure 48: Streetlighting Renewals

(e) Development Plan

Council will be implementing a streetlighting Central Management System in 2020/21 which will allow for dimming of LED lights within the local road network overnight. Auckland Transport dim their lights to 80% from midnight to 5am. As the Waitaki District is located significantly south of Auckland, the timing of sunset and sunrise differs so the proposed timing may be from 11pm through to 4am in the morning for weekdays and 12am to 5am for weekends. This will introduce further savings for Council.

Local road streetlights comply with P3 or P4 category and a development plan is required to ensure that streetlighting on primary and secondary collector routes within urban areas is increased to P1 and P2 category respectively.

Intersection improvements will be identified along with streetlighting upgrades and will prioritised accordingly. To achieve this, the investment in streetlights may need to be increased from $48,000 to $100,000 or more.

Council will have discussions with Network Waitaki on whether they are interested in taking over the operation of the network and completing the streetlight maintenance. This idea is in its infancy and further talks are required. NZTA will need to be consulted on possible outcomes and how this arrangement would fit in with the rules around procurement.

5.6.5 Alternative Options

Table 24: Streetlighting Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Sta
Investment Timing	Major investment to upgrade HPS streetlights to LED has been completed. Further investment is necessary to ensure remaining decorative HPS are also converted once financially viable.	If no further investment is made, the benefits of the total streetlight network will not be fully realised.	2	Mostly complete
LoS	Dimming of LED lights within the local road network overnight. It is unlikely that lights at intersections will be dimmed as they provide significant levels of lighting for safety reasons.	The proposal may be from 11pm through to 4am in the morning for weekdays and 12am to 5am for weekends. This will introduce further savings for Council. An indiscriminate reduction in street lighting will put motorists and pedestrians at risk.	3	Planned for 2020/21
Demand Management	Alternative modes of active transport will require more lighting on cycleways and footpaths.	Infill lighting required to meet standards.	4	Included in LCLR Improvements
Treatment Type	Replace all HPS with LED over next 10 years.	If not upgraded, benefits identified in business case will not be achieved.	5	Planned renewals
Risk Profile	Streetlighting in Waitaki does not meet standards identified in AS/NZS 1158.	No upgrades will compromise safety.	6	Included in LCLR Improvements
Policy	A new roading policy is required to outline standards of lighting by road ONRC classification.	No policy in place means that ad hoc category lighting is currently implemented.	1	Underway

5.6.6 Consequences of Reduced Investment

Council is looking to make further savings from the installation of LED streetlights through the proposed dimming which would be completed within a controlled environment. An indiscriminate reduction in street lighting will put motorists and pedestrians at risk. It is unlikely that lights at intersections will be dimmed as they provide significant levels of lighting for safety.

5.6.7 Procurement & Delivery

WDC's streetlight maintenance is delivered by local sub-contractor Clements Electrical on behalf of Electricity Ashburton. Contract no. 628 Streetlight Maintenance was awarded in June 2016 for 2+3 years subject to satisfactory performance. The contract allows for normal daily maintenance, emergency response in the event of crashes and dayworks of the street lighting network as well as for infrastructure renewals as and when programmed. For the NZTA delegations agreement with WDC, the contract has a component of maintenance and renewals for State Highway street lighting within the District for which WDC is compensated on a 6 monthly basis.

Costs have been escalated with inflation and population growth to reflect the increases in transport activity and vested assets.

A new streetlight contract is due to be publicly tendered in the first quarter of 2021 calendar year to commence from 1 July 2021.

5.6.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

Our confidence level regarding streetlighting is high at approximately 95%. The streetlighting inventory was added into RAMM in 2000. A full inventory was completed and Council has had the benefit of a single contractor looking after the lights for 17 years. External auditing of the streetlight network has recently been completed and the accuracy of the network means that the next audit will be in 2 years. The intention is to continue to improve the accuracy of data and build confidence levels further.

Network Waitaki are the lines network provider in the district north of Shag Point, while PowerNet includes Shag Point and Palmerston. As Network Waitaki are a community trust, they have no incentive to run the network at a profit. For this reason, Council hasn't experienced any increase in line charges as has been the case in other parts of the country. In fact, Network Waitaki have been supportive of the upgrade to LED as they have not had to increase their infrastructure to cope with dairy conversions and commercial developments.

(b) Risks

Table 25: Street Lighting Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Level of Service	Inadequate Intersection street lighting – resulting in crashes.	Possible	Major	High	Identify high-risk intersections; Review Levels of Service; Review CRM resulting from poor or inadequate lighting; Review position of streetlights (distance from carriageway edge); Review Street tree placement	Low Cost Low Risk Improvements
Level of Service	Inadequate Carriageway/Amenity lighting resulting in accidents (e.g. tripping and falling)	Unlikely	Minor	Low	Match bulb types to appropriate areas; Identify high-risk areas; Review Levels of Service.	Traffic Services budget
Financial	Damage to streetlights due to vandalism and or vehicle damage, resulting in higher replacement costs and safety considerations	Unlikely	Moderate	Low	Streetlight maintenance contract	Traffic Services budget
Financial	Electricity cost escalation	Rare	Minor	Low	Mitigated through LED conversion. Further 15% savings anticipated due to CMS implementation (due 2020/21)	Traffic Services budget

(c) Opportunities

Collaboration with Otago Southland councils on the LED streetlight upgrade has provided $317k savings which has been identified for the implementation of a Central Management System. A CMS will provide benefits with accurate power consumption, accurate inventory which will satisfy audit requirements and will allow the streetlight network in Oamaru to be permanently made live. Once the heritage lanterns in Oamaru have a LED equivalent or are fitted with a Nema Cap they will also be able to be added to the CMS network.

One of the possible opportunities of a CMS network is to provide links for water meter reading. This will be assessed when the options of systems have been considered.

Other opportunities could include improving the standard of lighting in the district.

5.7 Traffic Services (WC122/123/131/222)

5.7.1 Asset Description

(a) Overview

Traffic Services include road furniture, signs and markings. These assets have a total replacement cost of $2.1 million, with a depreciated replacement cost of $810,000 and annual depreciation of $182,000.

There is a separate work category (131) for rail level crossing warning devices which covers costs associated with maintenance, renewal, upgrading and installation of level crossing warning devices carried out by the relevant rail track authority. No programme has been provided by KiwiRail for the 2021-24 RLTP.

Table 26: Traffic Services Quantities

Asset Description	Qty	Unit
Directional Sign	4	ea
Culvert position marker	218	ea
Guide	8	ea
Hazard Markings	787	ea
Information Sign	1279	ea
Permanent Warning	1236	ea
Regulatory General	1,032	ea
Regulatory Heavy Vehicle	29	ea
Regulatory Parking	280	ea
Edge Marker Posts	20,985	ea
RRPM's	776	ea

(b) Asset Condition

There is currently no condition rating undertaken on signs other than 6 monthly night audits. However, signs are replaced on a continuous basis dependent on their night-time reflectivity. A condition rating survey will be completed as an improvement item during the 2021-24 NLTP.

Pavement markings are re-marked annually as a maintenance item.

(c) Asset Capacity

Signs in the District generally provide adequate regulatory and wayfinding functions. However, improvements could be made based on crash risk. The budget is currently sufficient to cover maintenance and renewal of signs and edge marker posts. An increased level of service will require additional investment.

(d) Critical Assets

Signs and markings on primary and secondary collector routes:

- Weston Road and Westview Drive which is a main link between Oamaru and Weston
- Weston Ngapara Road, which is the busiest route into Corriedale
- Seven Mile Road, a link between SH1 and SH83
- Kakanui Valley Road, a secondary collector also through Corriedale and a resilience route for the state highway
- Prohibition Road, a link between SH83 and SH8.

(e) Key Issues

Signs are not accurately recorded in RAMM at present. During the Covid-19 lockdown, redeployed Council staff updated a portion of the signs inventory using Council's Clearview 360 photography of the roading network. A continuation of this work will be added as an improvement item for the 2021-24 RLTP.

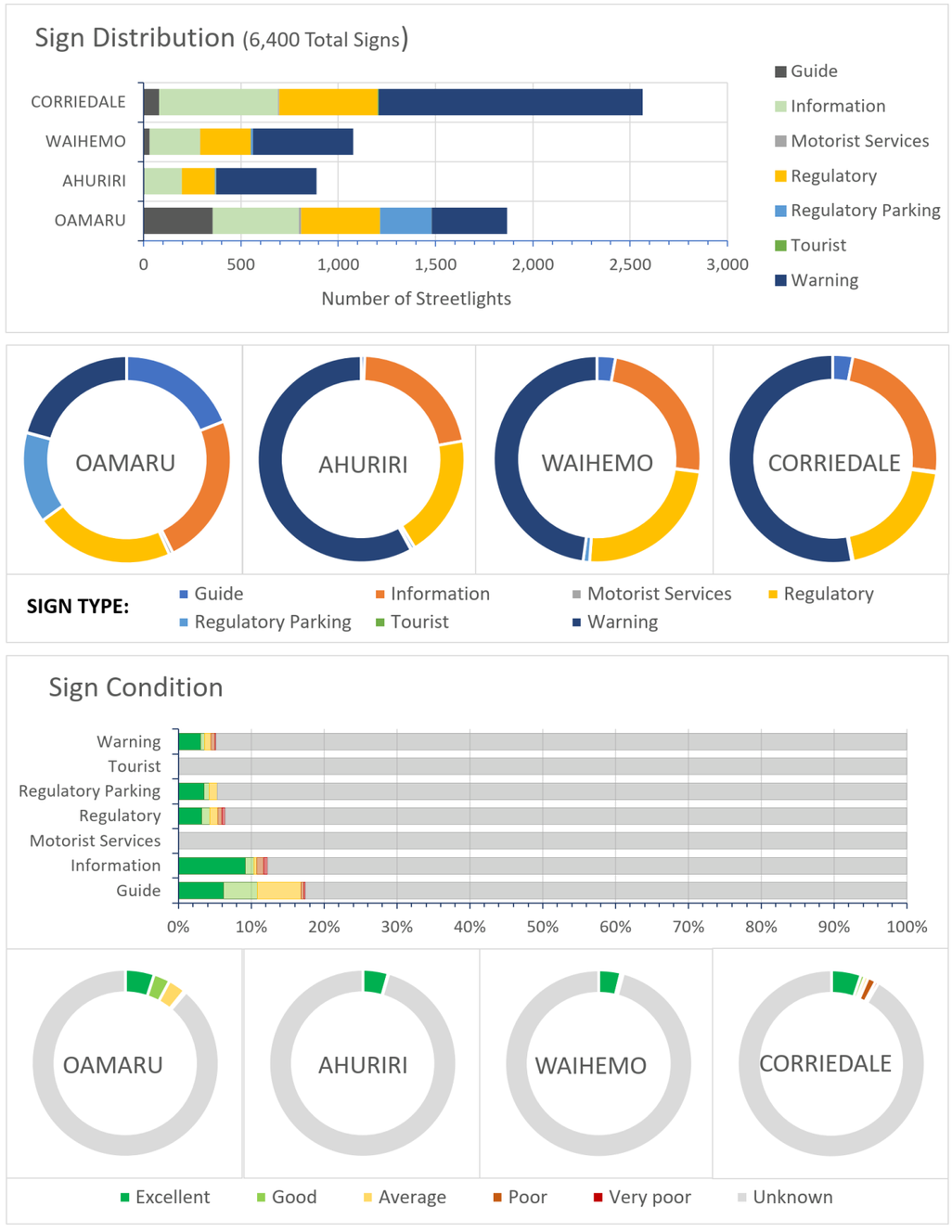


Figure 49: Traffic Services Statistics (1)

5.7.2 AM Processes and Practices

(a) Inspections & Assessments

Night audits are completed on signs every 6 months to check reflectivity. Every road in the network is inspected which takes almost a week. There are also general inspections of signs and edge marker posts completed by cyclic maintenance crews during the day.

(b) Decision Criteria

The level of reflectivity in night audits is a key determinant of replacement need. If reflectivity is marginal, it will be replaced with a new sign with sizing as per the correct specification and prioritised by ONRC classification. MOTSAM and TCD Manuals will be reviewed for correct specification.

5.7.3 Data Quality

A selection of metrics from the 2019/20 annual REG Asset Management Data Quality Report are shown at right. These metrics are used to assess the RAMM data supporting asset management of traffic services assets.

The results show that there are major issues with sign asset data. Although this data is rated as low to moderate importance, it has the potential to impact our investment decision making, understanding of the effectiveness of investment and asset valuations. The requirements for completeness relate mainly to either having an installation date or a condition rating undertaken within the last three years.

RAMM Contractor has been in place since 2007 and the use of this system would usually result in an improvement to inventory over time. However, the process for replacement or upgrade of signs has not been correctly reported by the contractor. Procedures are to be confirmed and historical dispatches for new and replacement signs will be reviewed so that the accuracy of the inventory can be improved.

Inventory of pavement markings is also less accurate than desired. In conjunction with signs, it will be updated in the 2021-24 period.

Response times for signs, edge marker posts and reflectors:

- Regulatory Sign damaged or missing – 24 hours.
- Permanent Warning Sign damaged or missing – 24 hours.
- Street or Road name sign missing – Three weeks.
- Chevron damaged or missing – 24 hours.
- Special or non-standard signs – Four weeks.
- Edge markers missing – One week.
- Reflectors missing – One week.

Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Signs	SIGNS1	Sign assets known	Completeness	Moderate			10.3	—	5 24 43 62 81 100
	SIGNS2	Sign asset associated to a 'road'	Accuracy	Low			91.7	—	90 92 94 96 98 100
	SIGNS3	Sign replacement activity	Timeliness	Low			1.5	▼	0 5 10 15 20

Figure 50: Traffic Services Metrics REG Asset Management Data Quality

5.7.4 Lifecycle Management

(a) Maintenance Strategy

A continuation of existing signage maintenance levels is planned and is specified within contract No. 642 which has been in effect from 1 July 2017. This maintenance activity covers maintenance of new signage and existing signs. Vandalism and accident damage of signs and posts is also covered under this activity and WDC makes all endeavours to recover monies where possible.

The pavement markings contract includes an annual remark of pavement markings for collectors, local roads and roads in commercial and CBD areas, with parking lines completed biennially. The contract outlines application rates, paint thickness and reflectorisation with glass beads dependent on road hierarchy. Parking space lines are not reflectorised. The contract does not include the remark of off-street car parks but these are completed as necessary.

In the new contract awarded earlier this year, we are increasing collector routes to 2 markings per annum with extra re-marking also on high wear areas and will consider using high-performance markings where lifecycle costs can be reduced e.g. at high-wear intersections. This will provide safety benefits.

Other delineation including sight rails is also a focus.

The figure to the right shows the cost of traffic services maintenance and renewals by Peer Group. The Waitaki District is below the Peer Group average for both cost per km and cost per lane km.

(b) Maintenance Programmes

The signs maintenance annual budget is $105,000 and covers all maintenance items as well as new signs (not replacements). This also includes customer requests, approximately 1 per month.

Pavement marking budget is $203,000 and covers all items as identified in the maintenance strategy. This has increased to allow for new contract rates and an increased ONRC-based level of service i.e. 2 markings per year for primary and secondary collector routes.

Annual maintenance budgets for level crossing warning devices are a continuation of existing and adjusted for inflation (shown in the chart to the right).

A budget for operational traffic management ($40,000 annually) has been added to allow for maintenance of electronic sign boards at schools.

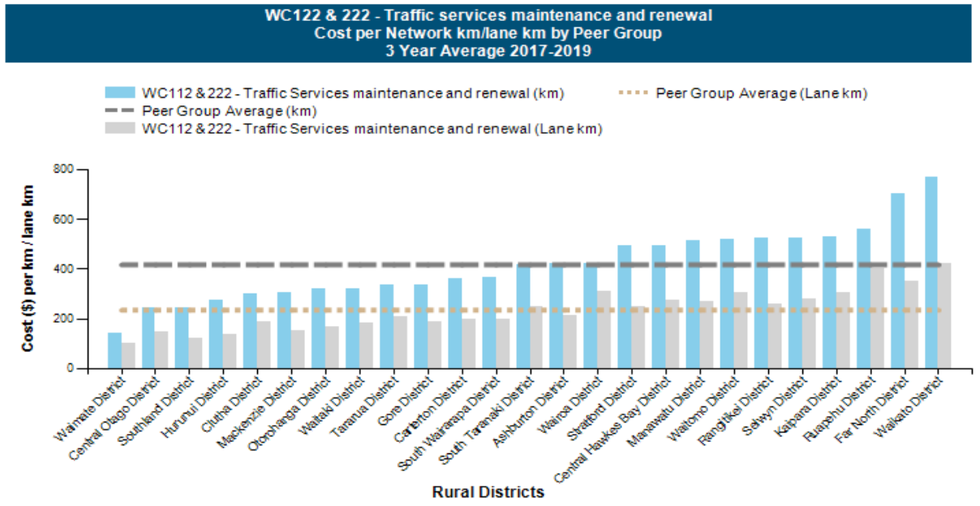


Figure 51: Cost of Traffic Services Maintenance and Renewals by Peer Group

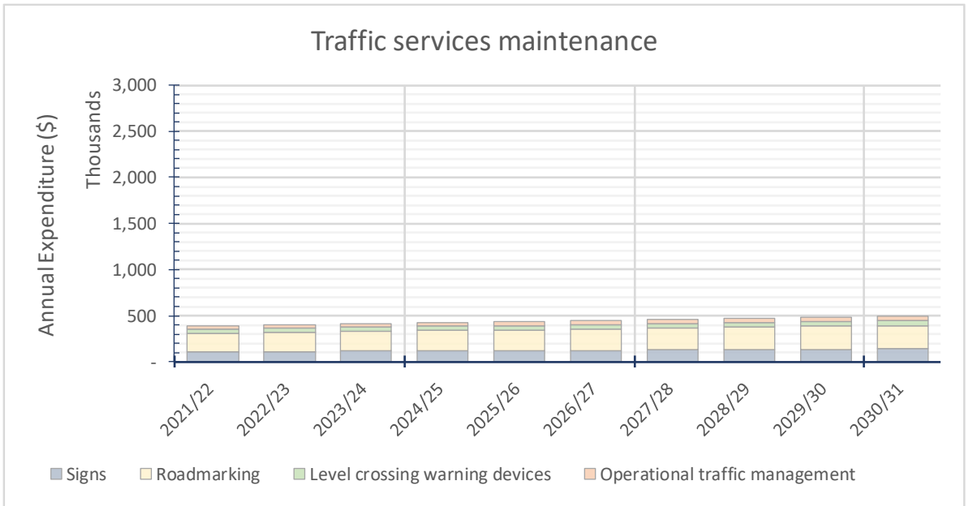


Figure 52: Traffic Services Maintenance

(c) Renewal Strategy

Signs and edge marker posts are renewed as identified during night audits. Annual Depreciation for Traffic Facilities and Signs reported in the 2020 valuation is $182,000. Further investigation of asset condition is necessary to verify the difference between planned renewal expenditure and depreciation to confirm whether there is a risk to long term asset performance.

(d) Renewal Programmes

The annual expenditure for signs renewals is approximately $100,000 and is shown in the chart at right.

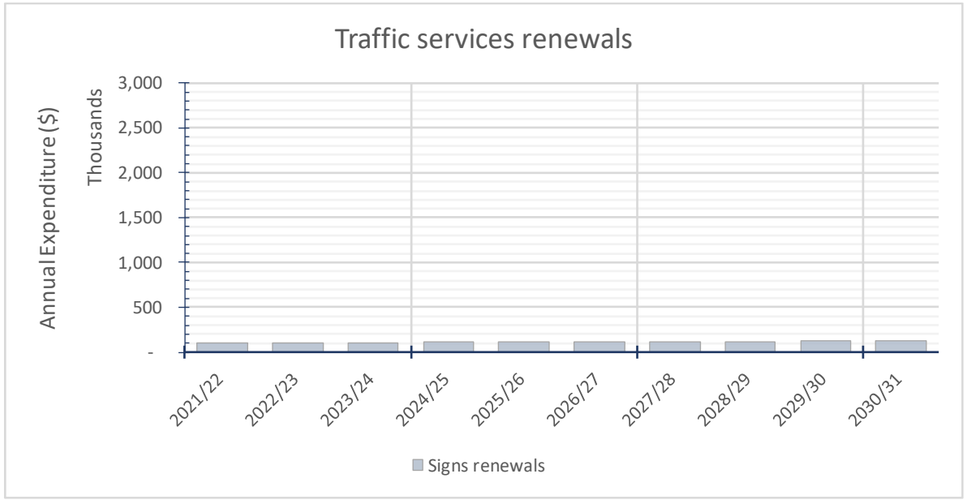


Figure 53: Traffic Services Renewals

(f) Development Plan

Signs and markings are to be prioritised by ONRC classification in future; to be developed during 2021-24 NLTP.

5.7.5 Alternative Options

Table 27: Traffic Services Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Stat
Investment Timing	Increased funding for annual pavement re-marking may be needed depending on the pricing of tenders.	New pricing may not allow for additional pavement markings to be completed.	3	Currently out for tend
LoS	Levels of service need to be clearly defined.	Ad-hoc maintenance and renewals.	2	To be developed
Demand Management	Customer requests for signs and pavement markings are approved by delegations with the Roading Manager.	Resident satisfaction could be affected.	5	Currently underway
Treatment Type	Signs to be of hi-grade reflectivity rather than engineering grade. Pavement markings to remain reflectorised as currently completed.	Anything less will compromise road safety.	4	Check specifications amend if necessary
Risk Profile	Signs, edge marker posts and pavement markings are not a high value asset but contribute significantly to safety for road users.	Reduction of this activity may increase personal and collective risk.	6	Assess 2019/20 PMR results
Policy	Complete new policy to ensure signage and pavement markings are correctly developed.	Maintenance programmes could be better defined than they are currently.	1	Currently underway

5.7.6 Consequences of Reduced Investment

Investment in Traffic Services has reduced in real terms because cost increases smaller than CPI and quarterly escalations have been applied to budgets thereby reducing the actual spend. Any further reduction in investment will increase the safety risk.

5.7.7 Procurement & Delivery

Contract No. 753 was awarded to Downer in September 2020 for 2+1+1 years subject to satisfactory performance. This contract includes an annual remark of pavement markings for collectors, local roads and roads in commercial and CBD areas, with the parking lines completed biennially. Collector routes will be completed twice per annum requiring an increase in investment.

5.7.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

Confidence in the appropriateness of signage for regulatory and wayfinding purposes is high. However, inventory collection is required to improve data accuracy.

(b) Risks

Table 28: Traffic Services Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Road safety	Inadequate signage/markings – due to vandalism, non-compliance with standards, missing or deterioration – causes crashes/damage. This includes sight rails, chevrons, edge marker posts, bridge end markers, culvert markers etc.	Possible	Major	High	Monitor and improve current practices; Ensure that safety measures/ temporary traffic measures are implemented as part of all roadworks; Review of standards (MOTSAM, NZ Transport Agency specs etc), and audit of controls and control works. Ongoing crash reduction studies (in conjunction with Police, NZ Transport Agency); Continue informal safety audits managed in-house.	Road Safety, Traffic Services and Network & asset management
Financial Cost	Insufficient budget to continue current signage and marking regime.	Likely	Moderate	High	Monitor. Cost of marking may increase but could also reduce post Covid-19.	Traffic Services

(c) Opportunities

- Clearer and more defined levels of service could be implemented so that signage maintenance can be completed as appropriate.
- Improvements to RAMM inventory and accuracy of information.
- Influence safety of the road network at low cost through targeted maintenance and renewal.

5.8 Footpaths & Cycle Paths (WC124/125)

5.8.1 Asset Description

(a) Overview

Footpath and cycle path assets have a total replacement cost of $18.8 million, with a depreciated replacement cost of $9.5 million and annual depreciation of $540,000.

This activity includes maintenance and renewal of public footpaths and facilities associated with public footpaths, such as stairs, alleyways and off-road connections. It also covers the pavement and facilities associated with cycle paths and shared paths, including the operation of associated lighting.

There is 4.8km of financially assisted walking and cycle paths in the Waitaki District, mostly in Oamaru, 500m on Loch Laird Road in Otematata and 50m in Shag Point.

Table 29: Footpaths & Cycle Paths - Asset Descriptions

Asset Description	Quantity	Area	Unit	Length	Unit
Asphaltic concrete (black)	710	224,331	M2	114.2	Km
Asphaltic concrete (red)	8	1,950	M2	0.7	Km
Seal	241	75,135	M2	37.2	Km
Concrete	34	9,296		7.0	
Concrete (black)	1	84	M2	0.1	Km
Metal	33	6,729	M2	4.5	Km
Interlocking blocks	19	7,979	M2	2.4	Km
TOTAL	**1046**	**325,505**	**M2**	**166.2**	**Km**

(b) Asset Condition

Since the DIA Performance Measures were introduced, annual condition rating of a random 10% sample has been completed. In the first two years, footpaths rated exceeded Council's 96% target. However, in the third year they failed. As a result, Council engaged WSP to complete a 100% survey of the 166km of footpaths in the District. The survey was due to commence in early May but, as a result of Covid-19, was deferred to late September and is now complete. Information should be available for the final bid on maintenance and renewals.

Footpaths around street trees are particularly poor.

(c) Asset Capacity

The footpath network provides a good foundation for urban mobility. There are areas where footpaths are required e.g. a $500,000 project for new footpaths and kerb and channel in Weston.

Oamaru has wide footpaths on Thames Street and Thames Highway which provide good options for mobility scooters and pedestrians. Consideration of whether to make footpaths shared cycle tracks will be discussed by Council. At this stage the roading bylaw does not allow cyclists on the footpath.

(d) Critical Assets

Footpaths on Thames Street and Thames Highway in the CBD, as well as those on Severn and Wansbeck Streets to the south and Thames Highway to the north.

Additionally, footpaths from the Oamaru CBD up Eden Street to the new Observatory retirement home on Stoke Street have increased in criticality. The footpath will require widening for it to provide a suitable level of service.

(e) Key Issues

Footpath inspections and maintenance has been included in the roading maintenance contract since 1 July 2012. This has improved the level of service for this activity.

Tree roots have become a problem in recent years, especially those from private property or street trees.

Lichen has also become a problem for Council with footpaths becoming slippery when wet or frosted. The spores also break up the footpath surface.

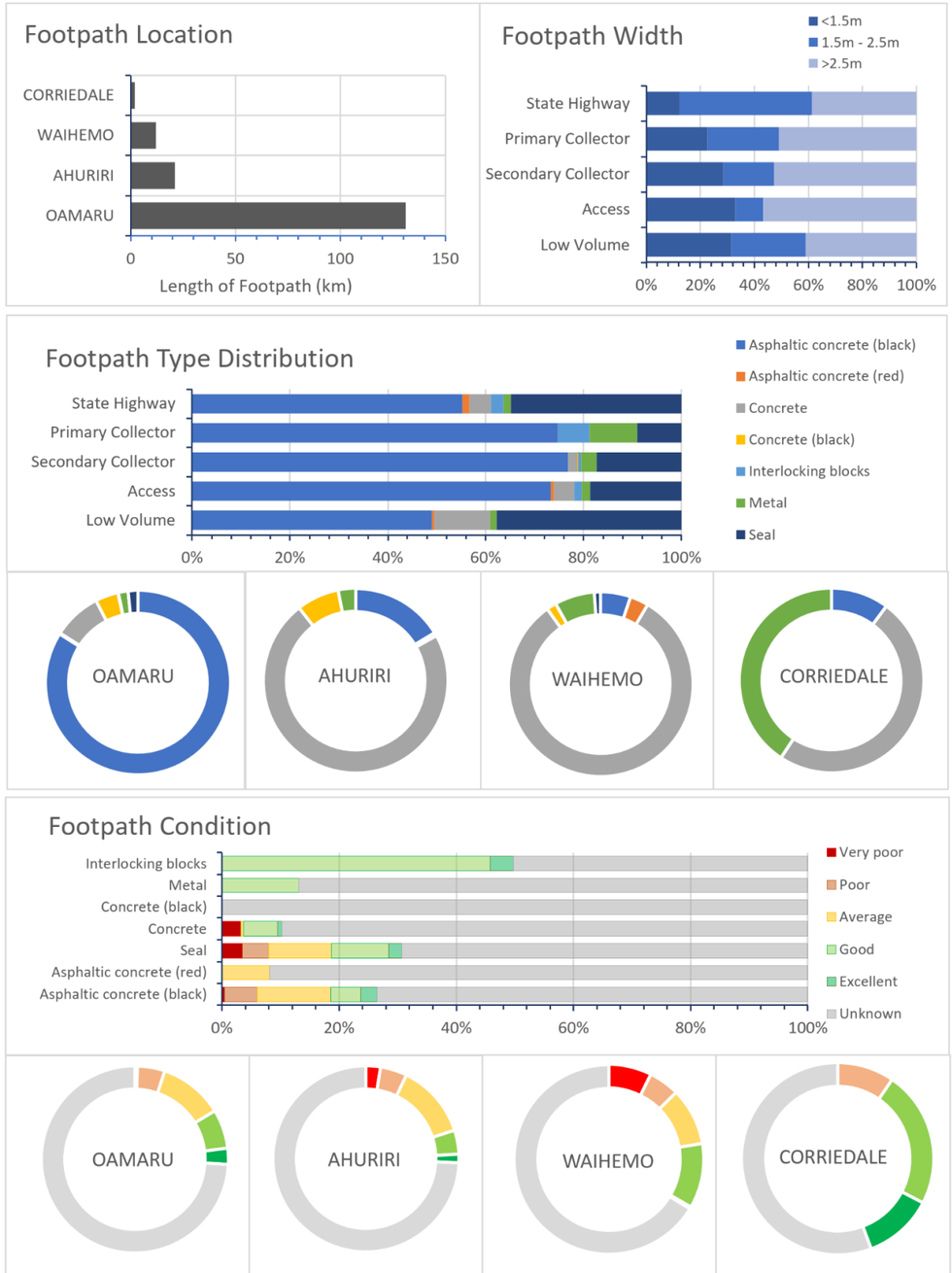


Figure 54: Footpaths & Cycle Paths Statistics (1)

5.8.2 AM Processes and Practices

(a) Inspections & Assessments

The footpath condition rating system is currently based on an annual inspection process and a condition rating survey by an external professional services provider. These inspections form the basis for developing the annual maintenance and annual replacement programme.

The condition rating survey of 100% of the footpath network will provide a good basis for maintenance and renewals; a forward works programme for all footpaths will be completed.

A table of faults to be used in the survey is included at right.

(b) ONRC Performance Measures

It is expected that the measures will have improved for the 2019/20 financial year as inventory will have been updated in preparation for the condition survey.

(c) Decision Criteria

The contractor is required to provide an annual inspection report from which footpath maintenance is programmed. Any urgent footpath maintenance or maintenance required due to customer requests is programmed by the maintenance contractor.

More significant maintenance and renewals are expected to be developed as part of a forward works programme output from the condition survey that is due to be completed.

Our planning is based upon a useful life of 20 years for asphalt footpaths, and 10 years for chip seal footpaths.

5.8.3 Data Quality

A selection of metrics from the 2019/20 annual REG Asset Management Data Quality Report are shown at right. These metrics are used to assess the RAMM data supporting asset management of footpath assets.

The results show that footpath data is at the expected standard. Work has been undertaken over the course of the last year to improve footpath data to get to this position.

5.8.4 Lifecycle Management

(a) Maintenance Strategy

Maintenance of footpaths and cycle paths generally includes potholes and cracking repairs. In addition to general maintenance, WDC has commenced a programme of lichen spraying which has been quite effective in extending the life of the footpaths.

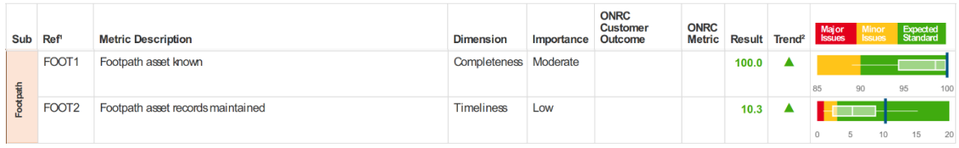
There is no analysis showing the cost of footpath maintenance and renewals by Peer Group as footpaths were only added as a financially assisted activity in the 2018-21 NLTP period.

(b) Maintenance Programmes

For the 2021-24 RLTP submission, footpath maintenance is increased by cost escalations plus $89,000. This is to mitigate levels of service decline related to the impacts of an increasing over 65 population, UFB renewal, water lateral renewals and lichen issues.

Table 30: Footpaths & Cycle Paths Fault Rating Criteria

Fault	3 Fair	4 Poor	5 Very Poor	Causes
Trip Lip	> 0 mm <= 10 mm	> 10 mm <= 15 mm	> 15 mm	Trees, Utilities, Service Covers, Ground Movement
Crack. Broken	> 3 mm <= 10 mm	> 10 mm <= 15 mm	> 15 mm	Trees, Utilities, Ground Movement, Vehicles
Displacement (Vertical - Slab)	> 5 mm <= 10 mm	> 10 mm <= 15 mm	> 15 mm	Vehicles, Service Covers, Ground Movement, Trees, Utilities
Veg Encroachment (% of Envelope)	10 - 25% H <= 1.8m V	25 - 50% H <= 1.8m V	>= 50% H <= 1.8m V	Vegetation (Horizontal), Trees (Vertical)
Uneven	> 5 mm <= 10 mm	> 10 mm <= 15 mm	> 15 mm	Workmanship, Patches, Ground Movement, Service Covers, Utilities, Trees
Pothole (Depth)	> 5 mm <= 10 mm	> 10 mm <= 15 mm	> 15 mm	Workmanship, Utilities, Age
Ponding (Depth)	> 5 mm <= 10 mm	> 10 mm <= 15 mm	> 15 mm	Workmanship
Slippery (% of area)	10 - 25%	25 - 50%	>= 50%	Vegetation (such as lichen, moss), Patches
Scabbing, stripping (% of area)	10 - 25%	25 - 50%	>= 50%	Vegetation, Age
Trench sunken (Depth)	> 5 mm <= 10 mm	> 10 mm <= 15 mm	> 15 mm	Utilities, Workmanship



Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major issues / Minor issues / Expected Standard
Footpath	FOOT1	Footpath asset known	Completeness	Moderate			100.0	▲	85 90 95 100
	FOOT2	Footpath asset records maintained	Timeliness	Low			10.3	▲	0 5 10 15 20

Figure 55: Footpaths & Cycle Paths Metrics REG Asset Management Data Quality

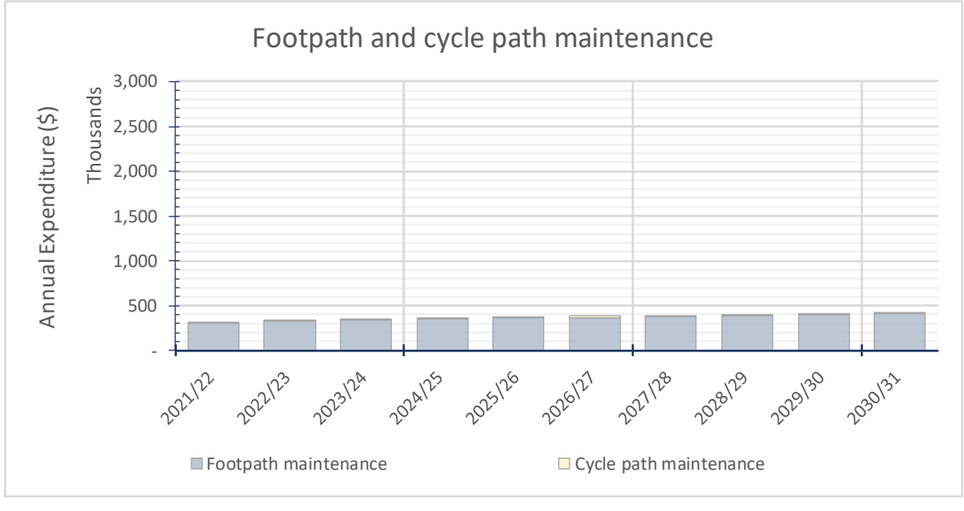


Figure 56: Footpaths & Cycle Path Maintenance

(c) Renewal Strategy

Footpath renewals are defined as the replacement of continuous sections exceeding 20m in length. Sections shorter than that are considered as expensed maintenance items. The types of renewal work undertaken to restore footpaths to the required condition are;

Resurfacing to provide a smoother surface by:

- Overlaying with a thin layer of asphaltic concrete or pave coat where it already exists; or
- Removing the existing surfacing and laying new surface (where the high footpath profile in relation to berm prevents surface overlay). The Roading Manager has set a policy of 2 footpath layers above the kerb after which the layers are required to be removed – refer to the figure to the right.

Reconstruct basecourse and surfacing when:

- The footpath base structure has deteriorated to an extent where resurfacing is not practical;
- The condition of the kerb and channel or the condition of the carriageway rather than the footpath condition dictates renewal; or
- Where the footpath is to be reconstructed on a new alignment.

The required level of renewal will vary depending on: the age profile of footpaths; the condition profile of footpaths; the adequacy of historical control of trenching, vehicles and weed growth; proximity to trees; the level of ongoing maintenance demand; and the differing economic lives of the materials used.

Ongoing condition assessments will assist with the knowledge and development of Forward Works Programmes for footpath assets

(d) Renewal Programmes

The current renewal programme tends to be based on identifying candidates by age and verifying with inspections. The condition rating survey of 100% of the footpath network completed at the end of September will provide a comprehensive Forward Work Programme for renewals.

The programme for renewals is increased by $100,000 in the first year with $50,000 added to years 2 and 3.

(e) Development Plan

Once a Forward Work Programme has been developed, Council will be able to consider whether the budgets for maintenance and renewals need to be updated. It was intended that the FWP would be developed prior to the 2021-24 RLTP submission. However, Covid-19 related delays mean it has just been completed and a separate review will be submitted if additional investment is required.

Consideration is also to be given to whether footpaths should become shared paths. This would allow for more urban mobility for pedestrians, scootering, cycling and mobility scooters. Currently the roading bylaw prohibits cycling and scooters, except for mobility scooters.

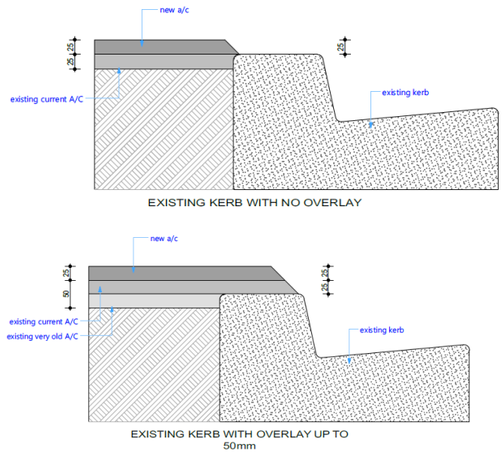


Figure 57: Footpaths & Cycle Path Cross Sections

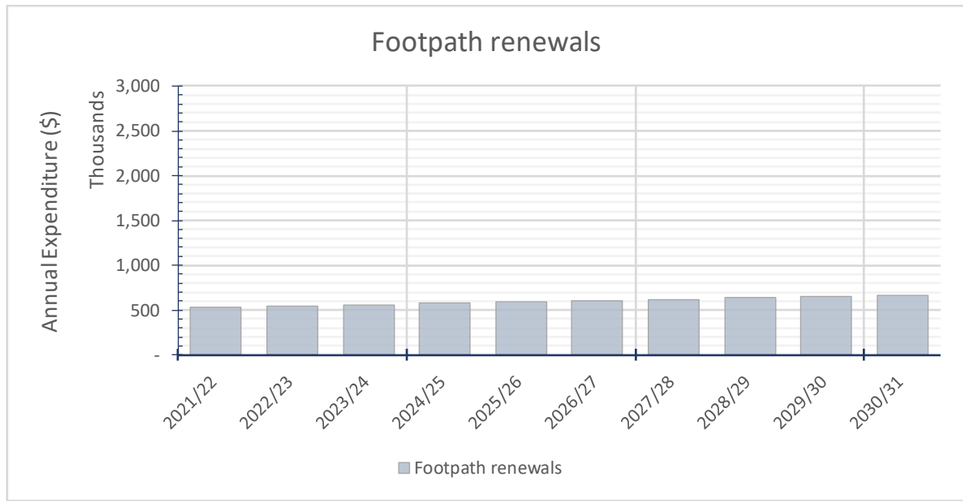


Figure 58: Footpath Renewals

5.8.5 Alternative Options

Table 31: Footpaths & Cycle Path Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Increased investment required for urban mobility and improved level of service.	Under-investment in the footpath network will result in a level of service decline.	2	2021-24 RLTP submission
LoS	Improved level of service required for greater urban mobility, particularly as Waitaki has a greater percentage of elderly than the national average. The level of service is currently declining.	A reduced level of service will hinder further network development and alternative modes of active transport.	3	Currently underway with condition rating survey
Demand Management	Footpaths are requested by individual customer requests and, unless it is a safety issue where footpaths are paid out of LCLR Improvements, they are to be funded by the amenity rate of the township it is in.	Without this funding constraint, Council would have an excessive number of requests and would find it difficult to rate for investment.	4	Current policy
Treatment Type	Footpaths are surfaced as asphalt, chipseal or concrete and are resurfaced in the existing type of material unless upgraded by the individual townships.	Without this funding constraint, Council would have an excessive number of requests and would find it difficult to rate for investment.	5	Current policy
Risk Profile	Footpath level of service is currently declining and there is a risk that, with under-investment, the footpath network will deteriorate further.	Under-investment will require prioritisation of footpath maintenance and resurfacing.	6	Additional investment required
Policy	Policy required on new footpaths i.e. asphalt, chipseal or concrete.	Without a policy, footpath network is rather ad-hoc.	1	Currently underway

5.8.6 Consequences of Reduced Investment

Reduced investment will result in a level of service and asset condition decline, which could affect urban mobility and other alternative modes of transport. Council will also experience reduced satisfaction, and more customer requests and safety issues.

5.8.7 Procurement & Delivery

Council tendered a new 3-year footpath resurfacing contract in early 2019 to commence in 2019/20. There was only a single tender as other companies are unable to compete with pricing for asphalt. Whitestone Contracting has their own asphalt plant in Nimmo Road which is less than 25km to Oamaru. Previously, asphalt was trucked in from Timaru or Dunedin.

5.8.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

Confidence levels in footpaths and cycle path inventory is high. Once the 100% footpath condition rating survey is complete, Council will be able to make an accurate assessment of current levels of service.

(b) Risks

Table 32: Footpaths & Cycle Path Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Level of Service	Inadequate accessibility for physically and visually challenged persons/ wheelchairs/ strollers/ walkers/ prams/ mobility scooters. This may be due to a lack of footpaths or inadequate level of service.	Unlikely	Moderate	Low	Continue current practices. Monitor complaints and feedback.	Condition rating survey
Under investment	Insufficient investment for Council to provide a good network of footpaths.	Possible	Moderate	Medium	Prioritisation of footpath maintenance and renewals.	Footpath maintenance and renewals

(c) Opportunities

- Increased investment to improve the programme and the footpath and cycle path network.
- Improved footpaths and cycle paths to encourage more walking and cycling.
- Shared walking and cycling with footpaths encouraging multi modal transport.

5.9 Bridges and Structures (WC114/215)

5.9.1 Asset Description

(a) Overview

Includes road bridges, large culverts (greater than 3.4m^2 cross-sectional area), pedestrian over-bridges/underpasses, retaining structures, tunnels, stock access structures and cattle stops. Total replacement cost for these assets is $51.6 million, depreciated replacement cost $20.2 million, and annual depreciation of $619,000.

Table 33: Bridges and Structures Asset – Asset Descriptions

Bridges			
Asset Description	**Qty**	**Length**	**Unit**
Standard multispan	4	72	m^2
Standard single span	17	154	m^2
Standard complex	0	0	m^2
Single lane multi span	37	1,301	m^2
Single lane single span	64	533	m^2
Single lane complex	3	208	m^2
Culvert, Armco, 2.4m Dia	1	20	m
Culvert, Armco, 4.0m Dia		0	m
Culvert, Armco, 4.2 by 2.8	8	102	m
Culvert, 2.5 by 2.5 Precast Box	11	98	m
Culvert, twin 2.0 by 3.0 Box	9	97	m

Minor Structures			
Asset Description	**Qty**	**Length**	**Unit**
Concrete	54	4,424	m
Concrete Blocks	1	24	m
Crib Blocks	1	21	m
Crib Wall	4	229	m
Gabion	9	150	m
Hardwood	1	95	m
Oamaru Stone	8	567	m
Oamaru Stone Conc Laminate	2	251	m
Rock	2	22	m
Stone	5	311	m
Stone Concrete	1	21	m
Unknown	3	150	m
Wood	1	97	m

(b) Asset Condition

Overall, the bridge portfolio is in good condition as confirmed by the 2019/20 inspection. However, one bridge – Slaughter Yard Road bridge in Enfield – has deteriorated to a poor condition. It hasn't been renewed as the detour is less than 5km and there are only a few houses on the road. It is also used for pedestrians to access the Enfield Tavern and village.

Retaining walls are generally in good condition and are maintained on a regular basis. We have had one retaining wall collapse on Beach Road due to a significant storm event where the loading behind the wall was too great.

(c) Asset Capacity

Bridge capacity in the network is generally good with 15 posted bridges, three of which are on secondary collector routes. These are:

- Two bridges on Lake Ohau Road which are currently being renewed and strengthened and will revert back to full Class I.
- The Kakanui Point Bridge which is 120 years old and is restricted for weight and speed.

(d) Critical Assets

There are two bridges that are on the only resilience routes for the state highway between Maheno and Oamaru. The alternative route to go north is a 5-6 hour trip through Central Otago.

Kakanui Point Bridge was put forward for replacement in the 2018-21 RLTP but was deferred to 2027/28. The indicative and detailed business cases are now scheduled for completion in 2022/23 with the design and construction in 2024-27.

The Maheno Iron Bridge is posted for speed only and is restricted to Class 1 vehicles only. Council's bridge engineer is completing a 6-month trial on allowing 50MAX over the bridge depending on results will be followed by a 6-month trial of HPMVs. Depending on the results of the trials, the bridge is due for renewal in 2022/23.

The Dunback Domain Bridge is in a similar position to the Maheno Iron Bridge and is due for renewal and upgrade in 2022/23.

(e) Key Issues

Council has 10 structural timber bridges in the District. They are all nearing the end of their lives and are proving expensive to maintain.

Council has inherited rail overbridges from KiwiRail which were vested to local authorities by legislation passed in 2005. No budget accompanied the vested assets which includes the Weston overbridge and a small bridge on Frame Road.

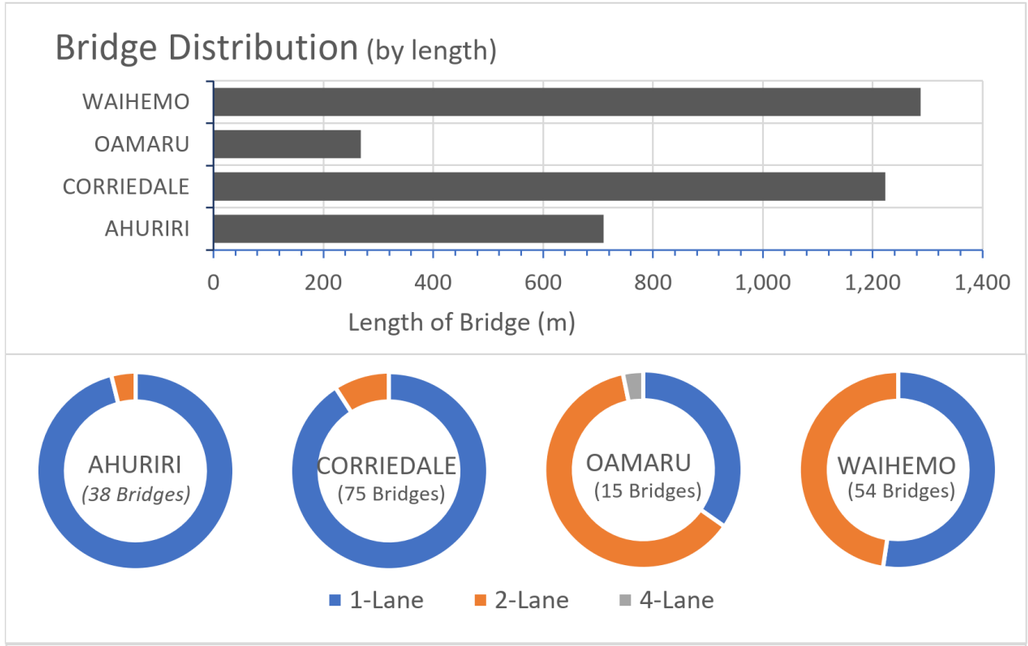


Figure 59: Bridges and Structures Statistics (1)

5.9.2 AM Processes and Practices

(a) Inspections & Assessments

Bridges are subject to planned inspections on a three-year cycle. Timber bridges and posted bridges are inspected annually. The inspection policy broadly follows NZTA Policy S6: 2014 with the relaxation that general inspections of relatively recent bridges that are neither timber nor have restricted capacity are carried out on a three-year cycle, rather than the two-year cycle nominated in the above policy. This has been adopted on the basis that rural bridges have significantly less usage than State Highway bridges. Where more frequent inspections are considered necessary these are adopted on a case-by-case basis.

Retaining walls are inspected every three years with an increased frequency if any issues are evident.

(b) Decision Criteria

Prioritisation of bridge renewals is primarily by ONRC classification, in alignment with Council's 30-year bridge renewal strategy and/or strategic importance in the Waitaki District roading network.

Retaining walls are renewed as necessary. However, it would be very useful to have a similar 30-year strategy for retaining walls. Some of the walls in Oamaru are quite substantial (i.e. 5-6m high) and a collapse could have severe consequences.

Table 34: A Sample of the Bridge Inspection Plan

WAITAKI DISTRICT COUNCIL

BRIDGE INSPECTION PLAN 19 20

Bridge No	Name	Type	2019/20
8	Breakneck Bridge	Through Truss	22/06/2020
16	Maheno Iron Bridge	Steel	1/05/2020
20	Kakanui Point Bridge	Timber Beam and Deck	22/06/2020
21	Teschmakers Bridge	Steel	22/06/2020
22	Beach Rd Bridge	Timber Beam and Deck	4/06/2020
30	Kauru Hill Bridge	Steel	22/06/2020
40	Slaughter Bridge	Timber Beam and Deck	4/06/2020
53	Ngapara-Georgetown Bridge	Concrete	12/07/2019
67	Danseys Pass No3 Bridge	Steel	29/06/2020
79	Otamatapaio No2 Bridge	Timber beams and deck.	12/07/2019
83	Ben Omar Bridge	Timber Beam and Deck	12/07/2019
85	Birchwood No2 Bridge	Steel	11/07/2019
86	Birchwood No3 Bridge	Timber Beam and Deck	11/07/2019
95	Lake Ohau No5 Bridge	Steel	11/07/2019
96	Lake Ohau No6 Bridge	Steel	11/07/2019
106	Sale Yards	Concrete	1/05/2020
116	Crown Hill Culvert	Oamaru Stone Arch	22/06/2020
156	Weston Bridge	Timber/Steel beams. Timber Deck.	4/06/2020
157	Teschmakers No2 Bridge	Timber Beam and Deck	22/06/2020
161	Humber St Bridge	DHC.	1/05/2020
162	McEwans Bridge	Timber Beam and Deck	22/06/2020
163	Awakino Bridge	Steel	12/07/2019
201	Horse Range Bridge	Concrete	3/11/2019
202	Fleming No1 Bridge	Concrete	30/01/2020

5.9.3 Data Quality

Bridges and major structures are included in RAMM but do not currently have REG asset management performance measures.

However, a selection of metrics for retaining walls from the 2019/20 annual REG Asset Management Data Quality Report are shown at right.

The results show that retaining wall data is at the expected standard. Work has been undertaken over the last year which rectified several issues to get to this position.

Retaining walls that support footpaths would have previously been non-financially assisted. They will need to be identified in RAMM as financially assisted assets now that footpaths are financially assisted.

Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Retaining Walls	RETAIN1	Retaining Wall assets known	Completeness	Moderate			92.0	▲	20 36 52 68 84 100
	RETAIN2	Retaining wall asset records maintained	Timeliness	Low			12.6	▲	0 20 40 60 80 100

Figure 60: Bridges and Structures Metrics REG Asset Management Data Quality

5.9.4 Lifecycle Management

(a) Maintenance Strategy

We have a robust programme of bridge inspections and have gained improved value for money and cost efficiencies of 10-20% p.a. on our physical works procurement. The savings gained are being used to accelerate bridge maintenance work that has not previously been possible. We expect to see a resulting increase in the level of customer satisfaction with our bridge network.

Structures maintenance includes subsidised maintenance of Council bridges and retaining walls. Annual and biennial inspections of these two asset types result in structures maintenance programmes and are undertaken outside of the roading maintenance contract. Major repairs to bridges and retaining walls are programmed under renewals. Response times and performance criteria of all maintenance activities in this area are appropriate to the existing Levels of Service or as per the updated and amended Levels of Service.

We have been able to recycle sections of timber bridges from state highway into our district which has been cost effective for repairing those timber bridges on lower classifications. On lower classification roads, if a ford is available alongside a bridge for heavy vehicles, the bridge can be posted for light vehicles only.

An improvement to the level of retaining structure maintenance is planned to ensure that retaining structures adjacent to footpaths are appropriately maintained. These do not include retaining walls on private property.

(b) Maintenance Programmes

A full maintenance schedule has been developed by Council's bridge engineer and half a page of the full document is included as a sample. Retaining walls also have a similar schedule for required maintenance.

Table 35: *Sample of bridge maintenance schedule*

WAITAKI DISTRICT COUNCIL

BRIDGE MAINTENANCE SCHEDULE: 2019/2020

PRIORITY 3, BEFORE FEBRUARY 2021

DCL Consulting

Bridge No	District	Road Name	Item No	Maintenance Recommendation	Priority	Estimated Cost	Notes
8	WtDC	Breakneck	3	Replace 1x silver BEM	3	$200.00	
20	WtDC	Waianakarua	3	Fit 1x Gold BEM abut B	3	$200.00	
22	WtDC	Beach	1	New deck planks not sealed. Slipping hazard	3	$600.00	
67	WtDC	Danseys Pass	3	Fit 2x BEMs Abut A	3	$500.00	
79	WtDC	Backyards	3	Refix gold BEM	3	$100.00	
85	WtDC	Arhururi	3	Attach BEMs Abut A	3	$200.00	
156	WtDC	Weston	3	Reattach 1x Gold BEM	3	$200.00	
156	WtDC	Weston	3	Fit new post and silver BEM	3	$500.00	
156	WtDC	Weston	2	Vertical alignment at Oamaru end still poor. Overlay	3	$4,000.00	
161	WtDC	Humber	35	Clear dead tree at the end of revetment	3	$500.00	
162	WtDC	Off Ngapara/Weston	3	All BEMs are obscured. Clear vegetation	3	$400.00	
163	WtDC	Awakino	3	Clear vegetation around gold BEMs	3	$100.00	
201	WtDC	Horse Range	3	Reattach BEMs Abut B side 2	3	$200.00	
205	WtDC	Fleming	9	Reattach guardrail section, Abut B side 2	3	$100.00	
205	WtDC	Fleming	9	Abut A side 1 guardrail damaged. Replace 4m	3	$500.00	
206	WtDC	Pagan	3	Priority give way sign obscured by vegetation and grime. Clear and clean	3	$300.00	
210	WtDC	Craig	3	Replace gold BEM	3	$200.00	
213	WtDC	Domain	3	Replace gold BEM Abut A	3	$100.00	
214	WtDC	Dunback Footbridge	31	Clear vegetation from tiedowns	3	$200.00	
233	WtDC	Hyde/Mcraes Rd	35	Clear woody debris upstream side	3	$400.00	
234	WtDC	Nenthorn	3	Fit new Give Way sign	3	$400.00	
234	WtDC	Nenthorn	9	Tighten handrails	3	$700.00	
235	WtDC	Nenthorn	3	Place advance warning signs	3	$600.00	

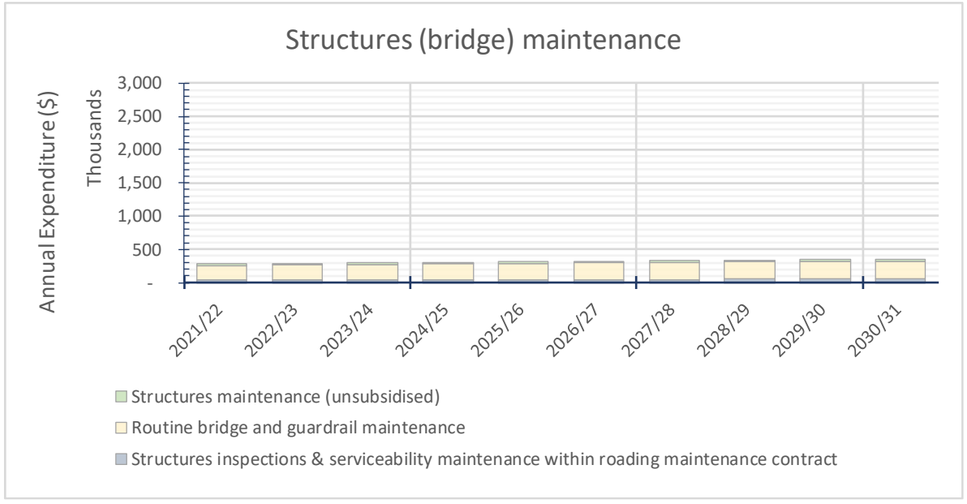


Figure 61: Bridge Maintenance

(c) Renewal Strategy

A long-term 30-year bridge replacement strategy has been completed. This strategy includes proposals to either renew bridges or replace with culvert structures to reduce long term costs.

Where possible, bridges have been replaced with concrete culverts or propriety products such as Driftek.

There are no condition-based renewals planned, rather renewals will represent enhanced resilience through replacement with a capacity of Class 1, that is the ability to pass any road legal load as a minimum.

(d) Renewal Programmes

Bridge renewals, widening or strengthening will be based on a mix of structural component replacements, bridge renewals and LCLR works.

Minor increases in structures component replacements and bridge renewals have been included.

All work categories are increased by 5.25% cost fluctuations to end June 2020 plus 2.5% for new roading maintenance contract in 2022/23.

(e) Development Plan

The Development Plan consists of the 30-year bridge renewal strategy. This includes conversion of old timber bridges which may be recycled for use in walking and cycling.

A development for Council is to ensure the roading network is open to HCV and 50MAX and that bridges on restricted HPMV routes are upgraded as necessary. This includes upgrades and/or renewals for Maheno Iron, Dunback Domain and Weston overbridge.

By far the biggest development for Council will be the replacement of the Kakanui Point Bridge. It was originally built in 1896, and rebuilt in 1899, so it is listed as a heritage bridge and is protected by the Heritage New Zealand Pouhere Taonga Act 2014. The bridge is 172m long with 16 sets of piers and is built from Australian hardwood. Since the original build there has been some steel inserted, but it is still mostly timber with renewed treated timber replacements.

At 120 years of age, the bridge has exceeded its expected life and is currently expensive to maintain. The renewal was previously proposed to take place during the 2021-24 NLTP. A strategic case was prepared and renewal by NZTA was accepted last year. However, they believed the bridge could be maintained for another 8 years at a minimal cost of $440,000. The Indicative and Detailed Business Case will be submitted for investment in 2022/23 which will allow 18 months to complete consultation with the Kakanui community and Heritage New Zealand.

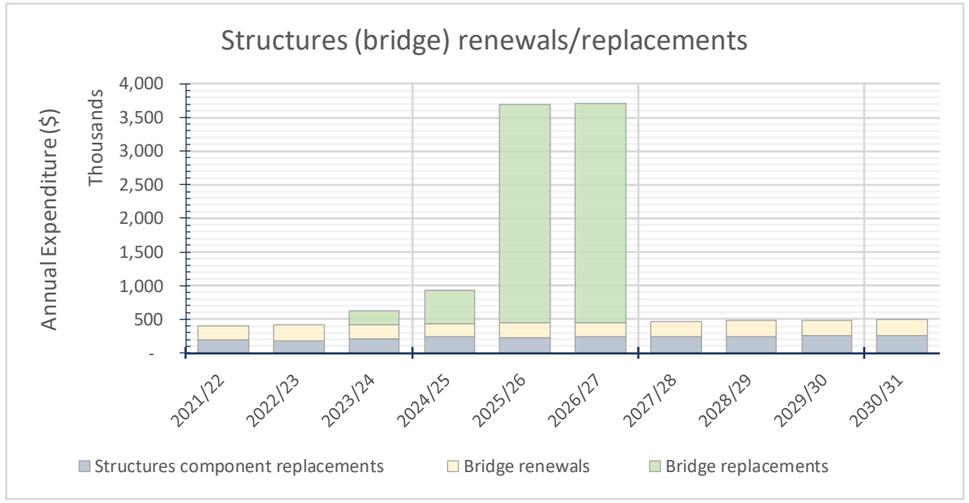


Figure 62: Bridge Renewals/Replacements

Table 36: Sample of the 30-year strategy reflecting the first 12 years

WAITAKI DISTRICT COUNCIL

BRIDGE RENEWAL STRATEGY: 1 JULY 2020

Bridge No	Bridge Name	Replace't Cost ($)	Funding Period		Comments.
104	Boundary Creek Rd Culvert	$45,000	2018	2021	
263	Frame Road Bridge	$430,080	2018	2021	
264	Harris Street.	$150,500	2018	2021	
145	Ainges Bridge	$75,000	2018	2021	Confirm foundation condition.
83	Ben Omar Bridge	$120,000	2018	2021	
22	Beach Rd Bridge	$190,179	2021	2024	Recently posted.
33	Rutherford Bridge	$86,100	2021	2024	Confirm on Principal Inspection.
157	Teschmakers No2 Bridge	$350,000	2021	2024	
219	Cookhouse Road	$105,350	2021	2024	Divest/Close?
259	Leicester St Bridge	$78,000	2021	2024	Divest/Close?
20	Kakanui Point Bridge 50%	$2,500,000	2024	2027	Pending NZTA decision. Split
20	Kakanui Point Bridge 50%	$2,500,000	2027	2030	over 2 x financial years.
7	Finlays Bridge	$38,000	2030	2033	Divest/Close?
9	Waianakarua Bridge	$350,000	2030	2033	
40	Slaughter Bridge	$120,000	2030	2033	Footbridge only.
47	Windsor Bridge	$115,500	2030	2033	
79	Otamatapaio No2 Bridge	$88,725	2030	2033	
103	Kakanui Valley Culvert	$97,500	2030	2033	
162	McEwans Bridge	$283,220	2030	2033	

5.9.5 Alternative Options

Table 37: Bridges and Structures Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Investment has been deferred for Kakanui Point Bridge.	Reduction in available investment for the remaining bridge network.	2	2021-24 RLTP
LoS	Current LoS maintained with all bridges.	Reductions in LoS where bridges have alternative options available.	3	2021-24 RLTP
Demand Management	New or renewed bridges.	Little demand for this where older bridges are closed and there are short detours.	6	2021-31 LTP
Treatment Type	New bridges to be composite steel and concrete.	Low ONRC classifications could be timber if cheaper.	4	2021-24 RLTP
Risk Profile	Bridges and retaining walls.	Low risk of failure – comprehensive inspection, maintenance and renewal programme.	5	2021-24 RLTP
Policy	Roading Policy to be developed for bridges and retaining walls.	Will identify level of service for ONRC classifications.	1	Currently underway

5.9.6 Consequences of Reduced Investment

Bridges and retaining walls provide lifelines on primary and secondary collector routes. A reduction of investment will jeopardise resilience in the district, including for state highways (alternative routes).

5.9.7 Procurement & Delivery

The Procurement Strategy endorsed in 2020 provides guidance on procurement for bridges and retaining walls. Waitaki's Roading Unit follows MBIE's approach to use standard templates for Requests for Proposal and Response Forms for tender submissions.

5.9.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

The confidence level is high. Bridge inspections have been completed by the same bridge engineer since 1996.

(b) Risks

Table 38: Bridges and Structures Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Financial	Bridge and retaining wall failure and reconstruction	Rare	Moderate	Low	Bridge and Retaining Wall Inspections as identified	2021-24 RLTP
Management	Bridge and retaining wall failures	Rare	Moderate	Low	Bridge and Retaining Wall Inspections as identified	2021-24 RLTP
Resources	Contractor availability	Rare	Moderate	Low	Retaining healthy procurement practices in Waitaki	2021-24 RLTP

(c) Opportunities

Opportunities are limited as historically investment for bridges from NZTA has been difficult to achieve. This is apparent with the deferral of Kakanui Point Bridge for 8 years from 2019 at a cost of at least $440,000 for the maintenance of the bridge at 80% weight posting and 10km/hr speed limit. NZTA has now included a separate work category 216 for bridge renewals.

5.10 Guardrails and Barriers (WC114/215)

5.10.1 Asset Description

(a) Overview

Guardrails are an important safety device that is used to prevent vehicles from travelling off the carriageway and/or protect assets from damage. These assets have a total replacement cost of $2.4 million, with a depreciated replacement cost of $698,000 and annual depreciation of $68,000.

Routine work can be necessary to maintain the function, structural integrity and appearance of guardrails. Asset components can be replaced or renewed where necessary. Sight rails are managed as a Traffic Services asset.

Table 39: Guardrails and Barriers - Asset Descriptions

Asset Description	Length	Unit	No	Unit
Double W Section Guard Rail	21	m	1	ea
		m	10	ea
Hand Rail (timber)	3,863		2	
Steel Wire Rope Barrier	1079	m	2	ea
Steel aluminium	924	m	24	ea
W Section Guard Rail	517	m	44	ea

(b) Asset Condition

The condition of these assets is unknown. A condition rating project will be programmed and completed during the 2021-24 NLTP period.

(c) Asset Capacity

There is no doubt that there is an insufficient number of barriers in the network and more are required. They will be prioritised in SWIPP with all low cost low risk improvements.

(d) Critical Assets

Primary and secondary collectors account for 70% of the 92 million vehicle kilometres travelled annually and these routes should be prioritised accordingly.

(e) Key Issues

Due to ongoing changes to standards for guardrails and barriers, Council has an increasing number of outdated systems that may need be renewed to meet current standards.

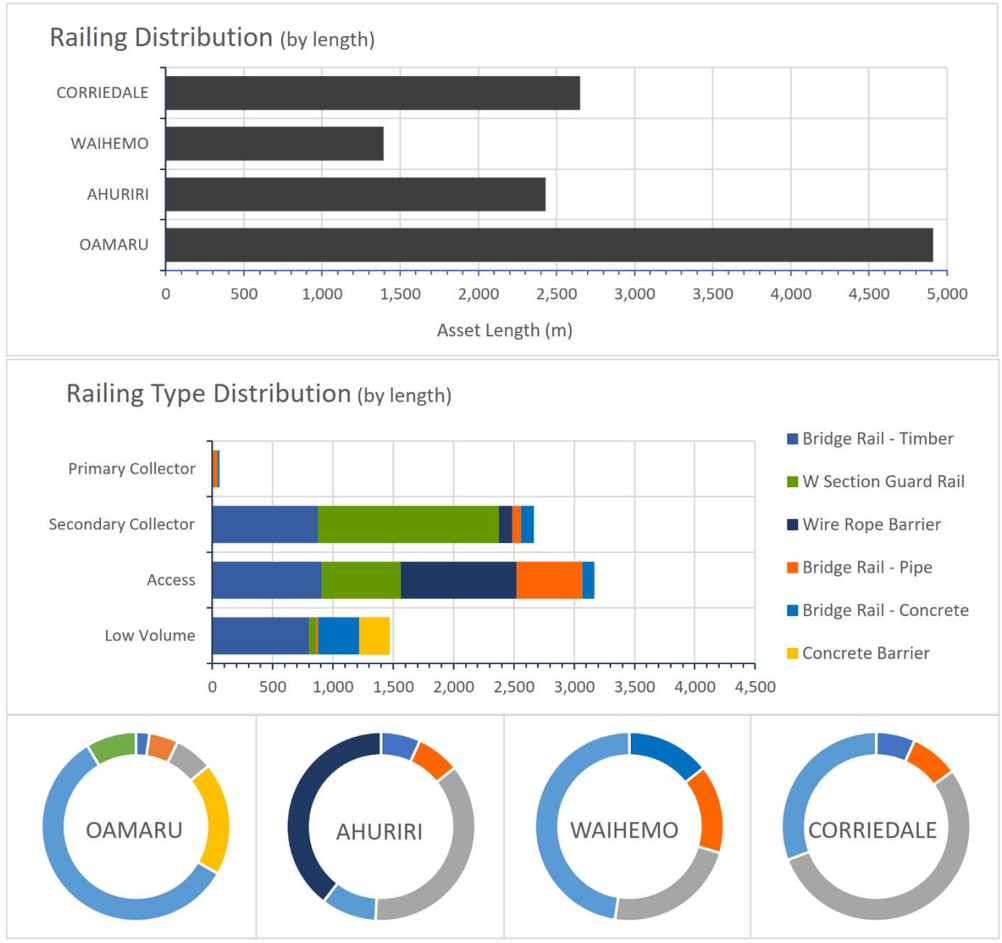


Figure 63: Guardrails and Barriers Statistics (1)

5.10.2 AM Processes and Practices

(a) Inspections & Assessments

Council's maintenance contract covers inspection and maintenance of guard rails and barriers on bridges as well as other guardrails and barriers under traffic services, in section 2.10.3 of the maintenance specification. Inspections will be programmed with the maintenance contractor for completion and are required to be uploaded into RAMM.

(b) Decision Criteria

Decisions made on installation, maintenance and renewal are based on priority, ONRC classification and level of hazard on the roadside or bridges.

5.10.3 Data Quality

A selection of metrics from the 2019/20 annual REG Asset Management Data Quality Report are shown at right. These metrics are used to assess the RAMM data supporting asset management of guardrail assets.

The results show major issues with completeness and minor issues with timeliness of guardrail data, although improvements have been made over the last year. The importance is listed as low to moderate; however, this has the potential to impact our renewal programme development, investment decision making, asset valuations and LoS delivery.

5.10.4 Lifecycle Management

(a) Maintenance Strategy

The maintenance of guardrails and barriers shall be as set out in NZTA specification C/19.

(b) Maintenance Programmes

Maintenance of existing guardrails and barriers is programmed by the contractor.

(c) Renewal Strategy

Renewal is programmed as required, or completed in conjunction with upgrade projects e.g. in 2020, guardrails and barriers on 9 bridges required terminal ends to be upgraded.

(d) Renewal Programmes

Renewal programmes are completed as identified by the contractor.

(e) Development Plan

There is currently no development plan for increased numbers of guardrail and barriers. Council will be implementing the use of the SWIPP prioritisation tool for Low Cost Low Risk Improvements.

Sub	Ref[1]	Metric Description	Dimension	Importance	ONRC Customer Outcome	ONRC Metric	Result	Trend[2]	Major Issues / Minor Issues / Expected Standard
Railings	RAIL1	Railing assets known	Completeness	Moderate			4.5	▲	0 20 40 60 80 100
	RAIL2	Railing asset records maintained	Timeliness	Low			4.9	▲	0 9 18 27 36 45

Figure 64: Guardrails and Barriers Metrics REG Asset Management Data Quality

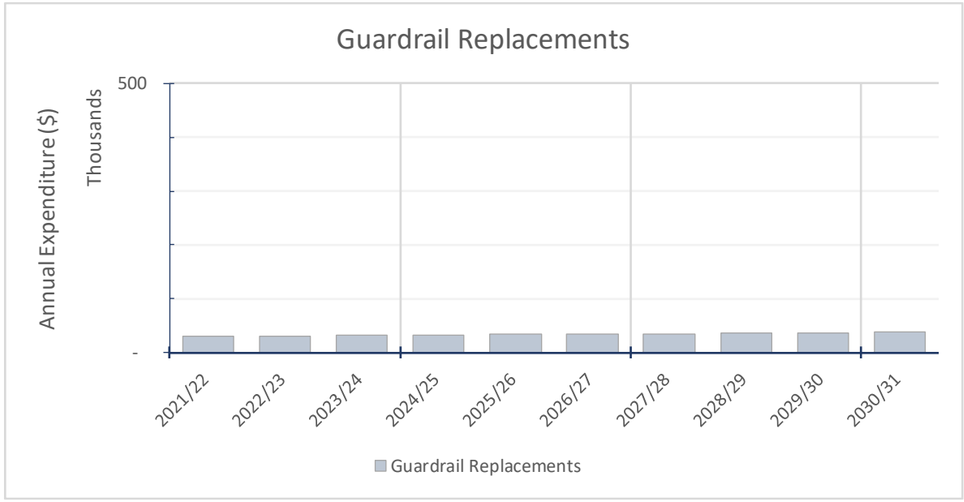


Figure 65: Guardrail Replacement

5.10.5 Alternative Options

Table 40: Guardrails and Barriers Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	New or renewal of guard rails and barriers is included in Low Cost Low Risk Improvements.	LCLR Improvements investment is increased for a staff resource only and will be prioritised with all other activities.	2	2021-24 RLTP
LoS	An increase in levels of service is required to improve road safety in the district.	Limited investment to complete new installations.	3	2021-24 RLTP
Demand Management	Additional demand for guard rails and barriers.	Insufficient investment in LCLR Improvements to allow for new installations.	4	2021-24 RLTP
Treatment Type	W section guardrails and wire rope barriers.	More reasonable alternatives will be considered.	5	2021-24 RLTP
Risk Profile	Guardrails and barriers.	Prioritise risk reduction in primary and secondary collectors and then consider access and low volume.	6	2021-24 RLTP
Policy	A Roading Policy to cover guardrails and barriers is required.	Policy will help to prioritise new installations.	1	Currently underway

(a) Consequences of Reduced Investment

Waitaki has limited guardrails and barriers and is completing more installations to provide an improved level of safety. A reduction in investment will increase our personal and collective risk within the roading network, and potentially increase the number of fatalities and serious injuries.

5.10.6 Procurement & Delivery

Waitaki's Roading Unit follows MBIE's approach to use standard templates for Requests for Proposal and Response Forms for tender submissions.

5.10.7 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

Historically, less focus has been given to guardrails and barriers than to other bigger ticket items. A programme needs to be completed to assess condition and asset life. Confidence level is medium.

(b) Risks

Table 41: Guardrails and Barriers Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Financial	Reduction in investment for installation of guardrails and barriers	Unlikely	Moderate	Low	Low Cost Low Risk Improvements	2021-24 RLTP
Management	Installation of guardrails and barriers is inadequate	Unlikely	Moderate	Low	Roading maintenance contract	2021-24 RLTP
Management	Programme for installation of guardrails and barriers is inadequate	Possible	Moderate	Medium	Low Cost Low Risk Improvements	2021-24 RLTP

(c) Opportunities

There is an opportunity for improving cost effectiveness and efficiency by using alternative treatment types e.g. wire ropes.

5.11 Environmental Maintenance (WC121 & 221)

5.11.1 Asset Description

(a) Overview

This section relates to operational activities such as snow clearing, ice control, vegetation control, litter collection, graffiti, stock effluent disposal, run-off treatment, sweeping, removal of minor slips, rest areas and abandoned vehicles.

(b) Asset Condition

The only assets that apply to environmental maintenance are the stock effluent disposal sites at Shag Point and Pukeuri and the gritting signs.

Otago Regional Council paid for the construction and development of the stock effluent sites. Council is responsible for the removal of the effluent, maintenance of the Scada system and the cleaning of the sites.

(c) Asset Capacity

This is one of the few budgets that has funding remaining at the end of the financial year. This is generally because some budget is reserved for any gritting works or snow related works in winter. Gritting is generally $5-10k per year so is not significant. The budget pays for foldable ice gritting signs as well as their opening and closure when required. If budget is carried over to the next year, additional vegetation control may be undertaken.

This budget is also used to pay for temporary traffic control where private landowners are removing trees from the side of the road.

Waitaki does not have any rest areas. These types of assets tend to be maintained by parks and reserves.

(d) Critical Assets

Critical assets include gritting signs as well as any slippery road signs.

Danseys Pass Road is a critical asset in terms of the closure of gates when there is snow on the road.

(e) Key Issues

- Monitoring of grit and slippery surface signs.
- Sweeping of detritus off roads and intersections.
- Vegetation control – compliance by private landowners.

5.11.2 AM Processes and Practices

(a) Inspections & Assessments

These are completed by the two cyclic maintenance crews in the district.

(b) ONRC Performance Measures

Input measures are to be developed for the 2021-24 RLTP.

(c) Decision Criteria

Decisions are required to be made on the opening and co-ordination of signs for gritting and gritting works.

Decisions are also made regarding the closure of the Danseys Pass Road, which is normally prompted by Central Otago District Council.

There will be a focus on intersection levels of service to assist with tackling crash trends.

5.11.3 Data Quality

There are no applicable metrics in the REG Asset Management Data Quality Report. Input measures are to be developed for the 2021-24 RLTP.

5.11.4 Lifecycle Management

(a) Maintenance Strategy

Response times and performance criteria of all maintenance activities have been stipulated in the maintenance contract no 642:

- **Pest Management**: The Otago Regional Council and ECan Pest Management Strategies require local authorities to control roadside weeds (gorse, broom) and wilding pines. Schedules within the Pest Management Strategies outline the pest plants for control, containment or eradication.
- **Vegetation Control:** The sight line corridor is critical to ensure customer safety by allowing an unobstructed view of oncoming hazards from a distance, at least about 80m, that allows safe stopping whilst travelling at or near the posted speed in wet conditions. We proactively engage with roadside adjacent landowners to manage their own vegetation where it encroaches into the sight line boundaries. This improves our efficiency by reducing our vegetation control costs.

  We have also reintroduced spraying of shoulders instead of roadside mowing. This allows the contractor to be more proactive in terms of shoulder maintenance, has allowed storm water to run off the road more quickly and has been cost effective. As a result of this initiative, we have also introduced a shoulder strengthening programme on some of our narrow roads which has allowed heavy transport operators to drive on the shoulder with confidence and ease. This has provided benefits in the use of local roads as a bypass for State Highway resilience in the event of crashes or road closures.

The figure to the right shows the cost of environmental maintenance and renewals by Peer Group. The Waitaki District is below half of the Peer Group average for both cost per km and cost per lane km.

Climate change has meant that in future we plan to increase the frost gritting programme to manage safety with increased winter rainfall. Climate change is also affecting vegetation control requirements. We intend to move to performance mowing to offset the increased control requirements.

(b) Maintenance Programmes

Environmental maintenance is included in the road maintenance contracts as lump sums and reactive maintenance.

Programmes include mowing, vegetation control, winter services (i.e. gritting), stock effluent disposal facilities, Scada operations and other rural unsubsidised maintenance. Increases have been included to cover the increased costs of stock effluent waste disposal and increased vegetation control.

(c) Renewal Strategy

Renewal is of the gritting signs only.

(d) Renewal Programmes

Renewal programmes of the signs are programmed after reflectivity is checked during night audits.

(e) Development Plan

The contractor will provide a development plan within the programme.

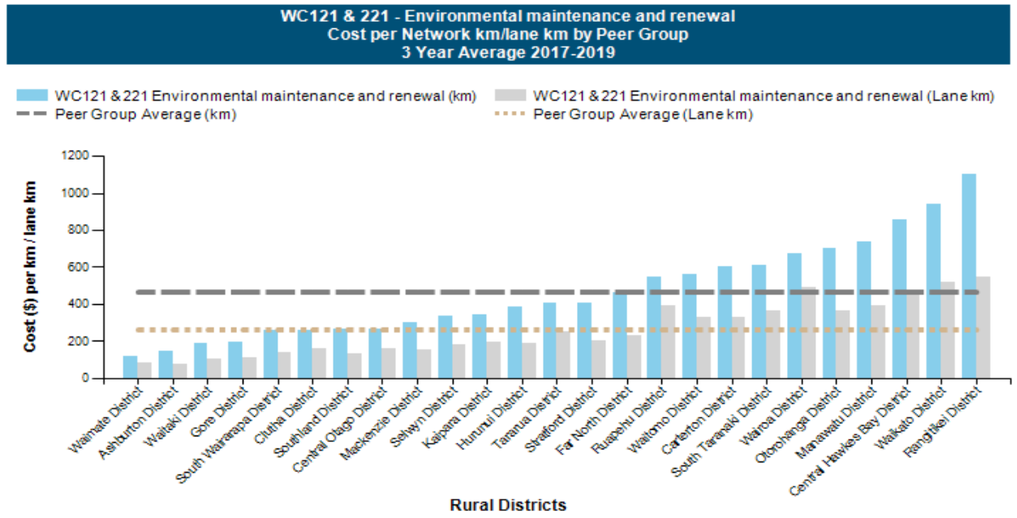


Figure 66: Cost of Environmental Maintenance and Renewals by Peer Group

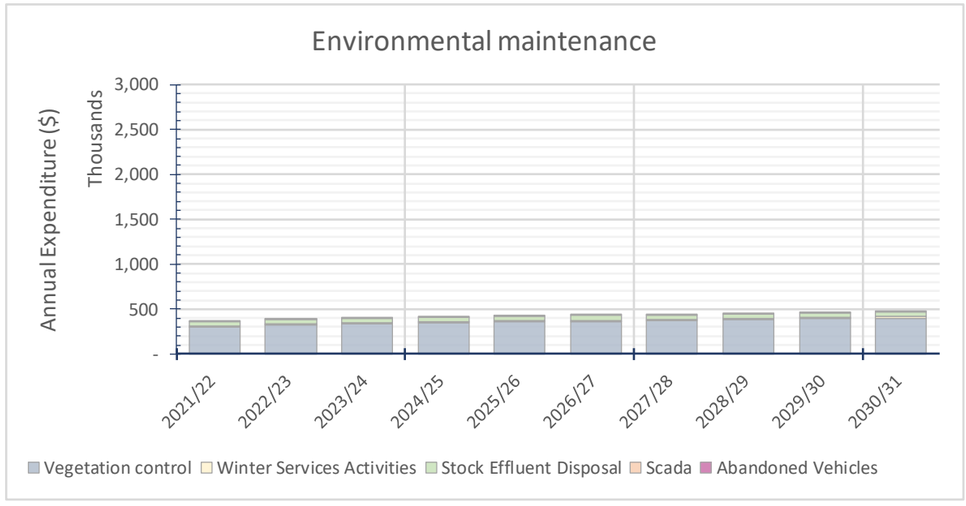


Figure 67: Environmental Maintenance Programme

5.11.5 Alternative Options

Table 42: Environmental Maintenance Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Additional investment is not required for this activity.	Reduction in investment may be sustainable.	2	2021-24 RLTP
LoS	Achievement of the required level of service.	It is not always achieved as some landowners resist instruction from Council.	4	2021-24 RLTP
Demand Management	Gritting and abandoned vehicles.	Abandoned vehicles are becoming problematic.	5	2021-31 LTP
Treatment Type	Snow clearing, ice control, vegetation control, litter collection, graffiti, stock effluent disposal, run-off treatment, sweeping, removal of minor slips and abandoned vehicles.	There is little movement as all treatments are completed by the maintenance contractor as a contract lump sum. Abandoned vehicles is carried out by Council officers which is increasing rather than declining.	6	2021-24 RLTP
Risk Profile	Vegetation control encroaching into road envelope.	Resulting in possible crashes with potential deaths and serious injuries.	3	2021-24 RLTP
Policy	Roading Policy to cover vegetation control as well as proposed and existing shelter belts on the road reserve.	Policy will give clear guidelines for Council officers as well as for customers and landowners.	1	2018-21 RLTP

5.11.6 Consequences of Reduced Investment

A small amount of reduced investment is likely to be sustainable.

5.11.7 Procurement & Delivery

Lump sums in the road maintenance contract are procured within the constraints of the endorsed Procurement Strategy.

5.11.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

The maintenance contractor provides monthly reports. Confidence levels in our environmental maintenance performance are medium-high as there are activities that are not thoroughly completed by the contractor.

(b) Risks

Table 43: Environmental Maintenance Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Financial	Completion of all environmental maintenance activities	Possible	Minor	Medium	Maintenance contract	2021-24 RLTP
Management	Poor management of all environmental maintenance activities	Possible	Minor	Medium	Maintenance contract	2021-24 RLTP
Management	Management of abandoned vehicles	Possible	Minor	Medium	Council processes and procedures	2021-31 LTP

(c) Opportunities

There are opportunities for improvement in environmental maintenance, particularly once an additional staff resource is available.

5.12 Network & Asset Management (WC151/003)

5.12.1 Activity Description

(a) Overview

Network & Asset Management encompasses management activities; people, processes, data and systems required to manage and control the transport network and transport assets. These activities are delivered as professional services, either in-house (Council's Roading Unit) or by external suppliers in specialised areas such as road design, RAMM, dTIMS and asset management. Other professional services, such as those required for design and delivery of renewals or new infrastructure, are provided and funded through the relevant activity classes and work categories.

Council's Roading Unit currently has a total of 12 staff which includes network and contract engineers, an asset engineer, systems and admin support, and the Roading Manager. Total investment for 2020/21 is in the order of $14M.

The figure on the right outlines what activities are included in Network and Asset Management.

(b) Key Issues

The Roading Unit is short staffed in the following areas;

1. Supervision and auditing of the road maintenance contract
2. Asset Management including RAMM inventory collection.

1. Council's Roading Maintenance Contract 642 is held by SouthRoads (approximately $4.2M per year excluding storm damage). SouthRoads provide good 1-3 month programmes but have not developed a robust 12-month programme to the satisfaction of Council. Council have suggested completing an "all faults" inspection of the network which will help to prioritise works in the district. Council is assisting with this task.

   In addition, auditing of dig out repairs has revealed a failure rate of over 50%.

   To ensure that Council is able to respond with adequate supervision, Council has a Network Infrastructure Engineer who has overall responsibility for the road maintenance programme. They are also responsible for roading input into subdivision consents so have little time to assist their Contract Engineer who currently oversees the maintenance contract by themselves. The Contract Engineer's responsibilities include all aspects of roading maintenance including auditing and there is not enough capacity left to provide the supervision required to ensure the contractor performs to the contract specifications. An additional staff member is required to assist with monitoring contractor performance. A possible option identified by the Roading Manager is to split the contract into areas (north and south). The additional staff resource will increase the supervision required at a cost of $153,700.

2. The Asset Management team is led by the Asset Engineer who is responsible for Programme Delivery, Programme Management, Financial Management and Asset Management. Staff include RAMM Data & System Support and the Road Safety Co-ordinator. The Asset Engineer role responsibilities are currently considered to be that of 1.6 FTEs. As the Road Safety Coordinator role responsibilities are considered to be 0.7 FTE, there is an option to redistribute a share of responsibility for Programme Delivery, Programme Management and Financial Management within the existing team. An additional staff resource for asset management is required at a cost of $153,700.

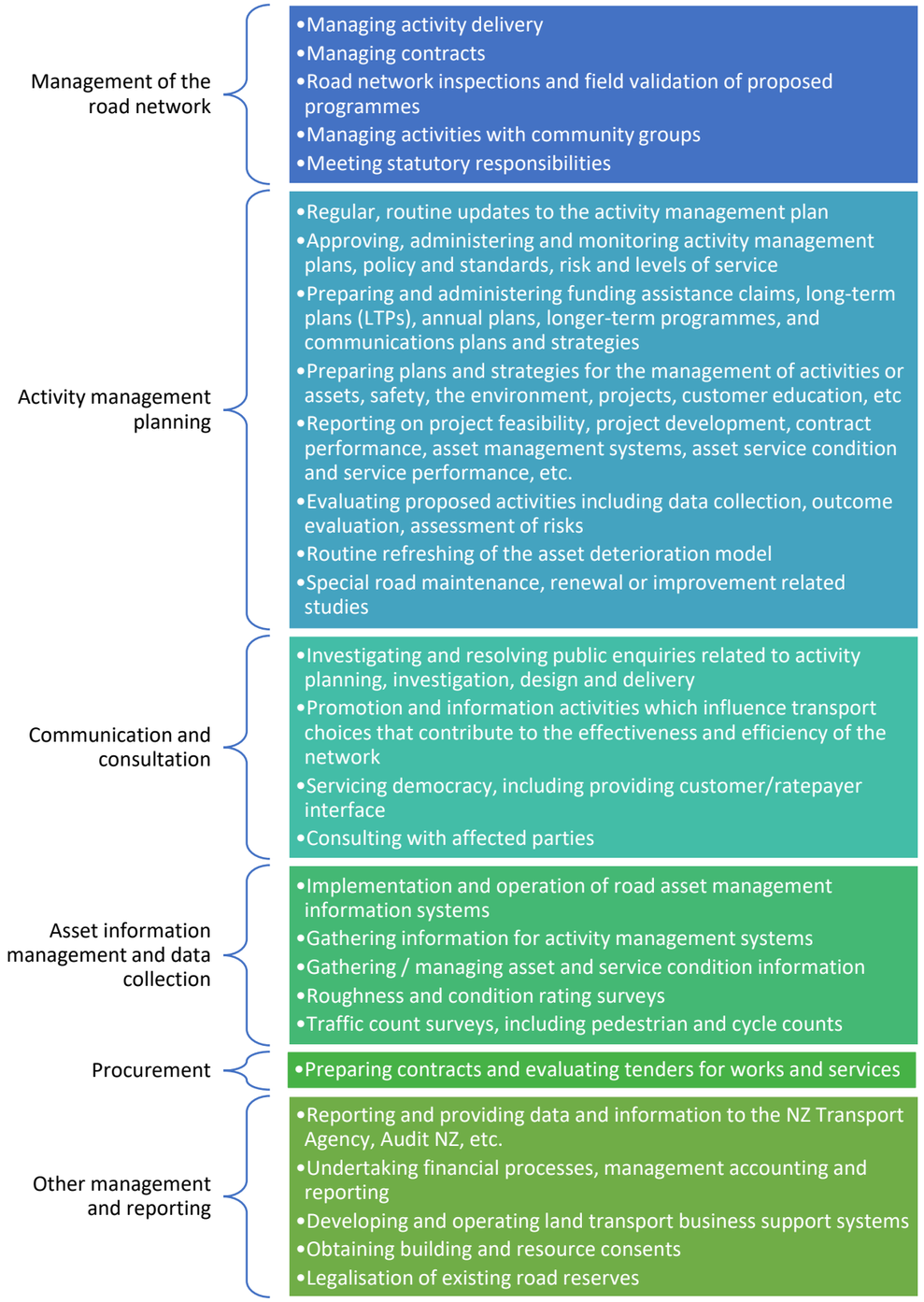


Figure 68: Activities are included in Network and Asset Management

5.12.2 Our Approach

(a) Summary

Our approach is to consider people, processes, data and systems as assets in their own right. What this means is they all need their own associated planning, monitoring and review to ensure they make an efficient and effective contribution to the transport activity

A range of broad management strategies are presented in Section 5.12.3 to enable this. There is also a significant list of operational activity that falls under the Network and Asset Management banner. This is presented on the previous page and discussed further in Section 5.12.3 1(b).

(b) Benchmarking

The chart on the bottom right represents Network and Asset Management, Cost per Network km/lane km by Peer Group for the period 2017-2019. Waitaki is just above the Peer Group Average in both cost per km and cost per lane km.

(c) Decision Criteria

Decisions are based on a range of tools that we have available within the investment provided, including but not limited to the following;

- Condition rating and roughness surveys with reporting, Treatment Selection, FWD surveys, dTIMS modelling and asset valuation, as well as data on demographics.
- The Roading Efficiency Group (REG) has processes in place for measuring performance of the roading network and improving RAMM data. Council has been particularly focused on improvements to the RAMM data quality sheets for the 2021-24 RLTP submission.
- In addition to the ONRC performance measures, the Department of Internal Affairs have introduced performance measures which are required to be reported in Council's annual report.

All of this information, data and metrics tell a story of the condition of the roading network, where we should be prioritising maintenance works and when we should be renewing pavements to cater for the traffic in the network.

Individual decisions made give effect to the GPS, Road to Zero safety strategy, Councils LTP and also the community outcomes. Council is always striving for whole-of-life value for money to benefit the customer base.

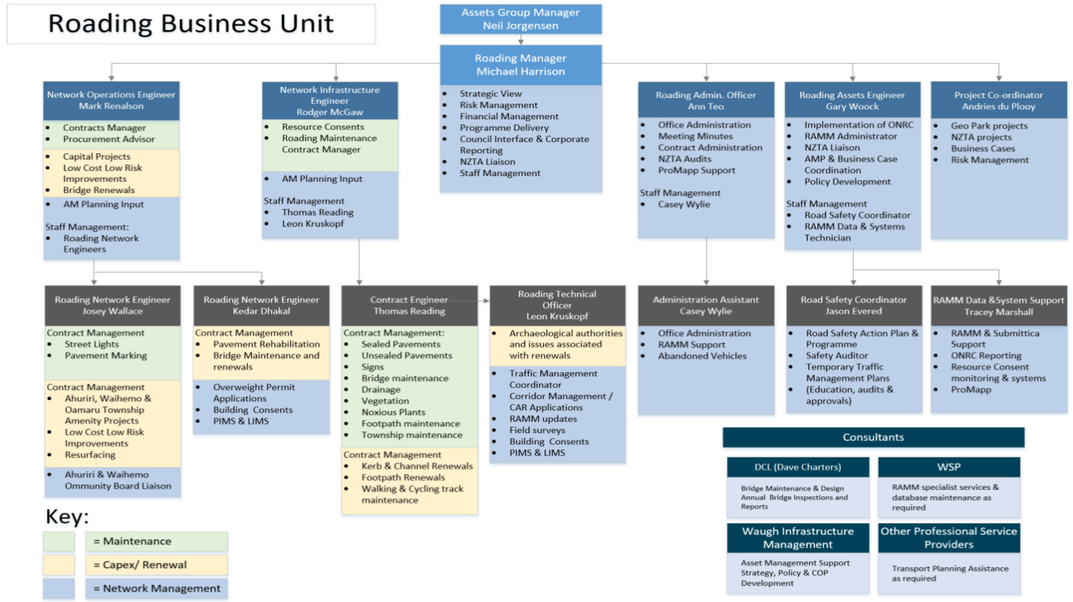


Figure 69: Roading Business Unit organisation chart

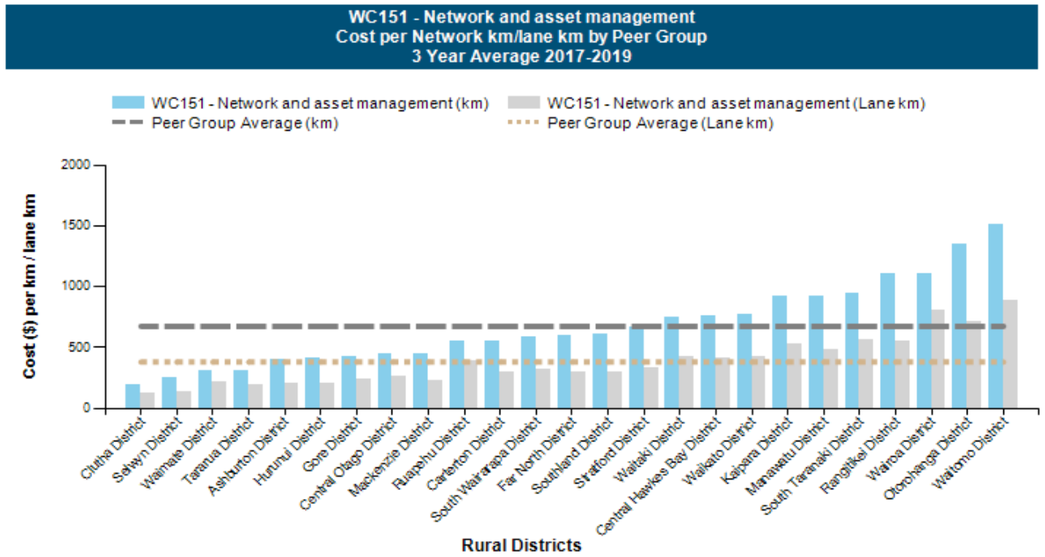


Figure 70: Network and Asset Management, Cost per Network km/lane km by Peer Group for the period 2017-2019

5.12.3 Management, Monitoring and Improvement

(a) Management Strategies

The following broad strategy areas (expanded to the right of page) will enable sustainable Network and Asset Management activity:

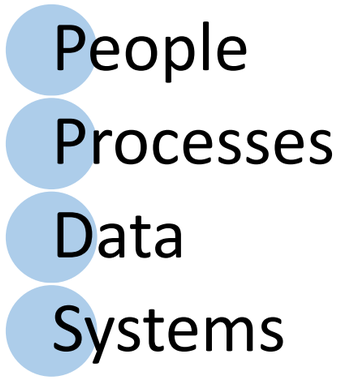


Figure 71: Network and Asset Management Activity Strategy Areas

Some of these strategies are delivered corporately, and others are delivered through the Roading Business Unit, supplemented by external suppliers where required.

Detail on transport-specific organisational structure and management systems is presented in Sections 2 and 3.

Activity can be divided into the following broad categories:

Figure 72: Activity Categories

Transport-specific activity is discussed below.

(b) Ongoing Activities

Much of the activity listed earlier in the section can be described as either:

- Day-to-day management of the road network,
- The activity that must be undertaken to deliver transport services, or
- Management of the people, processes, data and systems that support this.

Managing the road network doesn't stop and neither does management of contracts, customer and stakeholder communication, corridor access, monthly reporting etc. The core professional services delivered by the Roading Business Unit would fall under this category.

Activity such as road legalisation, regular asset data updates and traffic counting is also considered to be ongoing and business-as-usual. Road legalisation, for example, ensures that historical issues of formed WDC roads crossing into private freehold land can be rectified. It also covers where new roads are formed and constructed over private property or reserve land.

An increased focus on proactive monitoring of high-risk slopes, coastal erosion and river scour sites is on the forward agenda.

Table 44: Network and Asset Management Activity Strategy Areas (expanded)

Area	Strategy
People	**Learning & Development** Develop capacity and capability.
	Retention Focus on staff retention.
Processes	**Process Definition** Analyse existing business processes and define objectives.
	Process Improvement Prioritise and address identified inefficiencies and culture within business processes.
Data	**Data Management** Address factors such as data ownership, governance, quality and usage.
	Data Collection Prioritise and address identified gaps in existing data.
Systems	**Activity Management Systems** Develop and maintain management systems for the activity.
	Asset Management Information Systems Develop and maintain appropriate information systems for asset management purposes.

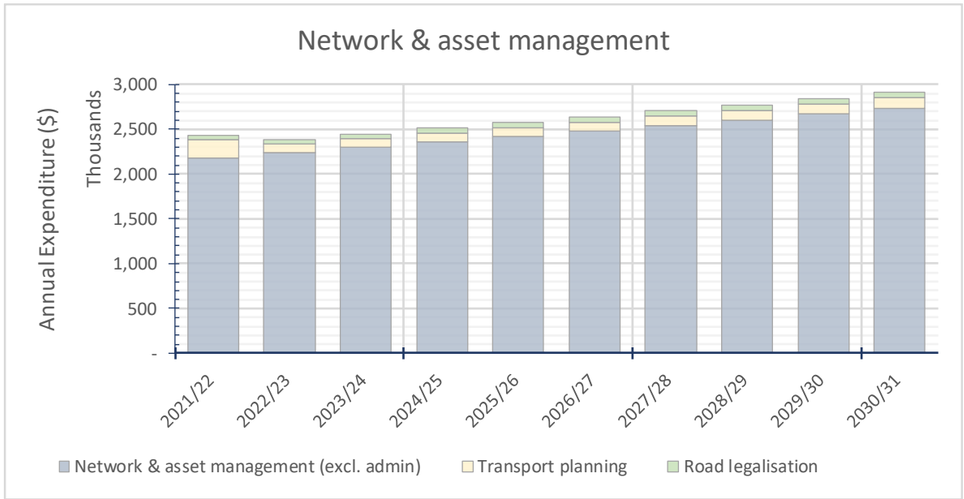


Figure 73: Network and Asset Management

(c) Periodic Activities

Those activities that are required on a yearly, triennially, or another periodic basis. Some of these would be delivered by the Roading Business Unit and others would be outsourced.

Table 45: Periodic Activities Planned Expenditure

Item	Planned Year	Planned Expenditure		
		Year 1 2021/22	Year 2 2022/23	Year 3 2023/24
Database Management	2021-24	$20,000	$20,000	$20,000
RAMM / REG updates	2021-24	$80,000	$80,000	$80,000
dTIMS Modelling – Unsealed roads	2021/22	$50,000		
Condition Rating & High Speed Data Survey	2022/23		$90,000	
Asset Management Advice	2021-24	$45,000	$45,000	$45,000
Bridge & Retaining Wall Inspections	2021-24	$55,025	$55,025	$55,025
Geotechnical Support	2021/22 & 2023/24	$25,000		$25,000
Footpath Condition Rating	2021-24	$10,000	$10,000	$10,000
Traffic Management Plans	2021-24	$50,000	$50,000	$50,000
Risk Management Plan Updates	2021-24	$10,000	$5,000	$10,000
ORC & ECan Consents – Road Mtce	2021-24	$20,000	$10,000	$20,000
BCA/AMP Update	2023/24			$50,000
Road Maintenance Contract Update	2021/22	$25,000		

Roading Business Case – Strategic and Programme Business Case

This is updated every 3 years to support Council's submission for investment to the Regional Land Transport Plan. All the activities identified below provide information to support this submission.

Activity/Asset Management Plan (AMP) Update

This AMP and associated documents are updated triennially in line with Waka Kotahi NZ Transport Agency three-yearly funding block requirements and legislated long term planning requirements.

Procurement Strategy Update

The Procurement Strategy is updated at least every 3 years to ensure that it complies with Council's organisation-wide procurement policies, as well as Waka Kotahi NZ Transport Agency and legislative requirements.

Risk Management Plan Update

The Risk Management Plan is updated every year to ensure that risks and opportunities are current and are being managed appropriately in line with Council's current risk approach.

Road Safety Action Plan Update

The Road Safety Action Plan is updated every 3 years to ensure that actions are in place to respond to road safety needs in line with Council's strategies, national and regional road safety strategies, current trends and funding requirements.

(d) Improvement Initiatives

Those activities that can be considered improvements because they involve developing a new approach or making a step-change. Some of these would be delivered by the Roading Business Unit and others would be outsourced.

Table 46: Improvement Initiatives Planned Expenditure

Item	Planned Year	Planned Expenditure		
		Year 1 2021/22	Year 2 2022/23	Year 3 2023/24
Transport Planning	2021/22	$120,000	$15,000	$15,420
FWD Survey	2021/22	$74,180		

Transport Planning

Council analyse data on demographics within the district to give us an idea of population in the district as well as residential and commercial rating units.

Falling Weight Deflectometer (FWD) Survey

FWD data is to be captured across the network to build up an understanding of pavement strength. This data is an important input into dTIMS modelling and other pavement management and design analysis. A structural number below 3 is generally a weak pavement and requires more investigation.

Pavement Condition Rating and Roughness Surveys

These are completed every 2 years and provide Council with information on a sample of the sealed road network. A Condition Rating Report from the surveys is completed which gives Council a snapshot of the condition of the network and identifies trends in rutting, shoving, scabbing, flushing, various forms of cracking, potholes and edgebreak, Currently the roughness surveys are completed with a laser profilometer. In future, Council will be completing High Speed Data surveys that measure roughness, rutting and skid resistance.

Treatment Selection Algorithm (TSA)

This an algorithm in RAMM which uses the information from the condition rating and roughness surveys and produces candidate maintenance and renewal programmes for the year.

dTIMS Modelling

Pavement performance modelling is procured through an external supplier every 3 years. This modelling is an important exercise to support investment decisions as the output includes the impact of different 30-year financial scenarios on overall performance of the asset and by ONRC classification.

Road Asset Valuation

Every 3 years a full asset valuation is completed with updated rates. This gives an updated replacement cost of all the assets in the district, the depreciated replacement cost and the annual depreciation. The annual depreciation is used to calculate the annual council rates requirement. Each year an interim valuation is completed so that the finance department and Audit NZ are able to assess whether there is a significant movement or an update in rates is required.

REG and ONRC

The Roading Efficiency Group in conjunction with NZTA rolled out One Network Road Classification which was introduced in 2014. In addition, there are 27 performance measures with a range of input measures requiring information to be input each year. Subsequent to that REG introduced data quality sheets for ONRC and asset management which include a significant number of metrics (66) to give a snapshot of the accuracy of RAMM data and the accuracy and timeliness of getting the information into RAMM.

Bridge Inspections

The bridge stock is subject to planned inspections on a three-year cycle. Timber bridges and posted bridges are inspected annually. The inspection policy broadly follows NZTA Policy S6: 2014 with the relaxation that General Inspections of relatively recent bridges that are neither timber nor have restricted capacity are carried out on a three-year cycle, rather than the two-year cycle nominated in the above policy. This has been adopted on the basis that rural bridges have significantly less usage that State Highway bridges. Where more frequent inspections are considered necessary these are adopted on a case-by-case basis.

Retaining Wall Inspections

These inspections are completed every 3 years. Waitaki has some large retaining walls in Oamaru that require regular inspections. With footpaths now financially assisted, the retaining walls supporting footpaths now also become financially assisted.

Clearview 360° Digital Carriageway Photography

Detailed digital video footage of all Waitaki District Roads has been recorded using vehicle mounted cameras. This has been updated in 2019/20 financial year. Photographs of the network are stored on Council's computer system which allows consultants, contractors, officers and asset managers visual reference to carriageway structure, water table, geographical surrounds and the area the carriageway serves, eliminating the cost of travelling to the site.

Roading Policies & Bylaws

Council is currently updating the Roading Bylaw and speed limits in the district which has been through a two-stage process and is due to go to Council prior to the end of the 2020 calendar year.

Roading Policy updates are also in progress which includes all current policies as well as the creation of new ones. Once signed off, Council will have a comprehensive list of policies for the road network within the Waitaki District.

Footpath & Carpark Condition Rating Survey

Council completes an annual condition rating survey of footpaths each year (10%) to report against the DIA's footpath performance measure in the annual report. The condition rating also gives useful information for maintenance and renewals. A full 100% survey is planned for 2020.

Risk, Resilience & Recovery Planning

Council's Roading Team has a robust risk management process in place that covers contract management and other risks.

The roading network has had resilience improvements by use of cost-effective solutions such as wash-over structures that allow the roading network to reopen quickly after storm events.

Council has good recovery processes that are led by the Emergency Team.

Feasibility Studies and Business Cases

Council completes studies and business cases when required.

5.12.4 Alternative Options

Table 47: Network & Asset Management Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Additional investment is to be requested for 2021-24 primarily around 2 additional staff members, but also for increases in contract prices i.e. escalations. This is required to ensure that we are giving effect to the GPS, Road to Zero, Otago Southland Transport Plan and Councils LTP.	Without additional investment, Council will be financially constrained and will have to prioritise what is able to be completed with less investment. This could result in doing the 'basics' rather than being able to deliver a 'smart' approach.	1	Submission to the 2021-24 RLTP
LoS	Council has current policies in place regarding the road network. However, some are old and need updating; there are also the REG performance measures and data quality sheets.	External professional service providers can be expensive and consume investment quickly. They are used where necessary and cost effective processes are considered for saving money.	4	2018-21 & 2021-24 NLTP and beyond
Demand Management	It is essential that Council prioritises work to ensure that value for money and optimal whole of life costs are continuously considered.	Council's Roading Unit needs to be a 'smart buyer' to achieve this goal and without the right staff to supervise the maintenance contractor there could be a sub-optimal balance of time, money and resources.	3	2018-21 & 2021-24 NLTP and beyond
Treatment Type	Making sure that we are getting the 'basics' right in asset management before moving on to advanced technology and practices.	Council has previously (in the 2015-18 period) tried to implement processes and procedures without the help of external professional service providers with the aim of reducing costs. However, in some of the more complex data systems like RAMM, it is unavoidable as they have the expertise necessary for improving performance measures and data quality sheets	5	2018-21 & 2021-24 NLTP and beyond
Risk Profile	Risks around Network & Asset Management are low. However, erroneous decisions can be costly so knowing the rules, regulations and having the experience necessary to make the correct decisions is important. In addition, it is worth making sure that robust systems, preparation and improvements are in place to achieve full green light procedural audits from NZTA.	Without additional staff resources, processes and procedures are given fleeting responses and poor decisions can cause errors and rework which put staff under stress.	6	2018-21 NLTP
Policy	Policies for the roading network are in development i.e. existing and new.	Council is creating a comprehensive list of policies that will improve communication both internally and with customers.	2	Currently underway

5.12.5 Consequences of Reduced Investment

Reduced investment will force Council to prioritise implementation and delivery of processes and procedures with reduced staff. This will impede the development that is necessary to continue giving NZTA the confidence that Council is delivering well in the Otago Southland region. Reduced investment could also inhibit adequate succession planning from taking place so that we continue well into the future.

5.12.6 Procurement & Delivery

Council aims to design service procurement options that will cushion budgets from the impacts of the escalating cost of asset inputs as far as possible. It further aims to maintain a balance between asset management control, the cost of services in the short to medium term and the cultivation of credible market competition. To achieve this, Council has implemented MBIE's requirements for all of government resourcing, that is in the NZTA Procurement Manual, and has also adopted MBIE's standardised RFP templates and Response Forms, This ensures that the Roading Unit is following good practice and achieving value for money, including saving time and reducing the cost of tendering for suppliers. Most contracts have 3 to 4 tenders, and to keep this healthy, Council is conscious of ensuring that works are shared out through a robust, easy and straightforward tendering process.

This healthy procurement and delivery process allows for a comprehensive asset measurement regime to ensure that maintenance contracts are operating to the right standard and preserving the stock and life of assets overall.

5.12.7 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

NZTA provides guidance and regulation around all that is required of Council in a financially constrained environment. Successful delivery of programmes by Council's Roading Unit has given NZTA the confidence that they seek in a well-run Council business unit.

Council's Roading Asset Engineer has worked in various aspects of roading at Waitaki, including Roading Manager, for 22 years and has a very good knowledge of the rules and regulations, processes and procedures to be followed to ensure that we get best value for money. This has provided advantages for Council in Programme Management, Programme Delivery. Financial Management and Asset Management. However, there are disadvantages in having all this experience in one person. The challenge is to ensure there are well trained and capable staff who can continue this into the future i.e. good succession planning.

There are currently 12 staff in the business unit and each one provides critical input into ensuring successful delivery of the programme.

(b) Risks

Table 48: Network & Asset Management Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Management	Staff instability/turnover	Unlikely	Major	Medium	Overall desirability to work for WDC allows for reduced staff turnover and a high calibre of candidates for vacant positions.	
Management	Business continuity	Unlikely	Moderate	Low	Good business continuity procedures currently in place.	Executive Management
Management	Internal knowledge	Possible	Moderate	Medium	Succession planning and good mapping of processes and procedures.	Council's Promapp software
Financial	Network growth e.g. this could lead to more investment in engineering advice and network measurement	Possible	Moderate	Medium	Network growth is positive and requires additional investment in the business unit and in the roading network.	

(c) Opportunities

- Continuing to optimise Asset Management Planning through the collection and analysis of information, determining available options and adopting those in a changing service environment. Ensure, through the deployment of appropriate asset data management practices that critical information is captured and expertly analysed.
- Potential re-adjustment of cost allocation to include the contract network management costs such as routine inspections and patrols, joint inspections, programming, reporting, plans implementation and compliance. Currently this may be allocated as a percentage split across the asset categories.
- Shared services have been explored with Dunedin City in the past. However, Council has made the decision to invest in their own Asset Management team which is delivering very well with a strong capable team.
- Provision of more road user information for customers so that residents survey results can improve to reflect good management of the road network by Council.

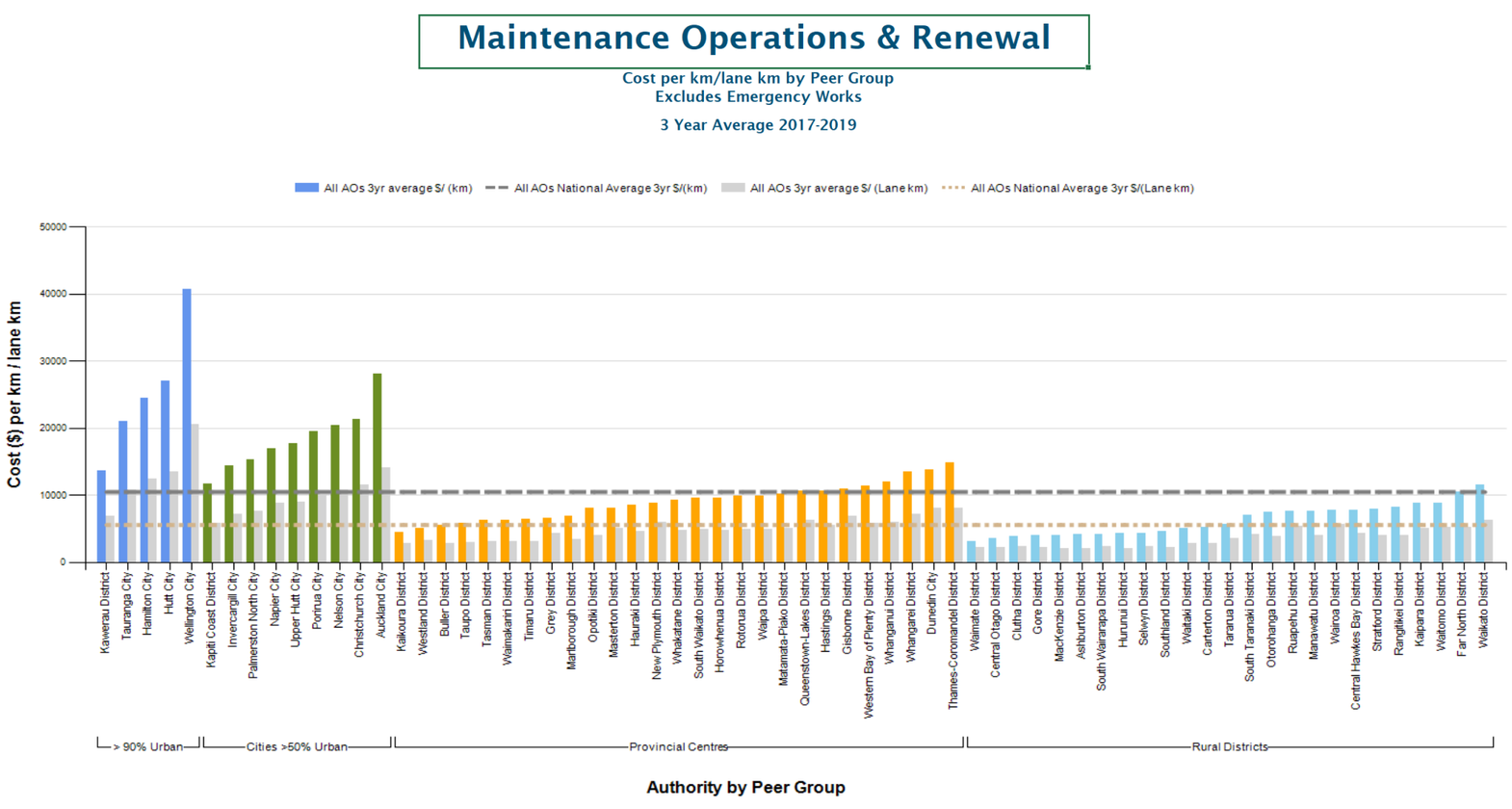


Figure 74: Maintenance Operations and Renewal

5.13 Parking & Street Furniture (Not Financially Assisted)

5.13.1 Asset Description

(a) Overview

WDC currently have 42 'Pay & Display' parking meters in Oamaru. These assets are managed within the transportation activity and have been recorded in RAMM for depreciation over a 10-year period. The enforcement and maintenance of parking meters is a regulatory issue and day to day maintenance and care of the meters is completed by the Enforcement Unit. There are also 11 off-street car parking areas in the District. These are standalone parking areas in Oamaru, Kurow, Otematata, Omarama, and Palmerston.

(b) Asset Condition

The parking meters were installed in 2013/14 so will be due for replacement in 2023/24.

The carparks are well cared for, particularly those in Oamaru with one remaining due for reseal in the last 5 years, and then the districtwide carparks will be assessed for resurfacing.

Street furniture i.e. litter bins and bench seats, as well as a few Oamaru stone planter boxes on the main street, are well used and well cared for.

(c) Asset Capacity

The Pay and Display meters provide a good level of travel demand management in Oamaru. However, business retailers in the CBD often risk getting parking tickets as there is insufficient enforcement on the ground. Interestingly enough, increased enforcement doesn't necessarily provide additional revenue so the current level of enforcement remains.

Additional street furniture, i.e. heritage bins and benches, seem to be sufficiently provisioned as there is no significant demand. However, at times – particularly over holiday periods – the frequency of collections can be contentious.

With the rollout of Oamaru, Otematata and Omarama Masterplan, there may be more amenity items installed to complement the existing assets.

(d) Critical Assets

Through the Covid-19 pandemic, Council announced that all pay and display parking would be free to encourage local shopping in the Oamaru CBD. Council has extended that free parking to 1 October 2020. It is evident that staff from businesses and Council have used up the capacity on the main street and off-street carparks. This illustrates how important the pay and display meters are to managing demand within the Oamaru CBD. Pavement marking of car parking is critical to efficient use of the carpark.

Litter bins could be considered a critical asset as they provide a facility for use during local shopping by residents as well as for domestic and international tourists alike.

(e) Key Issues

Pay and Display meters have been the target of vandalism in the past with damage to solar panel power feeds and coin slots which increases the cost of maintenance.

The heritage style litter bins have octagonal shape fibreglass tops with a round hole to prevent indiscriminate household use. These tops are easily opened and are sometimes abused by retailers and residents alike. The sticker on the bin identifying a $400 fine for indiscriminate use for household litter is largely successful.

Bench seats are generally left alone but occasionally vandals will try to pull mounting bolts loose.

5.13.2 AM Processes and Practices

(a) Inspections & Assessments

Pay and Display machines are inspected daily with coin collections once a week.

Litter bins are currently inspected monthly.

(b) Decision Criteria

Pay and Display parking meters are an asset that Council will approve for use before it is rolled out.

Bins that don't lock or are in poor condition are programmed for maintenance.

New litter bins and bench seats are funded out of each township amenity rates so will generally require a Council decision for Oamaru or recommendations to Council by the Ahuriri or Waihemo Community Boards.

5.13.3 Data Quality

There are no applicable metrics in the REG Asset Management Data Quality Report. Information on the pay and display parking meters and the off-street car parks is in RAMM. Information on the litter bins and bench seats will also be added to RAMM.

5.13.4 Lifecycle Management

(a) Maintenance Strategy

Car park maintenance and vegetation control is completed annually and has been included in the roading maintenance contract. Renewal of line markings is completed as required by the Pavement Marking contractor.

Township Maintenance: There are 4 wards within the Waitaki District (Ahuriri, Corriedale, Oamaru and Waihemo) and there are non-financially assisted township works to cover the towns in each of the wards. Rates are collected from each ward and are targeted to those wards. These are projects which improve the amenity aspects of townships throughout the Waitaki District and include the following maintenance;

- Grass mowing
- Litter collection
- Street furniture
- Footpath cleaning.

(b) Maintenance Programmes

Pay and Display machines are inspected daily. An external contractor provides maintenance of parts and software to the machines. Litter bins are currently inspected daily with collections. The maintenance programme includes temporarily replacing damaged bins. Once the damaged bin can be repaired (e.g. panel beating) and repainted it will be returned to service. Bench seats are oiled twice per year.

(c) Renewal Strategy

Most car parks have already been sealed and annual depreciation of the sealed surface allows for resurfacing on a programmed basis.

(d) Renewal Programmes

Car parks are maintained and renewed as required. Pay and Display meters are due for replacement or upgrade in 2023. Litterbins are made of heavy cast iron and so with regular maintenance should last a significant time. The fibreglass tops may need to be replaced more often.

Bench seats should last in excess of 10 years as they have heavy cast iron ends with hardwood timber slats.

(e) Development Plan

Masterplans for Oamaru, Otematata an Omarama may identify further amenity items.

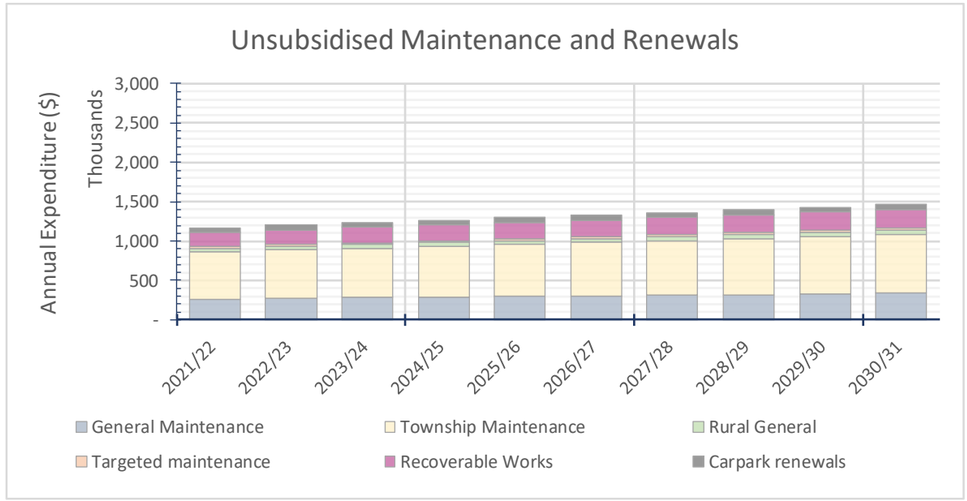


Figure 75: Unsubsidised Maintenance and Renewals

5.13.5 Alternative Options

Table 49: Parking & Street Furniture Alternative Options

Adjustment Category	Description	Impact / Assessment	Ranking	Implementation Status
Investment Timing	Investment into each township as recommended by Community Boards and/or approved by Council.	Amenity rate funds provide investment e.g. Weston has a $500k loan for new footpaths and kerb and channel which is funded annually by the amenity rate.	1	Not proposed for 2021-31 Council LTP
LoS	Level of Service is set either by the Community Boards or by Council.	This is a non-financially assisted activity but may be impacted by reduced investment from NZTA.	3	2021-24 RLTP
Demand Management	Car parking in Oamaru has previously achieved a very high level of service at over 80%. Litter bins and street furniture LoS seems about right; not too many requests.	Reduction or elimination of pay and display meters will have a profound impact on accessing local shops. Bins and bench seats could be reduced without much impact.	4	Not proposed for 2021-31 Council LTP
Treatment Type	Reduction of pay and display meters in Oamaru, Township Maintenance Works and Amenity funds.	Reduction in travel demand management in Oamaru. Impact on townships providing amenities for residents and tourists.	5	Not proposed for 2021-31 Council LTP
Risk Profile	Reduction of pay and display meters in Oamaru, Township Maintenance Works and Amenity funds.	Low risk. Council savings should target non financially assisted activities first.	6	Not proposed for 2021-31 Council LTP
Policy	Amenity rates and Ward rates for townships are provided for in Councils revenue policy.	Amenity Rates are often accumulated over years – no reduction is proposed. Ward rates are expensed annually.	2	Not proposed for 2021-31 Council LTP

5.13.6 Consequences of Reduced Investment

Amenity value will deteriorate. If pay and display meters are removed, additional enforcement will be required to provide a similar level of service for users and additional rates will be required rather than a user pays system.

5.13.7 Procurement & Delivery

A maintenance contract is in place ensuring a good maintenance regime to meet the levels of service and customer satisfaction required. The new meters are maintained by local firm First Security Ltd. However, Council is considering maintaining the meters in-house.

Carparks are resurfaced as a variation of the resurfacing contract and street furniture is either produced locally or purchased under Council's procurement policy.

5.13.8 Risks, Issues, and Opportunities

(a) Assumptions & Confidence Levels

Pay and display meters are paid for by parking revenue, with litter bins and bench seats paid for by Amenity Rates and maintained out of Township Works budget.

(b) Risks

Table 50: Parking & Street Furniture Risks

Risk Type	Description	Likelihood	Consequence	Risk	Management Plan	Linked Programme
Financial	Reduction in Amenity Rates and Township Works budgets	Unlikely	Moderate	Low	To be defined by consultation in the 2021-31 Waitaki LTP	2021-31 Waitaki LTP
LoS	Reduction in level of service across the district	Unlikely	Moderate	Low	To be defined by consultation in the 2021-31 Waitaki LTP	2021-31 Waitaki LTP
Management	Reduction in township maintenance below current level of service	Unlikely	Moderate	Low	To be defined by maintenance budgets that are approved by Council	2021-31 Waitaki LTP

(c) Opportunities

Oamaru, Otematata and Omarama master plans will make provision for any new assets.

5.14 Capital Improvement Programmes

5.14.1 Demand Management & Improvement Strategy

(a) Road Safety Improvements & Community Focussed Activities (WC341/432)

This is a group of activities which makes up the Waitaki Road Safety Action Plan and supports the targets of the Government Policy Statement and Road to Zero strategy.

The WDC Road Safety Action Plan was updated and amended in 2020 to reflect draft GPS 2021, Road to Zero and the Communities at Risk Register.

The five main themes of the Road Safety Action Plan 2021 are:

1. Fatigue,
2. Safety for everyone at intersections,
3. Safe walking and cycling,
4. Increasing the safety of younger drivers, and
5. Reducing alcohol and drug impaired driving.

Although Waitaki District has experienced a decline in fatal and serious crashes on the State Highway and Local Roads network between 2009-2019, safe speeds, alcohol/drugs and young drivers are a continued area of concern. The Road Safety Action Plan 2021 was developed for the Waitaki District in consultation with road safety partners and community. Keeping in line with the Waitaki District Councils LTP, and outcome 1: "Waitaki people are safe and healthy," it contributes to social wellbeing,

- We feel safe in our homes and on our streets,
- We work together to protect people and property,
- We support policing, particularly in small and rural communities;

We intend to increase investment in this programme to give effect to the national Road to Zero Safety Strategy. In alignment with Road to Zero, our goal is to reduce deaths and serious injuries (DSI) by 40% over the next 10 years. The benefits of the programme are demonstrated by the continued downward trend in serious injuries on our network. While the trend in fatal injuries is increasing, Council will be working hard to reverse that trend. From an ONRC perspective, the increase in DSI relates to Secondary Collectors and Low Volume roads. Road Safety programmes cover state highways as well as local roads.

Council has included the seal widening budget into low cost low risk improvements. The programme of works was based on projects identified through a risk assessment process, known as the Safety Deficiency Database. Council will be moving to the SWIPP tool for the 2021-24 RLTP. Safety deficiencies are identified by the roading team, and/or the contractor, and prioritised in terms of customer safety risk.

Seal widening gives effect to the WDC 2008 Carriageway Width Standards Policy, Road to Zero and High Risk Rural Roads Guide, as well as the One Network Road Classification which gives Council guidance as to where seal widening should be completed.

We will continue to carry out targeted seal widening at locations prioritised by ONRC where there is a high risk of head-on crashes due to the narrow carriageway and the increased volume of heavy vehicle and over width vehicle traffic on low volume rural roads. There is additional benefit sought in reducing whole of life costs associated with increased deterioration. This investment will also reduce the reactive maintenance costs associated with edge break on these carriageways.

We will be undertaking detailed assessment of high risk locations, as identified by the ONRC performance measures.

The seal widening programme is well underway and is being accelerated with the Low Cost Low Risk increase to $1M per project. Acknowledging that this limit will be $2M for projects in the 2021-24 RLTP, it is not intended to go to that amount for seal widening.

Other safety improvements e.g. traction seals and safety barriers are included in the 2021-24 programme along with walking and cycling projects and other small projects.

Tourist carparks for visiting drivers have also been included but will be deferred due to the effects of the Covid-19 pandemic. This has been a growth area for Waitaki and there is a requirement for appropriate domestic and international tourist infrastructure within the roading network.

Council is establishing a risk register within the AMP to identify, assess and treat risks. Where these relate to safety issues on the network, the risk register will be used to prioritise projects alongside SWIPP.

An increase in Low Cost Low Risk Improvements is being requested to accelerate safety improvement works. Increased budget matches Business Unit capability and delivery.

Business Unit Staff Input

Project Delivery and Support is led by the Network Operations Engineer whose responsibility is primarily Low Cost Low Risk Improvements along with other renewal projects e.g. reseals and pavement renewals. It has been identified that additional internal resource is required, or alternatively external professional providers will be required to give assistance.

Low Cost Low Risk Improvements will be increasing from $2,411,000 to $3,000,000 which will include 85% of another staff resource. This is an additional cost of $130,000 to ensure that projects are completed and delivered on time.

(b) Resilience Improvements (WC322/341/357)

Bridge Replacement

Bridge Renewals and upgrades will be completed as a combination of structural component replacements with LCLR Improvements paying for widening and strengthening. Council will prioritise projects out of the 30-year Bridge Renewal Strategy which is shown in the programme section below.

Rural Resilience

Council have agreed to fund $50,000 per year in unsubsidised preventive protection works for rural roads to give effect to their Coastal Roads Strategy. This will apply to the length of Beach and Waianakarua Roads and to the roads in Oamaru that are affected by coastal erosion.

River Training

Council will monitor the Kaura River that runs under the Kakanui Valley Road bridge and the Kakanui River on Fuchsia Creek Road to make sure that the rivers stay within the bridge openings. This will also apply to the rest of the bridges on the network.

(c) Efficiency Improvements (WC341)

Council will continue to utilise cost effective methods to provide efficiency improvements within projects e.g. roundabouts installed in Oamaru consist of prefabricated rubber products which has enabled Council to keep costs low.

(d) Drainage Improvements (WC324/341)

Council will upgrade drainage capacity where necessary and appropriate in conjunction with renewals, particularly where it is known that drainage is deficient and/or causing additional roading maintenance.

(e) Walking & Cycling Improvements (WC341/451/452)

WDC has an existing Walking and Cycling Strategy that has been included in the Recreation Strategy. Whilst there is currently a small network of commuter walking and cycling tracks in the district, 5.1km, WDC has an implementation plan to ensure planned and staged growth of the network to provide efficient and effective links. It is noted that walking and cycling

commuter tracks must meet a specific design and minimum requirements by NZTA for financial assistance. This is clearly defined as opposed to recreational tracks that may vary in design across the district. It is not clear whether the Great Rides and Heartland Rides will in future be funded out of the NLTP. WDC plans to continue to improve the walking and cycling network in the district with additional projects.

(f) Level Crossing Improvement (WC321)

This is KiwiRail's responsibility and at this stage we have not had any requests for upgrades to level crossings.

(g) Stock Crossings (WC341)

Council adopted a new Stock Crossing Code of Practice in October 2011 which has been implemented in the Waitaki District. Roading funds the consent fees associated with underpass construction from the low cost low risk improvements programme allocation

Council have also included construction of stock underpasses that qualify for financial assistance in their programme. This covers mainly collector routes and is defined in the Code of Practice.

The estimate included in LCLR Improvements is based on 2-4 crossings per year that will need to be upgraded to an underpasses.

(h) Township Amenity Enhancement (Non Financially Assisted)

There are projects which improve the amenity aspects of the Oamaru Town Centre that are funded by Oamaru.

There are also projects which improve the amenity aspects of townships throughout the Waitaki District. For the 2021-31 LTP, townships fund an amenity rate each year and don't necessarily use it until the balance of the account has accrued to a substantial amount and the Community Boards or Council approve a project for completion.

5.14.2 Demand Management & Improvement Programmes

(a) Community Focussed Activities (WC432)

Council has set investment of $174,132 per annum for the community road safety programme.

Figure 76: Community Focussed Activities

(b) Low Cost Low Risk (LCLR) Improvement Programme (WC341)

The Council is to continue with their LCLR improvement programme of $3,000,000 per year, with a 0.85 FTE included to assist with delivery of the programme at a cost of $153,700. Currently the Council road projects team is stretched to deliver the programme and additional help is required.

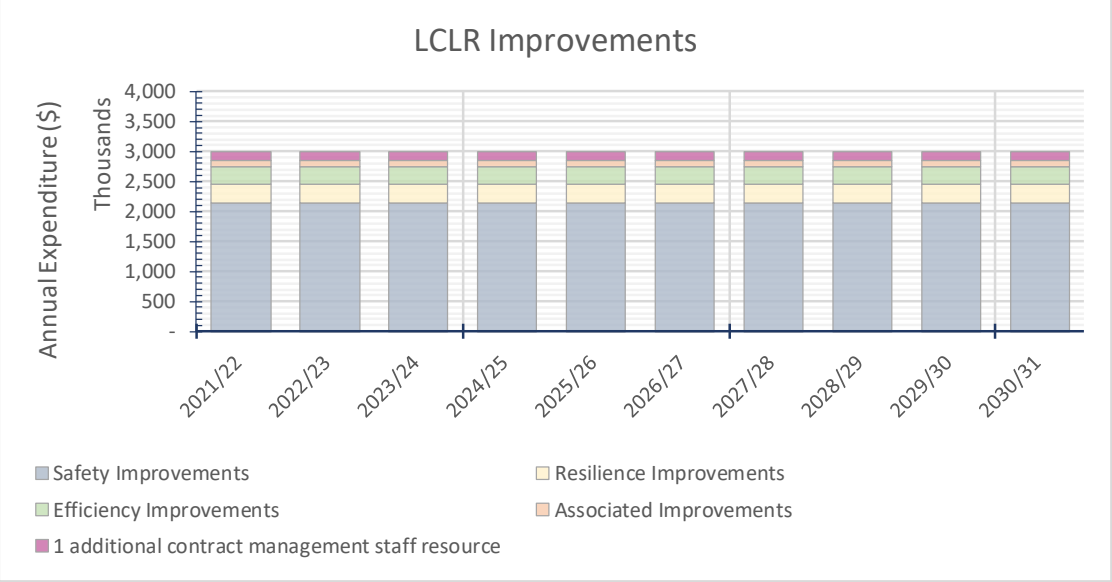


Figure 77: Low Cost Low Risk (LCLR) Improvement Programme

Seal widening is a significant aspect of the of the LCLR Programme and is at least $300,000 per year. Sealed primary and secondary collector routes are being prioritised for widening as they carry 70% of the 92 million vehicle kilometres travelled each year on less than 25% of the road network.

Seal Widening Estimates

Road	RP start	RP end	Length km	Rate $/km	estimate $	Comments
Weston-Ngapara	18.40	21.10	2.7	100,000	270000	Currently 6.4 m width, will complete this road widening project.
Thousand Island	1.10	5.30	4.2	100,000	420000	Currently 6.1 m width, shows extensive edge break and development taking place
Qualburn Road	0.00	3.85	3.85	100,000	385000	Currently 5.4m width, lower volume road but has tourist traffic and is part of A2O route. Has extensive edge break. Widening
Roundhill	3.00	7.10	4.1	150,000	615000	Extensive edge break. Widen prior to next reseal (2022?). More expensive to widen.
Whitestone - Five Forks	7.10	9.80	2.7	100,000	270000	Existing seal width 6.6m. Has extensive edge break and low shoulder. Widen prior to next reseal (2023?)
Seven Mile Road	0.00	11.50	11.5	100,000	1150000	Currently 6.3 to 6.5 m width. Has extensive edge break. Widening would give consistency and improve for heavy vehicles.
Kakanui Valley Rd	1.00	1.80	0.8	100,000	80000	Existing seal width 6.0m. Extensive edge break, widen before next reseal (2024?).
Kakanui Valley Rd	2.40	6.00	3.6	100,000	360000	Existing seal width 6.2m. Extensive edge break, widen before next reseal (2025?).
Horse Range Road	0.00	2.20	2.2	100,000	220000	Existing seal width 5.5m. Widen before next reseal .
Horse Range Road	8.00	8.70	0.7	150,000	105000	Existing seal width 5.0m. Widen before next reseal. More expensive as will require some retaining.
Whitestone - Five Forks	0.00	7.10	7.1	100,000	710000	Existing seal width 6.6m. Has extensive edge break/low shoulder. Widen prior to next reseal (2026?)
Airdale Rd	0.30	4.60	4.3	100,000	430000	Existing seal width 6.5m. Widening this portion will provide uniformity of width. Do before next reseal (2026?)
Lake Ohau Rd	12.70	18.40	5.7	100,000	570000	Existing seal width 5.4 m. Currently has extensive edge break, and is Tourist attraction area.
Lake Ohau Rd	0.00	12.70	12.7	100,000	1270000	Existing seal width 6.2m. Currently has extensive edge break, and is Tourist attraction area.
Livingstone - Duntroon	4.10	7.65	3.55	100,000	355000	Existing seal width 5.4m. Extensive edge break.
Livingstone - Duntroon	0.00	4.10	4.1	100,000	410000	Existing seal width 6.3m. Extensive edge break.
Dansey Pass Rd	0.00	2.80	2.8	150,000	420000	Portion to camp. Existing seal width 4.8m. More expensive as will require some retaining.
Coal Pit Rd	9.00	11.30	2.3	100,000	230000	Existing seal width 5.3m. Extensive edge break. Slaughteryard Rd closed.)
Tokarahi-Ngapara Rd	0.00	5.47	5.47	100,000	547000	Existing width 6.7m.
Happy Valley Rd	0.00	2.50	2.5	100,000	250000	
					0	
Totals			**86.87**		**$9,067,000**	

Figure 78: Seal Widening Estimates

Council's 30-year bridge strategy provides a guide to **resilience** improvements under the LCLR programme. ONRC and other priorities may change the programme over time. The Maheno Iron bridge is actually not identified within the first 10 years but will be prioritised as it gives the state highway and the local road network resilience. Refer to the Bridge Lifecycle Management Plan for further detail.

Table 51: Bridge Renewal Strategy

WAITAKI DISTRICT COUNCIL

BRIDGE RENEWAL STRATEGY: 1 JULY 2020

Bridge No	Bridge Name	Replace't Cost ($)	Funding Period		Comments.
104	Boundary Creek Rd Culvert	$45,000	2018	2021	
263	Frame Road Bridge	$430,080	2018	2021	
264	Harris Street.	$150,500	2018	2021	
145	Ainges Bridge	$75,000	2018	2021	Confirm foundation condition.
83	Ben Omar Bridge	$120,000	2018	2021	
22	Beach Rd Bridge	$190,179	2021	2024	Recently posted.
33	Rutherford Bridge	$86,100	2021	2024	Confirm on Principal Inspection.
157	Teschmakers No2 Bridge	$350,000	2021	2024	
219	Cookhouse Road	$105,350	2021	2024	Divest/Close?
259	Leicester St Bridge	$78,000	2021	2024	Divest/Close?
20	Kakanui Point Bridge 50%	$2,500,000	2024	2027	Pending NZTA decision. Split
20	Kakanui Point Bridge 50%	$2,500,000	2027	2030	over 2 x financial years.
7	Finlays Bridge	$38,000	2030	2033	Divest/Close?
9	Waianakarua Bridge	$350,000	2030	2033	
40	Slaughter Bridge	$120,000	2030	2033	Footbridge only.
47	Windsor Bridge	$115,500	2030	2033	
79	Otamatapaio No2 Bridge	$88,725	2030	2033	
103	Kakanui Valley Culvert	$97,500	2030	2033	
162	McEwans Bridge	$283,220	2030	2033	

In addition, there are the following projects proposed under LCLR;

- Associated improvements - $100k
- Pedestrian Safety upgrades - $200k
- Signage upgrades - $50k
- Urban accessible service upgrade - $100k
- Mode Neutral Improvements - $150,000
- Rural and Urban Intersection improvements, some of which will have been completed prior to the start of the 2021-24 RLTP - $3.7M.

Council has also included an amount of $55,000 for non-financially assisted seal extensions where there is a share paid by an external party in line with Council's policy on seal extensions.

Intersections and Curves Estimates – Rural

Table 52: Intersections and Curves Estimates – Rural

Intersection/curves	Estimate	Reason for Consideration	Treatment
T.Y Duncan/Shortland Intersection	$26,000	Previous fatal accident	Installation of street lighting at "T" intersection.
Redcastle/Shortland Road Intersection	$159,000	Overflow parking from meat works obstructing sight distance. Two accidents at site	Installation of kerb and channel, sealed carpark area. Includes streetlighting and signs installation, with hedge removal. Does not allow for any land purchase.
Livingstone Duntroon/Earthquake Road	$70,000	"Y" type intersection with unsealed area in middle. Poor alignment and no clear priority. High speed approaches. Fatal accident site	"T" up intersection with warning signage, chevrons and priority control. This will slow traffic on approaches for greater safety.
Island Cliff - Duntroon/Tokarahi Ngapara Intersection	$88,400	"Y" type intersection with unsealed area in middle. Poor alignment, visibility and no clear priority. High speed approaches. Accident site.	“T" up intersection and fill through dip with warning signage, chevrons and priority control. This will slow traffic on approaches for greater safety.
Weston Ngapara/ Ngapara Georgetown Rd	$70,000	"Y" type intersection with area in middle being used for "burnouts". Poor alignment and no clear priority. High speed approaches	"T" up intersection with warning signage, chevrons and priority control. This will slow traffic on approaches for greater safety.
Gardiners/Thousand Island Int.	$33,400	Narrow seal on Thousand Island Rd does not allow safe passing movements when vehicles stopped to turn into Gardiners Rd.	Install street lighting to increase awareness of intersection with seal widening/passing bay for traffic.
Teschmakers/Fortification int.	$21,200	Poor visibility for vehicles looking from Teschmakers Rd. to Fortification Rd.	Install single light and cut back rock embankment to improve sight distance.
Seven Mile Rd/Peebles Rd Int.	$63,000	Intersections not clearly visible, high speed rural environment being used as shortcut. Has been site of previous accident.	Install lighting/Stop control/extend seal to 100 metres along Peebles Rd.
Seven Mile Rd/Gibson Rd Int.	$40,000	Intersections not clearly visible, high speed rural environment being used as shortcut. Accident site.	Install lighting/Stop control/seal tapers on Gibson Rd.
Seven Mile Rd/Papakaio Rd Int.	$30,000.	Intersections not clearly visible, high speed rural environment being used as shortcut.	Install lighting at Intersection for improved visibility.
Seven Mile Rd/Grey Rd Int.	$63,000	Intersections not clearly visible, high speed rural environment being used as shortcut.	Install lighting/Stop control/extend seal to 100 metres along Grey Rd.
Seven Mile Rd/Ferry Rd Int.	$36,400	Intersections not clearly visible, high speed rural environment being used as shortcut.	Install lighting/Stop control/seal tapers on Ferry Rd.

Intersection/curves	Estimate	Reason for Consideration	Treatment
Seven Mile Rd/Steward Rd Int.	$38,200	Intersections not clearly visible, high speed rural environment being used as shortcut.	Install lighting/Stop control/seal tapers on Steward Rd.
Tokarahi Livingstone Duntroon Int.	$14,000	Intersection needs better definition/control	Install central island/Give Way control/seal tapers on approaches
Livingstone Duntroon/Settlement Rd Int.	$70,000	"Y" type intersection. Poor alignment and no clear priority. High speed approaches	"T" up intersection with warning signage, chevrons and priority control. This will slow traffic on approaches for greater safety.
Fuchsia Creek/Whitestone Five Forks/Kakanui Valley Rd Int.	$32,500	Poorly defined intersection with wide seal area. Accident site.	Install centre island on Fuchsia Creek Rd, street lighting and improve signage/markings
Lighthouse Rd (Moeraki)	$10,000	Used by Tourists, some who will be unfamiliar with these road conditions. Partly unsealed road with tight corners, blind brows and narrow seal where sealed. Accident site	Install improved advance warning/chevron signage.
Lighthouse Rd (Moeraki)	$471,900	Used by Tourists, some who will be unfamiliar with these road conditions. Partly unsealed road with tight corners, blind brows and narrow seal where sealed. Accident site	Improve site distance around curves, and brows, seal existing road
Lighthouse Rd (Moeraki)	$125,000	Used by Tourists, some who will be unfamiliar with these road conditions. Partly unsealed road with tight corners, blind brows and narrow seal where sealed. Accident site.	Widen existing seal to improve safety and reduce maintenance.
District Rd/Gilligan St. Int.	$120,000	Poorly defined intersection with sight distance problems. Leads to medical centre and houses. No protection for pedestrians.	Install K&C, footpath, improve alignment and grade to increase sight distance.
Fortification/Cormacks-Kia Ora Int.	$88,400	Has poor visibility on approaches to intersection and poorly defined.	Lower brow of rise (2 metres) on Cormacks-Kia Ora Rd to improve sight distance to approaching vehicles. Install chevrons and street lighting.
Springfield/Cormacks-Kia Ora Int.	$97,800	Has poor visibility on approaches to intersection and poorly defined	Lower brow of rise (2 metres) and bench east side on Cormacks-Kia Ora Rd and bench east side of to improve sight distance to approaching vehicles. Install chevrons and street lighting.
Battersby/Weston Ngapara Int.	$32,500	Has poor visibility on approaches to intersection and poorly defined	Advance warning sign/Give Way control/lighting
Roundhill/Clarke Int.	$10,000	Poor visibility for vehicles at intersection.	Trim vegetation and install lighting.
Roundhill/Woolshed Int.	$5,000	Poor visibility for vehicles at intersection.	Install light.

Intersection/curves	Estimate	Reason for Consideration	Treatment
Roundhill/Gemells Crossing Int.	$5,000	Poor recognition of intersection	Install light.
Roundhill/Kieleys Rd. Int.	$5,000	Poor recognition of intersection	Install light.
Airdale/Turfus Int.	$99,000	"Y" intersection on unsealed road	"T" up intersection and seal approaches.
Island Stream Rd. - RP 235m to RP 430m	$70,200	Narrow seal with poor visibility around curves	Widen seal on curves, cut back embankments for sight distance
Island Stream Rd. RP 430m to end .	$300,000	Poor visibility on approaches to curves	Daylight cuttings/improve sight distance around curves/seal widening around curves/painted centreline markings.
Coal Pit Road	$417,000	Narrow seal with poor visibility around curves. Has increased traffic due to Slaughter Yard Rd. being closed. Accident site.	Lower crest @ 10.2 km, widen/daylight remainder of road where required.
Turfus Rd.	$150,000	Poor visibility on approaches to curves	Widen/daylight road where required.
Roundhill Rd. RP 8.3 to RP 12.6km.	$100,000	Unsealed road with narrow carriageway and blind corners/brows.	Widen carriageway at horizontal and vertical curves.
TOTAL	**$2,961,900**		

Intersections and curves estimates - Urban

Table 53: Intersections and curves estimates - Urban

Intersection/Curves	Estimate	Reason for Consideration	Treatment
Redcastle/Warwick Int.	$5,000	Uncontrolled intersection. Accident site.	Install Give Way priority and street light.
Ribble/Reed St. Int.	$10,000	New development will increase turning movements Ribble/Reed Int.	Install central island on Ribble St. with control. Install right turn bay on Reed St.
Dee/Reed St. Int.	$10,000	New development will increase turning movements Dee/Reed Int.	Install central island on Dee St. with control. Install right turn bay on Reed St.
Homestead/Parsons Int.	$17,000	Difficult intersection to see. Accident site.	Install Intersection advance warning sign, central islands on Parsons Road, thermoplastic road markings and rumble treatment on approach to Stop's.
Humber/Usk St. Int.	$15,000	Wide intersection with poor layout. Accident site	Install K&C, roadmarking to improve layout.
Humber/Orwell St. Int.	$8,000	Traffic cutting corners and no control. Accident site.	Install Central island Humber St. and controls.

Intersection/Curves	Estimate	Reason for Consideration	Treatment
Wharfe/Tess St. Int.	$61,000	Difficult intersection to see. Accident site.	Install bulbous kerb treatments, and upgrade road markings and signage to indicate intersection. This will also give continuity of intersection treatments along Wharfe Street.
Wansbeck/Tess St. Int.	$61,000	Difficult intersection to see. Accident site.	Install bulbous kerb treatments, and upgrade road markings and signage to indicate intersection. This will also give continuity of intersection treatments along Wansbeck Street.
Wansbeck/Ure St. Int.	$61,000	Difficult intersection to see.	Install bulbous kerb treatments, and upgrade road markings and signage to indicate intersection. This will also give continuity of intersection treatments along Wansbeck Street.
Wansbeck/Greta St. Int.	$61,000	Difficult intersection to see.	Install bulbous kerb treatments, and upgrade road markings and signage to indicate intersection. This will also give continuity of intersection treatments along Wansbeck Street.
Wansbeck/Hull St. Int.	$61,000	Difficult intersection to see. Accident site.	Install bulbous kerb treatments, and upgrade road markings and signage to indicate intersection. This will also give continuity of intersection treatments along Wansbeck Street.
Westview Drive/Weston Rd./District Road.	$32,500	Partially obscured intersection on bend. Poor sight visibility from District Road and narrow carriageway.	Cut back bank, widen seal to allow for turning bay, install Give Way control.
Westview/Essex Rd Int.	$100,000	Intersection on bend with poor horizontal and vertical alignment. Difficult left turn into. Accident site.	“T" up intersection, fill hollow to improve vertical alignment, widen Westview Drive for slip lane. Kerb and channel around corners.
Westview/Whiterocks Rd Int.	$61,000	Poorly defined intersection with angled approach.	New horizontal intersection layout with lighting installed.
Whiterocks/District Rd. Int.	$115,000	Intersection with compromised sight distance due to vertical profile.	Lower brow of vertical curve on Whiterocks Road (cut to fill into District Road) with lighting and intersection control.
Westview/Gordon Int.	$61,000	Badly defined intersection. Accident site.	New horizontal alignment with lighting.
TOTAL	**$739,500**		

(c) Drainage Improvements (WC341)

Drainage improvements will likely be restricted to culvert upgrades and washover structures. A certain amount of Oamaru stone kerb and channel works could be completed in conjunction with the rollout of the Oamaru Masterplan.

(d) Walking & Cycling Improvements (WC341/451/452)

The next planned financially assisted walking and cycling track is that from the Harbourside and Oamaru Creek bridge through to the Waitaki Boys High School cycleway which starts at the north end of Humber Street. The length of cycleway track along Humber Street was due for completion in 2019/20 and 2020/21. However, the project has been deferred and the linkage is being investigated to assess whether or not it should be on Humber Street given that Humber street is a secondary collector with light industry. Estimate $500,000.

A possible track will be a safety footpath up Buckleys Hill on Redcastle Road to Reservoir and Ardgowan Roads. Estimated at $395,000.

Council will also be completing an assessment for linking of the Great Ride Alps2Ocean from Oamaru through to Palmerston. A business case for this has been completed.

There is also the Oamaru to Pukeuri cycleway which will be constructed alongside State Highway 1 and will give access to the Pukeuri Alliance Meatworks. This was scheduled to commence in 2020 as a joint NZTA project with construction in 2021 but has not been prioritised by Council and will be a project in future years. Estimated cost $770,000.

There is also a proposal for a walking and cycling track on Weston Road from SH1 through to Essex Street. Estimated at $350,000.

(e) Multi-modal and urban mobility projects

Council has 2 projects for inclusion in this area;

- North End shops in Oamaru to Ouse Street also in Oamaru. This will create a shared walking and cycling connection in a non-roading space. Estimate for project $300,000.
- Observatory Retirement Village in Eden Street to Oamaru town centre. This is also a shared walking and cycling connection in non-roading space linking Oamaru's largest retirement village with the Oamaru town centre. Estimate for project $300,000.

(f) Level Crossing Improvements (WC321)

To date, no programme has been provided.

An upgrade of the Thames Street crossing is likely in 2020/21 after KiwiRail did some interim maintenance in 2018/19.

(g) Stock Crossings (WC34)

At this stage there is one proposed stock crossing to be converted to an underpass with an amount of $53,000 allocated for building consent applications and construction of stock underpasses.

(h) Township Amenity Enhancement (Non-Financially Assisted)

Amenity rates are in place for each township. These represent 2018-21 and will be updated with the LTP process.

Table 54: Township Amenity Enhancement (Non-Financially Assisted)

Work Programme	Project Type	2021/22	2022/2023	2023/24
Amenity Works	Duntroon	$1,500	$1,539	$1,582
	Hampden	$10,000	$10,260	$10,547
	Herbert	$1,500	$1,539	$1,582
	Kakanui	$5,000	$5,130	$5,274
	Kurow	$17,600	$18,058	$18,563

Work Programme	Project Type	2021/22	2022/2023	2023/24
	Maheno	$1,500	$1,539	$1,582
	Moeraki	$5,000	$5,130	$5,274
	Oamaru	$50,000	$51,300	$52,736
	Ohau	$3,000	$3,078	$3,164
	Omarama	$11,000	$11,286	$11,602
	Otematata	$20,000	$20,520	$21,095
	Palmerston	$30,000	$30,780	$31,642
	Shag Point	$1,500	$1,539	$1,582
	Weston	$16,000	$16,416	$16,876
	Total	$173,600	$178,114	$183,101

5.14.3 Alternative Options

Table 55: Alternative Options

Adjustment	Description	Impact / Assessment	Rank	Implementation
Investment Timing	Increased programme to align with public consultation in 2017	Reduced	1	2021-24 RLTP
LoS	Higher levels of service	High impact to improve road safety in the road network	3	2021-24 RLTP
Demand Management	Greater urban mobility and alternative modes of transport	Reduce programme of improvements to lower levels of service	5	2021-24 RLTP
Treatment Type	Increased levels of service in road safety	Unable to meet outcomes of the Road to Zero	4	2021-24 RLTP
Risk Profile	Improved road safety	Reduction will increase personal and collective risk on the road network	6	2021-24 RLTP
Policy	Roading Policies already developed for some activities but more needed	Policies will inform decision making	2	2021-24 RLTP

(a) Consequences of Reduced Investment

Reduced investment will seriously impact on the programme of works in the district. The programme per year has increased by more than 300% from 2017/18 but allows Council to catch up with bridge renewals, seal widening, pedestrian upgrades, walking and cycling and urban mobility.

5.14.4 Financial Summary

(a) Expenditure Forecast

Table 56: Low Cost Low Risk Expenditure Forecast

Low Cost Low Risk Improvements	2021/22	$3,000,000
	2022/23	$3,000,000
	2023/24	$3,000,000

(b) Funding

Council has allocated funding for this activity, some of which is funded from depreciation, particularly for bridge renewals. Whether this is sustainable in the long term is a question to be asked in the future as programmes are completed.

5.14.5 Risks, Issues, and Opportunities

(a) Risks

Risks include not having sufficient resources to deliver the programme which is why an additional 0.85 FTE is being added to the budget.

(b) Opportunities

This increased programme is a great opportunity for Council to make positive gains in road safety and improve the road network to be more fit for purpose. There is opportunity for these activities to be included in maintenance or renewal activities.

5.15 Asset Disposals

Abandonment of the following bridge was proposed, subject to consultation:

Bridge 40 on Slaughter Yard Road, north of Enfield off the Weston-Ngapara Road.

Consultation has been carried out and the results were that the bridge will be closed to vehicle traffic but remain open to pedestrians and continue to support utilities such as potable water.

Adjustment to WDC's valuation, maintenance and renewals strategy will need to take place to reflect this reduction in network.

6 Valuation Summary

6.1 2020 Valuation

An interim asset valuation has been undertaken as at 1 July 2020 using the RAMM Asset Valuation module for all assets except for bridges which have been valued in a spreadsheet. The table below shows the Replacement Cost, Depreciated Replacement Cost and Annual Depreciation figures by asset group.

Table 57: Replacement Cost, Depreciated Replacement Cost and Annual Depreciation figures by asset group.

Asset Groups	RC	DRC	AD
Land	$43,545,140	$43,545,140	$0
Formation	$354,248,943	$354,248,943	$0
Unsealed Pavement Structure	$28,804,450	$27,303,413	$712,969
Sealed Pavement Structure	$200,097,112	$114,240,976	$1,994,269
Sealed Pavement Surface	$28,879,282	$11,516,115	$2,087,837
Drainage	$23,757,766	$9,099,823	$457,584
Footpaths	$18,844,917	$9,526,073	$539,517
Markings	$8,934	$4,467	$2,234
Railings	$2,361,190	$698,119	$68,205
Retaining Walls	$7,986,199	$2,460,309	$114,762
Signs	$1,427,978	$557,844	$118,983
Street Furniture	$383,410	$115,023	$38,341
Street Lighting	$2,415,688	$1,677,977	$87,346
Surface Water Channels	$43,212,959	$19,928,997	$553,959
Traffic Facilities	$266,274	$133,137	$22,190
Bridges	$43,563,171	$17,710,278	$503,838
TOTAL	**$799,803,412**	**$612,766,635**	**$7,302,033**

Overall confidence in the valuation has been assessed as Reliable, based on an assessment of quantity, unit cost, life and residual life inputs. Section 5.2.7 explains data confidence grades.

The valuation is summarised by Work Category in the following chart:

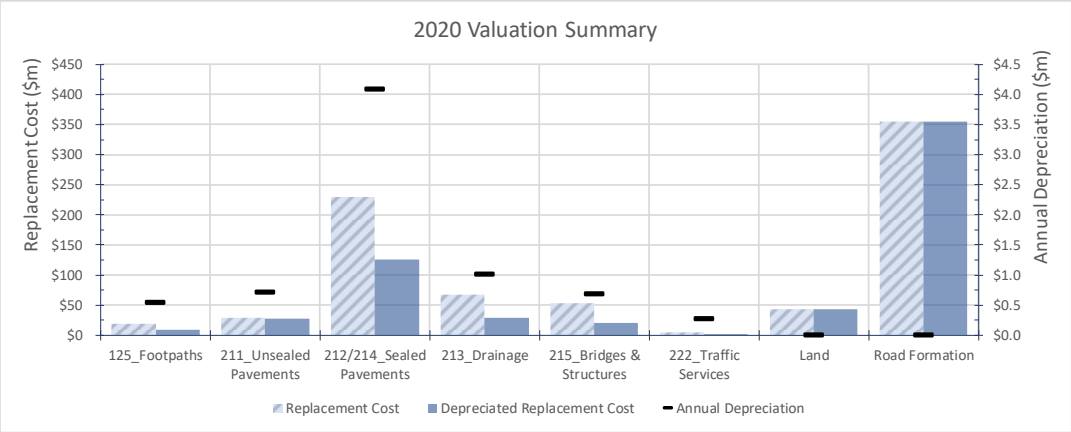


Figure 79: 2020 Valuation Summary

The current Asset Consumption Ratio is 47%. This means that 47% of the depreciable amount of the asset portfolio has been consumed. The following chart shows this broken down by Work Category.

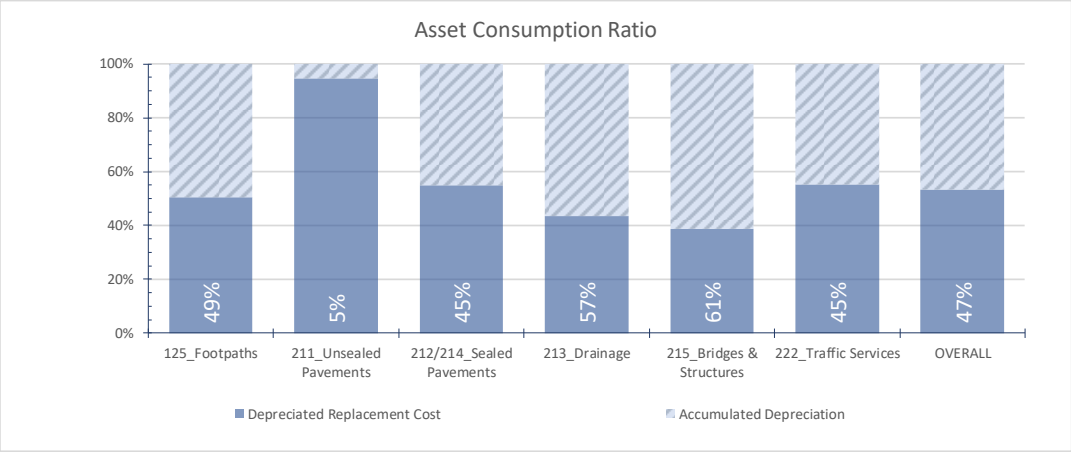


Figure 80: Asset Consumption Ratio

The Asset Sustainability Ratio (un-discounted) over the 10-year period of this plan is 87%. This ratio compares annual renewals expenditure with annual depreciation. Therefore, planned renewals expenditure is restoring 87% of depreciated asset value over the long term when assessed across the portfolio.

The following chart shows this broken down by Work Category. It is clear that bridges renewals, as a relatively high value asset category, is having a significant impact on the overall Ratio. This is indicative of an aging bridge stock which is requiring increased renewal expenditure and aligns with the above consumption chart.

Drainage renewal investment is lagging behind other categories. This will continue to increase the Asset Consumption Ratio for this asset type and indicates that further investment in drainage renewal may be needed over the long term.

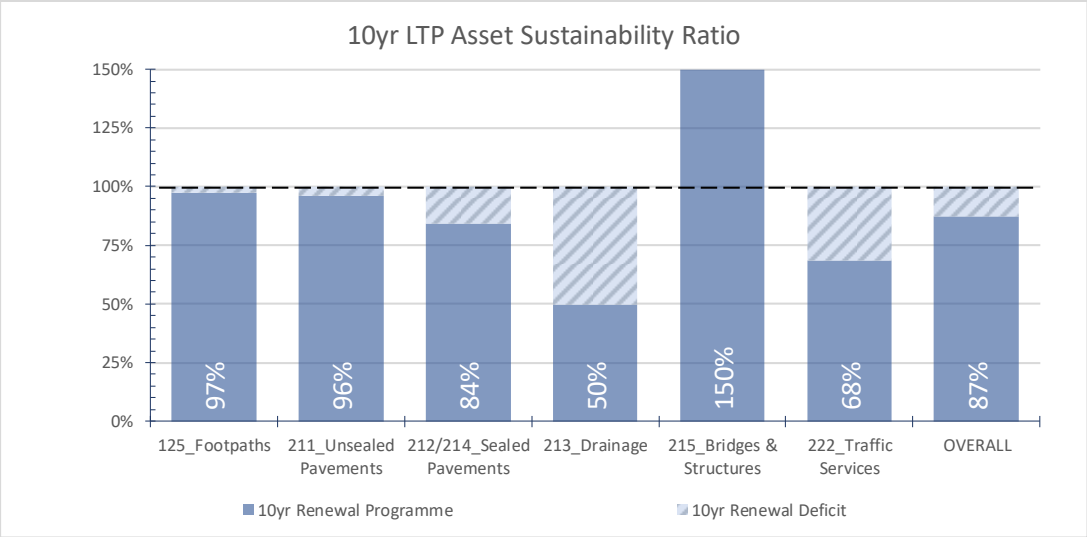


Figure 81: 10 year LTP Sustainability Ratio

The following chart compares the total annual depreciation with the total annual planned renewal expenditure over the 10-year period of the plan. This shows that there is a significant increase in renewal expenditure in 2025/26 to 2026/27 which is linked to the bridge renewal programme and underscores that overall programme sustainability is being enhanced by this significant proposed spend.

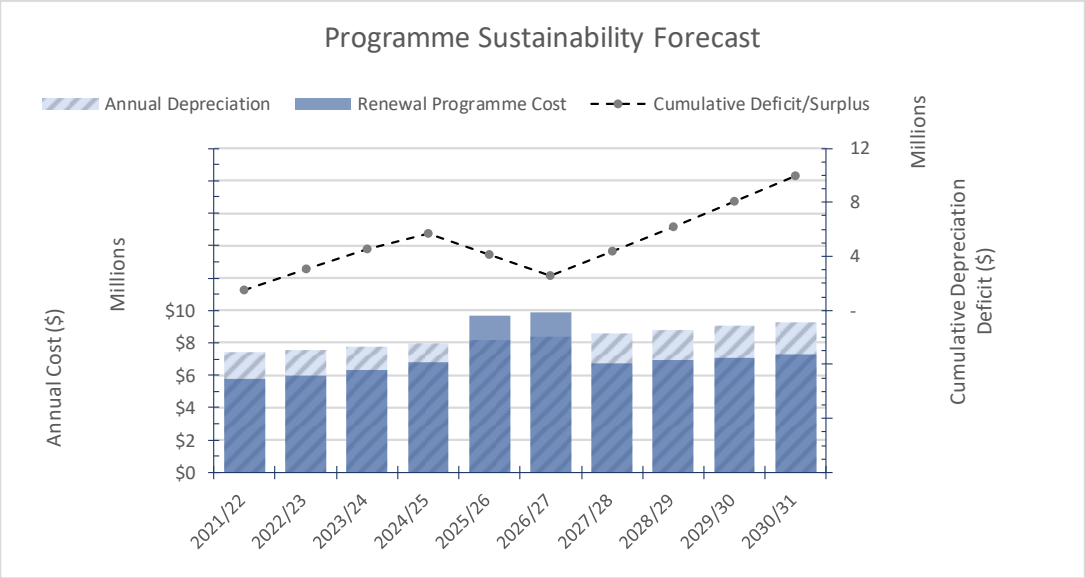


Figure 82 Programme Sustainability Forecast

The dashed line is an indicator of the 'Change in Service Potential' occurring across the land transport asset portfolio. It is clear that, without the increased bridge investment in 2025/26 to 2026/27, there is a significant negative trend represented. This indicates that, in general, there is room for further increases in renewal expenditure to maintain a sustainable level of investment in the portfolio.

6.2 Expenditure Forecasts

Expenditure forecasts are included in Part B of this AMP.

7 Monitoring, Review, Continual Improvement & Innovation

7.1 Continual Improvement

Continual improvement is a key component of asset management (AM). It drives business efficiency and effectiveness and ensures that, over time, processes and practices are adjusted for changing circumstances. This ensures that the AM system consistently delivers required outcomes.

The continuous improvement methodology incorporates the Plan-Do-Check-Act model known as the Deming Cycle. This methodology must be applied to multiple elements of the AM system including documentation.

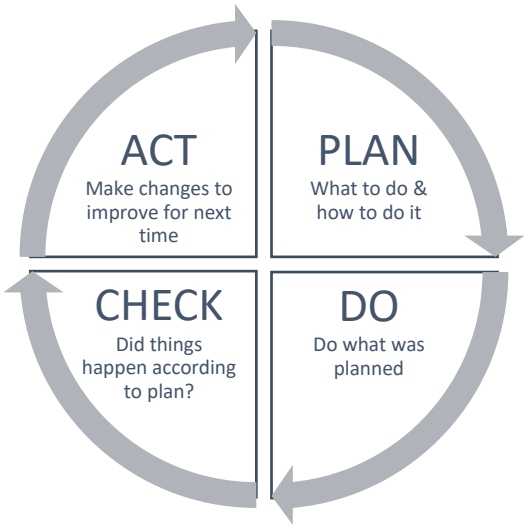


Figure 83: Deming Cycle

7.2 AM Performance Management

WDC sets goals and periodically monitors performance to manage programs, achieve targets, and deliver on strategic goals and customer levels of service. A hierarchy of performance measures allows Council staff and stakeholders to manage progress, identify improvements, and adjust programmes to ensure achievement of the desired outcomes.

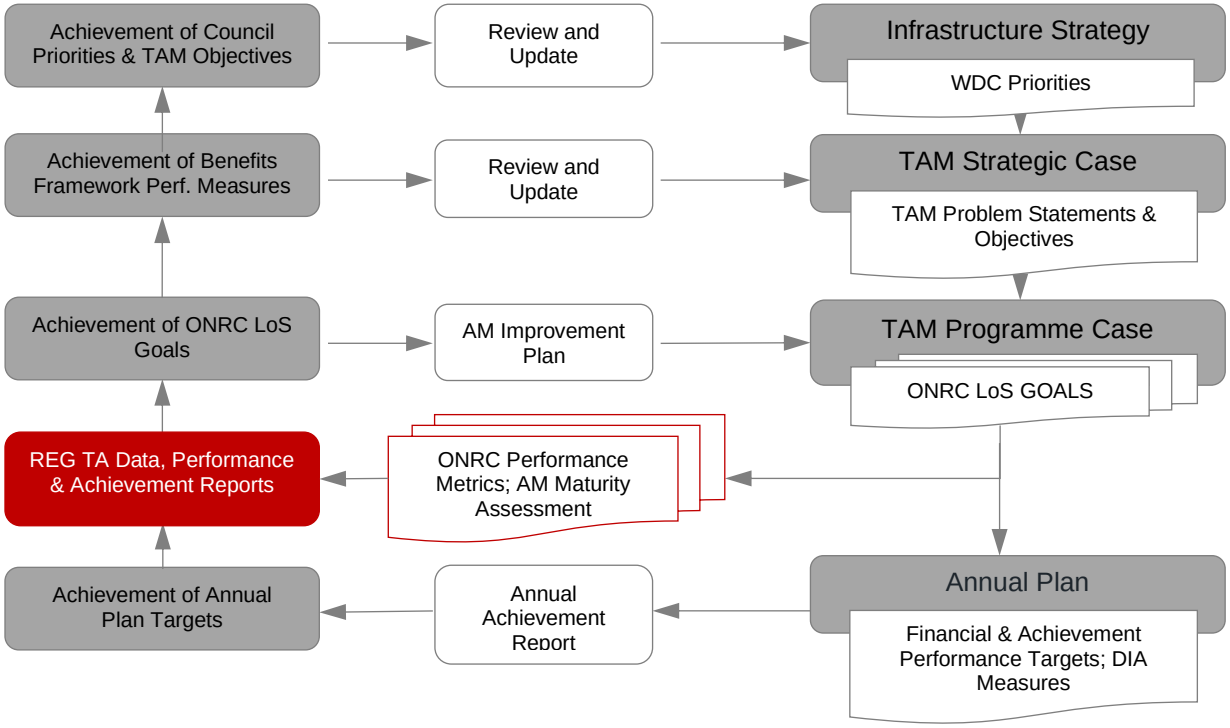


Figure 84: AM Performance Management

7.3 Management Reviews

The Assets Group Manager is accountable for continual improvement of the AM system. The Roading Manager is responsible for completing regular AM performance reviews to prove achievement of corporate and AM objectives, and for ensuring sustainability of continued achievement of the AM objectives. The senior leadership team use the results of the reviews to identify improvements necessary to maintain the suitability, adequacy and effectiveness of the AM system.

A formal management review of the AM system, including the AM policy and AM Strategy, are completed at least once every three (3) years as part of the LTP Infrastructure Strategy update process , but may be completed more frequently if necessary to address issues from annual management reviews and performance reports. The management review will be documented and include consideration of the following:

- Reassessment of AM maturity
- the status of actions from previous management reviews
- changes in external and internal operating environments that are relevant to AM
- AM objectives and achievement of the AM objectives
- AM system performance including trends and progress on improvement action plans
- opportunities for continual improvement
- changes in the profile of risks and opportunities
- competency, skills, resources and support
- asset performance and condition

The outputs from the reviews should include decisions and actions relating to improvements in AM system and activity including variations to the scope, policy and objectives; criteria for AM decision making; updates to performance requirements; resources including financial, human and physical resources; changes to controls and how their effectiveness is measured including roles, responsibilities and authorities.

The necessary changes and/or corrective actions identified from the management reviews and performance reporting are documented and relevant information is communicated to specific employees and stakeholders.

7.4 Peer Reviews

This AMP is regularly peer reviewed by NZTA through the technical review process. Council completed a minor restructure of the roading unit in 2018 to improve efficiencies and performance in service deliveries for the 2018/19 financial year and beyond. This will allow more resources in asset management to concentrate on improvement items. The restructure is shown and included in the Organisational Structure in Part B of this Plan.

7.5 Current AM maturity

Our target level of advancement is “Core-Plus”, reflecting the scope, scale and risk of the transportation service and its criticality to the wellbeing of Waitaki District. The last review was completed by Waugh Infrastructure in 2017 and showed a developing level of maturity. Significant improvements have been made since 2017, assisted by the REG programme and our self-assessed maturity level is “Competent”. An independent review will be undertaken during the first year of this plan. The significant improvements recommended by the review have been incorporated into this AMP. The remaining recommendations have been scheduled as future improvements to be undertaken over a timeframe that reflects available time and Council resources.

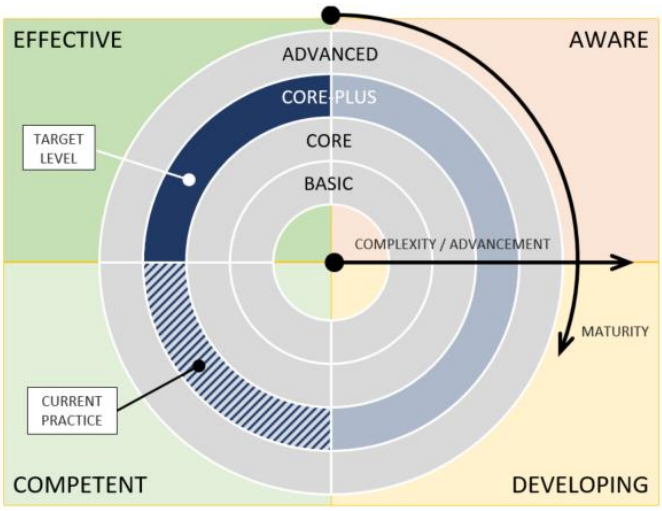


Figure 85: Current AM maturity

7.6 Improvement Plan

Table 58: Improvement Plan

Ref	Title	Activity	Current Status	Future Status and Identified Improvements	Improvement approach	Priority	Timeframe	Responsibility	Resources
SYSTEMS									
1	Improvement framework	Adopting regional improvement framework	New framework prototype drafted for discussion and feedback.	Agreed framework adopted and signed off by NZTA and RCAs. Regular meetings and monitoring. Supports continuous improvement and NLTP funding conditions. Preparing RCA for 2021 NLTP.	Partnership workshops to discuss approach and framework	High	30/06/2021	Roading Manager	REG workshops
1a	Risk framework	Embed risk framework	Risk framework developed and being embedded into the business	Continue embedding risk framework and identify/assess risks, populate risk register with critical risks etc.	Work collaboratively within Council to follow the risk process for AM risks	High	30/06/2021	Roading Asset Engineer	WDC Roading Team
2	Line of sight	Improve the use of the BCA and line of sight connection in Activity Management Plan and programme of works.	Regional Plan has been developed with regional problem statements.	Test problem statements within each local RCA network. Better understand the scale of regional problems at local level. Improve link of local programme delivery to high level strategy. Improve use of BCA in AMP for next NLTP.	Work collaboratively with other regional RCAs. Ensure individual ownership and how this applies within each individual RCA.	High	30/06/2021	Roading Asset Engineer	WDC/Waugh
3	ONRC integration	Improve how the ONRC is linked to business systems	Regional Plan has been developed incorporating the ONRC; 2018 NLTP use of ONRC was a new initiative and work to date has started the integration.	Business / AMP systems fully integrated with ONRC classification, levels of service, and use of performance measures.	Work collaboratively with other regional RCAs and NZTA.	High	30/06/2021	Roading Asset Engineer	WDC
5	Speed Limits	Management and setting of speed limits in conjunction with Roading Bylaw	Assessment of speed limits at 38 sites through the Waitaki has been completed	Assessment within ONRC framework	Speed limits set within speed limit management guidelines and speed limit setting rules	High	30/06/2022	Roading Asset Engineer	Network Engineer - RM
8	Review of CAS database in relation to ONRC Performance Measures	Identify common safety themes and issues for prioritisation in SWIPP and inclusion in LCLR Improvements	In-house review yet to commence	Ensure import of CAS data into RAMM by 31 July each year to update ONRC performance measures around crashes and safety	Utilise current speed limit review document as a basis to review and complete safety audits on Primary and secondary Collector routes	Medium	30/06/2021	Roading Asset Engineer	Road Safety Co-ordinator
13	Improvements identified in 2020 dTIMS modelling	RAMM database improvements to improve outputs of modelling	improvements to be started	To improve future accuracy of dTIMS modelling for improved forward work programme and budgeting	Continuous improvements to RAMM data will improve dTIMS modelling	High	30/09/2023	Roading Asset Engineer	Waugh, WSP, Beca

Ref	Title	Activity	Current Status	Future Status and Identified Improvements	Improvement approach	Priority	Timeframe	Responsibility	Resources
EVIDENCE									
16	RAMM Data Quality	Upgrade of the RAMM database	2017/18 Data Quality scores; ONRC - 62 & Asset Management - 50. Number of data quality issues present	Accurate, complete and timely RAMM data to better inform investment decisions and facilitate performance management. Improved capability to utilise data	Audit RAMM databases and identify gaps. Develop and implement prioritised action plan. Assess options for future management of RAMM database - Achieve 80% for Data Quality Sheets by30/06/20120	High	30/06/2021	Roading Asset Engineer	Beca/WSP
17	ONRC measures	Collection and reporting of ONRC customer performance and technical output measures	A number of ONRC performance measures are not being collected and/or monitored	Collect data to better understand network performance indicators, comparative measures and guide investment	Draft ONRC data collection plan, collect and store data, analyse and report	High	30/06/2021	Roading Asset Engineer	WDC/Waugh
18	Satisfaction surveys	Collection and analysis of customer and stakeholder satisfaction with the road networks	Varied approach to customer satisfaction surveys	Review satisfaction survey questions and usefulness of data received. WDC survey to be spread over financial year rather than one-off survey	Define customer user groups, develop plan and programme for collection of data from users groups, implement and analyse data	Medium	30/06/2021	Roading Asset Engineer	WDC
19	ONF review	review ONF classifications as appropriate - ensure all roads have classifications	ONF Classifications 4 years old	Review ONF classifications with criteria	review on a hierarchy basis starting with collector routes	High	31/12/2022	Roading Asset Engineer	In-house team
20	Surveys - high speed data	High speed data collection	use of condition rating and roughness surveys	Assessment within ONRC framework	Improve data source for dTIMS modelling	High	30/11/2019	Roading Asset Engineer	Beca/WSP
20a	Condition rating (non-pavement assets)	Condition rating of non-pavement assets	Use condition rating surveys of non-pavement assets to develop programmes	Assessment within ONRC framework	Improve evidence of condition and inform decision-making	Medium	30/09/2023	Roading Asset Engineer	Maintenance supplier
22	DIA and Annual Plan non-financial performance measures	Results from footpath survey, information from CAS and surfacing renewals	Footpath survey to be programmed for March of each year	results from footpath survey to be used in assessing annual maintenance and renewal programmes	Annual footpath survey to be completed	High	30/06/2021	Roading Asset Engineer	WSP
25	Traffic monitoring	Continue traffic counting programme ensuring compliance with requirement of ONRC data quality sheet	Collecting classifier traffic count information on sealed roads	Review traffic count programme in context of ONRC framework	Traffic counting programme to include unsealed roads that have estimates older than 5 years	Medium	30/06/2021	Roading Asset Engineer	WDC programme & SouthRoads t/counting

Ref	Title	Activity	Current Status	Future Status and Identified Improvements	Improvement approach	Priority	Timeframe	Responsibility	Resources
26	Asset inventory collection	signs & markings, street light inventory verified with LED upgrade	signs and markings out of date with street lights 90% accurate	Inventory collection to be verified using Clearview 360	desk top exercise using Clearview 360 rather than on-site inventory survey	Low	30/06/2021	Roading Asset Engineer	In-house team or student
COMMUNICATING									
34	Asset Management Plan Improvement Items	As per Waugh AMP Compliance Report with Moderate Consequences	As per AMP Compliance Report	Improve from Existing Status to Appropriate Level as identified in the AMP Compliance Report	Improvements within the context of the ONRC framework	Medium	30/06/2021	Roading Asset Engineer	WDC/Waugh
35	Asset Management Plan Improvement Items	As per Waugh AMP Compliance Report with Minor Consequences	As per AMP Compliance Report	Improve from Existing Status to Appropriate Level as identified in the AMP Compliance Report	Improvements within the context of the ONRC framework	Medium	30/06/2021	Roading Asset Engineer	WDC/Waugh
36	Asset Management Compliance Report	Updated report on BCA AMP	to be completed	Improvement to be to Appropriate Level or better as identified in the AMP Compliance Report	Complete all improvements within 2018-21 period so that further assessment can be completed	High	30/06/2021	Roading Asset Engineer	Waugh
DECISION MAKING									
46	Forward works programme	Programme development	Lack of data and evidence base to develop proactive forward works programmes.	Use data to develop longer term views in renewal programmes which will assist collaboration and procurement opportunities	Co-ordinated approach to data collection, review of strategic problems and priorities, develop and assess programme options for 2021-24 bid	Medium	31/03/2023	Roading Asset Engineer	IDS/Beca/WSP
46a	Maintenance programming	Maintenance	More reactive than desired	Implement a proactive maintenance programming approach, including use of “all faults” and specific focus on some asset types e.g. retaining walls and guard rails as well as environmental maintenance	Apply proactive maintenance programming techniques within funding constraints	High	30/06/2021	Roading Asset Engineer	WDC Roading Team/ Suppliers
47	Renew Archaeological Authority	Roading maintenance in historic areas as defined in archaeological assessment	Due to expire in early February 2019. Application for renewal made in December 2018 - renewed authority expected on 14 February	Renewal of existing authority with options of expanding areas at a later date	Archaeological Authority requires annual reporting to Heritage NZ which has been completed	High	30/09/2022	Roading Asset Engineer	WDC Technical Officer
48	Renew Global Resource Consent with ORC	Resource consent to allow for roading maintenance and bridge repairs	Existing Resource Consent in place to 29 March 2020	Resource consent renewal and improve on compilation of annual monitoring returns	Investigate the possible use of RAMM Contractor to assist identification of sites that require performance monitoring information	High	30/09/2022	Roading Asset Engineer	Infrastructure Network Engineer

Ref	Title	Activity	Current Status	Future Status and Identified Improvements	Improvement approach	Priority	Timeframe	Responsibility	Resources
SERVICE DELIVERY									
62	Maintenance contracts	Procurement of new transport and roading contracts	roading maintenance contract ends June 2022 including roll-overs, other contracts are resurfacing, street lighting and pavement marking	Retender maintenance contract having regard to updated procurement strategy. Adopt common contract specs across the WC Councils, integrate ONRC	Develop programme of tasks required over 20 month period between Sept 2018 and July 2020. Obtain internal approvals and develop communications plan	High	31/03/2021	Roading Asset Engineer	WDC Roading Team
63	Aggregate Resources	Aggregate supply for maintenance, new and renewal projects	In second year of implementation	Make improvements to service delivery within ONRC framework	Improvements include identification and purchase of new properties to ensure long term sustainable supply	Low	30/06/2021	Roading Asset Engineer	Network Operations Engineer
64	Collaboration of Services	collaboration of roading and water services	to be investigated	improvements and efficiencies in workloads	review within ONRC framework	Medium	30/06/2021	Roading Asset Engineer	3 Waters Manager
PEOPLE / CULTURE									
76	Regional collaboration	Regional collaboration is continued to be developed and new opportunities identified	Collaboration and development of combined AMP occurred in 2018 NLTP.	Continue to work together with shared improvement opportunities for AMP development. Identify further collaborative opportunities	Reinstating regular collaboration meetings. Involve both RCAs and NZTA.	High	30/06/2021	Roading Manager	REG workshops
77	Capability plan	Development of a regional capability and success plan	No plan in place	Review individual RCA plans (if available) and identify any gaps.	Individual RCA capability matrix of core competencies required developed. Combine into an integrated regional plan. Gaps identified collectively. Action plan developed collectively.	Medium	30/06/2021	Roading Asset Engineer	HR departments

Waitaki
DISTRICT COUNCIL

PART C: ASSET MANAGEMENT PLAN

APPENDIX A: Asset Management Data Quality Report