

ROADING – NGA HUARAHI WAKA

ASSET MANAGEMENT PLAN

Masterton District Council 2024-2034

Incorporating the Strategic Case and Programme Business Case for the 2024-27 National Land Transport Programme



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Abbreviations	
AC	Asphaltic concrete
ADS	Advance direction sign
ADT	Average daily traffic
CAS	Crash Analysis System
CBD	Central Business District
CI	Condition index
DSI	Deaths and serious injuries
EMP	Edge marker post
ESA	Equivalent standard axels
GIS	Geographical Information System
HCV	Heavy commercial vehicle
HPMV	High Performance motor vehicle
HSIMS	Highway structure information management system
LCLR	Low-Cost Low Risk
LED	Streetlight (light emitting diode)
LGA	Local Government Authority
LoS	Level of service
MDC	Masterton District Council
MOR	Maintenance, Operations and Renewals
MOTSAM	Manual of Traffic Signs and Markings
NAASRA	National Association of Australia State Road Authorities
NRB	Nation Roads Board (now NZTA)
NZTA	New Zealand Transport Agency (also known as Waka Kotahi)
ONRC	One Network Road Classification
PII	Pavement integrity index
RAMM	Road Asset Management System
RCA	Road Controlling Authority
REG	Roading Efficiency Group
RP	Route Position
RRPM	Raised reflective pavement marker
RTS	Road and Traffic Standard
SCI	Surface condition index
SON	Streetlight (Sodium)

STE	Smooth Travel Exposure
SWC	Surface water channel
TA	Territorial Authority
TNZ	Transit NZ (now Waka Kotahi - NZTA)
TTM	Temporary traffic management
VKT	Vehicle kilometres travelled
WC	Work Category

EXECUTIVE SUMMARY

This Roding Asset Management Plan (AMP) provides strategies that combine management, financial, engineering, and technical practices. This AMP should be read in conjunction with the Long-Term Plan (LTP 2024-34).

The plan contributes towards achieving the Masterton District Councils (MDC) stated community outcomes of being an easy place to move around, achieving a strong sustainable economy and having an active, involved, and caring community, making us a sustainable, healthy natural environment, and creating a knowledgeable resilient community. Strategic and tactical asset management also plays a role in improving social and environmental outcomes for Masterton.

This AMP has been prepared during recovery from the impacts of Cyclones Hale and Gabrielle, which caused considerable damage to portions of the network. Restoration of full service through recovery works is expected to take two or three years. In the Mataikona situation a business case will guide a long-term solution. At the same time the remainder of the network cannot be ignored, and prudent management remains key.

Building a strong programme to rehabilitate a declining network by investing in timely renewals is the overarching theme of this AMP; in association with targeted investment in improving the safety, access, and resilience of the network.

The maintenance and renewal programme of works is data driven which shows the optimal timeframes for work to be completed. The works programme has been planned to address the problems highlighted by recent recommendations raised in a technical audit. Carrying out these recommendations will reduce the risk of significant future costs to our community, which have been exacerbated by unsustainable contract rates and many years of restrained investment in capital renewals.

Using sound strategic planning MDC has built a long-term programme that is both fiscally responsible and addresses the key issues over the life of this AMP.



Photo: [Cyclone Gabrielle: Region in line for share of \\$1b - Wairarapa Times-Age](#)

What we manage

MDC manages a range of transportation services and assets to facilitate transportation in the Masterton District.

The Figure 1 (right) shows the quantity and range of assets MDC is responsible for within the roading network, Section 9 (Programme Business Case) covers the work undertaken on the assets in detail.

Level of Service

This AMP describes what Roding assets MDC manages, talks of the expected levels of service, and how these factors may influence the growth or demand for Roding in the future.

For the duration of this AMP, MDC is maintaining existing levels of service. However, some urban areas will require new assets to be created to provide the standard level of service expected from the community. This includes areas where residential development is occurring as well as where town centre upgrades are proposed Assets, such as footpaths and lighting improvements, also help address safety and access for pedestrians and align with regional and national outcomes.

For further detail, including measures and targets for the levels of service, refer to Section 3.

Upon review, the problem statements identified in 2021 remain appropriate with a particular focus on accessibility, now extending to the impacts of cyclone damage on the network.

Figure 1: Roding Assets

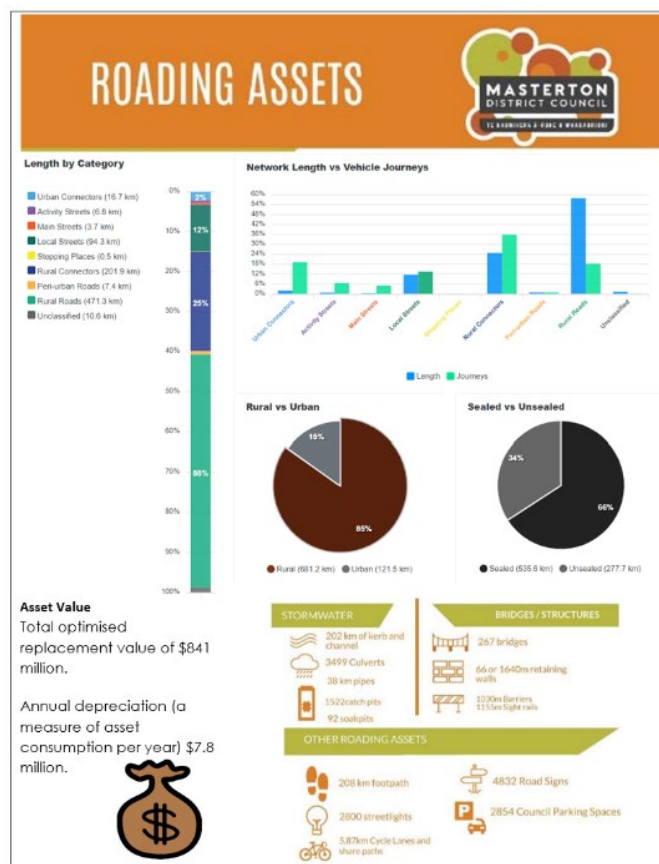


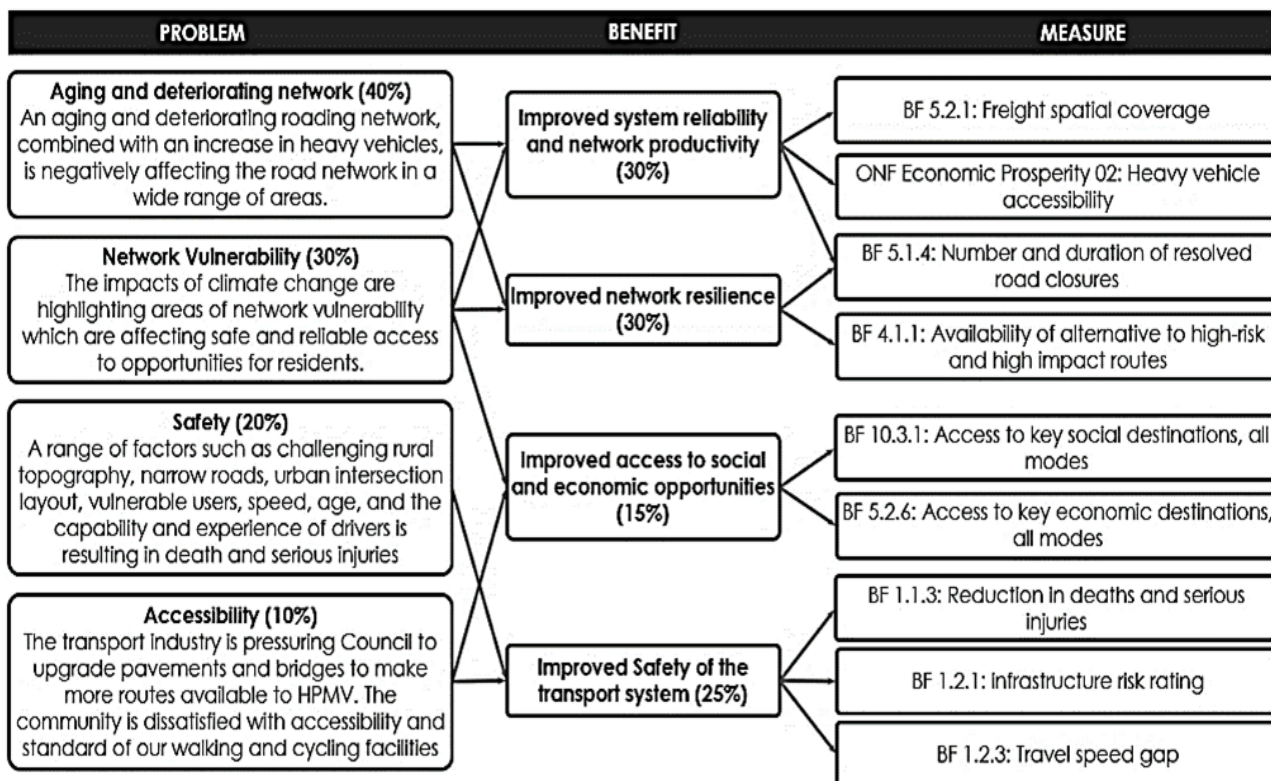
Figure 2: Innovative local solutions



Key Issues

To assist in shaping the programme of works in this AMP, MDC has further developed problem statements. These focus on the major problems affecting the network, what the benefits to solving these problems would be and how MDC will respond. An overview of the problems, along with the proposed benefits and responses are outlined in the Figure 2 and Figure 3

Figure 3: Investment Logic Map



Operational Programme

The transportation maintenance, operational and renewals programme is the largest of MDC activities. Together it constitutes around 14 million dollars of annual spending. The three major areas within the programme and their forecast spend for the next 10 years are shown below. The detail programme case is for the funding outlined in section 9.

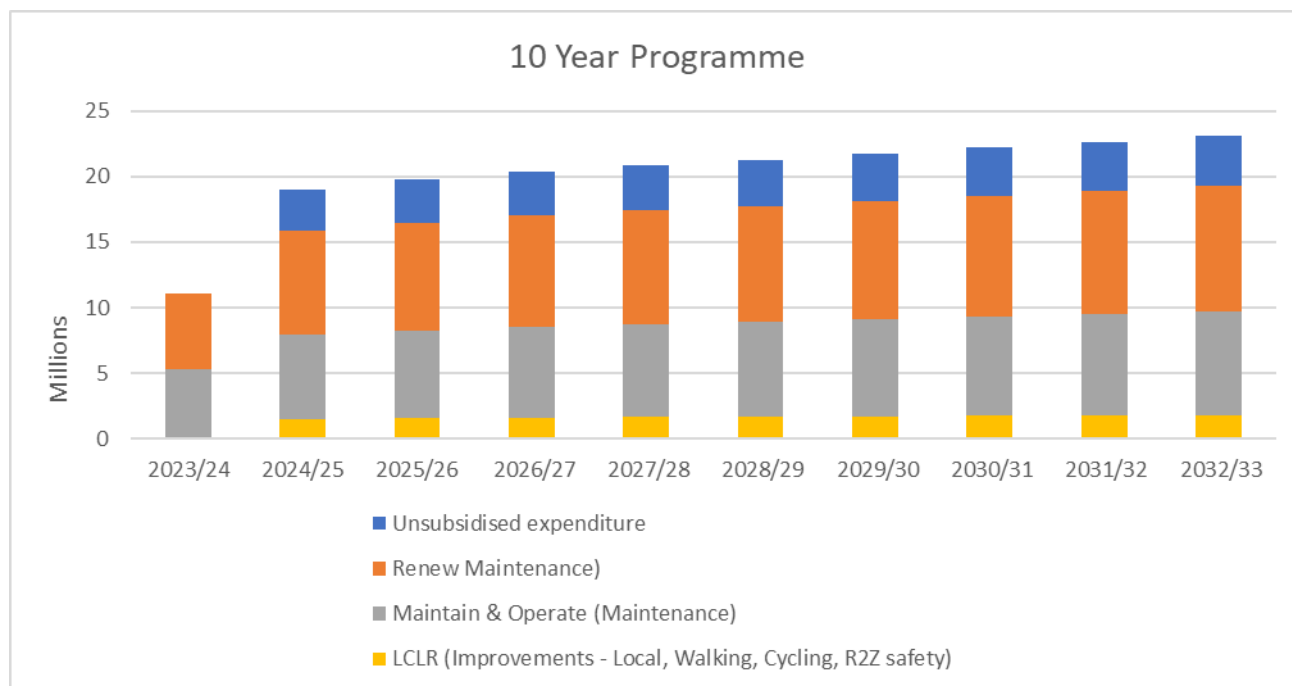
In 2021, it was anticipated that investment in maintenance and operations would remain relatively constant for the foreseeable future. This investment in renewals proposed was in response to MDC deterioration modelling scenarios, Waka Kotahi (NZTA) audit recommendations and the increased activity in the forestry sector, which is applying additional demand loading on pavements.

Over the past three years the impact of cyclones Gabrielle and Hale along with other storms has refocused efforts. While rebuild and recovery of storm damaged assets is an immediate focus, it is important that we do not allow other assets to fall into disrepair. Accordingly, the focus will remain on timely asset renewal outside of the recovery works.

Capital Programme

MDC has developed the capital programme of works based on prioritisation of projects that address resilience, safety, access, renewals and growth. These projects are moderated for alignment with the GPS, RLTP and LTP outcomes.

Road safety remains a high priority with project funding being aligned with a programme to reduce death and serious injuries by 40% in the next 10 years. This focus aligns with national and regional priorities and Road to Zero safety strategy.



Financial Strategy

Roading is funded through a district wide roading charge per property, a smaller allocation through the charge of land value and from financial assistance from Waka Kotahi/NZTA dedicated central transport funding programme.

Councils Funding Assistance Rate (FAR), the amount of financial assistance given to MDC from NZTA, will be 56% in 2024/27 period. The FAR is for subsidised work activities meeting the funding criteria. The remainder will be met by MDC from uniform and targeted rates.

The total optimised replacement cost of roading assets as at 30 June 2022 was \$840,740,319. With an optimised depreciated replacement cost of \$651,957,155. Annual depreciation (a measure of asset consumption) for 2023/24 was calculated \$7,810,387.

Risk and Improvements

The AMP also talks of the possible risks that may lie ahead of us for Rooding and summarises the levels of maintenance and renewals required to provide appropriate levels of service. This now includes asset criticality to focus actions on priority areas (see section 8).

This AMP is a critical tool; we see it as a living document that has a continuous cycle of improvement and will continue to be refined as our organisation moves forward; refer to Improvement Plan section.

STRATEGIC CASE (Nos. 1-8 inclusive)

1 Introduction

Masterton District Council's (MDC) Land Transport Activity Management Plan (AMP) sets out how Council will manage transport assets across the district. These assets are critical to the efficient operation of the district's transport network and include roads, footpaths and cycleways, bridges, drainage, lighting, retaining walls and signage. Investment is needed to maintain these assets to provide a safe and efficient transport network that meets customer needs. This plan identifies the assets Council is responsible for managing, the challenges Council faces in maintaining and renewing its assets and how Council will plan and prioritise investment over the next 10 years.

1.1 Purpose Of This Plan

The purpose of the AMP is to outline the Council's plan for managing its land transport assets for the next 30 years. The AMP combines Council's management, financial, engineering, and technical practices and is intended to:

- ensure that an agreed level of service is provided to defined standards at optimum cost
- be sustainable in the long term
- comply with regulatory requirements
- help the Council to achieve the outcomes the community has defined.

The key elements of this AMP are:

- a description of the asset including its various components
- the level of service to be delivered for customers
- the management strategy for operating the roading network
- the financial impacts of managing the assets
- an improvement plan to optimise assets

1.1 Relationships With Other Council Plans

Council Strategies and Plan establish the focus and priorities of investment. The AMP enables plan should be read in conjunction with Council's other key planning documents, as detailed in Table 1-1.

Table 1-1: Linkages between the AMP and other strategic documents

Document	Linkage to AMP
Long Term Plan (LTP)	This is Council's broad strategic direction and investment priorities for set in the context of current and future customer requirements. The AMP is the means for developing appropriate strategies and policies for the long-term management of council assets. It also forms the basis for analysing the impact of corporate strategy options on levels of service and long-term funding needs, which feed into the council's strategic plan, the Long Term Plan (LTP).
Infrastructure Strategy	The Infrastructure Strategy supports Council's LTP. It outlines how Council intends to manage their infrastructure assets over the next 30 years.
Annual Plan	The service level options, and associated costs developed in the AMP will be fed into the Annual Plan consultation process.
Financial and Business Plans	The financial and business plans requirement by the Local Government Amendment Act (3) requires expenditure projections. These will be taken directly from the financial forecasts in the AMP.
Contracts	The service levels, strategies and information requirements contained in the AMP are the basis for performance standards in the various roads and traffic services maintenance contracts.
Corporate Information	Sound asset management is dependent on suitable information and data and the availability of sophisticated asset management systems which are fully integrated with the wider corporate information systems (e.g., financial property, GIS, customer service, etc.). The Council's goal is to work towards such a fully integrated system.

1.2 Why Is Transport Important for Masterton?

Transport is an important part of any community. It enables people to move around to access to employment and key goods and services, provides opportunities for social and recreation activities and supports mental and physical wellbeing.

Council's vision is "*Masterton/Whakaoriori: Provides the best of rural provincial living*". Council's vision is supported by five community outcomes:

- An engaged and empowered community
- Pride in our identity and heritage
- A sustainable and healthy environment
- A thriving and resilient economy
- Efficient, safe and effective infrastructure

An efficient and effective land transport system is a key element in achieving each of these outcomes and underpins overall vision. As a community, Masterton has limited transport options and is highly dependent on the road network for moving people and goods. A well-designed and maintained roading network is the primary means of doing this. An AMP provides the plan to achieve this outcome.

1.3 Achieving key strategic outcomes

This AMP covers all land-based transportation activities that Council funds, either in full or with assistance from Waka Kotahi. The AMP seeks to provide value for money by identifying how Council can optimise its assets to deliver a transport network that meets both national transport outcomes and the key community outcomes. Council's community outcomes are highlighted previously (Section 1.2), while the Government's Transport Outcomes Framework is shown in Figure 1-1.

An outline of Council's key transport activities and services and how these contribute to these outcomes is shown in Section 5: Levels of Service.

Figure 1-1: Transport Outcomes Framework (Ministry of Transport)

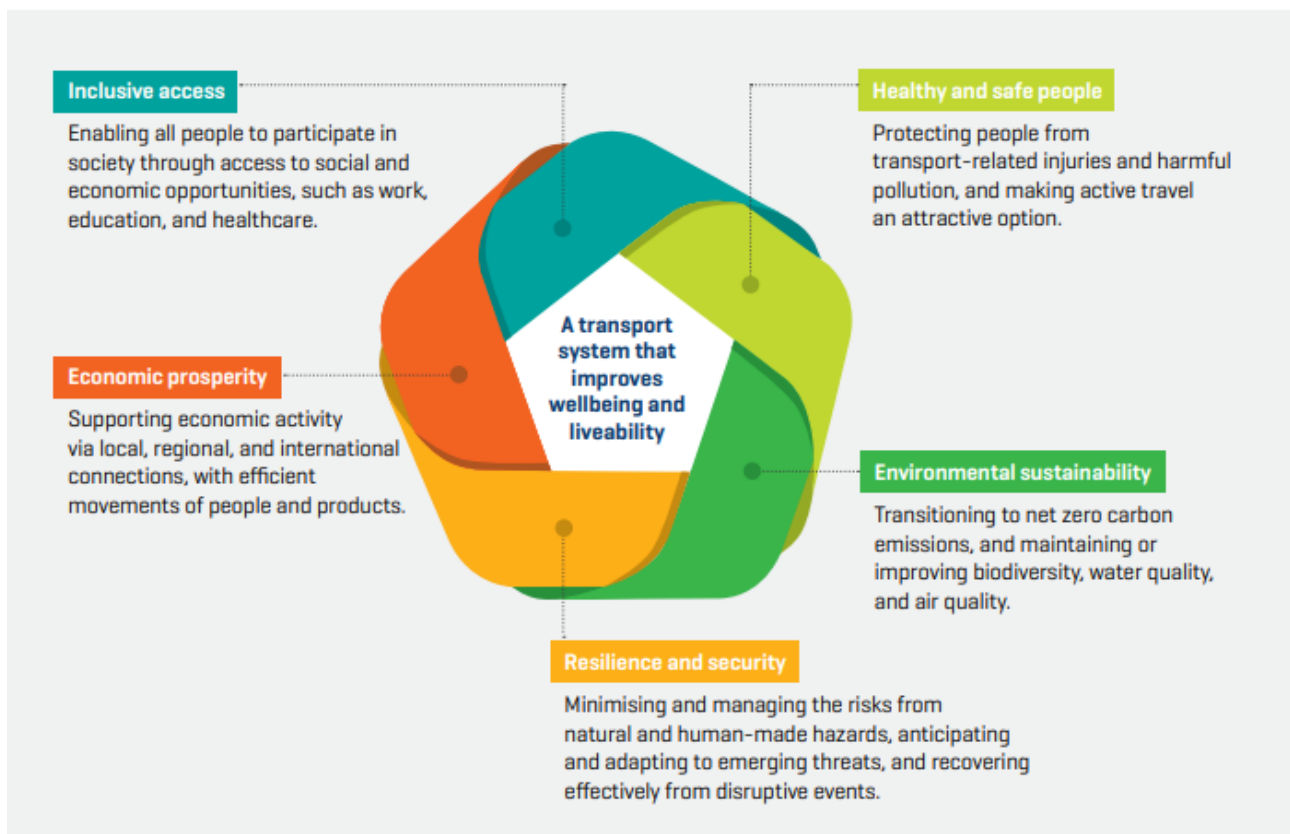


Table 1-2: Alignment of Council's transport activities/services with community and national outcomes

Transport Activity	Benefit	Key Services Council Provides	MDC Community Outcomes	National Transport Outcomes
Providing a safe transport system	The transport network enables the safe movement of people and goods around the district.	Safety improvement works. Maintenance and renewal of transport assets.	Efficient, safe, and effective infrastructure.	Healthy and safe people: reduction in accidents due to fit for purpose road surfaces, guardrails, lighting, road marking, signs.
Providing a resilient transport system	A resilient transport network enables the movement of people and goods around the district.	Resilience improvement works. Reconstruction of damaged infrastructure. Planning and management to ensure the transportation system can better withstand the increasing frequency and intensity of extreme weather events.	Efficient, safe, and effective infrastructure. A thriving and resilient economy	Resilience and security: reducing the risk of interruption to travel as a result of extreme weather events by providing drainage and road support structures. Economic prosperity: supporting economic activity by providing routes that are more resilient to the increasing frequency and intensity of extreme weather events and their impacts.
Movement of people and goods	The transport network enables people to move around the district, providing access to key goods and services, education, employment, and opportunities for social and recreation activities.	Maintenance and renewal of: - Sealed roads - Unsealed roads - Bridges and other structures - Drainage - Traffic services including signage, road marking, and other road furniture - Street Lighting	Efficient, safe, and effective infrastructure A thriving and resilient economy.	Resilience and security: reducing the risk of interruption to travel as a result of high intensity rainfall events by providing drainage and road support structures. Economic prosperity: supporting economic activity by providing bridges that allow for heavy vehicle access to productive land. Healthy and safe people: reduction in accidents due to fit for purpose road

Transport Activity	Benefit	Key Services Council Provides	MDC Community Outcomes	National Transport Outcomes
		Planning and management to ensure the transportation system can cope with future needs. Development of the transportation and traffic networks.		surfaces, guardrails, lighting, road marking, signs. Inclusive access: enabling people to access social and economic opportunities through a road network that is easy to navigate with well-maintained guidance signage and comfortable journey provided by quality pavements.
Active Transport (walking and cycling)	Provision of footpaths and cycle routes promotes opportunities for physical activity, and provides low carbon transport options. Active transport networks also enhance transport equity and improve community resilience with transport choice.	Maintenance and renewal of: • Footpaths • Cycleways	A sustainable and healthy environment Efficient, safe and effective infrastructure.	Healthy and safe people: protecting people from transport related injuries when using active transport modes by providing paths separated from other traffic. Inclusive access: cycling and walking paths kept tidy and functional by keeping vegetation controlled, graffiti removal, roadside furniture maintenance. Economic prosperity: Investment in pedestrian improvements in urban centres contributes to attractive place that entice people to visit and shop.

Transport Activity	Benefit	Key Services Council Provides	MDC Community Outcomes	National Transport Outcomes
Protecting our Environment	Mitigation and management of negative impacts from roads and vehicle.	Maintenance of the road reserve including: • Mowing, weed spraying • Sweeping and cleaning (e.g. litter and graffiti removal) • Dust mitigation measures	A sustainable and healthy environment.	Environmental sustainability: maintaining biodiversity, water quality and air quality by managing plant pests, roadside cleaning and dust control.
Parking	Provides convenient access to local businesses to support economic growth.	Maintenance and renewal of car parks.	Efficient, safe and effective infrastructure A thriving and resilient economy.	Healthy and safe people: on and off-street parking facilities to ease the safe movement of passenger vehicles within the transport network. Inclusive access: enabling people to access social and economic opportunities through availability of car parking within the CBD and community facilities.

2 Key Partners and Stakeholders

Our key partners are the groups or organisations who we share responsibility to manage the transportation issues in our district. Key partners are detailed in Table 2-1.

Table 2-1: Key partners

Partners	Knowledge and Involvement
Waka Kotahi NZ Transport Agency (Waka Kotahi)	Funding partner – currently provides a Funding Assistance Rate (FAR) subsidy rate of 56% for approved projects. Sets out the activities that can receive funding from the National Land Transport Fund under the Land Transport Management Act. Provides a vital link between government policy making and the operation of the transport sector.
Iwi	Local iwi include Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa.
Te Ringa Maimoa Transport Excellence Partnership	Te Ringa Maimoa is a collaborative initiative between Local Government NZ, Waka Kotahi and Road Controlling Authorities (RCAs). They provide support and tools for implementing One Network Framework (ONF) and Business Case Approach (BCA) Activity Management Plans.
Road Controlling Authorities Forum New Zealand (RCAF)	RCAF is a closed, non-political group with representatives from the 73 territorial local authorities, the Department of Conservation, Local Government New Zealand, and Waka Kotahi. Its purpose is to assist RCAs to make informed decisions, through information exchange, working groups, legislation, standards and guidelines, highway and procurement strategies etc.
Greater Wellington Regional Council	Sets the direction for the region's land transport system for the next 30 years through the Regional Land Transport Strategy and Regional Public Transport Strategy.
Carterton District Council, South Wairarapa District Council	Neighbouring RCAs with whom we have a strong strategic alignment.
Kapiti Coast District Council, Upper Hutt City Council, Lower Hutt City Council, Porirua City Council, Wellington City Council	Other RCAs within the Greater Wellington region.

Our key stakeholders are those groups or individuals who can help us to focus our strategic planning on the right things. They have information and knowledge to help us make better decisions. Our key stakeholders are:

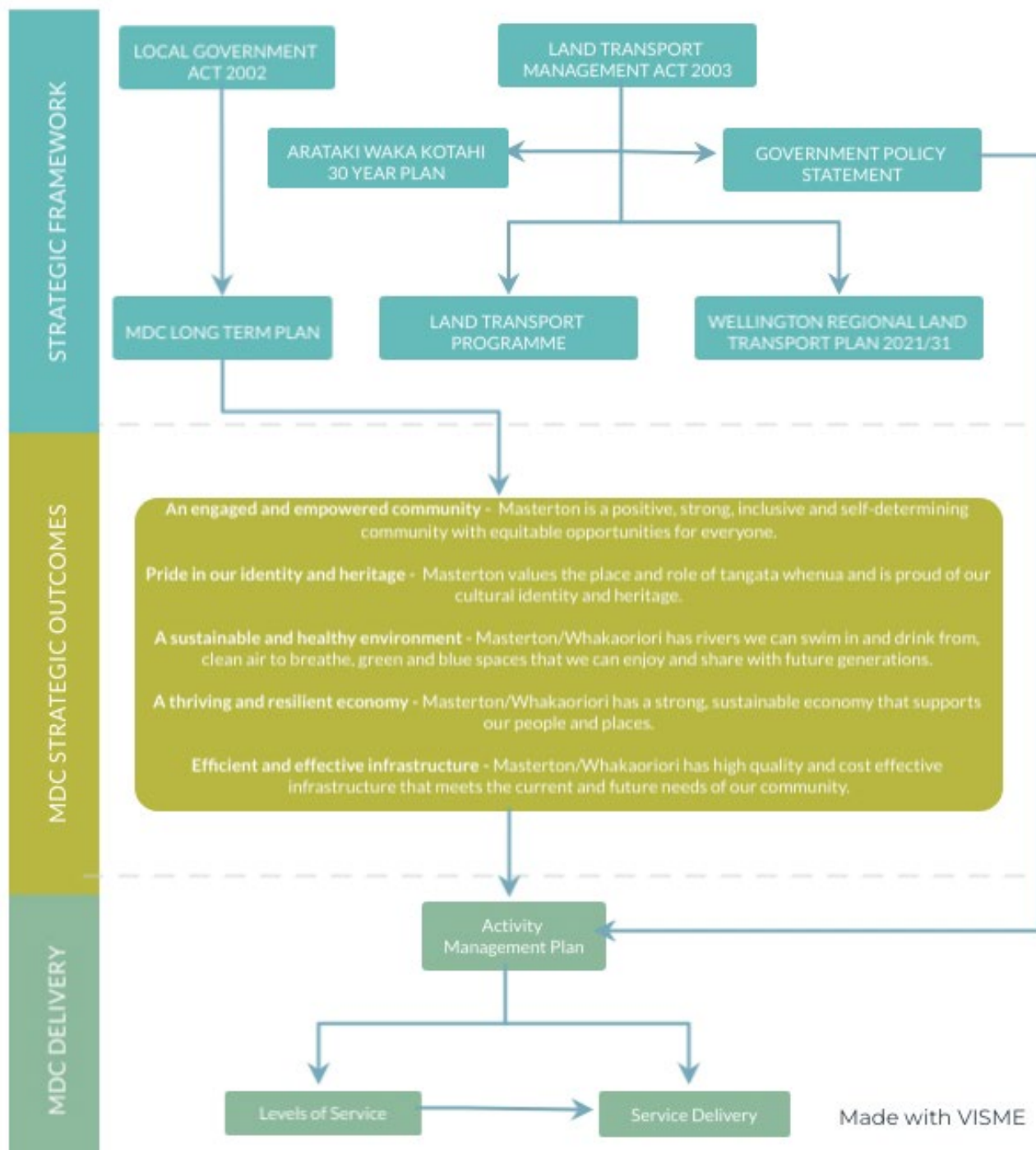
- Forestry companies
- Federated Farmers
- Road Transport Forum
- NZ Police and other emergency services
- Destination Wairarapa
- Roading contractors
- Utility owners
- NZ Heavy Haulage Association
- Tranzit Coach lines
- Ratepayers and residents
- Cycle Groups
- AA Wairarapa
- Education institutions



3 Strategic Alignment

This AMP has been prepared to align with the relevant national, regional, and local strategic context. Figure 3-1 shows how national, regional and local strategies and plans provide the overarching context of Council's activity management planning approach.

Figure 3-1: Alignment between national, regional and local strategies and plans



3.1 Strategic Documents

Key documents providing national, regional, and local strategic direction for land transport are included in Table 3-1.

Table 3-1: Key strategic documents

Document	Summary												
National													
Land Transport Act 1998 (Reprint as at 30 November 2022)	Key objectives that provide direction for Masterton's Land Transport include: • Assisting economic development • Improving access and mobility • Protecting and promoting public health • Ensuring environmental sustainability • Assisting safety and personal security												
National Transport Outcomes (2018)	The Ministry of Transport's (MOT) Transport Outcomes Framework states the key purpose of the land transport system is to improve wellbeing and liveability. The Transport Outcomes that government is seeking to achieve through the transport system are: 1. Healthy and safe people 2. Environmental sustainability 3. Resilience and security 4. Economic prosperity 5. Inclusive access. The outcomes provide an enduring framework to guide transport decisions and direction. All of these outcomes are inter-related and need to be met as a whole to improve intergenerational wellbeing and the quality of life in New Zealand's cities, towns, and provinces. Table 1-2 Demonstrates how Council's transport services contribute to these national transport outcomes.												
Government Policy Statement on Land Transport (2024)	The GPS sets out the Government's priorities for expenditure from the National Land Transport Fund (NLTF) and how Crown funding complements that investment. It also provides direction to local government, KiwiRail and NZTA on the type of activities that should be included in Regional Land Transport Plans (RLTP), the Rail Network Investment Programme (RNIP) and the National Land Transport Programme (NLTP) respectively. The draft GPS 2024 was released in March 2024, with the engagement period ending after the time this section was developed. The results the Government wishes to achieve from NLTF investment are expressed via a set of strategic priorities. GPS 2024 includes an overarching priority of economic growth and productivity, supported by three equally weighted priorities which are: <table><tr><th colspan="3">Economic growth and productivity</th></tr><tr><td colspan="3">Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities.</td></tr><tr><td>Increased maintenance and resilience</td><td>Safety</td><td>Value for money</td></tr><tr><td>Increasing access to markets and resilience on our state highway, local and rural roads</td><td>A focus on safer roads, safer drivers and safer vehicles.</td><td>Investment in transport must deliver better outcomes for present and future generations of New Zealand</td></tr></table>	Economic growth and productivity			Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities.			Increased maintenance and resilience	Safety	Value for money	Increasing access to markets and resilience on our state highway, local and rural roads	A focus on safer roads, safer drivers and safer vehicles.	Investment in transport must deliver better outcomes for present and future generations of New Zealand
Economic growth and productivity													
Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities.													
Increased maintenance and resilience	Safety	Value for money											
Increasing access to markets and resilience on our state highway, local and rural roads	A focus on safer roads, safer drivers and safer vehicles.	Investment in transport must deliver better outcomes for present and future generations of New Zealand											

Document	Summary
Arataki Strategy (2023)	Arataki presents Waka Kotahi's 30-year view of what is needed to deliver on the government's current priorities as set out in the Transport Outcomes Framework and other strategies. It details the most important issues to be resolved over the next 10 years for the Greater Wellington Region. Some key challenges identified are: • Vehicle kilometres travelled (VKT) reduction • Improved access to opportunities by public transport, walking and cycling • Rapidly accelerate delivery of walking and cycling networks • Confirm how resilience risks will be addressed over time, and work with communities to plan when to defend, accommodate, or retreat
Road to Zero (2019)	The Road to Zero Strategy has a vision of <i>"a New Zealand where no one is killed or seriously injured in road crashes"</i>. The strategy acknowledges that people make mistakes on the road, but this should not result in death or serious injury. The Road to Zero marks a step change in road safety and builds on the previous Safer Journeys strategy. The strategy will focus on: • Infrastructure improvements and speed management • Vehicle safety • Work-related safety • Road user choices • System management
Ministry for the Environment National Adaptation Plan	The first National Adaptation Plan sets out what the Government will do to enable better risk-informed decisions, drive climate-resilient development in the right locations, help communities assess adaptation options (including managed retreat) and embed climate resilience into all of the Government's work. The long-term adaptation goals identified by the plan are to reduce vulnerability, enhance our ability to adapt, and strengthen our resilience. The plan identifies four adaptation options: avoid, protect, accommodate and retreat.
Tiro Rangi – Climate Adaptation Plan 2022–2024	Tiro Rangi is Waka Kotahi NZ Transport Agency long-term plan for adapting the land transport system to our changing climate. Tiro Rangi looks at the long-term impacts of climate change. It lays out a plan for adaptation over two years to 2024 with 21 high-level actions in six themes, and a long-term goal.
Regional	
Wellington Regional Land Transport Plan 2021 (RLTP)	The RLTP is the primary document guiding integrated land transport planning and investment for the Wellington region. It sets out the Wellington regional 30-year vision as <i>"A connected region, with safe, accessible and liveable places – where people can easily, safely and sustainably access the things that matter to them – and where goods are moved efficiently, sustainably and reliably."</i> The 2021 strategic priorities are to help achieve this vision are: • People in the Wellington Region have access to good, affordable travel choices

Document	Summary
	• Transport and land use are integrated to support compact urban form, liveable places, and a strong regional economy • People can move around the Wellington Region safely • The impact of transport and travel on the environment is minimised • Journeys to, from and within the Wellington Region are connected, resilient and reliable
Wellington Regional Public Transport Plan 2021-31 (RPTP)	The RPTP guides the design and delivery of public transport services, information and infrastructure in the Wellington region. It states the strategic priority is to achieve an “<i>efficient, accessible and low carbon public transport network</i>.” The three strategic priorities to achieve this are: • of mode shift, • decarbonisation of the public transport fleet and • improving customer experience
Regional Economic Development Plan (2022 – 2032)	The vision of the plan is “to build a future-focused, creative, sustainable and thriving Wellington region for all to be proud of.” The strategic objectives relevant to Masterton’s land transport include: • To be a leader of change using our competitive advantage in key sectors • To build a prosperous and creative region with improved quality of life • To build resilience in our workforce and infrastructure to support economic development • To support a transition to a low carbon economy and responsibly manage our natural resources for future generations
Wellington Regional Growth Framework (2021)	The Framework is a 30-year spatial plan for the Wellington-Horowhenua region. It outlines how the region can accommodate additional people and jobs. The Framework includes the following key initiatives that will impact on future transport infrastructure requirements: • Regional approach to climate change • Increase rapid transit rail/bus network accessibility, capacity and frequency including inter-regional connectivity • Significantly improve multi-modal connections to rapid transit stops
Local	
Long Term Plan 2021 - 2031	The LTP is the key planning document for Council and describes how Council will fulfil its responsibilities under the Local Government Act 2002 to promote the well-being of the district and enable democratic decision making. The LTP states that Council’s vision is that Masterton offers the best of rural provincial living. Five aspirational outcomes were identified to help achieve the vision and enhance community wellbeing. For more information about the outcomes refer to Section 1.2.

Document	Summary
Wairarapa Economic Development Strategy 2022 – 2030	This document provides key strategy for economic development in Wairarapa. It outlines Wairarapa's current and future economic prospects and goals for further economic development and population growth.
Wairarapa Combined District Plan 2021	The Plan sets out the framework for the sustainable management of natural and physical resources in the Wairarapa District. It gives key guidance on land use, changes and effects, as well as natural resource management impacting on land transport considerations. There are no spatial plans for MDC. See also 6.1

3.2 Other Key Legislation

The legislative requirements that the Council is required to comply with when carrying out its services are extensive. There are a number of Acts which set out the need, the requirements and the standards for the provision of services. Table 3-2 details the key legislation relating to the management of roading assets.

Table 3-2: Legislative Requirements

Legislation	Requirements of Council
Local Government Act 1974	Empowers Council to control all roads (excluding State Highways) in the district. Schedule 10, Clause 2(1): Requires Council to consider all reasonably practicable options and to assess the economic, environmental, social, and cultural impacts of each option. Schedule 10, Clause 6: Requires Council to comply with certain funding and financial management policies. Sections 76/81: Requires Council to ensure public consultation in decision-making process. Section 102(4)(d): Requires Council to have a policy on development contributions and to include it in its LTP.
Transit NZ Act 1989	Council works in partnership with Waka Kotahi to undertake capital projects and maintenance works in its district which forms part of the national roading programme in return for which it receives financial assistance from the National Roads Account administered by Waka Kotahi. This work is subject to the application of competitive pricing procedures and must be carried out in accordance with the performance agreement between the council and Waka Kotahi.
Resource Management Act 1991	The RMA is currently going through a reform and will be repealed and replaced with three new Acts which are expected to become law in mid to late 2023: • Spatial Planning Act (SPA) which requires the development of long-term regional spatial strategies to help coordinate and integrate decisions made under relevant legislation

Legislation	Requirements of Council
	• Natural and Built Environment Act (NBA), the main replacement for the RMA, to protect and restore the environment while better enabling development • Climate Adaptation Act (CAA) to address complex issues associated with managed retreat, and funding and financing climate adaptation. Currently, the RMA requires Council to: • sustain the potential of natural and physical resources to meet the reasonable foreseeable needs of current and future generations • comply with the District and Regional Plans • avoid, remedy, or mitigate any adverse effect on the environment and structures (e.g., adverse effects of surface run-off from roads) • consult with the Tangata Whenua and consider the principles of the Treaty of Waitangi in the management of roading assets.
The Building Act 1991	Requires Council to: • ensure all buildings and facilities constructed comply with the Act • produce Project Information Memoranda (PIMs) which supply all available information relating to an individual property. For roading services, the relevant information may include details of access restrictions, approvals, leases, plans, relevant records, notices, etc.
Local Government (Rating) Act 2002	Provides local authorities with flexible power to assess, set and collect rates and charges on rateable properties within its district to fund activities including roading.
Land Transport Management Act 2003	Requires the council to prepare an annual Land Transport Programme.
Wairarapa Combined District Plan	This document determines land use and levels of consultation required to undertake certain kinds of work.

3.3 Network Classification

3.3.1 This Activity Management Plan

The One Network Framework (ONF) has replaced the One Network Road Classification (ONRC) system. However, key data sources and reporting tools (such as the Transport Insights tool) are still using the ONRC system. The new Differential Level of Service (DLoS) approach proposed for the ONF is also still in development and has not been implemented.

For these reasons, assessment and reporting for this AMP period continues to use the ONRC system. It is expected that the next AMP update will use the ONF exclusively.

3.3.2 One Network Framework

The ONF is a road classification tool using both place and movement functions to identify road categories. It classifies the network into rural or urban (based on land use) and assigns a place (based on activity and physical form) and movement (based on traffic volume) function to the network by section, shown in Figure 3-2. As such, a length of road can have multiple classifications based on its place and movement function. This allows for targeted design, and better planning and delivery of a modern transport system that meets the increasing needs of people, businesses, communities and our climate.

Figure 3-2: Street Categories as per the ONF



3.3.3 One Network Road Classification

The ONRC was adopted by the roading sector for national consistency of the level of service delivered by a network. While the ONRC has been replaced by the ONF, the ONRC continues to be used for this NLTP period. ONRC classifications are based on a number of different factors which are described in Table 3-3.

For information on the Masterton roading network characteristics refer to Section 4.5.1.

Table 3-3: ONRC Descriptions

Road Classification	Description	Annual Average Daily Traffic (AADT)		Heavy Commercial Vehicles
		Urban	Rural	
National (high volume)	As below but higher traffic volumes	> 35,000	> 20,000	> 1,200
National	Link major population centres and transport hubs	> 25,000	> 15,000	> 800
Regional	Major connectors between regions; often public transport routes	> 15,000	> 10,000	> 400
Arterial	Link regionally significant places and industries	> 5,000	> 3,000	> 300
Primary Collector	Link significant local populations and industries	> 3,000	> 1,000	> 150
Secondary Collector	Provide secondary routes, can be the only route in some places	> 1,000	> 200	> 25
Access	Small roads facilitating daily activities	> 1,000	> 200	< 25
Access (Low Volume)	As above but low traffic volumes	> 200	> 50	< 25

Performance measures for the ONRC, along with customer level of service (CLOs), have been developed. The CLOs will vary based on the road classification, and are defined as follows:

- **Safety:** How road users experience the safety of the road
- **Resilience:** The availability and restoration of each road when there is a weather or emergency event (unplanned), whether there is an alternative route available and road user information provided
- **Amenity**
 - **Travel Quality:** The level of travel comfort experienced by the road user
 - **Travel Aesthetics:** The aesthetic aspects of the road environment (e.g. cleanliness, comfort, convenience, security) that impact on the travel experience of the road users in the road corridor

- **Accessibility:** The ease with which people can reach key destinations and the transport networks available to them, including land use access and network connectivity (wayfinding)
- **Travel Time Reliability:** The consistency of travel times that road users can expect

Application to the Masterton transport network is discussed in section 4.5.1.

4 Strategic Context

4.1 Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa

Historical Overview

Wairarapa is said to have been named by the Māori explorer Haunui as he stood on a peak in the Remutaka Range, looking down over the extensive valley. As he looked, the sun sparkled on the waters of the rivers and lakes, and he called the area Wairarapa – meaning Glistening Waters.

In pre-European times, the Wairarapa was settled by successive waves of Māori. By the time European settlers arrived, the two iwi - Rangitāne and Ngāti Kahungunu were the tangata whenua of Wairarapa.

During the disruption caused by the Musket Wars many Wairarapa Māori left the district for sanctuary in Hawke's Bay and the East Coast, returning in 1841 following 10 years of exile. They set about rebuilding their villages and re-establishing cultivations on their traditional sites. Sites near Masterton included Kaikokirikiri (near Mahunga golf course), Mangaakuta (Homebush), and Kaitekateka at Te Ore-Ore.

Treaty Settlements

Both iwi have now settled, with their treaty settlements reflected in the following legislation:

- Rangitāne Tū Mai Rā (Wairarapa Tamaki nui-ā-Rua) Claims Settlement Act 2017
- Ngāti Kahungunu ki Wairarapa Tāmaki nui-ā-Rua Claims Settlement Act 2022
- Te Rohe o Rongokako Joint Redress Act 2022

All three Acts have implications in terms of what Council needs to give effect and provide for. More detail is available via the following websites www.govt.nz and www.govt.nz and www.legislation.govt.nz

Iwi-Council Relationships

Today, Council is committed to developing and maintaining positive working relationships with iwi, hapū, marae, and Māori communities in the Masterton district.

Council has Memorandums of Partnership with Kahungunu ki Wairarapa and Rangitāne o Wairarapa. These documents will be reviewed and updated to reflect iwi entity structure changes, and in particular partnership agreements with the post Treaty Settlement Entities now that Rangitāne o Wairarapa and Ngāti Kahungunu ki Wairarapa have settled.

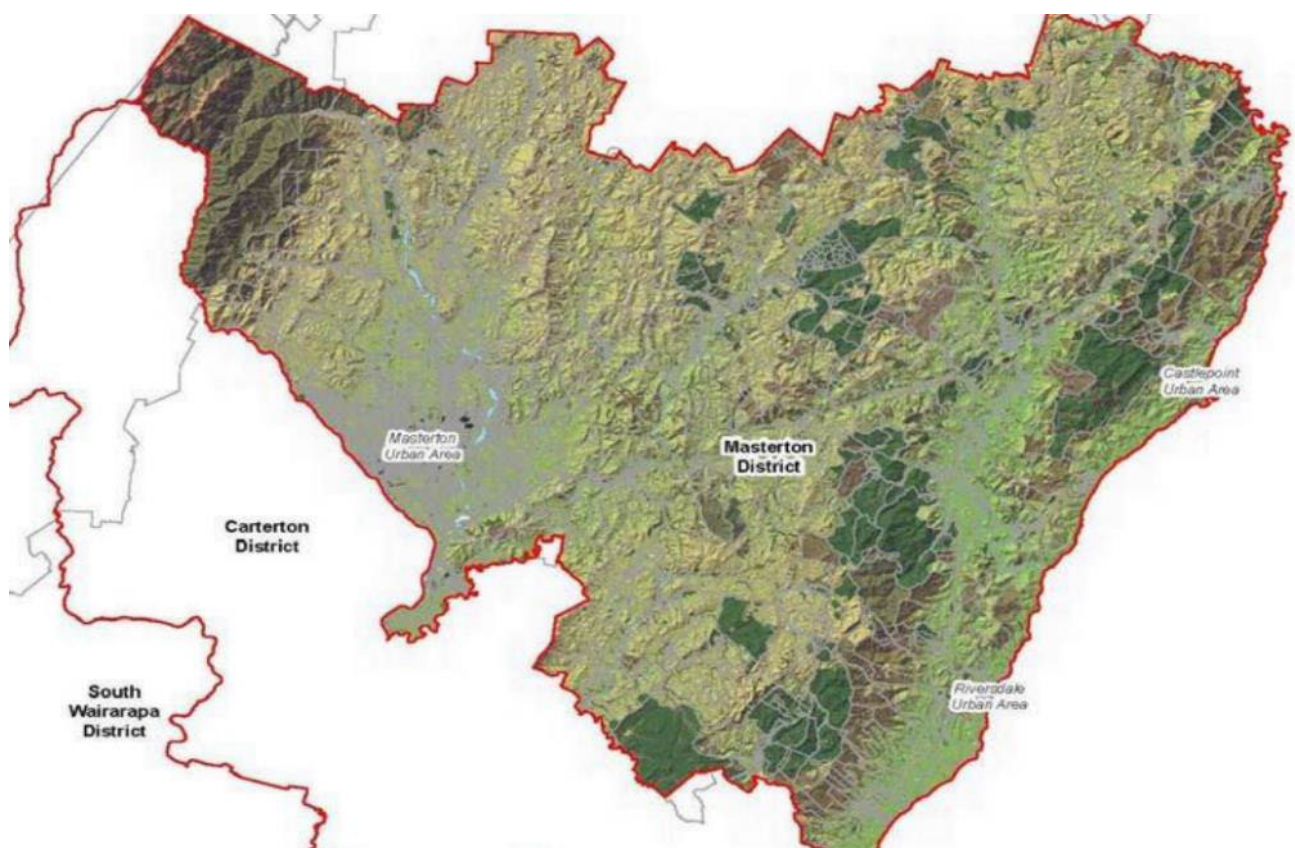
In terms of Governance and representation, Council has two iwi representatives. One nominated by Ngāti Kahungunu ki Wairarapa and the other by Rangitāne o Wairarapa. They are appointed to all Council's committees and have both speaking and voting rights. They also attend and have speaking rights at Council meetings but do not have voting rights as it isn't possible for Council to appoint non-elected members to Council.

Other Council committees and Council Advisory Groups have iwi representation or space within its Terms of Reference to have iwi representation. Recent examples include the Wairarapa Combined District Plan Committee, and the Climate and Rural Advisory Groups.

4.2 Geography

Masterton District occupies part of the south-eastern North Island, within the Greater Wellington Region. It extends from the Pacific Ocean coast in the east, through to the Tararua Range in the west. The eastern and western parts of the District are characterised by hilly topography with low density population and land use. Generally, hilly topography increases the challenges of delivering and maintaining transport connections and networks. The central part of the District, near the Waingawa River and Ruamahanga River, contains flatter land, more conducive to intense land use, population density, and easier transport connections.

Figure 4-1: Masterton District Map



4.3 Social

Masterton is home to an estimated 29,000 people¹, with approximately 78%² of the district's population residing in the Masterton urban area. Population growth in the Masterton district averaged 2.4% per annum over the last five years compared with 1.3% per annum in New Zealand.³

¹ <https://ecoprofile.infometrics.co.nz/Masterton%20District/Population>

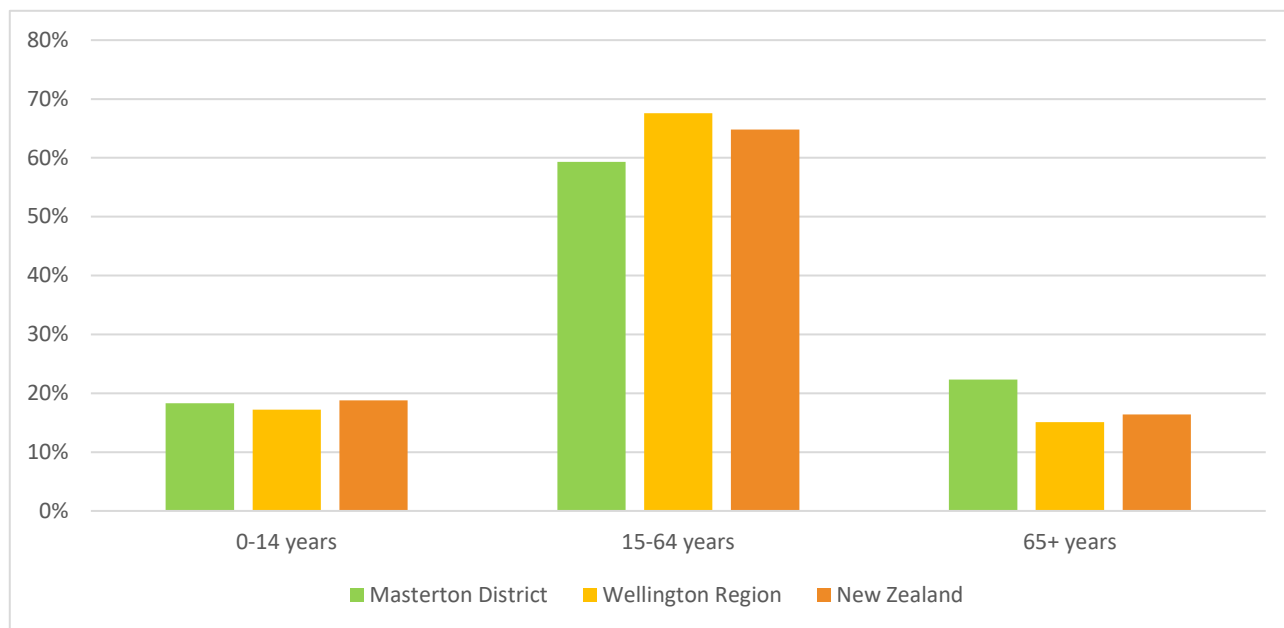
² 2018 Census

³ Infometrics (2023) 2022 Regional Economic Profile – Masterton District.

Figure 4-2 shows the age structure for the district. Approximately 59% of the population is working age (15-64 years old), which is significantly lower than the proportion of the Wellington Regional population (68%) and the national population (65%). Masterton also has a slightly lower proportion (18%) of young people (0-14) than the country as a whole (18.8%) and a significantly higher proportion (22%) of people 65 years and older when compared with New Zealand (16%).⁴

Approximately 22% of the Masterton population identify as Māori, compared to 14% for the Greater Wellington region, and 17% for New Zealand.

Figure 4-2: Age composition comparison



4.4 Economy

Local industries are predominantly service industries for the surrounding farming community, with industrial development growing in new industrial parks being developed at Waingawa (in agreement with Carterton District), Solway, Ngaumutawa Road north in the Upper Plain area. According to Infometrics, the three largest industry sectors in the district (excluding Owner-Occupied Property Operations⁵) by GDP in 2022 were:

1. Health Care and Social Assistance (12.0%),
2. Professional, Scientific and Technical Services (8.1%), and
3. Retail Trade (7.3%).

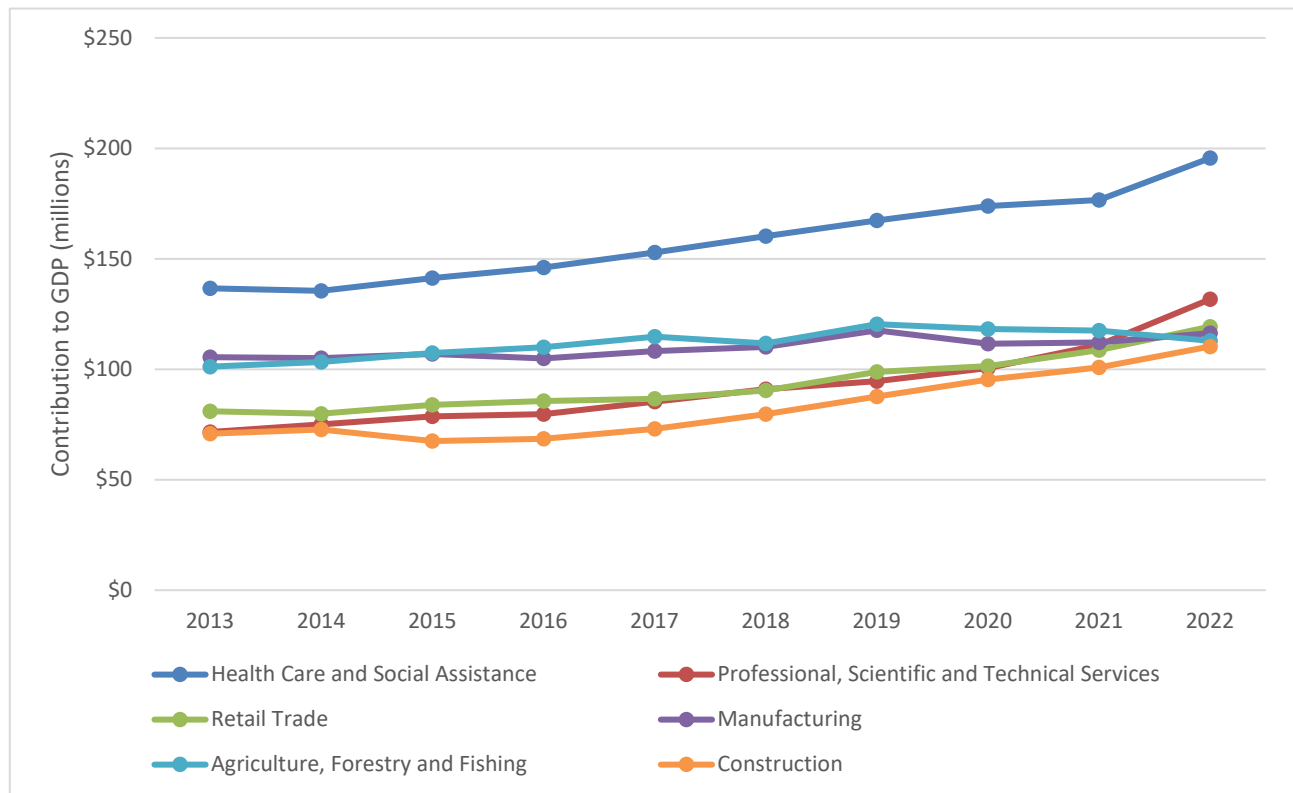
Since 2019, the contribution of Agriculture, Forestry and Fishing to GDP has declined (refer to Figure 4-3). Despite this, the number of sheep, beef and grain farms⁶ has remained steady at around 330 and is anticipated to remain an important part of the district. Over the same period the number of dairy farms has increased from 33 to 42. Beekeeping is also a growing industry for the district. These types of industry rely on access, often on rural roads, linking the hinterland to the state highway as well as rail networks.

⁴ Infometrics (2023) 2022 Regional Economic Profile – Masterton District.

⁵ If included, owner-occupied property operations account for 8.4% (\$136.8m) of GDP

⁶ As per the 'business unit' definition from Infometrics (<https://rep.infometrics.co.nz/masterton-district/notes#business-units>)

Figure 4-3: Top Contributors to GDP Over Time



Employment in the District is roughly in line with the GDP distribution. The three largest employment industries in Masterton in 2022 were:

1. Health Care and Social Assistance (16.3%)
2. Retail Trade (11.7%)
3. Agriculture, Forestry and Fishing (11.5%)

Masterton District's commercial zones are located in the Masterton urban area and cover the main business and retail areas. Masterton has several small suburban shopping centres in addition to its large central commercial zone (CBD). The main town centre, Queen Street, is largely contained within two major arterial streets (Chapel and Dixon). Recent retail development has been accommodated within this area and there is adequate capacity in the CBD for further development.

4.5 Transport Network

4.5.1 Roads

Figure 4-4 and

Table 4-1 provide an overview of Masterton's road network characteristics by ONRC. Figure 4-5 and Table 4-2 provide the same information but by ONF. State Highway 2 (SH2) connects Masterton to the surrounding area and districts. The Masterton heavy traffic bypass provides an alternate transport route on the western edge of the urban area. Overall, the district has an extensive road network that has good existing capacity for higher traffic flows.

Figure 4-4: Masterton Road Network by ONRC

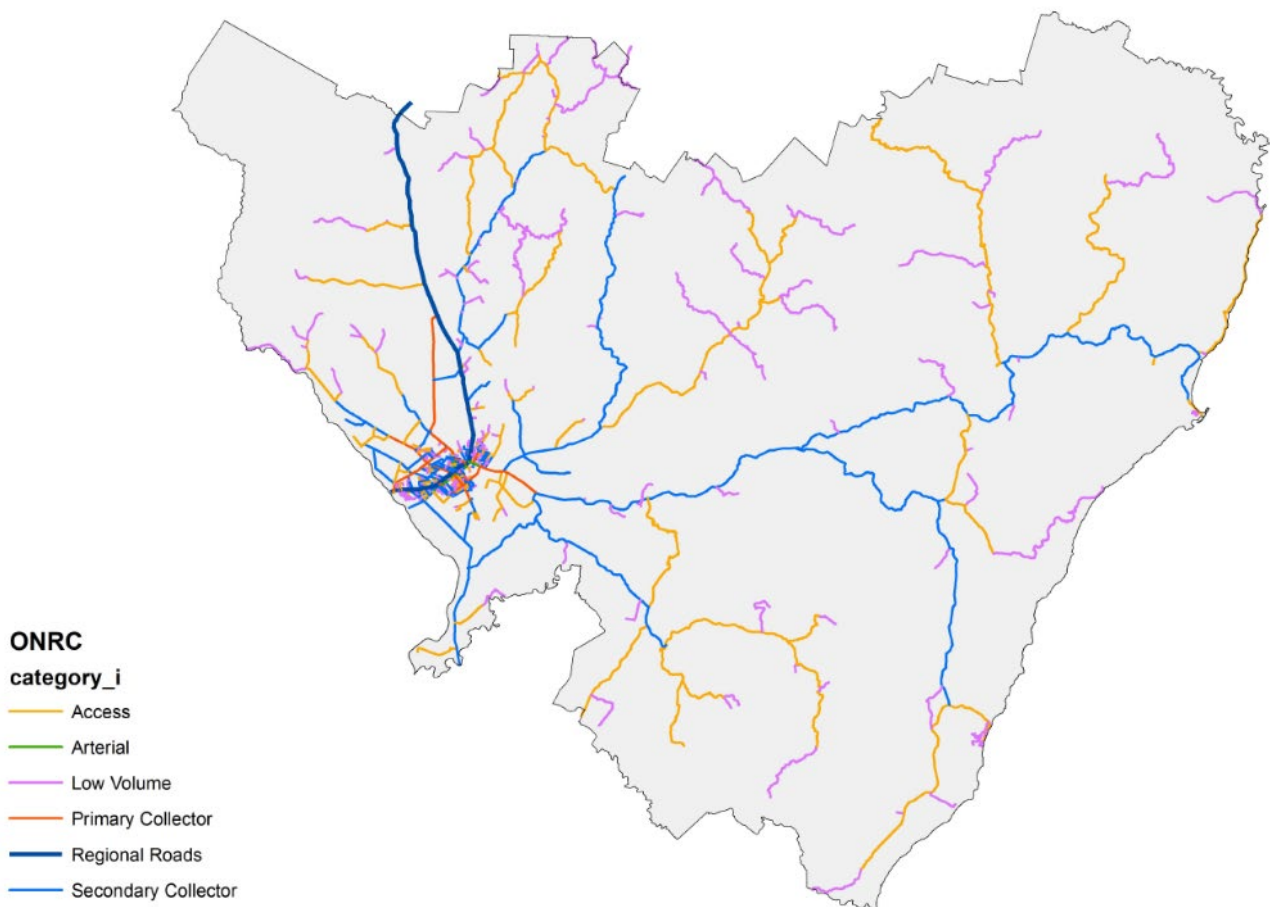


Figure 4-5: Masterton Road Network by ONF

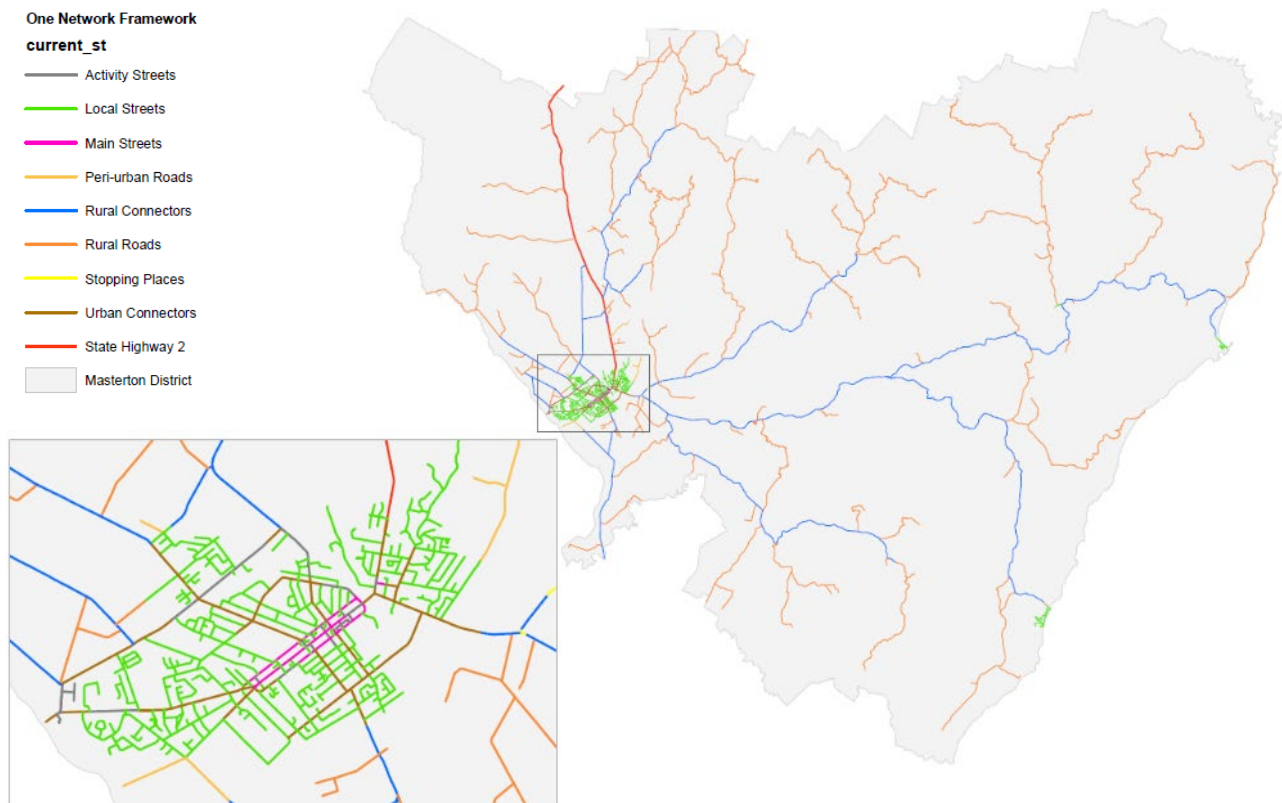


Table 4-1: Network Statistics by ONRC Class

ONRC	Urban		Rural		Total		
	Length (km)	Journeys (m vkt)	Length (km)	Journeys (m vkt)	Length (km)	Journeys (m vkt)	% length
Arterial	6	16.0	0	0	6	16.0	1%
Primary Collector	15	25.1	17	16.8	32	42.0	4%
Secondary Collector	43	18.6	200	50.2	243	68.7	30%
Access	22	3.6	262	14.3	284	17.9	35%
Low Volume	34	2.1	213	3.1	246	5.3	30%
TOTAL	120	65.4	691	84.4	811	149.9	100%

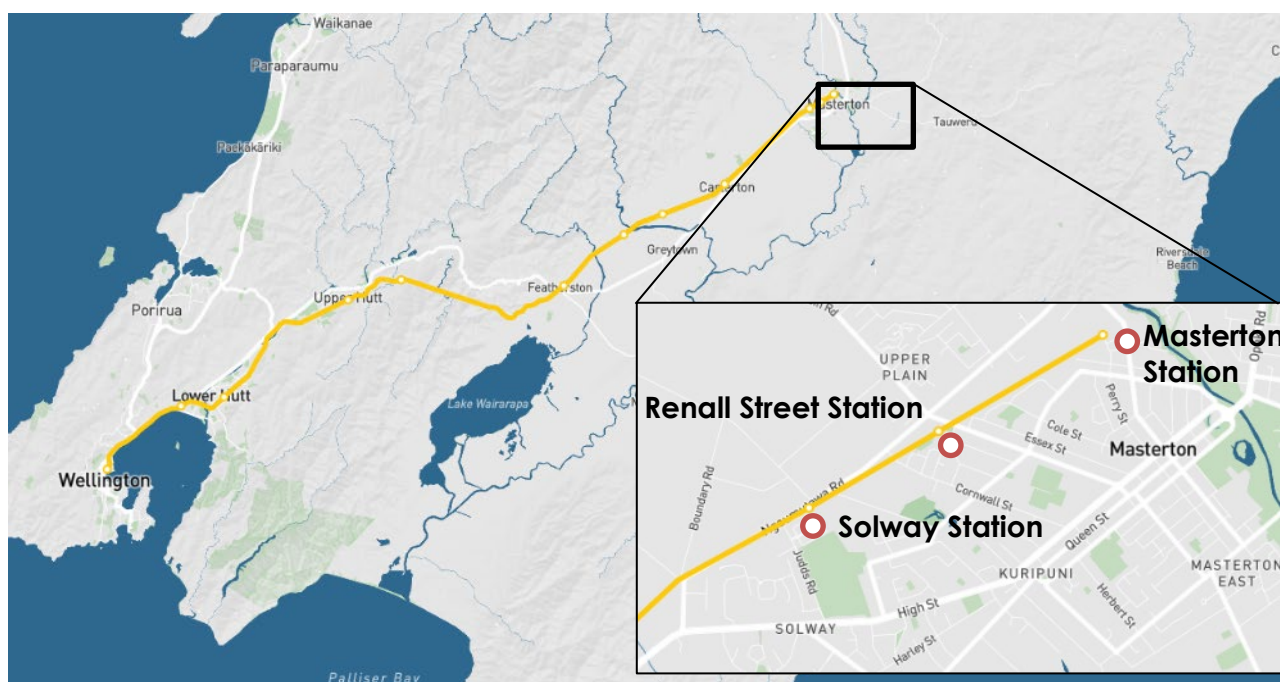
Table 4-2: Network Statistics by ONF Category

Category		Length		Journeys	
		km	%	m vkt	%
Urban	Urban Connectors	17	2.1%	28.0	18.7%
	Activity Streets	7	0.8%	10.8	7.2%
	Main Streets	4	0.5%	9.1	6.1%
	Local Streets	93	11.4%	21.4	14.3%
	Total Urban Network	120	14.8%	69.3	46.2%
Rural	Stopping Places	1	0.1%	0.0	0.0%
	Rural Connectors	202	24.9%	62.4	41.6%
	Peri-Urban Roads	7	0.9%	1.6	1.1%
	Rural Roads	471	58.0%	16.2	10.8%
	Total Rural Network	681	83.9%	80.3	53.5%
Unclassified		11	1.3%	0.3	0.0%
Total Network		812	100%	150.0	100%

4.5.2 Rail

The Wairarapa railway connects Masterton to Wellington, with three stations located at Solway, Renall Street, and central Masterton as shown in Figure 4-6. The single track railway is used for both passenger and freight services. The Wairarapa rail line allows many residents easy commuting access to work in the cities of Wellington, Lower Hutt and Upper Hutt.

Figure 4-6: Wairarapa Rail Line



Council is not responsible for providing any public transport infrastructure or operating any services. The public transport that is available to Masterton residents is provided by GWR and is detailed below.

Passenger rail services are provided via the Wairarapa rail line, connecting Masterton to Carterton, Greytown and Featherson in the Wairarapa and Maymorn Upper Hutt, Petone, and Wellington. It is primarily a commuter line with five services on weekdays (six on Fridays). There are plans to enhance regional rail capacity through rail infrastructure improvements⁷, and the availability of additional rolling stock which is currently expected to arrive in 2025.

There are five bus routes that service the Masterton urban area. Four of them are peak only bus routes that only run three times a day on weekdays. An hourly bus service connects Masterton to Martinborough. Consideration is being given to providing better coverage of bus routes in the Masterton area, including links to rail services.⁸

4.5.4 Walking and Cycling Infrastructure

There is an extensive network of footpaths in the Masterton urban area, however, there is very little cycling infrastructure. Much of the district's cycling activity occurs on local roads, but this is often not suitable for less confident cyclists.

4.5.5 Transport Assets

The transport network comprises a broad range of assets that enables the daily flow of people and commerce across the district. Key transport assets include roads, footpaths, streetlights, signs, traffic signals, parking, cycleways, road drainage, kerb and channel, bridges, and retaining structures. Masterton's transport asset portfolio grows each year as new assets are constructed through Council projects and by developers.

Public transport is provided and managed by the Greater Wellington Regional Council and public transportation services are provided by commercial operators. As MDC does not own any public transport assets, these have not been included in the AMP.

Table 4-3 is an overall summary of key Council-owned transport assets for the district. The detail of each of the asset components has been described in the respective lifecycle management chapter.

⁷ Wellington Regional Growth Framework

⁸ Wellington Regional Council (2021) Wellington Regional Public Transport Plan 2021-2031

Table 4-3: Transport Assets

Asset	Unit	Quantity
Land	Million m ²	14
Carriageway		
• Sealed pavements	km	523
• Unsealed	km	278
Drainage		
• Kerb and channel	km	200
• Surface water channel	km	958
• Catchpits	ea	1,667
• Culverts (area < 3.4 m ²)	km	38
Structures		
• Bridges ⁹	ea	267
• Culverts (area > 3.4 m ²)	ea	26
• Retaining Walls	ea	77
Streetlights		
• Urban lights	ea	2,083
• Rural lights	ea	96
• Under veranda	ea	468
• Amenity	ea	13
Traffic Services		
• Road Signage	ea	5,109
• Raised Traffic Islands	ea	80
• Edge marker posts	ea	Approx 3,000
• Raised Reflective Pavement Markers	ea	4,836
Sight trail	m	3,970
Footpaths		
• Sealed/ paved	km	200
• Unsealed	km	8
On road Cycle lanes	m	750
Car parks		
• On street parking spaces	ea	1,350
• Off street parking spaces	ea	1,044

⁹ Approximately 10% of bridges are weight restricted (27). Refer to Section 7.5.1 for more information on this.

5 Levels of Service

5.1 Understanding Community Needs

Council conducts a residents' survey every three years to gain feedback on community perceptions of MDC. This is a means of measuring Council's effectiveness in representing the wishes and viewpoints of their residents and provides a comparison for the council on major issues.

The National Research Bureau (NRB) carried out Communitrak Surveys for the council from 1993 to 2018. In 2020 a new survey provider was used, KeyResearch. Figure 5-1 shows the trend of decreasing satisfaction for roads, footpaths and parking over the past 10 years for both survey providers.

Figure 5-1: Percentage of customers satisfied with roads, footpaths, and parking

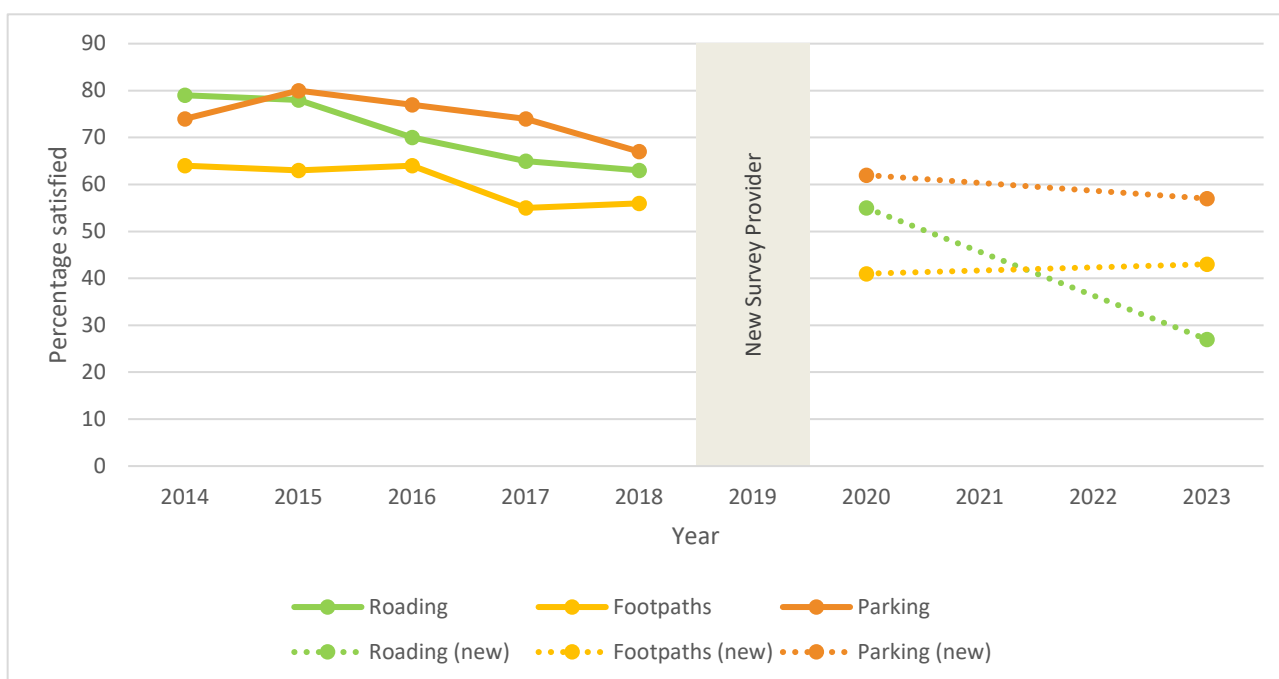


Table 5-1 shows results of the survey ratings for the level of service for roads, footpaths, and parking in 2020 and 2023. Satisfaction with overall *roading* and *footpaths* has significantly decreased over the last three years. Satisfaction with nearly all aspects of roads and footpaths has decreased between 2020 and 2023. This is driven by the significant decrease in satisfaction in *roads throughout the district* and *ease of moving around the district at peak times*. The decrease in satisfaction is apparent for both rural and urban residents. The exception to this decrease is footpaths and cycling in the district, which have largely remained steady.

Table 5-1: Percentage of customers satisfied with roads and footpaths

Service	Urban		Rural		Total	
	2020	2023	2020	2023	2020	2023
Overall roading and footpaths	49%	32% ▼	45%	26% ▼	48%	31% ▼
Roads throughout the district	58%	28% ▼	45%	26% ▼	55%	27% ▼
Ease of moving around the district at peak times	45%	37% ▼	44%	29% ▼	45%	35% ▼
Footpaths throughout the district	40%	40%	46%	53%	41%	43%
Availability of parking in the district	61%	57%	66%	57%	62%	57%
Cycling in the district	45%	45%	46%	47%	45%	45%
Street lighting throughout the district	54%	44% ▼	61%	50%	55%	46% ▼

Year-on-year
▲ Significantly higher
▼ Significantly lower

Between demographics
Significantly higher
Significantly lower

Key comments made on the districts roading infrastructure include:

- Footpaths are in bad condition (25%)
- Roads are in poor condition, need maintenance – potholes, bumpy, bad surfaces etc (21%)
- Traffic congestion /roading issues need attention (19%)
- More street lighting for roads and footpaths (11%)
- Maintenance on roads etc is poor quality, need to do it right the first time (11%)
- Need more cycleways and walkways, and maintenance of the current ones (9%)
- Not enough car parks (5%)
- Gravel roads/rural roads need more regular grading and maintenance (4%)

5.2 Performance

5.2.1 Te Tari Taiwhenua Department of Internal Affairs

Te Tari Taiwhenua Department of Internal Affairs (DIA) developed five performance measures that all councils must report on yearly through the Annual Report and LTP. The performance measures reflect a range of information about asset condition and responsiveness to service requests that assists councils in managing their assets and service delivery. The measures are:

- **Road safety:** the change from the previous financial year in the number of death and serious injury (DSI) crashes on the local road network.
- **Road condition:** The average quality of ride on a sealed local road network, measured by smooth travel exposure.

- **Road maintenance:** The percentage of the sealed local road network that is resurfaced.
- **Footpaths:** The percentage of footpaths that are maintained to the level required by the LTP
- **Response to service requests:** The percentage of customer service requests relating to roads and footpaths which are responded to within the time frame specified in the LTP.

Table 5-2 shows Council's performance targets for the current and previous LTP cycles for each of the performance measures and how these relate to Council's community outcomes, and the MOT transport outcomes.

Table 5-2: DIA Performance Measure Targets

Transport Outcome	Council Community Outcome	Measure	Target	
			2018-28 LTP	2021-31 LTP
Healthy and safe people	Efficient, safe and effective infrastructure	Road Safety	Reduction in DSI crashes compared to the previous year	No more DSI crashes than the 5-year average
	A sustainable and healthy environment	Footpaths	97% of footpaths are rated Excellent, Good or Fair	90% of footpaths are rated Excellent, Good or Fair
Inclusive Access	Efficient, safe and effective infrastructure	Road Condition	Maintain or improve on 90% across the network	Network: 90% Ar: 90% PC: 90% SC: 90% Ac: 85% LV: > 85%
Economic Prosperity	A thriving and resilient economy	Road Maintenance	Maintain within 5-7%	
	An engaged and empowered community	Urgent service requests	95% within specified timeframe	
		Non-urgent service requests	80% within specified timeframe	70% within specified timeframe

Performance against these measures are reported on through the LTP and Annual Reports. Performance against these measures for the previous and current LTP cycle is shown in Table 5-3. Red cells indicate where the target has not been met, and green cells indicate if the target has been met or exceeded.

Table 5-3: DIA Performance Measure Results

DIA performance measure	2018-28 LTP			2021-31 LTP
	2018/19	2019/20	2020/21	2021/22
Road Safety	11	10	12	13
Road Condition	94%	92%	91%	N: 94% A: xx PC: 93% SC: 96% A: 95% LV: 94%
Road Maintenance	6.3%	6.5%	5.0%	TBC
Footpaths	93%	94%	92%	TBC
Urgent service requests	98%	100%	100%	TBC
Non-urgent service requests	76%	69%	91%	TBC

5.2.2 ONRC Customer Levels of Service

ONRC CLoS and performance measures are reported on through the Te Ringa Maimoa Transport Insights web tool. Reporting is completed both individually for each Road Controlling Authority (RCA) and on a comparison basis against a Peer Group of other similar RCAs.

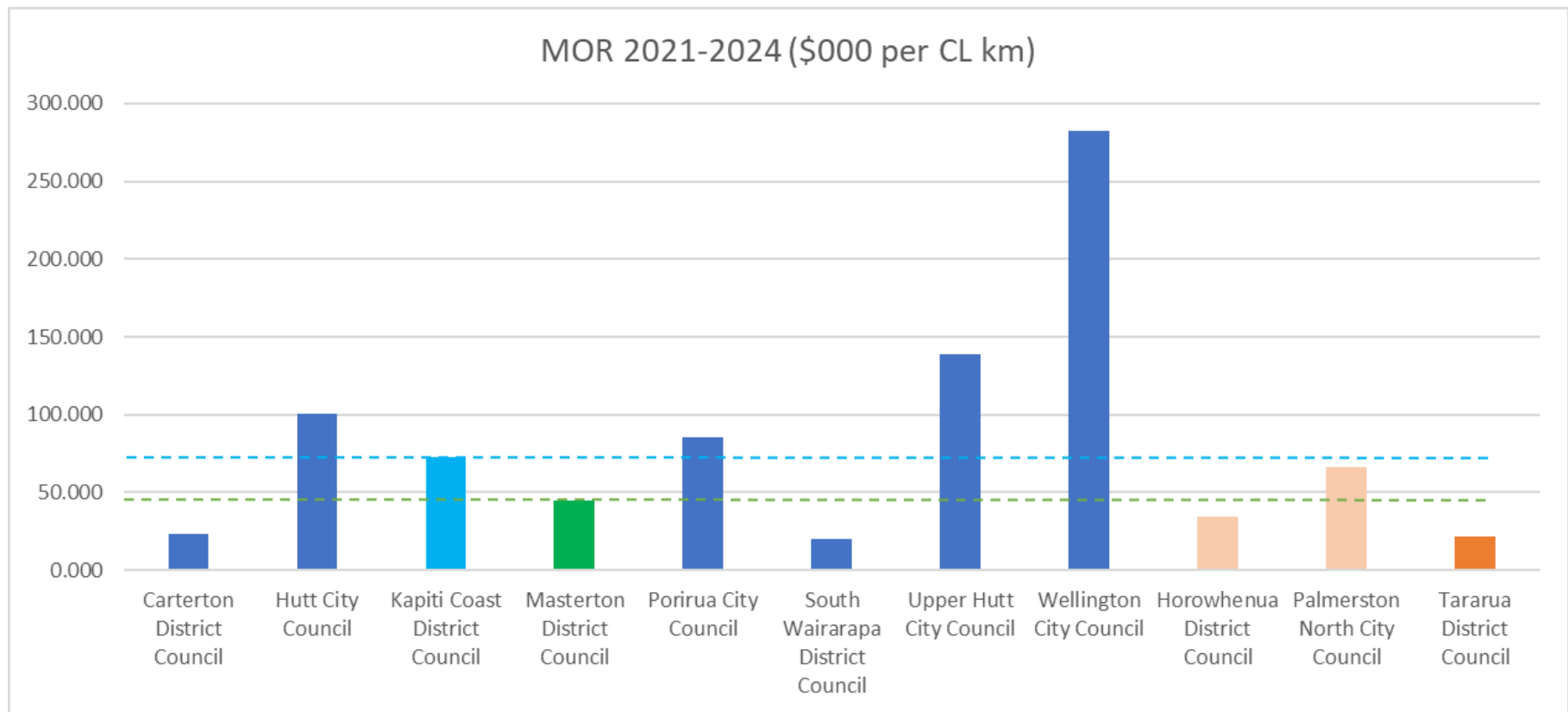
Table 5-4 summarises the ONRC CLoS, associated performance measures and outcomes for Masterton in 2021/22 compared to our Peer Group. It should be noted that the highlighted red, orange and green cells indicate where Council is worse or better compared to the peer group. Red = worse, orange = average, green = better. No peer group comparison was available where cells are not highlighted.

Table 5-4: Summary of 2021/22 ONRC Performance measure results for Masterton by classification

Measure	Network	Ar	PC	SC	Ac	LV	Comments
Safety		Efficient, safe and effective infrastructure					Healthy and Safe People
SCO1: number of DSIs	Urban	2	1	2	0	0	No peer group comparison
	Rural	NA	0	7	1	0	
	Combined	2	1	9	1	0	
SCO2: Collective Risk (DSI rate per kilometre)	Urban	0.162	0.060	0.023	0.005	0.009	
	Rural	NA	0.077	0.015	0.004	0.000	
	Combined	0.162	0.069	0.016	0.004	0.002	
SCO3: Personal risk (DSI rate per kilometre)	Urban	6.811	3.722	5.014	2.541	12.604	
	Rural	NA	7.210	5.874	6.963	2.858	
	Combined	6.811	5.212	5.633	5.633	6.804	
STO4: Loss of Control on wet road DSI's	Urban	0	0	2	0	0	No peer group comparison
	Rural	NA	0	1	0	0	
	Combined	0	0	3	0	0	
STO5: Loss of driver control at night DSI's	Urban	0	0	2	0	0	No peer group comparison
	Rural	NA	0	3	0	0	
	Combined	0	0	5	0	0	
STO6: Intersection DSI's	Urban	2	0	0	0	0	No peer group comparison
	Rural	NA	0	2	0	0	
	Combined	2	0	2	0	0	
STO9: Vulnerable user DSI's	Urban	2	0	0	0	0	No peer group comparison
	Rural	NA	0	2	1	0	
	Combined	2	0	2	1	0	

Measure	Network	Ar	PC	SC	Ac	LV	Comments
Resilience		A thriving and resilient economy					Resilience and security
RCO1: Unplanned closures with a detour							No information provided
RCO2: Road access lost							No information provided
Amenity		Efficient, safe and effective infrastructure					Inclusive access
AMCO1: Smooth Travel Exposure (STE)	Urban	80.8%	88.3%	92.3%	91.9%	94.3%	Smoother than peer group for all classifications but Arterial
	Rural	NA	98.2%	98.0%	95.6%	92.1%	
	Combined	80.8%	92.5%	96.4%	94.8%	93.8%	
AMCO2: Peak Roughness - 85 th %ile	Urban	117.6	116.0	123.8	124.0	136.0	Lower than peer group for all classifications but Arterial
	Rural	NA	77.0	88.0	108.0	125.8	
	Combined	117.6	95.0	94.0	111.0	132.0	
AMCO2: Peak Roughness - 95 th %ile	Urban	146.6	140.8	154.0	146.0	170.2	
	Rural	NA	98.3	110.0	137.0	154.0	
	Combined	146.6	124.0	120.0	139.0	165.0	
AMTO1: The median roughness	Urban	84	77	82	88	91	Lower than peer group for all classifications but Arterial
	Rural	NA	50	59	69	79	
	Combined	84	59	61	71	87	
AMTO1: The average roughness	Urban	88	83	87	91	96	Lower than peer group for all classifications but Arterial
	Rural	NA	55	63	75	88	
	Combined	88	65	67	77	93	
Accessibility		Efficient, safe and effective infrastructure					Economic prosperity
ACCO1: % of network not available to Class 1 HCV	Combined	0.0	0.0	0.0	1.1	3.2	Using 2019/20 data

Measure	Network	Ar	PC	SC	Ac	LV	Comments
ACCO1: % of network not available to 50MAX vehicles	Combined	0.0	0.0	0.0	5.1	14.1	Information not available by urban/ rural No peer group comparison available
Cost Efficiency		A thriving and resilient economy					Economic prosperity
CE2: Chipseal resurfacing cost (cost per lane km \$)	Urban	50,627	37,210	19,288	22,273	27,321	
	Rural	NA	47,157	13,491	13,926	18,077	
	Combined	50,627	44,033	14,257	15,104	20,953	
CE2: Chipseal resurfacing Average Life achieved	Urban	13.6	16.1	19.9	19.0	17.2	Achieving longer chip seal lives than peer group
	Rural	NA	12.5	17.5	16.4	20.4	
	Combined	13.6	15.0	18.3	17.2	18.5	
CE3: Asphalt resurfacing cost (cost per lane km \$)	Urban	-	208,133	206,632	NA	-	
	Rural	NA	350,743	-	NA	NA	
	Combined	-	231,166	206,632	NA	-	
CE3: Asphalt resurfacing Average life achieved	Urban	19.8	7.8	22.0	NA	32.3	
	Rural	NA	-	8.2	NA	NA	
	Combined	19.8	7.8	15.1	NA	32.3	



5.2.3 Other Measures

Council also reports on other performance measures through the AMP. These measures and their targets are detailed in Table 5-5, as is their relationship to Council's community outcomes and the MOT transport outcomes. The performance against these targets is shown in Table 5-6, where red cells indicate where the target has not been met, and green cells indicate if the target has been met or exceeded.

Table 5-5: Council Performance Measure Targets

Transport Outcomes	Council Community Outcomes	Name	Description	Target
Healthy and safe people	A sustainable and healthy environment	Cyclists	the number of cyclists using the urban roading network	Increase on the previous year
Economic prosperity	Efficient, safe and effective infrastructure	Condition Index ¹⁰	Council maintains the condition index (CI) for sealed roads within the specified range.	90% of the network ≤ 8
		Pavement Integrity Index ¹¹	Council maintains the Pavement Integrity Index (PII) within the specified range.	90% of the network ≤ 8
		Surface Age	Council maintains a sustainable average sealed surface age and maximises the whole of life cost of the surface.	80% of the surface age < 16 years
Inclusive Access	A thriving and resilient economy	Roughness	The average ride (85th percentile NAASRA Value) comfort level of the sealed road network meets specified levels.	Ar: ≤ 100 PC: ≤ 110 SC: ≤ 120 Ac: ≤ 120 LV: ≤ 140
	An engaged and empowered community	Satisfaction	Percentage of residents who are satisfied ¹² with roads, footpaths, and cycling in the district	Maintain or increase satisfaction level.

¹⁰ CI is a measure of visual defects identified during Condition Rating inspections completed biennially. The lower the CI, the better the condition.

¹¹ PII combines surface faults (CI) with structural defects rutting roughness and shoving. The lower the PII, the better the condition.

¹² Scored roads, footpaths, and cycling seven or greater in the residents satisfaction survey

Table 5-6: Other Council Performance Measure Results

Other performance measures	2018-28 LTP			2021-31 LTP
	2018/19	2019/20	2020/21	2021/22
Cyclists (count at sites)	176	164	191	185
Condition Index	94%	94%	94%	TBC
Pavement Integrity Index	TBC	TBC	92%	TBC
Surface Age	84%	84%	84%	TBC
Roughness	NA	Ar: 120 PC: 88 SC: 92 Ac: 102 LV: 133	TBC	TBC
Satisfaction: Roads	NA	55%	NA	27% ¹³
Satisfaction: Footpaths	NA	41%	NA	43% ¹⁴
Satisfaction: Cycling	NA	45%	NA	45% ¹⁵

5.3 Remote Communities

Cyclones Hale and Gabrielle have highlighted the challenges of providing resilient connectivity to remote communities. Council is very aware that roads provide the lifeline for these communities and are vital to community wellbeing. A new section 'resilience and recovery' has been added to this plan to discuss this issue further.

The performance measured detailed along with the targets and achievement levels may not represent the issues remote communities face fully. For example, if access is provided to residents 90% of the time, a target may be met but if the same 10% is regularly affected by loss of access, this is a real concern for those involved. Similarly providing uninterrupted service may not be realistically achievable, particularly in light of the increasing frequency and severity of extreme weather events.

5.4 Summary of Level of Service Priorities

In reviewing the performance results and community issues, the priorities for 2024-27 have been summarised as follows:

Customer Satisfaction	Low and declining
Road Safety	Results vary – an ongoing national, regional and local priority Arterial and Primary Collector Roads are high in terms of both high Collective Risk (DSI rate per kilometre) and Personal risk (DSI rate per vehicle km)
Road Condition	Roughness/STE comparably poor on Arterial Roads
Road Maintenance	Cost efficiency indices appear than similar entities.
Footpaths	Performance just below target

¹³ 2023 residents survey result

¹⁴ As above

¹⁵ As above

6 Demand and Growth

Growth is a critical demand driver of service provision. Demand forecasting is full of variability and uncertainty. While there is no way to be certain that forecasts are accurate, it is still critical to develop strategies that attempt to understand and respond to future growth. Growth trends will provide insights into the future needs of the community and inform the asset investment strategy.

Arataki outlines six key drivers that will shape the future land transport system, including:

- demographic change
- changing economic structure
- climate change
- technology and data
- funding and financing challenges
- changing travel patterns

A summary of how these drivers are likely to impact Masterton's transport network is included in Table 6-1.

Table 6-1: Drivers of Change for the Masterton District

Current Situation	Change	Transport Impact
Demographic Change		
Population estimated at 29,000 people in 2022. 78% in the Masterton urban area.	Stats NZ projects an increase to 32,100 by 2048 in medium growth scenario ¹⁶ . The LTP assumes 1% growth per annum from 2020 which equates to 30,500 people by 2031, and 32,200 by 2051. Bulk of growth expected in the Masterton urban area, with expansion to the north and west, and light intensification around railway stations and in Masterton Central.	Increased demand for commuter rail services, local bus services, safe walking and cycling networks, and increased parking demand in the CBD. Growth on the fringe likely to increase VKT. May be conflicts with heavy vehicle traffic and vulnerable road users due to inadequate cycling infrastructure.
Age Structure in 2018: • 0-14 years: 19% • 15-39 years: 28% • 40-64 years: 32% • Over 65s: 21%	Age Structure in 2048: • 0-14 years: 16% • 15-39 years: 26% • 40-64 years: 31% • Over 65s: 28%	Accessible and reliable transport options, along with well-maintained urban spaces, footpaths and crossing points will be key as our population ages.

¹⁶ Statistics NZ considers the medium projection suitable for assessing future population changes

Current Situation	Change	Transport Impact
The percentage of over 65s is one of the highest in the region.	Over 65s are projected to account for 28% of the population by 2038.	
Population diversity in 2018: • Māori: 21.3% • Pacific: 4.0% • Asian: 3.9%	Masterton's population is expected to become more diverse, with the Māori population continuing to grow. Masterton is also a refugee resettlement location.	Increasing diversity is unlikely to have a direct impact on the District's transport. However, consideration will need to be given to ensuring access to opportunities are equitable for all users.
There were 11,200 households in Masterton in 2020. ¹⁷	The LTP assumes 1.25% growth per annum, which equates to 12,700 households by 2031, and 13,800 by 2051. This is higher than population growth, as households are also projected to get smaller.	Greenfields development will require new transport infrastructure, and brownfields or intensification areas may need upgrades to the existing transport infrastructure. ¹⁸
Changing Economic Structure		
In 2022 Masterton's GDP was \$1.64b ¹⁹ (0.5% of NZ GDP).	GDP increased 3.5% between 2017-2022, compared to 2.9% nationally. Largest contributors to growth were: Professional, Scientific and Technical Services; Health Care and Social Assistance; Construction; and Agriculture, Forestry and Fishing.	Agriculture, forestry and fishing will remain significant contributors to the local economy in the future and rely on the local road network to access key markets.
Freight movement: 24.3m tonnes through the Wellington region in 2018. In 2018 road transport moved 93% of freight in the Wellington Region, and rail carried 5%.	Government has a desire to increase rail mode share for freight.	Road freight likely to increase. Rail unlikely to take pressure off future local road freight

¹⁷ Masterton District Council, 2021-31 Long-Term Plan Significant Assumptions (n.d.), 17

¹⁸ Known development areas include: behind the Copthorne Hotel, Iorns Street, Judds Road, Tuatahi Avenue, Carters Subdivision South Belt, Chamberlain Road, Williams Block, Cashmere Downs, and Gordon Street.

¹⁹ Infometrics

Current Situation	Change	Transport Impact
Health Care and Social Assistance accounted for 12% of Masterton's GDP and 16.3% of employment in 2022.	The hospital for the wider Wairarapa area is in Masterton. It is expected to continue to be the main employer for the District. Masterton's ageing population and future growth forecasts will result in increased demand for health care and social services.	The hospital and aged care residential facilities continue to be a key employer and trip generator for staff, patient and visitor journeys.
Forestry: 37,925 ha in district. Currently over 100 truck movements a day into the Waingawa industrial hub south of Masterton to the rail hub and domestic mills.	Bulk of forestry at or reaching harvest age, peak harvesting expected in the short to medium term.	Anticipate 270 truck movements a day at peak harvest and up to 350 if full volume yield was to be utilised. ²⁰

Climate Change

Temperature: About a third of the warming predicted for mid-century has already happened in the Wellington region.	Annual average temperatures are projected to increase by 0.7-1.0°C by 2040, and 1.2-3.0°C by 2090. Up to 30 more hot days (>25°C) per year by 2040, and up to 80 more hot days by 2090. Up to 15 fewer frost days by 2040; and up to 40 fewer frost days in inland Wairarapa by 2090.	More hot days will impact the expected life of road surfacing, particularly chipseals. There may also be changes to the type farming and cropping which may impact freight vehicle movements.
Wind currently has a minimal impact on the transportation network in Masterton District.	Change in the intensity of the wind: up to 3% increase by 2040 and up to 4% by 2090. Change in annual number of windy days: up to 4 days by 2040, and up to 12 days by 2090.	More frequent damage to trees and powerlines. This may result in an increase in road closures.
The impacts of increased frequency and duration of rainfall events is already being felt across the district.	Rainfall will vary locally within the Wairarapa region. The largest changes will be for particular seasons rather than annually.	Increased flooding, slips and landslides affecting land, houses, roads and other assets, public transport and rural productivity.

²⁰ S.Andrew, Woodflows of the Eastern Southern North Island 2019-2028

Current Situation	Change	Transport Impact
	Heavy/extreme rainfall is likely to increase especially for the end of century.	Any flood protection infrastructure will become less effective over time. Impacted rural community due to reduced agricultural production, which will impact on freight movements.
Sea level rise:	Up to 0.12 to 0.24 metres above present by 2040 and 0.12 to 1.75 metres by 2090.	Coastal communities such as Mataikona, Castlepoint and Riversdale may experience increased rates of coastal erosion and inundation due to storm surge. Some areas may become permanently inundated. Difficulty in obtaining insurance due to sea level rise and increasing frequency of flood events for community, business and central and local government.
Technology and Data		
Technology is broadening the range of mobility options and available services. Technology is helping us to monitor and maintain the land transport system.	Travel options increasing e.g. electric vehicles (EV), e-bikes, autonomous vehicles, on demand public transport. Customer service and engagement opportunities changing so can respond in real time to customer demand and information needs.	Providing for new methods of mobility, monitoring and access to information.
Funding and Financing Challenges		
Funding for transport reliant on central government subsidy, which are largely reliant on petrol taxes.	Local government funding for the land transport system may be constrained as the sector faces significant investment in three waters, other infrastructure and roading recovery work during the next 10 years. NLTP model reliant on petrol taxes which are expected to decline as a result of EV uptake and mode shift.	Significant funding challenges for local and national government may impact on future transport funding available.

Current Situation	Change	Transport Impact
Changing Travel Patterns		
Travel to work (2018): • Drive/ Passenger: 77% • Active transport: 6.1% • Public transport: 3.6% • Work from home: 13.4%	Between 2013 and 2018 there was an increase in the percentage of people working from home. This is expected to have continued following the impacts of COVID 19.	Masterton residents are heavily car dependent and reliant on the road network for most trips. While there may be a slight decrease in trips made due to more people working from home it's not expected to have a significant impact.
Vehicle ownership (2018) • No vehicle: 7% • One: 38% • Two or more: 55%	The percentage of households with no vehicle has decreased since 2013, while the percentage of households with three or more vehicles has increased.	

6.1 Developments and Subdivisions

The Wairarapa Combined District Plan (Last Amended: 27 October 2021) describes the role of the transportation networks in the district.

In terms of the Wairarapa's roading network, there are four hierarchy classifications:

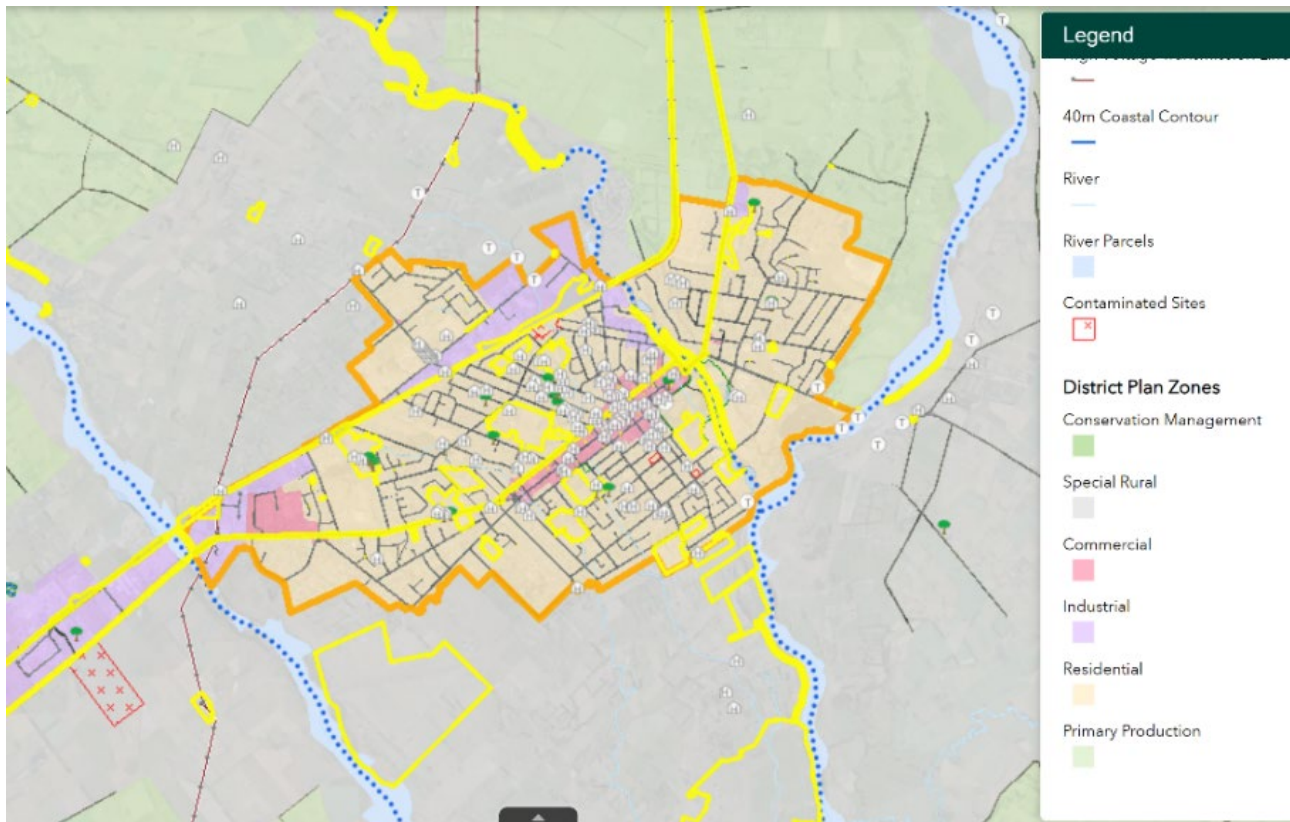
- Strategic Arterial: State Highways and major bypass routes, the backbone of the network, linking the Wairarapa with the rest of the country;
- District Arterial: Key district roads of considerable importance to the local economy, linking communities within the Wairarapa;
- Collector: Local roads or routes within or between population centres and activity areas, that collect traffic from local roads and feed through to arterial routes;
- Local: Predominantly providing access to properties.

The function of a road within the hierarchy and the impact of new activities on its operation are vital considerations. New activities, for instance, often require new entrances to the road network and this need to be carefully located and designed to avoid adverse effects on the safety and efficiency of that road. Where development is an important part to the growth and development of the Wairarapa, then a broader approach than a property-by-property basis may be required to addressing potential deficiencies in the roading network, particularly intersections and new roading and active travel routes.

The rail corridor is also a key part of the Wairarapa's transportation network, and therefore its efficient and safe operation must also be protected from potential adverse effects of activities.

Hood Aerodrome is a strategic component of the Wairarapa aviation industry, and it is important that nearby land uses do not inhibit its functionality and its future development by undue sensitivity to the effects of air traffic, such as noise.

The areas most likely to see residential growth are at the north end of Masterton. There are some issues with access to SH2 which will need to be addressed in partnership with developers and Waka Kotahi to ensure access is convenient and safe for all road users. No other significant growth areas or restrictions have been identified.



The Development Contribution Policy includes transportation assets with a contribution of 2% (Urban) and/or 3% (Rural) of Land Value Rural of each new lot. In the rural zone a maximum of \$7,500 plus GST applies per new lot for the Roding and Reserves contributions combined.

Roding contributions are forecast to average some \$394,000 per annum across the ten years of the 2021-31 LTP. Expenditure of these funds includes the upgrading of Millard Avenue and parts of Gordon Street and Chamberlain Road to full urban standard. Funds may be utilised in the future for roding upgrades and safety improvements.

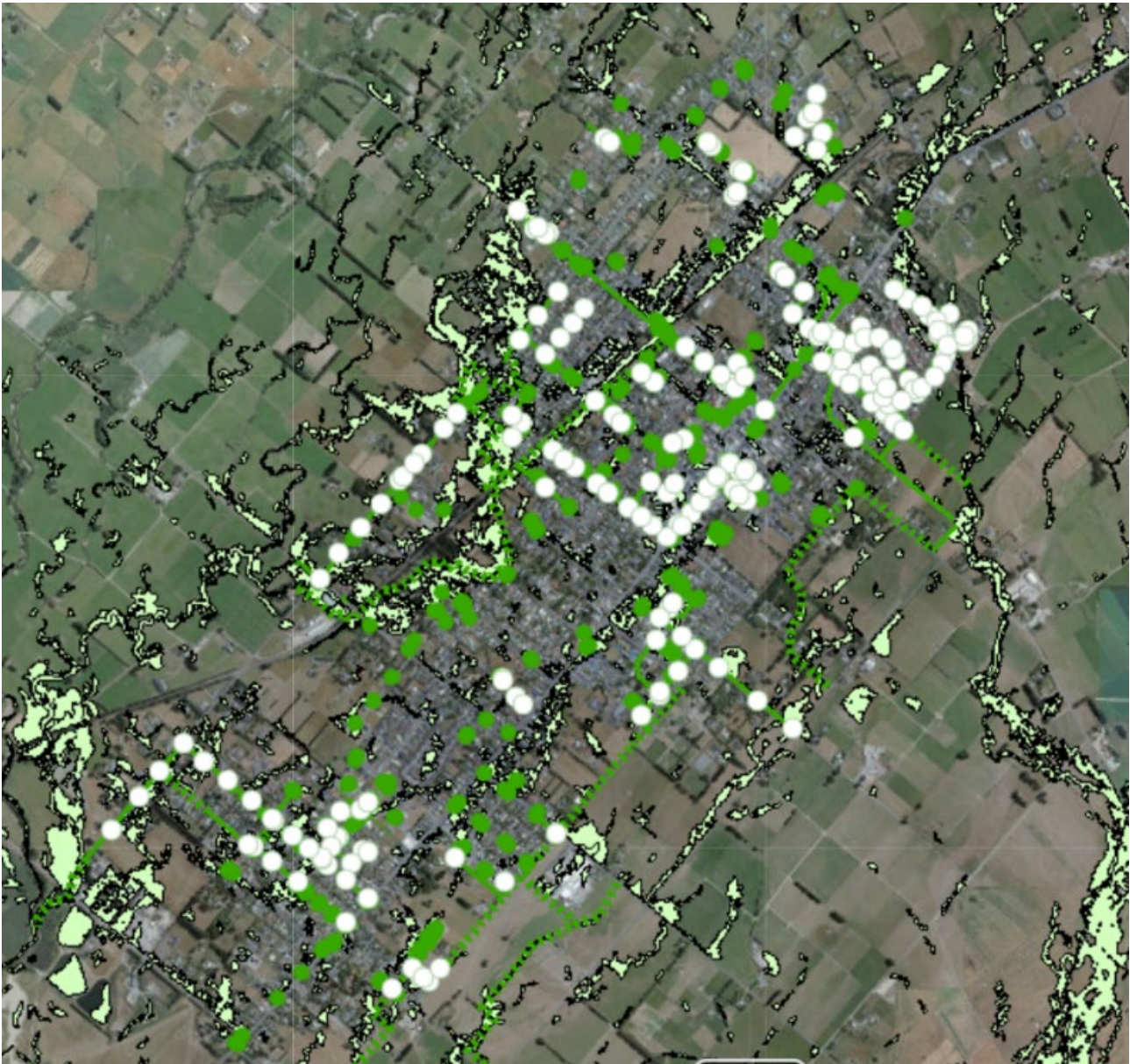
Development and Contributions Policy (mstn.govt.nz)

The policy is currently under review as part of the Wairarapa Combined District plan review.

Stormwater reticulation is relatively limited in the Masterton urban area, with road corridor drainage reliant on a combination of pipes, open channels and manholes. In effect overland flow is part of the primary network and the core purpose is road drainage. It is expected this responsibility will be assigned to Roding following Three-Waters reforms given much of the system exists for carriageway drainage rather than as a service to residents.

Overland flow paths are not mapped nor have access provisions. In order to maintain the system and avoid conflict in future, mapping and property notices are proposed.

Allowance in WC 151 for network data collection and establishment of management notices.



Distribution of stormwater assets across Masterton urban area.

6.2 Town Centre Strategy Rautaki Pokapū Tāone

The Masterton Town Centre Strategy was adopted by Council in August 2018. This followed extensive community engagement through 2015-17, and formal consultation as part of the 2018-28 Long-Term Plan (LTP) consultation process.

The actions for the roading team include project planning, design options, liaison with the project team and Waka Kotahi.

The project areas relevant to roading are:

- 2 Park Street
- 3 Bruce Street
- 4 Dixon Street
- 5 Queen Street
- 6 Town Hall Precinct
- 7 SH2: East/West Connections
- 8 Railway Link
- 9 Placemaking Activities
- 10 Library Square



6.3 Walking and Cycling

While demand for walking and cycling is relatively low, this can be increased with improved opportunities and connections and a greater 'feeling' of safety.

Masterton District Council adopted their Cycling Strategy in 2017. It proposes a number of cycle routes and initiatives. these are discussed in 7.5 Problem 4: Accessibility and the Walking and Cycling section of the Programme Business Case.

6.4 Disability

Council is aware of the needs of a range of road users. It is intended to commit to progressive changes as part of footpath programme to ensure less abled pedestrians are catered for.



These improvements to Colombo Road, near Lakeview School, provided a shared path for school cyclists, and also on-road cycle lanes for the more confident cycle tourists who will also use this route

Executive Summary

Shaping Our Future - A Strategy for the Masterton Town Centre is the culmination of a process initiated by Masterton District Council in 2016. It seeks to crystallise objectives and actions, that together with stakeholder and community partners, will transform the town centre over the next 20 years and beyond. The process started with community engagement led by Massey University Toi Aria and assisted by Letting Space. From this the Council gathered a substantial body of feedback from participants about the town and what people sought from it for the generations to come.

The strategy charts a way forward that draws on the 2016 community feedback, recent technical urban planning analysis, and a further round of engagement to propose 10 initiatives with attendant implementation actions. It is intended that these 10 initiatives will catalyse other partners' projects and ideas that will reshape the town over many years.

The Council will get moving with the first tranche of these initiatives immediately and budget has been set aside in the new 2018 Long Term Council Plan to enable them to proceed. The public funding of town centre initiatives is intended to attract and lead private and other agency funding. Council will continue to facilitate the process of the centre's development as the initiatives move into concept design.

The urban planning analysis of the town centre has identified big picture influences on the town's future, and considerations and opportunities in respect of land uses, built form, green and blue infrastructure, street network, transport and movement. The town centre has been conceptualised as having different character areas or precincts in order that there is definition to the experiences, amenities and functions we seek from these different areas. From this analysis and considering the community feedback the strategy has identified four key objectives for the future of the town centre: *Take us to the river, Join it up, In Focus, and Green it up* as leads to how to address issues and take advantage of opportunities.

The 10 initiatives are mostly physical change projects in the centre, but a few are new processes. The process related initiatives include placemaking activities to bring new life, vibrancy and attractions to the town centre. Another will be to explore with iwi, stakeholders and community how best to connect the town to the Waipoua River as a key asset and point of difference the town has. The river's environmental quality, cultural significance and recreational values can be enhanced and a range of outcomes could be possible. From better walking links, cycle paths, sitting places and ecological improvements, to more substantial development that might enable new residential or work place commercial spaces with a river outlook.

The physical change initiatives look to focus at the top of the town in the cultural and retail/food and amenity precincts primarily between Jackson Street and the Waipoua River. Connections are to be amplified so it is easier to move about, especially walking and cycling such as from QE Park to Queen Street, across Chapel Street (SH2) and to the rail station. The old town hall is to be considered along with the opportunities around it. Library redevelopment presents a great opportunity to consider what is inside, but also how it can open out to spaces around it. Water is a theme running throughout the strategy and initiatives all look to deal with stormwater more responsibly, reflect on natural values like streams beneath the town, reflect cultural values and other greening ideas. An action plan at the end of the strategy provides a framework for more detailed project plans to be developed using working and reference groups to ensure there is good representation of young people, iwi, business, and other stakeholders working alongside Council and technical experts to make it happen.



Our 4 town centre objectives...

- take me to the river
- join it up
- focus in
- green it

Under these objectives we have shaped-up 10 initiatives to catalyse transformation of the town centre

6.5 Heavy Traffic

Increasing heavy traffic, both in numbers and vehicle configuration is a change in demand having a significant impact on the network. This is discussed in detail under section 7.2 Problem 1: Aging and Deteriorating Network.

An extraordinary number of oversized vehicles are a feature of managing the Masterton District network. House relocations are quite common and this places specific demands on the infrastructure and its use.



Photo <https://www.goldcoastbuildingremovals.co.nz/house-relocation-wellington>

7 Strategic Assessment

This section outlines the need for investment. It defines the key issues and challenges facing our region and our district, the evidence base for these issues and the benefits of investing to address them.

7.1 Key Issues and Challenges Facing Our District

An investment logic map (ILM) was developed in 2019 and highlights the agreed problems that need to be addressed, and the likely benefits of investment. The ILM was reviewed in 2023, and the following changes were made:

- A new problem was added that focused on network vulnerability.
- Affordability was removed as a problem and will be used as an evaluation criterion when assessing options.

The agreed problems facing the region and the benefits of addressing these problems are detailed in Figure 7-1. This guides local investment decisions.

The alignment of the problems with local, regional and national strategic objectives is shown in Figure 7-1.

Figure 7-1: Investment Logic Map

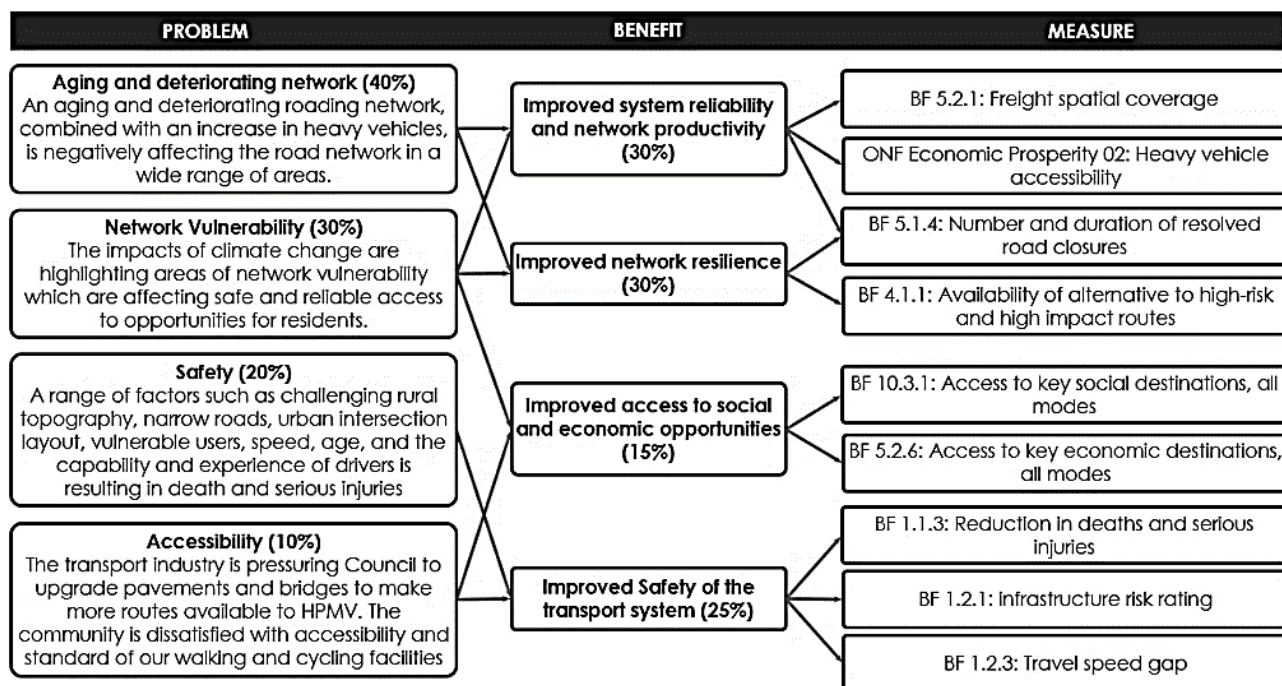


Table 7-1: Problem Alignment with Strategic Objectives

Masterton Transport Problem Statement	LOCAL	REGIONAL	NATIONAL		
	Council Community Outcomes	Regional Objectives	ONRC Customer Outcomes	GPS 2024 ²¹	Transport Outcomes
Aging and deteriorating network (40%)	An engaged and empowered community A thriving and resilient economy	Journeys to, from and within the Wellington Region are connected, resilient and reliable	Accessibility	Economic Growth and Productivity, Value for money	Economic prosperity
Network vulnerability (30%)	A thriving and resilient economy	Journeys to, from and within the Wellington Region are connected, resilient and reliable	Resilience	Economic Growth and Productivity - Increased maintenance and resilience	Resilience and Security
Safety (20%)	Efficient, safe and effective infrastructure	People can move around the Wellington region safely	Safety	Economic Growth and Productivity - Safety	Healthy and safe people
Accessibility (10%)	An engaged and empowered community Efficient, safe and effective infrastructure	Journeys to, from and within the Wellington Region are connected, resilient and reliable	Accessibility	Economic Growth and Productivity, Value for money	Inclusive access Economic prosperity

²¹ Following Cyclone Gabrielle the MOT is revising GPS 2024 to ensure a greater focus on reconstruction of damaged infrastructure, as well as building greater resilience so our transport network can better withstand the increasing frequency of extreme weather events.

7.2 Problem 1: Aging and Deteriorating Network (40%)

Problem 1: An aging and deteriorating roading network, combined with an increase in heavy vehicles, is negatively affecting the road network in a range of areas.

Cause	• Aging pavements and surfaces • Increasing numbers of heavy vehicles • Heavy loading on key sealed and unsealed routes beyond their original design capability • Limited resources (materials and people) are increasing the cost to do the work • Age of surface on collector roads extended beyond recommended practices
Consequence	• Decrease in pavement integrity/ increasing faults • Increasing maintenance costs • Decreasing customer satisfaction • Decreasing safety performance

7.2.1 Causes

Pavement History

Masterton's road network has evolved, with pavements built to standards to withstand the traffic loading of the time. In the 1980's a programme of government funded pavement strengthening was undertaken to allow for heavier vehicle loading on the local road network. However, further increases in vehicle tonnages over time has not corresponded in increased funding for pavement construction or upgrades.

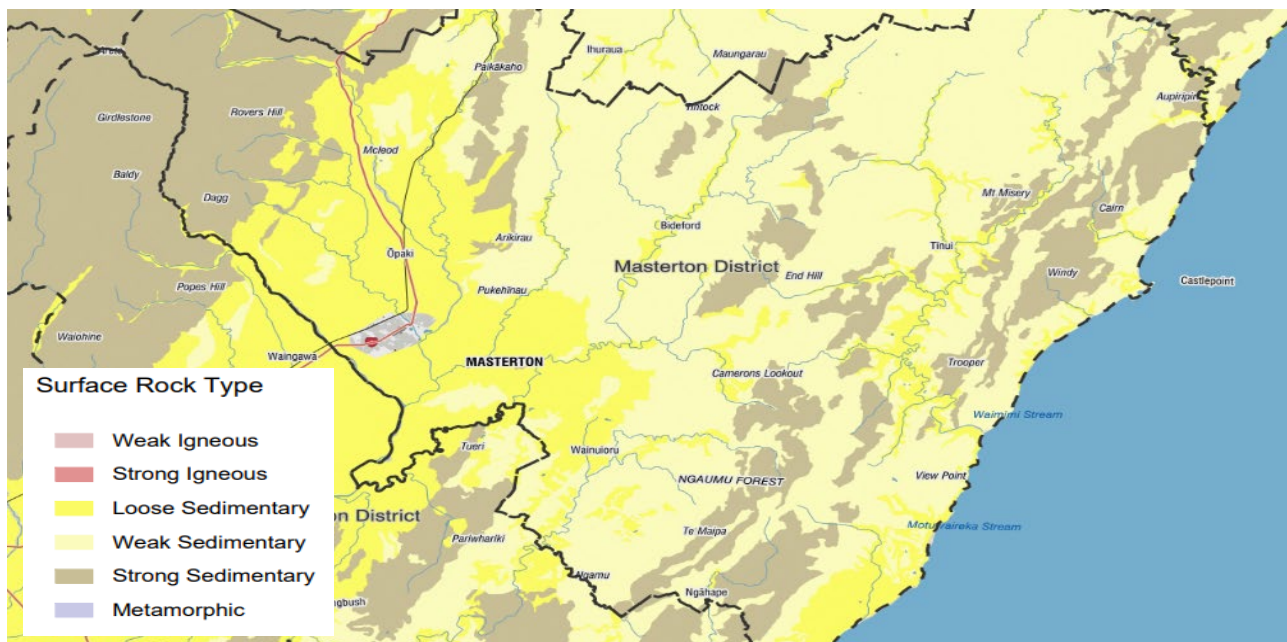
This is a particular problem for Masterton as the underlying geology is weak resulting in a poor pavement subgrade. Good quality aggregate for road construction is very limited and is becoming increasingly expensive to obtain and transport to site. Figure 7-2 shows that the surface rock type in Masterton is sedimentary rock. Of this, 53% of the surface rock is weak sedimentary rock²², 54% is loose sedimentary materials²³, and the remaining 23% is strong sedimentary rock²⁴.

²² mudstones, sandstones, weak conglomerates and crushed argillite

²³ peat, loess, sands, alluvium, glacial fill and unconsolidated sands, silts and clays

²⁴ moderately strong to extremely strong: argillite, greywacke, conglomerates and limestones

Figure 7-2: Surface Rock Type²⁵

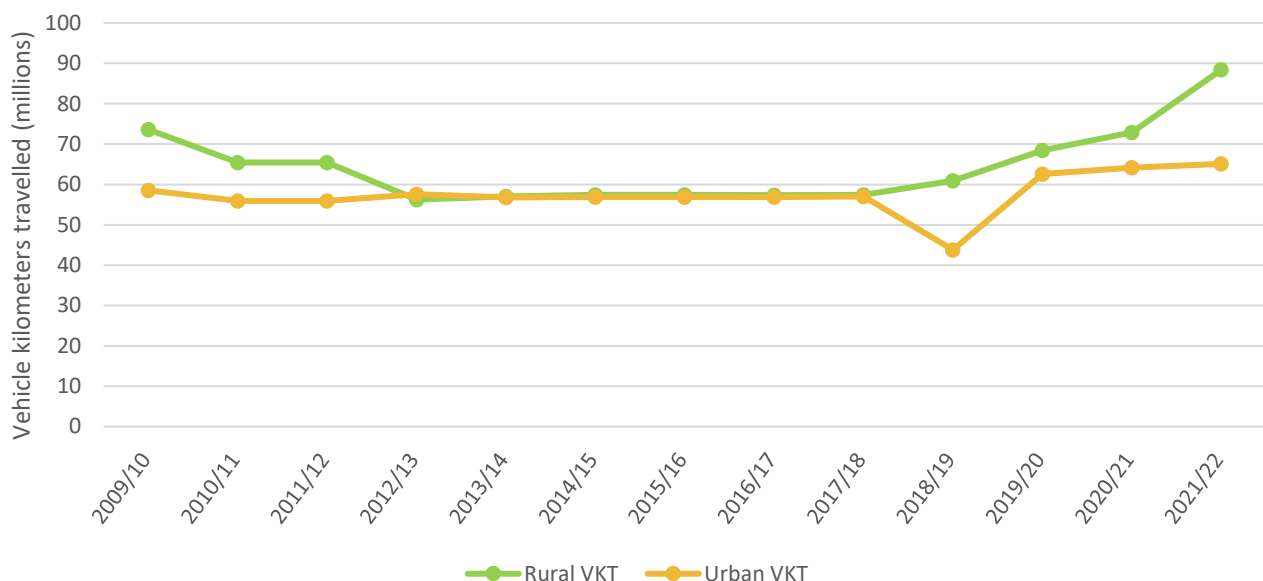


Increasing Heavy Vehicles

Only limited data is available for the number of heavy vehicles in the district. Rural vehicles kilometres travelled (VKT) data has increased by 54% since 2018/19, compared to the five years previously (Figure 7-3). The urban VKT only increased 14% in the same time period.

Traffic count data from Masterton-Castlepoint Road (a known forestry route) aligns with the trend shown by the VKT. Between 2018 and 2022, heavy vehicles on the road increased at double the rate of general traffic. There was a 68% increase in heavy vehicles, but only a 32% increase in general traffic.

Figure 7-3: VKT for Masterton roads over time²⁶



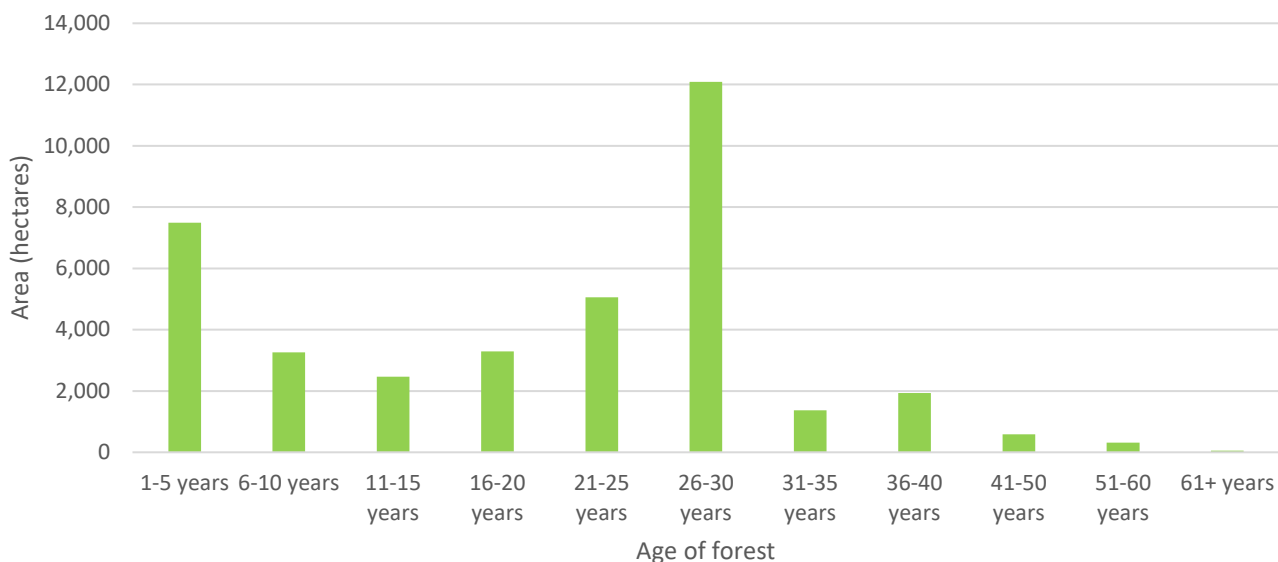
²⁵ Manaaki Whenua Landcare Research. (n.d.) OurEnvironment, Surface Rock Type

²⁶ Waka Kotahi (2022). Data and Tools: Vehicle use (VKT). <https://www.nzta.govt.nz/planning-and-investment/learning-and-resources/transport-data/data-and-tools/>

Forestry Forecast

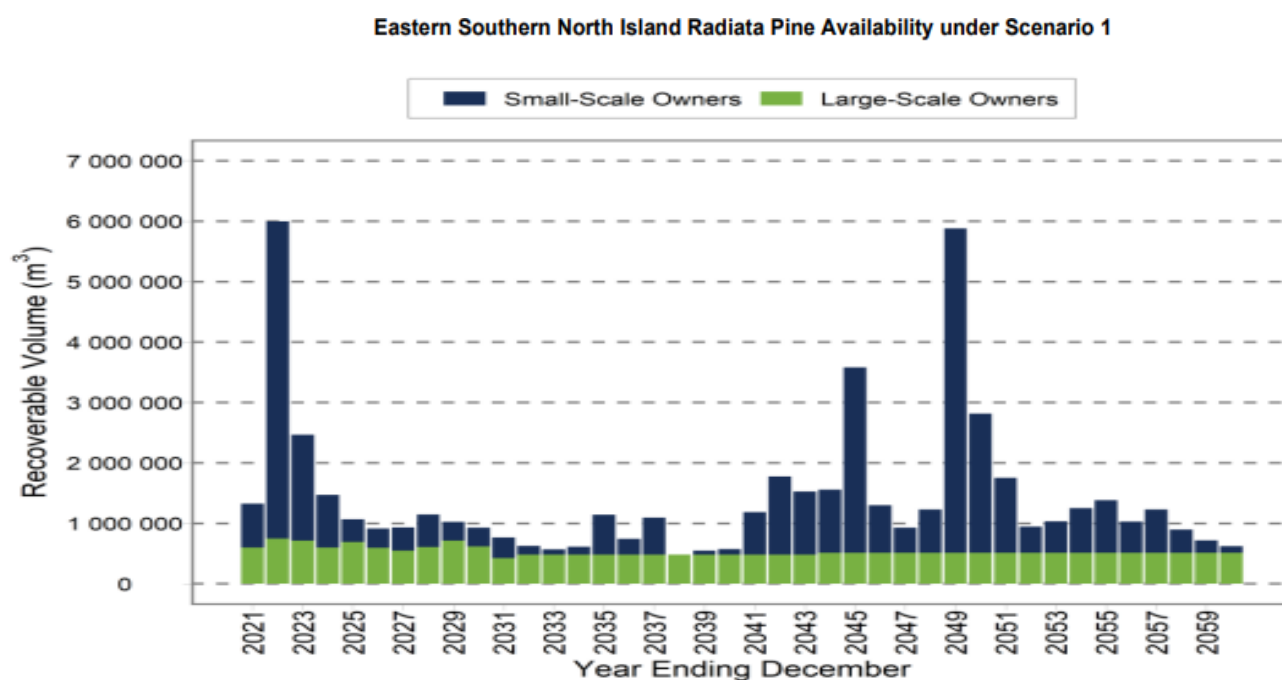
Part of the growth in heavy vehicles is believed to be due to the amount of forestry being harvested. Figure 7-4 shows the age of forestry in the Masterton District by hectare. Over 98% of the forestry in the District is radiata pine, and the optimal age to harvest this is between 24 and 35 years.²⁷ Approximately 35% of the total forestry in the District fits in this age group and is expected to be harvested over the next 10 years.

Figure 7-4: Area of Forest by Age in Masterton²⁸



MPI expect that the eastern southern North Island's wood availability is peaking. This peak is likely to plateau for a period before dropping significantly (Figure 7-5).

Figure 7-5: Eastern Southern North Island Radiata Pine forecast²⁹



²⁷ <https://www.nzffa.org.nz/farm-forestry-model/species-selection-tool/species/pine/radiata-pine/#:~:text=When%20to%20harvest,an%20adequate%20sheath%20of%20clearwood.>

²⁸ Ministry for Primary Industries (2023). National Exotic Forest Description as at 1 April 2022.

²⁹ Margules Groome (2021) Wood Availability Forecast – Western and Eastern Southern North Island 2021

The high frequency and weight from the truck and trailer units used to transport harvested logs within the District is accelerating the damage to structures and affecting the level of service on sections of the unsealed network to the forestry areas. This highlights the pressure that this type of economic growth can have on rural communities that rely on infrastructure that in some cases is nearing the end of its life.

Resourcing

Masterton's population is relatively small (29,000), yet it has a road network of over 800 kilometres. There are limited resources, both in terms of money materials and staff to address the issues in the district.

Resources are becoming more expensive and difficult to procure. The increase in larger capital projects and private developments is placing a high demand on construction workers, increasing the cost of tenders. Rates for labour and materials from recent tenders received by Council were 20-30% higher than anticipated. This reduces the work programme Council can undertake within the allocated budgets and will exacerbate the problems facing Masterton. This will lead to further deterioration, safety issues, and a perpetuating backlog of works. Historically, there has been pressure on roading budgets to find efficiencies and use less funding, which is now showing in the quality of the roading network. Large upcoming community projects will continue to put pressure on roading budgets.

7.2.2 Consequences

Pavement Deterioration

In the past year rural roads in the District have experienced a sharp decrease in quality and integrity. The Pavement Integrity Index³⁰ (PII) shows deteriorating quality in pavement over the last year, especially on rural roads (Figure 7-6). While the current pavement integrity is not as bad as it was in 2015/16, it is a concerning trend. The Condition Index³¹ (CI) has also experienced a sharp decrease for rural roads in the past year (Figure 7-7).

There has also been a steadily increasing trend in recorded pavement defects on the rural road network as shown in Figure 7-8. This can also be seen in the steadily decreasing percentage of roads that meet the smooth travel threshold (Figure 7-9).

³⁰ The PII is a measure of the condition of the pavement and seal of a sealed road.

³¹ The CI is a measure of the condition of the seal of a sealed road

Figure 7-6: Pavement Integrity Index

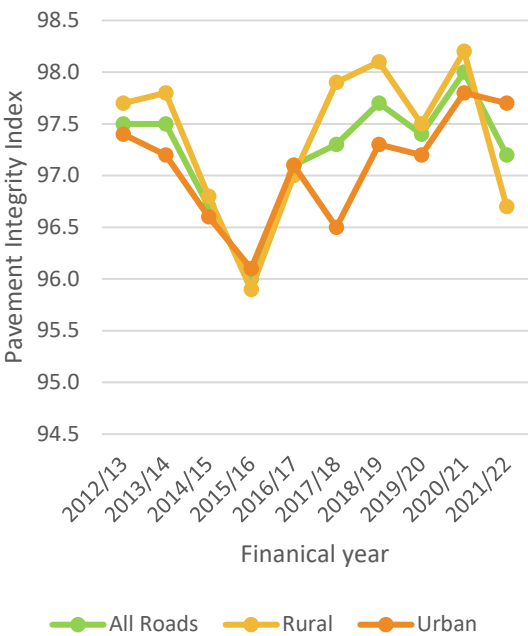


Figure 7-7: Condition Index

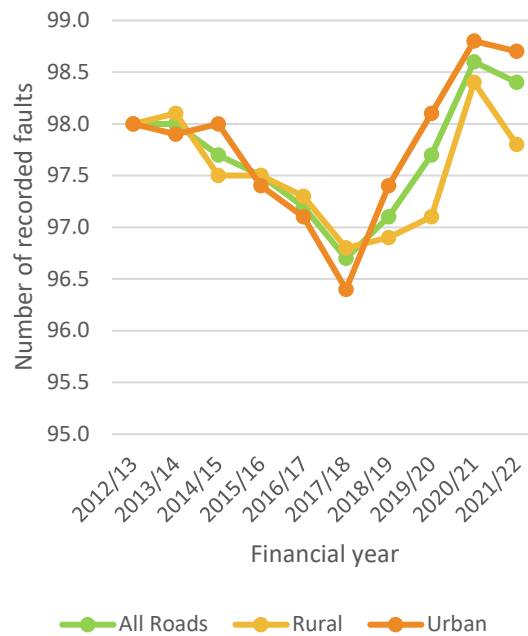


Figure 7-8: Pavement Faults

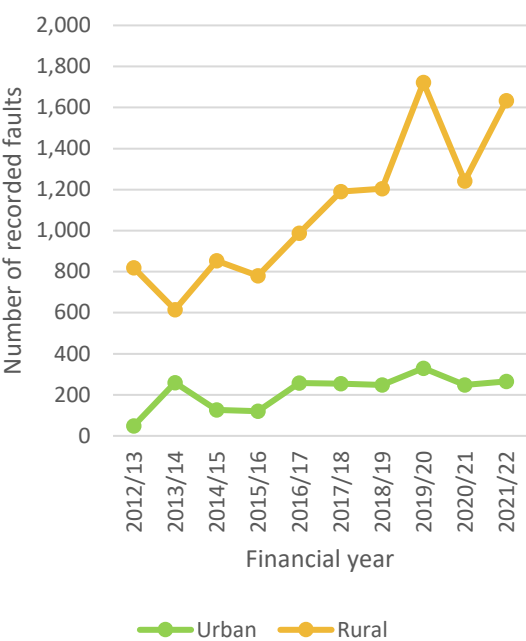
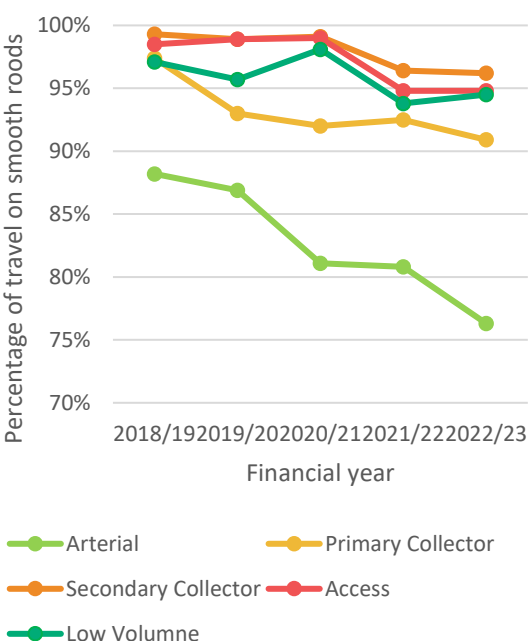


Figure 7-9: Smooth Travel Exposure



Increasing Maintenance Spending

Council's spending on roading maintenance has at least tripled over the last 10 years. If emergency spending is included, the yearly spend has quadrupled. This is shown in Figure 7-10.

Figure 7-10: RAMM Costs

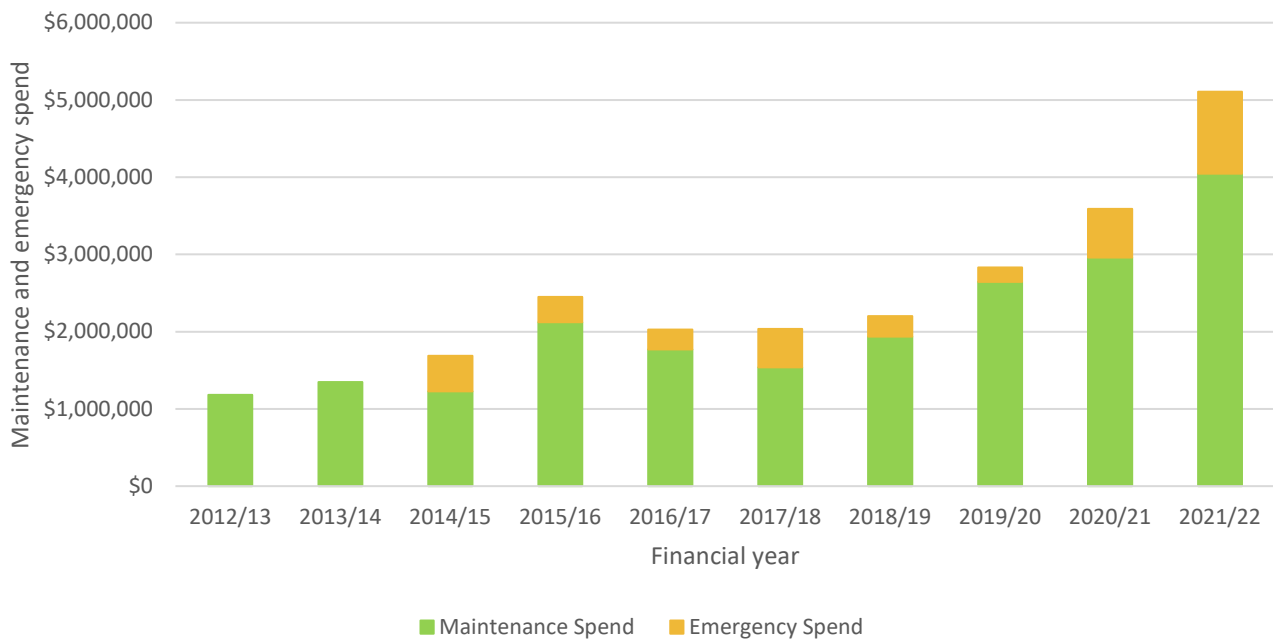
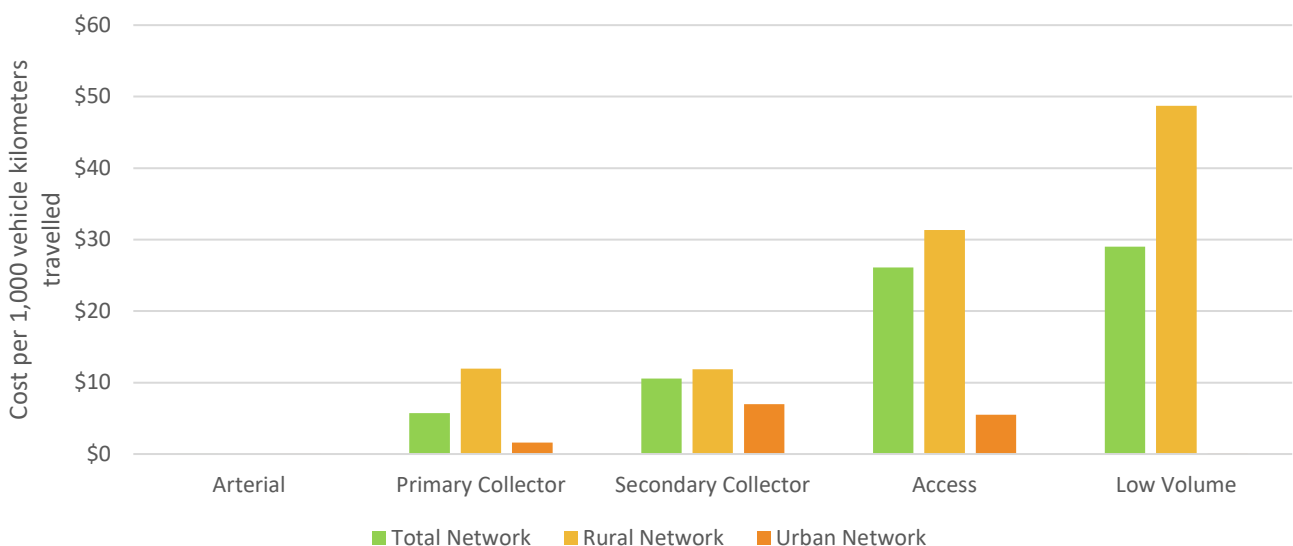


Figure 7-11 shows that generally more money is being spent on maintaining rural roads compared to urban roads per 1,000 vehicle kilometres travelled (VKT). Significantly more money is being spent on rural low volume roads. This is due to the amount of logging and stock trucks using the more remote, low volume, areas of the district. These roads are typically not built for extended periods of significant loading and are not as resilient to the impact of storm or flooding events.

Figure 7-11: Cost per 1,000 vehicle km travelled for routine pavement maintenance in 2021/22

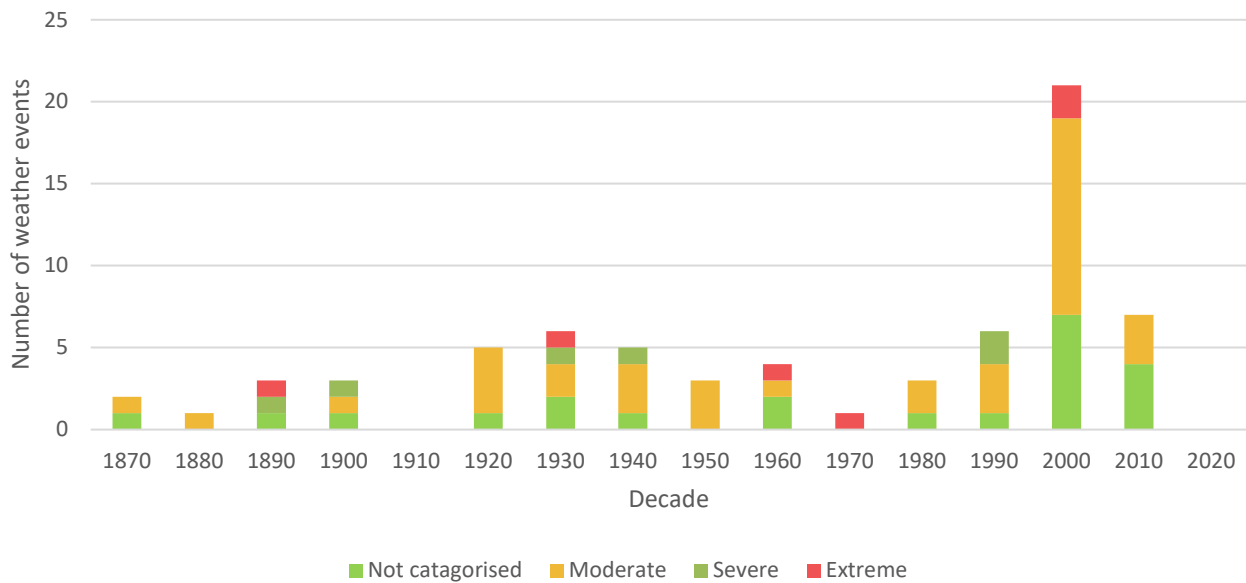


Decreasing Customer Satisfaction

Between 2020 and 2023 the percentage of residents satisfied by roads throughout the district decreased by half from 55% to 27%. This is significantly lower than the 2020 result and is seen for both rural and urban residents.

Refer to Section 5.1 for more information.

Safety



Pavement deterioration can also contribute to safety deficiencies across the network. Refer to Section 7.4 for more information on this.

7.3 Problem 2: Network Vulnerability (30%)

Problem 2: The impacts of climate change are highlighting areas of network vulnerability which are affecting safe and reliable access to opportunities for residents

Cause	• Storm frequency and intensity changes • Sea level rise and vertical land movement • Natural hazards • Coastal erosion
Consequence	• Increased frequency and duration of road closures • Restricted access to opportunities • Impacted access to lifeline infrastructure • Limited alternative routes • Changing community demographics

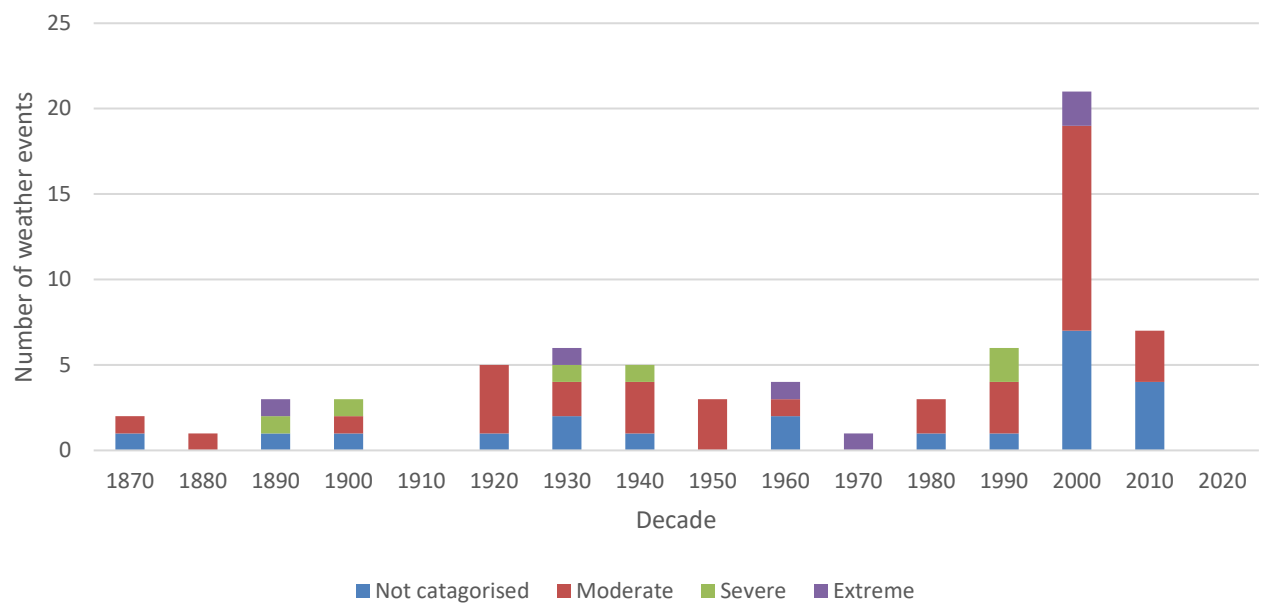
7.3.1 Causes

Storm Frequency and Intensity Changes

The effects of climate change are already being experienced in Masterton. Anecdotally the duration and frequency of storms affecting the district has been increasing. Figure 7-12 shows the number of media reports reported each decade relating to floods, landslides or storms for the District³². While there appeared to be a drop in severe events during the 2010s, compared to the 2000s, this decrease was likely driven by a tightening of the inclusion criteria for severe weather events in the NIWA Catalogue in the 2010s decade.

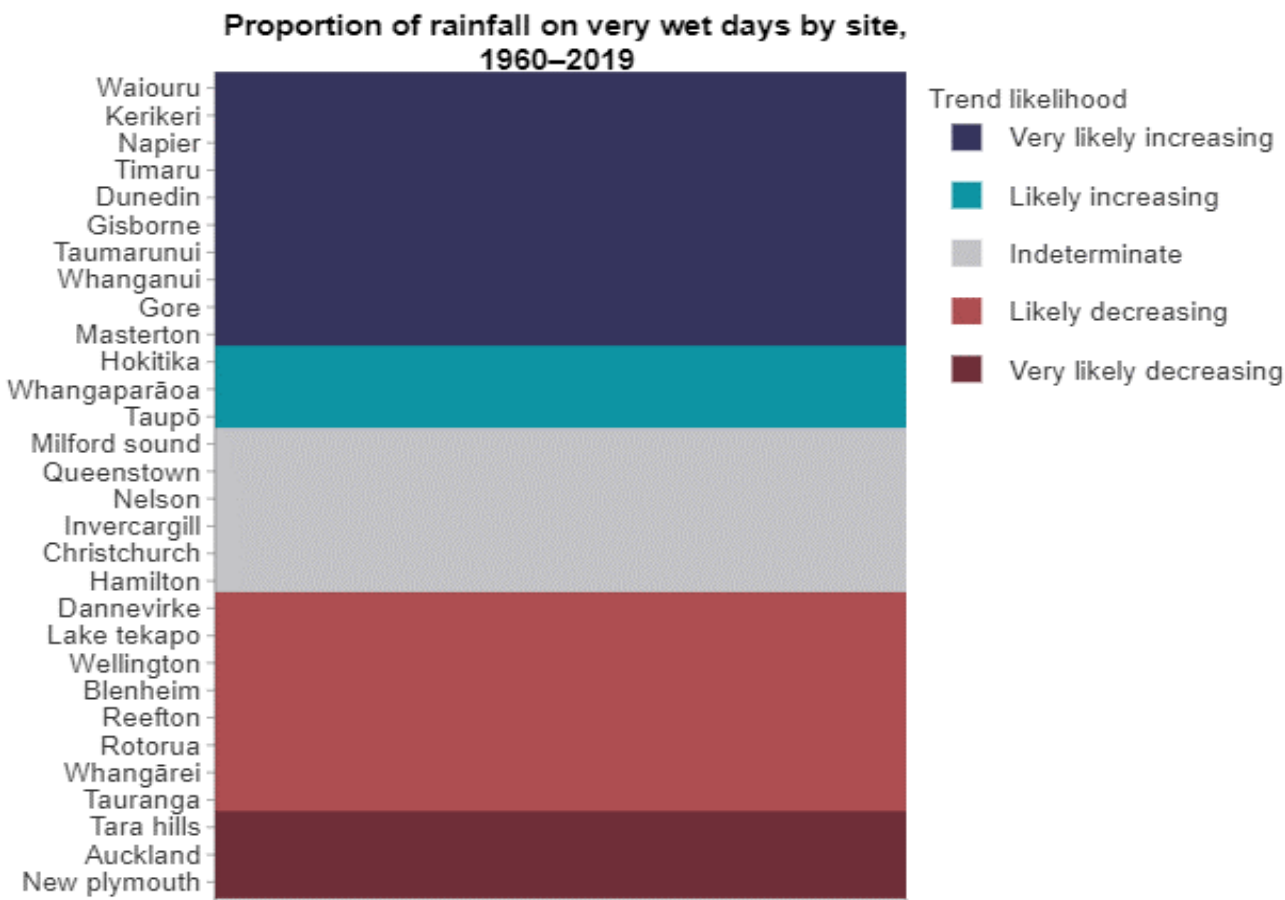
³² This information was sourced from the NIWA Historic Weather Events website. It has gaps as it contains information gathered from newspaper articles, journals, books and reports that periodically come to light.

Figure 7-12: Historic Weather Events by Decade



An assessment of extreme rainfall at 30 sites across New Zealand found that the proportion of rainfall on very wet days is very likely increasing in Masterton (refer to Figure 7-13). This means Masterton is receiving its annual rainfall through fewer, although more extreme rainfall events that can lead to flooding, slips and erosion.

Figure 7-13: Extreme Rainfall Trends³³



³³ Statistics NZ. Extreme rainfall. Page last updated 15 October 2020. <https://www.stats.govt.nz/indicators/extreme-rainfall>

This pattern aligns with climate projections for the Wellington region point to slightly less rainfall overall, but more intense extreme, rare rainfall events.³⁴ The key environmental impacts to the Wairarapa Coast and Ruamāhanga that will likely affect the District are:³⁵

- Increased flood intensity
- Increased coastal inundation
- Increased erosion
- Biodiversity losses
- Ocean acidification
- Increased wildfire

In terms of extreme rainfall events by 2040, there is projected to be up to 15% increase in the amount of rain falling during heavy rainfall days. By 2090, the projection is up to 30% increase. This indicates that rain events are projected to become heavier. The following comment is made by GWRC:

"Although the uncertainty in average rainfall range is high, extreme rainfall increases are more certain due to the increased amount of water vapour that the atmosphere can hold as it gets warmer (about 8% increase in saturation vapour per degree of warming)."

Sea Level Rise and Vertical Land Movement

While the majority of Masterton's land transport infrastructure is inland, coastal roads in Castlepoint, Riversdale, and Mataikona will be impacted by sea level rise and vertical land movement.

Figure 7-14 shows the projected sea level rise under the SSP2-4.5 scenario³⁶ combined with the vertical land movement (VLM) Whakataki, near Castlepoint. VLM needs to be considered when planning for sea-level rise effects, as tectonic activity in New Zealand leads to land subsidence or uplift. The land at Whakataki is sinking at a rate of 4.72 mm per year, accelerating the impacts of sea level rise. By 2050, sea levels are forecast to rise 0.44 m, and 1.03 m by 2100. 'Worst-case scenario' modelling (known as SSP5-8.5³⁷) results in a forecast sea level rise of 1.29m by 2100.

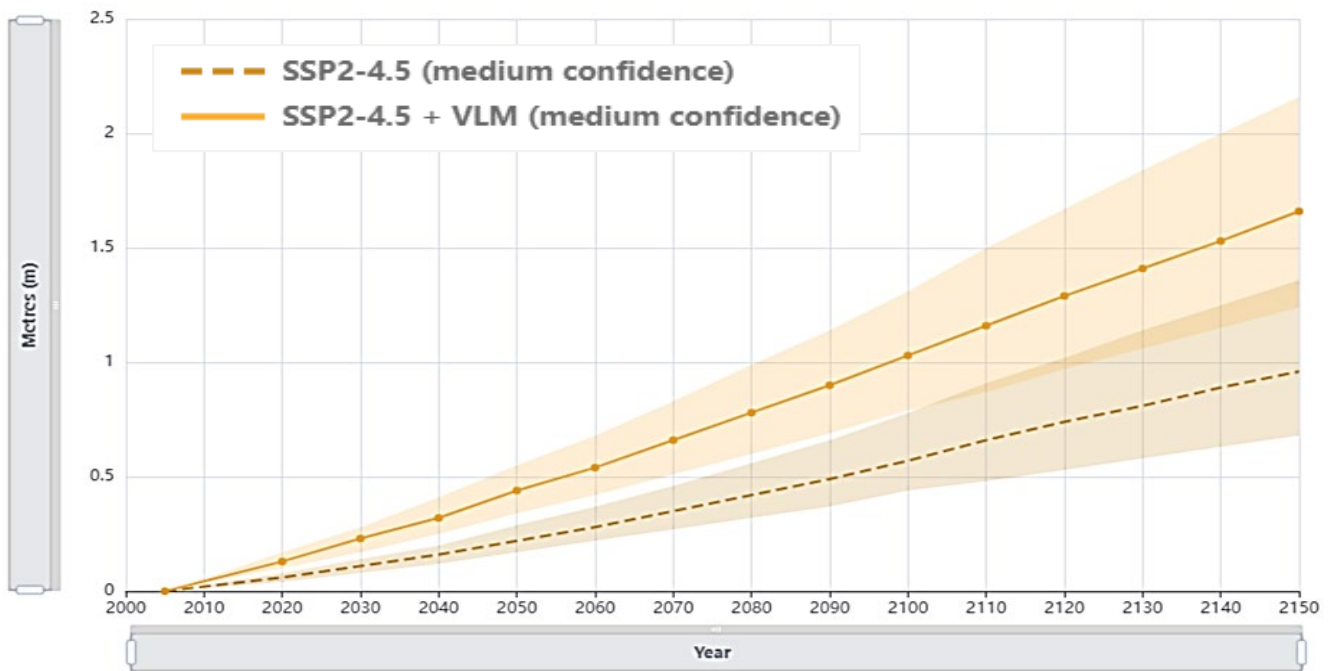
³⁴ Ministry for the Environment and Statistics NZ (2020). New Zealand's Environmental Reporting Series: Our atmosphere and climate 2020.

³⁵ Greater Wellington Regional Council (n.d.). Whaitua Catchments Climate Change parameters. <https://www.gw.govt.nz/environment/climate-change/impacts-on-our-region/>. Last updated 20 October 2022

³⁶ This is a world with moderate emissions (+2.7°C warmer world). This approximates the path associated with current global policy settings.

³⁷ This is a worst-case scenario world with very high emissions (>4°C warmer world). It is unlikely to materialize given ongoing climate mitigation.

Figure 7-14: Total Sea Level Rise with VLM at Whakataki under SSP2-4.5³⁸

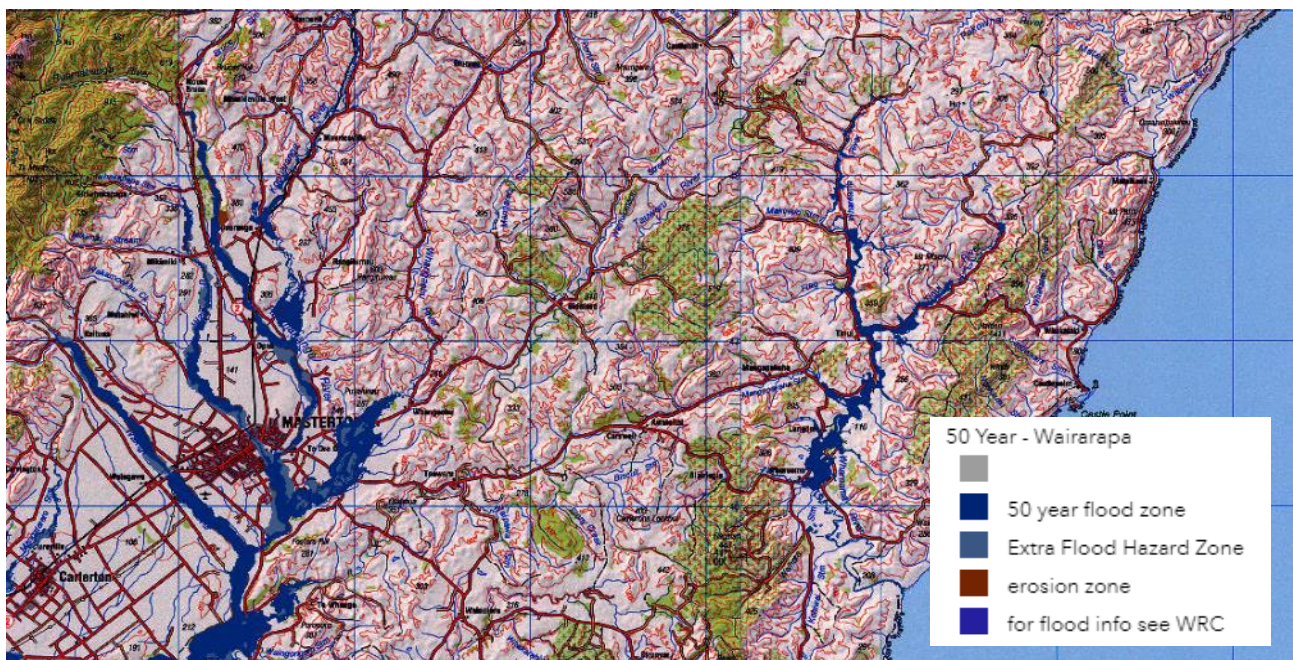


This means that the impacts from storm events will increase over time for coastal communities as the height of the storm surge increases. This is particularly relevant for roads and coastal communities located along the eastern coastline of Masterton. These areas are already vulnerable and experiencing significant erosion.

Natural Hazards

The District is exposed to various natural hazards including seismic activity, flooding, and erosion. Parts of Masterton, especially the central lowland area are especially susceptible to flooding (Figure 7-15).

Figure 7-15: Flood Risk Map³⁹



³⁸ NZ Sea Rise Map, Takiwā. Sea Level Rise Predictions by Decade for site 2379, <https://searise.takiwa.co/> (13/04/2023)

³⁹ <https://gis.mstn.govt.nz/WairarapaViewer/?map=9c596b4e03094743b28a375f0e042079>

7.3.2 Consequences

Frequency and Duration of Road Closures

Natural hazards can often result in road closures that disrupts travel reliability or results in longer detours. These events impact on the cost of travelling for people and goods, and communities can be severed.

There is currently limited information available regarding the frequency and duration of road closures in the District. Most roads that are closed due to weather events are generally restored within one or two days. However, part of Mataikona Road, on the coast north of Castlepoint, was closed for 10 days in 2005 following an extreme rain event. Mataikona Road services three small settlements with a permanent population of less than 190 people and has no alternative access route. During the closure most residents were able to get in and out using the beach, however there is a risk that over time climate change will result in more severe events, leading to longer and more frequent closures.

Limited Alternative Routes

During key weather and natural hazard events parts of the road network may not be accessible. Approximately 40% of the roading network does not have an alternative route, meaning that some communities may be cut off until access is restored.

Masterton-Castlepoint Road east of Tinui, the roads east of Whareama, and the roads southeast of Wainuiori are all roads where closure has widespread implications for the community beyond the closure.

Depending on the time of the year any closures may also impact tourists and day trippers visiting Castlepoint and other coastal locations.

Access to Services and Opportunities

The large majority of services and opportunities in the District are located in Masterton. This includes secondary schools, pharmacies, medical centres, the hospital, other emergency services, and job opportunities.

Increasing network vulnerability means that people may experience more times where access to these facilities is limited or unavailable. This is particularly relevant for the more remote locations of the network which have greater opportunity to be impacted by closures.

Lifeline Infrastructure

The roading network is often used to access key lifeline infrastructure such as power and communications. Any event which results in road closure may also impact power and communications supply. If the event is severe enough and prevents access to key parts of the power or communications network, some communities may be without power or communications for days, or even weeks.

7.4 Problem 3: Safety (20%)

Problem 3 A range of factors such as challenging rural topography, narrow roads, urban intersection layout, vulnerable users, speed, age and the capability and experience of drivers is resulting in death and serious injuries.

Cause	• Unforgiving road corridor with limited safety measures • Speed • Road alignment
Consequence	• Fatal and serious injury crashes • Community is over-represented in key road safety risk factors

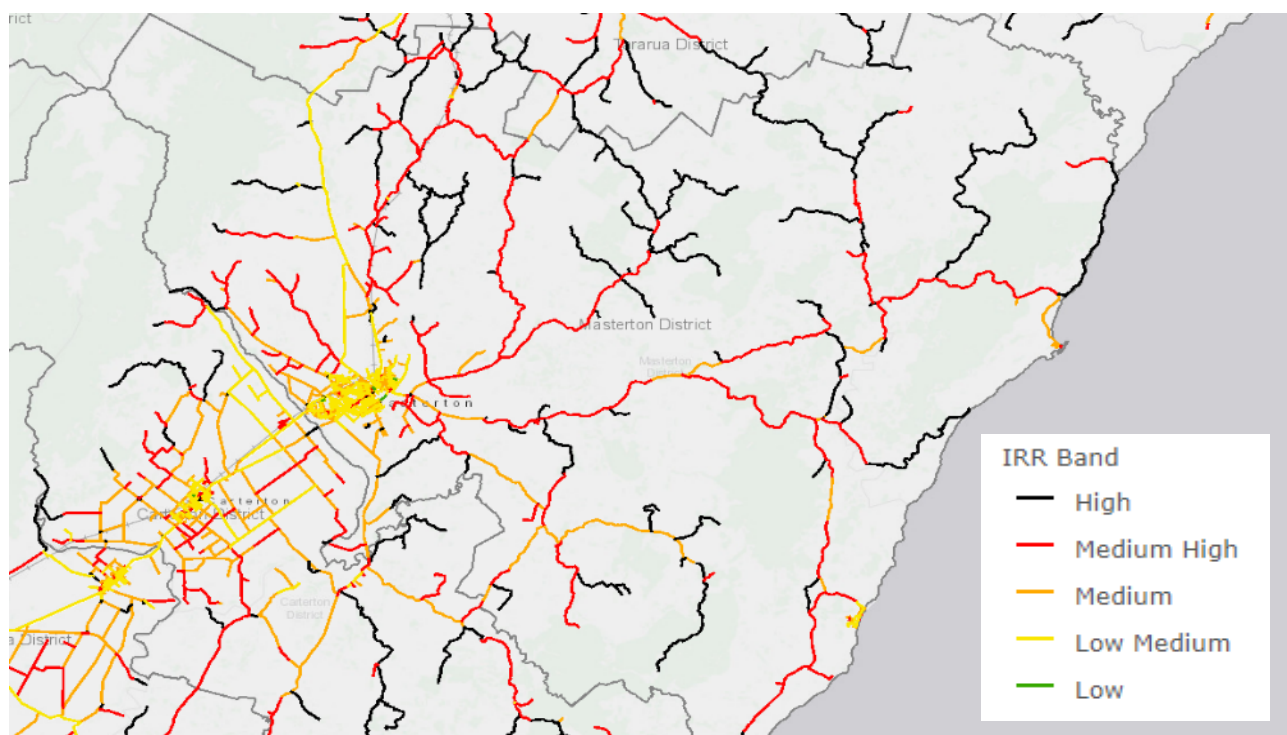
7.4.1 Causes

Unforgiving Road Corridor

The Infrastructure Risk Rating (IRR) predicts the underlying level of risk a road presents to an individual road user based on eight key road and roadside attributes⁴⁰. Figure 7-16 maps the IRR bands across the District, and Figure 7-17 and Figure 7-18 shows the IRR band by ONRC. They show that:

- Urban roads are generally less risky than rural roads
- 55% of access road length is in the 'High' IRR band (294 km)
- 36% of the total network length is in the 'High' IRR band (307 km). This is 50% to 100% higher than most other Provincial Centres.⁴¹

Figure 7-16: Map of IRR Bands



⁴⁰ The attributes that affect safety risk are land use, road stereotype, carriageway width, horizontal alignment, roadside hazards, intersection density, access density, and traffic volume.

⁴¹ Transport Insights

Figure 7-17: Percentage of IRR or each ONRC Length

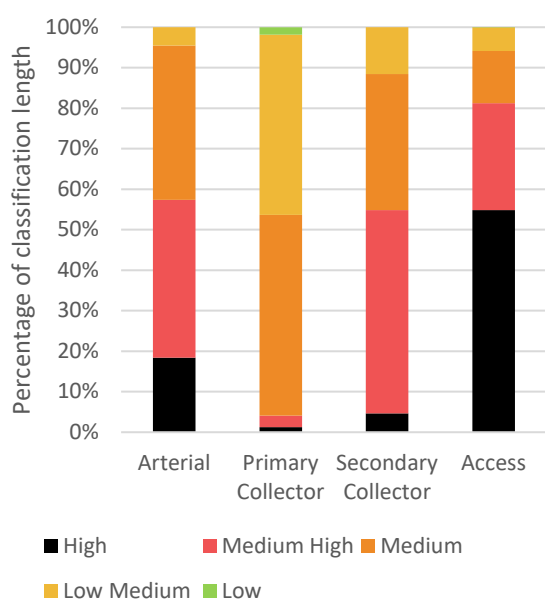
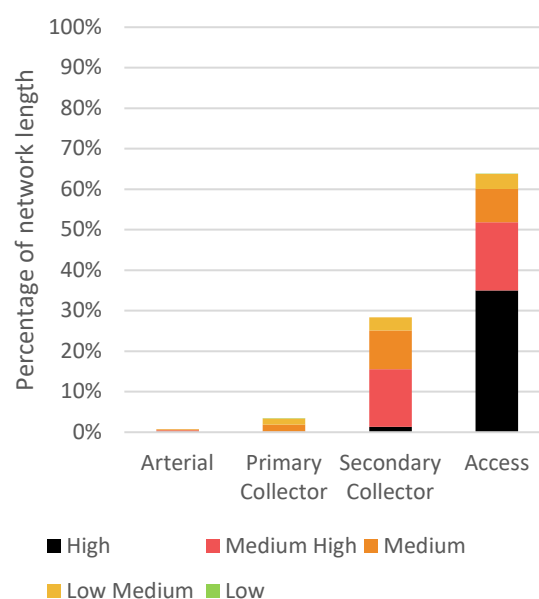


Figure 7-18: Percentage of IRR per ONRC Across the Network Length



High Speeds

Speed is a factor in crash likelihood and severity. Much of the rural network has a default 100 km/h speed limit, and some of these roads have unforgiving sections with unprotected roadside hazards. The safe and appropriate speed for much of the network is 60 km/h or lower, with some routes at 80 km/h.⁴²

Inappropriate speed was listed as a factor in 17% of the death and serious injury (DSI) crashes recorded over the past five years.

7.4.2 Road Alignment

Road alignment is also a contributing factor to crash likelihood. The western and eastern parts of the District have hilly topography, and therefore contain roads with frequent curves, winding sections, or tortuous alignments. This is something that is considered when assessing the IRR and roads with winding or tortuous alignments typically have higher IRR bands.

Winding and tortuous road alignments account for:

- 44% of the total network length (374 km)
- 52% of the rural network length (372 km)
- 2% of the urban network length (2 km)

⁴² Mega Maps: Road to Zero Edition 2

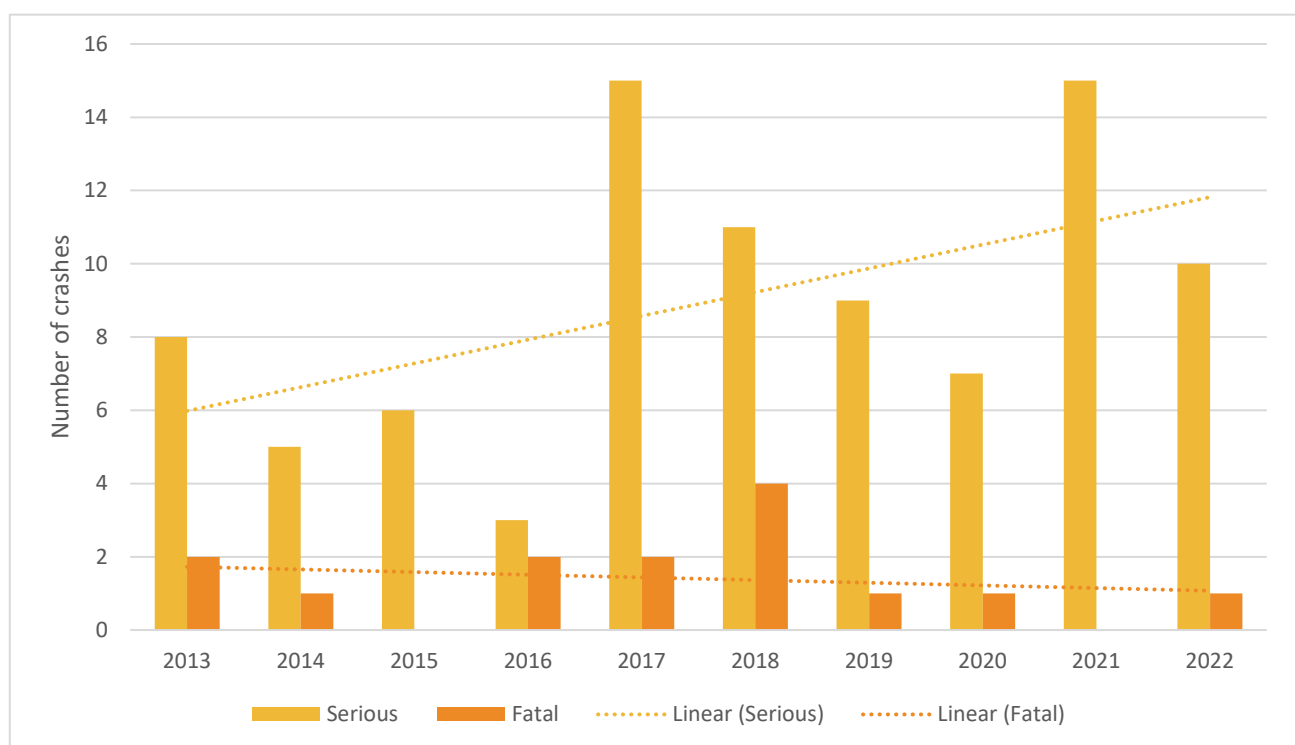
7.4.3 Consequences

Increasing Injury Crashes

In the latest five-year period (2018 – 2022), 237 injury crashes occurred on local roads (not SH2), compared to 176 in the preceding five years period. This is a 35% increase in injury crashes. Death and serious injury crashes (DSI) also increased by 35%, from 44 between 2013 and 2017 to 59 between 2018 and 2022 (Figure 7-19). Over the past 10 years, there have been a significant increase in DSI crashes

The intermediate target for the Road to Zero is to reduce deaths and serious injuries on our roads by 40% by 2030. Unfortunately, crash data shows DSI crashes are still high, and Masterton does not appear to be on track to achieve this.

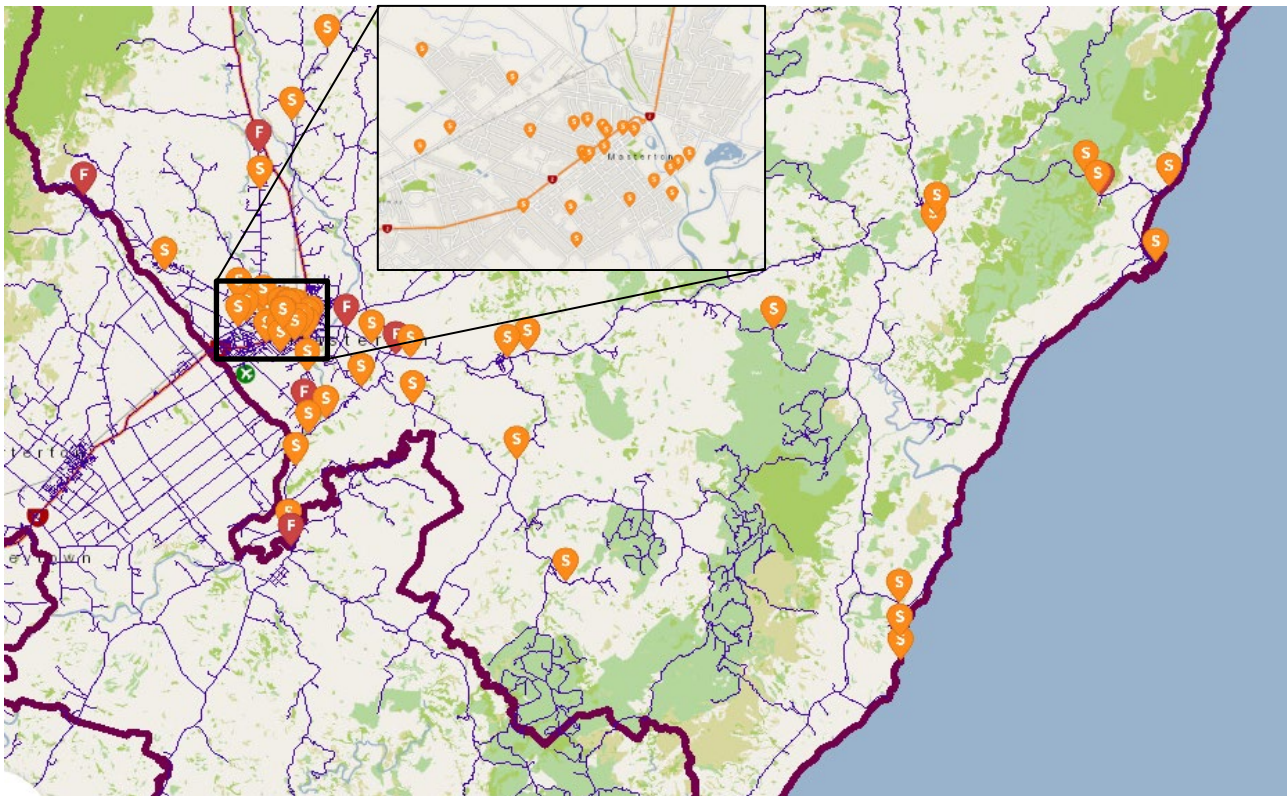
Figure 7-19: Number of DSI crashes in Masterton over the past 10 years



High Risk Routes

Figure 7-20 shows the locations of the 59 DSI crashes on local roads between 2018 and 2022. Just over half (33) of the crashes occurred outside the Masterton urban area, and all seven of the fatal crashes occurred outside the urban area. It highlights the Masterton Urban area, and the Masterton-Castlepoint Road, Colombo Road, and Te Whiti Road as areas of concern. Masterton-Castlepoint Road and Te Whiti Road are secondary collectors, and Colombo Road is a primary collector.

Figure 7-20: DSI crashes on Masterton's local road network (2018-2022)



Rural Crashes

Just under half (43%) of the total injury crashes in Masterton occurred on the rural network. This is typically an area with higher speeds, resulting in higher severity crashes. This is demonstrated by the fact that 58% of DSI crashes occurred on the rural road network, with all seven fatal crashes (2018-2022) occurring on the rural network.

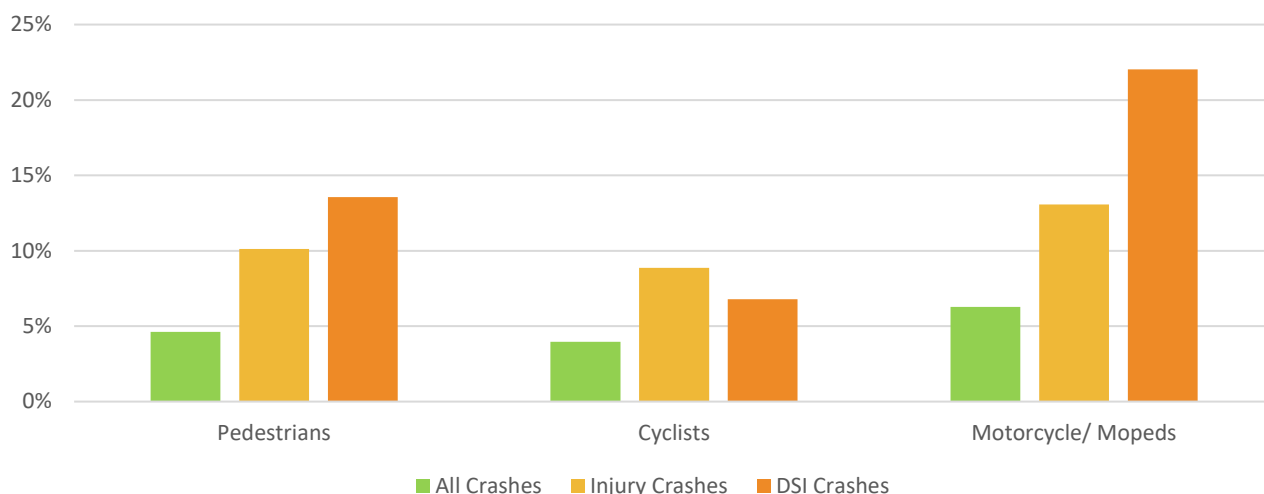
Of particular concern are loss of control crashes which account for 80% of all rural injury crashes, but only 25% of urban injury crashes. Of the rural loss of control crashes, three quarters are loss of control on bends, indicating inappropriate speed is a key factor in these crashes. This risk is reflected in the Communities at Risk Register (CaRR), which is discussed below.

Vulnerable Road Users

There were 606 crashes in Masterton between 2018 and 2022 including non-injury crashes. Vulnerable road users (pedestrians, cyclists, and motorcycle and moped riders) were involved in 15% of the total crashes for the district. However, they make up 42% of the DSI crashes.

Figure 7-21 shows the percentage of vulnerable users involved in all crashes, injury crashes, and DSI crashes. Motorcycles and moped riders are significantly overrepresented in DSI crashes compared to all crashes.

Figure 7-21: Percentage of Vulnerable Users in Crashes



Over-represented in the Communities at Risk Register (CARR)

The CaRR has been developed by Waka Kotahi to identify communities of road users that are over-represented in terms of road safety risk. The register highlights personal risk to road users by ranking each local authority area, based on the Road to Zero areas of concern.

Table 7-2 details the high and medium concern areas where the Masterton community road users are over-represented in terms of road safety risk. Of the fifteen risk factors, Masterton is overrepresented in seven, with five high concern risk factors.

The highest risk factors for Masterton in 2022 were speed, rural loss-of-control, motorcycle crashes, and seatbelts not being worn. Young drivers, and alcohol and drugs are factors identified as medium. It is clear that Masterton has significant work to do to address these areas of deficiencies in safety within our community.

Table 7-2: Communities at Risk Register 2022 – Masterton District ratings

Road Safety Risk Factor	Risk
Overview: All Deaths and Serious Injuries	High Concern
Young drivers (of light vehicles aged 16 – 24 yrs)	Medium Concern
Alcohol and/or drugs	Medium Concern
Speed (too fast for the conditions)	High Concern
Rural road loss of control/or head on >70km/hr.	High Concern
Motorcyclist involved	High Concern
Restraints (seatbelt not worn)	High Concern

7.5 Problem 4: Accessibility (10%)

Problem 4: The transport industry is pressuring Council to upgrade pavements and bridges to make more routes available to HPMV. The community is dissatisfied with accessibility and standard of our walking and cycling facilities

Cause	• Limited high performance motor vehicle (HPMV) routes • Government policy and legislative changes allowing heavier vehicles - 39T to 44T on New Zealand roads. • Increased forestry forecast (refer to Problem 1) • Limited specific walking and cycling facilities
Consequence	• Less routes available for heavier loads. • Increase of costs to strengthen bridges to accommodate heavier vehicles • Suppressed cycling demand.

7.5.1 Causes

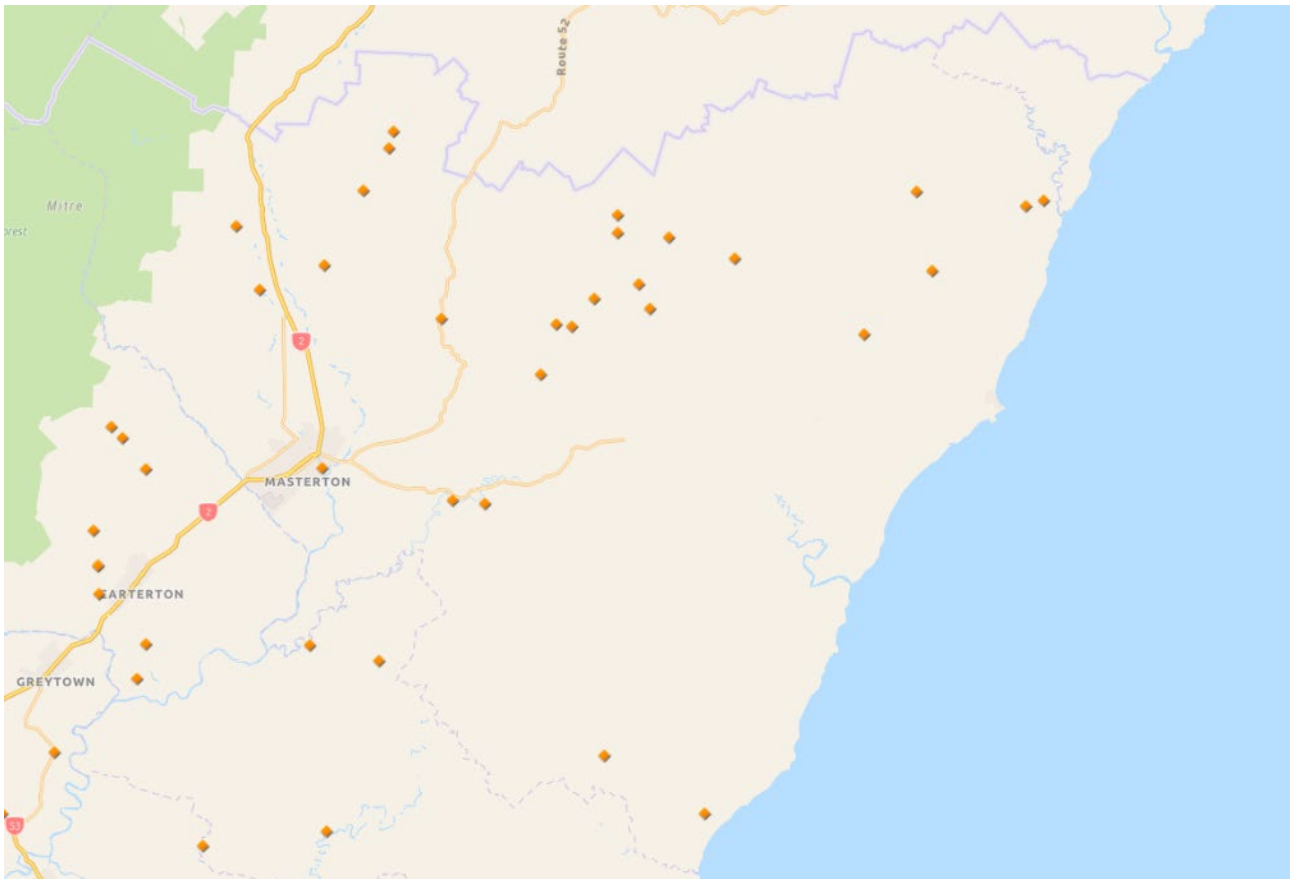
Bridge Restrictions and Limited HPMV routes

At present, Masterton has limited routes available to Class 1 heavy commercial vehicles (HCVs), 50 MAX vehicles and HPMVs which can limit the productivity of industries like agriculture and forestry. The limiting factor for most routes is bridges. There are 27 weight restricted bridges in Masterton (Figure 7-22). These weight restricted bridges mean⁴³:

- Access roads
 - 1% of access roads are not available to Class 1 HCV
 - 5% of access roads are not available to 50 MAX vehicles
- Low volume roads
 - 3% of low volume roads are not available to Class 1 HCV
 - 14% of low volume roads are not available to 50 max vehicles
- No information is provided on HPMV restrictions, but it will be greater than the amount of network that is unavailable for 50 MAX vehicles

⁴³ "Network Availability and Accessibility 2021/22," Performance Dashboard, Transport Insights, accessed 23/06/2023, <https://portal.transportinsights.nz/performance/dashboard/network-availability>

Figure 7-22: Location of weight restricted bridges in Masterton⁴⁴



Many of these routes were developed many years ago, and the infrastructure has aged (refer to Problem 1, Section 7.2). Many of the forestry roads in Masterton have not been constructed to carry HPMV loads and will be negatively affected by the increase in traffic loading unless engineering measures are taken.

Increase in vehicle weight

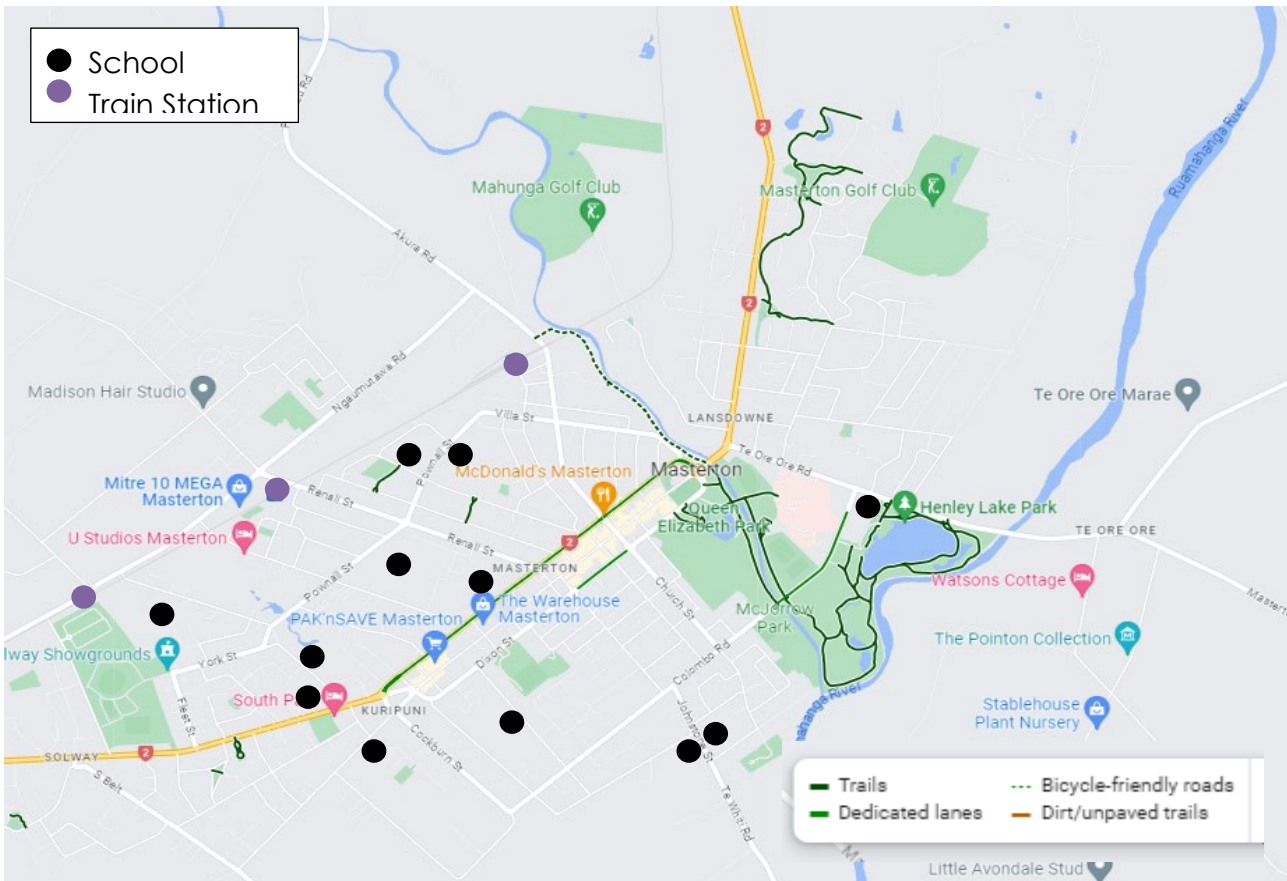
The maximum weight of heavy vehicles has increased over time which improves the efficiency and productivity of journeys and reduces the number of trips. While this has economic benefits it is putting more pressure on aging pavements. This combined with Masterton's poor underlying geology, weak subgrades and limited quality aggregates means that some routes are not available for certain vehicles, and that those routes that are available are deteriorating more quickly (refer to Problem 1 for more detail).

Active mode provisions

Most transport corridors in the District were developed with limited active mode provision. There are very limited provisions for cycling within the District. Those that do exist are generally located in the Masterton urban area and are typically off-road trails for recreational use (Figure 7-23). The footpath network is considerably more extensive than the cycling network but is also limited to the Masterton urban area.

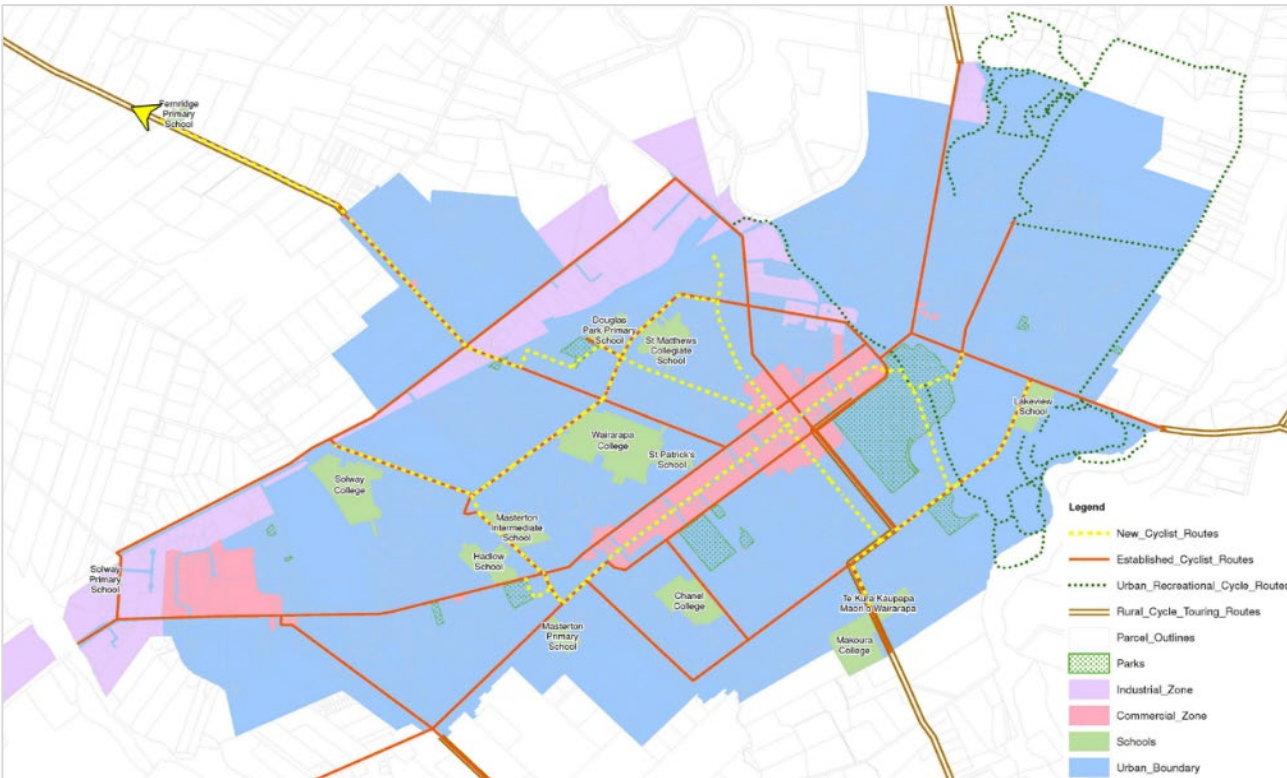
⁴⁴ Waka Kotahi (nd). "50 MAX June 2023." Accessed 23 June 2023.
<https://nzta.maps.arcgis.com/apps/webappviewer/index.html?id=28cdbf52c1664e92a1a84d6a5bdcf575>

Figure 7-23: Cycle Infrastructure in Masterton



A cycling strategy was developed for Masterton in 2017 and it proposed a cycle network as shown in Figure 7-24. Little progress has been made towards this network apart from some of the urban recreational trails.

Figure 7-24: Cycle Network Proposed in the 2017 Masterton Cycling Strategy



People in the rural area who want to walk, or cycle have to use the roads and these often have very limited shoulder space.

The limited active mode provision is reflected in the residents' survey satisfaction scores. The 2023 residents survey showed that only 45% of the community is satisfied with cycling in the district, and only 43% are satisfied with the footpaths.

7.5.2 Consequences

Heavy Commercial Vehicles

Increases in the weight of HVs is restricting the routes available to the transport industry. There are several consequential implications of this:

- Future economic potential is not unlocked, and land remains unproductive. Productive parts of the network remain unsuitable for increased payloads.
- Reduced options for safe transport choices to encourage people to change the way they travel around Masterton.
- Unattractive access and a perception of unsafe routes leads to less recreational activity.
- Reduced ability to deliver on social, environmental, and economic outcomes within Council LTP.

Increased bridge maintenance costs

The increasing heavy vehicle weight also means that the rate of deterioration for structures may increase, leading to further route restrictions. The cost of bridge maintenance in Masterton nearly tripled between 2017/18 and 2021/22 to \$180k and has been steadily increasing since 2014/15. Approximately 70% of the total spend on bridge maintenance in 2021/22 was on maintenance of structural members. This is considerably higher than in previous years.

All bridges are inspected every two years, with detailed inspections completed every five years.

Suppressed Cycling Demand

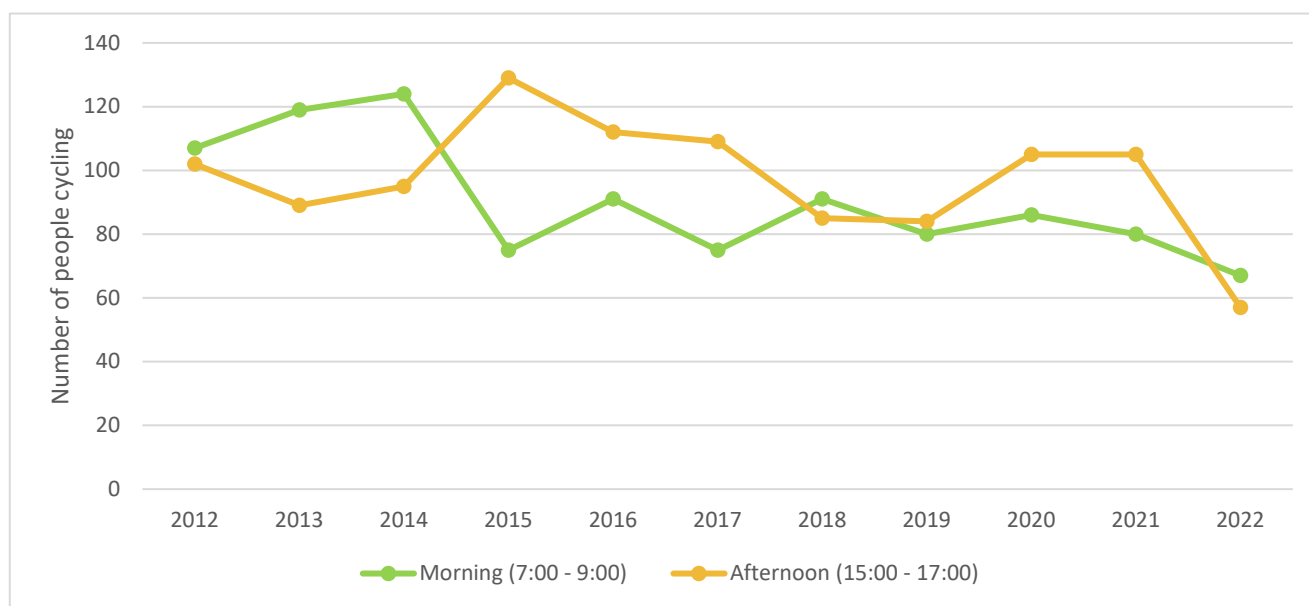
Anecdotally there is a desire among some residents to use active modes to a greater degree. In the 2020 residents survey 9% of comments about the districts roading or water-related infrastructure referred to the need for more cycleways. There is also a desire from Council to increase the amount of cycle routes in the Masterton urban area. This will help to encourage mode shift and VKT reduction which is a key focus of many national and regional strategies.

Despite the desire of both residents and Council there has been a steady decline in the number of people cycling in Masterton over the past 10 years (Figure 7-25). Lack of suitable cycling infrastructure has been known to suppress demand for cycling. People who cycle can typically be categorised as follows:⁴⁵

⁴⁵ Classification of transportation cyclists, adaptation of Geller (2009), based on values for the City of Portland from Dill and McNeil (2012)

- Strong and fearless (6%): people who choose to cycle regardless of the road and traffic conditions.
- Enthused and confident (9%): People who cycle on networks that provide little physical separation from motor traffic.
- Interested but concerned (60%): people who are, in principle, willing to cycle but only on facilities where they feel comfortable.
- No way no how (25%): people who will never choose to cycle for transport.

Figure 7-25: Total Number of People Cycling over Four Locations⁴⁶



If we assume the current people cycling in Masterton fall into the first category, there are approximately an additional 700 people who would be willing to cycle if appropriate facilities were provided.

7.6 Problems Summary

The key points from the above sections are summarised in Table 7-3, and any data gaps are highlighted.

Table 7-3: Problem Summary

Evidence		Key Points
Problem 1: Deteriorating network		
Cause	Pavement History	Masterton's road network has evolved, with pavements built to withstand the traffic loading of the time. Increases in vehicle tonnages has not corresponded in increased funding for pavement upgrades. Masterton's underlying geology is weak resulting in a poor pavement subgrade. Good quality aggregate for road construction is very limited and is increasingly expensive to obtain and transport to site.

⁴⁶ Short Street/ High Street (SH2)/ Intermediate Street; Te Ore Ore Road/ Colombo Road; Church Street/ Dixon Street; Pownall Street/ Renall Street

Evidence		Key Points
Cause cont.	Heavy Vehicles	Between 2018 and 2022, heavy vehicles on Masterton-Castlepoint Road increased 68%, while general traffic only increased 32%.
	Forestry	MPI expect that the eastern southern North Island's wood availability is peaking. This peak is likely to plateau for a period before dropping significantly
	Resourcing	Resources are becoming more expensive and difficult to procure. There is a high demand on construction workers, increasing the cost of tenders. Rates for labour and materials from recent tenders received by Council were 20-30% higher than anticipated.
Consequence	Pavement Deterioration	Rural roads have experienced a sharp decrease in PII over the last year. The number of pavement faults recorded on the network has increased 37% over the last five years.
	Increased Maintenance Spend	Council's spending on roading maintenance has at least tripled over the last 10 years. If emergency spending is included, the yearly spend has quadrupled
	Decreasing customer satisfaction	Between 2020 and 2023 the percentage of residents satisfied by roads throughout the district decreased by half from 55% to 27%.
Problem 2: Network Vulnerability		
Cause	Weather events	The proportion of rainfall on very wet days is very likely increasing in Masterton. This means Masterton is receiving its annual rainfall through fewer, although more extreme rainfall events that can lead to flooding, slips and erosion.
	Sea level rise and vertical land movement	Under the SSP2-4.5 scenario by 2050, sea levels are forecast to rise 0.44 m, and 1.03 m by 2100. Worst-case scenario modelling (known as SSP5-8.5) results in a forecast sea level rise of 1.29m by 2100.
	Natural hazards	The District is exposed to various natural hazards including seismic activity, flooding, and erosion.
Consequence	Road Closures	There is limited information about road closures. Most roads that are closed due to weather events are generally restored within one or two days. However, part of Mataikona Road was closed for 10 days in 2005.
	Limited alternative routes	Approximately 40% of the roading network does not have an alternative route.

Evidence		Key Points
Consequence cont.	Access to opportunities	The large majority of services and opportunities in the District are located in Masterton. Increasing network vulnerability means more remote locations will be more likely to be cut off from Masterton and the services and opportunities it provides.
	Lifeline infrastructure	The roading network is used to access key lifeline infrastructure such as power and communications. Any event which results in road closure may also impact power and communications supply to communities.
Problem 3: Safety		
Cause	Unforgiving corridor	55% of access road length is in the 'High' IRR band. 36% of the total network length is in the 'High' IRR band. This is 50% to 100% higher than most other Provincial Centres.
	High Speeds	Much of the rural network has a default 100 km/h speed limit. The safe and appropriate speed for much of the network is 60 km/h or lower, with some routes at 80 km/h. Inappropriate speed was listed as a factor in 17% of the DSI crashes over the past five years.
	Road Alignment	Road alignment is also a contributing factor to crash likelihood. Winding and tortuous road alignments account for 44% of the total network length (374 km), and 52% of the rural network length (372 km).
Consequence	Increasing injury crashes	DSI crashes increased 35% between the last two five-year periods: 44 occurred between 2013 and 2017 to 59 between 2018 and 2022
	High risk routes	There is a fairly even split between urban and rural DSI crashes, although all seven DSIs occurred on rural roads. Key areas of concern include the Masterton Urban area, and the Masterton-Castlepoint Road, Colombo Road, and Te Whiti Road.
	Rural Crashes	Loss of control crashes which account for 80% of all rural injury crashes, but only 25% of urban injury crashes. Of the rural loss of control crashes, three quarters are loss of control on bends.
	Vulnerable road users	Vulnerable road users accounted for 15% of the total crashes but 42% of the DSI crashes. Motorcycles and moped riders are significantly overrepresented in DSI crashes compared to all crashes and this is reflected in Masterton being having a 'High Concern' for motorcycle crashes in the CaRR.
	Communities at risk register	Of the fifteen risk factors, Masterton is overrepresented in seven, with five high concern risk factors: speed, rural loss-of-control, motorcycle crashes, and seatbelts not being worn.

Evidence		Key Points
Problem 4: Accessibility		
Cause	Route restrictions	There are 11 weight restricted bridges, 18% of access roads are not available to HPMV, and 42% of low volume roads are not available to HPMV.
	Increasing vehicle weights	The maximum weight of heavy vehicles has increased over time which is putting pressure on aging pavements.
	Active mode provisions	There is little to no provisions for people who cycle in Masterton, and the facilities that do exist aren't connected. This is reflected in the resident survey; only 45% of people are satisfied with the cycling facilities. The footpath network is considerably more extensive than the cycling network, but only 41% of residents are satisfied with it.
Consequence	Heavy commercial vehicles	Limited routes are available to heavy commercial vehicles. This means that some economic potential is not unlocked, and land remains unproductive.
	Bridge maintenance	Approximately 70% of the total spend on bridge maintenance in 2021/22 was on maintenance of structural members. This is considerably higher than in previous years.
	Suppressed cycling demand	There are approximately an additional 700 people in the Masterton urban area who would cycle if suitable facilities were provided

8 Risk

8.1 Introduction

Risk Management is the term applied to a logical and systematic method of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organizations to minimize losses and maximise opportunities. Risk Management is as much about identifying opportunities as avoiding or mitigating losses.

Risk Management in asset management planning is a requirement of the Local Government Act 2002. It should be used when there are:

- Large potential damages/losses
- Changing economic conditions
- Varying levels of demand for services
- Investments that lie outside the ability to fund
- Important political, economic or financial aspects
- Environmental or safety issues
- Threats or changes to service levels

The risk management process is defined as 'the systematic application of management policies, procedures and practices to the tasks of identifying, evaluating, treating and monitoring those risks that could prevent a local authority from achieving its strategic or operational objectives, or plans, or from complying with its legal obligations'.

In September 2019 MDC adopted a Corporate Risk Management Policy. As per the policy the main policy objectives are to:

- enhance MDC's ability to achieve business objectives
- maintain the integrity of services
- safeguard assets, people, finances, and property
- create a culture where all employees accept responsibility for managing risk
- ensure that MDC can adequately and appropriately deal with risk and issues as they occur
- demonstrate transparent and responsible risk management processes which align with and demonstrate good governance
- identify opportunities and promote innovation and integration
- record and maintain a risk management framework aligned with the AS/NZS ISO 31000:2018 standard
- utilise risk management process outputs as inputs into MDC decision-making processes

The following sections discuss the processes involved in risk management and its application to MDC.

8.2 Background

8.2.1 Risk management process

The process followed for this Plan was:

Strategic level risk assessment:

- Review of Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2006) in conjunction with asset managers and production of a revised report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2011)
- Risk Management Update (Waugh Consultants, 2014)
- The impact of the Waugh Update (2011 and 2014) was reviewed at a strategic level in conjunction with the risk assessments carried out by Council staff. The risk management analysis is now consistently incorporated into all respective asset management plans
- 2017 Council risk review undertaken following the Waugh Risk management assessments
- Production of a report: Masterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2020)

8.2.2 Risk review 2020

The 2020 risk management review process included:

- A review of the MDC Risk Management Policy and Corporate Risk framework
- Risk review workshops with Council's Infrastructure managers
- Review of and alignment of risk register format with the Corporate Risk Register
- Update of the risk registers

8.2.2.1 Risk review objectives

The objectives of the 2020 Risk Management Review process include:

- Update the MDC risk assessments and mitigation measures reflecting latest MDC risk management policy and practice
- Detailed risk registers that record latent (untreated) risk scores, current practise risk scores and residual risk (when identified improvement s have been implemented)
- Support the 2021-31 LTP financial programme development where risk is a driver for capital or operational funding

8.3 Risk Review Process

8.3.1 Staff Workshops

The 2020 risk review process and results presented in this report are based on the opinions and perspectives of asset management on operational MDC staff. Risk assessments based on opinion are particularly useful in extracting perceived issues/problems relating to an

activity, and in provoking discussion as to why one issue has a higher risk than another. Much of the value of this type of risk assessment exercise is gained when it is completed by groups of staff, as it tends to lead to questioning of assumptions surrounding the activity that may no longer be valid. The results presented should be challenged and reviewed as necessary within the wider corporate context and whenever additional asset information is obtained.

Qualitative asset condition and performance information is an important indicator of physical asset risk. Whilst specific asset condition has not been investigated in detail as part of work, asset condition and performance issues have been identified in the risk registers.

8.3.2 Risk Register Update

Improvements

The updated risk registers have been further developed to include likelihood and consequence scoring for the following, three stages of risk exposure:

- Un-treated risk
- Current or existing [E] risk rating, recognising existing processes that manage or mitigate the risk
- Residual risk or proposed [P] risk rating, a proposed process that if implemented will manage or mitigate the risk to its lowest level

Current risks with a score of 12 or higher, have been included in the improvement plans. The residual risk actions help to define the improvement actions.

8.3.3 Risk Methodology and Scores

8.3.3.1 Risk Stages

As mentioned, the risk registers have 3 risk scores 1 for each stage i.e., untreated, current practice and residual risk

8.3.3.2 Risk Scoring Process

Step 1:

Every risk is scored by assessing and allocating a score for both the likelihood and consequence of each score the scoring is based on the following tables:

Likelihood Table and Scores	
Likelihood	Score
Rare	1
Unlikely	2
Moderate	3
Likely	4
Almost certain	5

Consequence Table and Scores	
Likelihood	Score
Insignificant	1
Minor	2
Moderate	3
Major	4
Catastrophic	5

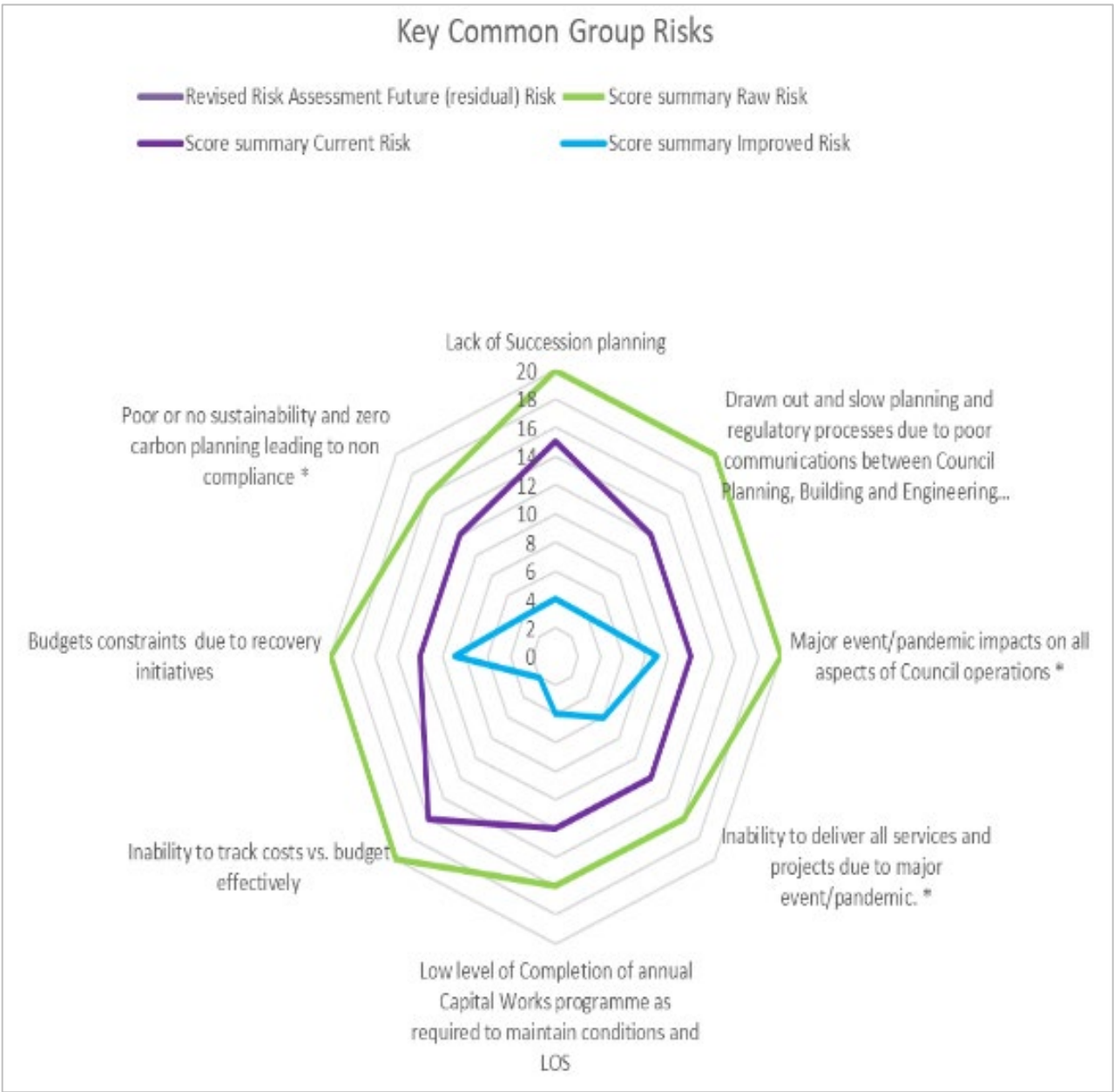
Step 2:

The risk score is calculated by multiplying the 'likelihood' score by the 'consequence' score

Likelihood score x consequence score = Risk score

This scoring process is repeated for each of the 3 risk stages.

The table below details the Risk Rating categories and potential implications for the following areas legislation, Community expectation financial and environmental.



Risk Rating Categories					
Risk Rating	Risk Scores	Legislation	Community Expectation	Financial	Environment
Critical (4)	> 19	Commissioners Appointed	Expectations not obtainable	Detrimental effects > \$0.5m	Widespread long-term effect
High (3)	12 to 19	Adverse Audit Opinion or Disclaimer	Expectations not obtainable medium term	Detrimental effects > \$50k	Long term effect
Moderate (2)	5 to 11	Qualified Opinion; Warning over non-compliance.	Expectations not obtainable in short term	Detrimental effects between \$10k - \$50k	Short term reversible effect
Low (1)	3 to 4	Minor non-compliance	Faults within agreed LoS	Detrimental effects <\$10k	Reversible and contained effect.
Insignificant (0)	2 or lower	Compliance	Expectations reached	No effect	No effect

8.4 Risk review outcomes

This section of the report provides an overview of the critical and high risks per activity, with the detailed risk registers attached as appendices.

8.4.1 Assets and Operations Group Risks

A number of Assets and Operations Group risks common to all the activities were identified. These risks have been grouped together as common group risks in this section of the report. Doing this reduces duplication of these risks in each individual activity risk register, streamlining the management and reporting of these risks.

Some of these common Group risks have different responses and mitigations measures in the different activities. Where this is the case the risks are included in the activity specific risk registers.

8.4.1.1 Key Risks

The tables below summary the Assets and Operations Group key risks, highlighting the raw risk , current risk and potential improved risk scores if improvement actions are implemented.

8.4.1.2 Group improvement items

The table below summarises the improvement actions that if implemented reduces the individual risk scores:

Group Improvement Items				
Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
Lack of Business Continuity Planning	15	9	6	[P] Review and revise BCPs [P] Trial /training run events to test BCPs [P] WSP IP implementation
Lack of Succession planning	20	15	4	[P] develop robust succession plans for key positions. Develop staff recruitment/retention strategies
Basic Risk Register and Asset Risk Plan	20	6	3	[P] Risk Control schedule to be developed for all assets. Risk control measures implemented. Staff training and awareness
Council Policy Document not updated	16	6	4	[P] More policies are required in the water chapter.
Poor Contracts Supervision	20	4	1	[P] Review and audit contacts supervision procedures
Poor level of capital Works programme Completion	20	4	2	[P] Review the capital delivery procedures and systems [P] Implement improvements
Low level of Staff Resources (NB: Licensed Treatment Plant operators)	16	4	2	[P] Review staff resourcing requirements and link in with succession planning and recruitment
Lack of Internal Monitoring and Reporting	15	6	2	[P] Review monitoring and QA systems and procedures
New-Poor emergency responses and loss if service	20	6	2	[P] Staff Training in ERPs [E] Mock event training NB: Changed due to responses during Covid -19 pandemic

Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
New- slow planning and regulatory processes due to fragmented communications between Planning, Building and Engineering Depts (i.e. working in silos)	20	12	4	[P] Review Reg /planning processes and Engineering interface
New-Pandemic impacts on all aspects of service delivery	20	12	9	[P] Ongoing pandemic response planning and reviews
Poor Service Standards	20	8	4	[P] Review/update operational service responsibilities and SOPs and JDs Review / update Capital delivery contract frameworks and works supervision/QA requirements
Service Levels out of date or not operationalised	16	6	2	[P] LoS and KPIs regularly reported on. Poor performance identified, and improvement plans implemented and monitored.
Poor infrequent Monitoring and Reporting to maintain conditions and LoS	16	6	2	[P] LoS/KPI reporting processes and systems reviewed/improved.
New-Inability to deliver all services and projects due to Pandemic impacts	16	12	6	[P] monitoring impacts and revision responses and budgets
Low level of Completion of annual Capital Works programme as required to maintain conditions and LoS	16	12	4	[P] Obtain executive agreement so that desire to employ locally is balanced against need to attract resource from outside of MDC to deliver on time. [P] Capital delivery process and procurement planning review and improvement

Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
Inadequate Insurance	20	6	2	[P] Review /update asset inventory for insurer. Review Council risk appetite and insurance policy
Customers billed incorrectly	6	4	2	[P] Review billing system process and procedures
Ratepayers dissatisfied with LoS and Charges	16	4	2	[P] Include LoS and charges in 2021 LTP focus groups.

8.5 Roading key risk summary

A Risk Register and treatment Plan has been developed in alignment with Masterton District Council corporate Risk Policy and current industry best practise. Risk are monitored and reported in accordance with MDC Risk Policy.

MDC has reviewed and updated the previous risk register in 2020 in consultation with staff. The complete risk register is shown in Appendix or you could link to external doc. The following risks in this section are where the current risk profile is equal to or exceeding 12. (some risks have been reduced through improvement plan since the 2020 workshop hence some "current risk" will be lower than 12 but have been left here for context)

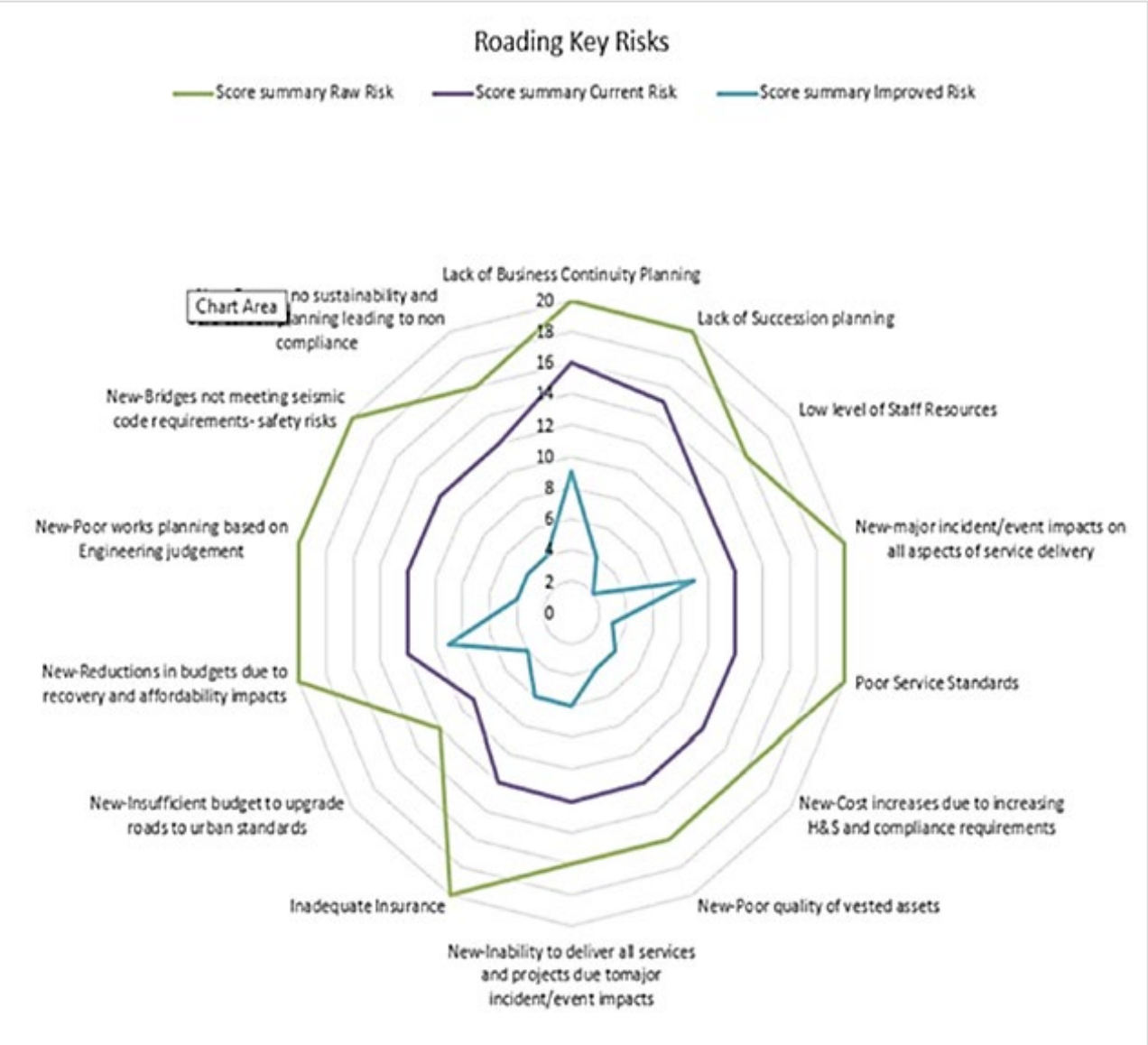
It is also worth noting that many risks are currently being addressed so the current or improved risk may change with each version of this document.

8.5.1 Key Risks

The chart below is a summary the Roading key risks, highlighting the raw risk , current risk and potential improved risk scores if improvement actions are implemented:

8.5.2 Improvement Actions

The table below summarises the improvement actions that if implemented reduces the individual risk scores:



Roading Risk Improvement Actions				
Risk Description	Score summary			Improvement Items
	Raw Risk	Current Risk	Improved Risk	
Lack of Business Continuity Planning	20	16	9	[P] Develop BCPs and link to Emergency Response Planning. [P] Operationalise the plans, training, and mock trials
Lack of Succession planning	20	15	4	[P] develop robust succession plans for key positions. Develop staff recruitment/retention strategies
Low level of Staff Resources	16	12	2	[P] staff resource planning and recruiting [P] Succession planning
Cost increases due to increasing HandS and compliance requirements	16	6	4	[P] Update long term budget forecasts in LTP and NZTA submissions
Poor quality of vested assets	16	12	4	[P] Review ECOP to 4404 Stds [P] Review works approval, monitoring and sign off procedures
Inadequate Insurance	20	12	6	{P} Council review risk appetite and insurance options
Insufficient Budget to upgrade roads to urban standards	12	12	4	[P] Review road upgrade programme and budgeting as part of LTP process
Poor works planning based on Engineering judgement	20	8	4	[P] Review and prioritise DTIMS planning and decision-making
Bridges not meeting seismic code requirements- safety risks	20	12	4	[P] Prioritise inspections and related works fed into LTP and AP budgets
Poor or no sustainability and zero carbon planning leading to non-compliance	16	12	4	[P] Develop activity plans and actions based on Council objectives and policy

Links to other documents:

For a full list of Roothing risks, please refer the MDC Roothing risk register and Assets and Operation Risk review 2020 document.

8.6 Cost to mitigate roading risks

Work required to mitigate roading risk identified by the 2020 risk review.

Cost of Mitigating Current Risks			
Action	Estimated Cost	Scheduled for	How this will be funded
[P] Develop BCPs and link to Emergency Response Planning. [P] Operationalise the plans, training, and mock trials	\$20,000	2024	LTP roading budget and corporate fund
[P] develop robust succession plans for key positions. Develop staff recruitment/retention strategies	Within Roothing budgets	2024	LTP roading budget and corporate fund
[P] staff resource planning and recruiting [P] Succession planning	Within Roothing budgets	2024	LTP roading budget and corporate fund
[P] Update long term budget forecasts in LTP and NZTA submissions	Within Roothing budgets	Started 2023 for 2024	LTP roading budge
[P] Review ECOP to 4404 Stds [P] Review works approval, monitoring and sign off procedures	Within Roothing budgets	From 2023	Corporate and road budget
{P} Council review risk appetite and insurance options	\$20,000 plus council time	2024 workshops for 2024	Roothing and asset budget
[P] Review road upgrade programme and budgeting as part of LTP process	Within Roothing budgets	From 2023 to 2024	LTP roading budget
[P] Review and prioritise DTIMS planning and decision-making	Within Roothing budgets	From 2023 for 2027	LTP roading budget
[P] Prioritise inspections and related works fed into LTP and AP budgets	Within Roothing budgets	From 2023 for 2024	LTP roading budget

Action	Estimated Cost	Scheduled for	How this will be funded
[P] Develop activity plans and actions based on Council objectives and policy	Within Roading budgets	From 2023	LTP roading budget

Figure 8-1: Map - Earthquake fault lines and flooding risk

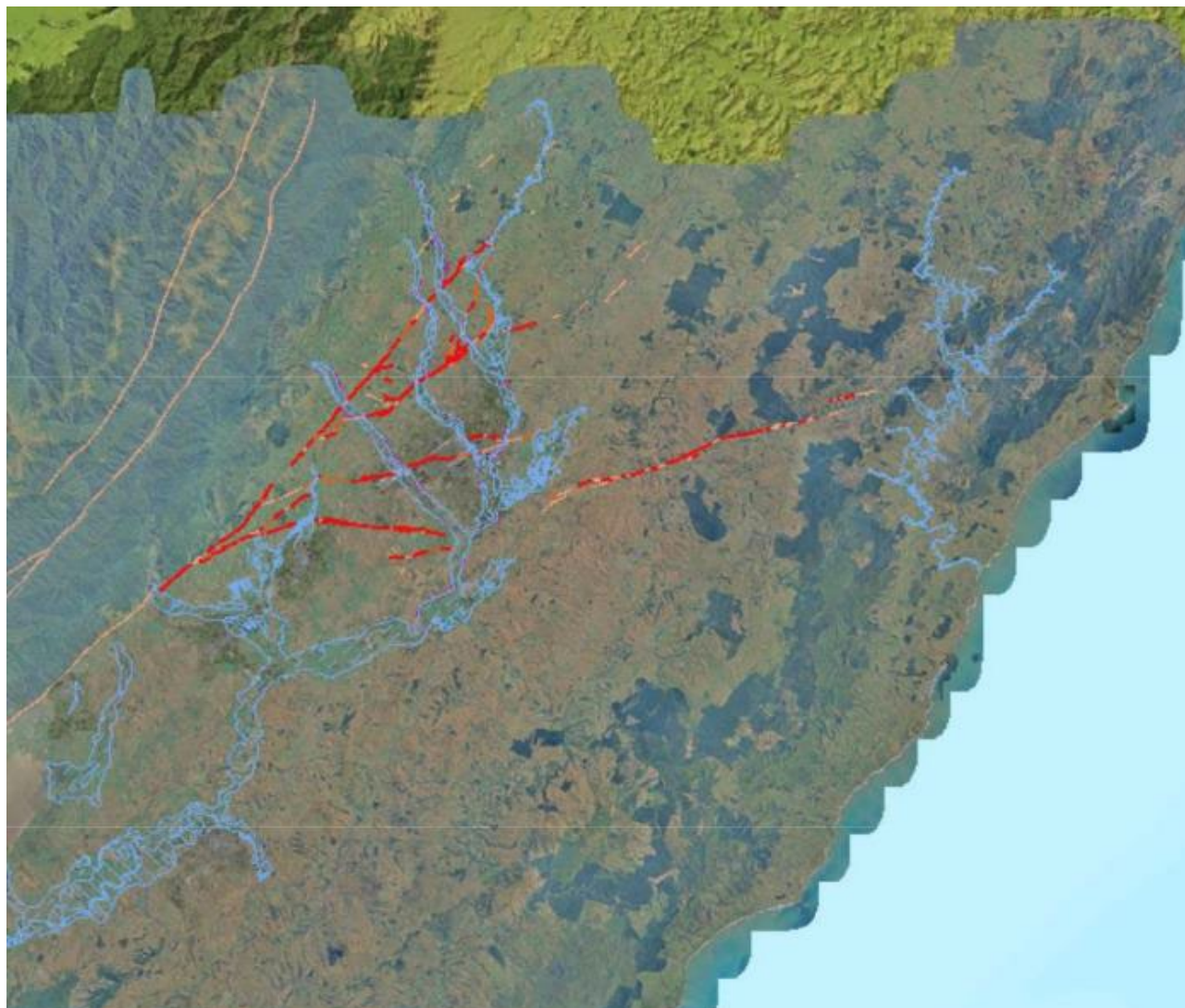


Figure 8-2: Map – Tsunami risk



Source: [LocalMaps \(mstn.govt.nz\)](https://localmaps.mstn.govt.nz/)

8.7 Critical Assets

An assessment of Critical Assets has been undertaken in line with the process developed by AECOM and used by NZTA and several other local authorities.

Critical assets can be defined as those that are especially significant to societal wellbeing and that therefore merit priority attention by utilities in emergency response and recovery. They are also defined as those which have a high consequence of failure. For example, a transport route may be critical because it carries high volumes of traffic, or if it is the only access route to a hospital.

The scope of the project involved a literature review of a range of approaches for measuring road hierarchy and criticality, including NZTA's One Network Road Classification (ONRC) system. The intent of the review was not to recommend changes to the ONRC itself. Instead, any additional (and relevant) 'criticality' criteria were to be captured and justified, alongside existing criteria.

As a result of the literature review and analysis undertaken, a criticality framework has been proposed which incorporates three elements:

1. ONRC/ONF classification.
2. Access to lifeline utilities or a lifeline evacuation route.
3. Access to essential services

(Source: Review of methods to determine criticality of roading networks, AECOM, 23-Sep-2016)

Priority Scores are assigned to levels of importance and a composite score ascertained for routes.

ONRC/ONF

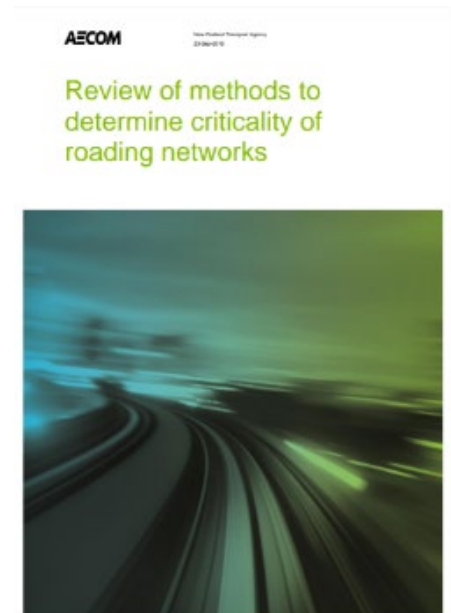
ONRC/ONF is readily accessed through RAMM and the ONRC/ONF Map viewer.

Access to lifeline utilities or a lifeline evacuation route

Lifeline utilities include:

- water, wastewater, power and telecoms to be able to access their assets to inspect and undertake repairs.
- physical utility assets such as sub-stations that require access to maintain continuity of service to the public
- access to critical transport hubs such as ports and airports.

Lifeline evacuation routes include any routes which are considered themselves as essential for evacuation.



Access to essential services

These are essential services which would be required for response and recovery during a natural hazard event; including:

- Hospitals and large aged care facilities
Ambulance, fire, police and emergency ops centres (and dialysis)
- Major utility control centres – Council, Telecom and Power
- Key retail outlets – hardware stores, construction resources (contractors) and supermarkets.

Figure 8-3: Critical Roads in the District

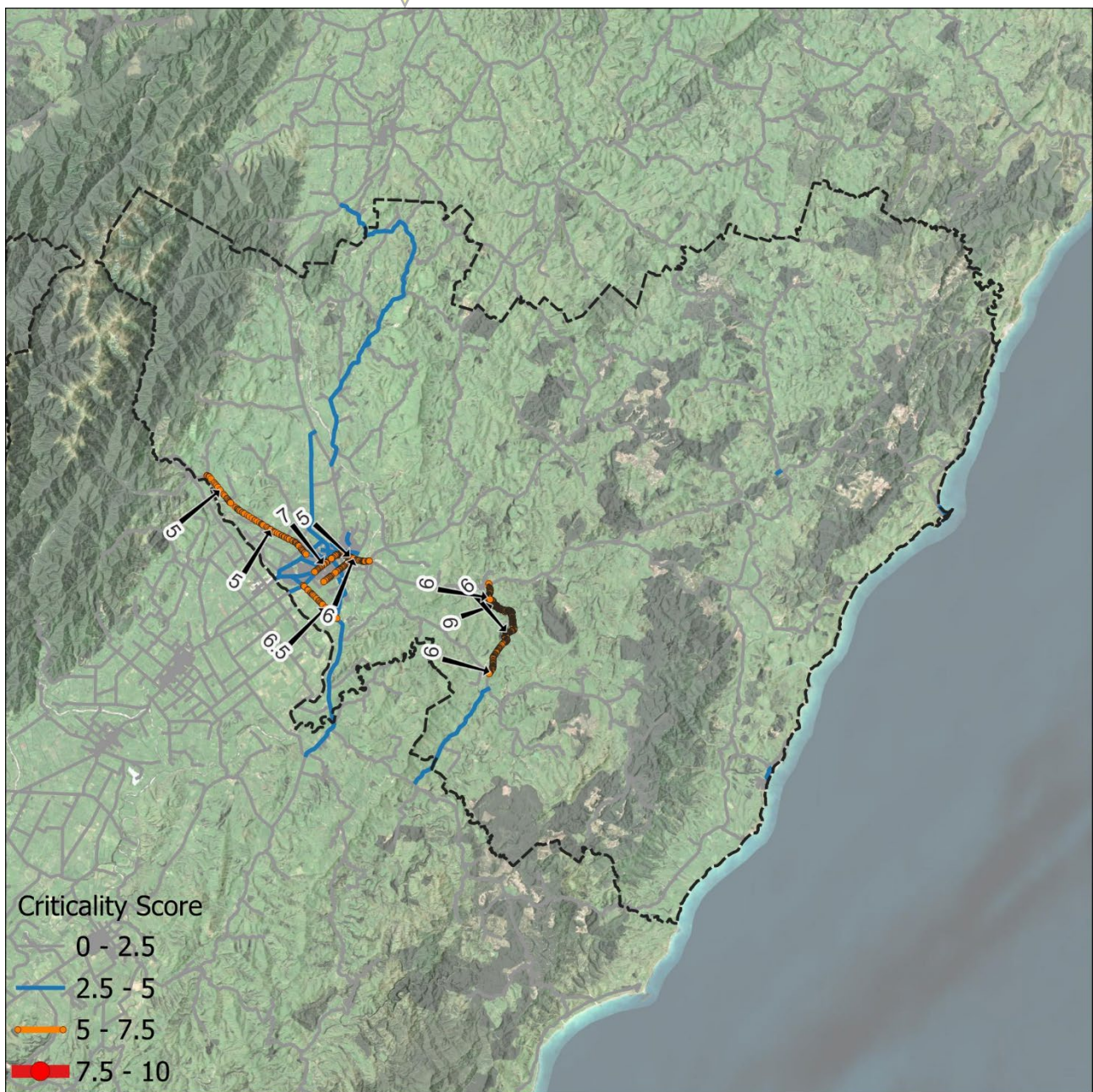
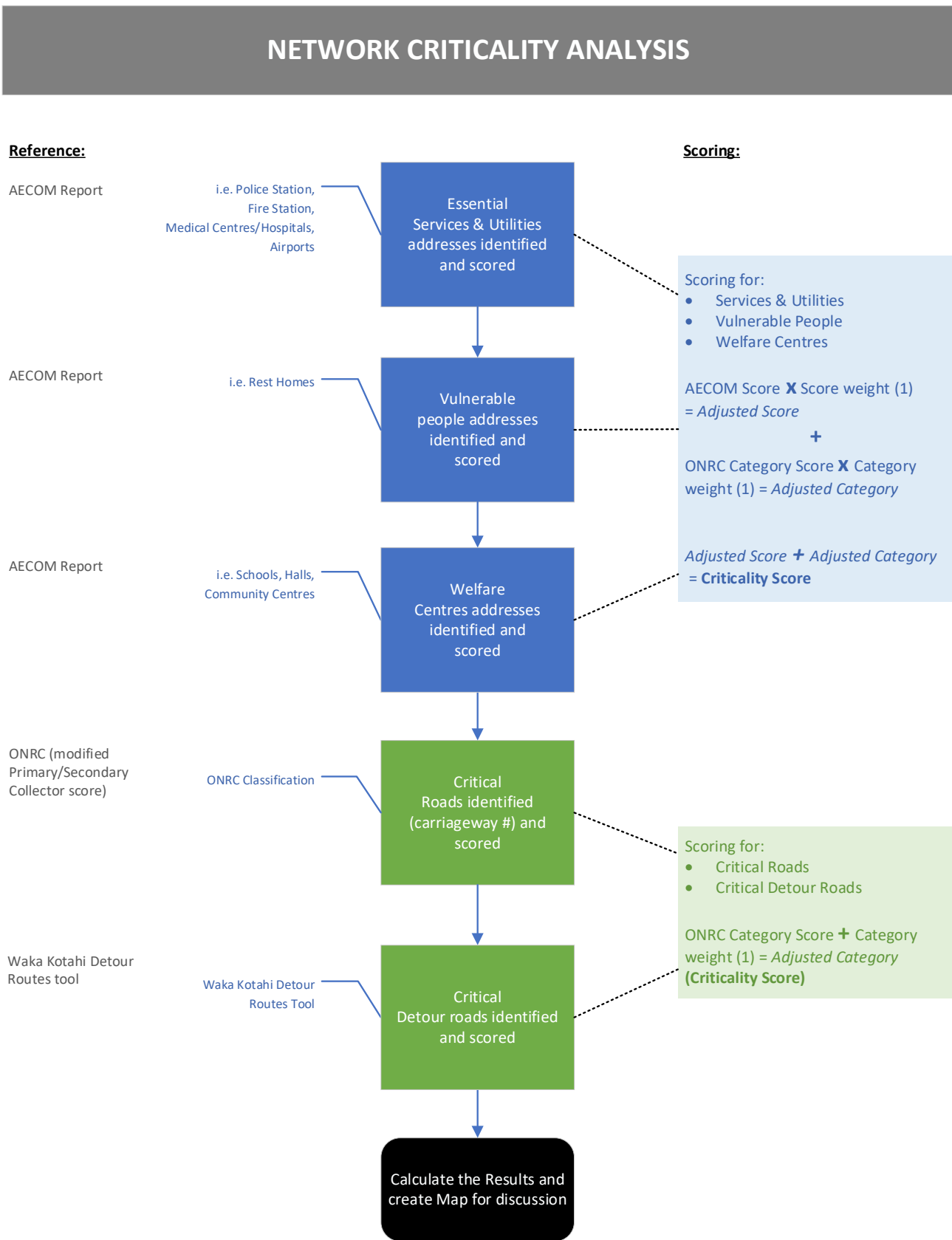


Table 8-1: List of Critical Roads

Criteria	Address	Area in District	Score	Score Weight	Adj Score2	Category	Category Weight	Adj Category	Criticality Score
SH Detour	Akura Road					2.00	1	3.00	3.00
Hall - Tinui	3 Blackhill Road	Tinui	0.25	1	0.25	1.00	1	1.00	1.25
Fire station - Tinui	11 Blackhill Road, Tinui	Tinui	2.00	1	2	1.00	1	1.00	3.00
Wairarapa Village	140 Chapel Street, Masterton	Masterton	3.00	1	3	4.00	1	4.00	7.00
Fire Station - Masterton	2 Chapel Street, Masterton	Masterton	2.00	1	2	4.00	1	4.00	6.00
School - Tinui School	25 Charles Street Tinui	Tinui	0.25	1	0.25	1.50	1	1.50	1.75
Amalgamated Helicopters NZ Ltd	625 Chester Road	West Taratahi	0.00	1	0	0.00	1	0.00	0.00
Police Station - Masterton	21 Church Street	Masterton	2.00	1	2	2.00	1	2.00	4.00
Lyndale Manor	95 Cole Street	Masterton	3.00	1	3	1.50	1	1.50	4.50
Lyndale Villa	5 Cole Street	Masterton	3.00	1	3	1.50	1	1.50	4.50
School - Douglas Park School	136 Cole Street	Masterton	0.25	1	0.25	1.50	1	1.50	1.75
School - Masterton West Kindergarten	159 Cole Street	Masterton	0.25	1	0.25	1.50	1	1.50	1.75
Kandahar Court	2/4 Colombo Road	Masterton	3.00	1	3	2.00	1	2.00	5.00
School - Masterton East School	83 Colombo Rd	Masterton	0.25	1	0.25	2.00	1	2.00	2.25
Cornwall Rest Home	3 Cornwall Street	Masterton	3.00	1	3	1.50	1	1.50	4.50
School - Cornwall Street School	Cornwall St	Masterton	0.25	1	0.25	1.50	1	1.50	1.75
School - Hadlow Preparatory School	76 High St Solway	Masterton	0.25	1	0.25	4.00	1	4.00	4.25
School - Masterton Intermediate	38 Intermediate Street	Masterton	0.25	1	0.25	1.50	1	1.50	1.75
Fire Station - Castlepoint	Jetty Road	Castlepoint	2.00	1	2	1.00	1	1.00	3.00
Hall - Rangitumau	14 Kaka Amu Road	Rangitumau	0.25	1	0.25	1.00	1	1.00	1.25
Hall - Whareama	6 Langdale Road	Whangaehu	0.25	1	0.25	1.50	1	1.50	1.75
School - Wharema School	84 Langdale Road Rd 12 Whareama	Masterton	0.25	1	0.25	1.50	1	1.50	1.75
SH Detour	Lincoln Road					3.00	1	4.00	4.00
Flight - Hood Aerodrome	Manaia Rd	Masterton	5.00	1	5	1.50	1	1.50	6.50
SH Detour	Manaia Rd	Masterton				1.50	1	2.50	2.50
Hall - Taueru	1 Main Road	Taueru	0.25	1	0.25	2.00	1	2.00	2.25
Hall - Wainuioru	133 Masterton-Stronvar Road	Masterton	0.25	1	0.25	1.50	1	1.50	1.75

Criteria	Address	Area in District	Score	Score Weight	Adj Score2	Category	Category Weight	Adj Category	Criticality Score
SH Detour	Ngaumutawa Road					2.00	1	3.00	3.00
School - Mauriceville School	1357 Opaki Kaiparoro Road	Mauriceville	0.25	1	0.25	1.50	1	1.50	1.75
Fire station - Mauriceville	1343 Opaki Kaiparoro Road	Mauriceville	2.00	1	2.00	1.50	1	1.50	3.50
SH Detour	Opaki Kaiparoro Road					1.50	1	2.50	2.50
Ultimate Care Lansdowne Court	Oxford Street	Masterton	3.00	1	3.00	1.50	1	1.50	4.50
SH Detour	Paierau Road					2.00	1	3.00	3.00
Fire Station - Riverside Beach	10 Pinedale Crescent	Riverside Beach	2.00	1	2.00	1.00	1	1.00	3.00
School - St Matthew's Collegiate School	33 Pownall Street	Masterton	0.25	1	0.25	2.00	1	2.00	2.25
School - Wairarapa College	83 Pownall Street	Masterton	0.25	1	0.25	2.00	1	2.00	2.25
School - St Matthew's Collegiate School	33 Pownall Street	Masterton	0.25	1	0.25	2.00	1	2.00	2.25
Army - Linton Military Camp	1 Puttick Road, Linton Camp, Palmerston North	Palmerston North	0.00	1	0.00	0.00	1	0.00	0.00
School - Poto College House	Renall Street	Masterton	0.25	1	0.25	2.00	1	2.00	2.25
Kandahar Home	8 Roberts Road	Masterton	3.00	1	3.00	1.50	1	1.50	4.50
SH Detour	South Belt					1.50	1	2.50	2.50
School - Masterton Primary School	53 South Road	Masterton	0.25	1	0.25	3.00	1	3.00	3.25
Hall - Whangaehu	685 Te Ore Ore – Bideford Road	Whangaehu	0.25	1	0.25	1.50	1	1.50	1.75
Wairarapa Hospital	Te Ore Ore Road	Masterton	3.00	1	3.00	3.00	1	3.00	6.00
Wairarapa Helicopters	Te Parae Road	Masterton	5.00	1	5.00	1.00	1	1.00	6.00
School - Gladstone School	147 Te Whiti Road	Gladstone	0.25	1	0.25	2.00	1	2.00	2.25
SH Detour	Te Whiti Road					2.00	1	3.00	3.00
Lansdowne Park Village	100 Titoki Street	Masterton	3.00	1	3.00	1.50	1	1.50	4.50
Glenwood Masonic Hospital	74 Upper Plain Road	Masterton	3.00	1	3.00	2.00	1	2.00	5.00
SH Detour	Villa Street					2.00	1	3.00	3.00
School - Opaki School	36 Waipipi Rd	Opaki	0.25	1	0.25	1.50	1	1.50	1.75
Fire Station - Wainuiora	6A Westmere Road	Wainuioru	2.00	1	2.00	1.00	1	1.00	3.00
School - 2023 Rathkeale College	203 Willow Park Drive	Opaki	0.25	1	0.25	1.50	1	1.50	1.75

Figure 8-4: Criticality Analysis Criteria



References:

AECOM Report "Review of methods to determine criticality of roading networks" September 2016
Waka Kotahi Detour Routes Tool <https://detours.myworksites.co.nz/>

9 PROGRAMME BUSINESS CASE

9.1 Investment Summary by Work Category

Table 9-1: Investment Summary by Work Category

W/C	W/C description	Activity Breakdown	2023/24 Approved Budget	Comments on changes proposed	Requested allocation			
					2024/25	2025/26	2026/27	3 year (total \$)
CONTINUOUS PROGRAMME – Local Road Operations								
114	Structures maintenance	Bridge maintenance			167,234	178,940	189,677	535,851
		Retaining wall maintenance			8,802	9,418	9,983	28,203
		Total cost	142,500		176,036	188,358	199,660	564,054
121	Environmental maintenance	Vegetation control		Larger allowance for slips 20% increase overall o manage the impacts of extreme weather events (e.g. slips)	533,057	570,371	604,593	1,708,021
		Winter maintenance activities			354,617	379,440	402,206	1,136,263
		Other environmental maintenance		New allocation to allow for observed increase in abandoned cars and graffiti	21,600	23,112	24,499	69,211
		Total cost	701,600		909,274	972,923	1,031,298	2,913,495
122	Network service maintenance	Traffic services power supply			70,509	75,445	79,971	225,925
		Traffic services maintenance			206,813	221,290	234,567	662,669
		Total cost	271,300		277,322	296,734	314,538	888,595

W/C	W/C description	Activity Breakdown	2023/24 Approved Budget	Comments on changes proposed	Requested allocation			
					2024/25	2025/26	2026/27	3 year (total \$)
123	Network operations			There are no traffic signals within MDC				
131	Rail level crossing warning devices maintenance	Total cost	23,300	Work category 131 provides for approved organisations and Waka Kotahi NZ Transport Agency (for its own activities) to share the costs associated with the maintenance and renewal of rail level crossing warning devices carried out by the relevant rail track authority where the crossing is part of the road controlling authority's road, cycle or footpath network. Assume upgrades NZUp Rail projects are fully funded	39,785	42,569	45,124	127,478
140	Minor events	Total cost	150,000	Includes a progressive increase to manage impact of storms	296,170	316,902	335,917	948,989
151	Network and asset management	Network management (incl inspections)		Increase to implement AM improvement plan. Maintenance Contract management escalation and review in some scheduled rates Increase address underfunding level in 2021-24, allowance to implement AM improvement plan and data enhancements alongside CCDC	1,433,367	1,533,703	1,625,725	4,592,795
		Network user information			164,520	176,036	186,598	527,154
		Management of asset inventory systems		Data and inventory improvements, including AMDS validation	61,517	65,823	69,773	197,113
		Total cost	1,380,500		1,659,404	1,775,562	1,882,096	5,317,062

W/C	W/C description	Activity Breakdown	2023/24 Approved Budget	Comments on changes proposed	Requested allocation			
					2024/25	2025/26	2026/27	3 year (total \$)
215	Structures component replacements	Bridge component replacement		Undertake high priority repairs identified in latest bridge inspection Delay one bridge deck replacement until after 2027 and combine with sub structure work	172,684	184,772	195,859	553,316
		Retaining wall component replacement			9,089	9,725	10,308	29,122
		Total cost	152,900		181,773	194,497	206,167	582,437
221	Environmental renewals	Total cost	0		0	0	0	0
222	Traffic services renewals	Total cost	753,500		600,730	642,781	681,348	1,924,858
CONTINUOUS PROGRAMME – Local Road Pothole Prevention								
111	Sealed pavement maintenance	Routine pavement repairs		Cost escalations only, Juno report comments on the need to keep up as even with more renewal there will be a maintenance lag, invest to ensure asset is 'held', alternative to add 10%	451,182	482,765	511,730	1,445,677
		Pre-seal repairs			698,413	747,302	792,140	2,237,855
		Total cost	1,054,400		1,149,595	1,230,066	1,303,870	3,683,532
112	Unsealed pavement maintenance	Total cost	650,700		555,228	594,094	629,740	1,779,062
113	Routine drainage maintenance	Street cleaning (30% only Subsidy)	53,700		56,729	60,700	64,342	181,770

W/C	W/C description	Activity Breakdown	2023/24 Approved Budget	Comments on changes proposed	Requested allocation			
					2024/25	2025/26	2026/27	3 year (total \$)
		Drainage maintenance	551,100	Increase to allow for ongoing performance issues with drainage systems Also increased to allow for high shoulder removal culvert cleaning programme	1,065,660	1,140,256	1,208,671	3,414,586
		Total cost	604,800		1,122,388	1,200,955	1,273,013	3,596,358
211	Unsealed road metalling	Total cost	1,102,300		1,087,941	1,164,097	1,233,943	3,485,982
212	Sealed road resurfacing	Chip sealing		Implement "Juno Current" option reflecting recovery works and allowing scope for ramping up of rehabilitation work to required level	1,355,162	1,450,023	1,537,025	4,342,210
		Thin asphaltic surfacing			59,638	63,813	67,642	191,093
		Total cost	1,402,100		1,414,800	1,513,836	1,604,666	4,533,303
213	Drainage renewals	Culvert renewals		Consider option to add 20% to undertake more culvert renewals	141,010	150,881	159,934	451,824
		Kerb and channel renewals			391,779	419,204	444,356	1,255,339
		Total cost	539,700		532,789	570,084	604,289	1,707,164
214	Sealed road pavement rehabilitation	Structural AC rehabilitation			597,402	639,220	677,573	1,914,195
		Granular pavement rehabilitation		Implement "Juno High" option to progress the level of rehabilitation that is needed in the long term, this includes urban and rural. (Proposed \$2.99M vs current \$1.30M)	2,631,798	2,816,024	2,984,985	8,432,807
		Total cost	1,233,900		3,229,200	3,455,244	3,662,559	10,347,002

W/C	W/C description	Activity Breakdown	2023/24 Approved Budget	Comments on changes proposed	Requested allocation			
					2024/25	2025/26	2026/27	3 year (total \$)
Walking and Cycling								
124	Cycle path maintenance	Total cost	10,700		10,000	10,000	10,000	30,000
125	Footpath maintenance	Total cost	69,800		109,607	117,280	124,317	351,204
224	Cycle path renewal	Total cost	0	No assets in MDC due for renewal	0	0	0	0
225	Footpath renewal	Total cost	572,200		633,167	677,488	718,137	2,028,792
Improvements								
216	Bridge and structures renewals	Total cost	Varies (individual project basis)0	Two Rural Bridges one rural retaining wall identified for replacement, see relevant NPV, section in AMP and engineer reports. Retaining wall cost are for design and investigation only	0	900,000	100,000	1,000,000
			10,816,200		14,085,208	15,863,472	15,860,681	45,809,367
Safety								
432	Safety promotion, education and advertising	Approval given for combined submission	267,800	No change to sum requested – individual RCA application required (Split MDC 57%/CDC 20%/SWDC 23% as per Waka Kotahi requirements)	240,000	252,000	270,000	762,000
Public transport services and infrastructure								
514	Public transport facilities							

9.2 Options, Assessment and Alternatives

9.2.1 Problem and Response Summary

From the strategic case, the appropriate responses have been developed and ranked within the Programme Business Case section; the table below summarises these.

In assessing options and ascertaining the ideal combination of investment and works, understanding the deterioration of assets over time is key. While allowances can be made to isolated failures from external events (such as floods and slips), over the network deterioration will have the greatest impact.

It is important this is not forgotten when there is a focus on restoration, and Council has considered the opportunity the current situation provides. With investment in repairing damaged assets, there is an opening to shift the long-term focus to an appropriate renewal programme. This is illustrated in the pavement management strategy.



A multi criteria analysis has been undertaken across the activities. These are summarised in the PBC and shown fully in the AMP

Figure 9-1: Road Asset Deterioration and the Impact of Maintenance Activity

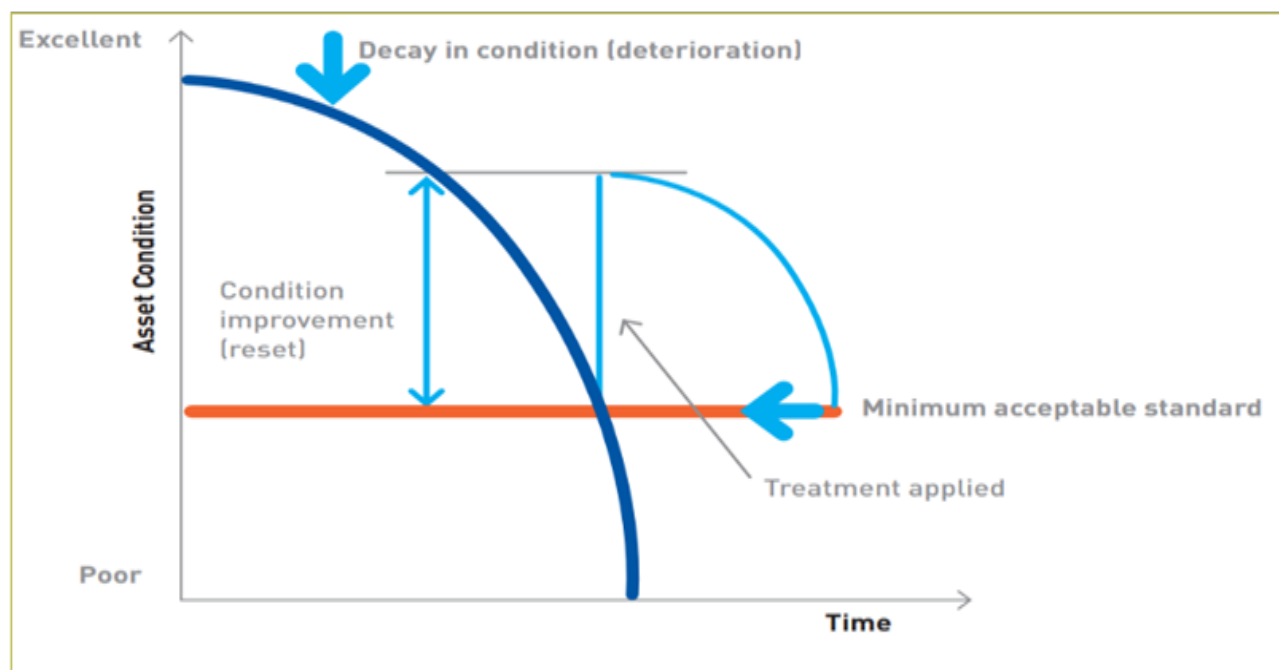


Table 9-2: Problem and Response Summary - Line of Sight

Problem	Benefits If Addressed	Trend	Strategic Response	Activity/Work Category
Aging and Deteriorating Network An aging and deteriorating roading network, combined with an increase in heavy vehicles, is negatively affecting the road network in a range of areas.	An affordable network which is economically sustainable Satisfactory level of service Reduction in the amount of reactive maintenance Roads are safer for everyone and more resilient.	Getting worse	Policy approach: adjust the LoS on sections of the network, carry out deterioration model of network using LoS as triggers for treatment. Improve data quality to inform policy and approach Funding approach: increase funding to reduce the age and condition index of the network to address deteriorated sections. Implement programme to do more pavement rehabilitation Relationship approach; build credibility with councillors, stakeholders, and contractors. Programme adjustment; improve drainage programme	Sealed and unsealed pavements and footpaths: 111,112, 125, 211, 212 and 214
Network Vulnerability The impacts of climate change are highlighting areas of network vulnerability which are affecting safe and reliable access to opportunities for residents	An affordable network which is economically sustainable Satisfactory level of service Reduction in the amount of reactive maintenance Roads are safer for everyone and more resilient.	Getting worse	Policy approach: adjust the LoS on sections of the network, carry out deterioration model of network using LoS as triggers for treatment. Improve data quality to inform policy and approach Funding approach: increase funding to undertake works that ensure access is better maintained and remedial works are reduced Relationship approach; build credibility with councillors, stakeholders, and contractors. Programme adjustment; improve drainage programme	Sealed and unsealed pavements 111,112, 211, 212 and 214; routine drainage maintenance and drainage renewals 125, 213

Problem	Benefits If Addressed	Trend	Strategic Response	Activity/Work Category
Safety A range of factors such as challenging rural topography, narrow roads, urban intersection layout, vulnerable users, speed, age and the capability and experience of drivers is resulting in death and serious injuries.	A safe, reliable and connected network for all Reductions in DSI rates towards Road to Zero targets Improvements in network design The management of safe and appropriate speed	Getting worse	Programme adjustment; increase road safety education programme. Target more infrastructure safety improvements. Policy and funding approach; implement zero harm safety strategy Adequately fund the LCLR, road safety promotion and traffic services programmes	Low cost, low risk 341 Walking and cycling 124, 125 Road safety promotion 432 Traffic services 222
Accessibility The transport industry is pressuring Council to upgrade pavements and bridges to make more routes available to HPMV. The community is dissatisfied with accessibility and standard of our walking and cycling facilities	Increased bridges open to heavy haulage sector Journeys within the district will be connected, resilient and reliable People can move around the district more safely	Getting better	Policy approach: adjust the LoS on sections of the network, increase the weight bridges can carry. Prioritise haulage routes for treatment over other roads, this will include low volume unsealed roads. Funding approach: continue to improve footpaths at current funding levels and look for opportunities to improve active transport in the district.	Structures 215 Walking and cycling 124, 125 Road safety promotion 432

9.2.2 Test LoS, Current Condition and Performance (evidence and gap analysis)

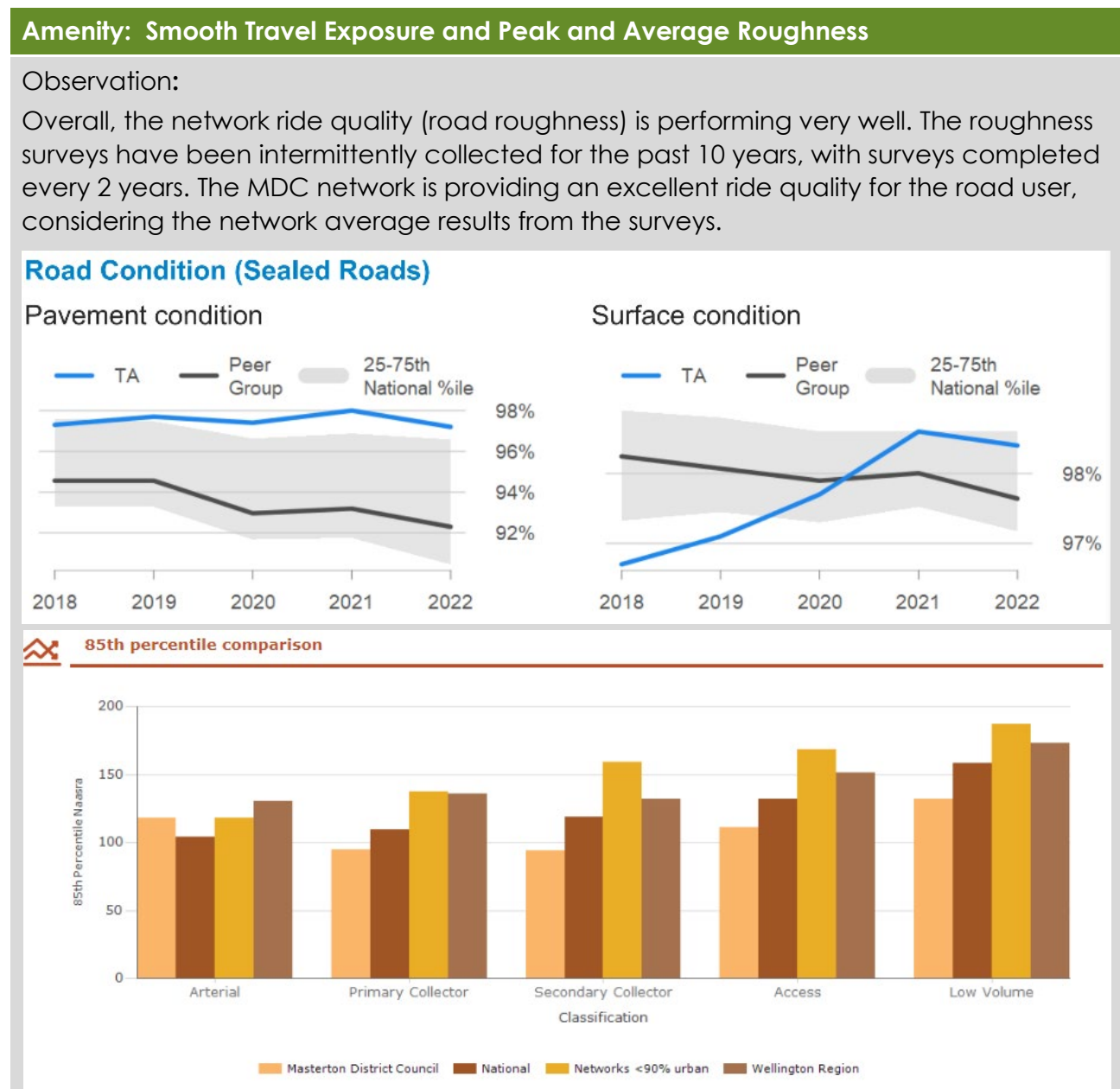
The following section analyses options for addressing the problems and issues identified in the strategic case.

The current condition and performance of the roading assets is presented below against our peer group (where available). It is analysed, where possible, against the ONRC customer outcomes and customer level of services.

This colour-coded rating system is based on a qualitative assessment of the LoS and cost comparison data.

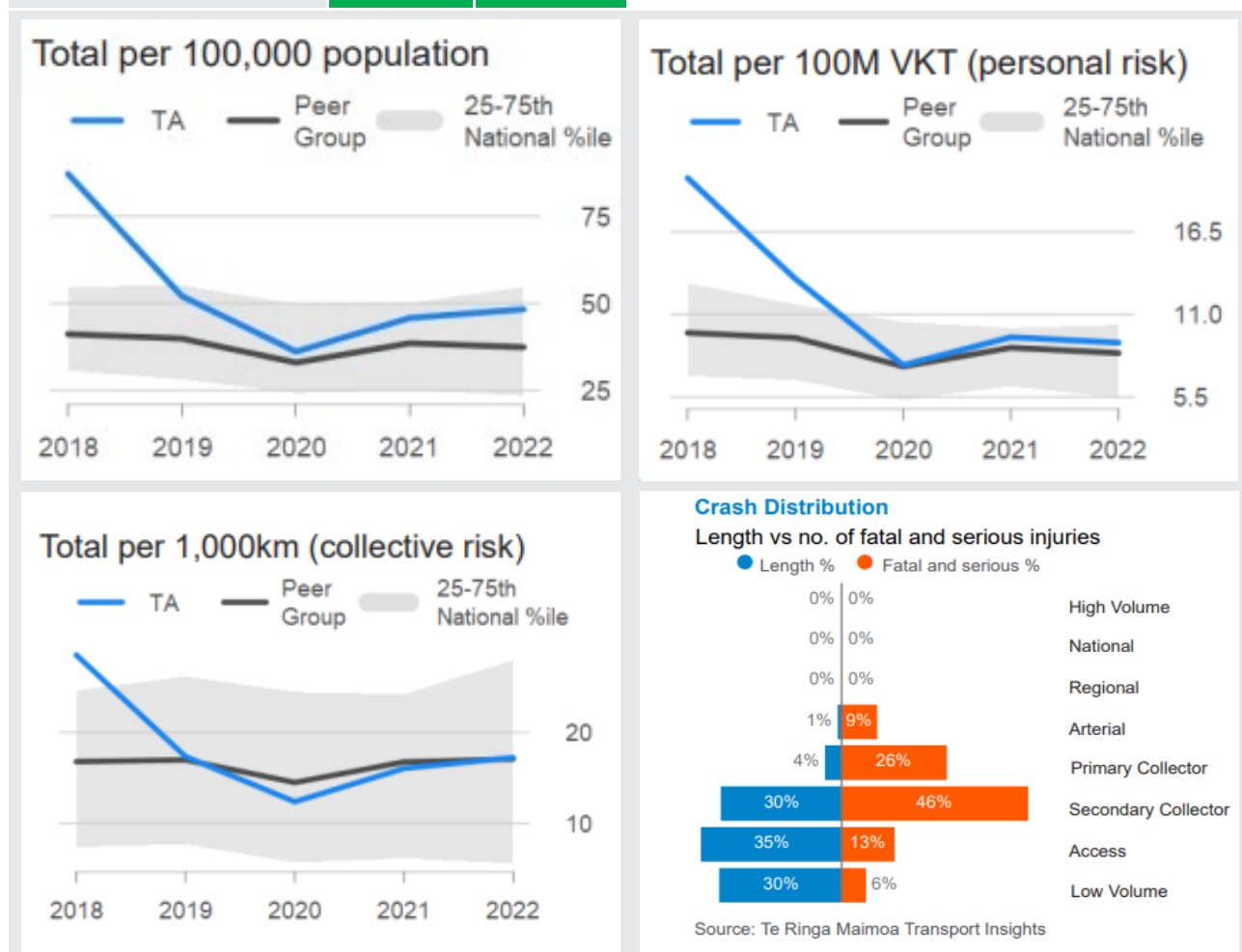


Table 9-3: Evidence and Gap Analysis



ONRC	Urban	Rural	ONF	Urban	Rural
Arterial			Urban Connectors		
Primary Collector			Activity Streets		
Secondary Collector			Main Streets		
Access			Local Streets		
Low Volume			Stopping Places		
			Rural Connectors		
			Peri-urban Roads		
			Rural Roads		

Safety and Amenity		
ONRC	Urban	Rural
Arterial		
Primary Collector		
Secondary Collector		
Access		
Low Volume		



Fatal and Serious Injuries by Mode (No. per 100,000 population)

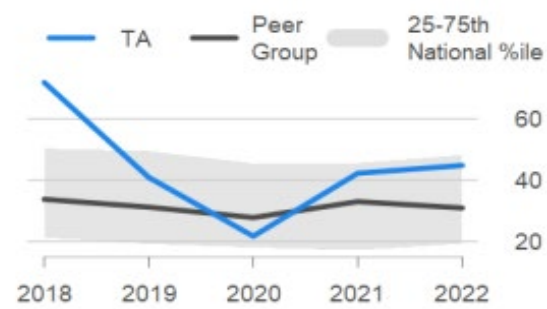
Road

Cycling

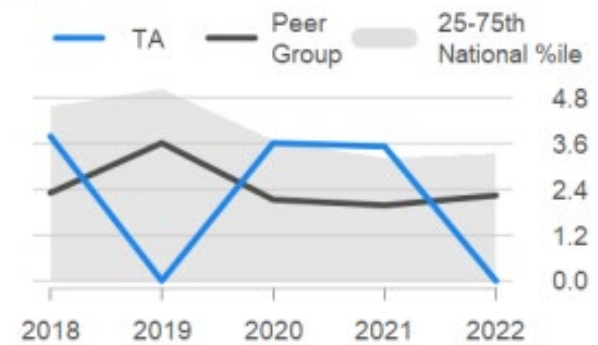
Walking

By Mode (no. per 100,000 Population)

Road



Cycling



Walking



Technical Outputs Safety

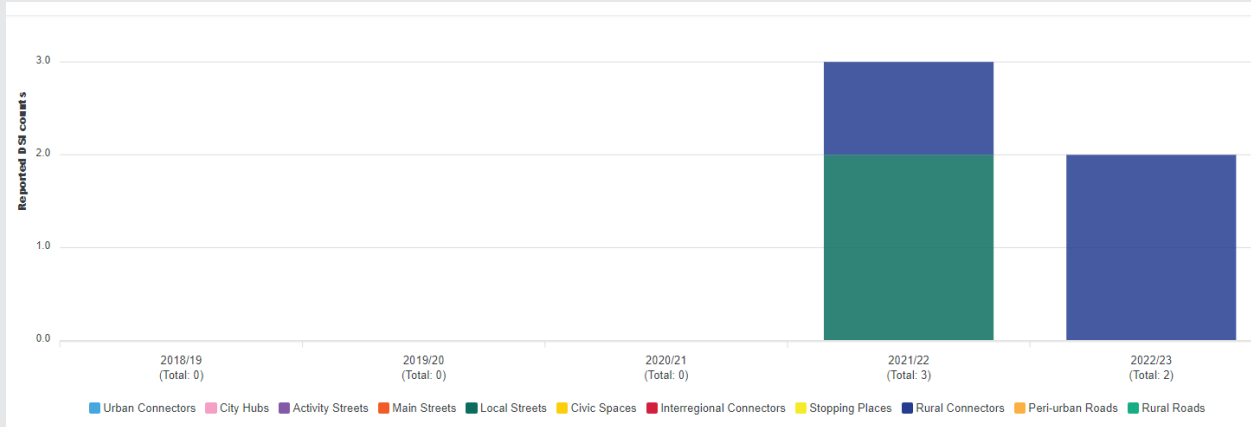
Wet

Night

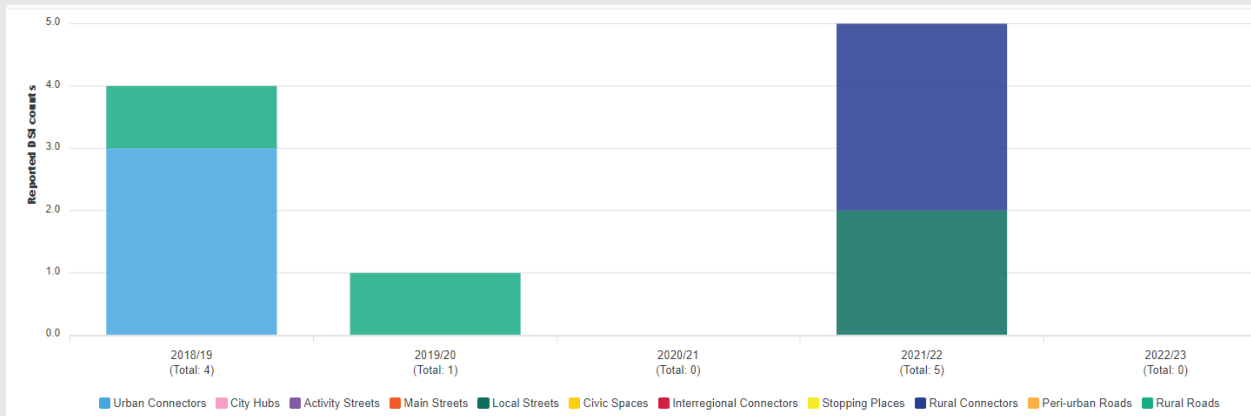
Intersections

Vulnerable Users

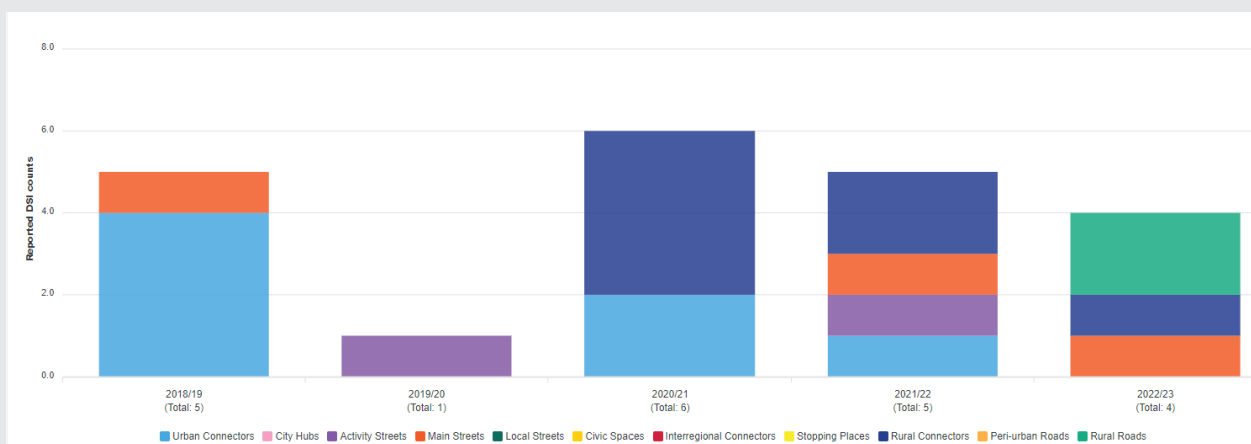
Loss of control on wet roads – this trend is above others and needs to be monitored.



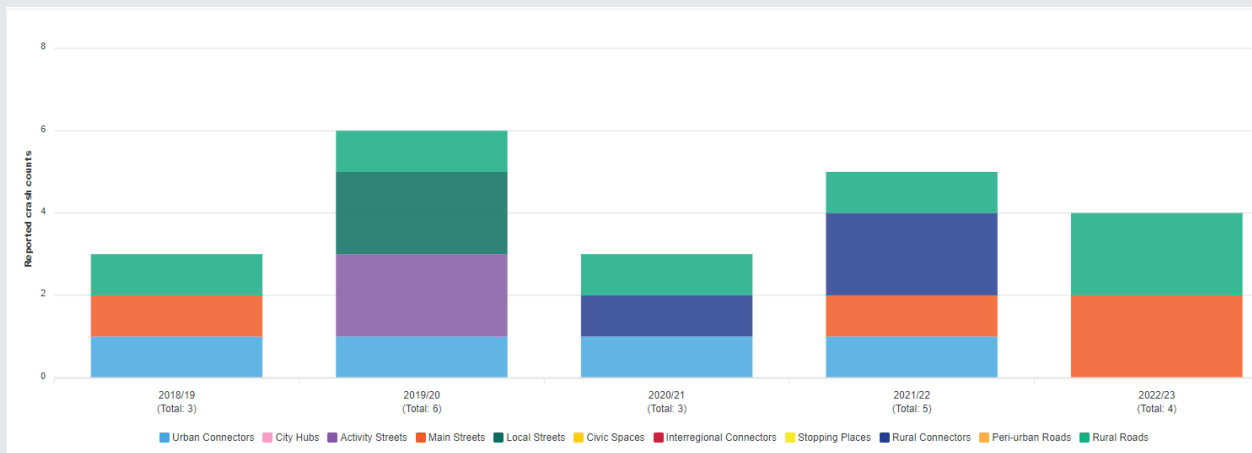
Loss of control at night – no distinctive pattern



Intersections – rural road trend is unusual, to be monitored.



Vulnerable users – no distinctive pattern except motorcycles make up a large portion of this group



(Source of all graphs: <https://portal.transportinsights.nz/onf/transport-outcomes/hsp3>)

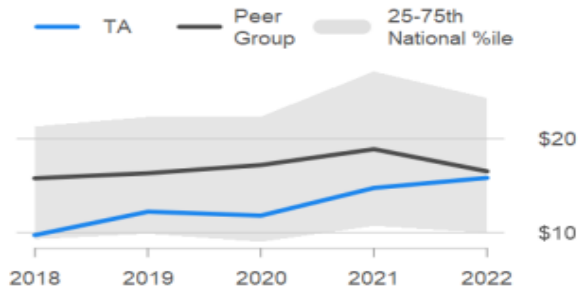
Expenditure / Cost Efficiency

Currently the annual cost for the maintenance and renewals activity is approximately \$10.6 per km of network per year. Compared to our peers of other provincial centres we are currently at the lower end of the investment scale in all areas.

Total Efficiency	
Maintenance and renewals	
Management	

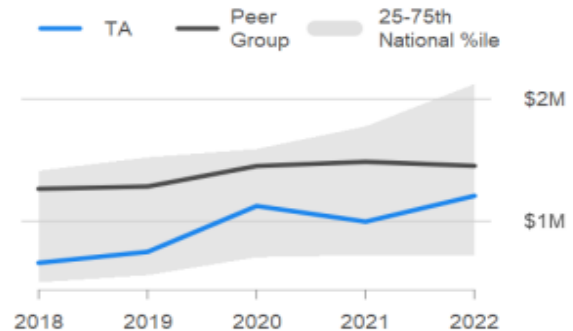
Cost Efficiency

Total expenditure / length (\$1,000 / km)

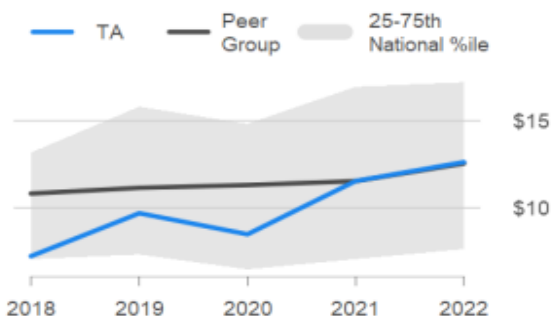


Source: Waka Kotahi Data and Tools

Investment management, network and property management



Maintenance, operations and renewals expenditure / length (\$1,000 / km)



Cost Efficiency Surfacing		
ONRC	Urban	Rural
Arterial		
Primary Collector		
Secondary Collector		
Access		
Low Volume		

Key Question: How does the cost of maintaining my sealed road network compare to others?

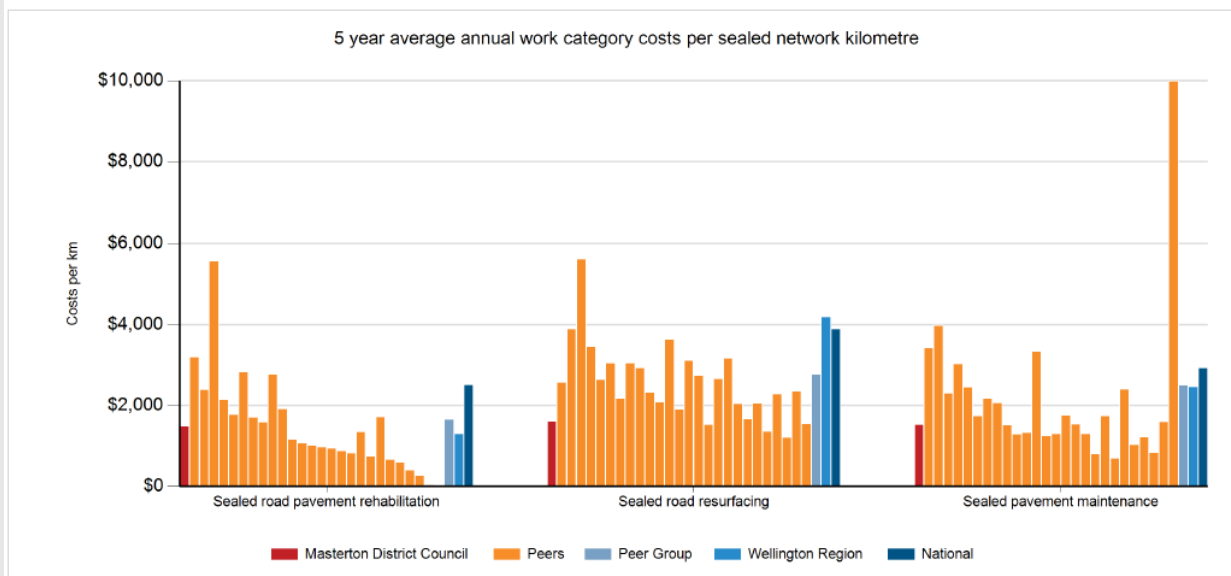
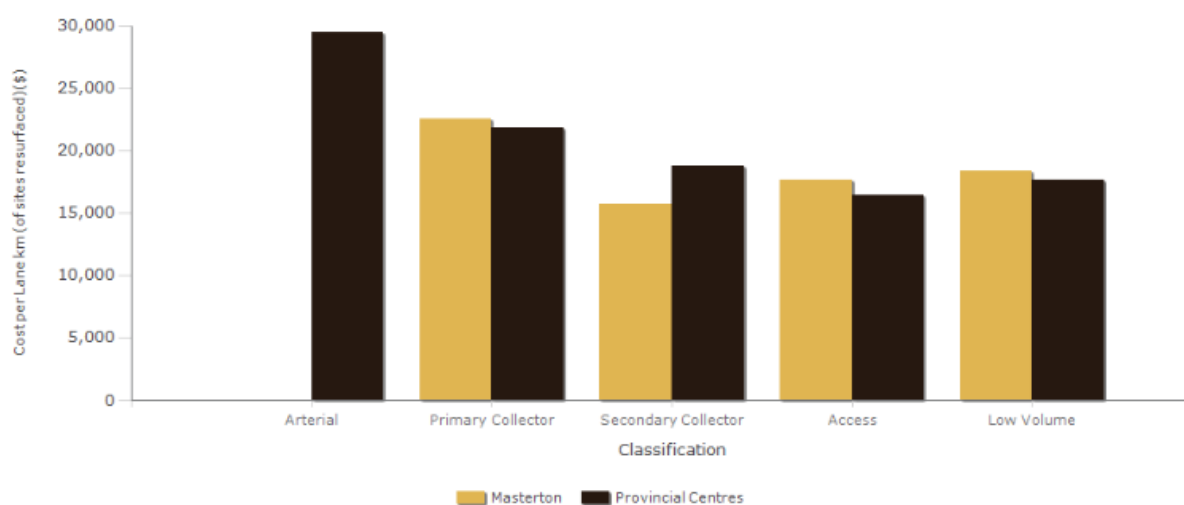


Figure 10: Sealed road maintenance costs per kilometre - Sourced from NZ Transport Agency TIO Work Category funding reports



The total cost of chipseal resurfacing undertaken over the selected Financial Year

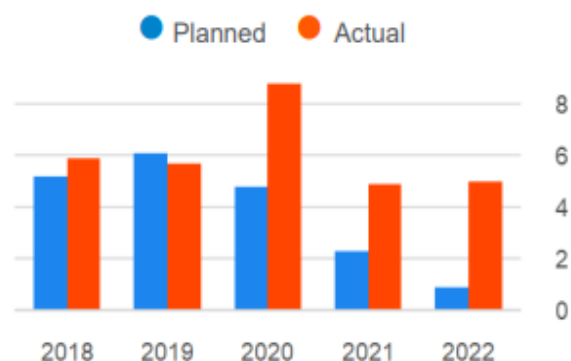
This classifies the Original Cost field for Surface records in RAMM



Works Completed vs Planned

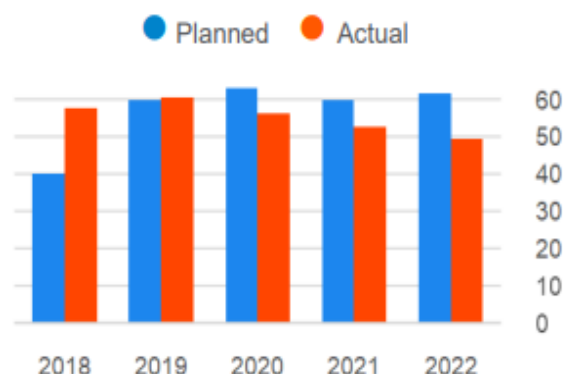
Overall

Pavement rehabilitation (lane kms)



Source: Waka Kotahi Data and Tools

Pavement resurfacing (lane kms)

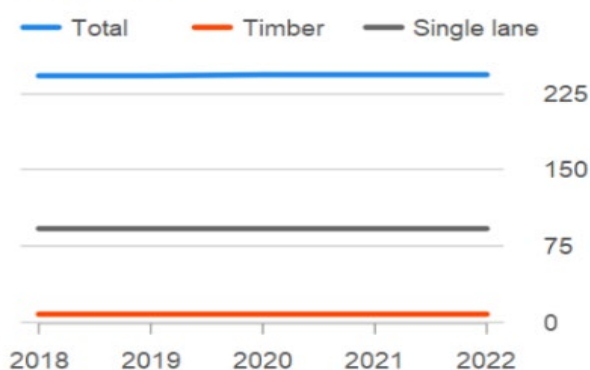


Bridges

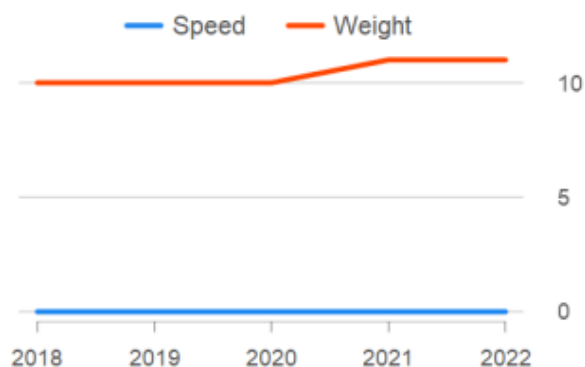
Overall

253 in total; 97 single lane, 14 timber and 10 weight restricted

Bridges No. bridges



No. of restricted bridges



Peer Group Comparison 5 years Cost

- 114 and 215 Structures Maintenance and Structural Component Replacement
- Unsealed 112 and 211

This data is now dated and similar comparisons are more difficult to obtain.

A total cost comparison is provided below.

Provincial Centres Peer Group

This peer group includes Cities and Districts with a proportion of ONRC classified network equalling between 10% urban and 50% urban: Buller District Council, Dunedin City Council, Gisborne District Council, Grey District Council, Hastings District Council, Hauraki District Council, Horowhenua District Council, Kaikoura District Council, Marlborough District Council, Masterton District Council, Matamata-Piako District Council, New Plymouth District Council, Otago District Council, Queenstown-Lakes District Council, Rotorua Lakes Council, South Waikato District Council, Tasman District Council, Taupo District Council, Thames-Coromandel District Council, Timaru District Council, Waimakariri District Council, Waipa District Council, Western Bay of Plenty District Council, Westland District Council, Whakatane District Council, Whanganui District Council, Whangarei District Council.

Network cost

Unsealed

The following graph indicates the expenditure per centre-line km across the 2021-24 period (source NLTF).



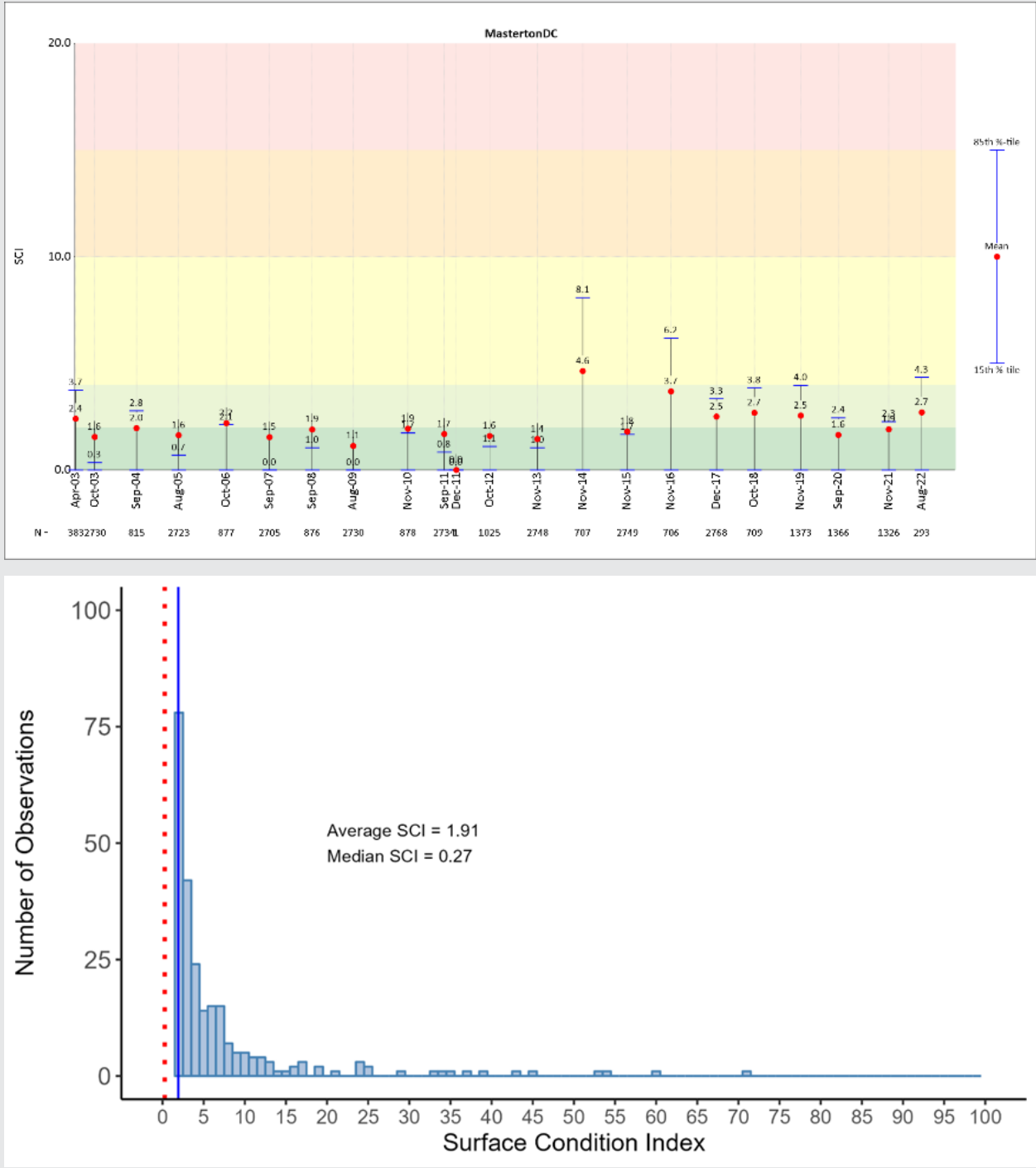
Road Condition MDC Surface Condition Trends by ONRC

Surface health measured through the visual rating surveys. The visual rating surveys provide details on key surface and pavement defects, being, cracking, flushing, chip loss, potholes and patches. These defect measures are combined into a surface condition index (SCI_CI). The lower the SCI_CI, the better the condition (healthier). The higher the SCI_CI the worse the condition, with potential of maintenance and asset renewal need.

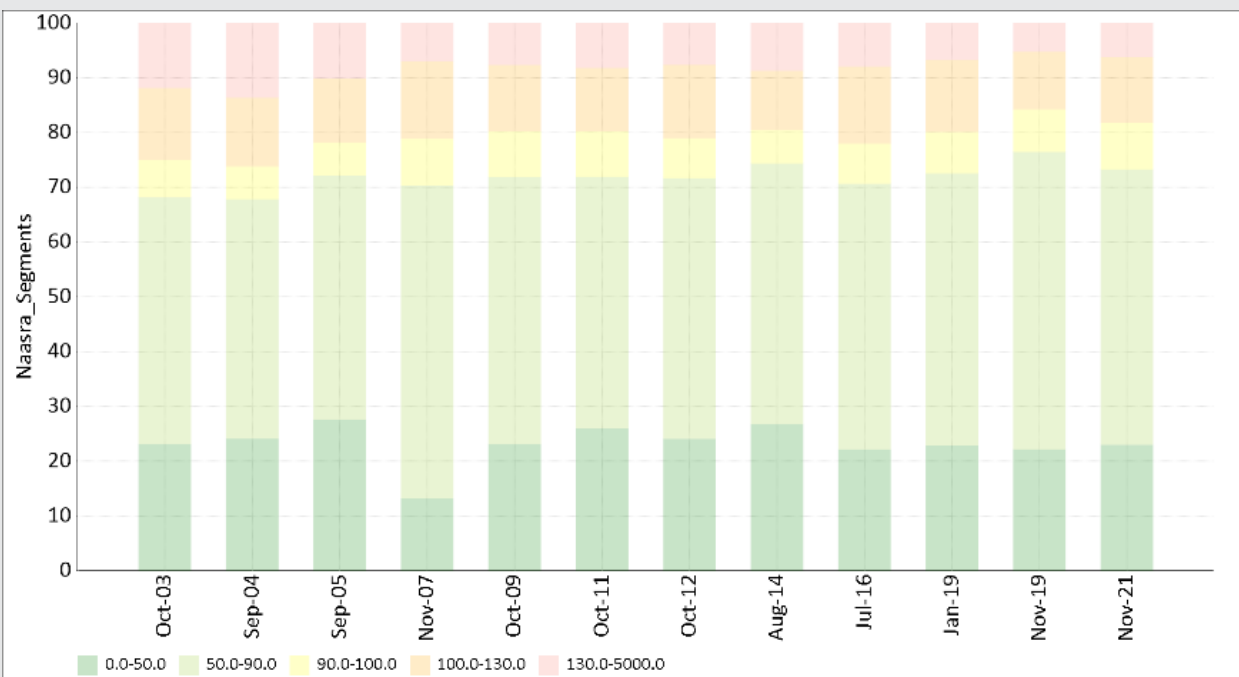
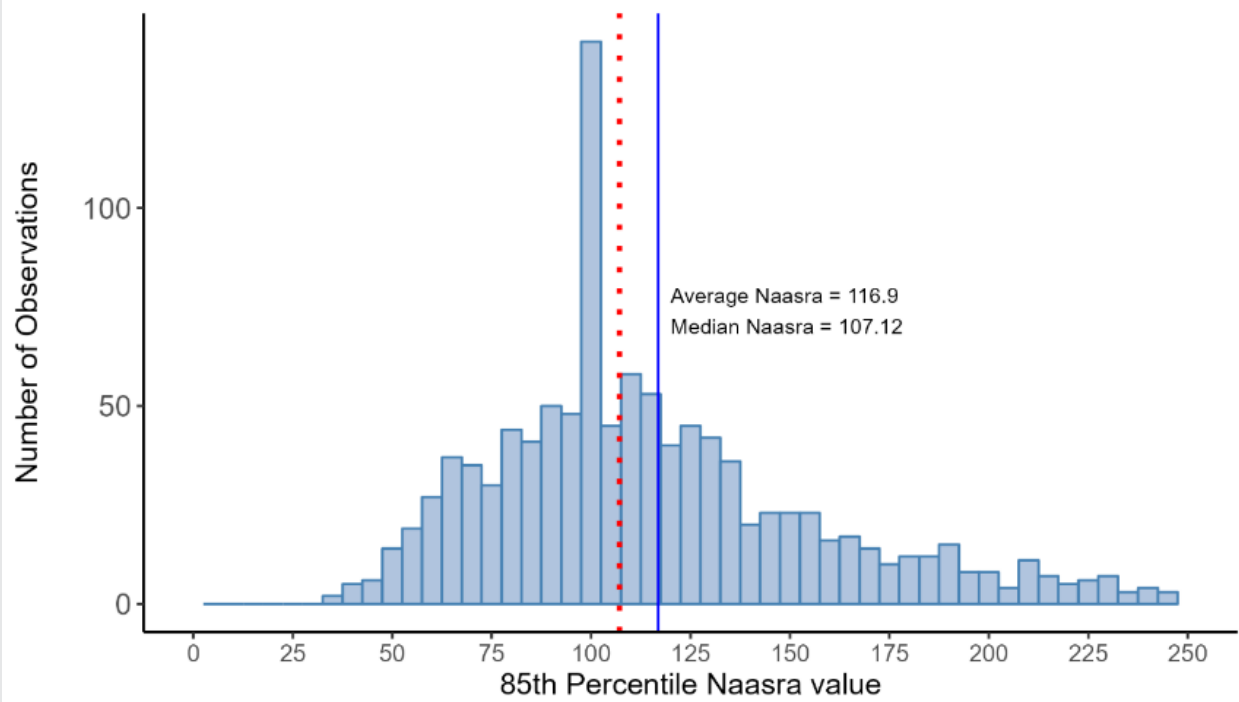
Overall, we can see that the rural network has been slowly getting worse since 2014, with poor results across the last ten years. In particular, the range have increased considerably. While this CI value is still satisfactory, the concern is the steady decay rate. This should be monitored with the network into the future.

ONRC	Urban	Rural
Arterial		
Primary Collector		
Secondary Collector		
Access		
Low Volume		

Distribution of current SCI



Distribution of current roughness data



Masterton District Council Resident Satisfaction Report (2020)

The resident satisfaction survey provides useful view of residents' impressions of service quality. As there are a range of factors that may affect the rating given by residents, it is important to consider the trends more than individual scores.

Refer to section 5.1.

Levels of Service Review 2022

In June-July 2022 Council reviewed the levels of service through a public consultation and workshop process, suggestions for improvement were combined into five groups.

Roads/Streets/Footpaths/Cycling Lanes (30)	
Better maintenance/improvement of roads – 14	Road Condition Failing Repairs Road Maintenance Rural Roads (in general)
Better maintenance/improvement of footpaths	Footpath Condition Lighting Support for Cycling
Address Congestion	
Underground Power	

9.2.3 Delivery - Maintenance Operations and Renewals Contract

During the 2018/21 programme of works in 2019, Masterton retendered their Maintenance, Operations and Renewals (MOR) programme and included reseals and footpath works. Retendering the contract has resulted in a significant adjustment and increase in the contract scheduled rates relating to around \$2.098M or 14% to the total budget over the 3-year period (2018/19 to 2020/21).

The contract extensions continue through 2023 and 2025 (if exercised).

This programme and the recommended investment levels have considered costs as at 2023 and estimates of increases for the following three years.

Further changes can be expected in 2025, these include but are not limited to:

- Bitumen availability and cost
- Aggregate quality and cost
- Legislative changes including emissions reductions, health and safety and environmental matters

Options for the style and composition of the next contract will be considered through the Service Delivery Review and Procurement Strategy update.

9.2.4 Integration, Partnering, and Performance Management

In the management of our Maintenance, Operations, and Renewals program, we emphasise a whole approach to ensure optimal program delivery efficiency and coordination with both suppliers and partner agencies. Key elements of our approach are as follows:

1. Coordination with Other Agencies:

We take into account the programs and activities of other agencies, such as Carterton and South Wairarapa District Council and Waka Kotahi (Wellington Transport Alliance - WTA), to enhance cooperation and reduce any duplication where possible. Open communication and information sharing with these stakeholders ensure a more efficient approach to resources, project timing and delivery. Lessons are also shared across all local partner organisations and regular liaison meetings held.

2. Regular Meetings and Collaboration:

We maintain a quarterly dialogue with the Wellington Transport alliance, discussing programmed works and opportunities for network improvements. This ongoing collaboration contributes to the overall efficiency of our maintenance program. We meet with neighbouring Wairarapa Council on a regular basis to share information and forward work programmes. We actively participate in regional transport meetings with Te Ringa Maimoa which is a partnership that supports New Zealand's drive to incentivise improved activity management, support multi-model decision making, and builds the capability of the transport sector.

3. Impact of Private Developments:

Private developments significantly influence supplier availability, and we consider their impact, especially as the region experiences growth. This awareness is essential for adapting our maintenance strategies to meet the evolving demands. We foster these relationships with the private sector with regular meetings with key development companies to ensure communications is open and transparent

4. Future Procurement Planning:

As Wairarapa current network maintenance contracts approach their term limits, we remain committed to open communication between Carterton and South Wairarapa councils, Waka Kotahi, and the market. This facilitates discussions on models that offer efficiency and value for money, ensuring the continuous improvement of our maintenance program.

9.2.5 Performance Monitoring and Reporting:

To monitor and improve the performance of our maintenance program, we utilise a comprehensive approach:

- We track program achievement, job priorities, and work categories through our contractor's programme.
- Performance is assessed through ONF/ONRC performance measures, DIA performance measures, internal performance indicators and contractor performance through PACE (Performance Assessment by Coordinated Evaluation) system.

- The Council focuses on achieving Customer Outcome, Technical Outputs, and Cost Efficiency, aligning with ONRC/ONF Performance Measures and additional internal reporting metrics.

By adhering to these principles, we ensure the efficient management, coordination, and performance monitoring of our Maintenance, Operations, and Renewals program, ultimately benefiting our community and stakeholders.

9.2.6 Significant Negative Effects

While the transport activity enables and supports much of community wellbeing, there are negative effects that need to be identified and appropriately managed, so that the positive contributions of a well-functioning, safe, and sustainable transport system can be realised. Significant effects are recorded and assessed against the following:

- Significant Negative Effects highlight risks posed by the Transport System, as it currently functions, or if the current management cannot be maintained.
- Mitigation of Negative Effects to describe how we manage these negative effects to minimise impact.
- Positive Effects which will result where mitigation is largely successful, and outcomes are achieved.
- These are mapped against the four aspects of community wellbeing.

Table 9-4: Significant Negative Effects

Significant Negative Effects of Sealed Roads		
	Negative Effects	How we will mitigate
Social	None identified	
Cultural	None identified	
Environmental	None identified	
Economic	Widespread incapacitation of network — for example, due to a storm event, bushfire, or widespread slips)	Co-ordinate network responses for events and be assisted by Civil Defence Emergency Management

CONTINUOUS PROGRAMME – LOCAL ROAD POTHOLE PREVENTION (Nos. 9.3, 9.4 and 9.5)

9.3 Sealed Pavements

Work Categories: 111 Sealed Pavement Maintenance, 212 Sealed Road Resurfacing, 214 Sealed Road Pavement Rehabilitation and 341 Low Cost/Low Risk Improvements (Associated activities: 113 Routine Drainage Maintenance and 213 Drainage Renewals).

9.3.1 Introduction

The purpose of sealed roads is to provide a network that is suitable for the effective movement of produce and people. It has a safe suitable all-weather surface that is appropriate to its location and functions suitably for its level of service.

Below is a summary of important physical characteristics within the network which have a bearing on this programme business case.

9.3.2 Strategic Case Linkage – Sealed Pavements

Work Class (W/C)	Problem / Opportunity	Benefits of proposed activity	GPS Strategic Priority	Consequences
111 Sealed Pavement Maintenance 212 Sealed Road resurfacing 214 Sealed Road Pavement Rehabilitation	Aging and deteriorating network Network Vulnerability Safety Accessibility	An affordable network which is economically sustainable Satisfactory level of service for the traffic demand, particularly heavy haulage Optimising long term maintenance cost with a reduction in the amount of reactive maintenance Roads are safer for everyone and more resilient Adequate funding for maintaining the network at the appropriate service levels A fit for purpose programme that can reduce the backlog of renewals	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Our sealed roads will continue to deteriorate under increasing traffic and freight demand, leading to a reduced level of service, reduced resilience during wet weather events, increased road hazards (potholes etc) and increased maintenance costs

9.3.3 Current Condition and Performance - Pavements

Masterton's sealed roads generally have good roughness results with smooth travel exposure (STE) at the same or better than the peer group average. Peak roughness is also comparatively good.

The amount of rehabilitated roads is lower when compared to the peer group and the average age of the network higher than the peer group. Renewal and maintenance costs would suggest that Masterton is under investing in the sealed network when compared to its peers.

Masterton current condition index (CI) continues to be a concern. This required a considered balance of maintenance, resurfacing and pavement renewal.

Overall, this indicates that Masterton should pursue options to improve the condition, age of the network and its safety performance by transitioning to more pavement renewals. If this happens there should be improvement in the problems identified in the strategic case.

MDC's deterioration modelling scenarios show pavement roughness and condition will slightly trend negatively upwards during the analysis period of the model.

Our maintenance strategy is to align maintenance expenditure to ONRC carriageway use by setting specific LoS triggers for those roads and routes, such as logging.

Table 9-3 Evidence and Gap Analysis provides evidential support to the statements above.

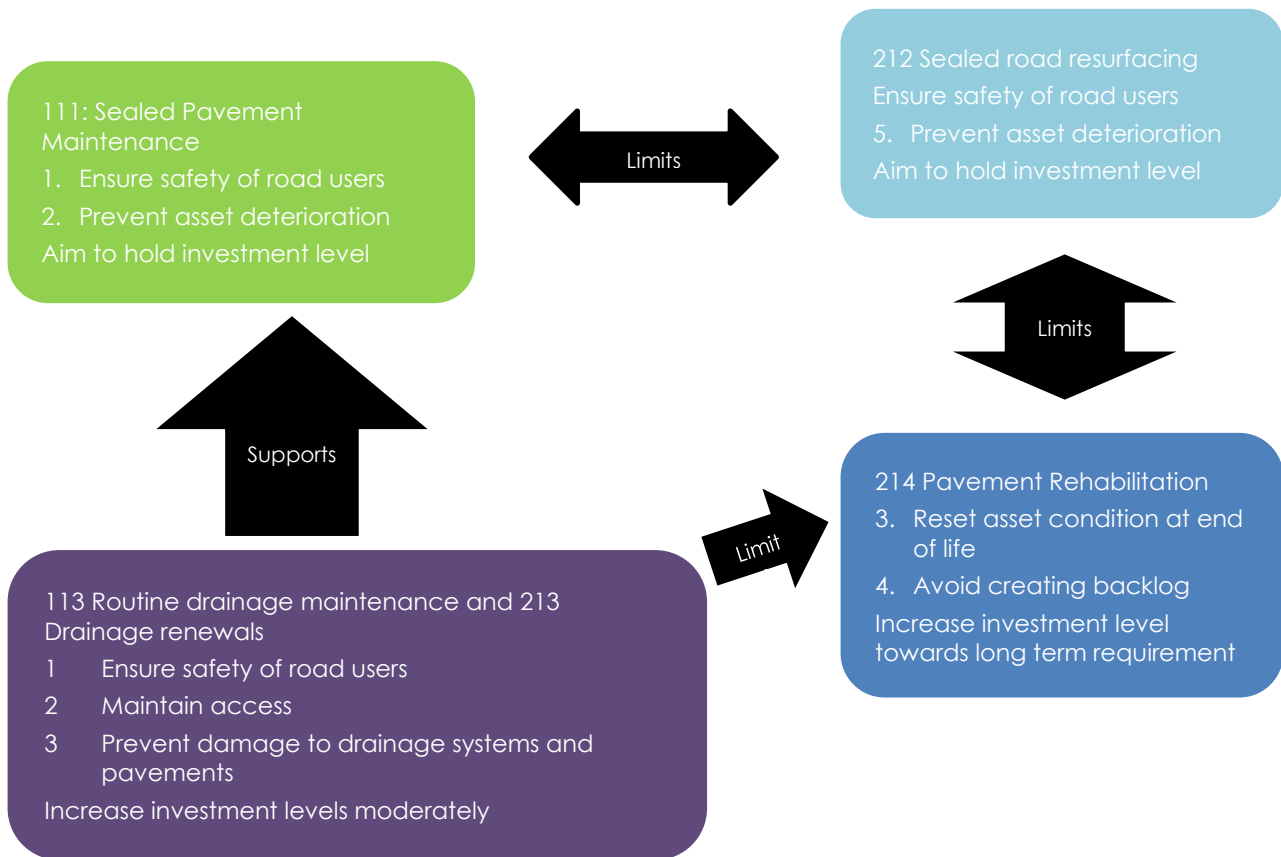
9.3.4 Sealed Pavement Maintenance

Since 2021 we have reviewed our approach in the context of rebuilding damaged roads, and investment across the entire portfolio.

Pavement Management Strategy

Over one-third of expenditure relates to the sealed maintenance, this is the main area where optimisation of resource can be sought by pursuing the best balance of effort as illustrated below.

Objective: Undertake rehabilitation works when needed, ensuring other activities support asset and delay deterioration.



We will monitor the success of this through customer feedback and annual assessment of the ONRC reporting tool. The level of expenditure on the lower classification roads is largely driven by customer enquiries and sharp changes in heavy traffic through forestry harvesting.

Pavement repairs are prioritised and carried out in accordance with the maintenance contract specifications, and in conjunction with the periodic resurfacing of the network. They are also carried out when required in other situations to ensure the safety of road users and the integrity of the road pavement. A key factor in the prioritising of work is the network classification, with higher weightings being applied to the more heavily used roads and known logging routes.

There are some factors on the Masterton network resulting in some unplanned reactive interventions and maintenance, contributing to sections of the network deteriorating below the target levels of service. These are:

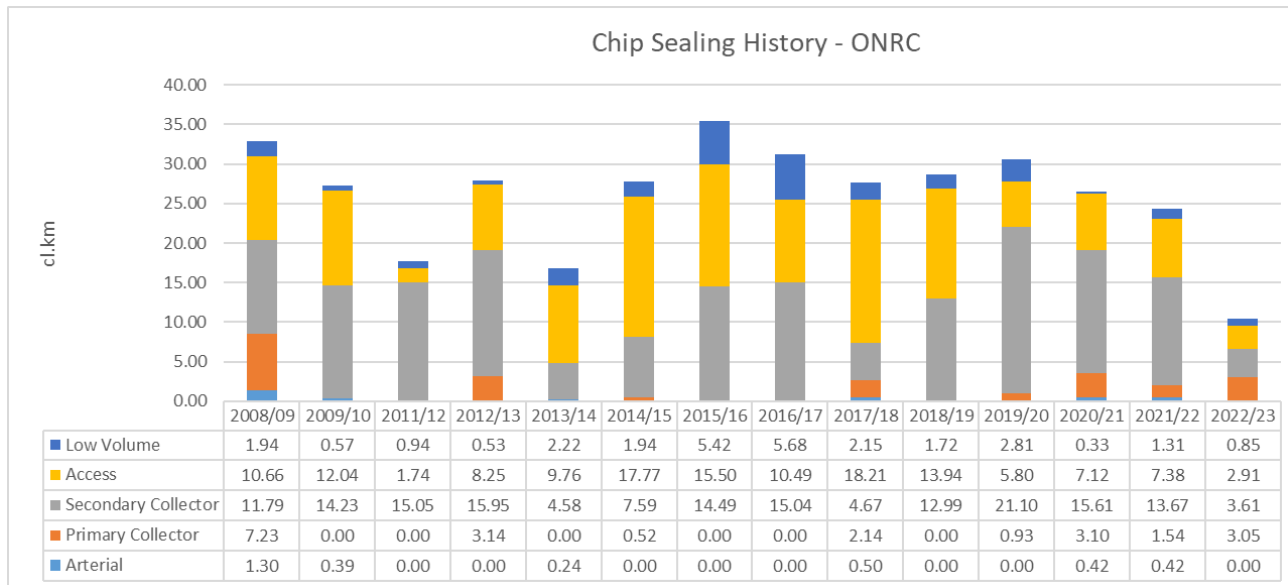
- geological challenges,
- changing agricultural sector with heavy loads
- peak in maturing forestry sector

Pre reseal repairs are undertaken prior to resealing. The type of repairs undertaken is dependent on the level of usage of the road and the corresponding level of service.

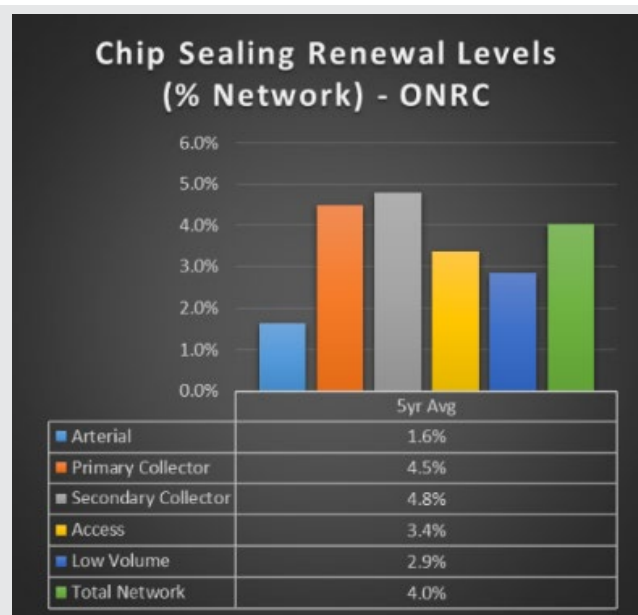
9.3.5 Pavement Renewals Historic Work Quantities

A review of completed renewal work was undertaken, to gain an understanding of the level of investment and asset renewal rates completed for the past 10 years, by the ONRC. The units are km/yr.

Figure 9-2: Chip Sealing - ONRC

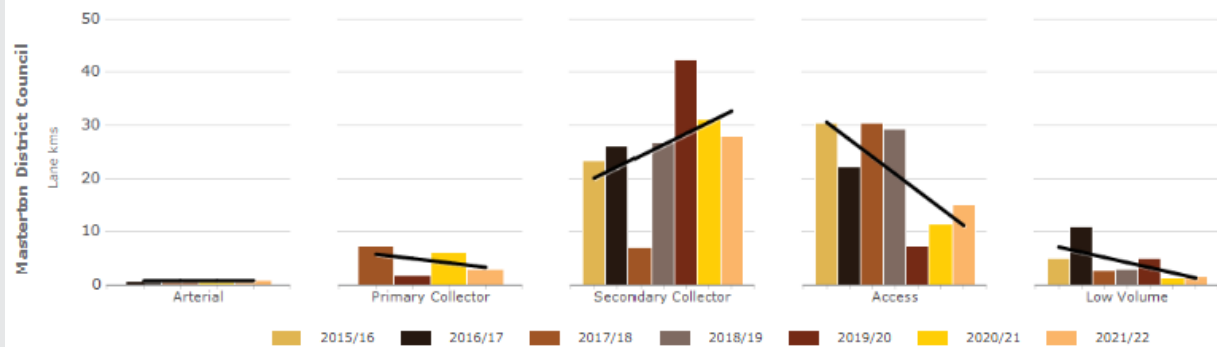


This pattern translates to an average sealing of 20.6km/year and the percentages across ONRC as illustrated.





Time series of the length of sealed road chipseal resurfacing by classification



Percentage by area of network chipseal surfacing (Latest and Comparative Trend)

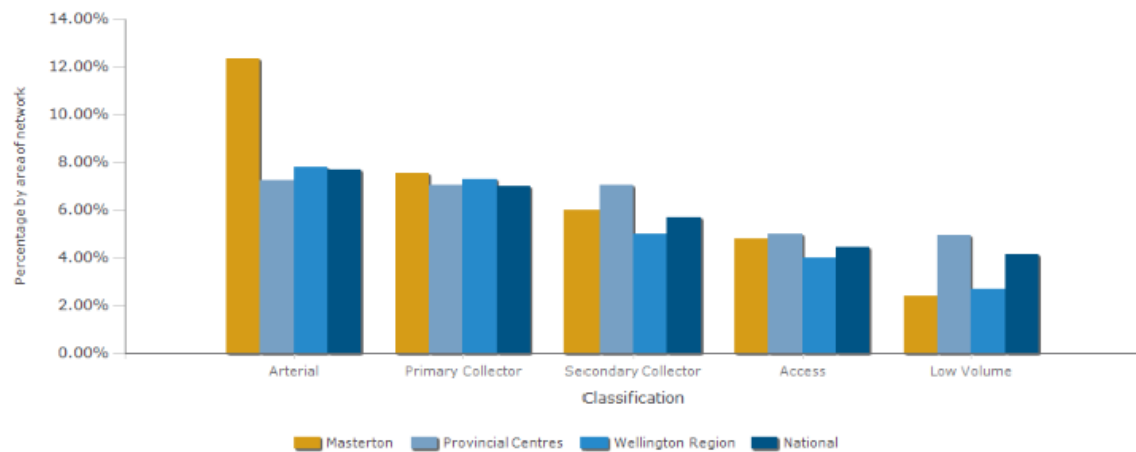
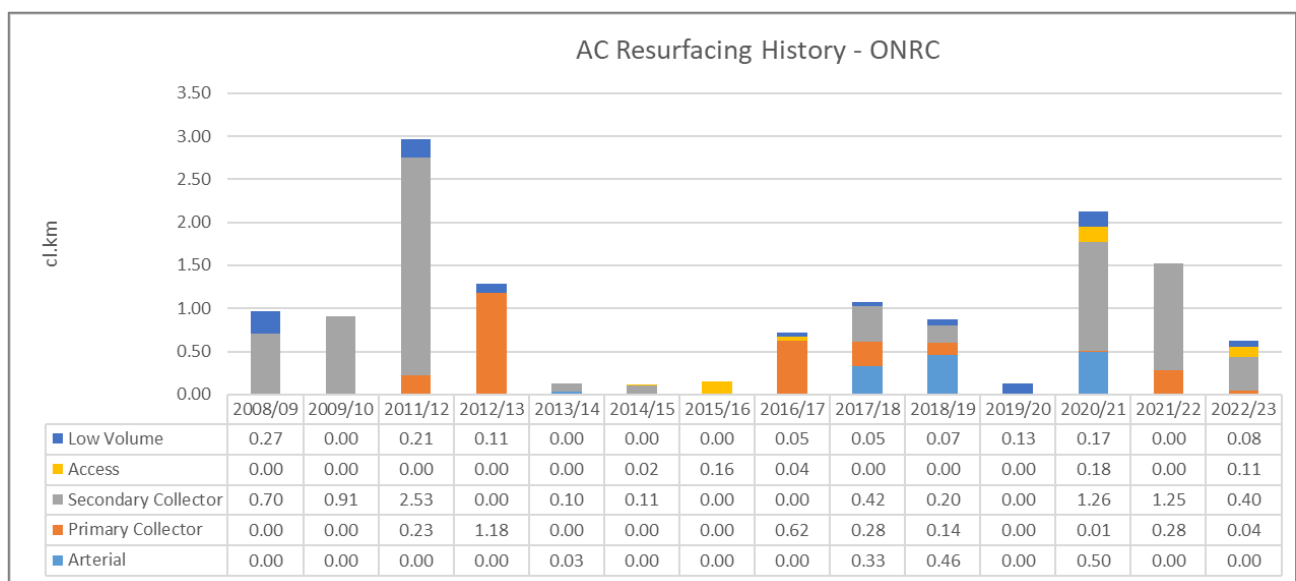
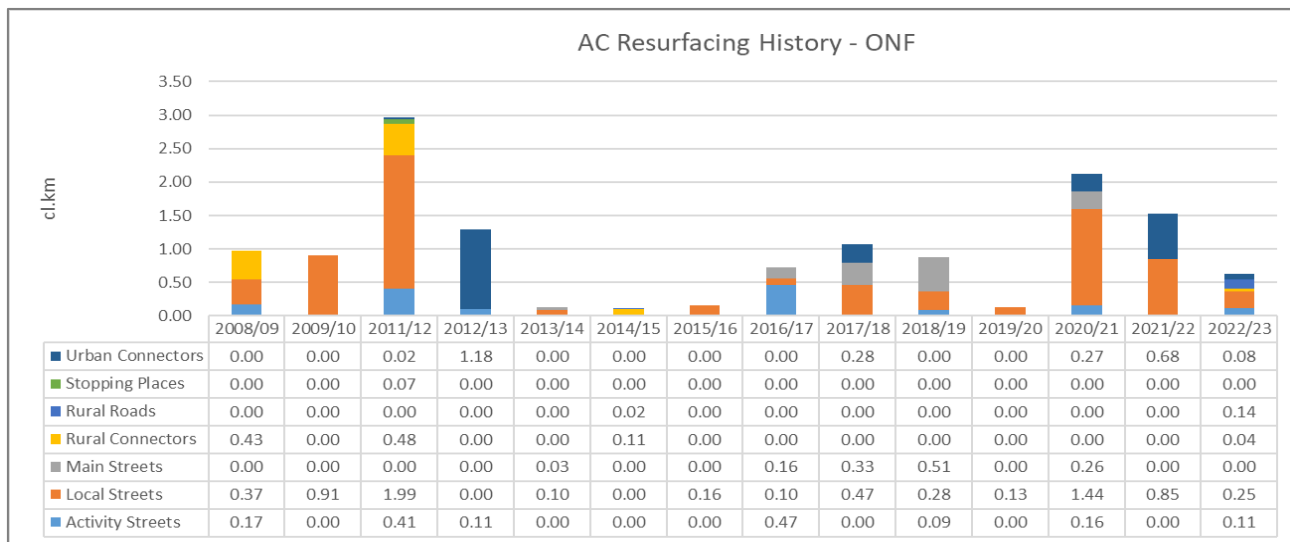
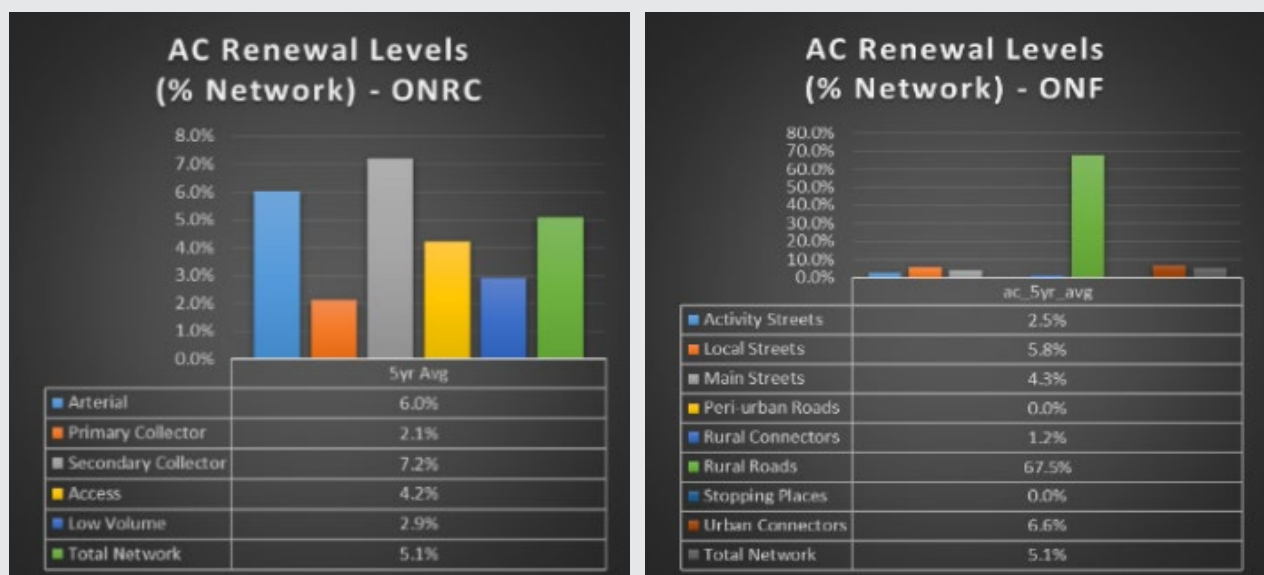


Figure 9-3: Thin Asphalt Resurfacing – ONRC and ONF





This pattern translates to an average sealing of 1.0km/year and the percentages across ONRC as illustrated.



The total surfacing achieved has varied by programme and cost factors as shown below:

Figure 9-4: Total Resurfacing

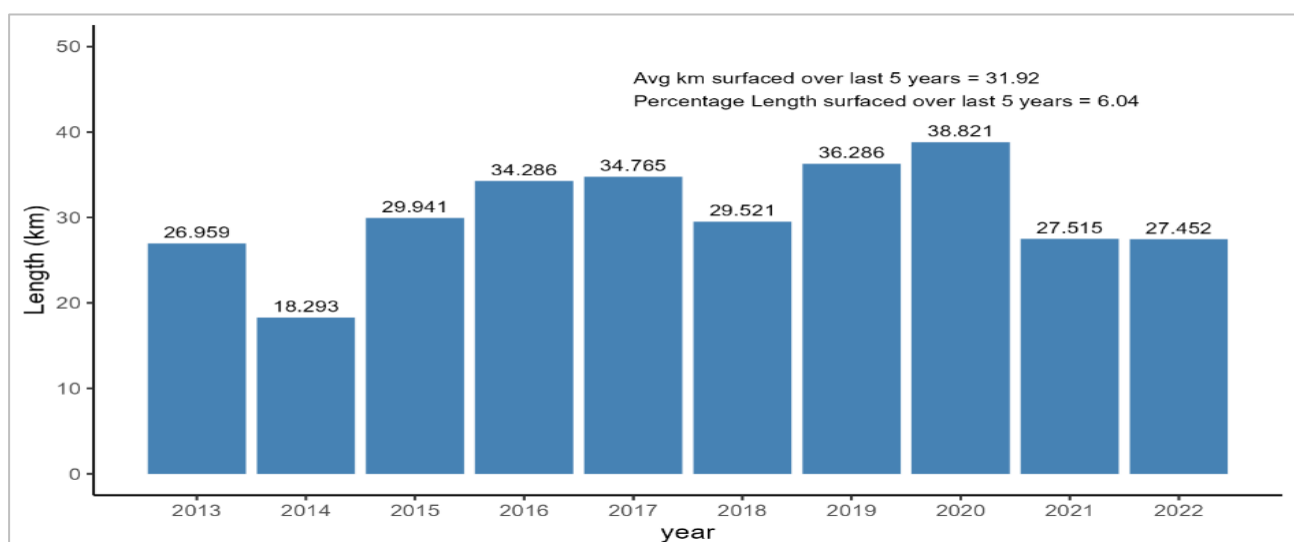
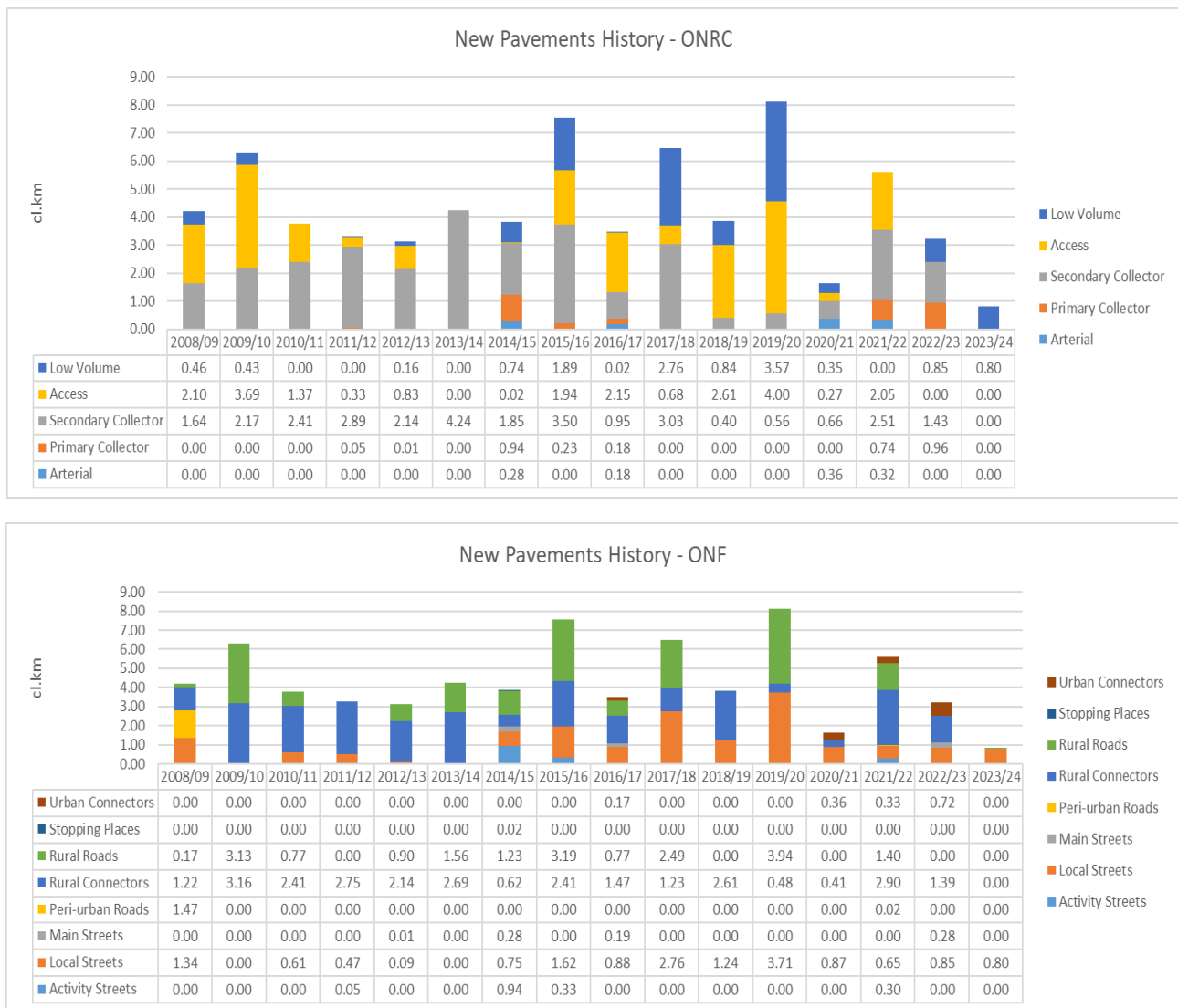
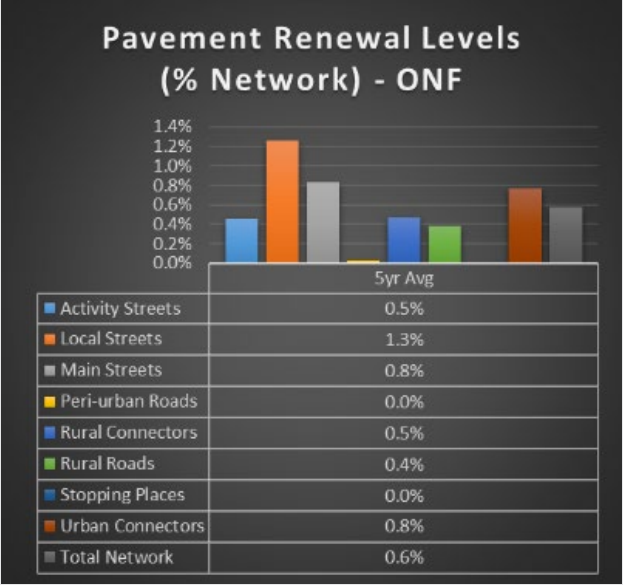
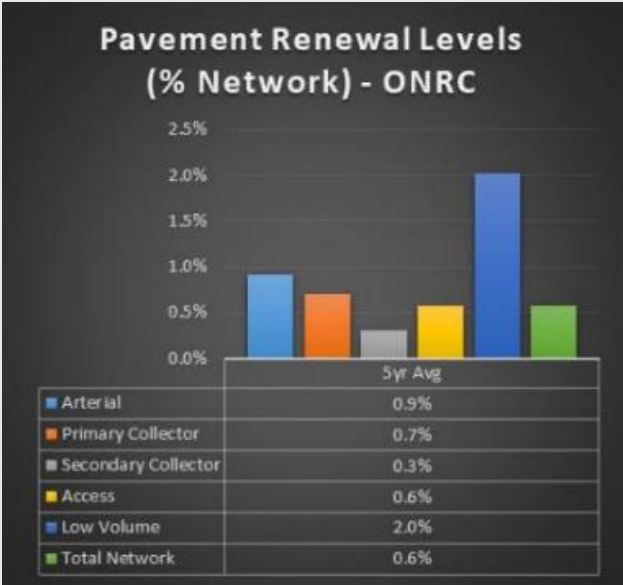


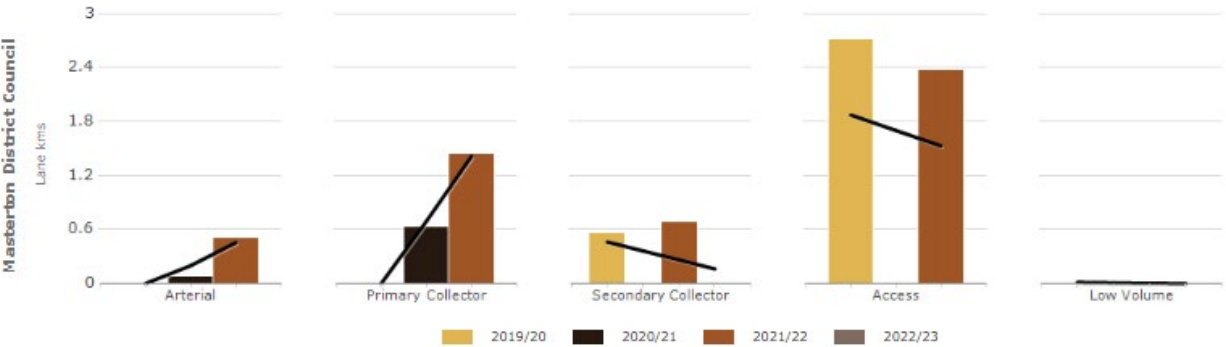
Figure 9-5: Pavement Rehabilitation (incl Capital Improvements) ONRC and ONF



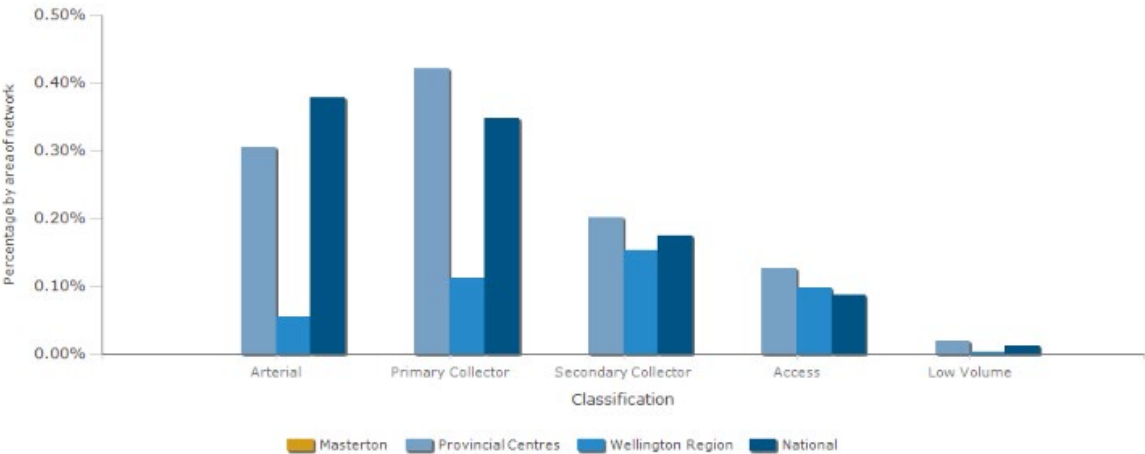
This pattern translates to an average sealing of 3.2km/year and the percentages across ONRC as illustrated.



Time series of the length of sealed pavement rehabilitation by classification



Percentage by area of pavement rehabilitation (Latest and Comparative Trend)



MDC has been renewing the surfaces, on average, every 17 years (5.9% per year), the pavements are renewed every 150 years (0.6% per year).

Investment based on these quantities would extend these renewal rates out to 19 years for surfacing and over 200 years for pavements.

These insights have been used to set the model parameters and target quantities for our programme review.

9.3.6 Overview of Deterioration Modelling

To undertake the pavement and surfacing modelling, Juno Viewer was used. The Juno Viewer platform is a data analytics tool, using the existing data from within the MDC RAMM database and other data sets. The Juno Viewer platform also contains a pavement modelling framework. This model framework has been in use for over 15 years. Juno Viewer has been in place in New Zealand since 2005. This framework provides a flexible engineering approach to modelling and treatment selection for pavements and surfacing's.

Juno Viewer uses a ranking approach to prioritise treatments, (rather than a Net Present Value approach) which is more applicable to MDC road networks and available data. The whole-of-life approach has been incorporated into the model through triggers and interventions, linked to our Asset Management plan. The ranking approach within Juno Viewer uses a looping algorithm, ranking and repeating through each year of the analysis term. For each road section, the multi-year ranking will determine the best return in investment linked to the treatment interventions.

The analysis method used is the Ranked Quantity Constrained method. This selects treatments based on trigger equations and places treatments in order of ranking score until the annual quantity budget is consumed. If more treatments are triggered than the allowed maximum quantity in a certain year, the treatments with the highest priority score will be placed first, and then the treatment with the next highest score, and so forth, until the quantity allowance for the specific treatment type is exhausted. The ranking parameter is configured so that the worst segments are not necessarily placed first, but other logic, like the ONRC category and the condition level of specific variables also comes into consideration. The ONRC Multiplier scores used in analysis also have a multiplier higher for logging routes , to ensure that these routes get preference and we prioritise their treatment as well.

MASTERTON DISTRICT
Common Forestry Haul Routes

Legend:
 — State_Highway_2
 — Logging_Haul_Roads_2

Scale: 1:100,000
 Date: 6/07/2023

Notes:
 This map is a general representation of the Common Forestry Haul Routes. It is not intended to be used for legal purposes. The Masterton District Council does not provide insurance for any vehicles or property involved in transport. It is the responsibility of the user to ensure that all vehicles and property are properly insured and that all transport is conducted in accordance with the relevant legislation.

Optioneering scenarios Results

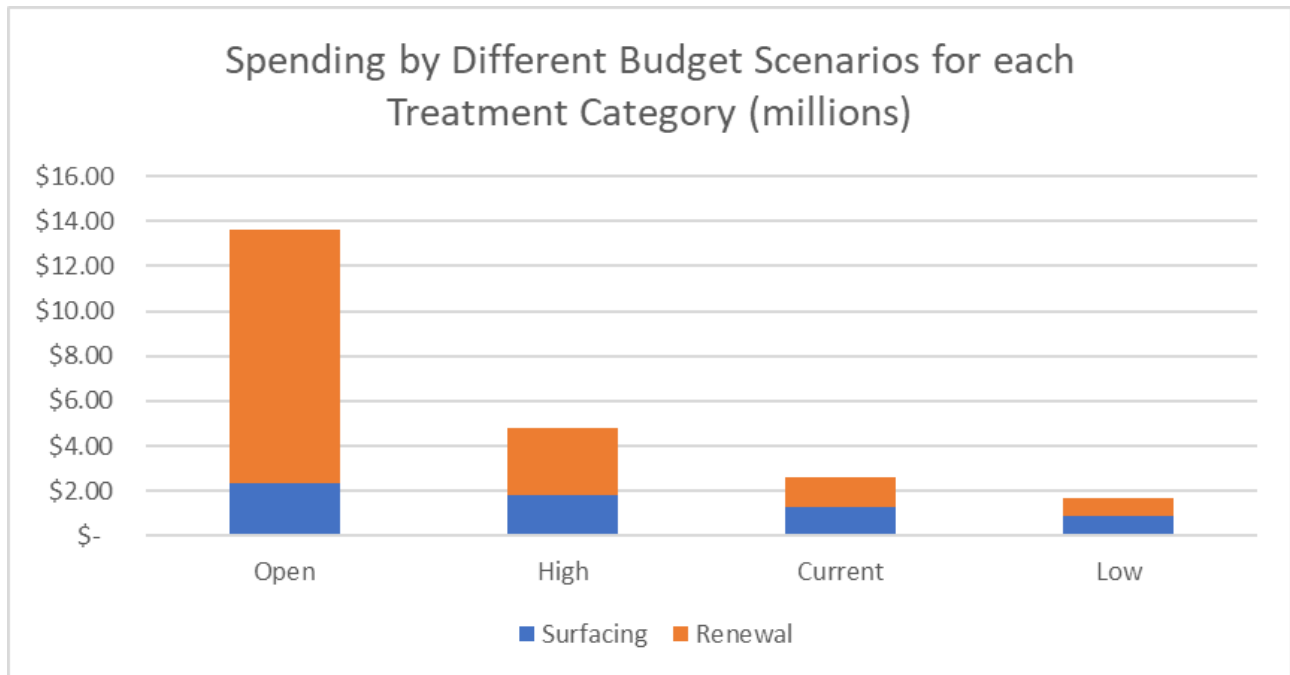
Four different budget scenarios were considered within the Juno model using LoS triggers. These were:

1. Current – current Budget Scenario was estimated from funding and treatment quantities that were historically applied to the network, i.e. approximately five percent resurfacing and 0.4 percent rehabilitation.
2. More/high – Budget Scenario allows for increased funding compared to the Current Budget Scenario with approximately 7.7 percent resurfacings and just over 1 percent rehabilitation.
3. Low – the less Budget Scenario shows the effect of decreased funding compared to the Current Budget Scenario at 3.6 percent resurfacing and 0.3 percent rehabilitation. The available budget for each strategy is shown in Figure 9-7
4. Open Budget Scenario is based on an unlimited budget scenario but is capped to ensure even treatment distribution throughout all analysis years. The outcome of this scenario provides the ultimate treatment plan based on the trigger logic, without constraining quantities and budgets.

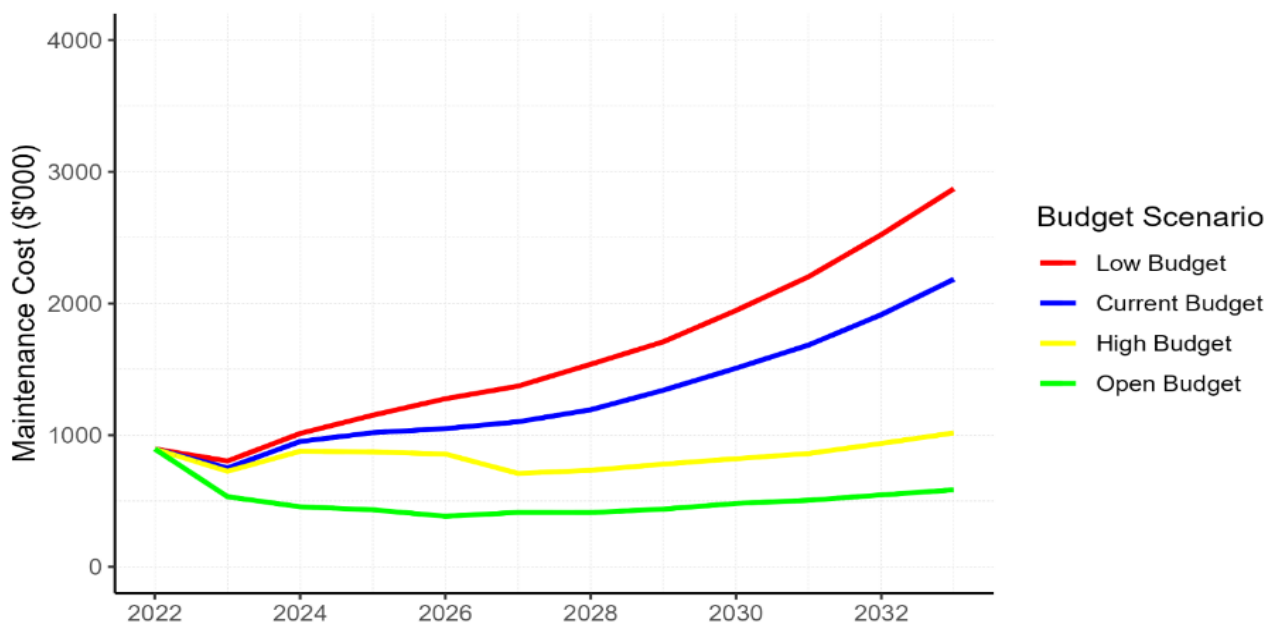
Figure 9-7 (below) shows the spending by each budget scenario for each treatment category. The relative spending by each budget scenario was controlled by creating budget categories for each treatment category.

The open budget option represents the total cost of work that is necessary on the network based on the current trigger levels. The open budget is more than **five times** the amount of the current budget.

Figure 9-7: Spending by Different Budget Scenarios for each Treatment Category



A key consideration is the maintenance impacts of the scenarios. The Juno model provides an indication of the relative change of the scenarios on maintenance itself. The 'high' scenario is expected to lead top maintenance costs closer to the 'high' scenario with a much lower investment level. There are significant risks with the current and low models in terms of escalating costs.



9.3.6.1 Length Treated by Different Scenarios

The length in metres treated by the different budget scenarios are summarised in Table 9-5. Rehabilitation are substantially higher in the open budget scenario compared to the constrained budget scenarios.

Given the climate, geology and soils of the Masterton District, very long reseal and rehabilitation timelines are unlikely. The current model expected an average seal life of nearly twenty years, and pavement of over 200 years. The more/high scenario appears to be more realistic as a sustainable and achievable option.

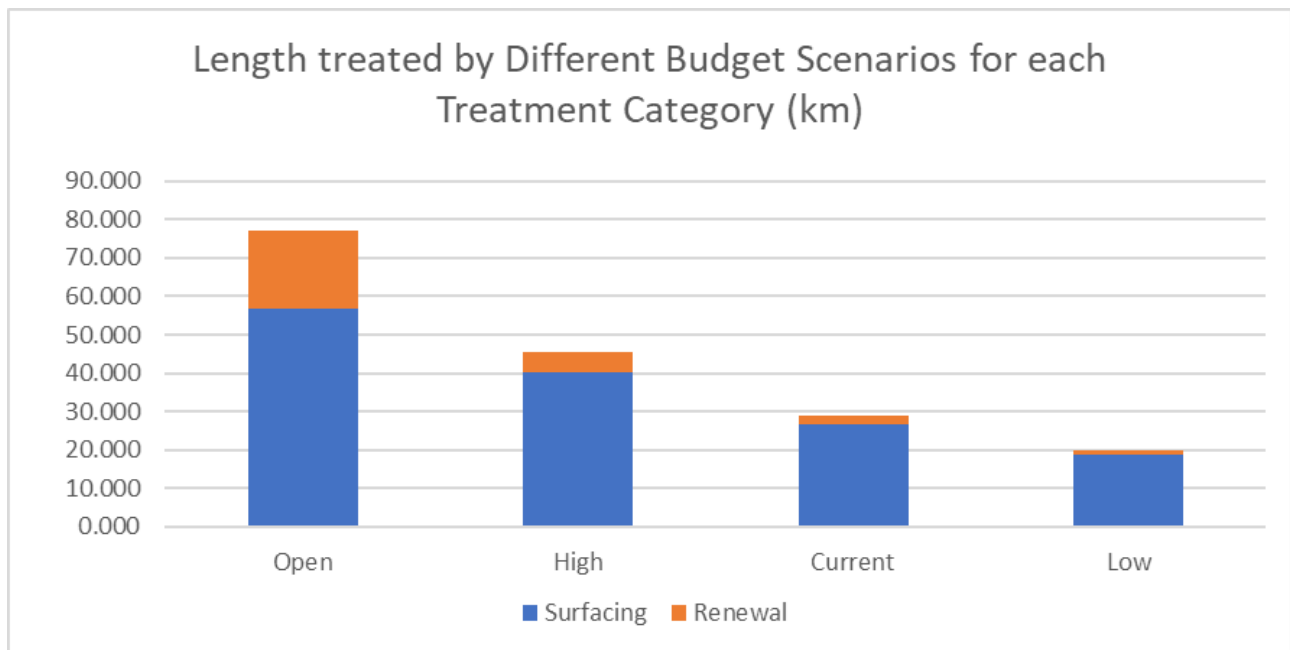


Table 9-5: Length Treated by Different Scenarios

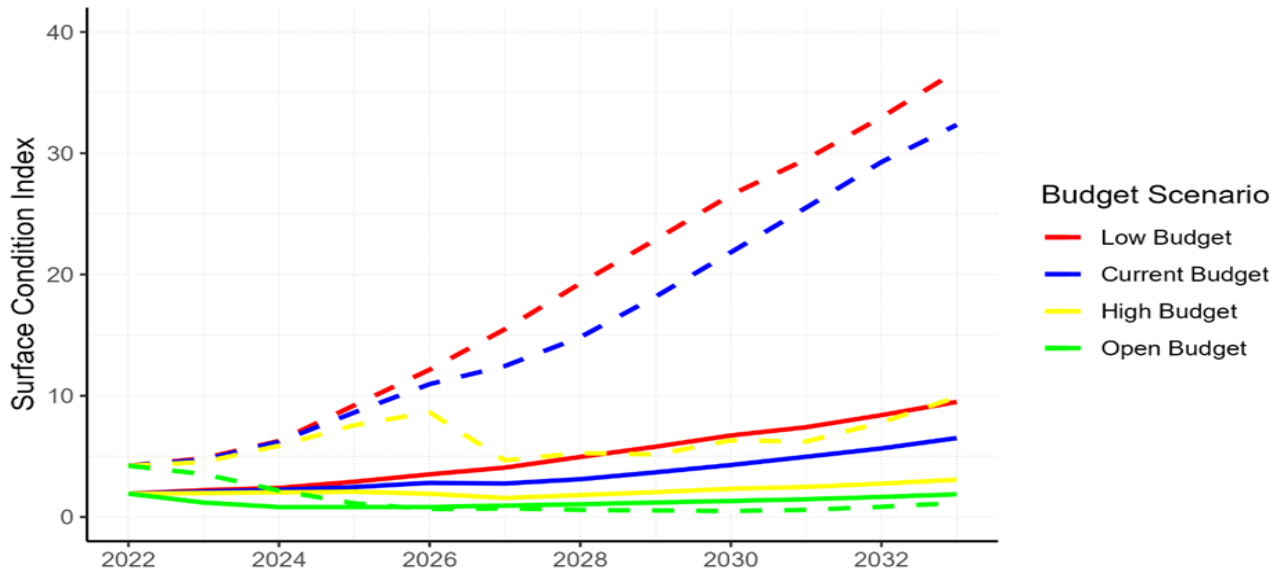
	Open			More/High			Current			Less		
(per annum)	Length	%	Average Renewal Rate	Length	%	Average Renewal Rate	Length	%	Average Renewal Rate	Length	%	Average Renewal Rate
Resurfacing	56,898	11.04	9.1	40,044	7.77	12.9	26,777	5.19	19.3	18,541	3.60	27.8
Rehabilitation	20,281	3.93	25.4	5,477	1.06	94.1	2,230	0.43	231.2	1,491	0.29	345.7

9.3.6.2 Predicted Condition for Different Budget Scenarios

Predicted Surface Condition Index (SCI)

The predicted SCI for different budget scenarios is shown below.

Figure 9-8: Predicted SCI for different Budget Scenarios

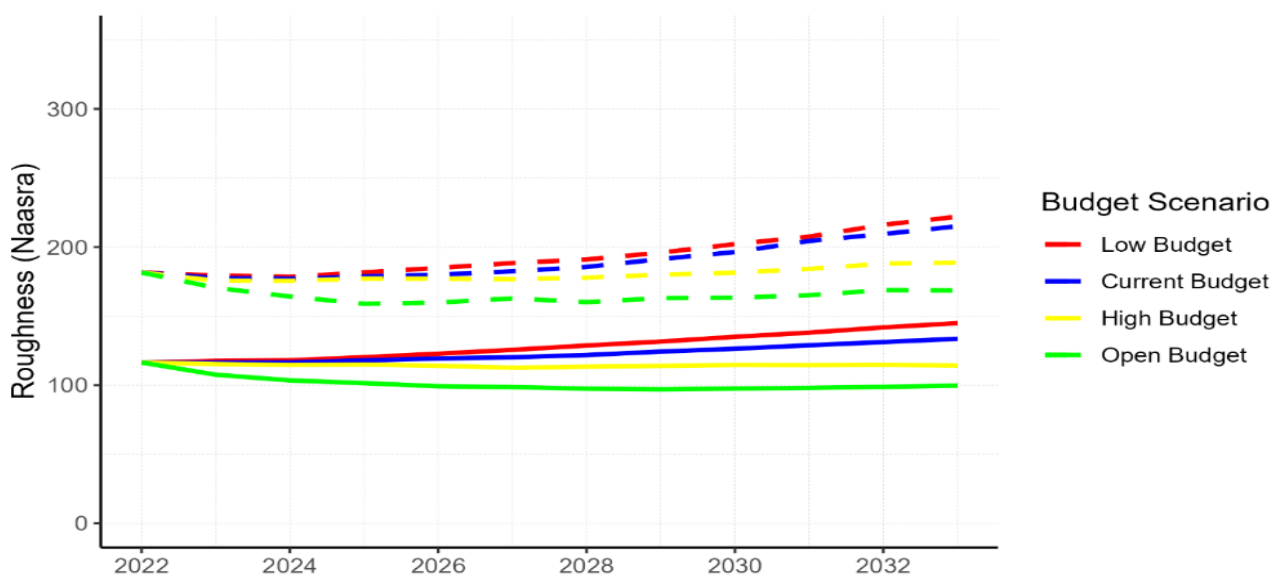


The High Budget Scenario is effective in maintaining the mean and 90th percentile SCI throughout the analysis period. The current and Low Budget Scenarios show an increase in the mean as well as 90th percentile SCI values. A treatment rate higher than that of the Current Budget Scenario is necessary to maintain the surface integrity of the network.

Predicted Roughness

All scenarios do not maintain the current weighted average of the NAASRA value of 75. The reason is that the model triggers for roughness are set to perform rehabilitation only when roughness is substantially higher than the current level.

Figure 9-9: Predicted Roughness for Different Budget Scenarios



The solid lines represent the predicted condition of the average NAASRA on the network while the dotted lines represent the predicted 90th percentile NAASRA.

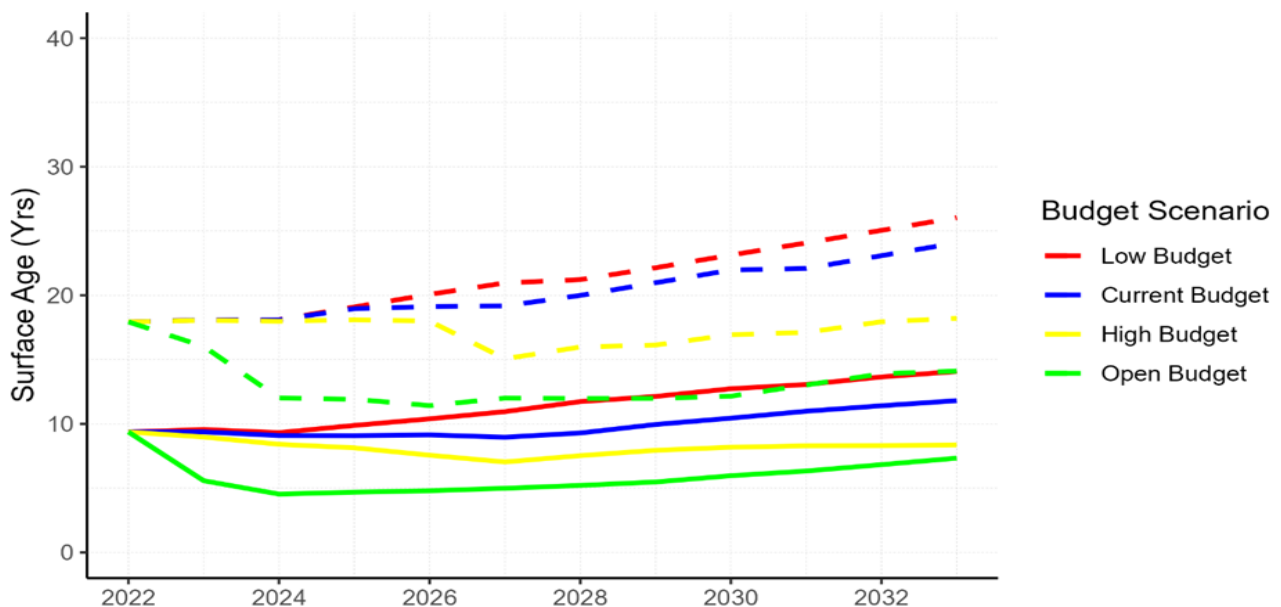
The Current Budget Scenario shows a slight increase in the mean NAASRA and an increase in the 90th percentile value. A resurfacing rate of 5.19 percent and 0.43 percent rehabilitation is not enough to maintain the NAASRA on the network at its current condition.

Predicted Surface Age

The average surface age is currently about 9.7 years. To maintain the average and 90th percentile surface age at its current condition throughout the analysis period, quantities associated with the High Budget Scenario is necessary (7.7% Resurfacing and 1.06% rehabilitation).

The High-and-Open Budget Scenarios are effective in reducing the current average surface age towards the end of the analysis period.

Figure 9-10: Predicted Surface Age for Different Budget Scenarios

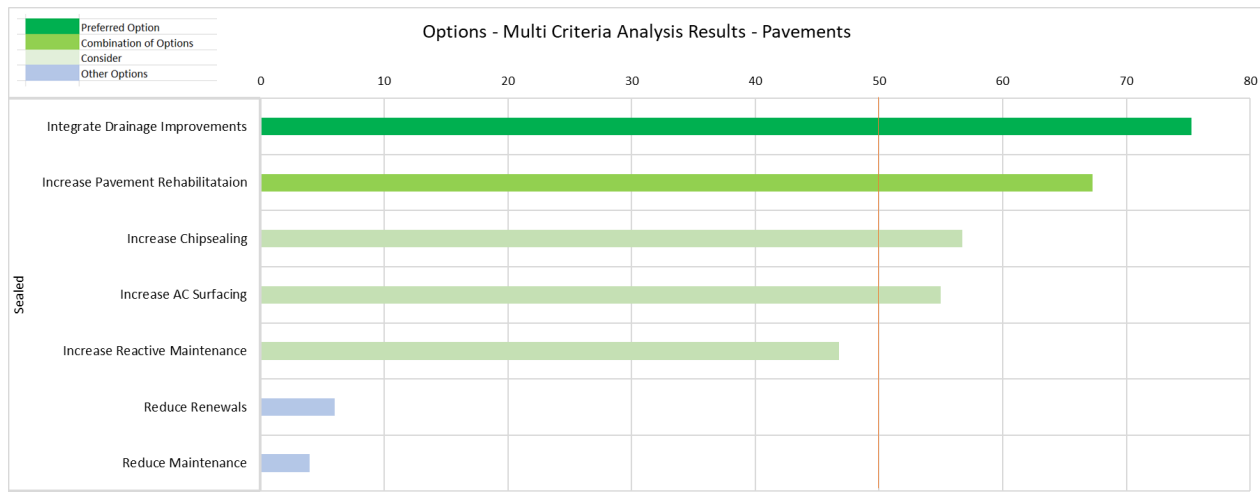


9.3.7 Options Analysis – Sealed Pavements

A Multi Criteria Analysis has been undertaken with consideration of:

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



The preferred option is to undertake a combination of drainage improvements and a greater quantity of pavement rehabilitation. This is discussed further under The Sealed Pavement Strategy (AMP).

This approach is favoured due to:

- Greater range of benefits realised
- Best outcome in terms of total cost of ownership
- Efficient and achievable work programme

There is an opportunity to transition to pavement renewals from a resurface/resurface early treatment regime due to the extensive repairs undertaken following Cycles Hale and Gabrielle. The level of renewal is derived from the Juno (High) model)

Cost increases associated with service delivery (escalations) have only been allowed for resurfacing and maintenance works in line with this approach.

Increasing surfacing while providing good customer outcomes is not 'best for asset 'as this ignores the ground conditions and topographical challenges.

Reductions in investment are unlikely to achieve the outcomes sought and there is a risk that the overall cost will increase as the asset deteriorates, along with the poor level of service that would be provided.

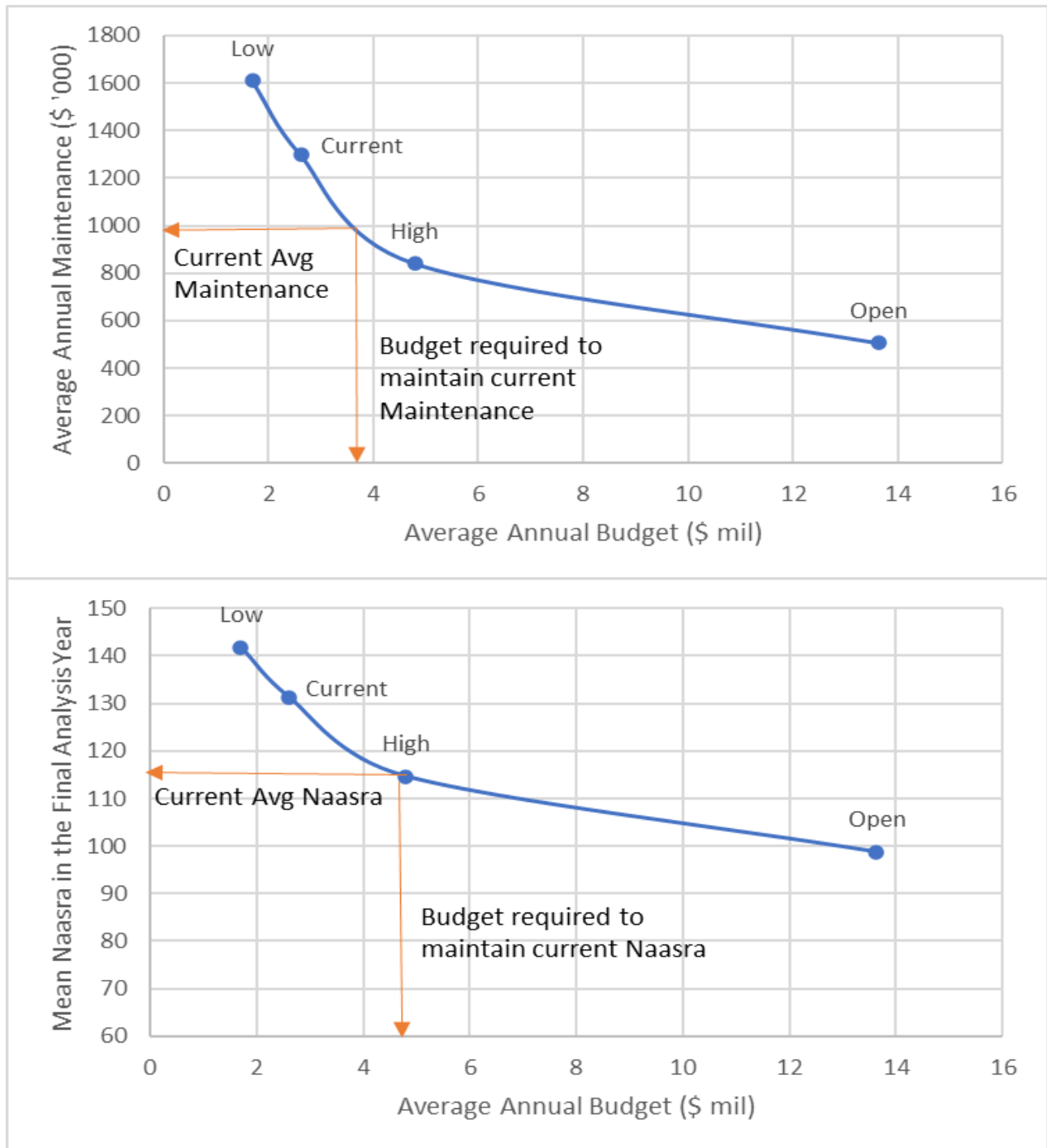
From the modelled data and multi criteria analysis, it can be concluded that the 'do minimum' status quo resurfacing rate is not enough to maintain the current surface condition in terms of surface age and SCI.

The more/high budget scenario is effective in addressing all parameters the model tests against. This is clearly explained in the Executive Summary of the Modelling report.

Cross sectional graphs below are showing the final year roughness values for different budget scenarios and the average annual maintenance expenditure predicted for different budget scenarios. From these graphs it is evident that the current level of

roughness and maintenance cost can only be maintained by treatment rates higher than that of the Current Budget Scenario.

Figure 9-11: Analysis of Scenarios



Finally, based on these results, it can be concluded that to maintain all parameters at its current level, and to reduce the risk of increased maintenance spending, it is necessary to apply treatment rates associated with the High Budget Scenario with suggested quantities of 7.8 percent resurfacings and 1.1 percent rehabilitation.

Table 9-6: Recommended Long-term Renewal Levels

Work Category	Recommended Renewal Investment		
	Length (cl.km)/Yr	%/Yr	Budget (\$,million)/Yr
Resurfacing (Chip Seal and AC)	40 km/yr	7.8%	\$1.80
Rehabilitation	5.5 km/yr	1.06%	\$3.00
TOTAL			\$4.80

9.3.8 CDB Rejuvenation

In conjunction with the above, a rejuvenation of a section of CBD has been planned in the first three years of the NLTP funding. This section of Queen Street in the CBD has pavements and other assets that are at their end of life and MDC have taken this opportunity to redesign this important community space and align our project outcomes with the strategic objectives within the LTP, GPS and Arakaki by providing a safer corridor for all users, not just vehicles. This will be achieved by focusing on the safety of pedestrians and other vulnerable users. Other significant improvements have been incorporated into the stormwater design to help Masterton achieve its environmental targets. The NLTP subsidised estimated costs below are in addition to the above preferred pavement investment.

Table 9-7: CBD Rejuvenation required subsidised funding first NLTP

Assessment	Problems being Addressed	Eligible Renewal Costs
Masterton District Council is progressing a rejuvenation of our town centre, starting with lower Queen Street between Jackson and Perry/Bannister streets. The Council has budgeted from 1 July 2024 to progress construction, earmarked for mid -late 2025. The redevelopment includes widening and upgrading pedestrian areas, creating public amenity space, including seating and upgraded lighting, and removing curbs along the segment of the street to facilitate possible pedestrianisation in the future. There will also be new gardens and additional trees planted, with careful consideration given to maintenance requirements. This project provides safety, efficiency and modal shifts benefits. The pavement and associated assets at the location of the stage 1 is at end of the design life.	Aging and deteriorating network. Safety Affordability Climate/ Environment	W/C 125 (footpaths) \$544,668 W/C 213 (Drainage) \$518,043 W/C 214 (Pave Rehab) \$720,508 W/C 222 (Traffic Ser) \$227,998

9.3.9 Financial Impact Sealed Pavements

The following table shows the financial impact of the option selected (note, some of the costs have been rounded off):

Table 9-8: Financial Impact Sealed Pavements

W/C	Description	Preferred Option Cost Impact per annum
111	Sealed Pavement Maintenance	Continue similar programme, acknowledging benefits of works undertaken as part of emergency restoration
212	Sealed Road Resurfacing	Hold programme, acknowledging benefits of works undertaken as part of emergency restoration, noting this programme will need to be review this level in future.
214	Sealed Road Pavement Rehabilitation	More than double the amount of rehabilitation based on modelling 'more' option +\$721,000/yr1 from CBD rejuvenation year 2 only
113	Routine Drainage Maintenance	See drainage section

9.3.10 Sealed pavements - Financial Summary Expenditure

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.3.11 Improvements:

Improvements that should be considered during the 2021/23 period for inclusion in the next AMP are as follows:

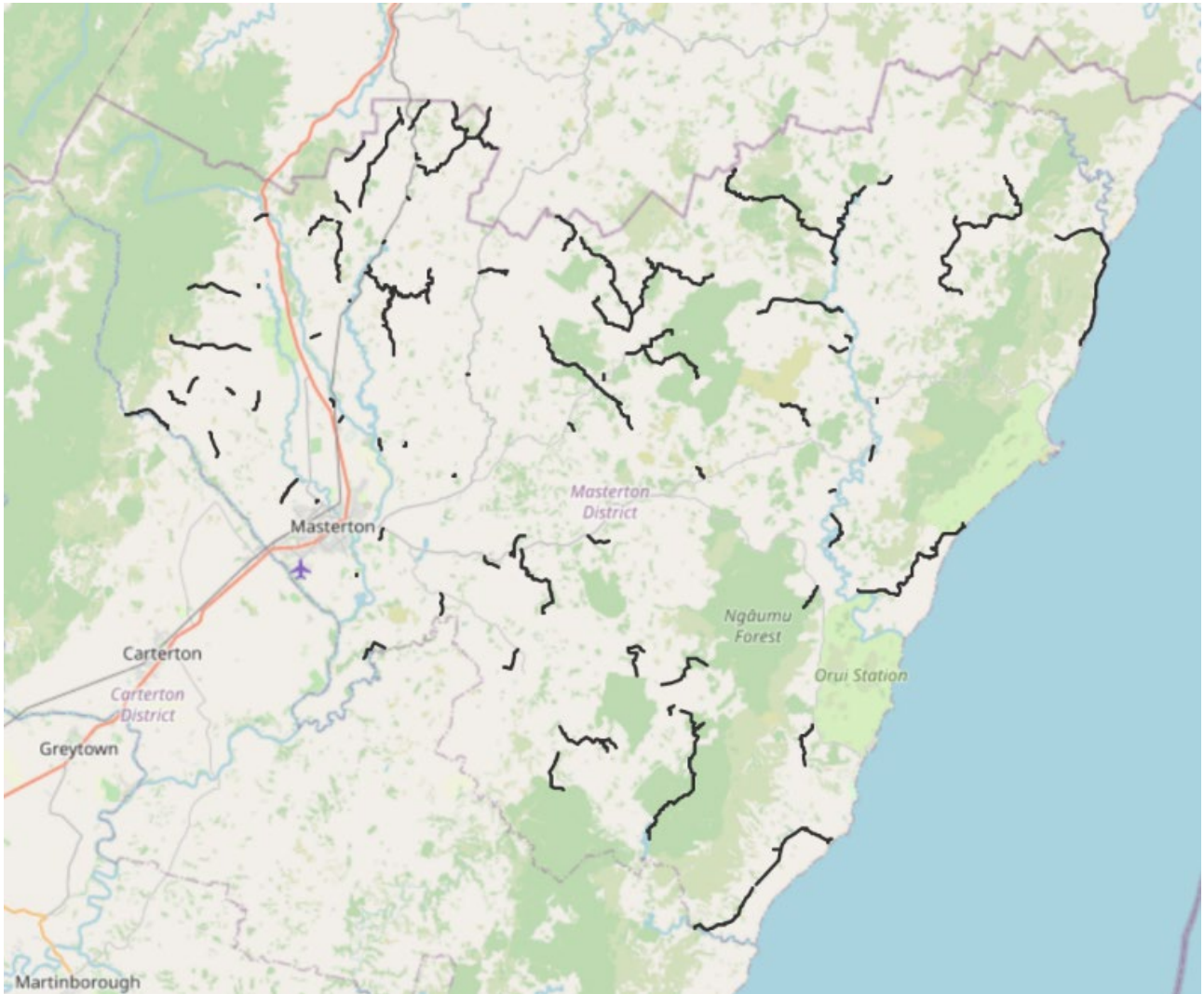
- Improve data quality and investigatory work in pavements, including implementation of Consistent Condition Data Collection programme.
- Address data issues arising from the AMDS implementation
- Continue to refine and optimise reseal and rehabilitation programme using Juno model and data

9.4 Unsealed Pavement

9.4.1 Strategic Case Linkage – Unsealed

Work Class (W/C)		Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
112	Unsealed Pavement Maintenance	Aging and deteriorating network Network Vulnerability Safety Accessibility	A fit for purpose LoS for our unsealed roads that improves customer satisfaction, while optimising the long-term maintenance costs. Less reactive, leading to significant improvements in customer satisfaction and optimal maintenance practices, particularly on logging and other heavy vehicle routes or roads with higher traffic volumes.	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Our customers will be dissatisfied with our condition and maintenance practices on unsealed roads, with continued issues on heavy vehicle routes potentially resulting in further unplanned expenditure.
211	Unsealed Road Metalling				

The unsealed network:



9.4.2 Current Condition and Performance - Unsealed

Masterton's unsealed roads generally have good running surface; however, unsealed roads can deteriorate very quickly through weather events and where there is a change of use in forestry activity.

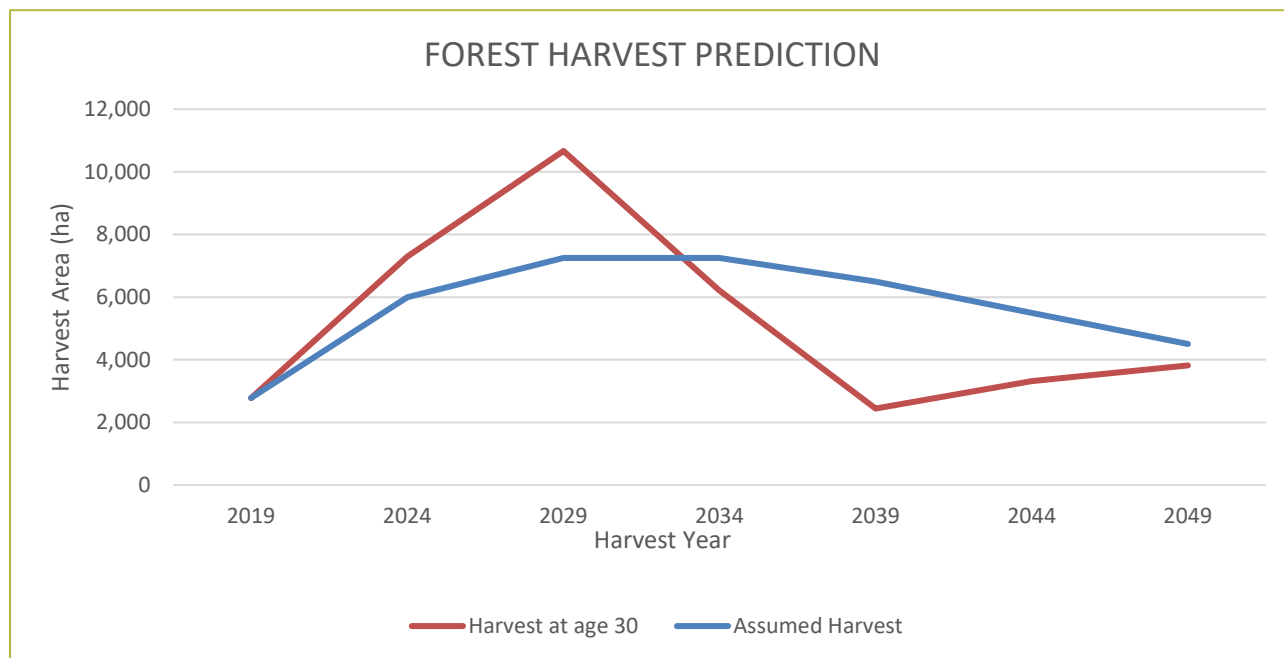
The customer LoS that applies to unsealed roads are cost efficiency and safety. Whilst safety performance raises no red flags, Masterton's expenditure on unsealed roads, in relation to that of its peers, is high. Table 9-3 Evidence and Gap Analysis provides evidential support to this.

The council has 278 km of unsealed roads and historically (six-year average) the approximate expenditure for maintenance and metalling is \$570,000 p.a. and \$906,000 p.a. respectively. This equates to an annual cost per Km of \$2,053 for maintenance and \$3,263 for metalling.

9.4.3 Evidence and Gap Analysis – Unsealed

MDC's unsealed roads stabilizing and strengthening methodology has historically been applied to routes that provide access to the 1990's Radiata pine forests, see Figure 9-12. In the past, there have been major pavement failures that have occurred as a result of logging starting in areas where the roads have weak pavements.

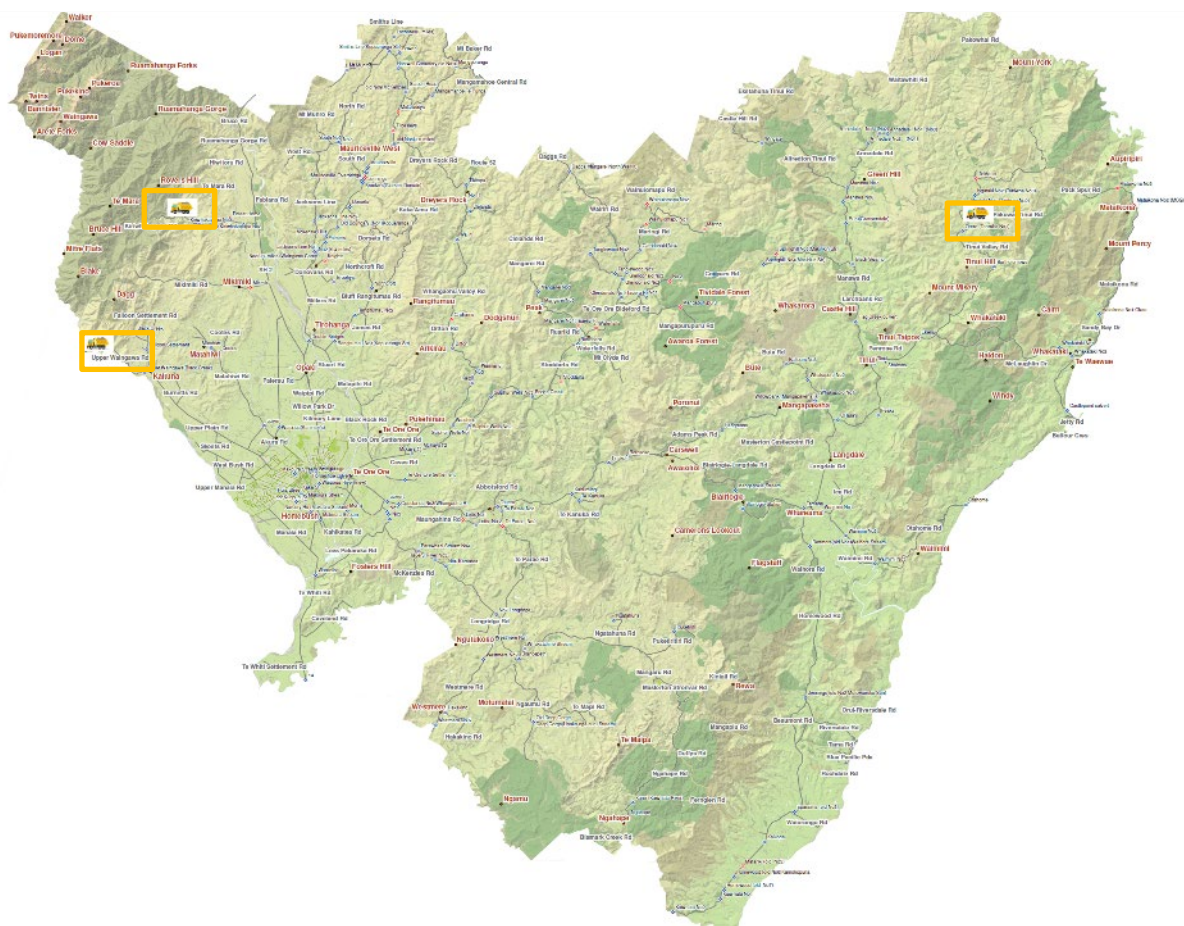
Figure 9-12: Projected Forestry Harvest Area



The failures that have occurred due to logging traffic have generated high levels of customer dissatisfaction. These customer complaints result in significant reactive work and unplanned budget expenditures. The frequency of unplanned interventions, (generally as a result of logging operations) is on the increase and this will place additional strain on resources required to maintain the unsealed road network.

The roads associated with the main forest areas also serve other farming activities, tourism traffic and some lifestyle properties. If roads are not strengthened, or continuously maintained, there can be a severe reduction in the level of service. This is particularly evident in the winter months and has severe impacts on all users of the network.

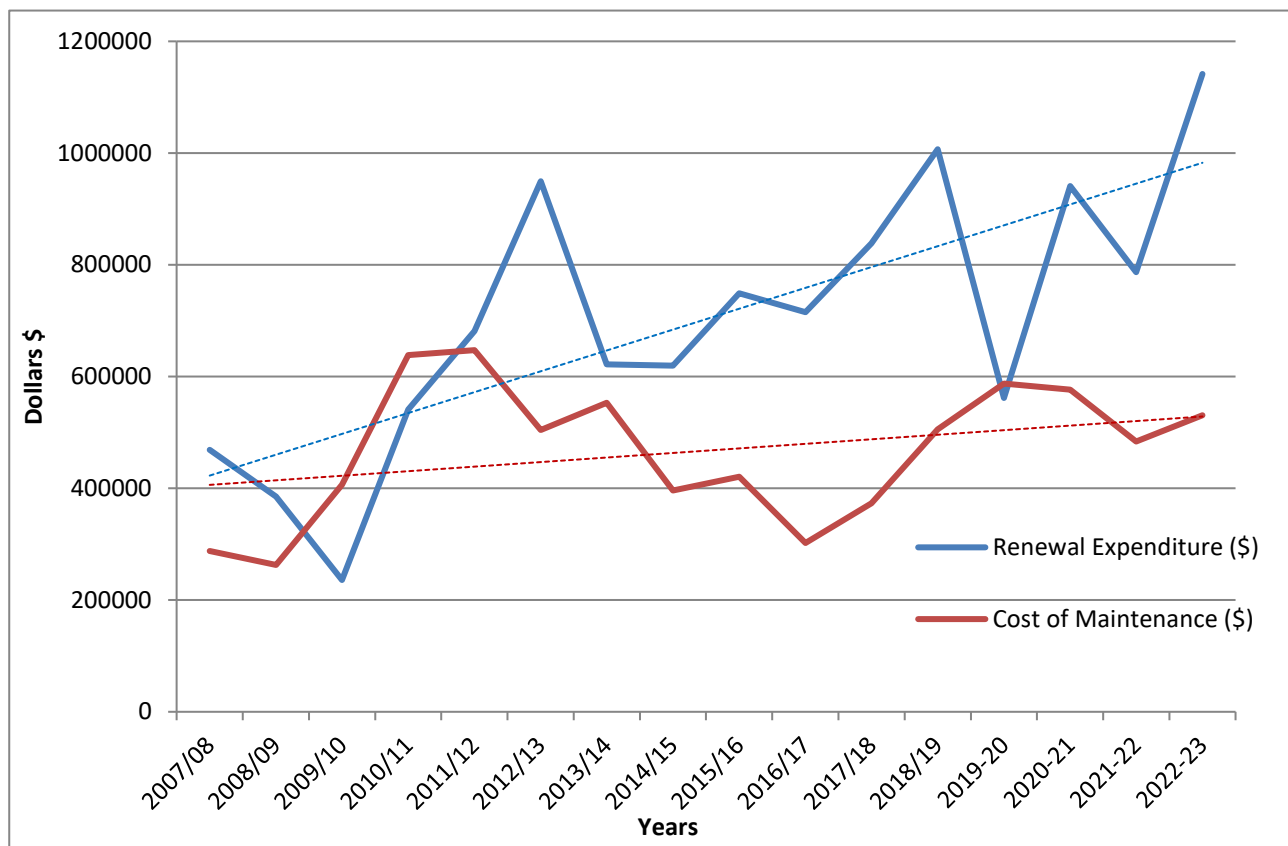
The costs of metalling unsealed roads are significantly influenced by the cost of procuring and delivering the metal to the isolated locations on our network. The Councils with lower costs have significantly cheaper road metal and placing costs per cubic metre. For example, Central Otago Council has significantly lower rates to re-metal its unsealed roads when compared to Masterton rates.



Masterton does not have the advantage of having any quarries close to unsealed sections of the roading network. Therefore, the cost for procurement is higher than some other Councils. The subgrade on many of the roads in MDC unsealed network is poor and requires a greater depth in base course and strengthening to take heavy traffic loads. It is likely that other councils may have lower costs due to higher subgrade strengths requiring less material. They also may experience lower volumes of heavy traffic, therefore the requirement to strengthen roads decreases.

Figure 9-13 illustrates that MDC has successfully reduced maintenance expenditure during the period between 2012 to 2013 however expenditure has recently increased.

Figure 9-13: Historical Expenditure Unsealed Roads



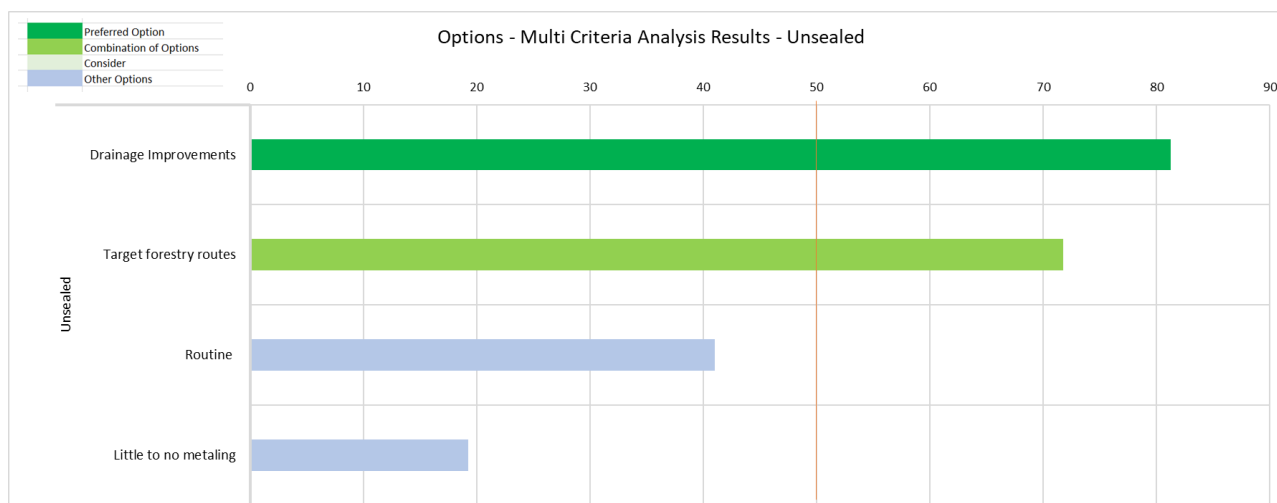
The road maintenance expenditure reduced from a peak expenditure in 2011-2012 of \$638,000 to \$396,000. This represents a \$242,000 annual saving. These costs are again spiralling up as logging activities have increase over the last 3 years will continue to over the next 10 years based on Figure 9-12: Projected Forestry Harvest Area.

9.4.4 Options Analysis – Unsealed

A Multi Criteria Analysis has been undertaken with consideration of

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



The PREFERRED OPTIONS is to undertake improvements to drainage across the unsealed network. This can be combined with grader operations and flanking. This should be done targeting critical and forestry routes for stabilising and undertake strengthening of these roads in line with demand and loading.

This approach is favoured due to :

- Greater range of benefits realised
- Best outcome in terms of total cost of ownership
- Efficient and achievable work programme

Routine work only or a reduction in metalling are unlikely to achieve the outcomes sought and there is a risk that the overall cost will increase as the asset deteriorates, along with the poor level of service that would be provided.

9.4.5 Financial Impact – Unsealed

The following table shows the financial impact of the options selected (note some of the costs have been rounded off):

W/C	Description	Preferred Option Cost Impact per annum
112	Unsealed Pavement Maintenance	No change
211	Unsealed Road Metalling	No change
113	Routine Drainage Maintenance	See drainage section
213	Drainage renewals	See drainage section

9.4.6 Unsealed - Financial Summary Expenditure

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.4.7 Improvements:

Improvements that should be considered during the 2024-27 period to support effective programmes are:

- Testing of aggregate

No additional cost - could be undertaken within existing budgets. Will help build a better understanding of unsealed road performance.

9.5 Drainage

113 Routine Drainage Maintenance, 213 Drainage Renewals and 341 Low Cost/Low Risk Improvements

9.5.1 Introduction

The purpose of drainage is to protect the road edge and substructure from stormwater intrusion, provide adequate drainage for runoff from the carriageway, and provide a protective barrier for pedestrians from passing traffic. The drainage systems represent a significant risk to the transportation network, whereby if maintenance and timely replacements are not done, the potential risk for expensive road repairs will ensue.

Our investment in maintaining good drainage is critical to preserving the quality of the transportation asset and forms the backbone of one of our key investment decisions. An active and comprehensive drainage maintenance effort will extend pavement life as water ingress has been identified as a major mode of failure for both sealed and unsealed roads.

9.5.2 Strategic Case Linkage – Drainage

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
113 213	Aging and deteriorating network Network Vulnerability Safety Accessibility	A fit for purpose drainage system which minimise water ingress into pavements, thus extends pavement life and reduces the likelihood of flooding and slips during heavy rain events. The drainage activity is part of the package and other activities rely on the delivery of activity. Non-delivery of proposed activity may impact negatively on benefits realisation of resilience, safety and access	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Pavements will continue to failure prematurely due to water ingress. Slips and flooding will continue to cause resilience issues on our roads during environmental events.

9.5.3 Current Condition and Performance Drainage

Masterton drainage network would benefit from increased expenditure in the rural area to improve the side channel condition and an increased maintenance programme of high shoulder removal. MDC programme of drainage renewals in the urban area is aimed at replacing some of the kerb and channel that is in very poor condition and in problem flooding areas.

9.5.4 Drainage Strategy

The principal maintenance activities are the proactive or cyclic cleaning of kerb and channels, sumps and catchpits in urban areas to keep the asset in good operational condition. Blockages will cause ponding which can damage the carriageway pavement, cause scouring and surface flooding which create a safety hazard.

Our drainage maintenance in the rural area principally targets culverts, high road shoulders that prevent runoff from the road, and surface water channels to ensure these are clear of obstructions in order to function effectively.

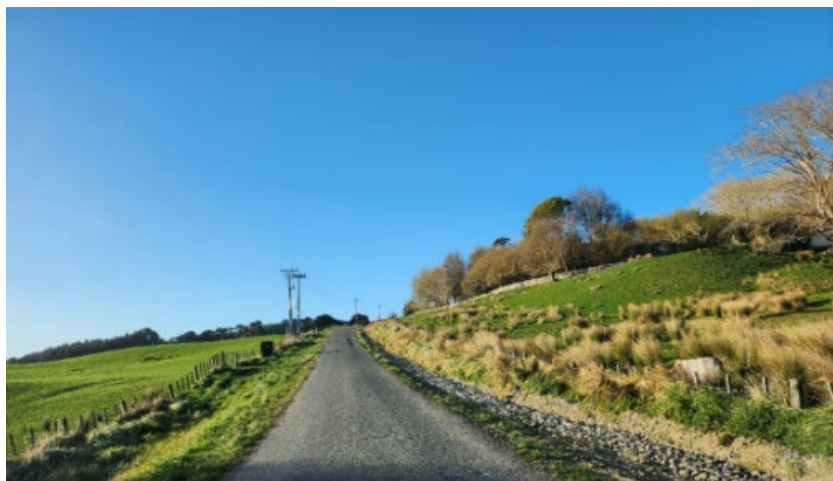
Our approach to developing a forward works programme is to identify high priority areas based on using condition inspections and fault identification, with a focus on upgrading systems that are under capacity where funding allows. This includes addressing problem surface water tables where water is entering pavements and removing high shoulders and side drain clearance as part of reseal and rehab programmes.

During the 2021-23 period, the impact of cyclones Gabrielle and Hale have been considerable. This has highlighted a shortcoming in the drainage programmes and the need to increase the preventative works undertaken on culverts, and the removal frequency of high road shoulders.

This work needs to be carried out in a timely manner to ensure access is maintained and pavements are protected from damage.



Given the soil types, preventing slips through effective drainage is vital to the resilience and cost-effective management of the network.



In hilly sections greater attention is being paid to preventing scouring but breaking water velocity, this is being done through stoney bases or energy dissipation.

While effective, this approach is more expensive to construct and maintain.

Stormwater programmes are aligned where possible with resurfacing or rehabilitation and footpath programmes to achieve operational efficiency and ensure a logical sequence of renewal of these related asset types. Typically, these drainage assets are inspected when the adjoining section of carriageway, footway, or stormwater channel is proposed for a renewal treatment. A decision on replacement is then made based on the condition.

Masterton District Council aims to renew stormwater assets wherever feasible, aligning with environmental objectives.

The rural drainage network includes steel corrugated culverts which were installed in the 1970's and 80's. These are failing early due to corrosion and have been high on the list of replacement for the last few years, and this programme will need to be continued.

Our culvert renewal replacements are identified and scheduled through inspections; however, every effort is made to align culvert renewal works with other programmed works including resurfacing and pavement rehabilitations.

The proposed programme for high should removal and culvert cleaning has been revised to align with the typical reseal pattern as illustrated below.

Approx Year	0	8	16	Number
Activities	Reseal		Next reseal	80 lane km
	Pre-reseal high shoulder removal	Mid resurfacing term high shoulder removal	Pre-reseal high shoulder removal	80 lane km every 8 years
	Culvert cleaning	Mid resurfacing term Culvert cleaning	Culvert cleaning	(3132 over 8 years = 390 per year)

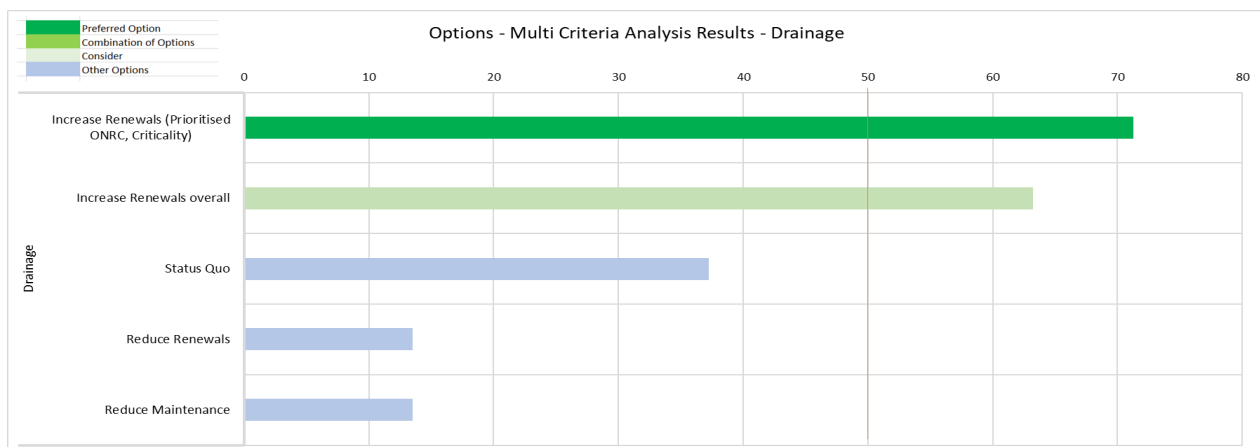
In addition, approximately 200m of culverts and 500m of urban Kerb and Channel are planned for renewal each year.

9.5.5 Options Analysis – Drainage

A Multi Criteria Analysis has been undertaken with consideration of:

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



The PREFERRED OPTIONS is to undertake improvements to drainage across the unsealed network. This can be combined with grader operations and flanking.

This approach is favoured due to :

- Greater range of benefits realised
- Best outcome in terms of total cost of ownership
- Efficient and achievable work programme

Routine work only or a reduction in metalling are unlikely to achieve the outcomes sought and there is a risk that the overall cost will increase as the asset deteriorates, along with the poor level of service that would be provided.

The preferred option is to increase the level of renewals on a prioritised basis. This would include a programme to remove high shoulders and reinstate surface water tables, with an 8 years average cycle time for all rural roads to align with resurfacing cycles. Focus should be first on sealed roads that are being resurfaced and rehab sites.

This is regarded as more achievable and affordable than an increase over all of the network.

In addition to this it is proposed to increase culvert cleaning to align with high shoulder removal and resurfacing cycles renew approximately 200m of culverts per year; and carry out an annual programme of concrete kerb and channel renewals, assuming 100-year life (or 500m of concrete K and C replaced per annum).

9.5.6 Financial Impact Drainage

The following table shows the financial impact of the options selected (note some of the costs have been rounded off):

W/C	Description	Preferred Option Cost Impact per annum
113	Routine Drainage Maintenance	+\$253,559/yr. to carry higher rate of high shoulder removal +\$97,875/yr. to carry higher rate of culvert cleaning
213	Drainage Renewals	+\$518,000/yr1 from CBD rejuvenation year 1 only

9.5.7 Drainage - Financial Summary Expenditure

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.5.8 Improvements

Improvements that should be considered during the 2021/23 period for inclusion in the next AMP are as follows:

- Record condition data on drainage assets, particularly kerb and channel, sumps, and culverts so a more informed programme of works can be delivered.
- Monitor the impact and potential savings in remedial works from new programme.

CONTINUOUS PROGRAMME – LOCAL ROAD OPERATIONS

(Nos. 9.6, 9.7, 9.8 and 9.10)

9.6 Structures: Bridges, Large Culvert and Retaining Structures

114 Structures Maintenance, 215 Structural Component Replacement, 341 Low Cost/Low Risk Improvements

9.6.1 Introduction

Bridge structures provide continuous all-weather access across our region's rivers, streams and uneven terrain, and form a crucial part of the Masterton District roading network. Structures facilitate the easy movement of people and goods through the district and contribute significantly to a vibrant economy. Structures also include retaining walls that support the road pavement or retain a cut batter adjacent to the road.

These structures also have a key function as a lifeline, especially to communities and customers with limited access to the rest of the transportation network. It is crucial that structures are maintained with resilience in mind, as consequences of under maintaining can prove to be very expensive.

9.6.2 Strategic Case Linkage - Structures

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
114 215 341	Aging and deteriorating network Network Vulnerability Safety Accessibility	A fit for purpose bridge and retaining wall asset that provides more sustainable access for freight and improves the network available for high productivity vehicles (50Max and HPMV) increasing the economic success of the region Improving freight connections for economic development. Reduction in duration of road closures/service disruptions	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. Supporting a transition to a lower carbon transport system The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Sustainable urban and regional development is focused on developing resilient and productive towns and cities that have a range of low-emission transport options and low congestion. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Structures will deteriorate over time leading to restrictions to freight movement and increasing risk of bridge or retaining wall failure resulting in safety

9.6.3 Current Condition and Performance - Bridges

The current condition and performance of the Masterton's structural assets are measured by how well they meet the requirement to provide safe passage for our customers, unrestricted access to all areas of the district, and whether they have sufficient capacity for both the volume and weight of all vehicles that wish to use them.

The bridge and large culvert stock are inspected every two years, and are generally in good condition, with only minor maintenance works required at most sites. Any significant works which have been identified from the inspections are programmed for replacement or maintenance in the forward works programme.

Some routes are more susceptible to increased traffic volumes and weights, particularly as forestry harvest gains momentum. New vehicle weight classifications for heavy weight vehicles (HWV) are exacerbating this situation, with demand from industry for more routes to be improved to allow for the heavier vehicles.

The development of this programme has benefited from a thorough inspection during the 2022-23 period. This information has been utilised in reviewing restrictions on use, routine maintenance requirements and structural repairs.

9.6.3.1 Performance (Capacity)

The following restrictions are currently in place across the network.

MASTERTON DISTRICT COUNCIL

BRIDGE POSTING LEVELS 2022/2023



Bridge No	Road	Bridge Name	Current Posting			Recommended Posting			Notes
			Gross	Axles	Speed	Gross	Axles	Speed	
21	Cameron	Jennings	60%	5800kg	20km/hr				
26	Coopers Bideford	Coopers Bideford No 2	50%	7300kg	20km/hr				
39	Grahams	Grahams	30%	4700kg	20km/hr				
52	Homewood	Matariki (Old No 5)	44000kg	8200kg					
64	Knights	Knights	50%	7300kg	20km/hr				
68	Letts	Letts No 1	44000kg	8200kg					
74	McGruddy Mauriceville	McGruddys	50%	7300kg	20km/hr				
85	Mangapurupuru	Mangapurupuru	44000kg	8200kg					
87	Mangarei	Mangarei No 1	44000kg	8200kg					
91	Maringi	Wainuiomapu No 1	44000kg	8200kg					
92	Maringi	Maringi	50%	7300kg	20km/hr				
136	Pack Spur	Mataikona No 2	44000kg	8200kg					
137	Pack Spur	Mataikona No 3	44000kg	8200kg					
139	Mikimiki	Mikimiki	44000kg	8200kg					
141	Ngahape	Karori (Kaiwhata River)	44000kg	8200kg					
176	Springhill	Sprinhill No 3	44000kg	8200kg					
179	Stoddarts	Stoddarts	75%	7300kg	20km/hr				
189	Te Mai	Te Mai Iti	44000kg	8200kg					
200	Te Parae	Te Parae No 1	44000kg	8200kg					
202	Tildesley	Tildesleys	60%	5800kg	20km/hr				
206	Upper Waingawa	Upper Waingawa (Black Creek)	Not posted.			Class 1	7700kg	20km/hr	New posting recommended. See email 02/12/2022
212	Wainuiomapu	Wainuiomapu No 2	50%	7300kg	20km/hr				
213	Waterfalls	Waterfalls	75%	7300kg	20km/hr	5000kg	3000	10km/h	Recommended posting until capacity assessment completed.

It is noted that in terms of network hierarchy and network criticality that all of these bridges are located on "rural roads."

Some bridges are located on roads that provide the only access to locations, these are to be prioritised under the criticality process.

9.6.3.2 Performance - Retaining Walls

A regime of inspections to ensure that retaining wall structures are continually monitored, in terms of condition and performance, is in development and part of the improvement plan.

9.6.4 Structures Maintenance Strategy

Maintenance programmes are developed from the schedules of defects identified during the inspections by both the 2 yearly formal inspections carried out by a structural engineer under a professional services contract and the maintenance contractor.

Minor bridge maintenance tasks of a non-structural nature are generally completed by the road maintenance contractor and generally will not require specialist engineering input. More major faults which may require specialist input are separately tasked to an appropriate designer and contractor.

Repair treatments and priorities are determined by considering the impact on:

- Public safety
- Traffic movement and road hierarchy
- Maintaining structural integrity and serviceability
- Future costs if the work is not done

The bridge maintenance programme selects, wherever possible, the most cost-effective solutions.

9.6.5 Bridge and Culvert Renewals Strategy

Renewal works are undertaken for the following reasons:

1. Major components have worn or decayed to the extent that they are preventing the bridge operating at its design capacity.
2. The waterway's characteristics have altered to the extent that the bridge can no longer pass the design flood flows.
3. Flood or earthquake damage has occurred.
4. Vehicle impact damage.

A number of timber decks structures will need to be replaced during the next 30 years at various locations. A programme bridge component replacement and maintenance need to continue to occur without delay to keep structures safe and fit for purpose.

There are some low volume bridges that may need replacement in the next 30 years but there may be better economical alternatives to their replacement.

The economics of renewing any bridge are reviewed by looking at the net present value of the various options, including the "do minimum" option, for a 30-year analysis period.

Two identified for the medium terms are:

Bridge	Estimate \$000	Estimated Timeframe	Issue
Upper Waingawa	400	2024-27	Deterioration, not cost effective to repair
Grahams	500	2024-27	

A 30-year programme for bridge or deck replacements with their remaining useful life is included in the appendix.

9.6.6 Disposal Plans

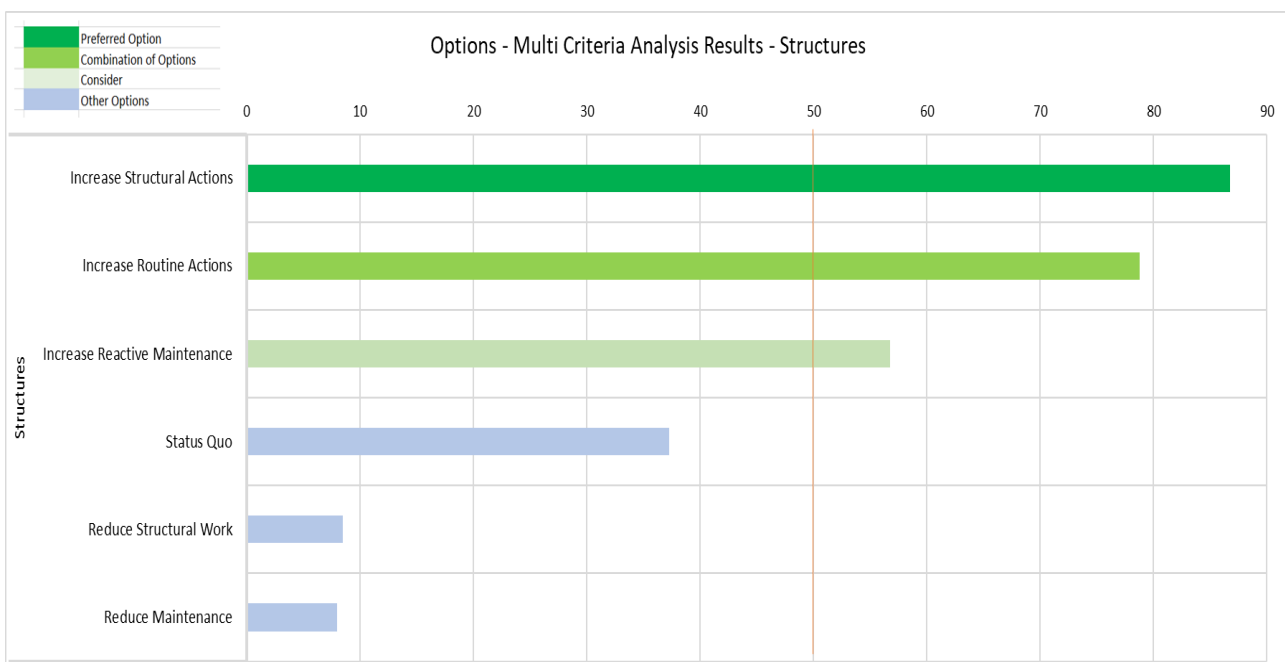
There are no plans to dispose of, or cease to maintain, any existing structural network assets within the current AMP. Where an existing bridge serves only one or two property owners and is essentially a private access, the need to retain the asset will be reviewed and reassessed during the life of each AMP.

9.6.7 Options Analysis – Structures

A Multi Criteria Analysis has been undertaken with consideration of:

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



Given the improvement in inspection data and forward works programmes for structures, a prioritised approach was expected to be the best option. There is considerable work over time to ensure structures are fit for purpose or rationalised.

This approach is favoured due to :

- Greater range of benefits realised
- Best outcome in terms of total cost of ownership
- Efficient and achievable work programme

It is proposed that Council implement the maintenance and renewal programme on bridges and structures to retain the current access for freight and reduce the likelihood of road closure due to structure failure.

Continue a programme of bridge upgrades to HPMV loading capacity if affordable to further developed routes compatible with economic accessibility

Failure to maintain the existing bridge stock undermines the outcomes sought and puts lives in danger.

The following table shows the financial impact of the options selected (note some of the costs have been rounded off):

W/C	Description	Preferred Option Cost Impact per annum
114	Structures Maintenance	No change – new programme can be accommodated within existing budgets
215	Structural Component Replacement	No change – new programme can be accommodated within existing budgets
216	Structural Renewals (Bridge and Retaining Walls)	none
341	Low Cost/Low Risk Improvements	Cost to be identified based on need – potentially \$500,000 in any one year

9.6.8 Structures – Financial Summary Expenditure

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.6.9 Improvements:

Improvements that should be considered during the 2024/27 period for inclusion in the next AMP are as follows:

- Improve and utilise Highway Structures Inventory Management System (HSIMS) to manage overweight permits, bridge inspections and structure assets database.
- Create a regime of inspections to ensure that retaining wall structures are continually monitored in terms of condition and performance.

9.7 Environmental and Minor Events

121 Environmental Maintenance and 140 Minor Events

9.7.1 Introduction

The environmental maintenance and minor events works provide routine care and attention to the road corridor and the reactive reinstatement of the transportation assets following adverse weather.

Removal of detritus contributes to a significant proportion of the available budget and due to the randomness of occurrences makes budget forecasting difficult.

The district can expect to receive weather events to various degrees of intensity during any particular year. Reinstatement works to restore road access and repair damaged infrastructure adds considerable pressure to available resources, both physically and financially.

9.7.2 Strategic Case Linkage – Environmental / Minor Events

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
121 140	Aging and deteriorating network Network Vulnerability Safety Accessibility	Sightlines and roadside hazards will be minimized therefore improving road safety. The environmental/minor events activity is part of the package and other activities rely on the delivery of activity. Non-delivery of proposed activity may impact negatively on benefits realisation of resilience, safety and access	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Negative customer perception of Masterton. Environmental pollution. Sightlines affected with increased hazards in the road corridor and a higher risk of fatal and serious injuries.

9.7.3 Current Condition and Performance

Routine and environmental maintenance programmes are currently achieving a good balance between network requirements and actual delivery within affordability.

9.7.4 Environmental Strategy

A programme of works that targets high risk areas. Use a boom mounted mulcher where vegetation is encroaching into the carriageway. Mow rural roadsides berms at a minimum of twice per year or when visibility is impeded. Spray programme focusing on ditches and delineation within the road corridor at a minimum of twice per year. Litter patrols to improve the appearance and environmental effects.

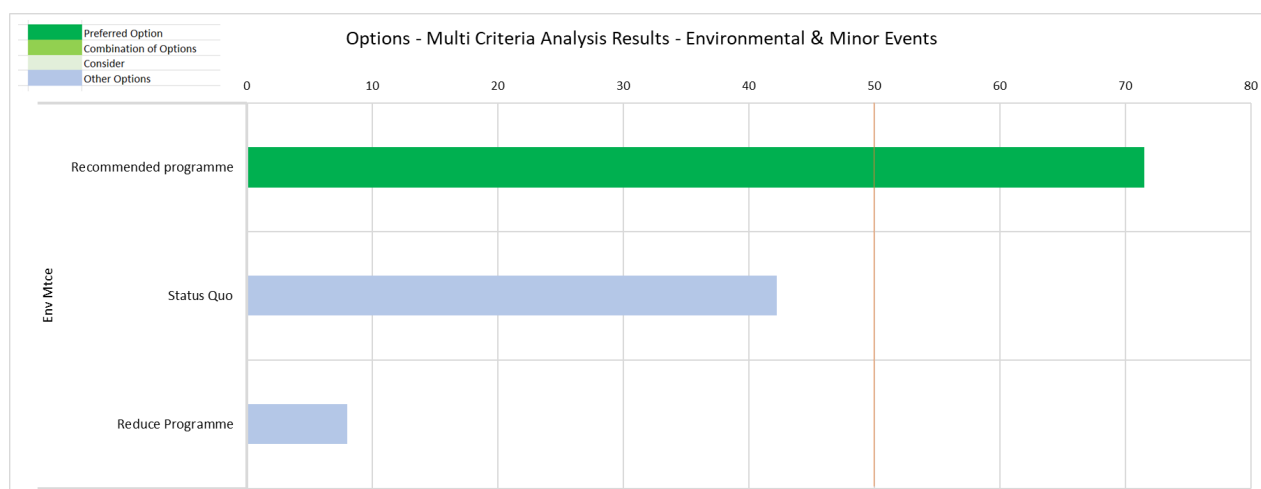
A targeted programme of removing high risk trees on primary roads has been undertaken in 2020, with provincial growth funding through MBIE. This should allow a more manageable programme of high-risk tree removal over the next 10 years.

9.7.5 Options Analysis – Environmental / Minor Events

A Multi Criteria Analysis has been undertaken with consideration of:

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



Given the impact of weather events observed, there is no doubt that environmental maintenance is essential. Not keeping up with work programmes affects road users safety and access, and contributes to rapid decline of the network itself. This approach is favoured due to :

- Greater range of benefits realised
- Best outcome in terms of total cost of ownership
- Efficient and achievable work programme

Work proposed to be undertaken, and given a greater priority (and funding level) in future includes:

- Tree clearance by boom-mounted mulcher maintain historic high-risk tree removal on all routes
- Keep trees away from sight lines and clearance envelopes, improving safety and road amenity.
- Sufficient funding to address any minor events that effect the carriageway (e.g. slips)

9.7.6 Financial Impact Environmental

The following table shows the financial impact of the options selected (note some of the costs have been rounded off):

W/C	Description	Preferred Option Cost Impact per annum
121	Environmental Maintenance	+20% over average of previous six years to cover abandoned cars and graffiti.
140	Minor Events	+20% over average of previous six years to address size and frequency of storm events.

9.7.7 Environmental - Financial Summary Expenditure

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.7.8 Improvements:

Improvements that should be considered during the 2024/27 period for inclusion in the next AMP are as follows:

- Monitor storm event size and frequency at ascertain trend of events and costs

9.8 Traffic Services

122 Traffic Services Maintenance and 222 Traffic Services Renewals and 341 Low Cost/Low Risk Improvements

9.8.1 Introduction

Traffic services aid the safe and orderly movement of vehicular and pedestrian traffic, by way of pavement markings, signage and delineation to direct and inform the motorist, and roadway lighting. A good standard of traffic services can contribute significantly to a safer road network.

9.8.2 Strategic Case Linkage – Traffic Services

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
122 222	Aging and deteriorating network Network Vulnerability Safety Accessibility	Delineation will be improved reducing the likelihood of loss of control and night crashes. The traffic services activity is part of the package and other activities rely on the delivery of activity. Non-delivery of proposed activity may impact negatively on benefits realisation of safety and access. Improvements Target medium high or high collective risk corridors.	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Loss of control crashes will continue, increasing the risk of fatal and serious injury.

9.8.3 Current Condition and Performance - Traffic Services

There is an increasing trend loss of control crashes with high severity outcomes, which suggests that further work is required to improve curve warnings and delineation on Masterton roads. The cost to maintain and renew Masterton's traffic services is about the same as the peer group average. The LED streetlight conversion project has reduced the costs associated with power usage and maintenance by approximately 60k and 20k respectively. These savings have been redistributed throughout the programme and helped to soften the impact of the overall increases in costs resulting from the retendering the maintenance contract in 2019. Resident satisfaction with the streetlight network and traffic services good, 55% being satisfied. Table 9-3 Evidence and Gap Analysis provides evidential support to this.

During April 2019 NZTA carried out an investment audit of MDC's road network. One of the findings was that the Council should develop and implement a delineation strategy to provide a safer and more consistent driving environment.

A strategy has been developed and is being progressively implemented. Key actions have been addressed within the 2021-24 period, with roll-out across the district to be integrated with other work programmes.

9.8.4 Traffic Services Strategy

A programme of works that consistently ensures traffic services assets, such as signs and edge post markers, are cleaned and visible to road users. If the asset condition meets any of the failure criteria, they are programmed for repair or replacement. Inspectors have a routine patrol that monitors the deterioration of these types of assets.

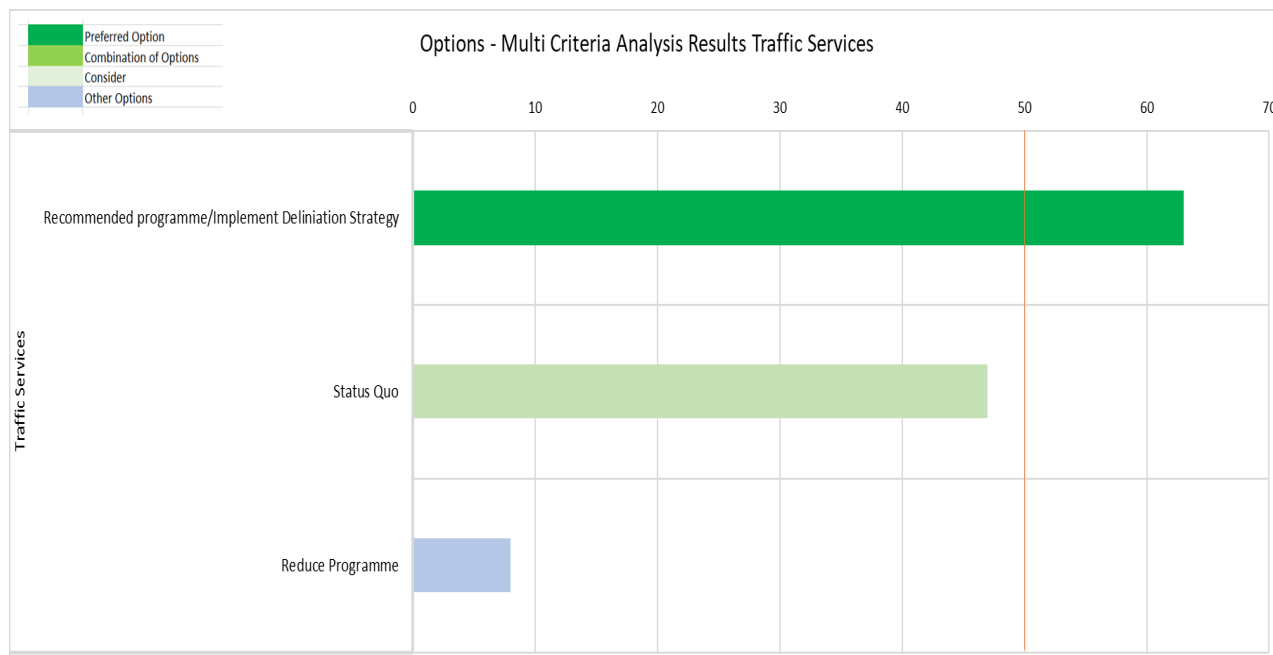
There has been an identified need for additional signs and delineation, mainly driven by safety issues highlighted in a 2019 Transport Agency audit. A delineation strategy has been developed with an identified programme to improve road delineation and safety. The strategy proposes a 6-year programme of pavement marking, delineation and signage improvements to ensure the networks meets the standards for these safety items.

9.8.5 Options Analysis – Traffic Services

A Multi Criteria Analysis has been undertaken with consideration of:

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



The preferred options is to undertake improvements to implement the delineation strategy. This is a continuation of the current work programme and will put in sufficient funding to accelerate progress.

This approach is favoured due to :

- Greater range of benefits realised
- Best outcome in terms of total cost of ownership
- Efficient and achievable work programme

The work programme includes a full annual line re-mark with targeted enhanced delineation upgrade programme with an associated increase cost in maintenance and replacement of some coastal lighting columns:

- Replacement of corroded coastal lighting columns
- Painted markings and RRPM's
- Edge marker posts
- Curve signage

Overview of delineation Improvement

We have successfully installed painted markings and RRPM's, ensuring uniformity on all major routes. We are addressed, prioritizing secondary collected routes, sealed, and unsealed roads, with funding spread over the next six years. Curve signage enhancements will be ongoing, aligning with the collector road upgrade plan. Additional funding of \$228k for traffic services maintenance was secured from 2021-24 to be carried forward for traffic services maintenance of additional delineation.

9.8.6 Financial Impact - Traffic Services

The following table shows the financial impact of the options selected (note some of the costs have been rounded off):

W/C	Description	Preferred Option Cost Impact per annum
122	Traffic Services Maintenance	No change (increase made in 2021-24 to implement delineation improvements)
222	Traffic Services Renewals	No change (increase made in 2021-24 to implement delineation improvements) +\$227,998/yr1 from CBD rejuvenation year 1 only
341	LCLR	No change (increase made in 2021-24 to implement delineation improvements)

9.8.7 Traffic Services - Financial Summary Expenditure

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.8.8 Improvements:

Improvements that should be considered during the 2021/23 period for inclusion in the next AMP are as follows:

- To continue implementation of the delineation strategy and monitor results.

9.9 Walking and Cycling

124 Cycleway Maintenance, 125 Footpath Maintenance (New Work Category), 341 Low Cost/Low Risk Improvements

9.9.1 Introduction

Walking and cycling assets are an essential component of our effective, efficient, multi modal sustainable transport system that enables our customers to make smart transport choices.

9.9.2 Strategic Case Linkage – Walking and Cycling

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
124 125 342	Aging and deteriorating network Network Vulnerability Safety Accessibility	Providing cycleway connections with good infrastructure to schools, parks and businesses will encourage cycle use. Providing an adequate level of footpath renewals will reduce trip hazards and will make footpaths more accessible for an aging population. Safety - addresses DSIs in an area of High. Access – shift from private passenger vehicle-based trips to other modes. Investment to support behaviour change to improve mode shift outcomes. Community Cohesion	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. Supporting a transition to a lower carbon transport system The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Sustainable urban and regional development is focused on developing resilient and productive towns and cities that have a range of low-emission transport options and low congestion. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Without adequate cycleway connections, potential cyclists may be put off from using the network which will result in lower uptake of users and less health and congestion relief benefits being achieved. Without an adequate level of footpath renewals and improvements, trip hazards will increase, the footpath condition will worsen, and footpaths will be less accessible for the aging population.

9.9.3 Current Condition and Performance Walking and Cycling

There is an increasing trend of high severity crashes involving vulnerable walking and cycling road users. The cost to maintain and renew Masterton's cycleway network is low, due to the limited amount of cycleway assets being implemented. Resident satisfaction with the footpaths in the urban area continues to remain low at 40% of residents being satisfied in the urban area; this is despite the increased footpath renewal rates per annum and the construction of the new shared paths with time we hope to see this increase. Table 9-3 Evidence and Gap Analysis provides evidential support to this.

9.9.4 Walking and Cycling Strategy

A combination of general maintenance and renewals to manage the number of footpath sections that have a poor condition rating. Incrementally increase the amount of safe and active travel options to grow the level of walking and cycling road users. MDC has adopted a cycling strategy that is used to help guide the investment and implementation of any new cycle infrastructure.

9.9.5 Transport Choices

Waka Kotahi's 'Transport Choices' program aims to promote alternatives to motor vehicle use. Its goals include improving road safety and reducing emissions from light vehicles. This initiative responds to the national Emissions Reduction Plan (ERP) and offers Central Government funding to councils. This funding supports the development of cycle networks and shared active transport spaces that provide viable alternatives to car usage. These networks not only offer affordable transportation options but also contribute to building healthier, more inclusive communities accessible to people of all ages and abilities.

Masterton District Council is actively participating in this program with a project designed to create a safe and attractive cycleway connecting schools, recreational trails, and local businesses on the eastern side of Masterton. The initial route (east side link - Colombo Road to Kuripuni) if funded by the transport choices programme is scheduled for construction in 2025, and additional routes are outlined below in order of priority:

- Route 1: Ngaumutawa Road to Solway
- Route 2: Upper Plain Road
- Route 3: Eastern School loop
- Route 4: Essex Street to CBD
- Route 5: Train station to CBD
- Route 6: Gordon Street
- Route 7: Totara Street
- Route 10: Kuripuni to Aerodrome
- Route 11: Cashmere connection

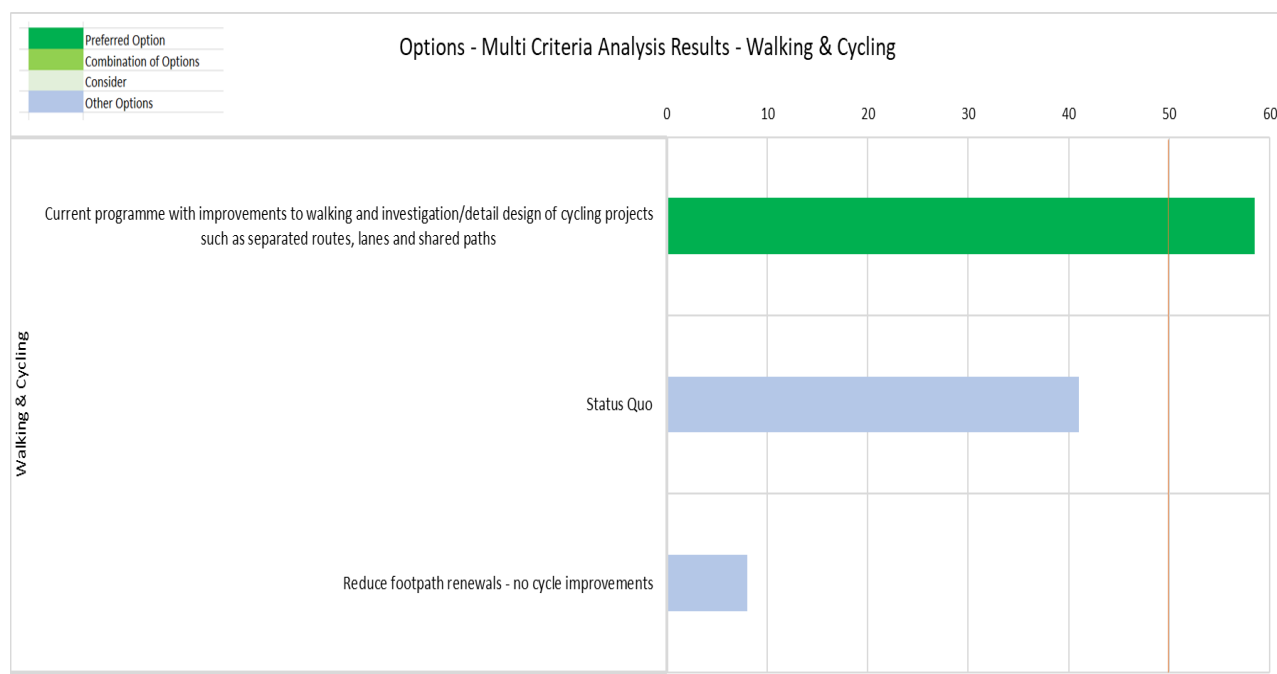
This project aims to deliver a comprehensive cycling network that provides safe, affordable transportation alternatives, fostering healthier, more independent, and equitable communities, aligning with Action 29 of the Masterton District Council's Climate Action Plan. The total estimated cost of this initiative will range from 2 to 20 million dollars, depending on the number of routes selected.

9.9.6 Options Analysis – Walking and Cycling

A Multi Criteria Analysis has been undertaken with consideration of

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



The preferred options is to enhance the continue the exsiting programme with replacement of aging footpaths and investigation/detail design of cycling projects such as separated routes, lanes and shared paths, no construction in first 3 years. This will include the CBD project.

Council will continue to deliver the current renewal rate of footpaths over the next 10 years. This level of investment is still considered appropriate to deliver on desired outcomes and maintain LoS going forward. Activity Seek any NLTF and Direct Crown Funding that supports Masterton in the construction of Cycle ways and mode shift.

Proposed investment to facilitate MDC strategic direction for active transportation over the next 3-year period, review of the cycling and walking strategy with investigation into preferred prioritise routes and detailed design options for safer, active transport options around key school routes.

9.9.7 Financial Impact Walking and Cycling

The following table shows the financial impact of the options selected (note some of the costs have been rounded off):

W/C	Description	Preferred Option Cost Impact per annum
124	Cycleway Maintenance	No current investment, no change
125	Footpath Maintenance	No current investment, no change
225	Footpath Renewals	+\$545,000/yr1 for CBD rejuvenation year 1-3
341	Low Cost/Low Risk Improvements	Apply for additional enhanced NLTF or direct Crown funding if opportunities arise and provide additional activities for future consideration in the RLTP process.

9.9.8 Financial Summary Expenditure - Walking and Cycling

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.9.9 Improvements:

Improvements that should be considered during the 2024/27 period for inclusion in the next AMP are as follows:

- Further develop the cycling strategy and create detailed options on key routes for safer active travel.

9.10 Network and Asset Management

151 Network and Asset Management

9.10.1 Introduction

This provides for the general management and condition of the road network and any associated facilities. This includes professional services, inspections, asset management and the collection and management of network data.

9.10.2 Strategic Case Linkage – network and asset management

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
151	Aging and deteriorating network Network Vulnerability Safety Accessibility	Improved staff resourcing, better decisions around programmes and funding, shorter project lead times, quality professional services, robust procurement resulting in higher quality outcomes. Value for money. The Network and asset management activity is part of the package and other activities rely on the delivery of this activity. Non-delivery of proposed activity may impact negatively on benefits realisation across all GPS and Community priority areas.	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. Supporting a transition to a lower carbon transport system. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Sustainable urban and regional development is focused on developing resilient and productive towns and cities that have a range of low-emission transport options and low congestion. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Poor data quality, shortages of appropriately qualified staff, lack of competition in the market and potentially poorer quality workmanship and contract outcomes.

9.10.3 Current Condition and Performance - Network and Asset Management

The cost of network and asset management is comparable to the peer group average, indicating that Masterton is operating within the expected range for its professional services. Urgent customer service requests are being addressed within the LTP timeframes; however, there is room for improvement in the response time for non-urgent service requests.

9.10.4 Asset and Management Strategy

MDC provides much of the engineering professional services internally. It also maintains the collection and maintenance of its network data inhouse. Council engineers provide professional services to contract management.

Masterton District was an early adopter of the Asset Management Data Standard (AMDS), which has revealed the need for certain data improvements to align with the new system configuration. An allocation has been included as part of the overall increase in this work category to address some of the data quality gaps

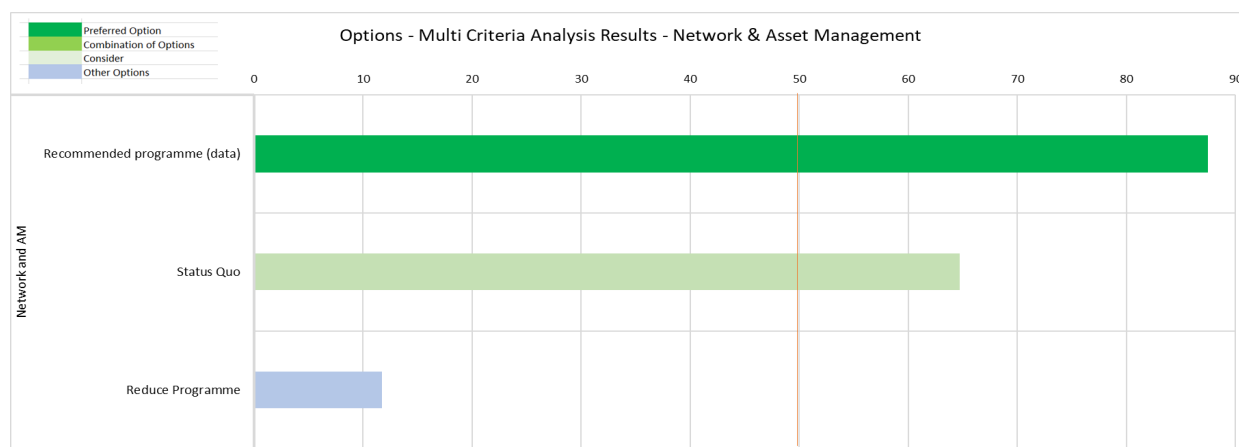
The implementation of the Consistent Condition Data Collection (CCDC) program will enhance future planning for the Council and facilitate meaningful comparisons with other networks. Additionally, an annual allowance has been allocated for any additional data capture and processing needs.

9.10.5 Options Analysis – Network and Asset Management

A Multi Criteria Analysis has been undertaken with consideration of:

- Contribution to Community Outcomes
- Response to Problem Statements
- Alignment with GPS Priorities
- Close LoS
- Total Cost of Ownership and Asset Preservation
- Efficiency
- Scheduling

The summary is shown below and, the details of the Multi Criteria Analysis scores are included in the AMP.



The preferred approach reflects the need to catch up given the underfunding of this category in 2021-24. Data improvements aligned with AMDS have been identified and there is the opportunity to make use of the data made available through the CCDC project. Numerous improvement items have been identified which will need funding to be actioned.

Council will continue to improve contractual relationships and develop internal professional services to add value for money across all work categories. Look to improve data management and analysis to inform future programme development and asset management in line with national best practice.

9.10.6 Financial Impact Network and Asset and Management

The following table shows the financial impact of the options selected (note some of the costs have been rounded off):

W/C	Description	Preferred Option Cost Impact per annum
151	Network and Asset Management	+\$99,025

9.10.7 Network and Asset and Management - Financial Summary Expenditure

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

9.10.8 Improvements:

Improvements that should be considered during the 2024/27 period for inclusion in the next AMP are as follows:

- Further develop opportunities with contractual relationships and use of shared services with adjoining Councils.
- Investigate target outcome cost and alliance-based contracting models and implement them where possible to test them under hybrid conditions before the end of the final contract year
- Carry out section LGLA 17A service delivery review this should be done in collaboration with Carterton and South Wairarapa district Council
- Improve RAMM data collection by and quality and Juno LoS data for deterioration models for asset programming.
- Improve data from lessons learned through AMDS Implementation
- Implement and utilise CCDC initiative

9.11 Low Cost Low Risk (LCLR)

341 Low Cost/Low Risk

9.11.1 Introduction

This section outlines the scope of the work category for construction and implementation of low-cost/low-risk improvements to the transport system. Examples of such activities include small geometric road and intersection improvements, traffic and speed calming measures, resilience improvements, lighting improvements, bridge upgrades, and minor engineering works associated with community programmes. All funding applications must align with the strategic priority outcomes outlined in the Government Policy Statement.

The strategic case linkage for this work class includes improving safety, accessibility, upgrading bridges, and resilience of the network.

9.11.2 Strategic Case Linkage – Low Cost / Low Risk

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
341 Low Cost/ Low Risk	Aging and deteriorating network Network Vulnerability Safety Accessibility	Journeys within the district will be connected, resilient and reliable People can move around the district more safely A network that is safe, resilient and addresses current and future demand for access to economic and social opportunities. Target medium-high or high collective risk corridors or intersections to achieve a death and serious injuries reduction of 20-50% Proposal addresses DSIs in an area of Medium Concern within Communities at Risk Register.	The condition of the existing transport system is efficiently maintained at a level that meets the current and future needs of users. The transport system is better able to cope with natural and anthropogenic hazards. Supporting a transition to a lower carbon transport system. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Sustainable urban and regional development is focused on developing resilient and productive towns and cities that have a range of low-emission transport options and low congestion. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Fatal and serious injury crashes will continue to increase and will therefore continue to cause significant harm to our community Access will not improve for freight and lifeline routes or for vulnerable users

9.11.3 Current Condition and Performance - LCLR

As the low-cost/low-risk work class includes a variety of initiatives that are incredibly varying, it is challenging to assess the current performance as a whole. However, based on the increasing trend in fatal and serious crashes, it is clear that the community would benefit from improving high-risk roads and completing more safety-related initiatives.

9.11.4 Programme and Funding Approval

1. Identify the need for improvement: The first step is to identify the need for improvement in the asset(s) under consideration. For safety projects this is done in collaboration with Waka Kotahi and for local improvement projects This could be done through asset condition assessments, stakeholder feedback, and alignment with strategic and government priorities.
2. Develop a business case: this section of the AMP is the business case used to justify the need for improvement and outline the benefits, costs, and risks associated with the project. And includes timelines, milestones, and key deliverables.
3. Submit the improvement projects for internal review: The AMP/business case is reviewed internally by relevant stakeholders, such as the asset management team, finance department, and executive leadership team and finally adopted by Council. Feedback should be gathered through the process and incorporated into the AMP as needed.
4. External Funding Approval: Once the internal approval is granted, MDC sends the AMP with the programme business case to the external funding stakeholder, Waka Kotahi, for their share of funding approval from the National land transport fund.
5. **Funding Agreement:** Once funding is approved from the National land transport fund MDC is able to receive funding assistance at the Council funding assistance rate (56%) from the improvement project.
6. Project Implementation: The project is then implemented according to the approved scope, budget, and timeline.
7. Project Monitoring and Evaluation: The project is monitored and evaluated throughout its lifecycle to ensure it meets the expected outcomes and benefits. Any changes to the scope, budget, or timeline are documented and managed through a formal change control process.

Minor improvement projects may arise from a variety of sources; including requests for service, identified safety deficiencies, community liaison, Council strategies and using the ONRC performance framework.

All potential projects identified will be entered into MDC's low-cost low risk activity list. To help prioritise projects an Assessment Criteria (outlined in Table 9-9) has been developed using Multi Criteria Analysis (MCA); projects will be undertaken subject to available funding.

The ranked programme may be adjusted after MCA analysis for the following reasons:

- To coordinate with other activities on the roading network, such as planned roadworks, other utility works, or adjoining developments
- To meet other community priorities or for other extenuating circumstances

Table 9-9: LCLR Assessment Criteria

Safety	Understanding of historical accidents or near misses and using engineering judgement to assess risk and probability.
Public Concern	Consideration must be given to: The strategic objectives of the community and other public and private projects, level of community interest. The highest scores will be supported by media, social media, and community discussions. However, there must be a balance between sustained issues and kneejerk reactions to change. It is expected that site validations have taken place and a good understanding of the problem exists.
ONRC/ONF (Traffic Volume and Function)	Classification defined by ONRC/ONF framework in MDC. This is based on traffic counts, function of the road/connectivity with significant community infrastructure.
Alignment with strategic priorities and outcomes	How well the project aligns with the strategic direction of the LTP, GPS and RLTP.

9.11.4.1 Projects

1. Local road improvements sightlines and safety
2. Road speed management improvements around schools and marae and high-risk roads
3. Traffic calming local improvements.
4. Intersection safety improvements
5. Road Resilience improvements along Mataikona road and at-risk routes to severe weather events
6. KiwiRail level crossing improvements local authority share
7. safety improvements identified in collaboration with Waka Kotahi
8. Reduced risk of fatal and serious injury crashes at level crossings:

Table 9-10: Projects LCLR

Project Description	Project Location	Problem / Opportunity	Benefits of Proposed Activity	Link to strategic Community and GPS priority	2024/25 (\$,000)	2025/26 (\$,000)	2026/27 (\$,000)
Local road improvements sightlines and safety	Various rural sealed and unsealed roads and improvements associated with rehab works	Higher risk of crashes due to poor sightlines and safety	Reduced risk of fatal and serious injury crashes	Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities with Safe and Resilient Land Transport System	\$85	\$85	\$85
Safety Improvements at urban schools and Traffic calming local improvements	Targeted improvements at five school crossing approved within Masterton's Speed management plan (specific details in infrastructure improvements section)	High risk of crashes due to excessive speed. Walkable and liveable neighbourhoods Excessive speed on local roads	Reduced risk of fatal and serious injury crashes	Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities with Safe and Resilient Land Transport System	\$340	\$480	
Road safety improvements	South and Cockburn Russell and Queen Bannister and Dixon Te Kanuka Phase 2	The high number of crashes and fatalities on the roads is a significant problem.	reduce the number of fatal and serious injury crashes on our roads, creating safer and more accessible	Connecting people and freight quickly and safely, supporting economic growth and creating social	\$320	\$800	\$1,050

Project Description	Project Location	Problem / Opportunity	Benefits of Proposed Activity	Link to strategic Community and GPS priority	2024/25 (\$,000)	2025/26 (\$,000)	2026/27 (\$,000)
			transport for everyone.	and economic opportunities with Safe and Resilient Land Transport System			
Road Resilience improvements	Mataikona Castlepoint Rd Blairlogie	Vulnerability of roads to severe weather events	Improved resilience and reliability of roads during severe weather events	Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities with Safe and Resilient Land Transport System	\$	\$3,050	\$4,550
Freight and bridge Improvements Kiwirail level crossing improvements	HPMV improves to bridges, renewal of bridges and KiwiRail level crossing improvement Project (Local share TBC)	Safety risks associated with level crossings and freight / bridge improvements	Connecting people and freight quickly and safely, supporting economic growth	Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities with Safe and Resilient Land Transport System	\$200 Note: Kiwirail level crossing cost TBC	\$300 Note: Kiwirail level crossing cost TBC	\$260 Note: Kiwirail level crossing cost TBC
Total \$,000					\$945	\$4,775	\$5,945

9.11.5 LCLR- Financial Summary Expenditure

Table 9-11 below summarises the Low Cost/Low Risk Improvements works expenditure for the period 2021/24, and the funding request for 2024/27 period.

Table 9-11: Preferred Programme LCLR - Financial Summary Expenditure

Work Category		2021/22 – 2023/24 (Approved NZTA) Average (pa)	2021/22 – 2023/24 (Actual Expenditure ⁴⁷) Average (pa)	Funding Request		
				2024/25	2025/26	2026/27
341	Low Cost/Low Risk Improvements	\$742,567	\$1,114,281	\$1,637,460	\$5,943,000	\$6,145,000

⁴⁷ Average expenditure calculated over 2 years
Masterton DC Roading AMP 2023

9.12 Road Safety Promotions

9.12.1 Introduction

The activity class, Promotion of road safety and demand management, promotes the safe, efficient and effective use of the land transport system through behavioural-based activities. It is described as an investment to support behavioural changes to increase road safety and promote mode shift and the use of travel planning to optimise the transport system – including

- work and school travel management plans,
- cycle safety training,
- ride sharing,
- promotion of public transport and
- active modes.

9.12.2 Strategic Case Linkage – Road Safety Promotions

Work Class (W/C)	Problem /Opportunity	Benefits of Proposed Activity	GPS Strategic Priority	Consequences
	Aging and deteriorating network Network Vulnerability Safety Accessibility	Fatal and serious injury crashes will decrease on our network, reducing the harm to our customers and communities.	Connecting people and freight quickly and safely, supporting economic growth and creating social and economic opportunities A focus on safer roads, safer drivers and safer vehicles. The primary focus of this priority is to make transport substantially safer for all road users and reduce the number of deaths and serious injuries on our roads. People can readily and reliably access social, cultural, and economic opportunities through a variety of transport options. Well-designed and operated transport corridors and hubs that provide efficient, reliable, resilient, multi-modal, and low-carbon connections to support productive economic activity.	Fatal and serious injury crashes will continue increasing and will continue to cause significant harm to our customers and communities.

9.12.3 Evidence and Performance

Serious injury and fatal crashes are increasing on Masterton's network. All road classes apart have higher Personal Risk than the peer group average. Table 9-3 Evidence and Gap Analysis provides evidential support to this. Seven of the fifteen strategic areas of Communities Risk Register have been identified as a high concern within the Masterton District, with six ranking in the top 10 problems areas in New Zealand. The Wairarapa Road Safety Council programme significantly helps to address these areas of deficiencies in safety within our community.

9.12.4 Road Safety and Promotion Strategy

The strategy for the Road Safety programme across the Wairarapa district is to continuously improve the level of regional road safety based on a firmly established safety culture. The three Wairarapa councils have agreed to a cluster arrangement for the purpose of delivering this road safety programme across their respective districts through the Wairarapa Road safety Council.

9.12.5 Financial Summary Expenditure

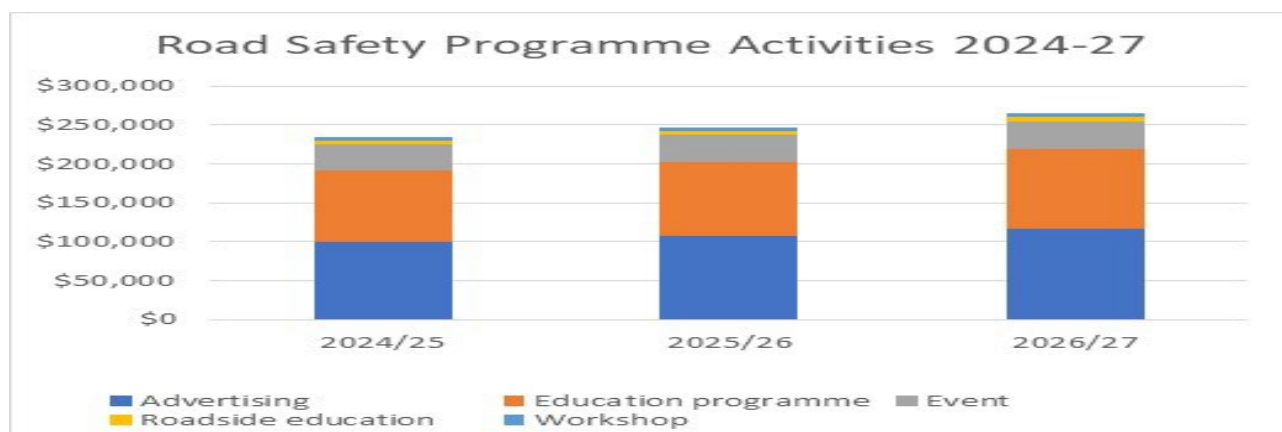
Table 9-12 below summarises the Road safety and Promotion expenditure for the period 2018/21, and the funding request for 2022/24 period.

The Wairarapa Driver Mentor programme, is a driver training programme created, run and administered by the Wairarapa Road Safety Council, since 2017. It supports four Wairarapa colleges, Te Puawanaga (Teen Parent Unit), REAP Wairarapa licence course referrals, Police referrals (via 'awhi' referrals and the youth and alternative resolutions courts), the Red Cross refugee programme, Pacifica Trust, and Community referrals.

The programme is primarily funded via the national and contestable Community Road Safety Fund, administered by Waka Kotahi. The three Wairarapa District Councils have historically also contributed annually via their contestable Community grants schemes.

Table 9-12: Preferred Programme subsidised -Road Safety Promotions - Financial Summary Expenditure

Work Category		2018/19 – 2020/21 (Approved NZTA) Average (pa)	Funding Request		
			2021/22	2022/23	2023/24
	Road to Zero	\$210,870	\$240,000	\$252,000	\$270,000



9.13 Resilience and Recovery

Draft LTP climate assumptions found here -

https://mastertondc.sharepoint.com/:w:/r/sites/ClimateChange/_layouts/15/Doc.aspx?sourcedoc=%7B0B6E4589-41F0-44C0-BF4B-D261C4D740C4%7D&file=LTP%202024-34%20Climate%20Assumptions.docx&nav=eyJjlxMTY0ODg0ODA0fQ&action=default&mobileRedirect=true

LTP assumption presentation notes

9.13.1 What our future holds

It is really hard to imagine.

Greenhouse gas emissions continue to rise. There has been a drop in the last couple of years, but this is likely due to the covid lockdowns. As the economy rebounds, and travel and tourism return to pre-covid levels, GHG emissions will likely rebound too.

In Masterton District, the largest emitting sector is agriculture. 81% of the District's gross emissions were from agriculture, mostly enteric fermentation, followed by 12% from transport. (Source AECOMM report for GWRC)

2022 was Aotearoa NZ's warmest year on record, surpassing the record set in 2021. The nationwide average temperature for 2022 was 1.2°C above the 1995 average, and 0.2°C above 2021. The top-four warmest years on record have now all occurred since 2016. (Source NIWA)

These have climate implications.

9.13.1.1 Less rain and changing rainfall patterns.

The increased temperatures will have greater impact on evapotranspiration, so it will get a lot drier even if the average rainfall doesn't change significantly.

Also, it is forecast that there will be up to 40 fewer frost days in inland Wairarapa by 2090.

9.13.1.2 More hot days

It is predicted that annual hot days (>25°C) may increase from 24 days a year currently to up to 80 days a year by 2090

Some sectors of our community are more vulnerable than others, including elderly.

9.13.1.3 Increased magnitude and intensity of flooding....

Warmer air holds more moisture, so when it does rain it is more intense.

9.13.1.4 Changes in pests and disease

More pests, vermin, and biosecurity threats

Conversely, loss of insects that we rely on to perform valuable services such as pollination.

9.13.1.5 More wind

It is forecast that by 2090 there will be 12 more days pa of strong winds.

9.13.1.6 Fire risk

More wild fires arising from the extra heat and dry conditions.

9.13.1.7 Sea level rise and coastal erosion

Rising sea levels of up to 1.75 metres by 2090. Storm surges will be more likely to occur but their impact will likely be limited to a 0.5 metres sea rise.

The risk of coastal flooding is therefore likely to increase, with rising sea levels, and more common storm surges. The worst will be when they coincide with high or even king tides as they did early in 2018 in Kaiaua (Firth of Thames) and later that year in Ruby Bay (Tasman). Even worse if they combine with high rainfall that inundates stormwater systems that can't drain to the coast.

Staff workshop notes re: roading

- Transport planning needed – strategy to manage retreat and public expectations.
- Shift burden back to the people who benefit (e.g. road maintenance or bridge repair on a road used by 3-4 properties, costs the district a lot for the amount of use).
- Higher public expectations on road network.
- Heavier transport (e.g. increased weight limits on trucks) puts more pressure on roads, more maintenance needed.
- Households move more than they did last century e.g. households in rural areas going to town once a month versus several times a week. Better condition roads which are used more frequently and driving speeds are faster.
- Forestry industry on many local roads.
- Roads are expensive to reconstruct after severe weather event or coastal erosion. Limited funds for general maintenance, let alone post-event fixes.
- Impacts of storm water/water runoff on roads. Pipes are not big enough to handle more intense rain. The water overflows onto the road causing erosion.
- Changes in the way roads are used have come too quickly for road maintenance budgets and resource to keep up.
- Need to consider managed retreat and buying out properties on the coast.
- Importance of planning and zoning.
- Dependent on central govt managed retreat funding.
- Option of having 4WD access on coastal/rural roads to reduce maintenance costs.
- EV strategy exists but needs updating? Requires staff time and resource.
- Cycling/active transport strategy needed.
- Exploring options such as Park and Ride (with free train or bus) and On-demand Bus network.

9.13.2 Risk Register

9.13.2.1 Risk to land transport due to climate hazards:

Current mitigation measures

- Maintenance of the network, especially drains, shoulders and culverts
- Increase energy dissipation to reduce the speed of water ahead of drains, culverts, bridges, etc
- Signage, temporary accesses and/or detours can be installed in case of road damage or closure
- Assessment of the sizes of all the culverts on the district to increase resilience of the network (keep the road open at all times)
- Protect the road against sea level rise and storm surge (e.g., Ecoreef)
- Partnership with GWRC and Wellington Water
- Support from the different fire brigades on the district
- Water supply requirements for firefighting
- Risk management framework
- Combined District Plan
- Assets Management Plans and Infrastructure Strategy
- Long Term Plan and Annual Plan

Future mitigations

- Increase our level of service or resilience when responding to climate event damage (e.g., increased size of culverts, etc)
- Investigate the roads that are appropriate flood paths and the road that are not
- Managed retreat

9.13.2.2 Risk to the stormwater drainage due to climate hazards:

Current mitigation measures

- Maintenance of the network
- Collaboration with the Community (cleaning leaves, etc)
- Communication and education of the Community
- Partnership with GWRC and Wellington Water
- Support from the different fire brigades on the district
- Water supply requirements for firefighting
- Risk management framework
- Combined District Plan
- Assets Management Plans and Infrastructure Strategy
- Long Term Plan and Annual Plan

Future mitigations

- 3-Waters reform
- Investigate cleaning drains and sumps
- Investigate low impact storm water solutions and urban design (green engineering)
- Investigate the development of ground models and storm water models
- Investigate the role of the water races in stormwater management.

9.13.3 Waka Kotahi info

9.13.3.1 Emissions from vehicle use:

Emissions from the vehicles using the land transport system (sometimes called enabled emissions) are the second largest source of GHG emissions in New Zealand, so this sector is expected to make a significant contribution to national emissions reduction targets. The wide-ranging transport-specific targets and actions that are contained in the emissions reduction plan (ERP) aim to reduce emissions associated with vehicle use by

- designing land use and transport networks to avoid or reduce the need for light vehicle trips altogether
- shifting from fossil-fuelled vehicles to walking, cycling or public transport, and
- improving transport efficiency through low emissions vehicles and fuels.

9.13.3.2 Construction emissions:

Construction emissions arise from the materials (e.g. concrete and steel) and activities (e.g. transport, earthworks and equipment use) involved in the construction of transport infrastructure. These are often referred to as the emissions 'embodied' in the infrastructure.

The greatest opportunity to reduce embodied emissions lies in the integrated planning and design of transport infrastructure in an urban form that reduces travel demand and makes best use of the existing network. Where new infrastructure is required, we must build cleverly and efficiently.

The ERP does not contain any specific emission reduction targets or actions for infrastructure construction emissions. However, under the Carbon Neutral Government Programme we will be expected to measure, verify, report and reduce emissions from our construction and operational activities.

We are working towards reducing embodied emissions in our infrastructure through developing and adopting our resource efficiency and waste minimisation strategy, together with use of our sustainability rating tools for high value projects.

9.13.3.3 Maintenance and operational (M&O) emissions:

M&O emissions arise from the materials and activities required to operate and maintain the infrastructure over its service life (e.g. resurfacing materials and activities, inspection activities, and electricity used by lighting).

Like the embodied construction emissions, M&O emissions will be measured and reported on through the Carbon Neutral Government Programme, and reduction targets will be set. We are working towards reducing our M&O emissions through our resource efficiency and waste minimisation strategy and policy.

9.13.3.4 Waka Kotahi is part of all-of-government work to:

- Drive climate-resilient development in the right locations
- Contribute to a resilient natural environment
- Reduce inequity and improve affordability and access to infrastructure services – for example, investment in public and active transport
- Reduce the vulnerability of assets exposed to climate change.
- Ensure all new infrastructure is fit for a changing climate.
- Use renewal programmes to improve adaptive capacity.

9.14 Masterton Town Centre Revamp

Refer 6.2 Town Centre Strategy Rautaki Pokapū Tāone

The current project status, as outlined in the Council ordinary meeting 13 September 2023 summary report, indicates that the Masterton Revamp Project is seeking approval for consultation as part of the 2024-34 Long-Term Plan (LTP). Significant cost escalations have been noted, prompting the consideration of three options for consultation: deferring the work, minimal infrastructure replacement, or completing Phase 1 and Phase 2 reconstruction of Queen Street while deferring the rest. Option C, which includes upgrading critical utility infrastructure and initiating elements of the CBD portion of the Masterton Revamp, is recommended. This option focuses on Queen Street Phase 1 and Phase 2, aiming to improve pedestrian access and attractiveness through various design elements. The report suggests consulting the community on all three options, with Option C as the preferred choice, and proposes carrying out Queen Street phases over two consecutive years within the LTP's first two years.

9.15 Value for Money

Overall, Masterton receives value for money for its roading activities when compared against council peers; see Table 9-3: Evidence and Gap Analysis.

MDC's roading team is characterised by its strong relationship approach to the administration of its general maintenance contract and has successfully developed an informal collaborative culture within the current contract. The team will look to develop this relationship further into the future.

MDC will continue to investigate and develop opportunities for greater efficiency through a more collaborative and shared approach with neighbouring councils, other stakeholders (such as Waka Kotahi) and our partnered contractors.

9.15.1 Procurement Policy

The Procurement Policy objectives are to:

- Provide best value for money over whole-of-life;
- Provide open and effective competition;
- Provide full and fair opportunity for all eligible suppliers;
- Improve business capability, including e-commerce capability;
- Require sustainably produced goods or services whenever possible;
- Have regard to local, regional or national economic, environmental, and social impacts over their life cycle.

In conjunction with the above objectives, MDC adheres to the five principles of Government Procurement which are:

- Plan and manage for great results
- Be fair to all suppliers
- Get the right supplier
- Get the best deal for everyone
- Play by the rules

Value for money is when comparing deals, we consider whole of life costs rather than just the initial up-front cost, taking into account on-going costs and uncertainties that may impact on delivery.

MDC will seek the best value for money, which isn't necessarily the lowest price.

9.15.2 Procurement Strategy

MDC's roading services has a procurement strategy which was endorsed by Waka Kotahi, in May 2022, to maximise value for money opportunities.

This will be reviewed along with the LGA 2002 Service Delivery Review as part of the preparatory work for the development of the new maintenance contract. (Improvement Item)

9.15.3 Smart Buyer Self-Assessment

MDC has carried out a review of self-assessment using the REG Smart Buyer form to determine how well their procurement processes are performing. A copy of this assessment is included appendix to this AMP. The result of this self-assessment was a score of 60 out of a possible 70 (the higher the score the better). This indicates that MDC has embraced the Smart Buyer principles but that there is still room for further improvement.

The areas that have improved from the previous assessment are as follows

- Better understanding of contracting models available
- Utilisation of existing data with quality evidence-based decisions

- A council that is prepared to pay more for quality and a targeted use of quality/price procurement where appropriate
- Better support and training for practicing staff within procurement

9.16 Data Quality

Masterton's RAMM data quality used in the ONRC Performance Reporting Tool has been assessed in 2020 and again in 2023.

Then key issues and actions in 2020 were:

ONRC aligns with traffic data
Treatment lengths not too long and match future rehabilitation areas.
Asset are known - this requires a construction date or condition date which for much of Masterton's assets is unknown

The 2023 report has been affected by the AMDS transition and shows a minor decrease in overall score from 74 to 72.

Issues to address include

Treatment length and renewal alignment	
Resurfacing data	Timing issue to be addressed
Footpath data	Currently being addressed
Streetlight renewal data	
Culvert condition	Work in progress with Contractor
Retaining walls – inventory and condition	Collection underway

 This issues will continue into the 2024-27 improvement programme if they are not being address through routine work processes.

The full report can be found on the Te Ringa Maimoa Transport insights portal under Data Quality Reports.

9.16.1 Waka Kotahi Audits

The Masterton District Council has been subject to several NZTA audits and assessments over the past five years in 2018 and 2019. The results of these audits have generally been very positive with only a few issues being raised. A summary of these audits and the actions being undertaken in responses to any feedback is detailed below:



A Procedural Audit is scheduled in February 2025.

9.16.2 Recommendations technical audit

- Commits to producing a 2021-31 AMP that will spell out the most cost-effective programme to ensure a long-term resilient network that delivers transport outcomes at an appropriate level of service while minimising the whole-of-life asset cost.
- Undertakes condition evaluations and predictive modelling on pavement, surfacing and roading assets to ascertain appropriate levels of renewals and to support the AMP's evidential business case for long-term performance.
- Addresses deficiencies in RAMM data by:
 - Reviewing the REG Data Quality report to identify and resolve data gaps in RAMM.
 - Reviewing and rationalising RAMM treatment lengths.
 - Reviewing the process to ensure that maintenance cost data added to the RAMM database is timely, accurate and complete.
- Ensures compliance with the Transport Agency funding rules that require Road Safety Audits for all renewal and improvement projects.
- Ensures that appropriate temporary hazard warning devices are put in place on network faults / hazards that will not be expeditiously remedied (e.g. within maintenance contract response times).
- Develops and implements a delineation strategy to ensure a safe and consistent driving environment during both day and night (in accordance with Pt 5 TCD manual).
- Ensure temporary traffic management is appropriate to the situation and complies with the Code of Practice for Temporary Traffic Management (COPPTM).

9.17 Preferred Programme of Works Maintenance, Operations and Renewals

For the 2024-27 programme of works, Masterton is seeking a funding increase to their Maintenance, Operations and Renewals (MOR) programme.

The reflect a focus on the problems council seeks to address as well as the strategic priorities identified in the government Policy Statement for Land Transport.

We are strategically planning our finances to confront the challenges brought about by the escalation in construction and fuel prices. These economic drivers, beyond our control, have significantly influenced both our operational efficiency and the delivery of our planned forward works programme. The recent surge in the cost of living and inflation of major indices has imposed strain on our budget, impeding our capacity to carry out projects and advance our work plans. In tandem with these issues, we have experienced a series of severe weather events that have rendered our network fragile and less resilient. Consequently, we find ourselves in a reactive mode for repairs and expenditure in the foreseeable short term.

Key to this programme is a commitment to pavement renewals which is needed to provide long term affordability in the suitable standard of roading. Also, drainage improvements and an effective programme is needed to protect access and limit damage from storm events.

10 LIFECYCLE MANAGEMENT

10.1 Introduction

The following sections of lifecycle management plans were prepared for these asset groups:

- Sealed Pavements
- Unsealed Pavement
- Pavement Drainage
- Bridges
- Culverts
- Carriageway Lighting
- Traffic Facilities and Guardrails
- Footpaths and Pedestrian Crossings
- Vegetation and Streetscape
- Parking Facilities

10.2 General

Each Lifecycle Management Plans includes the following information:

- Asset description (including physical parameters, capacity/performance, condition, valuation, historical expenditure, critical assets, significant negative effects, resource consents)
- Design standards
- Maintenance plan
- Renewal/replacement plan
- Asset creation plan
- Financial forecast
- Disposal plan

The Council retains roading plans and records for the significant range of components making up the roading asset. Information has been taken from these plans and from field survey to develop inventories of assets. Such information is available from the RAMM system database (Road Assessment and Maintenance Management) which holds comprehensive inventory data covering the following:

- carriageway
- traffic volumes
- surfacing
- condition rating
- roughness
- shoulders
- surface water channels
- pavement layers
- drainage
- traffic facilities
- minor structures

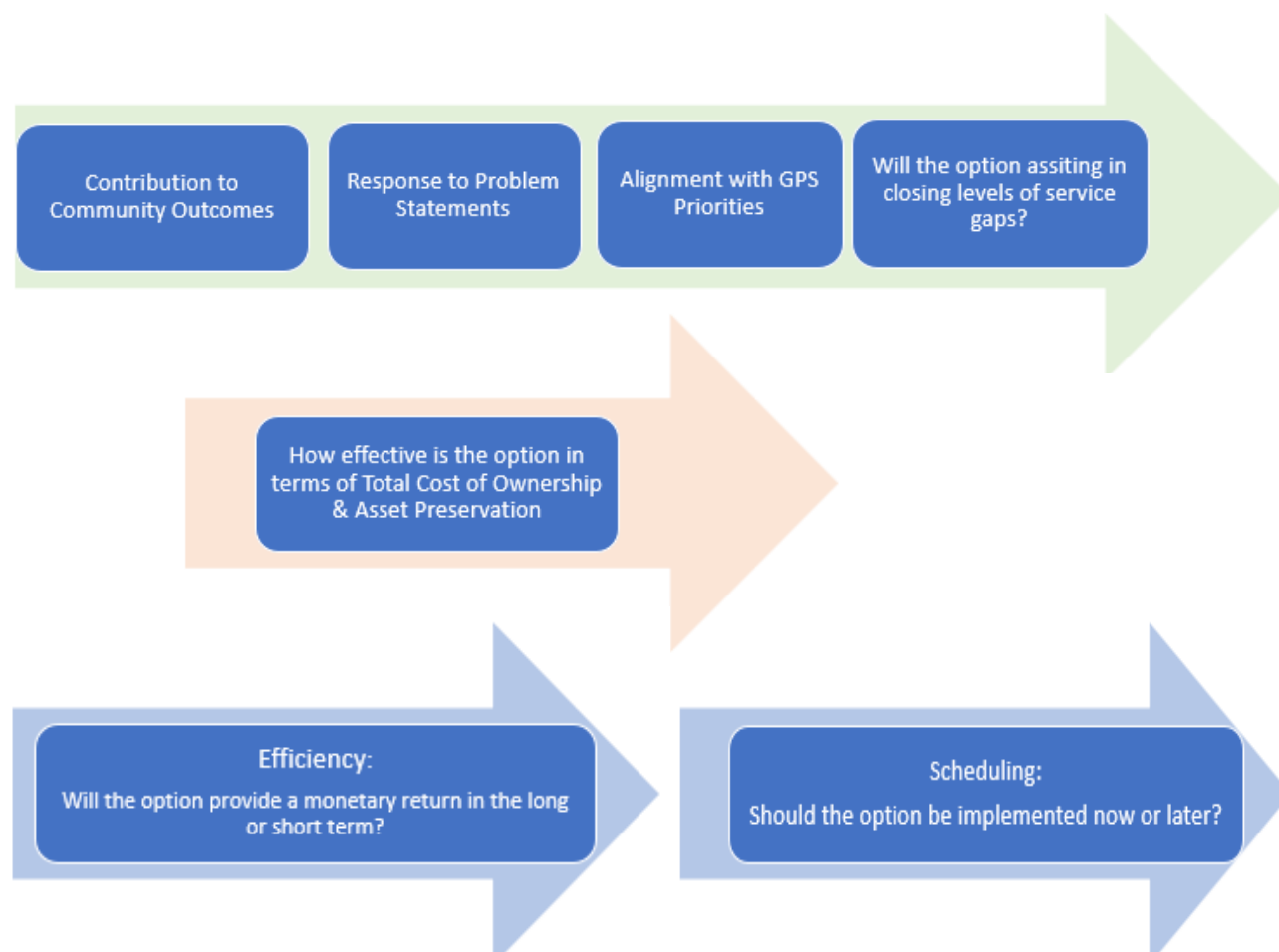
10.3 Options Analysis

A Multi Criteria Analysis has been undertaken within each work activity to ascertain which options represents the 'best' approach when a combination of factors are considered. This is an adaptation of the meth used in 2021, which was a predecessor to the Te Ringa Maimoa (TRM) model.

Council has chosen to develop the 2021 approach rather than start fresh with the TRM model.

The development of the model has also considered Waka Kotahi's draft Investment Assessment Framework. The multi-criteria analysis and alignment is illustrated below.

Strategic Fit	Efficiency	Schedule
(National, regional and Local)	(Does the option represent value for money?)	(How urgent is this option and can it be achieved?)



The graphics highlight the preferred option and where there are a combination of options that rate highly.

As the assessment include cost and non-cost factors, the preferred option a combination of both. Where there are a number of options worthy of consideration this is discussed.

10.4 Procurement

To meet the requirements of the NZTA Procurement Manual Masterton prepared a strategy. The strategy is developed to maximise value for money opportunities. It has been developed in full compliance with the requirements of the NZTA.

- provide best value for money over whole-of-life
- provide open and effective competition
- provide full and fair opportunity for all eligible suppliers
- improve business capability, including e-commerce capability
- require sustainably produced goods or services whenever possible

Have regard to local, regional or national economic, environmental, and social impacts over their lifecycle.

10.5 Sealed pavements

The sealed road pavement or carriageway is the part of the roadway that is designed for vehicle travel; in common terms it is the road itself.

It can be considered a core transport asset in providing for the movement of vehicles. It is therefore critical that it be of good quality and have adequate capacity to provide the required level of service (LoS) for present and future customers. The design, condition and performance of the pavement can also impact significantly on road safety in general. Road pavement helps deliver an effective and efficient transport system.

10.5.1 Introduction

This section covers sealed carriageways that Masterton District Council owns and maintains, this includes all public roads on legal road reserves in the Masterton District (except state highways which are the responsibility of NZTA).

The key issues relating to our sealed pavements are covered in the strategic case section 2 and in detail in the programme business case section 5:

10.5.2 Asset Description (Inc. how asset data is stored)

Masterton District Council responsible for the maintenance of about 535 km of sealed roads and these sealed roads are categorised into hierarchical categories to assist with the identification of point of view.

The ONRC classification will help local government (MDC) and the Transport Agency to plan, invests in, maintain, and operate the road network in a more strategic, consistent and affordable way throughout the country.

Table 10-1: Sealed Pavements - Category Groups

Sealed Pavements - Category Groups			
Road Type	Category	ONRC Category	Length (Km)
Sealed (\$1)	Urban	Low volume	34.3
		Access	22.2
		Secondary collector	44.0
		Primary collector	15.0
		Arterial	6.2
	Rural	Low volume	23.8
		Access	173.4
		Secondary collector	199.5
		Primary collector	16.9
	Total		535.0

*The seal width of sealed roads varies from 2.3m to 19.5m.

Table 10-2: Sealed Pavements - Lane Lengths

Sealed Pavements – Lane Lengths				
Group	Single Lane (km)	Double Lane (km)	Triple Lane (km)	Total (km)
Sealed roads (\$1)	72	466	0.4	538.4

The Council retains roading plans and records for the significant range of components making up the roading asset. Information has been taken from these plans and from field survey to develop inventories of assets. Such information is available from the RAMM system database (Road Assessment and Maintenance Management) which holds comprehensive inventory data covering the following:

Carriageway, traffic volumes, surfacing, condition rating, roughness, shoulders, surface water channels, pavement layers, drainage, traffic facilities, and minor structures.

10.5.3 Asset condition and monitoring

10.5.3.1 Pavement Age

Historically there had been no records kept of the sealed pavement structural layer. However, it is estimated that the age of original pavements varies from 0 years to >80 years. Every year, sealed pavements are upgraded generally by incremental granular overlay or through various stabilisation methods.

In general, sealed road pavements in New Zealand are designed for a 25-year life. But from experience, it has been observed that a road pavement can last up to 80 years with proper maintenance. The main factor in determining the life and performance of a flexible pavement is the expected traffic loading and the construction materials incorporated into the structure.

Most of the sealed roads in the district are chip sealed (Chip seal is a layer of sprayed bitumen with a stone chip spread on top as a running surface). A few mainly urban roads are surfaced with asphaltic concrete (AC) hot mix. The AC surface tends to be used where noise and chip loss are a factor. It has the advantage of long service, no stone loss, a pleasant appearance and a smooth ride.

Chip seal and AC expected lives are tabulated in the asset valuation as indicated.

Table 10-3: Roading Asset Lives

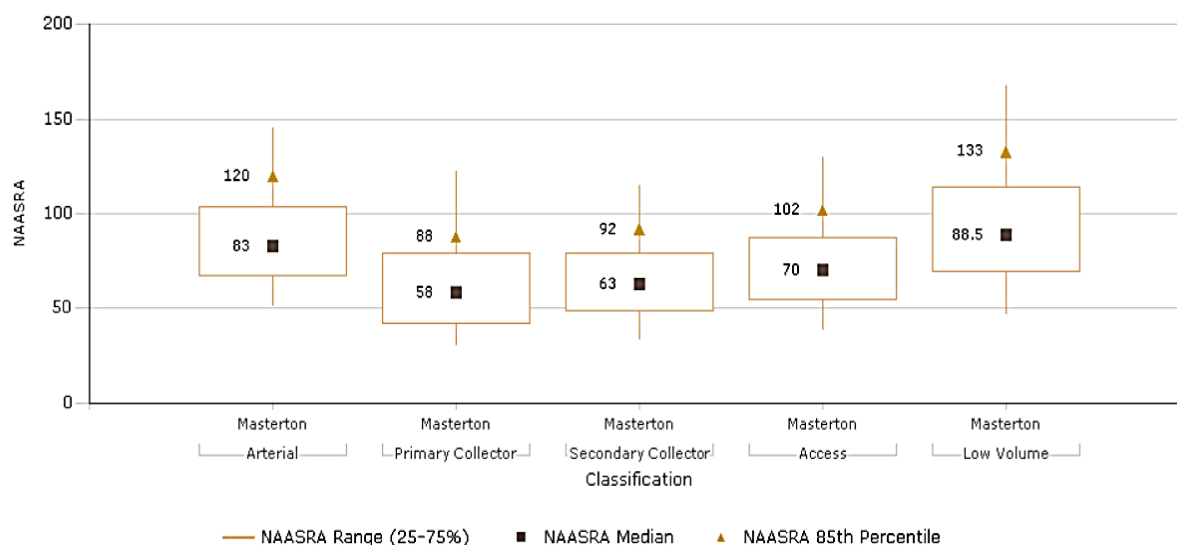
Roading Assets – Lives

Area	Type	Component	Material	Expected Life	Residual Value	Minimum Life	Default Life
Rural	Pavement	Subbase	Any	80	1	3	40
Rural	Pavement	Basecourse	Sealed	50	1	3	25
Rural	Pavement	Basecourse	Unsealed	50	0	3	25
Rural	Pavement	Seal	2-Coat Chip Seal	17	0	3	9
Rural	Pavement	Seal	Asphaltic Concrete	17	0	3	9
Rural	Pavement	Seal	Unsealed	3	0	3	2
Rural	Pavement	FirstCoat	1st Coat Chip Seal	50	0	3	25
Urban	Pavement	Subbase	Any	80	1	3	40
Urban	Pavement	Basecourse	Sealed	50	0	3	25
Urban	Pavement	Basecourse	Unsealed	50	0	3	25
Urban	Pavement	Seal	2-Coat Chip Seal	17	0	3	9
Urban	Pavement	Seal	Asphaltic Concrete	17	0	3	9
Urban	Pavement	Seal	Unsealed	3	0	3	2
Urban	Pavement	FirstCoat	1st Coat Chip Seal	50	0	3	25
Rural	Culvert	Any	Circular	90	0	3	45
Rural	Culvert	Any	Circular	90	0	3	45
Rural	Culvert	Any	Circular	90	0	3	45
Rural	Culvert	Any	Circular	90	0	3	45
Rural	Culvert	Any	Circular	90	0	3	45
Rural	Culvert	Any	Circular	90	0	3	45
Rural	Culvert	Any	Circular	90	0	3	45
Urban	Culvert	Any	Circular	90	0	3	45
Urban	Culvert	Any	Circular	90	0	3	45
Urban	Culvert	Any	Circular	90	0	3	45
Urban	Culvert	Any	Circular	90	0	3	45
Any	Footpath	Formation	Any	0	0	3	0
Any	Footpath	Basecourse	Asphaltic concrete (red)	50	1	3	20
Any	Footpath	Basecourse	Asphaltic concrete (black)	50	1	3	20
Any	Footpath	Basecourse	Concrete (black)	50	1	3	20
Any	Footpath	Basecourse	Concrete	50	1	3	20
Any	Footpath	Basecourse	Interlocking blocks	50	1	3	20
Any	Footpath	Basecourse	Crushed Lime	50	0	3	30
Any	Footpath	Basecourse	Slurry Seal	50	1	3	20
Any	Footpath	Basecourse	Seal	50	1	3	20
Any	Footpath	Basecourse	Unknown	50	1	3	20
Any	Footpath	Seal Coat	Asphaltic concrete (red)	18	0	3	10
Any	Footpath	Seal Coat	Asphaltic concrete (black)	18	0	3	10
Any	Footpath	Seal Coat	Concrete (black)	50	0	3	20
Any	Footpath	Seal Coat	Concrete	50	0	3	20
Any	Footpath	Seal Coat	Interlocking blocks	50	0	3	20
Any	Footpath	Seal Coat	Crushed Lime	0	1	3	0
Any	Footpath	Seal Coat	Slurry Seal	15	0	3	10
Any	Footpath	Seal Coat	Seal	50	0	3	12
Any	Footpath	Seal Coat	Unknown	15	0	3	12
Urban	Kerbs/Channel	Any	DCC	0	0	3	0
Urban	Kerbs/Channel	Any	KC	0	0	3	0
Urban	Kerbs/Channel	Any	KCC	79	0	3	39
Urban	Kerbs/Channel	Any	MCC	79	0	3	39
Urban	Kerbs/Channel	Any	SWCD	79	0	3	39
Urban	Kerbs/Channel	Any	SWCS	79	0	3	39
Urban	Kerbs/Channel	Any	MKC	79	0	3	39
Urban	Kerbs/Channel	Any	MKCC	79	0	3	39
Urban	Kerbs/Channel	Any	DC	79	0	3	39
Urban	Kerbs/Channel	Any	KDC	79	0	3	39
Rural	Kerbs/Channel	Any	DCC	0	0	3	0
Rural	Kerbs/Channel	Any	KC	0	0	3	0
Rural	Kerbs/Channel	Any	KCC	79	0	3	39
Rural	Kerbs/Channel	Any	MCC	79	0	3	39
Rural	Kerbs/Channel	Any	SWCD	79	0	3	39
Rural	Kerbs/Channel	Any	SWCS	79	0	3	39
Rural	Kerbs/Channel	Any	MKC	79	0	3	39
Rural	Kerbs/Channel	Any	MKCC	79	0	3	39
Rural	Kerbs/Channel	Any	DC	79	0	3	39
Rural	Kerbs/Channel	Any	KDC	79	0	3	39
Any	Berms	Any	Any	50	0	3	25

10.5.3.2 Road Roughness



The 85th percentile roughness of your roads



Road roughness is a measure of the acceptability of the longitudinal ride and is closely linked to vehicle operating costs. As the roughness of the road increases, the ride starts to deteriorate, and the repair effort needed to maintain surface condition increases. At some point, it becomes more economical to renew the pavement than to continue with routine maintenance.

The Council carries out a roughness survey of its sealed roads on average every two years. The roughness data is held within the RAMM system.

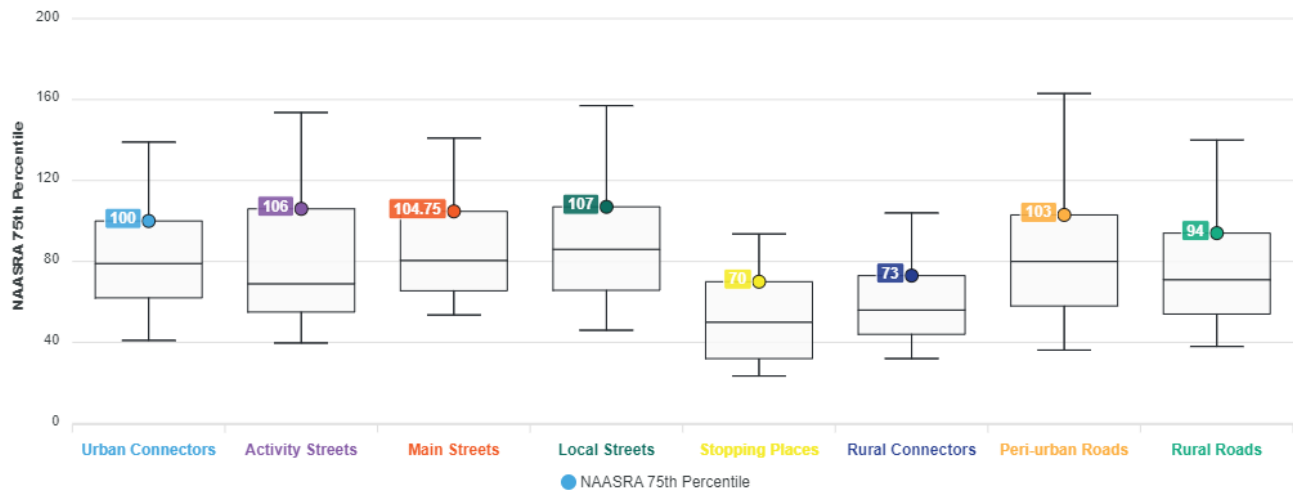
Road roughness is measured by a system developed by the former National Association of Australian State Roading Authorities (NAASRA). Values are obtained from a special-purpose vehicle traveling down both the outside lanes of the length of the road. The rougher the road, the higher the NAASRA counts per lane kilometre.

The roughness of a well-constructed new road is approximately 60 counts per km.

The urban survey rated higher with a count of 95 and the rural count was 75.

A NAASRA count of greater than 150 typically indicates a road which is becoming a high concern in terms of its roughness and the number of complaints likely to be generated. Targets values for roughness are set by road annual daily traffic of ONRC.

Figure 10-1: 75%ile Roughness Comparison



10.5.3.3 Pavement Condition Rating

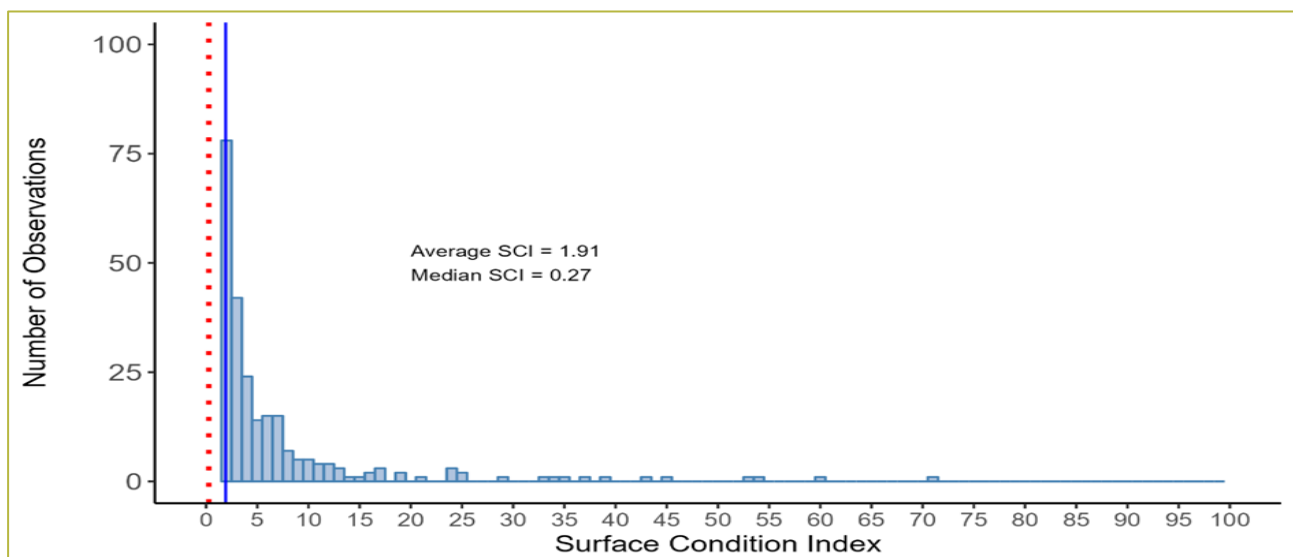
The condition of sealed pavement having ADT>500 is monitored on an annual basis with a complete network survey completed every two years. The most recent survey was completed in 2023.

Sealed pavements, like all structures, start to deteriorate as soon as construction finishes. Pavements can be damaged by a number of mechanisms: mechanical damage, overstressing, the ingress of moisture into the pavement etc. Condition rating defect trend analysis indicates potential trends in maintenance performance. These trends could reflect maintenance deterioration or improvements.

Over recent years, consistency of rating surveys has improved due to the implementation of limits of variation, refined definitions and a more comprehensive training system for both data collectors and auditors.

100% of the sealed roads are surveyed for pavement defects. The following figures show the Condition and Pavement Integrity

Figure 10-2: Distribution of SCI Values

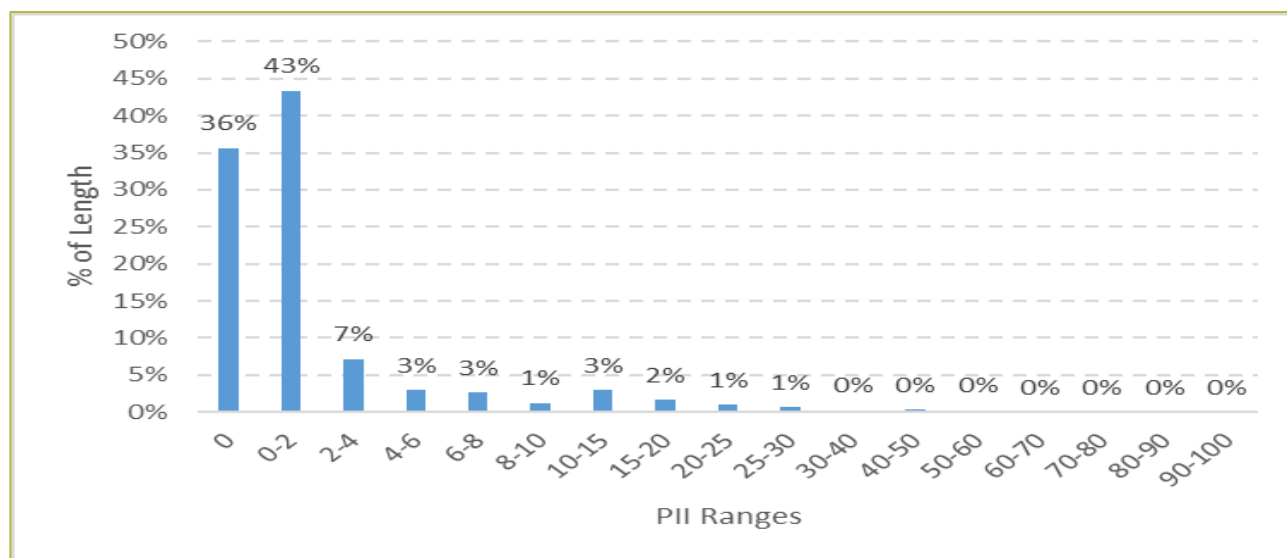


10.5.3.4 Pavement and Condition Integrity Index (PII and SCI)

The Pavement Integrity Index is a combined index of the pavement faults in sealed road surfaces. It is a 'weighted sum' of the pavement defects divided by total lane length. PII combines surface faults (CI) with rutting and shoving.

Like the SCI, the PII values on the network is mainly below 8, with only 8% of the network length having PII values greater than 8, see Figure 10-3.

Figure 10-3: PII Distribution

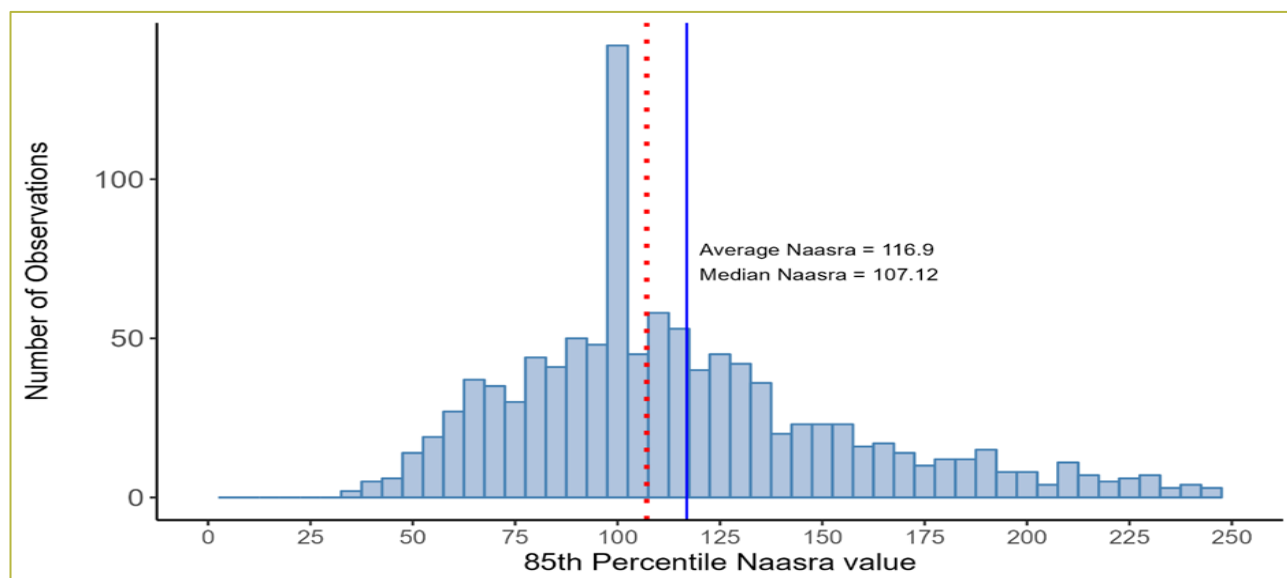


10.5.3.5 Smooth Travel Exposure (STE)

Smooth Travel Exposure measures the proportion (%) of vehicle kilometres travelled in a year (VKT) that occurs on 'smooth' sealed roads and indicates the ride quality experienced by motorists.

A 'smooth' road is one smoother than a predetermined NAASRA roughness threshold. The thresholds used vary with the road classification. Higher classification roads have a lower (smoother) threshold.

Figure 10-4: Distribution of Naasra Values



10.5.3.6 Skid Resistance

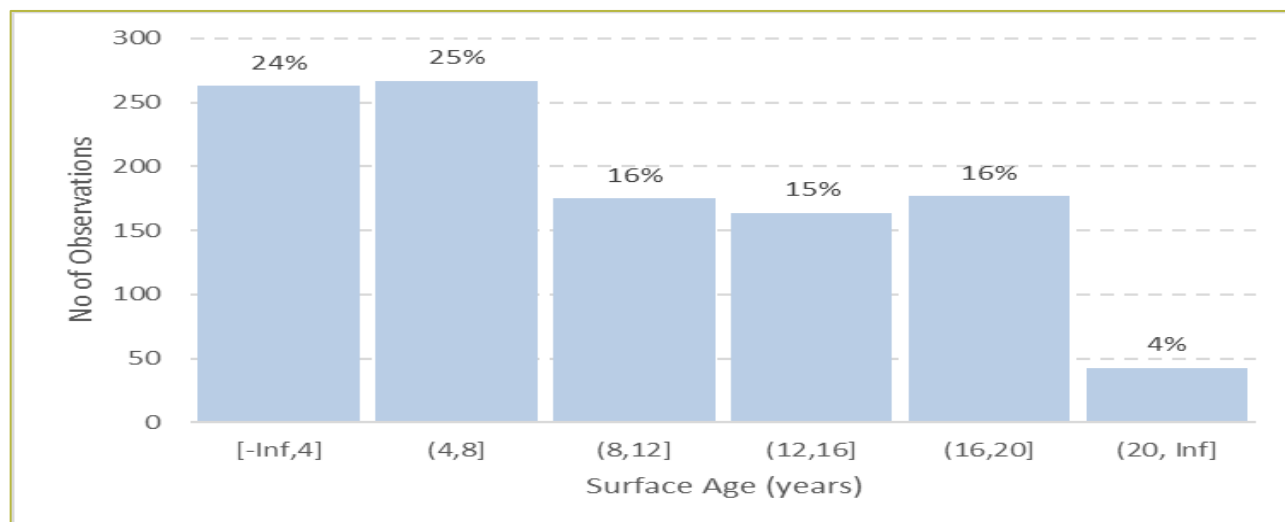
Skid resistance is a measure of tyre grip on the road surface and an important factor for road safety. In 2019 and 2021 MDC surveyed its main Arterial and Primary Collector Roads on the network. Further surveys will compare skid resistance against this survey.

10.5.3.7 Age Distribution and Life

The average surface age of the Masterton network is currently just below 10 years. Unless you we replace 10% of the network each year, this will continue to increase. As our plan is to treat less than the average age, this implies that a portion of the network will continually get older, and the average will increase. Over the lifecycle of the networks' pavement length there is an estimated average annual amount of the 6km of pavement rehabilitation. About 35-40 km of pavements are resealed. The age distribution of sealed road surfaces is shown in Figure 10-5.

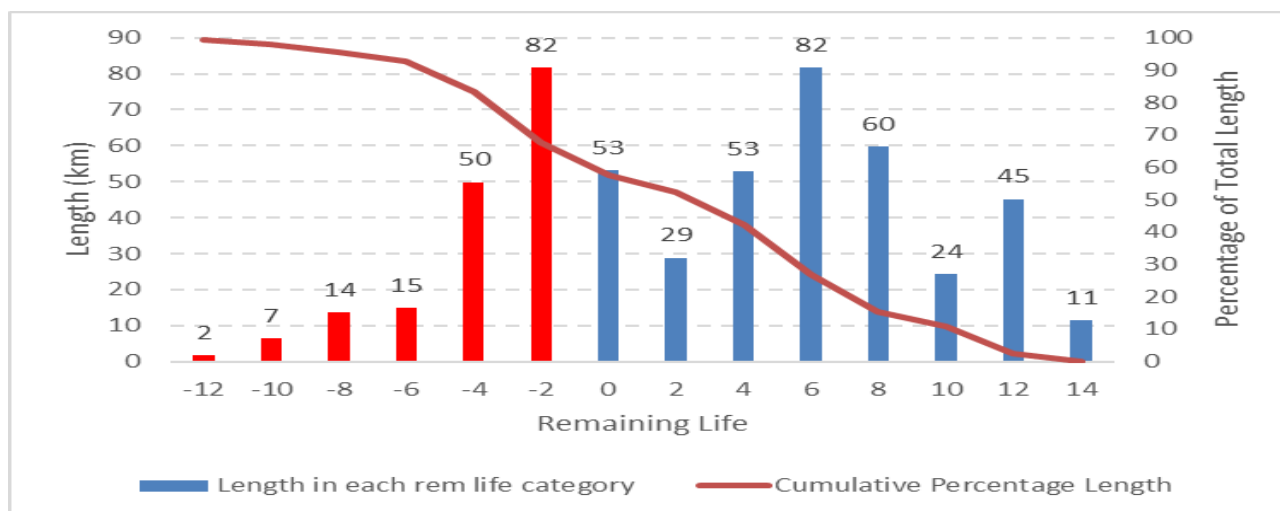
Figure 10-5: Distribution of Surface Age

The average surface age is currently 9.7 years while there are four percent of segments with surface lives greater than 20 years, the maximum being 48 years.



The remaining surface life was calculated based on the seal age and the seal life estimated with the Random Forest Regression model, it was found that about 40% of the network length is already past its expected seal life. This is shown in Figure 10-6.

Figure 10-6: Remaining Life vs Length and Cumulative Length



10.5.3.8 Significant Negative Effects of Sealed Roads

While the transport activity enables and supports much of community wellbeing, there are negative effects that need to be identified and appropriately managed, so that the positive contributions of a well-functioning, safe, and sustainable transport system can be realised. Significant effects are recorded and assessed against the following:

- Significant Negative Effects highlight risks posed by the Transport System, as it currently functions, or if the current management cannot be maintained.
- Mitigation of Negative Effects to describe how we manage these negative effects to minimise impact.
- Positive Effects which will result where mitigation is largely successful, and outcomes are achieved.
- These are mapped against the four aspects of community wellbeing.

Table 10-4: Significant Negative Effects of Sealed Roads

 Significant Negative Effects of Sealed Roads		
	Negative Effects	How we will mitigate
Social	None identified	
Cultural	None identified	
Environmental	None identified	
Economic	Widespread incapacitation of network — for example, due to a storm event, bushfire, or widespread slips)	Co-ordinate network responses for events and be assisted by Civil Defence Emergency Management

10.5.3.9 Asset Capacity / Performance

Carriageway capacity is defined as the maximum number of vehicles per hour that could reasonably expect to traverse a uniform section of roadway during a given period under typical roadway, traffic and control conditions.

Roadway conditions refer to the road alignment, number of lanes, road width and design speed. Traffic conditions refer to vehicle type and mix. Control conditions refer to the control devices and traffic regulations applicable to the section of road. The assessment of this capacity is usually a qualitative measure describing operational conditions and their perception by motorists (i.e. freedom to select desired speed, comfort, convenience and safety).

Traffic counts are undertaken on a continuing basis and as yet no roads within the district have met the criteria for increasing the number of lanes beyond the current situation. It is expected that current levels of service will mean this is unlikely to change within the life of this plan.

However, the type of vehicle and the mix of traffic on district roads are continually evolving. The roading network is carrying increasing numbers of heavy commercial vehicles. This is not confined to main strategic roads and is affecting all levels of the road hierarchy. Thus, issues such as road widths and road user safety are key issues.

10.5.4 Design and Service Standards

10.5.4.1 Road Width

Each road group has a target seal width and shoulder width.

Urban road widths are generally designed in accordance with NZS 4404.

Rural road widths are guided by NZTA standards and the following:

Sealed two lane roads:

- Primary and Secondary Collector - 7m
- Access and Low Volume - 6m

Sealed single lane roads:

- Access and Low Volume - 4m

Unsealed two lane roads:

- Access and Low Volume - 5m

Unsealed single lane roads:

- Access - 4m
- Low Volume - 3.5m

Analysis of existing rural seal widths compared to target width shows a reasonable level of compliance as detailed in the following. Data sourced from RAMM.

Table 10-5: Rural Road Widths

Rural Road Widths			
Category	Target	Complying	Not complying
Primary and Secondary Collector	7m	62km	153km
Access and Low Volume	6m	64km	78km
Access and Low Volume	4m	33km	31km
Access	5m	16km	8km
Low Volume	5m	7km	3km
Access	4m	46km	20km
Low Volume	3.5m	125km	53km

On average 51% of the length of rural roads comply with the target width.

Further analysis of the level of non-compliance shows that about 10% or 67 km of sealed road network is under width by 1.0 metre or less.

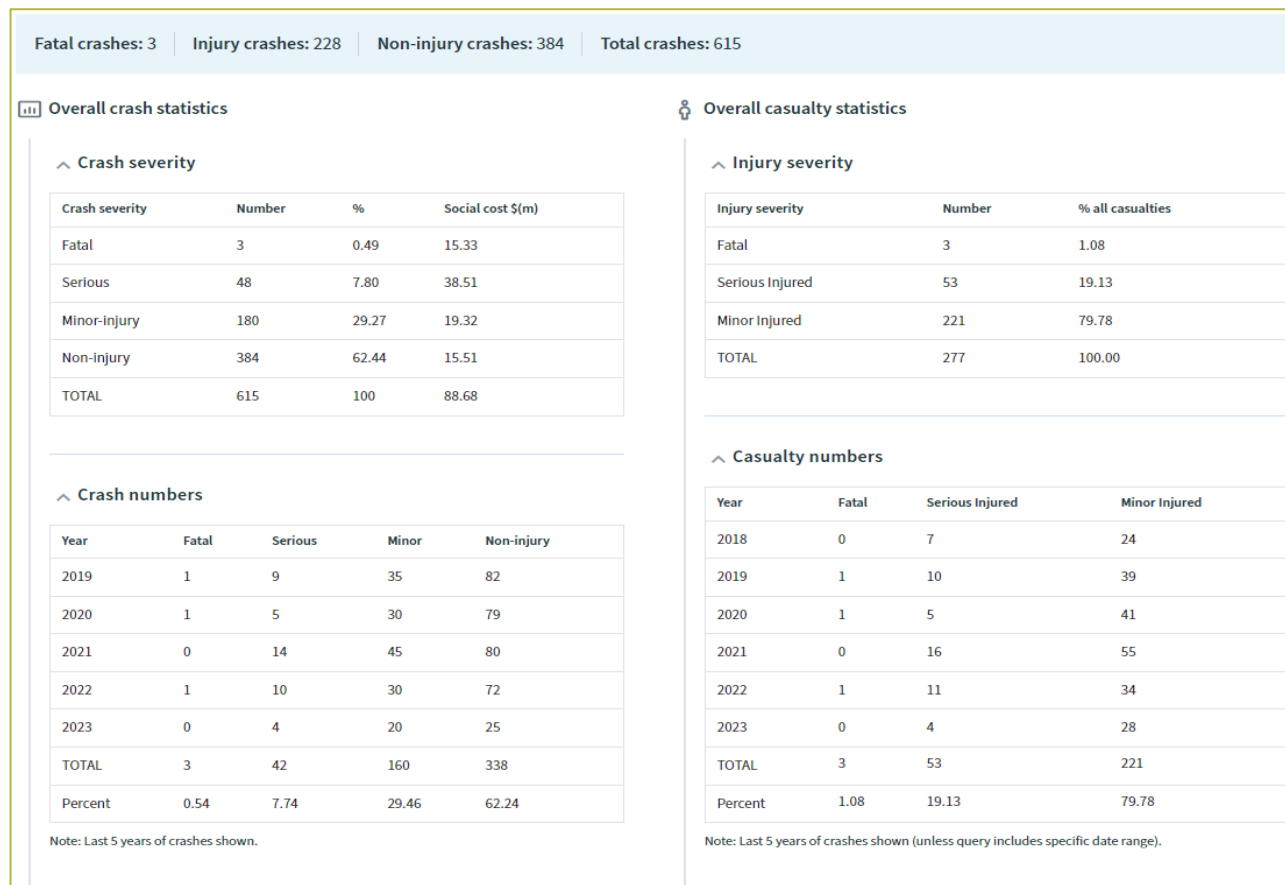
MDC currently follows design standards and specifications published by Waka Kotahi for the construction, maintenance and rehabilitation of sealed roads. The design standards are either based on the guidelines prepared by AUSTROADS, if the mechanistic design approach is used, or more commonly the NRB State Highway Pavement Design and Rehabilitation Manual if an incremental design approach is adopted. However, the design of a pavement depends on many factors including traffic volume, material strength, sub-grade soil condition and axle loading.

The maintenance consequences of under-width roads are edge break and unsealed shoulder rutting. The expenditure relating to edge break repair has increased in recent years.

10.5.5 Safety

The Waka Kotahi collects crash data on behalf of the Road Controlling Authorities (RCA). Each year Waka Kotahi reviews crash data from the previous five years and reports on results, trends and key safety issues. The information is used to assist in the development of engineering, education and enforcement programmes. A crash analysis of the district's sealed roads has been carried out on the last five complete years and is presented in . Data is sourced from Waka Kotahi Crash Analysis System (CAS) and is loaded into the RAMM.

Figure 10-7: Five years (July 2018 – July 2023) Crash data Sealed Roads SH2 excluded



The CAS calculated social cost for five years of crashes on MDC sealed roads is 88.68 million dollars.

10.5.6 Pavement Management Strategy

The sealed pavement programme is designed to optimise the combination of maintenance, resurfacing and rehabilitation. It is important that the role of each of these activities is understood.

Maintenance	Prevent damage to the pavement or surfacing Keep the road in a safe and serviceable condition
Reseal	Protect the pavement layers from failing Provide a safe surface for traffic
Pavement rehabilitation	Reset the condition when the asset reaches the end of its usable life

Renewal of the surfacing and the pavement ensures the longest asset life is achieved, and maintenance works are limited to variations in the pavement structure or external damage.

The greatest risk to achieving long asset lives are:

- Poor timing or works execution
- Water ingress (poor drainage management)
- Heavy traffic

Council's strategy to provide appropriate levels of service and ensure a value for money investment is to:

1. Strive to deliver the optimal combination of maintenance, resurfacing and rehabilitation
2. Manage works to ensure they are fit for purpose
3. Understand and plan for changes on the network (including traffic and climate)

10.5.7 Maintenance Plan

Maintenance is the on-going day to day work activity required to keep assets serviceable and prevent premature deterioration or failure.

The maintenance strategy has been developed to achieve cost effective maintenance to maintain the assets to meet the intended level of service.

Council has determined that the most effective way to achieve this objective is to contract out maintenance works to commercial contractors. This allows for competitive tendering as a way of ensuring true maintenance value for the works.

The term of contract is initially for five years, with rights for extensions to eight years on a year-by-year basis, provided the Contractor meets the performance requirements specified in the contract. The current contractor is Higgins Contracting Ltd, with a current contract completion date of June 2024 with right of renewal until 2027.

Masterton District Council will review the cost-effectiveness of the current arrangements for meeting the needs of the community within the district for good-quality local infrastructure, local public services, and the performance of regulatory functions according to the LGA act 2002 (section 17a). A Service Delivery Review for transportation section 17A was carried out by Opus in September 2018.

As per the contract, the contractor is paid lump sums each month to routinely maintain some components of the sealed carriageway and the shoulders to the required standard. All other work is covered by unit rates or day work rates. The lump sum and the unit rate items cover:

- Sealed Pavement lump sum maintenance activities include, pothole repair, removal of detritus, and monthly reports and programmes

- Sealed Pavement and Shoulder unit rate maintenance activities include, dig out repairs, repair surface openings and surface levelling, failure repairs, surface layer replacement, edge break repair, repair of surface defects, ice gritting and snow clearing, shoulder compaction, rut filling, edge marker posts installation, surfacing water tables, side drain formation, side drain cleaning, and vegetation control.

The performance of the maintenance contractor during the contract period will be measured by the following criteria:

Requirements of the specification are met.

- Potholes are repaired in a technically competent way ensuring a smooth ride and waterproof surface, within the response times.
- Repaired dig outs maintain a smooth riding surface within the surface deviation tolerances specified until the end of the defect liability period.
- The chip sealing does not flush, bleed or strip before the end of the defect liability period and there are no loose chips on the road surface on completion of the repair.
- Material used for crack filling and sealing shall remain in place, waterproofing the crack, until the end of the defect liability period.
- No flushing, bleeding or scabbing of the sealed surface of the repair.
- The treatment of flushing, scabbing or bleeding leads to a significant improvement in road condition.
- The repair remains an integral part of the pavement structure within the specified tolerances.
- All work is carried out regarding the safety of traffic both during and after completion of the repair.

Table 10-6 outlines the response times for maintenance works as per the contract document.

Table 10-6: Maintenance Response Times - Sealed Pavement Roads

Maintenance Response Times – Sealed Pavement Roads	
Fault	Response Times
Potholes - Arterial/Collector	5 days (programmed) 2 days (identified)
Potholes – Access/Low Volume	20 days (programmed) 5 days (identified)
Sealing - Arterial/Primary Collector	Within 3 days of repair
Sealing – Secondary Collector	Within 5 days of repair
Sealing – Access/Low Volume	Within 10 days of repair

10.5.8 Financial

The Roothing asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023 and includes all (sealed and unsealed) land and formation.

Table 10-7: Asset Valuation - All Roads (2023)

Asset Valuation – All Roads (2023)			
Item	Optimised Replacement Cost (\$)	Optimised Depreciated Replacement Cost (\$)	Annual Depreciation (\$)
Land	87,106,136 *	87,106,156	0
Formation	295,921,594	295,921,594	0
Pavement	141,791,681	100,911,491	2,500,606
Shoulders	10,466,982	8,697,825	133,167
Sealed Surfacing	29,986,644	15,296,722	2,015,113

*2020 valuation

In valuing the roading asset, three components were calculated the Optimised Replacement Cost, Depreciated Replacement Value and Annual Depreciation.

The Optimised Replacement Cost is the cost of building the asset “today”. In arriving at this value, it is assumed that modern construction techniques are used but the physical result replaces the asset as it exists. The rates used are current from construction, resealing and maintenance contracts.

- **Land**

The land within the reserve width of the roads has been calculated for valuation. The value of land does not depreciate as regular maintenance will allow them to provide adequate service indefinitely.

- **Formation**

Formation includes all earthworks necessary to prepare the cut and fill batters and bring the road formation up to the underside of the sub-base. The formation does not depreciate.

The unsealed pavement structure is assumed to consist of permanent sub-base and base layers protected by a maintenance metal layer, which is replenished as required to maintain the overall structural integrity.

- **Pavement**

An assumed age has been used in the valuation exercise and loaded into RAMM. The remaining service life was estimated from local experience.

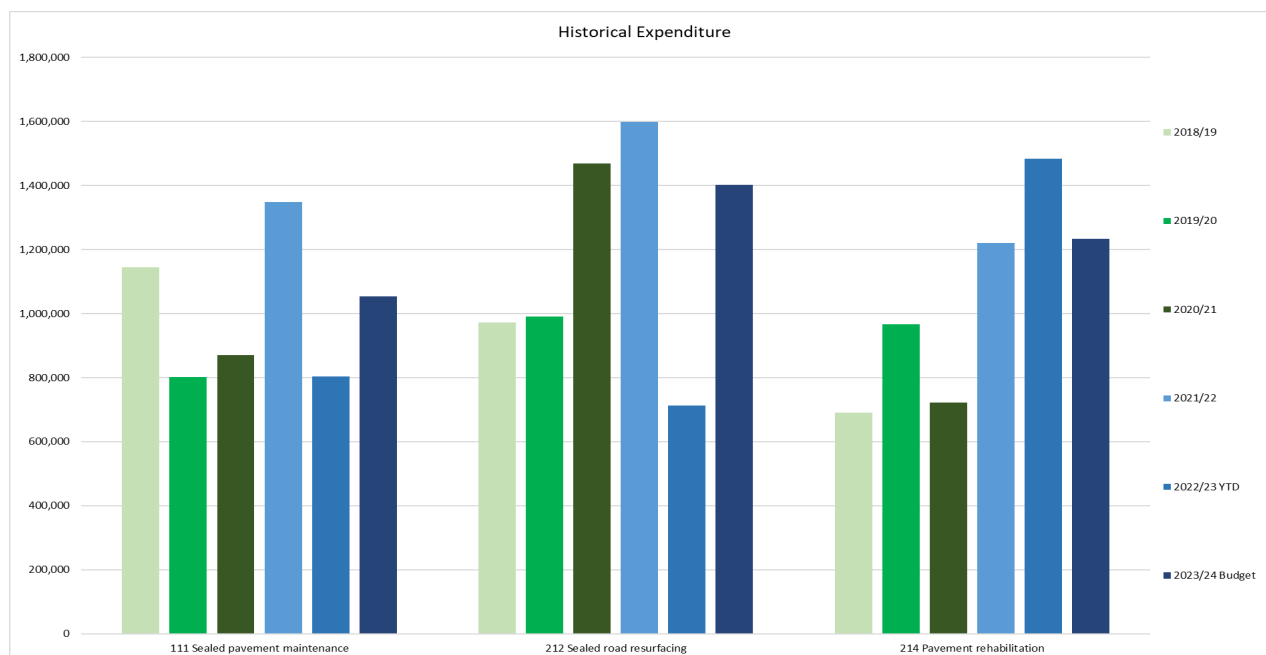
- **Sealed Surfacing**

The current sealed surface had its age and remaining life determined from an analysis of the historical RAMM sealing data. Data was sourced from the MDC Valuation 2023.

10.5.9 Historical Expenditure

Historical expenditure on sealed road assets from previous years is summarised in Figure 10-8. Data is sourced from financial reports.

Figure 10-8: Historical Expenditure – Sealed Roads

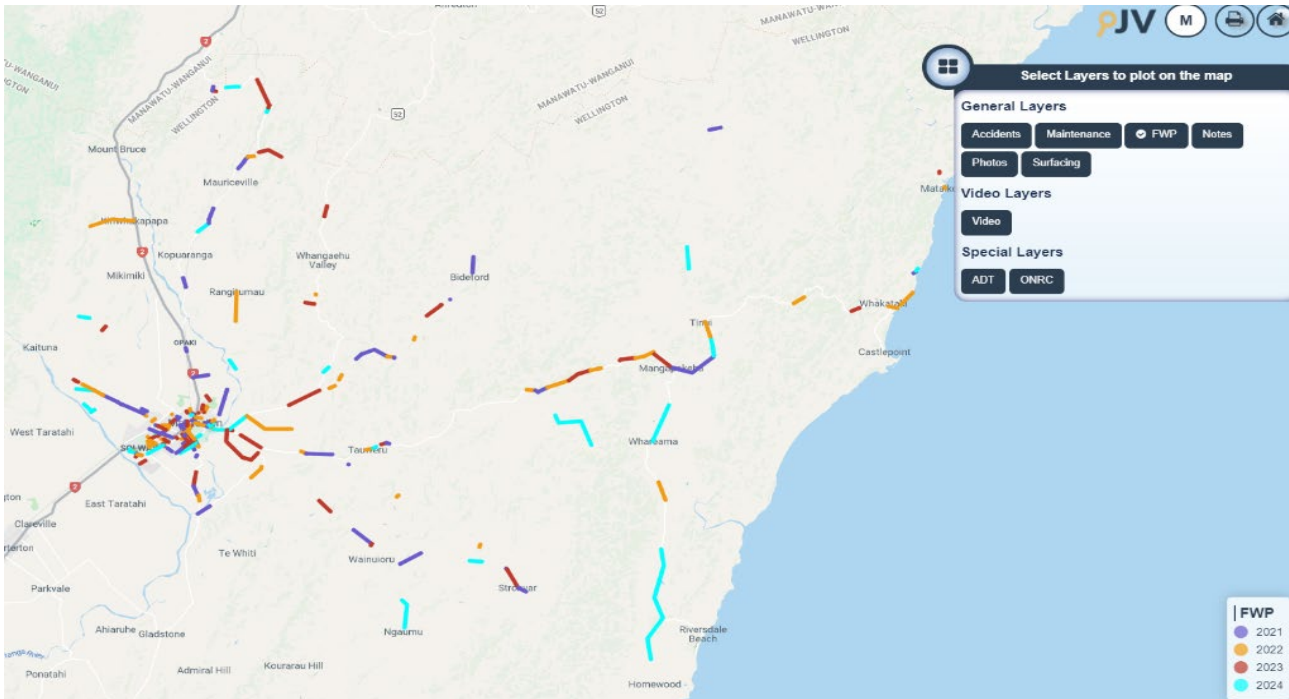


Council has made a strategic decision to 'at least' maintain the current levels of service for sealed roads. To maintain the current operational practise, and considering the increasing trend of expenditure, the annual operating expenditure for this asset in the next ten years, may be assumed to receive a FAR of 56% of the cost of maintenance and replacement of sealed pavement assets. The remaining proportion of expenditure is funded from rates.

Forecast costs are shown in the combined forecast table in section 11.4 (Table 11-2).

10.5.10 Renewal, Replacement and Programme

New maintenance and renewal work, as well as some capital expenditure, has been identified and is scheduled to enable current service levels to be maintained.



As described in Programme Business Case Section JunoViewer has been used to ranking and prioritise treatments, (rather than a Net Present Value approach) which is more applicable to MDC road networks and available data. The whole-of-life approach has been incorporated into the model through triggers and interventions, linked to our Asset Management plan. See 10.4.12 sealed pavements for programmed work and forecasted expenditure.

Renewal work restores, rehabilitates, replaces or renews an existing asset to its original capacity. Renewals include resurfacing, smoothing and pavement rehabilitation.

The identification of sealed pavements requiring renewal is brought about in several ways:

- Pavement deterioration modelling using Juno (implemented 2019 and rerun in 2023)
- Inspections by MDC engineers where, by model results are checked by engineers in field
- Contractor's inspection routine reports as described in the maintenance contract.
- RAMM condition rating and roughness survey
- Forward works programme generated from treatment length algorithms (treatment length used to populate deterioration model in Juno)
- Age profile of the pavement
- Public requests
- Annual maintenance costs

The required quantity of renewal varies depending on:

- The age profile of carriageway surfacing
- The condition profile of the carriageways
- The deterioration of the top surface
- The level of ongoing maintenance demand
- The likely future demand on the road
- The economic life of the material used

This information is used as base data in the generation of road condition forecasts, forward works programmes and road renewal programmes. Pavement layer information and strength data are still unavailable. Appropriate actions should be taken in order to obtain this information generally road rehabilitation is carried out only if a Waka Kotahi financial assistance can be obtained.

10.5.11 Asset Acquisition and Creation Plan

Asset creation can be defined as those works that create a new asset which did not exist in any shape or form previously; or works that improve an existing asset beyond its current capacity or performance.

The development of project evaluation procedures is an ongoing process. Waka Kotahi periodically revises the project evaluation procedures in the light of research and information from industry in order to continually improve them to meet the objectives of a safe and efficient roading system. In addition to the Waka Kotahi requirements, the Council has adopted a policy for prioritising unsubsidised seal extension projects.

Asset creation in respect of sealed roads includes following:

- Minor safety projects
- Seal extensions of unsealed roads
- Road reconstruction
- New road construction (often as a result of land subdivision)

Council's asset creation strategy is:

- To prioritise works in descending order of benefit/cost
- To carry out works where NZTA financial assistance can be obtained.

Vested assets require First Coat seals only, with second coat application following around four years after vesting. This cost is met as part of the roading programme, but to date represents a very small portion of the programme.

10.5.12 Programme

Pavement rehabilitation treatments provide for the replacement of, or restoration of strength to, pavements where other forms of maintenance and renewal are no longer economic. These may include overlays, rip and relays and chemical stabilisation.

Council is currently rehabilitating 2-3 km of sealed pavement annually or 0.5% of the network. A review of forestry logging on rural roads was completed in 2011 and reviewed again in 2019. The major recommendations from the review are;

- The quantity and location of harvesting cannot be accurately predicted and is dynamic and dependent on market forces
- rehabilitation required should be focused on routes and sections of roads where harvesting is scheduled to occur
- On the more remote roads, it is more economical to allow for any required heavy maintenance to maintain a reduced level of service during harvesting and carry out rehabilitation to return the road to the required level of service when harvesting is complete. This is primarily driven by the short notice given of intentions to harvest any particular area (commonly less than 3 months) and is dependent on the time of year harvesting occurs
- The current prediction of harvest volumes of harvesting will increase from current levels over the next 10 years

The forecast harvesting needs consent reviewed from 2024 onward to confirm current predictions and their effect on the roads.

Proposed rehabilitation sites are verified as the lowest cost maintenance option before being programmed for construction. Field observations have identified the following road sections as area-wide pavement treatment. Sites likely to justify further investigation for treatment over the next six years.

Forecast costs are shown in the combined forecast table in section 9 Table 9-1: Investment Summary by Work Category.

*Note – the work sites listed are provisional only and will be confirmed by the Project Manager prior to each year's activity.

Table 10-8: Pavement Rehabilitation Programme

Section ID	Section Name	Loc From	Loc To	Info length	Treat 2023	Treat 2024	Treat 2025	Treat 2026	Treat 2027	Treat 2028
142	MASTERTON CASTLEPOINT ROAD	27160	28060	900	c_rehab		ChipSeal			
142	MASTERTON CASTLEPOINT ROAD	28060	29560	1500	c_rehab		ChipSeal			
142	MASTERTON CASTLEPOINT ROAD	31550	31715	165	MaintPA	Rehab_CS		ChipSeal		
142	MASTERTON CASTLEPOINT ROAD	24810	26390	1580	MaintPA		Rehab_CS		ChipSeal	
146	MASTERTON STRONVAR ROAD	6	28	22	Rehab_AC					
404	TE ORE ORE ROAD	2288	2347	59	Rehab_AC					
142	MASTERTON CASTLEPOINT ROAD	41550	41565	15	Rehab_AC					
51	CHURCH STREET	6	114	108	Rehab_CS		ChipSeal			
18	BLAIRLOGIE LANGDALE ROAD	2844	3663	819	Rehab_CS		ChipSeal			
144	TE WHITI ROAD	3710	3990	280	Rehab_CS		ChipSeal			
144	TE WHITI ROAD	5206	5319	113	Rehab_CS		ChipSeal			
405	WHANGAEHU VALLEY ROAD	6600	6800	200	Rehab_CS		ChipSeal			
405	WHANGAEHU VALLEY ROAD	7000	8330	1330	Rehab_CS		ChipSeal			
405	WHANGAEHU VALLEY ROAD	8330	9258	928	Rehab_CS		ChipSeal			
274	TE PARAE ROAD	10265	10315	50	Rehab_CS		ChipSeal			
142	MASTERTON CASTLEPOINT ROAD	24090	24810	720	Rehab_CS		ChipSeal			
398	MASTERTON CASTLEPOINT ROAD 2	61123	61486	363	Rehab_CS		ChipSeal			
398	MASTERTON CASTLEPOINT ROAD 2	50827	51958	1131		MaintPA		Rehab_CS		ChipSeal
315	QUEEN STREET	711	847	136		Rehab_CS		ChipSeal		
315	QUEEN STREET	847	976	129		Rehab_CS		ChipSeal		
315	QUEEN STREET	976	1170	194		Rehab_CS		ChipSeal		
142	MASTERTON CASTLEPOINT ROAD	1750	2538	788		Rehab_CS		ChipSeal		

Section ID	Section Name	Loc From	Loc To	Info length	Treat 2023	Treat 2024	Treat 2025	Treat 2026	Treat 2027	Treat 2028
142	MASTERTON CASTLEPOINT ROAD	17224	17775	551		Rehab_CS		ChipSeal		
142	MASTERTON CASTLEPOINT ROAD	38562	39170	608		Rehab_CS		ChipSeal		
142	MASTERTON CASTLEPOINT ROAD	40650	41550	900		Rehab_CS		ChipSeal		
144	TE WHITI ROAD	498	1185	687			MaintPA		Rehab_CS	
144	TE WHITI ROAD	1185	2000	815			MaintPA			Rehab_CS
398	MASTERTON CASTLEPOINT ROAD 2	50531	50827	296			Rehab_AC			
405	WHANGAEHU VALLEY ROAD	6800	7000	200			Rehab_CS		ChipSeal	
214	PAIERAU ROAD	7052	7734	682			Rehab_CS		ChipSeal	
270	TE ORE ORE BIDEFORD ROAD	8673	9053	380			Rehab_CS		ChipSeal	
142	MASTERTON CASTLEPOINT ROAD	15750	17224	1474			Rehab_CS		ChipSeal	
146	MASTERTON STRONVAR ROAD	20670	20804	134			Rehab_CS		ChipSeal	
214	PAIERAU ROAD	3833	5540	1707				Rehab_CS		ChipSeal
142	MASTERTON CASTLEPOINT ROAD	18663	19442	779				Rehab_CS		ChipSeal
208	OPAKI KAIPARORO ROAD	19859	22094	2235				Rehab_CS		ChipSeal
112	LANGDALE ROAD	0	1285	1285					Rehab_CS	
214	PAIERAU ROAD	2493	3833	1340					Rehab_CS	
214	PAIERAU ROAD	5540	7052	1512					Rehab_CS	
270	TE ORE ORE BIDEFORD ROAD	7463	7723	260					Rehab_CS	
398	MASTERTON CASTLEPOINT ROAD 2	51958	52135	177					Rehab_CS	
142	MASTERTON CASTLEPOINT ROAD	10951	11420	469						Rehab_CS
270	TE ORE ORE BIDEFORD ROAD	16986	17970	984						Rehab_CS

10.5.13 Maintenance Surfacing

Council is currently undertaking approximately 25-30km of resealing (excluding the rehabilitation sites)

Examples of this activity include:

- Conventional chip reseals, including second coat seals
- Void filling seal coats
- Texturing seals
- Asphaltic Concrete seals

10.5.14 Seal Widening

Seal widening caters for widening of existing seals where this is the least-cost maintenance treatment necessary to overcome edge break or to reduce shoulder maintenance. Work may include shoulder strengthening and/or formation widening where this is necessary to maintain the structural integrity of the pavement.

10.5.15 Critical Assets

Table 10-9: Critical Assets - Sealed Roads

Road Name	Vulnerable To
Masterton – Martinborough (Te Whiti Rd)	Flooding
Opaki – Kaiparoro Rd	Liquefaction, Fault displacement, Flood
Whangaehu Valley Rd	Liquefaction, Landslide
Te Ore Ore – Bideford Rd	Liquefaction, Landslide, Flooding
Masterton – Castlepoint Rd	Liquefaction, Fault displacement, Landslide, Flooding, Tsunami
Blairlogie – Langdale Rd	Landslide, Flooding
Riversdale Rd	Liquefaction, Fault displacement, Tsunami
Homewood Rd	Fault displacement, Landslide
Upper Plain Rd	Fault displacement, Flooding
Masterton – Stronvar Rd	Flooding
Manawa Rd	Flooding
Mataikona Rd	Flooding, Windstorm, Tsunami, Wildfire, Landslide

10.5.16 Disposal Plan

Although there are currently no plans to dispose of any significant component of this asset, Council would follow a process complying with its legal obligations under the Local Government Act 2002, which covers:

- Public notification procedures required prior to sale
- Restrictions on the minimum value recovered, and
- Use of revenue received from asset disposal.

From time to time, areas of (unformed) legal road reserve, berm areas surplus to requirements, or areas being informally occupied by adjoining landowners may be identified for disposal.

10.6 Unsealed pavements

This section covers the unsealed paved roads that Masterton District Council owns and maintains.

10.6.1 Introduction

This section covers unsealed carriageways that Masterton District Council owns and maintains, this includes all public roads on legal road reserves in the Masterton District (except state highways which are the responsibility of Waka Kotahi, NZTA).

The key issues relating to unsealed pavements are:

- Understanding the road user's expectation regarding roading levels of service
- Optimising the issue of limited funds to maintain the condition of assets
- Poor quality pavements due to historic road construction techniques
- Moderately high rainfall and low winter temperatures
- Effect of heavy vehicle flows created by dairy and forestry industries
- Impact of possible increases in allowable axle loadings
- High incidence of single vehicle loss-of-control type crashes on rural roads

10.6.2 Asset Description (Inc. how asset data is stored)

Masterton District Council owns/maintains 278 km of unsealed roads and these sealed roads are categorised into hierarchical categories to assist with the identification of point of view.

The ONRC classification will help local government (MDC) and the Transport Agency to plan, invests in, maintain and operate the road network in a more strategic, consistent and affordable way throughout the country.

Table 10-10: Unsealed Pavements by ONRC

Unsealed Pavements - Category Groups			
Road Type		ONRC Category	Length (Km)
Unsealed	Urban	Low volume	189.7
		Access	88.3
Total			278.0

Most of the unsealed roads have developed over time from tracks into roads, with the vegetation removed and metal laid over a long period of time. The standards and requirements in terms of width and strength have improved over time.

Masterton District Council has adopted the following maintenance classes as summarised in Table 10-11, and these classes are used to determine the level of maintenance activity for these roads.

Table 10-11: Unsealed Roads Summary

Unsealed roads summary			
Road category	Definition	Average traffic volumes	Total (km)
U1	Normal maintenance criteria, standards and response times apply to both U1 and U2 roads. Only grading requirements differ.	ADT $\geq$ 100	85
U2		ADT < 100	168
Requested	Roads which carry very little traffic, and which serve few properties. The deterioration is minimal, and maintenance is only carried out on request. Generally, this classification applies by agreement with the road users.	Often unused	25
Total			278

* ADT = Average daily traffic.

The lane width of the unsealed road can vary from 2.5m to 3.0m.

Table 10-12: Unsealed Pavements - Lane Lengths

Unsealed Roads – Lane Lengths		
Single Lane (km)	Double Lane (km)	Total (km)
242.8	35.2	278

10.6.3 Asset Condition and Monitoring

The unsealed road asset is in a reasonable but constantly changing condition depending on traffic use, weather, position in its maintenance cycle etc. Routine maintenance work is undertaken to limit defects and to provide an acceptable level of service. The condition is monitored by Council engineers, contractors and consultant inspections, as well as via complaints and queries from users.

An assessment for RAMM of condition rating or roughness is not undertaken on unsealed roads.

The inventory for unsealed roads contains the following types of information, displacement, road type, pavement type, pavement use, and lane width, number of lanes, owner, loading, ESA, and traffic volumes.

For nominal asset lives Refer to Table 10-3

10.6.4 Vulnerable Assets

There are currently no unsealed roads classified as more critical than others within the Council's Transport network.

However, the following unsealed roads were assessed as being more vulnerable or at risk than others in the Wairarapa Engineering Lifelines Project report. See Table 10-13:

Table 10-13: Vulnerable Assets - Unsealed Roads

Vulnerable Assets – Unsealed Roads	
Road Name	Vulnerable To
Annedale Road	Liquefaction, Flooding / Drainage
Kaiwhata Road	Fault displacement, Land subsidence
Wairere Road	Land subsidence
Daggs Road	Land subsidence
Otahome Road	Land subsidence
Tinui Valley Road	Land subsidence
Ngahape Road	Land subsidence
Mataikona Road	Coastal erosion

10.6.5 Asset Capacity / Performance

Performance of the carriageway assets has been assessed in terms of capacity, customer satisfaction and safety.

10.6.5.1 Physical Capacity

The present geometric capacity of this asset is generally adequate to meet existing demand. All unsealed roads are well maintained, but there are still unsealed roads of irregular or narrow width which will need widening over the coming years, especially those used regularly by heavy vehicles.

10.6.5.2 Customer Satisfaction

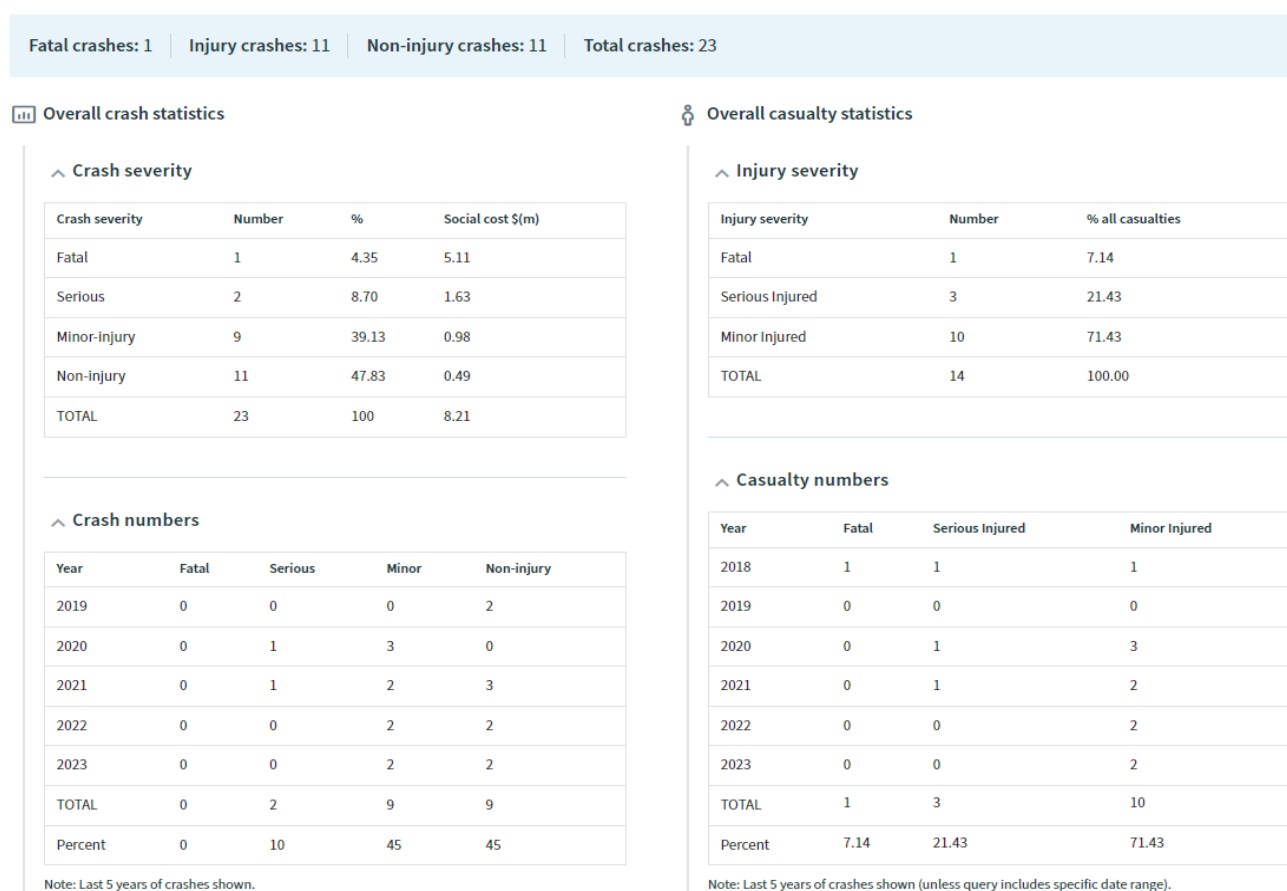
Public concerns generally relate to issues of roughness, dust, mud, corrugations, potholes and soft areas. These are all issues that are being dealt with to some degree by the maintenance contractors, in keeping the deficiencies within acceptable limits. There are relatively few requests for seal extensions on the unsealed portions of the network and these are usually difficult to justify economically because of low traffic volumes.

10.6.5.3 Safety

Waka Kotahi monitors and records crash data on behalf of Road Controlling Authorities (RCA). Each year NZTA reviews crash data from the previous five years and reports on results, trends and key safety issues. The information is used to assist in the development of engineering, education and enforcement programmes. A crash analysis of the district's unsealed roads has been carried out on the last five complete years and is presented in Figure 10-9. Data is sourced from NZTA Crash Analysis System (CAS) and is loaded into the RAMM. The CAS calculated social cost for five years of crashes on MDC unsealed roads is 8.2 million dollars.

10.6.6 Design and Service Standards

Figure 10-9: Last Five (July 2018 – July 2023) Years Crash Data on Unsealed Roads



Council currently uses pavement standards based on the NZTA specifications for construction, maintenance and rehabilitation of unsealed roads. The design parameters adopted in case of existing unsealed pavements use are outlined in Table 10-14.

Table 10-14: Design Standards - Unsealed Roads

Design Standards – Unsealed Roads			
Unsealed Road Type	Width of Lane (m)	Thickness of Sub-base + Base (mm)	Thickness of Running course (mm)
Access	3.0-3.5	100-150	25
Low Volume	2.5-3.0	100-125	25

MDC currently follows design standards and specifications published by Waka Kotahi NZTA and Austroads for the construction, maintenance and rehabilitation of unsealed roads. The design standards are either based on the guidelines prepared by AUSTROADS, if the mechanistic design approach is used, or more commonly the NRB State Highway Pavement Design and Rehabilitation Manual if an incremental design approach is adopted. However, the design of a pavement depends on many factors including traffic volume, material strength, sub-grade soil condition and axle loading.

10.6.7 Maintenance Plan

Maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure.

The maintenance strategy has been developed to achieve cost-effective maintenance to maintain the assets at the intended level of service.

MDC has determined that the most effective way to achieve these objectives is to contract out maintenance works to commercial contractors. This allows for competitive tendering as a way of ensuring a true maintenance value of the works.

The term of contract is initially for five years, with the opportunity for extensions to eight years on a year-by-year basis, subject to the contract performance and agreement of both parties.

The contractor performs measures for the following day to day maintenance works on gravel roads:

- Grading and reshaping of the road
- Providing and laying maintenance gravel
- Carrying out widening and strengthening of roads as required
- Vegetation control
- Marker post and drainage maintenance
- Repairing potholes
- Digging out soft points
- Clearing slips, dropouts and washouts
- In situ stabilisation works

Each road shall be graded at regular intervals, not less than the required minimum number of times.

The minimum number of times per year each road (in the 2 categories) shall be graded is shown in the following Table 10-15 together with an indicated possible average number of times per year that roads may require to be graded to meet the specified maintenance standards. These are guidelines only and are dependent on climatic conditions and traffic loading variations.

Table 10-15: Grading Frequency

Grading Frequency		
Road category	Number of Grading's per year	
	Minimum grading cycle	Probable grading cycle
Access	12	18
Low Volume	6	10
Low Volume (on request) (40km)	On specific request of the Engineer	

Grading will be used to remedy the following faults:

1. Corrugations

Corrugations shall not be permitted to exceed a maximum of 30mm from crest to trough anywhere on the carriageway and potholes when they are at regular intervals in the direction of travel, generally up to 1.0m apart, shall not exceed 50mm in depth.

2. Rutting

Ruts are removed, and the surface restored to the general cross fall of the road. Ruts shall not be permitted to exceed a maximum 75mm in depth from crest to trough.

3. Loose Surface

Loose aggregate on the pavement surface shall not exceed 30mm loose depth.

10.6.8 Maintenance contract monitoring

- Contractor's performance monitoring

The Council needs to be vigilant in monitoring the performance of contractors to ensure that performance standards are continually achieved. The Council's inspection programme therefore becomes a crucial element in managing these assets. The Council audits the contractor's performance by inspection and measurement of the contractor's work and the roading assets.

- Performance criteria

Requirements of the specifications are met.

- A pro-active maintenance programme is implemented.
- Inspections are undertaken at frequent enough intervals to ensure that the requirements of the specification are met.
- Repair works are programmed and completed in a timely manner.
- The carriageway, feather edges and tapers retain their widths and cross-fall.
- No reasonable complaints are received by the engineer concerning the contractor's operation or condition of the road during the contract period.
- During maintenance operations the carriageway shall remain passable to all traffic that would normally be expected to use that road.

- There is no debris within the carriageway, which compromises the safety of the road users or threatens the integrity of the pavement.
 - There is no drift of chemicals during spraying and there is minimum damage to the environment.
 - Visibility of traffic signs and roadside furniture is not hindered by vegetation.
 - Response times
- Response times for the contract are outlined in Table 10-16 and are from section 7.2 of the contract.

Table 10-16: Response Times - Unsealed Roads

Response Times – Unsealed Roads		
Work Category	Response Time (days)	
	Access	Low Volume
Significant Potholes	5	5
Grading	In programme	In programme
Pavement failure repairs	In programme	In programme
Supply and placement of maintenance aggregate	2	5

10.6.9 Financial

The Roding asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023 and includes all (sealed and unsealed) land and formation.

Table 10-17: Asset Valuation - All Roads (2023)

Asset Valuation – All Roads (2023)			
Item	Optimised Replacement Cost (\$)	Optimised Depreciated Replacement Cost (\$)	Annual Depreciation (\$)
Land	87,106,136	87,106,156	0
Formation	295,921,594	295,921,594	0
Pavement	141,791,681	100,911,491	2,500,606
Shoulders	10,466,982	8,697,825	133,167
Sealed Surfacing	29,986,644	15,296,722	2,015,113

*2020 valuation

In valuing the roading asset, three components were calculated: The Optimised Replacement Cost, Depreciated Replacement Value and Annual Depreciation.

The Optimised Replacement Cost is the cost of building the asset “today”. In arriving at this value, it is assumed that modern construction techniques are used but the physical result replaces the asset as it exists. The rates used are current from construction, resealing and maintenance contracts.

- Land

The land within the reserve width of the roads has been calculated for valuation. The value of land does not depreciate as regular maintenance will allow them to provide adequate service indefinitely.

- Formation

Formation includes all earthworks necessary to prepare the cut and fill batters and bring the road formation up to the underside of the sub-base. The formation does not depreciate.

The unsealed pavement structure is assumed to consist of permanent sub-base and base layers protected by a maintenance metal layer, which is replenished as required to maintain the overall structural integrity.

- Pavement

An assumed age has been used in the valuation exercise and loaded into RAMM. The remaining service life was estimated from local experience.

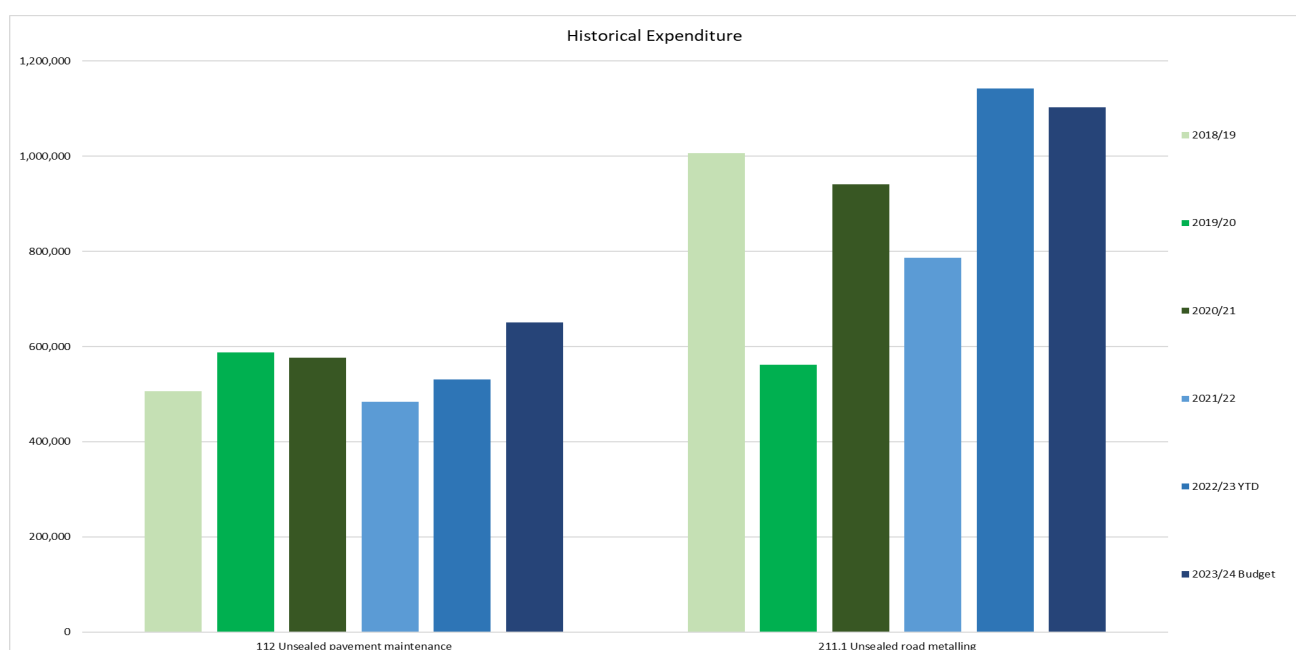
- Sealed Surfacing

The current sealed surface had its age and remaining life determined from an analysis of the historical RAMM sealing data. Data was sourced from the MDC Valuation report 2023.

10.6.10 Historical Expenditure

Historical expenditure on unsealed road assets from previous years is summarised in Figure 10-10. Data is sourced from financial reports.

Figure 10-10: Historical Expenditure – Unsealed Roads



Over the last six years the average cost of maintaining one kilometre of unsealed road is \$5,310 (excluding emergency works).

10.6.11 Renewal, Replacement and Programme

The main parameter for unsealed road renewals is the road condition and the cost of maintaining the required level of service. The renewal strategy is based around measuring and forecasting the deterioration of roads and scheduling investments in renewals when the level of deterioration becomes unacceptable. The main drivers for renewal works are:

- Progressive loss of surface materials due to trafficking and weather – the periodic application of wearing course materials is used to remedy this.
- Pavement strength being inadequate for the traffic loading. This usually occurs in association with forest harvesting or similar activity – pavement rehabilitation works are used to remedy this.

The application of metal to an unsealed road is classified as a capital investment in the pavement.

With an unsealed road, deterioration can sometimes be very rapid – e.g. a road that was adequate when used by the occasional heavy vehicle becoming impassable when new logging or increased farm activity takes place along it. The effects will be more rapid if this occurs during wet weather, i.e. winter. In these circumstances the strategy must be flexible and responsive to change.

Proposed rehabilitation sites are verified as the lowest cost maintenance option before being programmed for construction. Field observations have identified road sections as AWPT sites likely to justify treatment.

10.6.12 Asset acquisition and creation plan

Asset creation in relation to unsealed roads includes:

- Road reconstruction
- Minor improvements
- Road improvements

MDC's asset creation strategy is:

- To prioritise works in descending order of Benefit/Cost (B/C)
- To carry out works where Waka Kotahi NZTA financial assistance can be obtained.

1. Road construction/reconstruction

As the existing roading network is good enough to carry current traffic volumes, there is little scope for undertaking new construction or reconstruction of unsealed roads.

2. Minor Improvement Works

Minor improvement projects are defined under Waka Kotahi work categories and are generally small safety projects that are typically remedial projects identified by crash

reduction studies. The following minor safety works are generally undertaken on unsealed roads:

- Small, isolated geometric improvements
- Intersection improvements
- Traffic calming measures
- Provision of guard railing
- Sight benching
- Dust suppression
- Traction surfacing

3. Road Improvements

The overall unsealed road network is considered adequate to meet the needs of the District at present. There are no major improvement works planned for the unsealed road network other than small isolated projects as listed above.

Seal extension need is determined by economic analysis. Where Waka Kotahi funding criteria cannot be met Council's seal extension policy applies. Currently no seal extensions are endorsed that are not supported by economic analysis. Dust suppression products (where available and economic) are applied to unsealed pavements on a needs basis as a maintenance activity.

10.6.13 Programme

The unsealed roads require routine maintenance to maintain the required level of service.

Table 10-18 shows that the annual renewals expenditure for this asset is forecast to increase in future as outlined in the programme Business case.

Waka Kotahi currently provides 56% of the cost of maintenance, renewal and upgrading of unsealed pavement assets. The remaining portion of expenditure is funded from rates.

Table 10-18: Unsealed Roads, Renewal and Capital Costs Identified

Unsealed Roads Maintenance, Renewal and Capital Costs Identified			
Action/Work and Driver	Estimated Cost (\$'000)	Scheduled For	How this will be funded
Increase renewal and replacement of unsealed road assets as part of strengthening maintenance and application of new wearing courses.	\$1,088 \$1,164 \$1,233	2024 2025 2026 2024 and ongoing	This cost will be. Funded from NZTA subsidy, rates and depreciation.
Condition assessment and compliance with standards.			

*Note – the work sites listed are provisional only and will be confirmed by the Project Manager prior to each year's activity.

Table 10-19: Unsealed Road Rehabilitation Programme

Unsealed Rehabilitation Programme												
Road Name	RP Start	RP End	Area	Cost \$1000	Programme \$							
					2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Future
Bute Rd	2140	4440	7360	\$650.00		650						
Kaiwhata Rd	2123	3023	4500		188					X		
Ngahape Rd					350				X			
Wearing Coarse					550	514	600	599				
Tanawa Rd	0	7245	34216	\$232.60			233					
Mangapurupuru Rd	0	7480	28638	\$194.70				195				
Coopers Rd	0	2981	11912	\$81.00			81					
Mikimiki Rd	3200	8075	17402	\$118.30						118		
Ngaumu Rd	5580	8828	19488	\$132.50					133			
Puketitiri Rd	30	2780	16775	\$114.00				114				
Upper Waingawa Rd	1459	4855	10526	\$71.60						71.6		
Budds Road	0	1820	6904	\$46.90		47						
OTTA Seals			9282	\$320.00			320					
Total Costs Unsealed Roads												

Forecast costs are shown in the combined forecast table in section 9 Table 9-1: Investment Summary by Work Category

10.7 Pavement Drainage

Drainage is an essential component of the transport network and helps deliver an effective and efficient transport system. Masterton Council strives to contribute to the resilience of the transport network by protecting the road edge and substructure from stormwater erosion and damage.

10.7.1 Introduction

Efficiently diverting stormwater run-off from the road pavement and into the stormwater system has the resulting outcomes:

- Prevention of ponding of water on the road or footpath and adjacent properties
- Prevention of the saturation of pavement layers that may cause structural deterioration
- To provide the clear delineation and safe movement for pedestrians and traffic in the transportation network.

This section covers drainage control assets in the Masterton District that Council owns and maintains. Drainage control assets consist of surface water channels (earth and sealed), culverts (up to 3.4m² including piped vehicular crossings), kerbs and channels (various types), sumps and soak pits.

The Council maintains an urban Stormwater reticulation that is fully described in the Stormwater Asset Management Plan – Part B and this works in tandem with the Roding drainage assets.

10.7.2 Asset Description (Inc. how asset data is stored)

A summary of the Council's drainage control assets, taken from the RAMM inventory, is provided in Table 10-20.

The stormwater assets recorded in the second table are from the Council's GIS data base and these are listed for reference. The management of these assets in the second table is described in detail in the Stormwater Asset Management Plan which is a separate document to this Roding Asset Management Plan.

Table 10-20: Drainage Assets Summary

Drainage Assets Summary			
Roding Drainage Items	Total (m)	Urban Stormwater Items	Total
Dished Channel (Concrete)	1748m	Stormwater manholes	65
Kerb and Channel (Concrete)	187447m	Watercourses	96283m
Kerb and Dished Channel (Concrete)	140m	Soak pits	96
Kerb only (concrete)	918m	Stormwater pipes	46116m
Mountable Kerb and Channel (concrete)	11963m		
Mountable Kerb only (concrete)	133m		
SWC (Deep, >200 Below Seal Edge)	814387m		
SWC (Shallow, <200 Below Seal Edge)	141807m		
Catch pits	1548		
Culverts (length)	36275m		

Drainage Assets Summary			
Roading Drainage Items	Total (m)	Urban Stormwater Items	Total
Subsoil drain	5820m		

The diameter of the culverts varies from 100mm to 6000 mm. The diameter of the subsoil drains is usually 150 mm.

Culvert Size Ranges	Diameter Range
Small culvert	<600mm
Large Culvert	>600mm - <3400mm
Major culvert or bridge structure	>3400mm

Table 10-21: Drainage Assets - Material and Size

Drainage Assets – Culvert Material and Size		
Item	Diameter Range	Length (m)
Asbestos cement	225-500	397
Concrete	100-5,000	33024
Earthenware	125-375	253
HDPE	125-600	584
Poly Vinyl Chloride	50-480	396
Steel	225-1,200	1592
Stone	600-1200	18
Timber construction	300-425	11
Total		36275

The general life expectancy of concrete drainage control facilities is considered to be in the range of 75 to 100 years depending on the type of facilities.

For nominal asset lives Refer to Table 10-3

10.7.3 Vehicle Crossings – (bridge crossings)

Driveway Maintenance Policy Statement:

In Masterton, we emphasize the importance of driveway maintenance to uphold acceptable standards. This policy outlines our approach to driveway maintenance, repair, and reconstruction, as well as our responsibilities regarding accessways.

1. Maintenance and Repair Responsibilities:

Once a driveway is installed, it is the responsibility of the property owner to ensure its ongoing maintenance and repair. This includes the repair, reconstruction, renewal, or

removal of accessways. Property owners are required to maintain their accessways to an acceptable standard.

2. Footpath Maintenance:

Masterton District Council is responsible for maintaining the section of footpath adjacent to the property. Property owners are not responsible for footpath maintenance.

3. Alterations for Road Widening or Stormwater Realignment:

If road or stormwater improvement work is carried out by Masterton District Council and this work necessitates alterations to a vehicle crossing to meet the new kerb alignment, we will undertake these alterations at our expense. Property owners will not be responsible for the costs associated with such alterations.

There is approximately 4.7km of urban roads that have the older vehicle crossing 'bridges' amongst an approximate total of 200km of kerb (2.5%) in the urban area. These crossing points are a variety of construction types from varying ages that allow vehicles to bridge the kerb and channel for access from the public roading network into private properties.

These vehicle crossing bridges can be detrimental to flow of stormwater in the urban network being readily blocked by debris and frequently detaining water flow causing the ponding. They are a consistent source of public complaint and are an inefficient structure when managing the cleanliness of the kerb and channel structures.

However, the effect of removing these old structures could have a negative impact with the loss of the detention period provided by the bridges during flash floods, the replacement with newer standard crossings may also cause entranceway gradient complaints and could restrict cycle lane widths.

The replacement of older Vehicle Crossing Bridges is currently under consideration by Council as a staged long-term project where other urban drainage does not take priority.

An example of where bridge crossings have been upgraded in conjunction with the kerb and channel is in Renall and Essex Street These two streets had been nominated previously with a higher priority for replacement due to being in a less favourable condition.

The accepted standard required for replacement is in the Wairarapa Combined District Plan as the NZ Standard 4404:2004 – land development and subdivision engineering. Masterton District Council requires all new crossings to be constructed on existing streets to be in accordance with MDC plan 805 A, B or C.

Vehicle Crossings	
Bridge type	Industrial type 805c
	

10.7.4 Asset Condition and Monitoring

1. Surface Water Channels and Kerb and Channels (SWC)

The RAMM Condition rating inspects all surface water channels, inclusive of any broken channels, high lips, broken surfaces, uphill grades, blockages, blocked SWC, inadequate SWC and insufficient shoulders. The roading contractor also performs a bi-annual inspection of these assets.

The summary of the result is shown in Table 10-22 and Table 10-23, the actual data is held in the RAMM database. The exact age profile of all the drainage control assets is unknown. Planning is underway to assess this information.

Condition rating survey results show that the overall condition of SWCs and Kerb and Channels is reasonably good. From these inspection reports and the age profile of drainage assets, a 10-year programme for maintenance, renewal and new construction works can be developed.

Table 10-22: Water Channel - Condition

Surface Water Channel – Condition			
Item	Total length	Inadequate channel capacity (m/%)	Blocked channel obstruction (m/%)
Surface Water Channel	956.194 km	75/<1 %	180/<1%

Table 10-23: Kerb and Channel - Condition

Kerb Channel and – Condition					
Item	Total length	Blocked channels (m/%)	Broken surfaces (m/%)	High Lips (m/%)	Uphill Grade (m/%)
Kerb and Channel/Other	187.587 km	40/<1%	152/<1%	982/<1%	141/<1%

2. Culverts

Since 2000 Council has had an inventory for culverts in its RAMM database. Collated data includes details describing the asset.

There are some faults with the database, but these are being rectified as inspections are carried out. Items such as the age profile of culverts and a detailed size requires more verifying in the field.

From inspection by the MDC engineers, and from the contractor's reporting, the overall condition of the culverts is considered to be satisfactory.

The maintenance contractor is required to inspect all culverts in a cyclic programme of one sixth of the network capturing and determine asset condition and cleanliness.

3. Sumps and Soak pits

The inventory for sumps has been updated however the soak pits inventory is still incomplete. The age profile for sumps and soak pits is also unknown. These assets are not yet fully integrated into the RAMM condition rating survey. But the known overall condition of these assets is considered to be satisfactory.

Maintenance works are being done to keep them in good condition. Very few complaints are received for these assets. However, it is recommended to include these assets in the next RAMM condition rating survey.

All known or identified urban soak pits are contained within the Stormwater Asset Management Plans and that asset information is currently stored in the Council's GIS system.

10.7.5 Critical Assets

All drainage control assets are considered critical in providing an effective drainage system to promote safety and reduce risks such as flooding.

10.7.6 Asset Capacity /Performance

Current asset capacity and performance is assessed as being adequate on the basis of recent condition rating results, public complaints and comments from the maintenance contractors.

10.7.7 Design Standards

Current MDC drainage standards require assets to be designed for a primary system return period of ten years, and a total system return period of 50-100 years.

10.7.8 Maintenance Plan

Routine maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure.

Routine maintenance activities for drainage control assets include:

- Regular inspection
- Recording
- Repair/fault reporting
- Cleaning
- Replacement of the damaged portion of structures
- Unplanned maintenance activities include:
 - Replacement
 - Lowering of culverts
 - Increasing culvert sizes

At present, Council engineers identify maintenance needs in the course of their duties, and via public complaints and feedback from the maintenance contractor.

The maintenance contractor is currently responsible for carrying out routine maintenance works for all drainage control structures on both day work and a unit rate basis.

Asset failures are responded to as quickly as possible to make the drainage network effective and safe using the most economic method available, whether it is minor or major repairs that are required.

NZTA will provide 56% subsidy by 2023/24 for maintenance of the MDC's drainage control assets.

10.7.9 Financial

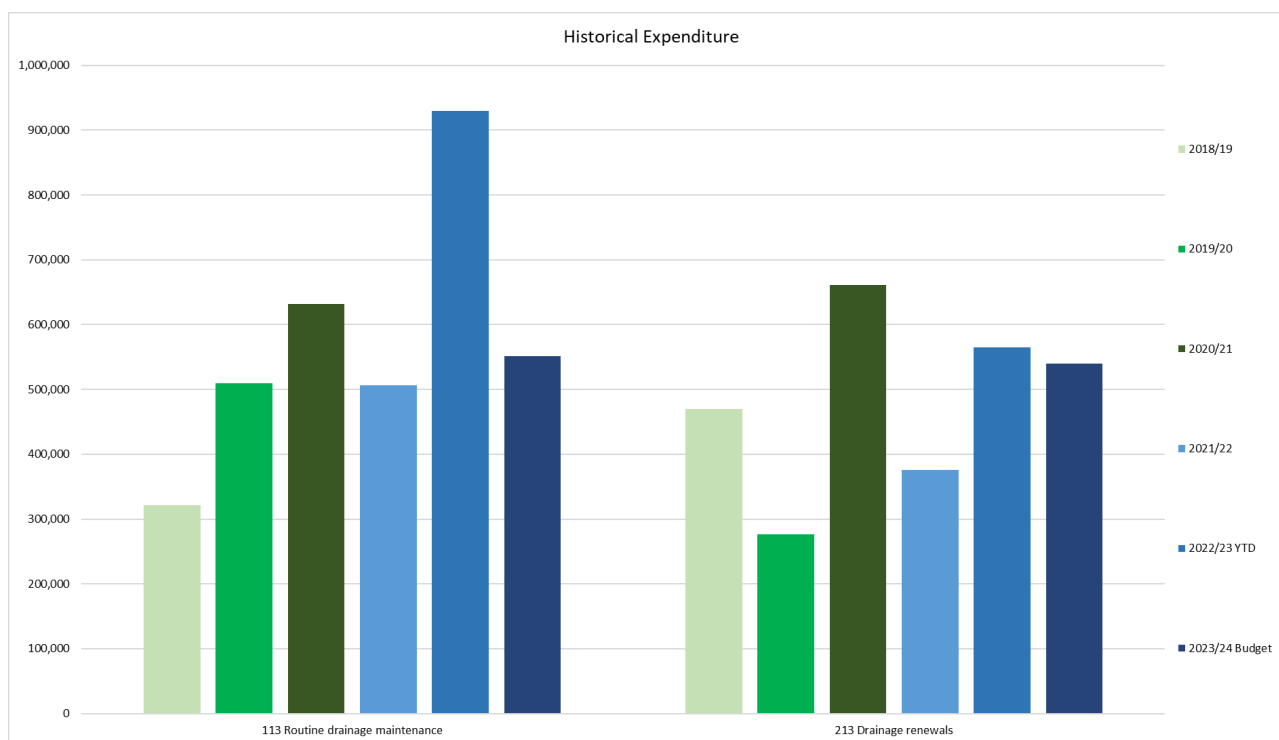
The Drainage asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023.

Table 10-24: Asset Valuation - Drainage (2023)

Asset Valuation – Drainage (2023)			
Component	Replacement Cost (\$)	Depreciated value (\$)	Annual Depreciation (\$)
Surface Water Channels	32,139,917	9,860,725	321,399
Culverts	54,869,249	31,162,571	824,938

Historical expenditure on drainage control assets from previous years is as summarised in Figure 10-11. Data is sourced from financial reports.

Figure 10-11: Historical Expenditure – Drainage



10.7.10 Renewal/replacement

Renewal expenditure is work that restores, rehabilitates, replaces or renews an existing asset to its original capacity.

Replacement/upgrading of drainage assets takes place in the following cases:

- Where faulty or damaged structures cannot be repaired because of obsolescence
- Where replacement is more economic than continuing repair
- Where compliance with new legislations is required

Every two years a RAMM condition rating assessment is carried out on the drainage channels (excluding culverts and chambers). The most recent report from June 2023 shows that there were very few faults found with the drainage structures and their physical condition is good.

Soak pits / Catch pits

While the maintenance of soak/catchpits is not excluded, Council's normal policy to install new soak/catchpits rather than attempt to rehabilitate any existing non-functioning soak/catchpits.

Culvert replacement strategy

The following culvert replacement strategy is currently used:

- The culvert replacement strategy is based on the location, condition and material of existing culverts. Road sections where pavement rehabilitation is proposed, and areas of high risk will be given priority for replacement works.
- Culverts smaller than 375 mm diameter or width can get easily blocked. It is difficult to maintain them and keep their waterways clear from debris. If these narrow culverts are located within either a proposed pavement rehabilitation site or a high-risk area, they should be replaced with new ones that have a diameter or width 375 mm or more.
- The butt-jointed culverts are structurally weak and vulnerable to lateral displacement. They should be gradually replaced according to their importance.
- After carrying out the condition rating survey, culverts having poor structural capacity should be identified, and replaced with priority based on the consequence of failure at the specific location.
- Culverts are upgraded in conjunction with pavement rehabilitation works as necessary, at specific sites known to be trouble spots and where the need is flagged by the land use demands.

Appendix 7 Culvert Replacement Decision Tree shows a proposed decision tree for replacing the culverts.

Vehicle Crossings - “bridges”

We currently budget around \$250k per annum in the urban network (approx. 0.5km) for kerb renewal this is not necessarily always where bridge crossing will be removed.

10.7.11 Asset acquisition and creation plan

Council currently has no plans to create new drainage control assets. However, Council may acquire new assets installed by developers as part of sub divisional development. Such drainage control assets are installed at the developer's expense.

10.7.12 Programme

Forecast costs are shown in the combined forecast table in section 9 Table 9-1: Investment Summary by Work Category

Waka Kotahi NZTA will provide 56% subsidy by 2023/24 for maintenance and replacement of drainage assets. The remaining portion of expenditure is funded from rates.

10.8 Bridges and other Structures

Bridges and structures enable people and freight to move safely, reliably and efficiently across physical barriers on the road network. It is Masterton Council's objective is that they are appropriate to carry the volumes and weights of traffic that wish to use the surrounding road, footpath and cycleway networks.

10.8.1 Introduction

Bridges are described as structures that have waterway area of greater than 3.4m². Works carried out to repair or renew components of a bridge structure meeting this description are eligible for subsidy from NZTA.F

10.8.2 Asset Description (Inc. how asset data is stored)

Council's roading network includes 261 structures that include both bridges and large culverts. These structures are constructed from a number of materials in different styles, as summarised in Table 10-25.

Data was originally sourced from individual bridge files and spread sheets.

Table 10-25: Bridges Summary

Asset Summary - Bridges	
Bridge Material Type	Number
Concrete	38
Concrete / steel /concrete	3
Concrete arch	8

Asset Summary - Bridges	
Bridge Material Type	Number
Concrete beam	57
Concrete box	91
Concrete slab	20
Concrete pipe	1
Pre-cast units	6
Steel	6
Steel (Armco)	1
Steel / Concrete	202
Steel / Timber	5
Timber	3
Total	261

**Note - Bridge Type describes the predominant material used in construction*

Of these structures 92 are single lane.

There are 8 cattle underpasses in the district. These are maintained by the owner and inspected by the Council in conjunction with the biennial bridge inspections.

The bridge data is stored on a combination of spreadsheets, paper files and the RAMM and HSIMS data base. The bridge inventory is also viewable on the Councils 'Map Viewer' GIS platform through the Councils website.

The bridge data is available with Waka Kotahi bridge management programme HSIMS which both holds inventory information and assists with bridge permitting for overweight loads.

Council is in the process of improving asset data for retaining walls. While these assets have been inspected over the last year, at this stage the data is being verified and added to RAMM. This has not proceeded due to AMDS migration, but will occur in the 2024/25 year.

Following this work a lifecycle management plan for retaining walls will be developed for inclusion in the 2027 Programme Business Case.

10.8.3 Asset Condition and Monitoring

Bridges are located district-wide and are subject to the range of local climatic conditions. Wet weather conditions have a big effect on the life of timber structures when they are in service in wet condition.

The overall condition of the bridge asset is considered to be satisfactory in terms of structural condition. The Maintenance Contractor inspects all bridges on a biennial basis and also after a significant event, such as a flood or earthquake, to identify report and repair minor maintenance issues that do not require structural design. A more detailed inspection is carried out two yearly by a bridging engineer to identify structural faults. From these inspections, the maintenance programme for the following two years is prepared. The need for further investigation of more serious structural concerns is noted and these investigations determine the need for renewal or upgrading.

The bridge network is in generally good condition due to these regular inspections and maintenance programme. Repairs are generally made before they threaten the integrity of structures. Where the cost of repairing a structure becomes significant and uneconomic, the option of replacing the structure is considered.

Other than routine maintenance, bridges and culverts do not have a regular work programme to maintain their service potential, accordingly a financial provision for the decline in service potential of bridges and culverts is included in the cost of roading service.

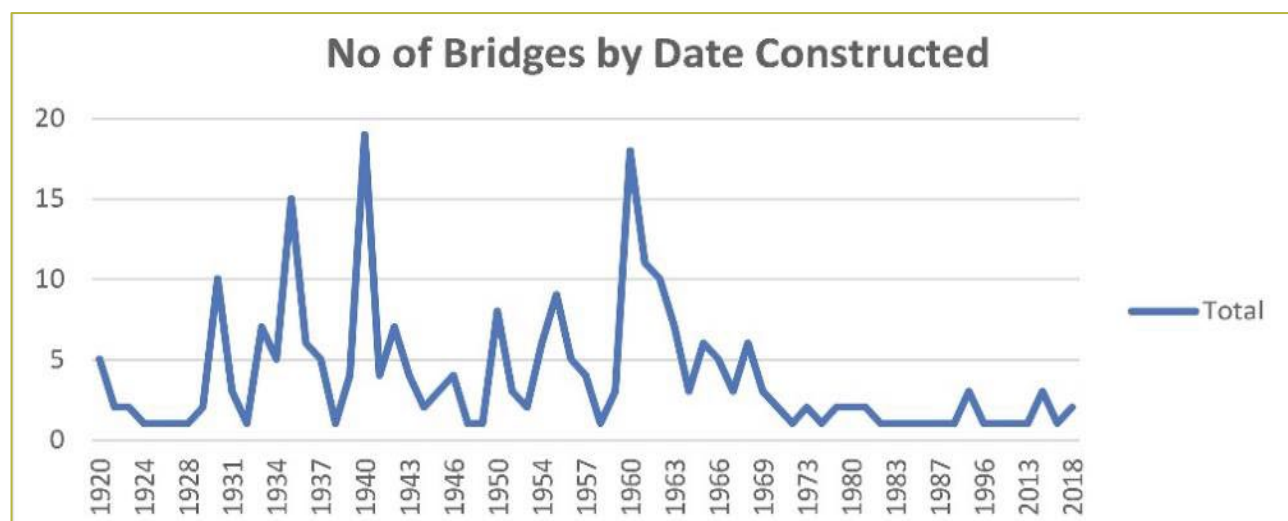
Retaining walls- Type, Age and Condition	
Type	Count of Retaining Wall ID
Anchored	24
Cantilever	4
Gabion	1
Gravity	2
Reinforced Earth	1
Rock	32
Single Crib	3
Timber Pile	1
Grand Total	68
Age	Count of Retaining Wall ID
1	1
2	1
3	3
5	1
13	3
32	59
Grand Total	68

For nominal asset lives Refer to Table 10-3

10.8.4 Age Distribution and Life

The oldest bridge recorded in the bridge database was constructed in 1920. Approximately 35% of the bridges are more than 50 years old.

Figure 10-12: Bridges by Construction Age



10.8.5 Critical Assets

The Wairarapa Engineering Lifelines Project report identified bridges on important routes considered vulnerable to natural hazards. See Table 10-26.

Table 10-26: Critical Assets - Bridges

Critical Assets - Bridges	
Bridge Name	Vulnerable To
Tinui Bridge at M/Castlepoint Road	Liquefaction
Double Bridge at Opaki/Kaiparoro Road	Fault displacement, Earthquake
Taueru Bridge at M/Castlepoint Road	Earthquake
Whakatahine Bridge at M/Stronvar Road	Earthquake
Brancepeth Bridge at M/Stronvar Road	Earthquake
Homewood bridge (old No. 7) at Homewood Road	Earthquake

**Note - The restricted bridges affecting the roading capacity are shown below*

Table 10-27: Restricted Bridges

Restricted Bridges							
Br #	Br Name	Br Type	Posted Restriction			Priority	Work Status
			Weight	%	Speed		
213	Waterfalls	Steel beam, timber deck	7300	75	20	1	Priority raised due to forestry and public concern. Bridge overtopped with moderate flood, closing road.
26	Coopers No 2	Steel beam, timber deck	7300	50	20	2	Diaphragms strengthening when deck replaced. Forest harvest traffic
179	Stoddard's	3 spans, conc' piers, steel beams, timber deck	7300	75	20	4	Diaphragm strengthening on weak span, Low priority
212	Waimapu	steel beams, timber deck	7300	50	20	3	Diaphragms strengthening when deck replaced.
64	Knights	2 spans, conc' pier, steel beams, timber deck	7300	50	20	5	Diaphragms strengthening when deck replaced.
190	Forest Home	3 span, Timber piles, beams and deck. RSJ span 2	4800	30	20		Replacement due to condition of timber members 2023. Due to only 3 properties beyond bridge with low use, replace with low level ford.
92	Maringi	3 span, timber piers, beams, deck	7300	50	20		Ford available for HCV. Programmed for upgrade
39	Graham	3 span, timber pile, steel beam, timber deck	4700	30	20		Serves one property, low usage, no requirement to strengthen.
74	McGruddys	3 span, timber piers, steel(1)/timber(2) beams, timber deck	7300	50	20		Bridge serves only one property. Low priority.
202	Tildersleys	steel beams, timber deck	7300	50	20		Bridge serves only one property. Low priority. Running planks installed 2014.
21	Jennings	3 span, timber pile, steel beam, timber deck	7300	50	20		Serves one property. HCV by-pass available. (Mauriceville Lime Co) Running planks installed 2014

In 2018 the Government increased the allowable weight limits for HCV's to 46T with conditions. This did not allow an increase in axle weights. Due to this change 13 bridges were identified as not being capable of this loading or required further investigation to allow this change. These bridges are signed as restricted and are listed below in Table 10-28. Design checks to determine the work required to remove the restrictions will be programmed on some during the next three-year funding programme.

Table 10-28: Restricted 44T Bridges

Restricted 44T Bridges			
Name of Road	Name of Bridge	Weight Limits	
		Maximum weight on any 1 axle (kg)	Gross weight (maximum sum of axle weights)
Letts Rd	Letts No 1	8200	100% Class 1
Te Parae Rd	Te Parae No 2	8200	100% Class 1
Miki Miki Rd	Miki Miki	8200	100% Class 1
Mangarie Rd	Mangarie No 1	8200	100% Class 1
Mungapurupuru Rd	Mungapurupuru No 1	8200	100% Class 1
Maringi Rd	Wainuiomapu No 1	8200	100% Class 1
Springhill Rd	Springhill No 3	8200	100% Class 1
Te Mai Rd	Te Mai-iti	8200	100% Class 1
Packspur Rd	Mataikona No 2	8200	100% Class 1
Packspur Rd	Mataikona No 3	8200	100% Class 1
Homewood Rd	Homewood No 5	8200	100% Class 1
Ngahape Rd	Ngahape	8200	100% Class 1

Other than restricted bridges, other significant works identified are timber deck replacements, steel beam painting, and concrete bridge condition investigations. Timber decks will be replaced with either timber or concrete depending on traffic use. Steel beams will be programmed for repainting based on need (generally a 25-year life depending on location – coastal areas require more frequent painting). Concrete bridges nearing age 80 are of concern regarding the condition of the concrete due to carbonation.

10.8.6 Asset Capacity /Performance

The capacity of the bridge assets is considered to be satisfactory for carrying existing traffic loadings with the exception of some routes that would benefit from upgrades to the structures to carry 50max loads (see programme business case).

A number of different loading standards have been adopted throughout the history of the bridge network. All new structures are designed to HN-HO-72 to allow for HPMV traffic. Where there is no documentation available, it has been assumed that bridges have been designed to the approved NZ code of practice of the day.

There are currently 11 (4%) weight and/or speed restricted bridges in the network. These are considered to have insufficient capacity to carry Class-I loadings at normal operating traffic speeds. Of these, two bridges are programmed for renewal in the 2027/30 RLTP and the balance will be maintained 'as is' due to being on routes with very low traffic counts and a low percentage of heavy vehicles.

Of the 11 (4%) bridges restricted to Class 1, 6 are recommended for upgrade to HPMV in the 2024/34 LTP. The balance will be upgrade as demand and funding allow.

The posting calculations for each bridge are based on an on-site inspection and physical condition of the members and are stored in the bridge database. Both steel and timber structures are assessed for posting based on their defects and an assessment of structural integrity.

10.8.7 Design Standards

All new structures and upgrades to existing structures are to be designed in accordance with the NZTA Bridge Manual to either HN-HO-72 and for HPMV vehicles where appropriate.

10.8.8 Maintenance Plan

Maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure.

Maintenance issues are identified through structural inspections or by the MDC engineers and the maintenance contractor during their general duties. Where damage occurs to a structure, a member of the public often reports it before it is identified by the maintenance contractor. Where possible, recovery of repair costs will be sought from those causing the damage.

Maintenance works include the following:

- routine maintenance inspection and reporting
- routine cleaning and/or replacement of reflective end-markers
- routine cleaning of metal and debris from bridges decks, joints and bearings
- routine painting of handrails, end posts and sight boards
- removal of debris from piers.

Routine maintenance issues, such as painting of handrails and sweeping of decks, are carried out on a regular basis. More significant maintenance issues, such as repair to expansion joints or bracing of timber piles, generally requires advice from an external engineering source in terms of design and approval of works. More extensive maintenance or upgrades may be carried out under the road maintenance contract or let as an individual contract.

Contractor response times range from two hours for urgent mobilisation to one month for less important items. Maintenance work is carried out in accordance with the terms of the maintenance contracts and with reference to the NZTA Bridge Manual. Repair work is carried out using similar materials to those being replaced, and with materials that will give the longest repair life for the least cost.

There is always an element of risk of injury when maintenance work is deferred. To minimise this risk, major maintenance is carried out as soon as practicable after identification. A temporary weight posting limit can also be put on a structure to control traffic using the structure until repairs can be done.

10.8.9 Renewal/Replacement

Potential renewals are identified through the different inspection programmes. Where a structure can no longer be economically maintained the structure may be replaced or upgraded. Factors such as the number of properties served, the availability of a bypass, and the numbers of heavy vehicles carried are taken into account in determining the need to upgrade or replace the structure.

Replacement structures are generally designed using reinforced concrete, as this provides the best whole of life cost. By using precast elements, the on-site construction time can also be kept to a minimum, reducing interruption to road users.

With the introduction of heavier allowable vehicle weight limits by Government (High Performance Motor Vehicles HPMV), there is now an expectation from industry and the community that routes are opened to allow the economic gains expected by the use of such vehicles to be made. Bridges are normally the limiting factor in making the decisions. This will generally require the bridges to be upgraded. There has been a programme of assessments of bridges from 2014, and in conjunction with NZTA, bridges that require upgrading on the likely HPMV or 50Max routes have been identified. In addition, the removal of restrictions on weight restricted bridges, and the renewal of timber decks as they reach the end of their life has been allowed for. These are shown in the table below.

Table 10-29: Bridge 30 Year Capital Expenditure Programme

Projected Bridge 30 Year Capital Expenditure Programme		
Bridge name	Programmed year	Est. Cost
Upper Waingawa replacement	2025-26	\$400,000
Tidesleys Deck replacement	2029-30	\$100,000
Grahams replacement	2025-26	\$400,000
Bartholomew's (Tinui Valley)	2024-27	\$200,000
Glendonald	2024-27	\$100,000
Maringi Road No3 upgrade for 50Max and renewal of deck	2024-27	\$200,000
Pack spur No1 upgrade for 50Max and renewal of deck	2024-27	\$80,000
Pack spur No2 upgrade for 50Max and renewal of deck	2024-27	\$80,000
Te Mai iti upgrade for 50Max and renewal of deck	2024-27	\$100,000

10.8.10 Financial

The Bridge asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023.

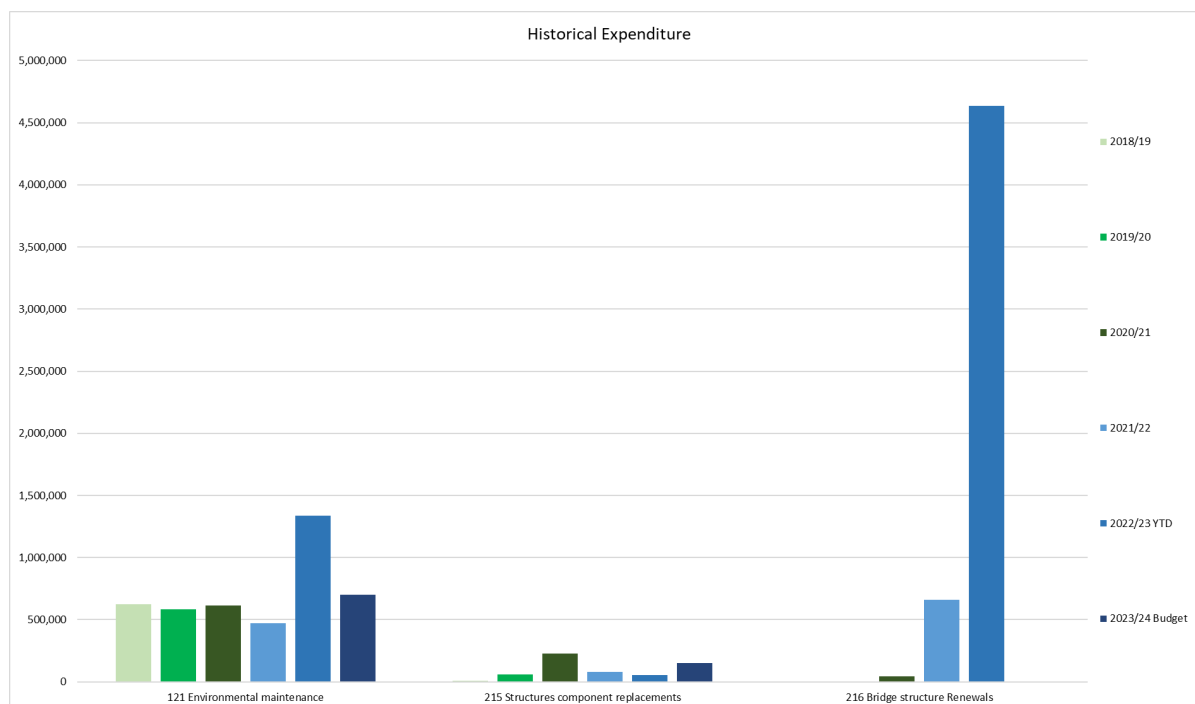
Table 10-30: 2023 Bridge Valuations

2023 Bridge Valuations			
Item	Full Replacement Value (\$)	Depreciated Replacement Value (\$)	Annual Depreciation (\$)
Bridges	147,928,489	108,215,357	1,643,650

10.8.10.1 Historical Expenditure

Historical expenditure from previous years is outlined in Figure 10-13 and is sourced from financial reports.

Figure 10-13: Historical Expenditure - Bridges



10.8.11 Programme

Expenditure for routine maintenance, component replacements and inspections for bridges over the next ten years is estimated at \$368,531 per annum based on current contract rates. The renewal/upgrade costs identified above is included in the Low-Cost low Risk budgets and is additional to this amount.

Forecast costs are shown in the combined forecast table in section 9 Table 9-1: Investment Summary by Work Category

10.9 Carriageway Lighting

Street lighting is an important amenity to local communities and an essential component of the transport network.

10.9.1 Introduction

Masterton District Council provides street lighting which complies with standard illumination levels. This enables safe and easy movement of vehicle and pedestrian traffic on the road network during the hours of darkness, particularly on urban streets. By lighting up the road corridor environment, street lighting encourages night-time use of local facilities and active transport modes such as walking and cycling.

Good street lighting helps improve road safety. It reduces night-time road traffic accidents, improves security for pedestrians and for neighbouring areas, and aids with crime prevention.

Following a major upgrade in 2018/19, all the street lighting luminaires excluding some SH2 in the district are now LEDs lights.

Streetlight assets are managed by the in-house engineering unit with routine inspections conducted by the maintenance contractor, Alf Downs Ltd. The maintenance contractor is responsible for maintaining the light fittings, mounting brackets, outreaches and poles owned by the Council. Most of the Council's streetlights are installed on power poles owned by the line company, PowerCo.

Technical issues are provided through Masterton Council's in-house Engineering Services. Masterton Engineering Staff are responsible for the confirmation and accuracy of the data entered by the contractor of streetlight assets and calculating the energy usage on a monthly basis.

Mercury Energy Limited currently supplies electricity to the Council, including that for streetlights.

10.9.2 Asset Description (Inc. how asset data is stored)

Council currently owns and maintains streetlights and amenity lights, including under-verandah lights in the Masterton urban area and the main residential rural areas of Tinui, Castlepoint and Riversdale.

In 2020 Waka Kotahi initiated a move to take the state highway lighting in the urban area back under their control. Waka Kotahi now manages streetlights on the urban SH2.

The numbers of the streetlights by area are given in Table 10-31.

Table 10-31: Streetlight Type and Number

Streetlights Types	
Area	Total
State Highway (Waka Kotahi NZTA)	395
Urban Rooding	1857
Rural Rooding	86
Amenity Lights (not Subsidised) including car parks, walkways, decorative lights	39
Under verandah	483
Parks (including community housing)	111
Total	2971

All LED lights have a colour temperature of 3000k as agreed with the adjoining Council' this is in line with their 'dark skies' policy.

10.9.3 Asset Condition and Monitoring

In 2018 the Councils roading streetlights and some amenity lights were converted from SON type lanterns to LED. This project was funded from an above normal NZTA subsidy and will lead to significantly decreased energy costs and lower maintenance costs. The effect of this has been reflected in the future operations and renewal funding requirement. Following this in 2021 all of the under-veranda lighting were converted to LEDs.

Currently the condition of the street lighting inventory is not rated. However, given the above LED conversion, all streetlights can be said to be in good condition.

Alf Downs Ltd, the maintenance contractor, maintains the database of streetlights as part of their maintenance of the lighting assets. Data is be stored in the RAMM database and will be updated with condition and performance ratings, so that the monitoring of compliance can be measured for the network in future.

For nominal asset lives Refer to Table 10-3: Rooding Asset Lives

10.9.4 Critical Assets

Failure of any of the street lighting network could have a serious impact on road and pedestrian safety during night-time so all assets are considered important.

The significant negative effects of the street lighting in the Masterton district are outlined in Table 10-32

Table 10-32: Significant Negative Effects of Street lighting

Significant Negative Effects of Street lighting		
	Negative Effects	How we will mitigate
Social	None identified	
Cultural	None identified	
Environmental	Light pollution	LED lights have significantly minimised impact (installed in 2019)
Economic	None identified	

10.9.5 Asset Capacity /Performance

Lighting assets are managed to provide sufficient lighting to maximise safety at the most affordable level. Current lighting levels are considered sufficient to achieve this objective.

10.9.6 Design Standards

Council's street lighting assets are currently designed to comply with the new joint Australian/New Zealand Standards NZS/AS 1158. Generally, all lighting on urban streets is to 'P4' level, however some arterial and primary collector roads have 'V' level lighting.

The following general principles for street lighting on residential and local roads are also considered:

- Adequate illumination to provide for safe and comfortable pedestrian movement, crime prevention and identification of premises.
- Lantern height of between 5.5m and 10m.
- Uniform spacing of lighting columns with spacing preferably not exceeding eight times the mounting height or 60 metres, whichever is less. The spacing may be increased up to twelve times the mounting or 80 metres, whichever is less if using existing service poles.
- Lighting levels of P4 or V as appropriate
- Positioning of lanterns at intersections, sharp bends, noticeable crests and dips in the road.
- Designs of the lighting columns in accordance with the joint AS/NZ standards 1158.
- Lantern type preferably 23- or 27-watt LED fitting.
- Colour temperature of lights is 3000k
- Pole type preferably Oclyte segmental galvanised iron or similar.

Council practice has been to adopt the latest standards and specifications for streetlight assets in order to reflect current practice.

10.9.7 Maintenance Plan

Maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure.

Due to the 'new' nature of the asset, Council relies on reports from the public to identify faults as they occur. Faults consist of either circuit outages, or luminaire failures. Circuit faults are reported through our energy supplier for the network owner (PowerCo) to repair, and luminaire faults are reported to our maintenance contractor.

Detailed inspections are carried out on poles and outreach arms at the time a luminaire is serviced to ensure the safety and security of the fittings.

Alf Downs Ltd, the maintenance contractor for the current contract period of 2019 - 2022, with two years right of renewal to 2024, to carries out maintenance of all streetlight assets.

Waka Kotahi provides 56% subsidy of the total costs for operating, maintaining and upgrading street lighting assets with the exception of any amenity lighting and under veranda lighting.

10.9.8 Financial

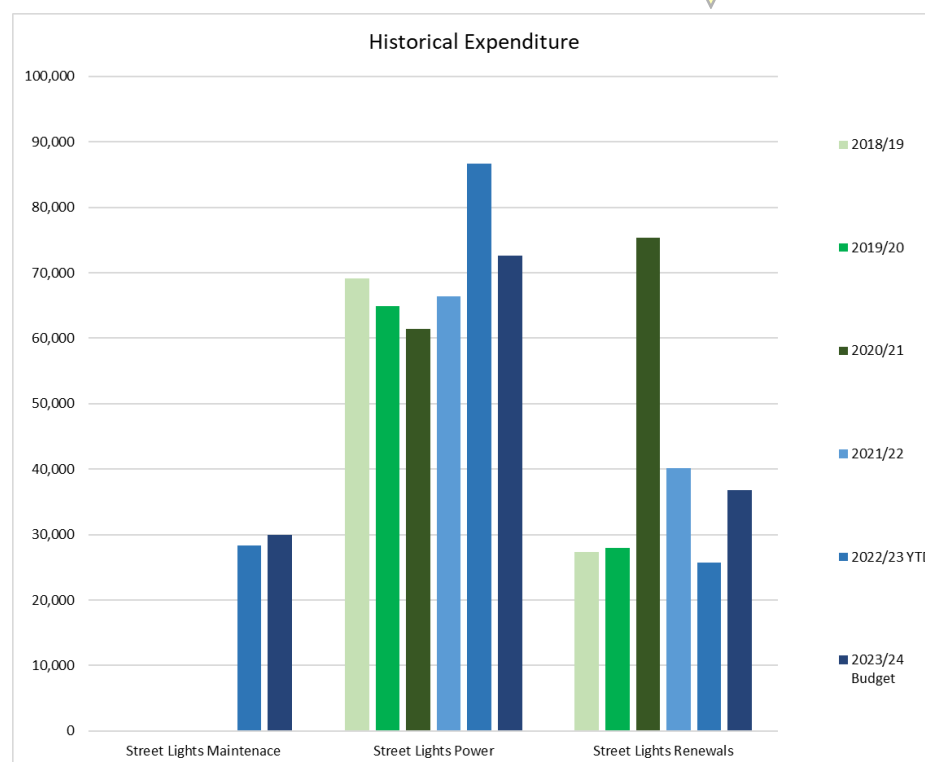
The Lighting asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023.

Table 10-33: Asset Valuation - Streetlights (2023)

Asset Valuation – Streetlights (2023)			
Item	Full Replace Value (\$)	Depreciated Replace Value (\$)	Annual Depreciation (\$)
Streetlights	8,366,765	1,376,661	221,352

Historical expenditure on streetlight assets from previous years is summarised Figure 10-14. Data is sourced from financial reports.

Figure 10-14: Historical Expenditure - Streetlights



10.9.9 Renewal/Replacement

Renewal work restores, rehabilitates, replaces or renews an existing asset nearly to its original capacity.

Poles have an effective life of 60-years and laminae 30 years. The LED fitting has an expected life of 100,000 hours or 12 years so is not included in this 10-year plan.

Replacement/upgrading of streetlight assets also take place in the following cases:

- When faulty or damaged lanterns cannot be repaired because of obsolescence
- When replacement is more economic than continuing repair
- To comply with new electrical regulations or standards
- Poles and outreach arms are replaced when they are no longer structurally sound

10.9.10 Asset Acquisition and Creation Plan

Council currently has no plans to create new street lighting assets. However, Council may acquire new streetlights installed by developers as part of sub divisional development. Such streetlights are installed at the developers' expense.

10.9.11 Programme

Council has made a strategic decision to 'at least' maintain the current levels of service for this activity. There are some corrosion issues with poles in the coastal areas which will require a small number of light poles to be replaced over the next 8 years in our coastal community areas.

Forecast costs are shown in the combined forecast table in section 9 Table 9-1: Investment Summary by Work Category

10.9.12 Disposal Plan

Council has no current plans to dispose of street lighting assets.

10.10 Traffic Facilities and Guardrails

The network of signs and road markings provides for safe and efficient wayfinding and movement across Masterton's transport network.

10.10.1 Introduction

The functions of traffic control devices have been defined by the purpose they provide to road-users and they, regulate, warn, guide, and inform. Signs provide instructions to road users, they warn of potential hazards, and offer general helpful information such as street names.

10.10.2 Asset Description (Inc. how asset data is stored)

The use of signs, road markings, edge marker posts (EMP's) and reflective raised pavements markers (RRPM's) are used for providing delineation, guidance, and control on council owned roads.

Sight rails, guardrails and medians are also used to a lesser extent.

The useful asset life for signs and road markings assets based on the 2020 revaluation is assumed to be:

- 12 years for reflective signs but less if the dominant colour is red
- 20 years for ADS
- Seven years for (long life) thermoplastic markings

Note that the useful asset life for road markings is assumed to be one year except where they are 'long life'.

10.10.2.1 Road Signs

A full sign inventory is maintained in the RAMM database. New signs and any adjustments are recorded in the RAMM system, including any associated posts or supports, an asset description and the assessed condition rating. The data on the following table is sourced from the RAMM database.

Table 10-34: Sign Inventory

Sign Inventory							
Sign type	Excellent	Good	Average	Poor	Very poor	Unknown	Total
Guide	105	685	32	1	10	1	1056
Hazard Markings	68	895	44	1	10	23	1041
Information General	1	2	1	0	0	1	5
Information Miscellaneous	19	62	3	1	1	3	89
Information signs	42	219	3	2	6	48	320
Miscellaneous	16	18	1	0	0	25	57
Motorist Services	1	710	43	9	13	120	997
Permanent Warning	102	710	43	9	13	120	
Regulatory General	135	570	36	1	8	120	86
Regulatory Heavy Vehicle	8	34	6	0	0	3	51
Regulatory Parking	18	123	0	1	5	135	282
Tourist	0	3	0	0	0	0	3
Warning Miscellaneous	1	12	0	0	0	9	22
Total	516	3372	171	16	54	748	4877

10.10.2.2 Road Markings

The Council maintains accurate road-marking data on an Excel spread sheet. Although inventory data was entered on the RAMM system it has not been updated or maintained in this database since 2000. The spread sheet has been continuously maintained and it is estimated to be more than 90% complete. The benefits and costs of maintaining these road marking assets in RAMM need to be assessed and this is identified as a future improvement initiative.

Council uses water-borne marking products, below is a summary of the main components of the road marking assets.

Table 10-35: Road Marking Inventory

Road Marking Inventory		
Item	Unit	Quantity
Centre lines	Km	23.55
Edge lines	Lane Km	262.39
No overtaking lines	Lane Km	28.15
No stopping lines	Km	9.05
Give way controls	Each	179.00
Stop controls	Each	22.00
Pedestrian crossings	Each	26.00
Car park marking	Each	1571.00
Raised pavement markers	Each	4836.00
Misc. words and symbols	Each	680.50

The maintenance contractor currently undertakes the road marking works using sub-contractors.

10.10.2.3 Edge Marker Posts

The Ministry of Transport's guideline for Rural Road Marking and Delineation 1992 (RTS-5) is the basis for the standard that has been adopted for Council's roads. There are approximately 3000 edge marker posts (EMP) on Council roads.

Edge Marker Posts are used to delineate the alignment of the roadway ahead and are primarily of use for night-time guidance. This is especially important at horizontal and vertical curves. EMPs are used in two different ways: to delineate full routes or on isolated curves. Their use on isolated sections of road is for safety reasons, for example where there are sub-standard curves, areas commonly subjected to heavy rainfall, fog or mist, where there is heavy night or tourist traffic flows, or where accident records indicate a need.

EMPs have only been installed on gravel roads to delineate isolated safety hazards but the extent of these is not recorded. The high cost of maintenance is a consideration in the number of new posts being installed.

10.10.2.4 Raised Reflectorised Pavement Markers (RRPMs)

There are about 98 km of RRPMs in the district. RRPMs are valuable for road delineation both for night-time visibility and during wet weather when water enhances their reflectivity. They also provide an audible and tactical warning when crossed by the vehicle.

10.10.2.5 Roundabouts and Traffic Islands

Roundabouts play an important role in regulating the traffic flow and enhancing safety. They are used as an alternative to signal lights at the intersections where installation and maintenance of signal lights is a concern. They also provide an aesthetic enhancement to the road alignment.

There are nine roundabouts in Masterton district. Five of them are owned by the Council. The design and construction of roundabouts is determined by Austroads and NZTA guidelines, which aim to ensure an efficient flow of traffic whilst minimising the number and severity of road accidents.

Traffic islands are constructed for the purpose of road delineation. There are about 800 lineal metres of traffic islands on the MDC roads.

10.10.2.6 Guardrails

There are 3.9km of timber sight rails, and 2.0 km of guardrail. These are designed to guide traffic, and for the guardrails, protect vehicles from identified hazards.

Guardrails and sight rails are programmed for installation following road safety audits in areas where there is an identified need and based on funding availability.

There are new guardrails proposed for installation at Te Kanuka Bridges in 10 year programme, based on the Masterton Castlepoint Rd safety audit completed in 2018.

Table 10-36: Guardrail Inventory

Guardrail Inventory		
Item	Quantity	Length (m)
Guardrail	48	1990
Timber sight rail	355	3950

10.10.3 Asset Condition and Monitoring

The maintenance contractor provides reports on signs, markings, EMPs and RRPMs on a regular basis. The contractor is directed to replace or maintain a traffic sign or marking as soon as it becomes damaged or loses its reflectivity or visibility.

The maintenance contract allows for night inspection of the arterial rural roads and all urban roads. The MDC engineer and the contractor jointly carry out this provision annually. Past joint night inspections reveal that the overall condition of this asset is satisfactory.

For nominal asset lives Refer to Table 10-3: Roadway Asset Lives

A complete survey of traffic signage assets was conducted to gather information about the type, actual number, location and condition of assets. A photographic record was also taken. The RAMM database has been updated with the latest information.

10.10.4 Critical Assets

Signs posted at all railway crossings, chevron boards, stop and give way controls are considered critical assets. Damage or loss of these assets may cause serious traffic accident and/or injury.

The following signs and markings are considered critical to network safety:

- Stop and give way intersections
- Pedestrian crossings
- Speed advisory signs in high-speed rural areas
- Centre lines and flush medians
- Clearways and Bus stops
- No overtaking and passing lanes
- One lane bridge's
- Keep left signage

The significant negative effects of traffic services in the Masterton district are outlined in Table 10-37 below:

Table 10-37: Significant Negative Effects of Traffic Services

Significant Negative Effects of Traffic Services		
	Negative Effects	How we will mitigate
Social	Redundant or inappropriate markings or definition which may lead to vehicle accidents.	Monitor and improve current practices, Ensure that safety measures / temporary traffic measures are implemented as part of all road works. Review standards (MOTSAM, NZTA specs etc.) and audit controls and control works Conduct ongoing crash reduction studies (in conjunction with police and NZTA) Manage continual safety audits in-house
Cultural	None identified	N/A
Environmental	None identified	N/A
Economic	None identified	N/A

10.10.5 Asset Capacity /Performance

Feedback from road users and contractors, and crash data are indicators of traffic services performance. Existing traffic services are considered adequate to provide safe movement for both vehicular and pedestrian traffic on the district's roading network.

The Road maintenance contractor's inspection reports do not reflect any significant lapse in this asset.

10.10.6 Design Standards

Generally, Waka Kotahi, NZTA prescribes the standards and performance on these items in the Traffic Control Devices Rule, MOTSAM signs manual, Road Traffic Standards guideline RTS 5 and various traffic notes.

10.10.7 Maintenance Plan

Maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. This includes public art installed on the road reserve.

At present, maintenance needs and requirements are identified by MDC engineers during their duties, or via public complaints and feedback from the maintenance contractor.

The maintenance contractor is currently responsible for the maintenance of signs, markers, EMPs, RRPMs and roundabouts. Maintenance includes:

- **Planned Maintenance:** Night-time visual inspections are carried out annually to check the reflectivity of signs, EMPs and RRPMs. The traffic signs are also cleaned once a year. All pavement markers are repainted on an annual basis.
- **Unplanned Maintenance:** Repair works carried out in response to reported problems or defects. Irregular detailed inspections are also carried out to identify faulty traffic services.

At present, the response time to repair a regulatory sign is two days and for other types of signs 28 days. According to Waka Kotahi - NZTA maintenance guidelines, the targets for missing or ineffective traffic facilities are as follows:

- Regulatory signs/markings – 0%
- Warning signs – 0%
- EMPS – 3 on straight road and 1 on curve
- RRMPs – 20%
- Pavement markings – 20%
- Bridge side rails, Guard rails – 0%
- Wire rope barrier, Crash cushions – 0%

Safety audits record Council's achievement against these targets these audits are conducted within the maintenance contract.

10.10.8 Service Standards

Signs are generally replaced when they become faded or damages/wear decreases visibility. All types of signs including chevrons, destination and directional signs are being replaced according to the latest standards and specifications.

Most of the traffic signs, EMPs and RRMPS comply with the new standards. Maintenance, renewal and upgrading of these assets are day-to-day activities. At present, road markings are re-done at twelve-month intervals with a partial remark at six months.

10.10.8.1 Financial

The Traffic Service asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023.

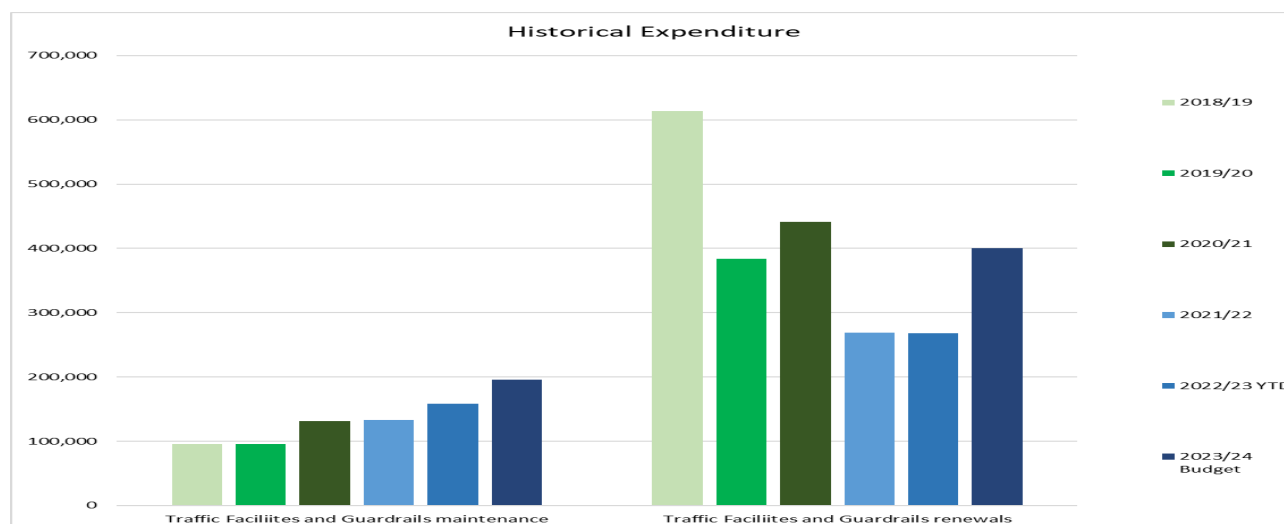
Table 10-38: Asset Valuation – Traffic Services (2023)

Asset Valuation – Traffic Services (2023)			
Type	Full Replacement Value (\$)	Depreciated Replacement Value (\$)	Annual Depreciation (\$)
Signs	1,172,007	648,129	78,134
Reflective Markers	112,399	76,948	10,505
Paint Marking	1,512,022	756,011	756,011
Traffic Islands	1,185,452	758,483	23,838
Road Structures (retaining walls etc.)	7,667,654	4,452,773	153,353

The assumed life of road markings is one year, and they are renewed each year. Therefore, the whole replacement value becomes the annual depreciation.

The expenditure on traffic services from previous years is summarised in Figure 10-15. Data is sourced from financial reports.

Figure 10-15: Historical Expenditure – Traffic Services



*Road marking redefined as renewal expenditure.

10.10.9 Renewal/Replacement

Renewal work restores, rehabilitates, replaces or renews an existing asset to its original capacity. In the case of traffic services, renewal/replacement is an on-going process, with needs identified by inspection, and via public complaints and reports from the maintenance contractor.

Assets in need of renewal are those that do not meet the standards for the level of service expected by road users and the Council; or do not meet the specifications required by Waka Kotahi, NZTA guidelines and/or the traffic rules.

There are no replacement plans in place for EMPs, RRPMS, road markings, roundabout and traffic islands. This work is carried out on an as needed basis under the maintenance contracts.

10.10.10 Asset Acquisition and Creation Plan

Council currently has no plans to create new traffic services assets, other than delineation devices.

A delineation strategy plan has been completed for implementation over 6 years from 2021/22. This will involve curve warning signs, pavement marking, edge marker posts and RRPM's. The aim is to install guidance where required, and to provide consistency of guidance throughout the network. The additional signs and markings installed over time will require additional funding for maintenance and renewal.

10.10.11 Programme

Council has made a strategic decision to 'at least' maintain the current levels of service for this activity, and to implement the delineation strategy. Maintenance and renewal work, as well as capital expenditure, is scheduled to enable this. See Table 9-1.

Waka Kotahi will provide 56% for the cost for maintenance and renewal of traffic services assets, as well as for new assets. The remaining portion of expenditures is funded from rates.

Forecast costs are shown in the combined forecast table in section 9 Table 9-1: Investment Summary by Work Category).

10.10.12 Disposal Plan

Council has no current plans to dispose of traffic services assets.

10.11 Footpath and Pedestrian Crossings

Masterton's footpaths are a key link between a journey's origin and destination and provide for a mode of travel. They are an essential component of the transport system that allows Masterton residents to make smarter transport choices.

Masterton's transport objective is that the footpath network is suitable, accessible, safe and well maintained, so that it will, contribute to the transport network by providing footpaths that are safe and easy to use. And provide an integrated, well planned and well-maintained footpath network that meets the needs of the community.

Footpaths are generally located in the area between the property boundary and the outer edge of the carriageway and allow for connection between road reserves. The footpaths have been constructed of a variety of materials to varying dimensions and standards over the years to suit pedestrian activity and available budgets of the time.

10.11.1 Introduction

The criteria for the provision of footpaths are based on a combination of traffic volume, road width, pedestrian demand and the availability of funds.

Council aims to provide adequate and well-surfaced footpaths in areas of high-level foot traffic and to separate traffic and pedestrian movement for safety. Demand for paths in near urban areas has increased due to the prevalence of lifestyle properties, and several lime paths suitable for pedestrian, cycle and horse traffic have been constructed.

Changing Public expectations for footpath provision may result in a greater Level of Service to be provided by the Council when renewal and maintenance options are considered in the future. At present, concrete footpaths are required of developers on all subdivisions in the urban area, and all renewal work by Council is with asphaltic concrete.

10.11.2 Asset Description (Inc. how asset data is stored)

Council currently maintains about 215 km of formed footpaths mostly located mostly in the urban Masterton area. There are some paths in the rural communities of Riversdale, Castlepoint, and Tinui. There are also paths in the rural area on Upper Plain Road making the Urban/Rural connection to Fernridge School Willow Park Drive and Gordon St.

Table 10-39: Footpath Surfacing

Footpath Surfacing	
Material	Total (m)
Asphaltic concrete	92,177
Concrete	55,913
Seal	56,820
Other	10,150
Total	215,060

A complete inventory of footpath condition ratings is managed using the road asset management system (RAMM), which contains both physical attributes and condition data.

10.11.3 Asset Condition and Monitoring

Each year 1/3rd of the footpath network is surveyed. The following data is collected during the survey

- Settlement (depression is longer than 3m with a > 30mm depth)
- Bumps is recorded by number of >20mm high
- Depression up to 3mm with a >30mm depth

- Cracked is greater than 10mm wide
- Scab Ravel – Severe only 10% or greater loss of aggregate
- Pothole is >70mm circumference
- Vegetation protruding >1/2m
- Overall condition score

Condition scoring of the footpath sections is as below.

Table 10-40: Footpath Condition Rating, 2024

Footpath condition rating			
Condition assessment		Km	%
1	Excellent (as new)	23.925	11.12%
2	Good (minor defects)	63.735	29.64%
3	Average (maintenance required)	110.070	51.18%
4	Poor (significant maintenance required)	14.778	6.87%
5	Very Poor (Renewal or rehabilitation required)	1.880	0.87%

The rating system basis included safety factors, structural defects, and the aesthetics / visual amenity of the assessed footpath section and is in accordance with the methodology of The New Zealand Institute of Highway Technology. Through condition rating information, the broad condition / level of service of the footpath can be determined. Condition grade rating is on a scale of one to five, where one is Excellent and five is very poor.

Footpath condition rating is section based. Each section will have portions of it at different condition grades.

Outcomes of the footpath condition rating process, in conjunction with other significant factors, drive the development of the footpath renewal works programme. The renewal programme prioritises footpath sections in the worst condition – those with the most lengths in poor and very poor condition (namely grades four and five). The renewal work is sometimes completed in entire sections of street to prevent patchwork construction and repair work, providing for a more consistent overall appearance of the footpath.

The useful life of base-course aggregates used on the footpaths is considered 50 years and is typically reflected in deterioration where vehicles cross the pavement. There are numerous variables that affect the life expectancy of a footpath, ranging from construction material to climate. The main reasons for footpath deterioration are the ageing of surfaces and loss of waterproofing, which create problems such as depression, ponding, cracks and weed intrusion.

The useful life of footpaths is also significantly affected by the continuing maintenance and replacement by utility operators for assets such as power, telecom, sewer, stormwater, and water that are buried beneath the footpaths.

Some patches and repairs made by the Utility Operators made to the footpath have been at times of a poor standard resulting in a reduced lifespan of the footpath.

Recent improvements in Council's corridor management have mitigated most of the non-standard repairs that used to occur however there are occasionally still works being performed that are less than is specified in the code of practice that is accepted by the Council.

Most times these failures will result in either subsidence of the substrate or water ingress under the final surface.

Council endeavours in each case to restore the surface at the offending parties' cost.

For nominal asset lives Refer to Table 10-3: Roading Asset Lives

10.11.4 Age Distribution and Life

The assessed useful life of various footpath surfaces is shown below.

Table 10-41: Life Expectancy of Different Footpath Surfaces

Life Expectancy of Different Footpath Surfaces					
Type	AC	Chip seal	Concrete	lime	Slurry/seal
Life Expectancy (yr.)	25	10 (1st coat) 15 (2nd coat)	50	10	20/25

Resurfacing records are available back to 1990 and educated estimates for pavement construction dates have been made for older footpaths. The theoretical expiry of footpath surfaces in the Masterton District network has been calculated based on this data.

From visual inspection, it is found that the actual useful life of most of the footpath surfacing's proving to be greater than their theoretical lifetime. It is estimated the majority of what has been calculated for renewal is still providing an adequate level of service.

Table 10-42: Age of Footpath Surface

Surface type	Average of Age
Asphaltic Concrete	2.7
Asphaltic Concrete (Black)	31.7
Concrete	21.4
Concrete (Black)	3.0
Crushed Lime	11.6
Interlocking Blocks	55.7
Seal	26.4
Unknown	2.0
Grand Total	27.6

The table above provides the average age of footpaths from RAMM, the data is considered to be inaccurate and needs further validation. A schematic of the Masterton urban area showing indicative average ages is attached in the appendices as Appendix 4 Footpaths by Age.

10.11.5 Critical Assets

There are currently no footpaths that are classified as critical to the council's operation.

However, the footpaths in the CBD area are of some economic relevance to the district by facilitating a strong link to the retailers of this area. Particular attention is always made to minimise any construction or renewal works that may have an impact within this zone.

The significant negative effects of the footpath network in the Masterton district are outlined in Table 10-43.

Table 10-43: Significant Negative Effects of Footpath Services

Significant Negative Effects of Footpath Services		
	Negative Effects	How we will mitigate
Social	Inadequate accessibility for physically and visually challenged persons, wheelchairs, strollers, walkers, prams, mobility scooters	Review and improve the current practices Prioritise renewals of footpaths. Review and increase budget levels. Review specifications of footpath design.
	Injury to footpath users from slips and falls and inaccessibility caused by inadequate footpath quality. (May be caused by settlement, cracking, tree root upheaval, poor design, construction, materials, lack of funding, and utilities reinstatements)	Review and improve current practices Prioritise renewals of footpaths Review budget levels Set specifications of footpath design Meet response times for public complaints via the call centre
Cultural	None identified	
Environmental	Trees and vegetation encroaching over footpaths	Policy review Enforcement relating to private trees Arboreal maintenance relating to public trees Meet response times for public complaints via the call centre
Economic	Contractor unable to deliver annual CAPEX renewal programme	Ensure the contractor to secure additional resources to deliver the programme, or source alternative suppliers

10.11.6 Asset Capacity /Performance

The existing footpath network is currently considered sufficient to enable pedestrians to move safely around the urban area. However as discussed in section 4 Future Growth and Demand), the ageing population and the increased use of mobility scooters on the footpaths, may impact on future footpath use. This is a trend that should continue to be monitored.

There will be a continuing need to identify gaps in the network where links are required to join up new footpaths in residential developments with existing footpath assets (such as Gordon Street, Kitchener Street, Millard Avenue, Andrews Street, Chamberlain and Upper Plain Road).

10.11.7 Design Standards

There are no particular design standards set out for MDC footpaths. The Pedestrian Planning and Design Guide (NZTA, 2008) provides a practice guide that comprehensively covers the planning and design for walking).

The draft Positive Ageing Strategy is currently under review (2020) and has an objective to provide safe, affordable and accessible transport options for older people and set out 4 sub-objectives with proposed actions in the draft that would achieve this. One of the draft objectives that related to footpaths was;

Sub-objectives	Action	Frequency	Comment/Progress
To provide safe footpaths in Masterton, in line with our Footpath Lifecycle Management Plan	Review footpaths for safety and for mobility scooter access be completed in consultation with relevant community organisations	3-yearly	Footpaths are managed with a Lifecycle Management Plan. Issues identified in 2019 with Disabled Persons Assembly (DPA) have been addressed. Next review will involve both DPA and Wairarapa Organisation for Older People (WOOPS)

Construction and reconstruction of unbound granular pavements is generally covered by the TNZ B/2 specification, and new concrete paths in new subdivisions and developments are constructed to NZS 4404:2010 standards.

RTS 14 - Guidelines for facilities for blind and vision impaired pedestrians (NZTA 2003) and NZS 4121:2001 Design for access and mobility are both used for disabled access.

Usually, the width of footpaths is chosen between 1.5m to 4.0m depending on the use and pedestrian volume. The thickness of base and surface commonly adopted for footpaths are as shown in Table 10-44.

Table 10-44: Footpath Design Thickness

Footpath Design Thickness			
Footpath Type	Base thickness (mm)	Surface thickness (mm)	Total thickness (mm)
Asphalt Concrete	120	25 -30	145 - 150
Chip Seal	120	5-8	125 - 128
Concrete	100	100	200
Slurry	120	5 – 8	125 - 128
Metal	120	Nil	120

10.11.8 Maintenance Plan

Maintenance is the on-going day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure.

Maintenance for footpaths includes cleaning, 'making safe' and minor repairs to the footpath networks. The following categories assist with determining the management, programming, and reporting responsibilities.

Maintenance needs are identified by Council engineers during their duties, via public complaints recorded on the Service request system and feedback from maintenance contractors.

Contractors delivering the maintenance services can programme works on a priority basis.

Repair works will be undertaken whenever a trip hazard or other safety issue has been identified using materials on a like-for-like basis.

All service requests will be assessed by the engineer upon receipt. If the engineer considers the fault to be a safety hazard, the contractor will be notified and will repair the fault within 2 days of notification by the engineer.

Each request or complaint will be recorded in a sequential manner with the date it was received, and the date of action noted.

The maintenance of footpath assets is now subsidised by NZTA and funded from rates.

10.11.9 Service Standards

The table below outlines the different responses required for asset maintenance and renewal.

Routine works	Week-by-week basis work across the network, sourced from non-urgent, noncyclic enquires from the call centre; network inspections undertaken by Masterton District Council or its contractors (e.g. repairs to roughness, sunken trenches, broken panels, broken vehicle crossings, etc.)
Programmed works	Identified activity in the forward work programmes (which has in coordinated with utilities works to minimise disruption)
Responsive works	In response to call centre requests for service

10.11.10 Renewal/Replacement

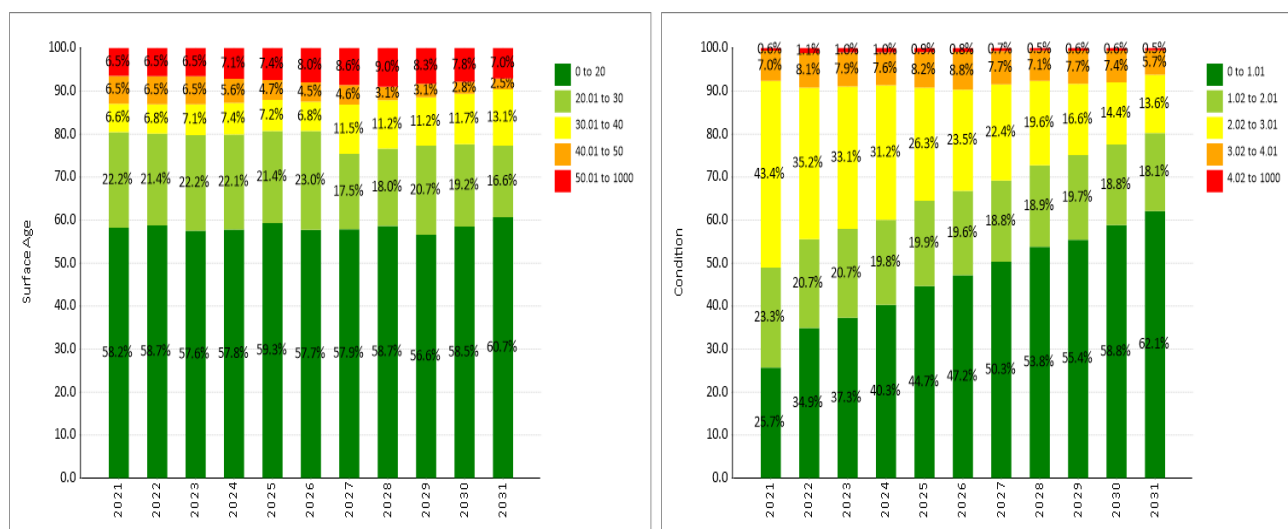
Renewal work restores, rehabilitates, replaces or renews an existing asset to its original capacity. Decisions on replacement and/or renewals of components of the asset have and will continue to be based on consideration of the following factors:

- Cost of repairs over a period being greater than replacing the component using net present value comparisons and life cycle costs.
- The level of service cannot be delivered either in quality or quantity.
- The risk to the asset of a failure causing significant effects.

One or several of these factors may have a bearing on the justification for replacement/renewal of part of the asset.

Renewal work for footpaths includes the replacement of damaged sections of footpath when replacement is more economical than repair.

Given the profile of the lifecycle we currently record for footpaths, Council will continue with the approximately 7-9 km of planned AC rehabilitation per year.



10.11.11 Financial

The Councils Footpaths asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023.

Table 10-45: Asset Valuation - Footpaths etc (2023)

Asset Valuation – Footpaths Etc. (2023)			
Item	Replacement Value (\$)	Depreciated Replacement Value (\$)	Annual Depreciation (\$)
Footpaths	33,476,574	17,326,068	836,161
Central Area Paving	2,409,460	1,281,509	59,617
Street Furniture	1,426,538	425,261	65,049
Berms and Street Trees	10,734,288	10,734,288	0

Note 1- The assumption has been made that the total area of footpaths includes the driveways and area of curves.

Replacement cost is the cost of building a new the existing infrastructure using present day technology but maintaining the originally designed level of service. Assuming current technology ensures that no value results from the additional cost of out-dated and expensive methods of construction. Maintaining the original level of service ensures that the existing asset with all its faults is valued, not the currently desirable alternative.

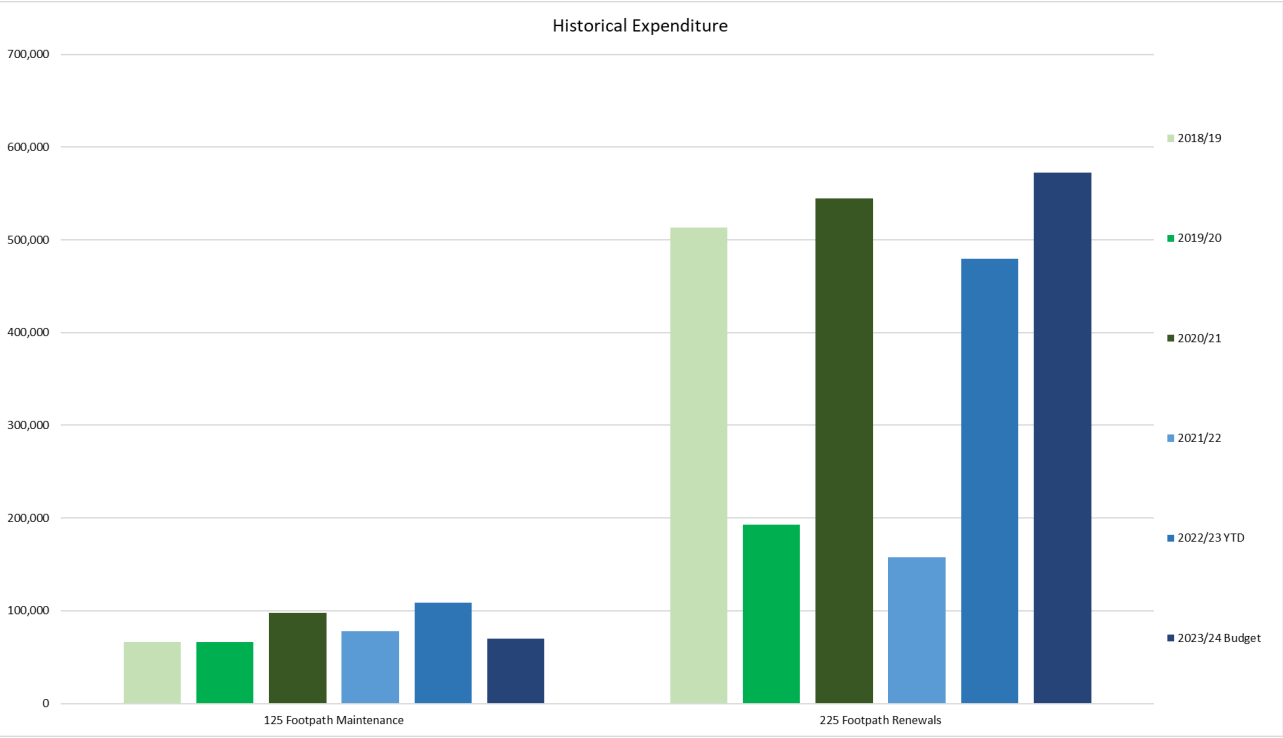
Values include actual purchase/construction price plus expenses incidental to their acquisition and all costs directly attributable to bringing the asset into working condition and location. These additional costs include:

- Professional fees of all types
- Delivery charges
- Costs of site preparation and installation
- Non-recoverable GST and other duties and taxes

The basic value of the assets reduces in accordance with the wear and tear and deterioration undergone over their lives. This reduced value is called the depreciated replacement value and has been calculated as the replacement cost proportioned by the ratio of remaining useful life to economic life on a straight-line basis. This method provides an accurate reflection of the service potential of the assets.

The expenditure on footpaths from previous years is summarised in Figure 10-16. Data is sourced from financial reports.

Figure 10-16: Footpaths – Historical Expenditure



The above figure lists the historical maintenance and renewal costs of maintaining the footpath assets.

10.11.12 Asset Acquisition and Creation Plan

Council currently has no plans to create new footpath assets, except for some minor construction work to complete gaps in the network. As discussed in section 4, the current network has adequate capacity to cope with anticipated changes in demand. However, Council may acquire new footpaths installed by developers as part of sub-divisional development. Such footpaths are installed at the developers' expense.

10.11.13 Programme

Council has made a strategic decision to 'at least' maintain the current levels of service for this activity. New maintenance and renewal work, as well as some capital expenditure, has been identified and is scheduled to enable this.in section 9.

Due to the inconsistent level of service and the community expectations not being meet the footpaths expenditure is being held at current levels for the next six years to enable additional resurfacing to be carried out to eliminate the remaining chip sealed surfaces.

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

10.12 Parking Facilities

This section covers parking facilities that Masterton District Council owns and maintains.

10.12.1 Introduction

Parking is an integral component of the transport network and helps deliver an effective and efficient transport system that enables vehicle users to make smarter transport choices.

The Council provides, maintains and manages sealed parking spaces at various locations, especially within urban areas, in order to; provide adequate parking for shoppers, commuters, worker, and those with disabilities.

The Council collects revenue from selected areas to offset costs associated with this activity.

10.12.2 Asset Description (Inc. how asset data is stored)

The Council owns and maintains 1495 off-street car park spaces; and 1359 on-street car park spaces. External staff are contracted to patrol their use and enforce restrictions. There are also 1733 privately owned car parks that are available for public usage in the central business area. There are 40 parks available for those with disabilities off-street.

Table 10-46: Car Parks Assets

Car Parks Assets		
Car parks	Unit	No.
Off Street time Restricted Parking Spaces	ea.	281
On street time limited car parking spaces	ea.	258
Metered car parking spaces	ea.	243
Number of Unrestricted on-street parking spaces	ea.	799
Number of Unrestricted off-street parking spaces	ea.	1214
Loading Zones, bus stops Taxi Stands and disability parks in CBD	ea.	59
Total Council parking spaces over all	ea.	2854
Privately owned car parking spaces available for public	ea.	1733

A complete inventory of parking facilities is stored on spreadsheet by the Urban Roading Manager on the Councils internal 'K' drive/carparking. Information includes location intended use and any other physical attributes.

10.12.3 Asset Condition and Monitoring

The overall condition of parking facilities is generally in order.

For nominal asset lives Refer to Table 10-3: Roading Asset Lives

10.12.4 Critical Assets

No parking spaces are considered critical.

Significant negative effects of the parking assets are outlined in Table 10-47.

Table 10-47: Significant Negative Effects of Parking Assets

Significant Negative Effects of Parking Assets		
	Negative Effects	How we will mitigate
Social	None identified	
Cultural	None identified	
Environmental	None identified	
Economic	Inadequate car parking spaces due to increasing usage causing a loss of revenue.	Continue to review car park inventory, number of spaces and levels of service annually.

10.12.5 Asset Capacity /Performance

The existing car parking spaces available are considered sufficient currently to enable shopping, worker, and commuter parking to park safely in the central business and urban area.

As discussed in the strategic case, factors such as population growth at about 1% and a growth in tourism revenue of up to 18.6% since 2014 may have an increasing impact on the usage and type of parking facilities required. A growing trend toward larger shopping establishments outside the central area with their own associated parking facilities will impact on the mix of usage of Council parking provided. These trends for demand will be monitored post Covid-19.

10.12.6 Design Standards

Standards described by Waka Kotahi NZTA in the Traffic Control Devices Manual, NZS 4121:2001 Design for access and mobility, and the Building Act 2004 outline the standards or guidelines for the provision of parking and disabled parks provided by MDC.

The draft Positive Ageing Strategy 2020 has an objective to provide safe, affordable and accessible transport options for older people and set out 4 sub-objectives with proposed actions in the draft that would achieve this. One of the draft objectives that related to parking was:

Sub-objectives	Action	Frequency	Comment/Progress
To provide adequate parking facilities and services for disabled/older persons	Review of disability car parks be completed to ensure distance apart, closeness to facilities/ services and seating/shelter is adequate	Review three yearly	Use of disability car parks included in the recent Parking Survey by Traffic Design Group concluded there was an appropriate and adequate level of accessible parking places in the CBD with additional spaces required only if there were changes in services that would attract older people
	Investigate places where handrails would make public places safer	As sites identified	Handrails are provided on both sides of the Queen St ramp into the library.
	Investigate and review public seating	As sites identified	Location needs to be sensitive to those in adjacent properties.

10.12.7 Maintenance Plan

Maintenance is the ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure.

Maintenance issues are identified both by the MDC engineers and the maintenance contractor during their general duties. Where damage occurs to a structure, a member of the public often reports it before it is identified by the maintenance contractor.

10.12.8 Financial

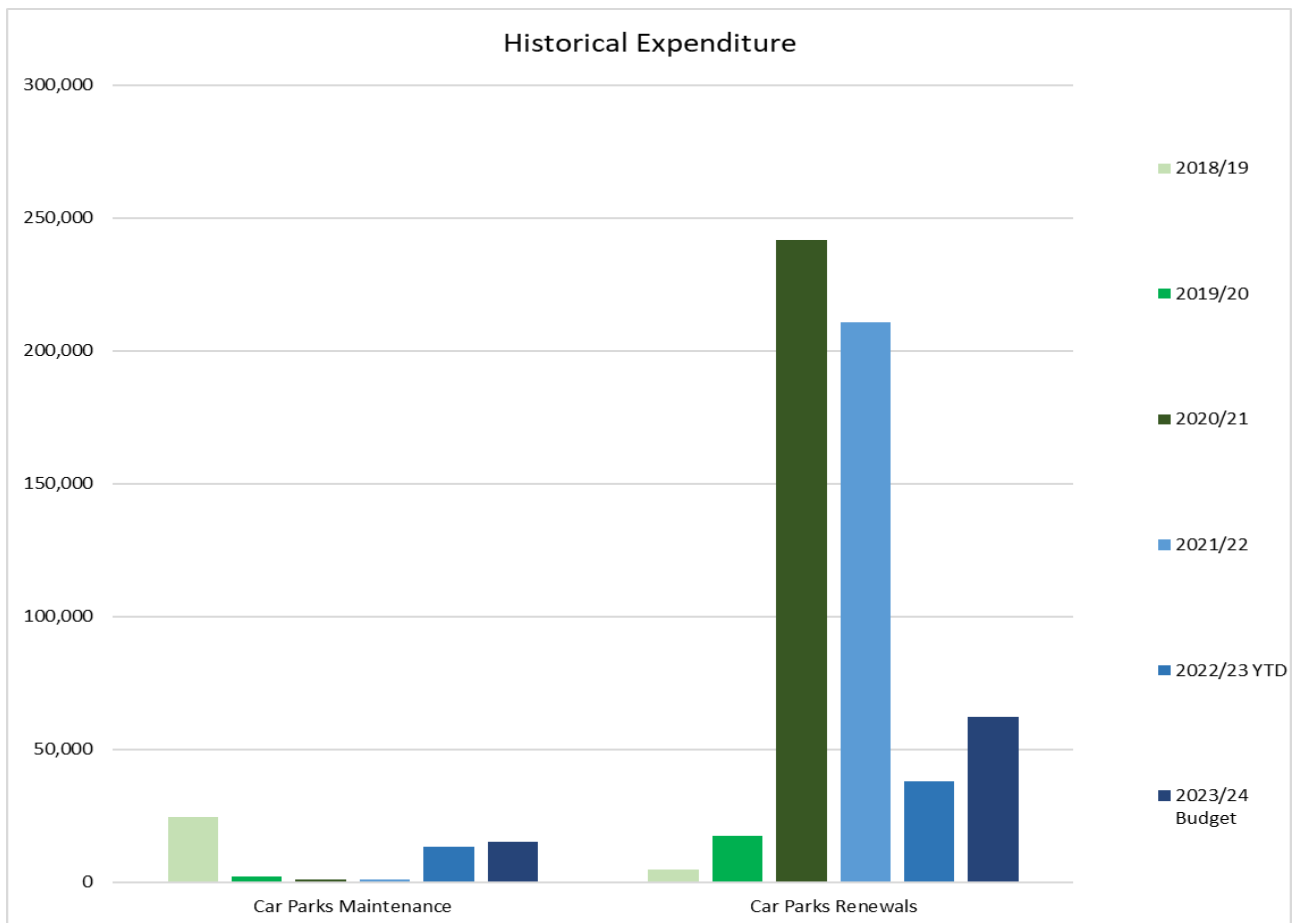
The Parking asset components were valued as follows, as at 30th June 2023. Data was sourced from the MDC Valuation Report 2023.

Table 10-48: Asset Valuation – Car Parks (2023)

Asset Valuation – Car Parks (2023)			
Item	Full Replacement Value (\$)	Depreciated Replacement Value (\$)	Annual Depreciation (\$)
Carpark Sealed Surfaces and Signs	3,206,039	1,669,421	64,573

Carpark expenditure data is stored in the Roding operating ledger. Expenditure over previous years is summarised in F. Data is sourced from financial reports.

Figure 10-17: Historical Expenditure – Car Parking



10.12.9 Renewal/Replacement

Routine maintenance and renewal works are carried out in conjunction with carriageway maintenance and sealing programmes.

10.12.10 Asset Acquisition and Creation Plan

The need for upgrading and /or expanding parking space provisions is determined primarily from a triennial review of the CBD Performance or other specific reports.

10.12.11 Programme

The annual maintenance and renewal costs for this asset over the next ten years are to be confirmed but were previously about \$144,000 p.a. This amount included miscellaneous costs such as rates, gardening, maintenance, reseals, and lighting costs.

Forecast costs are shown in the combined forecast table in section 9.1 (Table 9-1).

10.12.12 Disposal Plan

There are currently no plans to dispose of car park assets, but Council is prepared to consider disposal for new development on a site by site basis in the wider interests of the community.

11 FINANCE

Section to be updated once LTP is approved

11.1 Introduction

This section summarises the forecast level of expenditure required to enable the proposed level of service and action the proposed projects set out in this Asset Management Plan. Here we also discuss historical expenditure, funding sources (past and future) and the implications of these for Council's financial sustainability.

Estimates of future costs and revenues have been developed using best available information and expected flow on effects calculated using established financial assumptions and policies in the Long-Term Plan 2021.

The intended approach to service delivery for the activities of Roothing (urban and rural) have been selected taking into account resource availability and cost efficiency and effectiveness. An outsourcing approach has been taken to looking after and developing our important roading assets which include our roads, footpaths, signs, markings and street furniture and decorations.

As a Council we try to strike the optimal balance between maintenance and renewals. We have a number of big commitments in this area which will have significant impacts on our District. These include ongoing roading renewals, minor improvements, footpath upgrades, CBD upgrades and Mataikona front hill upgrade. Transport is essential to the connectivity of community in our District therefore we have a programme of maintenance to ensure that these assets do not get worn down and incur expensive replacement costs.

11.2 Financial Statements and Projections

The Draft Long-Term Plan for 2024-34 will be out for consultation in early 2024 and adopted by 30 June 2024.

11.3 Historical Financial Performance

We summarise in the table and graphs below historical financial performance of Roothing Asset Management Plan to place in context our current 10-year projections.

Past spending must be considered when we make our forecasts as it impacts our current financials through interest, depreciation and maintenance costs that arise when we make capital asset purchases, and the appropriateness of past operational spending influences the required maintenance programme going forward and available reserve funding.

The graphs below set out the operating income including transfers from reserves, operating expenditure including depreciation and resulting rates requirement for each Activity for the past ten years.

Figure 11-1: Historical Expenditure 10 years

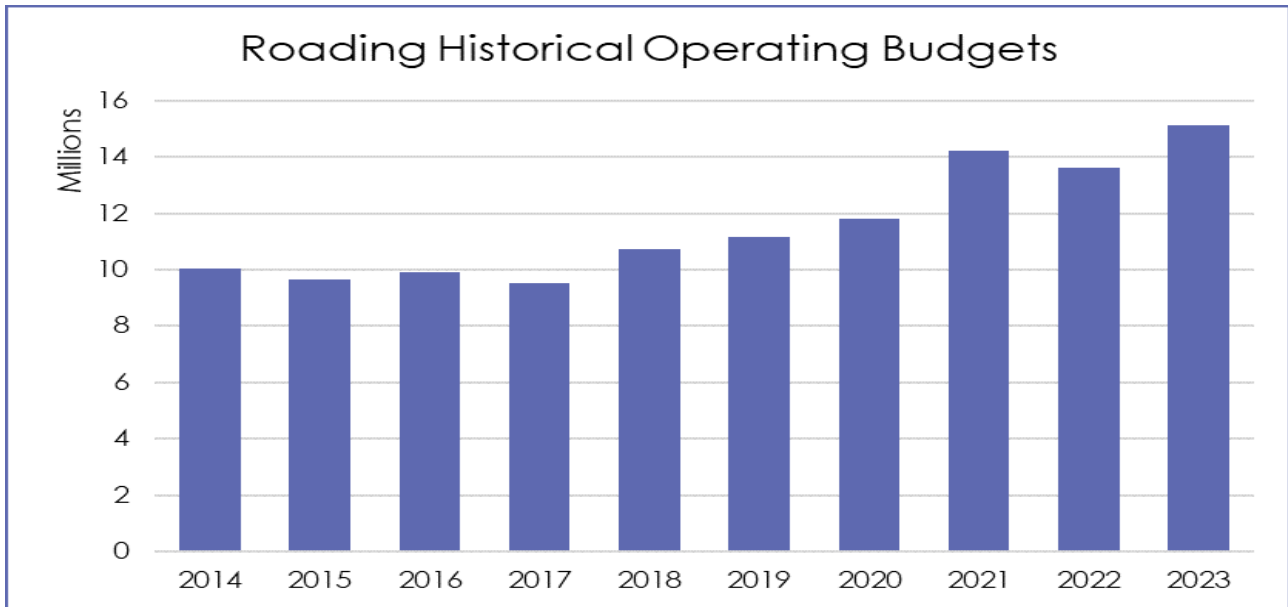


Table 11-1: Historical Expenditure 10 years

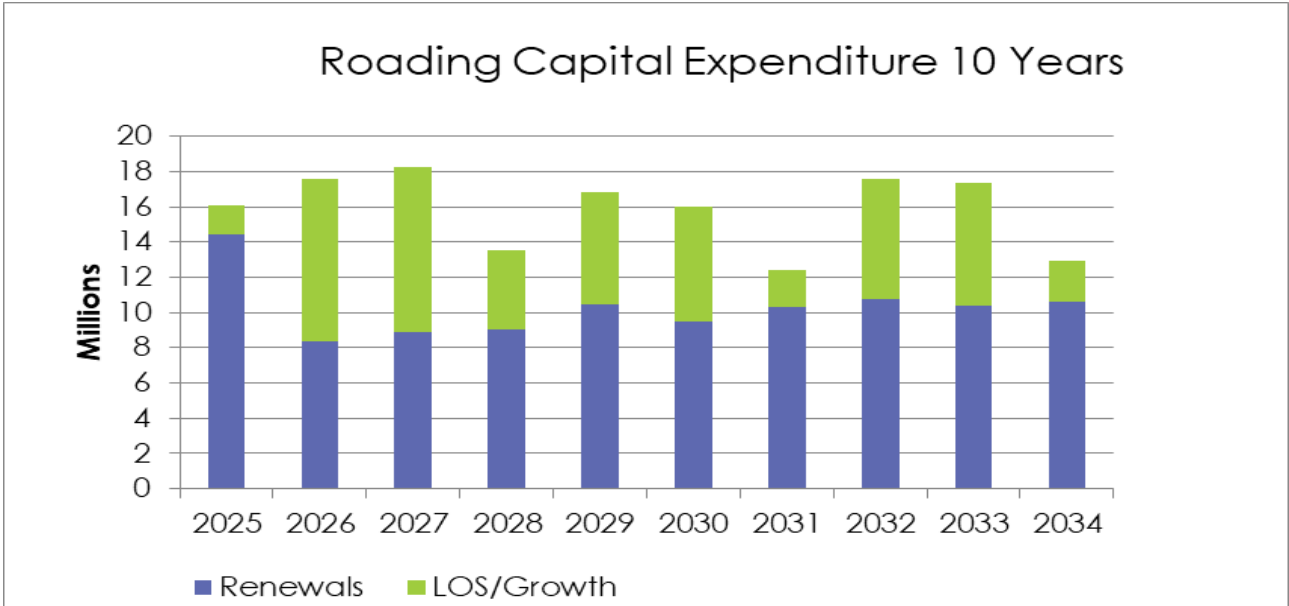
Roothing	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Operating Expenditure	10,056,986	9,649,581	9,899,115	9,520,051	10,713,407	11,148,209	11,799,867	14,223,395	13,612,863	15,145,302

11.4 Capital Expenditure

Investment in long life assets is essential to our Roothing Infrastructure as it stands as a core component of our overall infrastructure and economic development.

Over the current LTP 2024-33 timeframe we are projecting to invest \$142M into our Roothing assets.

Figure 11-2: Summary graphs (forecasts) – 10 years



11.4.1 Roothing Capital expenditure forecast

Figure 11-3: Roothing capital expenditure forecast

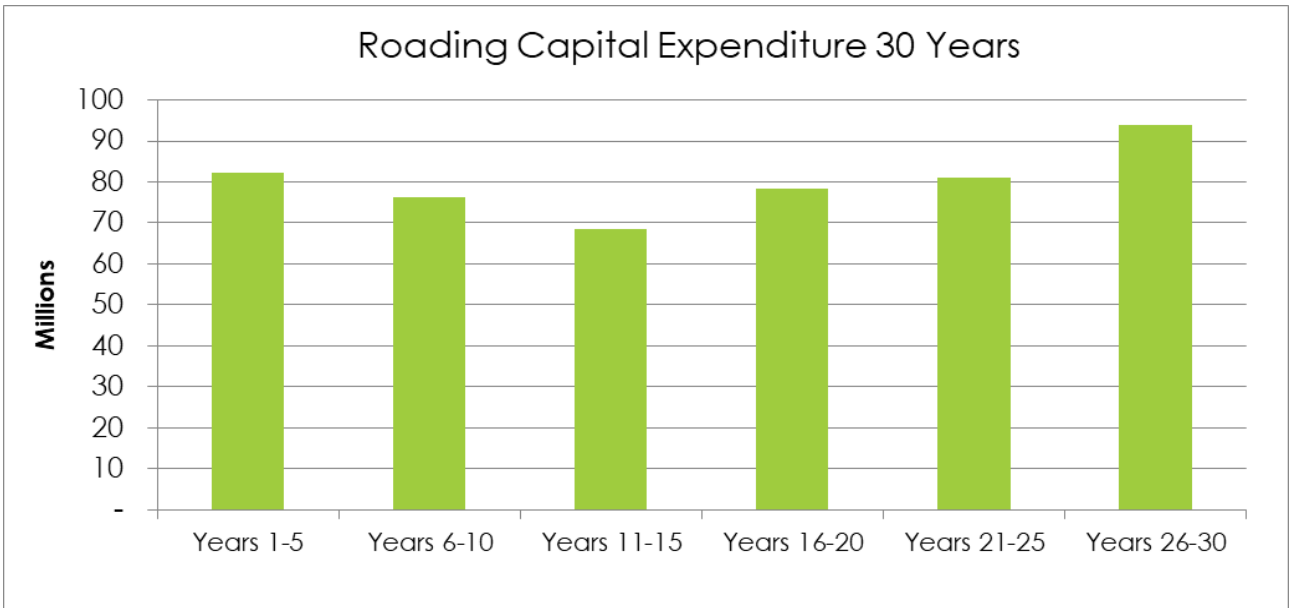


Table 11-2: Roading 10-year forecast expenditure statement

ROADING	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Operating expenditure	9,248,666	9,623,397	10,228,516	10,545,991	10,795,607	11,181,578	11,484,089	11,723,450	12,094,845	12,407,867
Depreciation	10,072,703	10,184,602	11,888,739	12,355,339	12,677,587	13,885,880	14,345,199	12,263,445	13,715,337	14,218,494
Operating expenditure	19,321,369	19,807,999	22,117,255	22,901,330	23,473,194	25,067,458	25,829,288	23,986,895	25,810,182	26,626,361
Capital expenditure										
Renewals	14,453,872	8,324,805	8,863,985	9,064,141	10,447,110	9,483,036	10,275,562	10,729,781	10,391,283	10,594,559
Upgrades - LoS	1,648,852	9,240,278	9,410,899	4,438,783	6,411,191	6,551,788	2,168,560	6,821,732	6,962,329	2,301,701

Figure 11-4: Forecast Capital Expenditure Summary

ROADING												
Annual Plan 2023/24	Capital Expenditure Summary	Source of Funds	LTP Year 1 2024/25	LTP Year 2 2025/26	LTP Year 3 2026/27	LTP Year 4 2027/28	LTP Year 5 2028/29	LTP Year 6 2029/30	LTP Year 7 2030/31	LTP Year 8 2031/32	LTP Year 9 2032/33	LTP Year 10 2033/34
\$	Capital Projects		\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
	Subsidised Roading											
3,201,160	Roading Renewals - rural	Rates & Subsidy	5,852,742	4,700,941	6,398,822	6,649,856	7,976,478	6,958,224	7,639,286	8,040,292	7,646,364	7,796,426
2,398,332	Roading renewals - urban	Rates & Subsidy	1,194,492	2,879,969	1,679,315	1,625,994	1,663,944	1,700,434	1,794,914	1,831,145	1,868,885	1,905,115
565,777	Footpath upgrading [incl reseals]	Rates, Depn & Subsidy	633,167	677,487	718,137	719,087	735,870	752,008	767,500	782,992	799,129	814,621
1,741,210	Rural/Urban Minor Improvement projects	Rates & Subsidy	1,648,852	2,826,278	1,998,899	1,786,691	1,828,391	1,868,488	1,906,980	1,945,472	1,985,569	2,024,061
-	Mataikona front hill upgrade	Loan & Subsidy	-	4,062,200	4,142,000	-	4,332,000	4,427,000	-	4,609,400	4,704,400	-
18,920,000	Cyclone Damage Reinstatement	Loan & Subsidy	6,711,350	-	-	-	-	-	-	-	-	-
215,180	Cycleways	Rates & Subsidy	-	-	-	245,080	250,800	256,300	261,580	266,860	272,360	277,640
27,041,659	Total Subsidised Roading		16,040,603	15,146,875	14,937,172	11,026,709	16,787,483	15,962,453	12,370,260	17,476,161	17,276,706	12,817,864
	Non-subsidised Roading											
62,120	Carpark reseals	Depn Reserve	62,121	66,407	67,712	69,203	70,818	72,371	73,862	75,353	76,906	78,397
-	Urbanisation of Millard Ave - Roading	Development Contributions	-	2,138,000	3,270,000	-	-	-	-	-	-	-
105,300	Masteron Revamp	Depn Reserve	-	213,800	-	-	-	-	-	-	-	-
360,000	Entrance	Loan	-	-	-	-	-	-	-	-	-	-
-	Chamberlain Rd upgrade	Development Contributions	-	-	-	2,407,012	-	-	-	-	-	-
450,000	Kitchener to Gordon - link road	Subdiv Contrib	-	-	-	-	-	-	-	-	-	-
977,420	Total Non-subsidised Roading		62,121	2,418,207	3,337,712	2,476,215	70,818	72,371	73,862	75,353	76,906	78,397
28,019,079	Total Capital Funding		16,102,724	17,565,083	18,274,884	13,502,924	16,858,301	16,034,824	12,444,122	17,551,514	17,353,612	12,896,260
(18,927,329)	Waka Kotahi subsidy (roading)		(8,982,738)	(8,482,250)	(8,364,816)	(6,174,957)	(9,400,991)	(8,938,974)	(6,927,346)	(9,786,650)	(9,674,956)	(7,178,004)
(710,120)	Transfers from reserves		(62,121)	(2,418,207)	(3,337,712)	(2,476,215)	(70,818)	(72,371)	(73,862)	(75,353)	(76,906)	(78,397)
(5,006,100)	Loan funds		(2,952,994)	(1,787,368)	(1,822,480)	-	(1,906,080)	(1,947,880)	-	(2,028,136)	(2,069,936)	-
(24,643,549)	Total other funding		(11,997,853)	(12,687,826)	(13,525,008)	(8,651,172)	(11,377,889)	(10,959,225)	(7,001,208)	(11,890,139)	(11,821,797)	(7,256,400)
\$3,375,530	Rates Requirement (Capital)		\$4,104,871	\$4,877,257	\$4,749,876	\$4,851,752	\$5,480,413	\$5,075,599	\$5,442,915	\$5,661,375	\$5,531,815	\$5,639,860

11.5 Funding Strategy

The Council has adopted a Revenue and Financing Policy which defines how each activity of the Council will be funded. For funding purposes, the Roding activity is split into three categories, the subsidised programme, the urban non-subsidised programme and the rural non-subsidised programme. The sources of funding for each are described below.

11.5.1 Masterton District Council's FARs for 2021-24 NLTP

The subsidised programme will be 56% subsidised for the 3 years of this LTP. No NZTA funding is available for expenditure on non-subsidised programme work.

11.5.2 Council Funding Policy

The preferred funding mechanism for the costs of the roading infrastructure is outlined in the Revenue and Financing policy as:

- External Income - NZTA assistance- Maximising the opportunities for obtaining financial assistance from NZTA in maintenance, development and safety improvements
- User Contributions – Obtaining contributions from particular users where roading network costs are incurred and arise from specific needs of individuals, for example, projects to accommodate unusual heavy traffic volume
- Petroleum taxes
- Loan Finance – Loan finance for identified capital improvements
- Depreciation reserves
- Roding Rates – a Targeted Uniform Charge set differentially in rural and urban wards, charged on each property
- Roding Rate – a targeted Land Value Rate set differentially in the rural and urban wards
- Allocation of the Subsidised Roding costs between urban and rural wards is based on a 29/71 split, which is based on the split between the wards where the programme expenditure is to be applied over the following three years

11.5.3 Cash flow Smoothing

The Council manages its cash-flows internally using working capital funds. Subsidy claims are made on a regular basis in order to ensure (as much as possible) cash being paid to contractors is matched by subsidy funding coming back from NZTA. Rates funding inward flows are largely quarterly and do not always match expenditure flows.

11.5.4 Asset Valuation

The values listed in the Council's 2022/23 Annual Report were revalued as at 30 June 2023, verified by Opus International Consultants. No insurance cover is carried on roading assets, including bridges. The Council receives funding assistance for all work categories. In the case of flood damage, higher funding rates and assistance will be available for emergency repairs resulting from very large events. The balance will be effectively self-insured by the Council drawing on its flood damage, roading asset depreciation and general capital reserve funds

Table 11-3: 2020 Rooding Infrastructure Asset Values

Location	Description	2017 Value (ORC)	2017 Value (ODRC)	2020 Value (ORC)	2020 Value (ODRC)	2023 Value (ODRC)	2023 Value (ODRC)
Rooding	Bridges	57,311,000	24,300,000	88,184,085	34,234,589	147,928,489	108,215,357
Rooding	Culverts (Box)	12,135,00	5,158,000	14,472,527	4,916,953	N/A	N/A
Rooding	Culverts (Pipe)	19,607,000	5,821,000	23,871,865	14,929,574	N/A	N/A
Rooding	Culverts (Combined)	N/A	N/A	N/A	N/A	54,869,249	31,162,571
Rooding	Drainage	N/A	N/A	N/A	N/A	8,322,139	3,606,082
Rooding	Kerb and channel	20,852,000	11,682,000	23,928,930	13,148,027	32,139,917	9,860,725
Rooding	Land	85,157,000	85,157,000	87,106,136	87,106,156	88,076,270	88,076,270
Rooding	Formation	269,633,000	269,633,000	290,945,911	290,945,891	295,921,594	295,921,594
Rooding	Pavement	95,758,000	68,018,000	103,231,684	74,046,020	141,791,681	100,911,491
Rooding	Seal	29,171,000	11,682,000	28,040,017	14,443,980	29,986,644	15,296,722
Rooding	Retaining walls and Guard rails	2,543,000	1,809,000	3,462,396	2,263,317	7,667,654	4,452,773
Rooding	Reflective markers	12,000	6,000	93,719	72,918	112,399	76,948
Rooding	Paint markings	166,000	83,000	969,730	663,374	1,512,022	756,011
Rooding	Traffic islands	918,000	680,000	988,432	652,300	1,185,452	758,483
Rooding	Shoulders	7,934,000	5,688,000	8,804,906	5,848,935	10,466,982	8,697,825
Rooding	Signage	965,000	274,000	784,548	312,904	1,172,007	648,129
Rooding	Streetlights	4,913,000	1,349,000	5,201,508	2,508,437	8,366,765	1,376,661
Urban	Street trees and Berms	6,798,000	6,798,000	7,349,410	7,349,410	10,734,288	10,734,288
Urban	Car parks	2,249,000	1,439,000	2,673,201	1,445,808	3,206,039	1,669,421
Urban	Carpark signage	12,135	N/A	N/A	N/A	N/A	N/A
Urban	Footpaths	17,802,000	10,566,000	21,036,134	13,326,389	33,476,574	17,326,068
CBD	Furniture	1,012,000	482,000	1,181,931	464,493	1,426,538	425,261
CBD	Paving	1,863,000	1,152,000	2,016,252	1,118,233	2,409,460	1,281,509

11.6 Valuation Methodology

The 2020 revaluation of roading assets was carried out by Opus International Consultants. They have used asset inventory information supplied by the Council, largely from the RAMM asset management system. Assets are valued at component level, unit rates to replace assets are applied to the units of each component to build up a value of the network asset. The depreciated value is arrived at by using the age of the components and modifying that based on how far through the useful life the component may be.

11.7 Forecasts of depreciation

Depreciation is calculated based on each components' depreciated value divided by the remaining useful life. Overall, the depreciation expense should approximately match the amount being spent on renewing the assets, particularly for those assets with shorter lives. This will vary year to year, but the renewal programme assumptions about asset lives are the same as the asset lives used in the valuation and depreciation calculations. Those components with long lives, e.g. bridges, will not always have replacement expenditure scheduled in the asset management plan, but depreciation continues to be recognised.

11.8 Key Financial Forecast Assumptions

11.8.1 Assumptions

It is the Council's view that the roading programme is keeping the service potential of the roading asset at a constant level. A decline in service potential for roading has been recognised as being the value of reseals and rehabilitation work to be undertaken each year. This work has been treated as renewals expenditure and capitalised. NZTA subsidies on the renewals work have been assumed.

Bridges and culverts do not have a regular work programme to maintain their service potential. Accordingly, a financial provision for the decline in service potential of bridges and culverts is included in the cost of the roading service.

Table 11-4: Assumptions and Uncertainties about Financial Provision

No.	Significant Assumptions and Uncertainties <i>(The information provided has been developed from)</i>	The degree of the assumptions and uncertainties	Likely Impact if assumptions not realised
1	A sound base	Low	Funding requirement may vary
	The RAMM database	Low	
	Renewal projections based on age, existing physical condition or performance and growth factors.	Medium	
	Operation and maintenance cost have been developed from:		

No.	Significant Assumptions and Uncertainties <i>(The information provided has been developed from)</i>	The degree of the assumptions and uncertainties	Likely Impact if assumptions not realised
2	Historic costs, existing and proposed operating procedures	Medium	Contract rates vary by +/- 15%
	Open tendering of Roding Maintenance Contract and other Roding contracts	Medium	Contract rates may vary by up to + 15%
3	Based on the current condition of the roding infrastructure, existing maintenance levels will be sufficient to ensure the Council's standards for the service.	Medium	If condition deteriorates seriously, the Council will be required to spend additional money to maintain the service level.
4	Maintenance cost included make allowance for inflation according to BERL indexes	Medium	Insufficient funding
5	NZTA requirements and specifications for the performance of subsidised work do not alter within the ten years to 30 June 2031.	Medium	NZTA financial assistance may change. Additional funding may be required by the Council to meet the local share.
6	NZTA current subsidy rate	Medium	NZTA financial assistance will be reduced. Additional funding will be required by the Council to meet operational costs.
7	Population predictions for all communities based in general on static or minor increases	High	If increases higher, then anticipated upgrades may be required earlier. Development may be hindered by delays in carrying out upgrades.
8	Resourcing of supervisory staff for increase in maintenance requirements, renewals programme and capital works programme.	Low	Inability to comply with agreed levels of service.
9	An average of 10% linear increase for depreciation with respect to the base year 2005-06, has been considered for projecting future costs.	Low	If depreciation increases, more funding will be required for the maintenance budget.

No.	Significant Assumptions and Uncertainties (The information provided has been developed from)	The degree of the assumptions and uncertainties	Likely Impact if assumptions not realised
10	New Major Capital works will be undertaken subject to the recommendations of a study, strategy or model.	Low	If not carried out properly: - Negative impact on environment. - Financial loss. - Public dissatisfaction.
11	Future renewals and new capital works are based on customers' current expectations to maintain the service levels and contribute to achieve following community outcomes: An Efficient and Effective Infrastructure A Thriving and Resilient Economy An Engaged and Empowered Community	Low	If customers' expectations increase significantly, additional funding will be required to meet the demand.

11.9 Accuracy of Financial Forecast

The confidence level for various issues related to financial forecast is graphically shown below: Where, A = Highly Reliable B = Reliable C = Uncertain D = Very uncertain

Table 11-5: Data Confidence Level

Attribute	D	C	B	A
Historical Expenditures				
Future Growth and Demand				
Cost Fluctuation Rate				
Depreciation Fluctuation				
Operational Revenue				
Future Public Debt				
Loan Interests				
NZTA's subsidy rate				
Level of Service				

12 ASSET MANAGEMENT PRACTICES AND IMPROVEMENT PLAN

12.1 Overview

Asset management improvement planning is a process. It enables Council to improve the way it manages infrastructure assets and the services they provide.

The Asset Management Practices and Improvement Plan section identifies the maturity of Masterton District Council asset management practices, improvements made since the last Activity Management Plan review and a plan for future asset management improvements resulting from areas for improvement identified in earlier Sections of this plan.

12.2 Asset Management Policy

Masterton District Council developed and adopted its Asset Management Policy in 2023. The Policy establishes the first level of Council's asset management framework for managing infrastructure assets in a structured, coordinated, and financially sustainable manner. The purpose and objectives of this Policy are:

- Is to state Masterton District Council's/Te Kaunihera ā-rohe o Whakaoriori (MDC's) commitment to asset management and set a consistent framework for asset management at MDC.
- Demonstrate to the community that Council recognises the critical importance of managing the District's assets and related activities in an effective and sustainable manner in order to deliver appropriate Levels of Service to current and future generations.
- Confirm a coordinated process for each asset/activity area that links their contribution to the Community Outcomes with specific Levels of Service performance requirements and desired improvement priorities and strategies.

The Council's Asset Management Policy can be viewed on the Masterton District Council website.

12.2.1 Asset Management Goals and Objectives

Masterton's asset management goals and objectives are guided by the Asset Management Policy to drive best practice. Masterton District Council's asset management decisions will be made in accordance with the following principles:

- Assets will be created or acquired for their service delivery potential. Service delivery needs and levels of service will be defined in consultation with the community, also taking into consideration relevant demographic, social, environmental, technical and financial factors.
- Asset management planning will be fully integrated with all activities across MDC.
- Asset management decisions will be made in line with service provision determined through the Long-Term Plan and Section 17A reviews.

- Assets will be managed to effectively and efficiently meet the needs of the community now and in the future.
- Responsibilities for the control and management of assets will be defined.

12.3 Activity Management Plan Development

Planning processes tend to be circular with built in reviews. The AMP and LTP need to have regular review cycles so that they remain current and deal with issues at the time. An important function of the review cycle is to monitor performance against the goal levels of service and KPIs that were set some years before.

The AMPs are reviewed every three years in line with the 10 year long term planning cycle but work programmes can change annually. These changes can be brought about by outside pressure, weather events, budget constraints and new projects becoming apparent. The ability to become responsive each year is through the annual planning process. The AMP details goals, levels of service, goals, KPIs and targets which contribute to Masterton's organisational vision for the district and community.

The review process considers the overall impact of the planned programme to deliver the defined levels of service through the on-going development of the AMP. This review/AMP development process moderates competing priorities within the context of community affordability and may result in some projects being deferred or budgets being re-prioritised. An example of this for Masterton is the planned increase in sealed road pavement rehabilitation to cater for condition with an increasing age and the surge in forestry throughout the period of this AMP.

12.4 Asset Management Maturity

We have assessed that our asset management system maturity is predominantly at the Core to intermediate level. It is largely based on the long-term knowledge built up from within the Roding team. It contains asset data that has been collected over time and held in RAMM asset management information systems.

Through continual improvement and development of asset management practices and processes it is our intention that the activity management plans progressively improve.

Our target is to develop our asset management practices and processes to an Intermediate level of maturity where appropriate. The Council has internally rated our maturity level to identify areas for improvement. The Council is considering options for undertaking a formal assessment of our asset management maturity. The five levels of activity management plan maturity are shown to the right and are Aware, Basic; Core; Intermediate and Advanced.

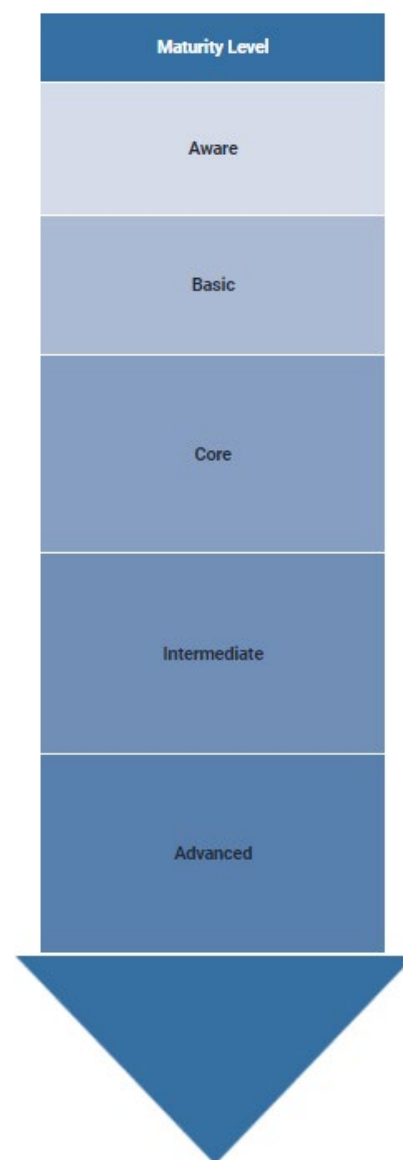
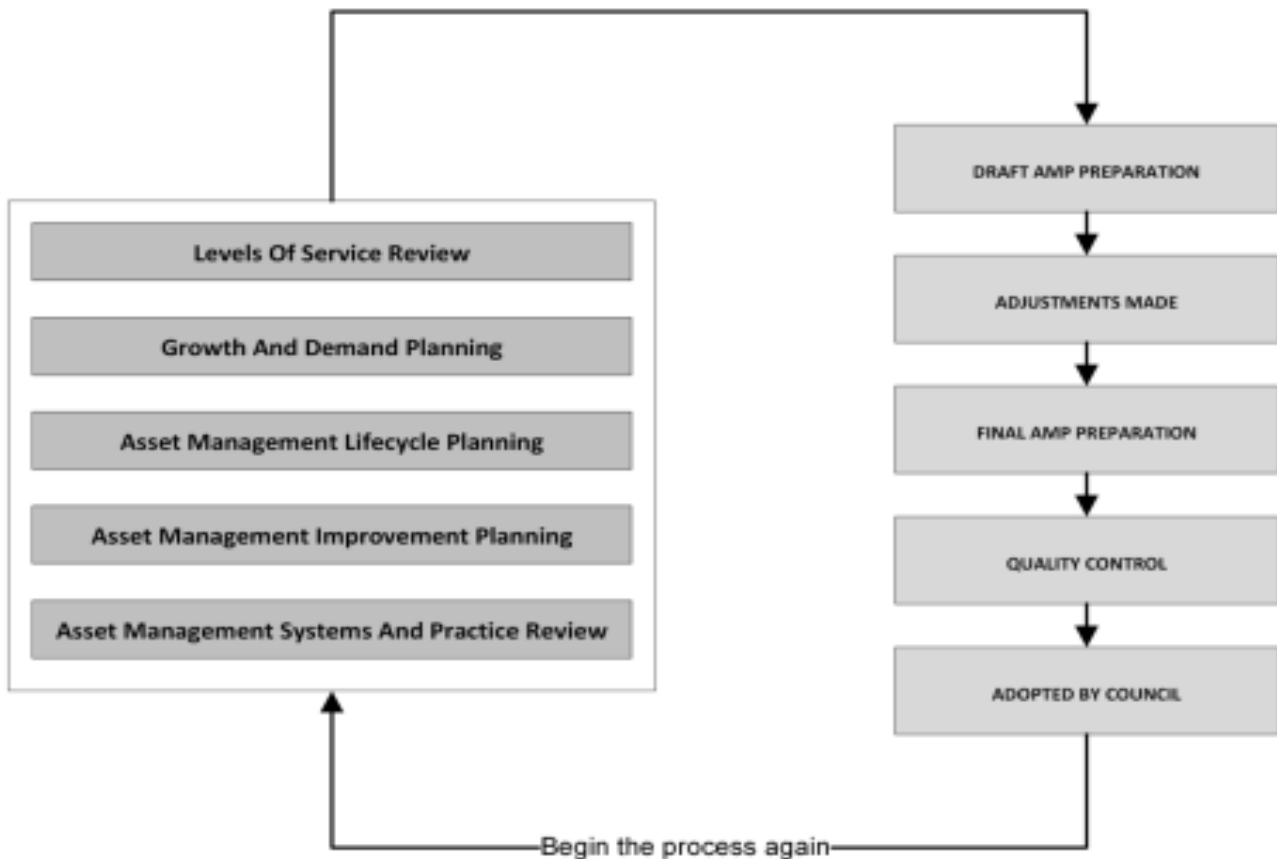


Figure 12-1: Activity Management Plan Development Process



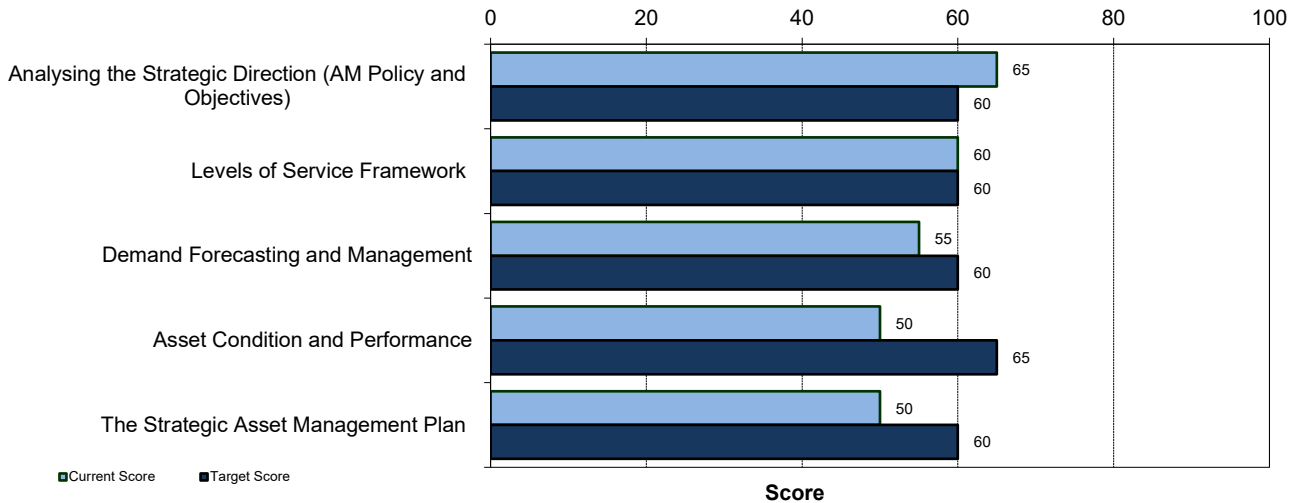
12.4.1 Asset Management Maturity Assessment

The Council has assessed its Asset Management maturity across 3 key disciplines of asset management practice including:

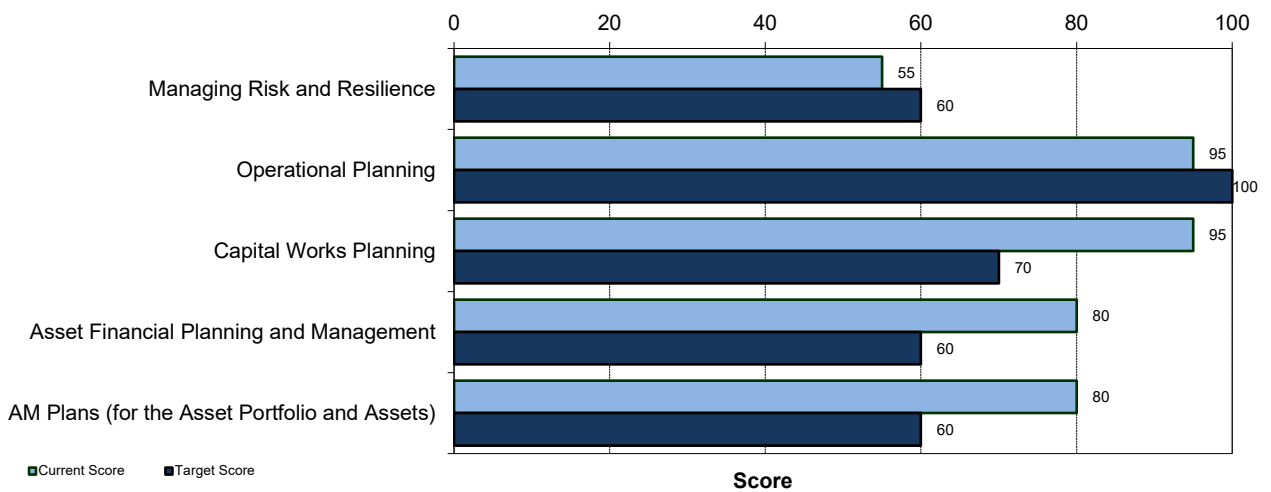
- Understanding and Defining requirements.
- Developing Asset Management Lifecycle Strategies
- Asset management enablers.

The Asset Management Maturity Index assessment results in below provides a snapshot of where the Council is at in its asset management practices and in particular, emphasises that seeking advanced practice in all areas may not be the best solution across activities, as this depends on the scale and type of assets being managed.

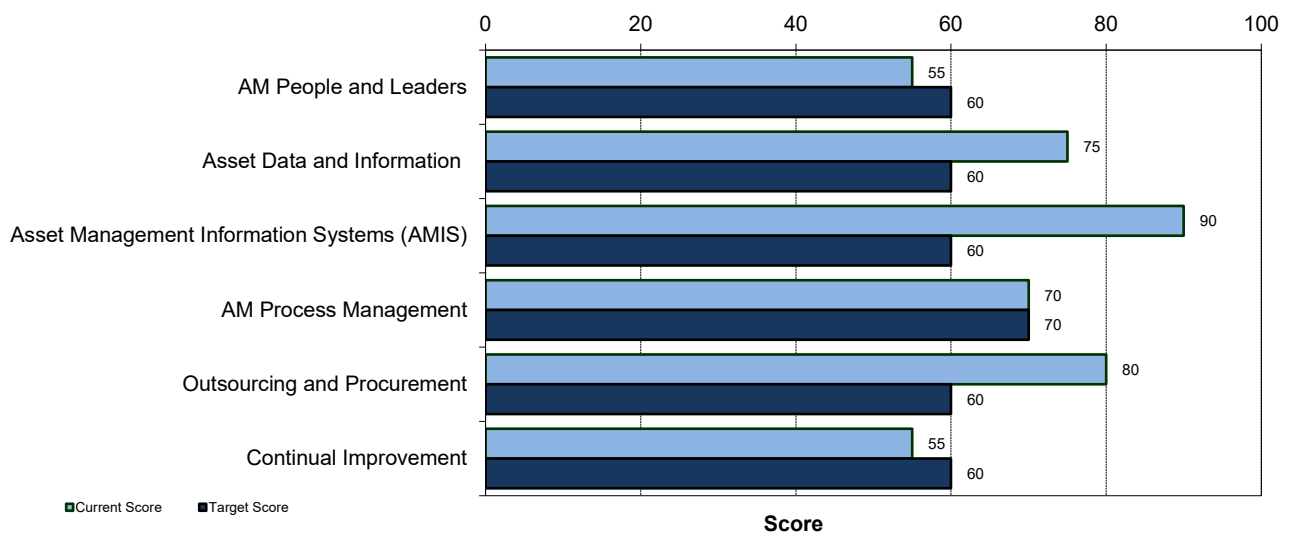
Understanding and Defining requirements



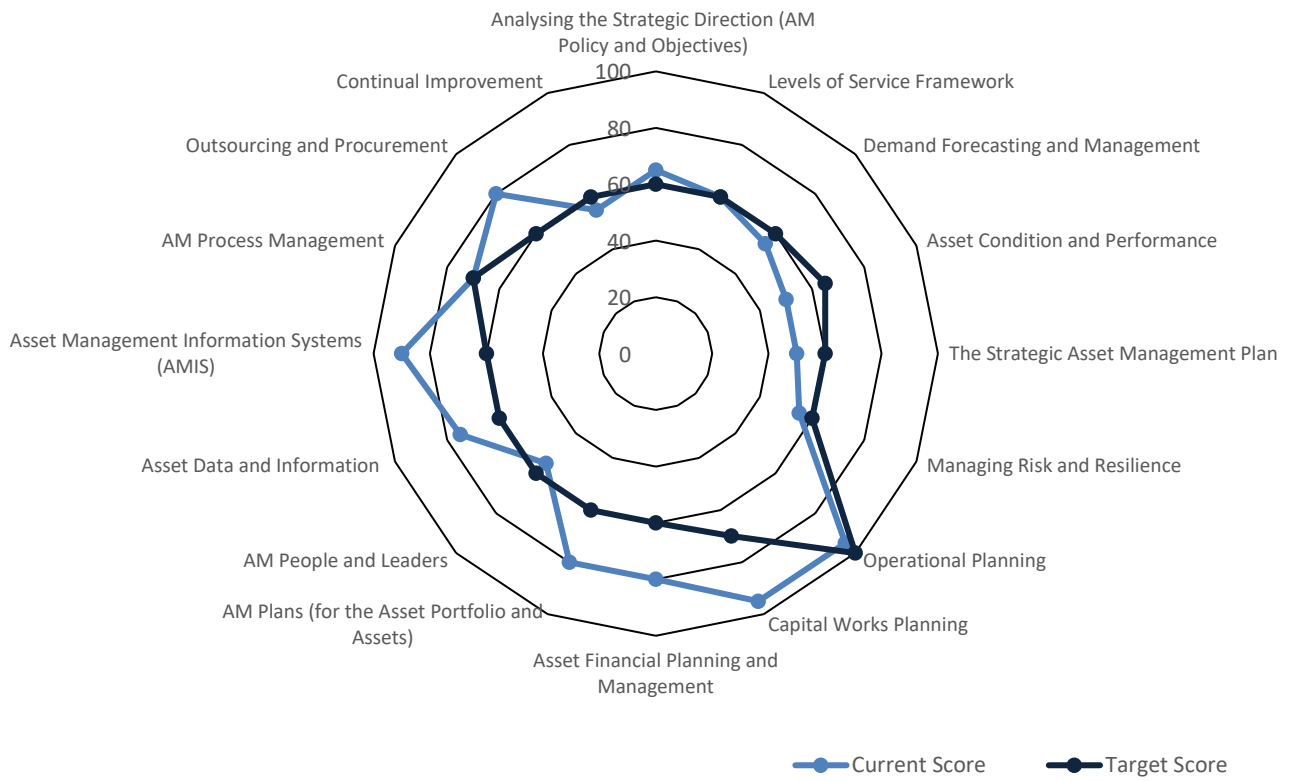
Developing Asset Management Lifecycle Strategies



Asset Management Enablers



Asset Management Maturity Rating



12.5 Improvement Plan

It's critical to plan for the regular review of an AMP. This ensures that it remains relevant to the issues being addressed and adapts to new technologies and changes in industry practice.

Each AMP should include an improvement plan to address gaps in knowledge and data. The improvement plan sets out key tasks for the next three years to improve the next review of the AMP.

A thorough asset management review process will often identify more improvements that an organisation is able to realistically deliver within a short timeframe. Therefore, the improvements identified have been prioritised so they are realistic and affordable.

12.5.1 Three-Year Improvements

The table that follows contains the improvement projects/tasks to be undertaken over the next 3 years across the organisation and specific improvements to be undertaken by the transportation activity.

Improvements

Note KJ: The following items were provided to Reg to be assessed during the 2024-27 period:

- **Run the RIMS basic Candidate Selection Algorithm (CSA)** alongside our existing model (Juno Cassandra) to ensure we are analysing the least whole-of-life cost and making the best informed decisions when selecting candidate sites for forward work programs. This links to optimizing resal and rehabilitation FWP using Juno in the improvement plan.

- **Continue to improve our asset condition data** in the new AMDS format. This links to enhancing data collection in the improvement plan.

- **Conduct the excellence assessment** carry out the excellence assessment internally and have it externally moderated. The aim is to understand the next steps in our improvement journey and receive independent feedback on our processes. This links to the Asset Management Competency Framework (AMCF) improvement objectives in the improvement plan.

- **Further develop Risk Management.** Risks such as Level of Service Risks, Business Risks, and Health and Safety Risks should be included, with clear links to asset management decision-making. This links to continuing the development of risk management in the improvement plan.

Look to improve our knowledge of structures specifically retaining walls their condition and performance

.

Table 12-1: Three-Year Improvements

SYSTEMS				
No.	Item	Current Status	Year	By Whom
1	Continue to improve the use of the business case approach, create a tighter link (using line of sight) to the transport benefits/outcomes desired and then to the programmed strategic response/programme of works.	Strategic and programme business case have been integrated in AMP with line sight to problem statements.	Ongoing	Authors
2	Testing of aggregate strategy to help understand local unsealed road performance	Improvements in planning	Ongoing	Engineering to Maintenance Contract
EVIDENCE				
No.	Item	Current Status	Year	By Whom
3	Improve data collection and storage	2019/20 Data Quality score 75. Some improvements required to lift data quality	Ongoing	Roading
4	Carry out AI condition assessment, deflection testing on high volume roads to determine the appropriate treatment and intervention level and assist in refining MDC's deterioration model. This should enable better decision making as to whether a repair or renewal response is required.	Deterioration model has been developed using RAMM data including some high speed data collected on primary collectors. Further data inputs could refine the model and help with decision making	2025	Roading
5	Continue to refine and optimise reseal and rehabilitation programme using Juno model and data	First version of a model has been developed using LoS and data as triggers for treatment to minimise whole of life pavement costs.	Ongoing	Roading
6	Record condition data on assets, particularly kerb and channel, so a more informed programme of works can be delivered.	Some roading assets have not had the most current condition recorded against the asset.	2025	Roading

COMMUNICATING				
No.	Item	Current Status	Year	By Whom
7	Conduct a problem and consequence workshop to support a cohesive investment story.	Second iteration of the BCA within the AMP, reviewing problems using ILM	Ongoing	Assets/Authors
DECISION MAKING				
No.	Item	Current Status	Year	By Whom
8	Continue to Develop risk management assessment in conjunction with the activities of the Wairarapa Earthquake Lifelines Association. Highlight and include major risks in PBC	Risk management assessment was developed and is in the current asset management plan. Risks from last lifelines review highlighted in current version of AMP.	Incorporate with Wela review	General Manager Infrastructure and Assets
9	Use additional data within models, identified as necessary for closing gaps in evidence, to make better informed decisions on longer term renewal programmes.	Models have been created and programmes developed from these. A and assess programme options for 2024-27 bid using further refined sound evidence.	2026	Roading
10	Look to improve our knowledge of structures specifcilly retaining walls their condition and performance.	Currently retaining walls are inspected ad hoc	Ongoing	
11	Develop and include uncertainty log (i.e. risks, constraints and interdependencies and agreed approach to considering these with the Risk management section	Risk section developed and continues to improve	2024	Assets Advisor
SERVICE DELIVERY				
No.	Item	Current Status	Year	By Whom
12	Review roading procurement strategy.	Procurement strategy has been formally endorsed effective in 2022. The strategy endorsement will expire on the 30 April 2025.	2025	Roading

13	Implement latter stages of the delineation strategy	There has been an identified need for additional signs and delineation, mainly driven by safety issues highlighted in a 2019 Transport Agency audit.	6-year programme	Roading
14	Look for opportunities to improve contractor competition and participation when procuring council projects.	The current procurement risk facing Council is the lack of contractor competition. Only 1.5 tenders, on average, are being received for each contract (over two years). Council is keenly aware of this and is concerned they could potentially receive no tenders for less 'attractive' work.	ongoing	Council whole

PEOPLE/CULTURE

No.	Item	Current Status	Year	By Whom
15	Succession Planning Strategy and Workforce development. Create working environment that retains and attracts engineers	Our current plan is to develop staff alongside experienced existing staff and plan to recruit and reduce risk where staff have indicated they are looking to retire or reduce working hours. Improve local and network knowledge in new staff and imbed staff where possible with major contractors.	Ongoing	Roading Manager
16	Conduct a thorough assessment of our team's competencies using the Asset Management Competency Framework (AMCF) to objectively measure our capability in different aspects of asset management. Use the insights gained to identify areas for skill development and enhance our team's ability to deliver exceptional service under current pressures, aligning with best practices and the ISO 55000 standard.	Our team hasn't checked in on our asset management competency framework; getting started with the AMCF could be a way to kickstart our improvement journey.	Ongoing	Roading Manager

13 APPENDICES LIST

13.1 References

1. Asset Management Plan and Code of Service, Roothing, Masterton District Council, June 1998.
2. New Zealand Infrastructure Asset Management Manual; National Asset Management Steering Group, November 1996.
3. Toward 2020 – Strategic Plan; Masterton District Council, May 1996.
4. Draft Statement on Levels of Service for Asset Management Planning; Masterton District Council, March 1998.
5. Masterton District Council Infrastructure Asset Valuations, June 2003.
6. Masterton District Council Long Term Council Community Plan, 2003.
7. National Roothing Programme 2003-04: Transfund New Zealand, July 2003.
8. Local Authority RAMM Database Operation Manual; Transfund New Zealand, June 1997.
9. Bituminous Sealing manual; Transit New Zealand, July 1993.
10. Routine Maintenance Contract – Roothing, 1999-2002, Masterton District Council, April 1999.
11. State Highway Pavement Design and Rehabilitation Manual; July 1989.
12. Pavement Design; Austroads, 1992.
13. Guide to Geometric Standards for Rural Roads; National Roads Board, 1985.
14. NZS 6701: 1983 Code of Practice for Road Lighting; Standards Association of New Zealand, September 1983.
15. AS/NZS 1158:1997 Road Lighting; Standard Australia/Standards New Zealand, April 1997.
16. Bridge Inspection and Maintenance Manual; Transit New Zealand, May 2004
17. Report Number 046/98 – Forestry Impacts Study; Masterton District Council, 1998.
18. Advanced Roothing Asset Management Plan, Southland District Council, May 2002 (Internet Version).
19. Manual for Traffic Signs and Markings Part 1, Traffic Signs Edition 3; Transit NZ/Land Transport Safety Authority, January 1998.
20. Manual of Traffic Signs and Markings Part 2, Road Markings Edition 3; Transit/ Land Transport Safety Authority, October 1992.
21. RTS 2 Guidelines for Street Name Signs; Land Transport Safety Authority, November 1990.
22. RTS 5 Guidelines for Rural Road Marking and Delineation; Land Transport Safety Authority, October 1992.
23. Guideline for the Preparation of a Roothing Activity Management Plan, MWH New Zealand Limited, Version 5, November 2003.

24. Wairarapa Combined District Plan (May 2011).
25. NZS4404:2004 land development and subdivision engineering.
26. MDC plan 805 A, B or C. This is shown in Appendix 6.
27. Masterton Central Area – Parking Study and Parking Assessment Report July 2010
28. Masterton District Council Roadway Procurement Strategy (May 2022)

13.2 Glossary (Common to all documents)

1. Annual Plan, A plan required by the Local Government Act 2002 to be produced by Council in the two intervening years between each three-yearly Long Term Plan (LTP). The main purpose of the Annual Plan is to identify any amendments and variations to the specific year of the base Long Term Plan.
2. Annual Report, Annual Reports are published following the end of each financial year which ends on 30 June. It is an audited account of whether Council completed its planned work programme. Any work not completed as planned is explained. The Annual Report is a key method for Council to be accountable to the community for its performance.
3. Activity Management Plans, Activity Management Plans (which are the 'new generation' of Asset Management Plans) describe the infrastructural assets and the activities undertaken by Council and outline the financial, management and technical practices to ensure the assets are maintained and developed to meet the requirements of the community over the long term. Activity Management Plans focus on the service that is delivered as well as the planned maintenance and replacement of physical assets.
4. Assumptions, Assumptions are the underlying premises made by Council that affect its financial planning for a specific activity, or for all Council activities. These are made clear so everyone can understand the basis for Council's financial planning, and form an opinion about how reasonable those assumptions are.
5. Capital Expenditure, This expenditure relates to the purchase or creation of assets that are necessary to assist in the provision of services. They have useful lives in excess of one year and are therefore included in the Statement of Financial Position. Capital expenditure includes the creation of assets that did not previously exist or the improvement or enlargement of assets beyond their original size and capacity.
6. Capital Value, Capital value is the value of the property including both the value of the land and any improvements (e.g. buildings) on the land.
7. Community, Community means everyone in Masterton District: individuals, businesses, local and central government, groups and organisations, iwi, Māori, disabled, young, old, families, recent migrants and refugees, rural and urban residents.
8. Communitrak™ Survey, The Communitrak™ Survey is the survey of residents' opinions that the Council has undertaken annually by an independent research agency.
9. Community Outcomes, Community outcomes are the priorities and aspirations identified by the Council that it aims to achieve in meeting the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions.
10. Consultation, Consultation is the dialogue that comes before decision-making. Consultation is an exchange of information, points of view and options for decisions between affected and interested people and the decision makers.
11. Cost of Services, The cost of services relate to the activity, not the organisational departments. The Local Government Act 2002 requires the Long Term Plan and Annual Plan to be expressed by the activity. The cost of the activity includes the direct and the indirect costs that have been allocated to the activity. Indirect costs

include interest on public debt, cost of support services and depreciation allowances.

12. Depreciation, Depreciation is the wearing out, consumption or loss of value of an asset over time.
13. Financial Year, Council's financial year runs from 1 July to 30 June the following year.
14. General rate, A general rate is a district wide rate through which all ratepayers contribute to a range of council activities and is based on the capital value of ratepayer's properties.
15. Income, This includes fees and licences charged for Council's services and contributions towards services by outside parties.
16. Infrastructure, Networks that are essential to running a district, including the roading network, water supply and wastewater and stormwater networks.
17. Infrastructure Assets, These are assets required to provide essential services like water, stormwater, wastewater and roading. They also include associated assets such as pump stations, treatment plants, street lighting and bridges.
18. Levels of Services, The standard to which services are provided, such as speed of response times to information requests or the standard of the stormwater drainage system that prevent incidents of surface water flooding. It is what the Council will provide.
19. Long Term Plan, The Local Government Act 2002 requires Council to adopt a Long Term Plan (LTP). The Long Term Plan outlines Council's intentions over a 10 year period. The Long Term Plan requires extensive community consultation, the identification of community outcomes and priorities, and the establishment of monitoring and review mechanisms. The LTP was previously called the Long Term Council Community Plan (LTCCP).
20. Network Infrastructure, See Infrastructure Assets.
21. ONRC, One Network Roding Classification.
22. Operating Costs, These expenses, which are included in the Prospective Income Statement, are the regular costs of providing ongoing services and include salaries, maintaining assets, depreciation and interest. The benefit of the cost is received entirely in the year of expenditure.
23. Performance Targets, These are the measures that will be used to assess whether the performance has been achieved.
24. Separately Used or Inhabited Parts of a Rating Unit, Where targeted rates are calculated on each separately used or inhabited part of a rating unit the following definition will apply: Any portion of a rating unit used or inhabited by any person, other than the ratepayer or member of the ratepayer's household, having a right to use or inhabit that portion by virtue of a tenancy, lease, licence or other agreement.
25. Solid Waste, Waste products of non-liquid or gaseous nature (for example, building materials, used packaging, household rubbish).
26. Stormwater. Water that is discharged during rain and run-off from hard surfaces such as roads.

27. Sustainable Development, "Development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (from the Sustainable Development for New Zealand Programme of Action, Department of Prime Minister and Cabinet, January 2003).
28. Targeted Rate, A targeted rate is designed to fund a specific function or activity. It can be levied on specific categories of property (e.g. determined by a particular use or location) and it can be calculated in a variety of ways. It may also cover a distinct area of beneficiaries.
29. Targeted Uniform Charge – Rooding (TUC), The Rooding TUC is a portion of the rooding rate collected as a fixed charge per rateable property. It is deemed that all properties (in a particular ward) receive equal benefit for the service charged regardless of the rateable value of the properties.
30. Wastewater, Wastewater is the liquid waste from homes (including toilet, bathroom and kitchen wastewater products) and businesses
31. Smart Buyer, a concept where TA's used the Government procurement methods and develop procurement strategies and improve their procurement processes

13.3 Appendix 1 Smart buyer Principles Assessment Tool

This assessment is based on the Smart Buyer Principles identified in the Road Maintenance Task Force Report. That statement of principles is included at the end of this document. Score the following by ticking the appropriate box - (1) Disagree to (5) Strongly Agree

Assessment Statement					
Our Organisation	Score				
	1	2	3	4	5
1. Fully understands the different contracting models available				4	
2. Holds meetings that updates the contracting industry on the forward works programme and any changes it is taking in approach and proactively engages with the contracting industry to ensure that gains optimal value out of any changes being implemented			3		
3. Has sufficient robust data (or is in the process of gathering robust data) on our networks that enables optimal integrated decision-making					5
4. Has access to expertise that fully enables best use of the data available					5
5. Is open to alternative solutions to those proposed in the contract documents					5
6. Understands risk and how to allocate and manage it				4	
7. Has a Council that is prepared to pay more now to achieve a lower whole of life cost				4	
8. Actively pursues value for money and does not always award contracts to the lowest price					5
9. Is able to manage supplier relationships / contracts to ensure that expenditure is optimal and sustains infrastructural assets at appropriate levels of service				4	
10. Supports ongoing skill and competency training and development for its staff					5
11. Actively participates in gatherings to share and gain knowledge within the sector					5
12. Is effective in keeping up with best practice in procurement including best practice RFP / contract documentation				4	
13. Regularly seeks and receives candid feedback from suppliers on its own performance as a client and consistently looks to improve its performance			3		
14. Explores opportunities for collaboration by either sharing in-house resources with neighbours, or by procuring together or tendering together. That exploration could be through an LGA s17A evaluation of transport function delivery options.				4	

Assessment Statement					
Our Organisation	Score				
	1	2	3	4	5
Number of ticks in each column					
Multiplying factor	x1	x2	x3	x4	x5
Total Score in Column			6	24	30
Total Score	60				

Score: Interpretation

- 65 to 70: A smart buyer: Our organisation is a smart buyer. We help to minimise rate increases by maximising the value created for our community
- 55 to 64: Developing: Our organisation has embraced the principles of being a smart buyer but can still create further improved value for our communities
- 30 to 54: Limited: Our organisation currently has limited capability to maximise the value created from being a smart buyer
- 0 to 29: Basic Our organisation is focused on tender process and compliance. We have not developed the capability to realise any of the value created for our community from being a smart buyer

If you were to repeat this assessment in say one or two years' time, how do you expect it will have changed, which questions will show the greatest change (up or down) and what action / inaction on the part of your organisation will have been the driver of that change?

The need for 'smarter buyers'

A theme that underpins a number of the conclusions of this review is that RCAs must be both efficient and effective managers of their road assets and smart buyers of the services they require. These issues strongly relate to the concept of 'smart procurement' with a balanced focus across 'the three Es':

1. Economy – through securing (or supporting) the provision of products, materials and expertise at the quality, in the volumes and at the times and locations required, at the lowest price
2. Efficiency – through the processes used, including standard documentation and contracting forms selected for achieving best cost / quality and outcomes; and knowledge of the product / materials and supplier market applied
3. Effectiveness – taking opportunities for changing from traditional products and materials by maintaining support for innovation in the nature and characteristics of products and materials, and for a strong supplier market

The impact of raising the capability of RCAs would include reduced supplier selection process costs, better management of risk and more objective assessment of performance for use in future supplier selection processes.

The contracting industry has provided the following useful analysis of the characteristics of a smart buyer: Some RCAs are smart buyers but this is believed to be the exception.

Smart buyers have:

- An improved understanding of costs that better inform their decision making process
- An understanding of the impact delivery models and supplier selection criteria can have on the value of contracts
- Robust forward work programmes that are communicated to the industry and supported by budgets that allows the work to be completed
- Knowledge of the network to determine treatments required based on physical evidence and supported by knowledge of the costs involved
- In house expertise that aids the decision making process and allows acceptance of innovative solutions possibly with or without the involvement of consultants
- A clear understanding of risk and how it is allocated and managed
- An understanding that lowest price will not always deliver desirable outcomes
- An understanding that being prepared to pay more may result in enhanced whole of life value for money.

Not so smart buyers:

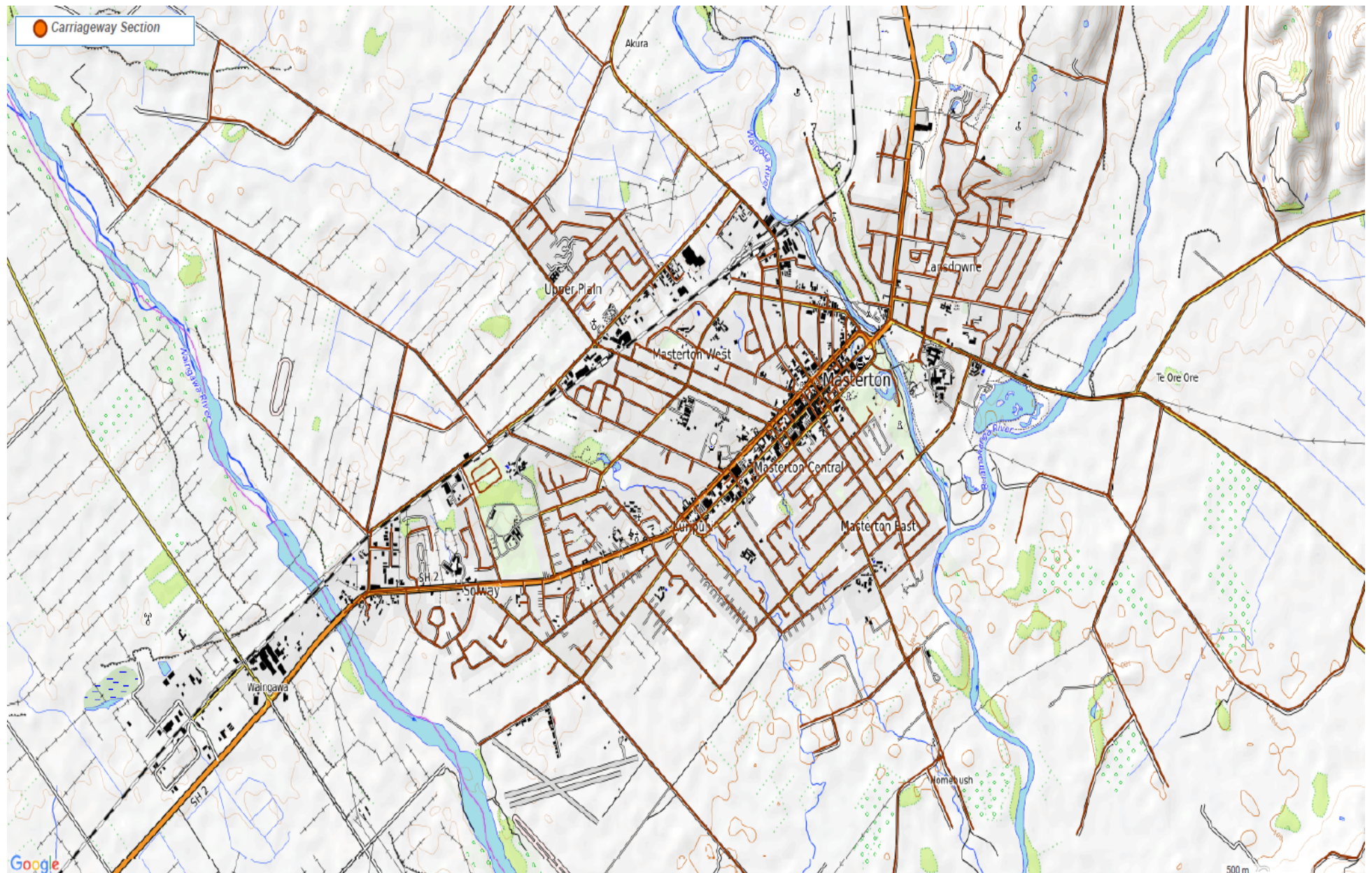
- Award contracts predominately based on price – with little appreciation of any risk to best value for money
- Outsource work to the detriment of asset knowledge
- Choose contract forms that are fashionable, not well understood and poorly managed
- Lack technical and contractual management skills
- Lack asset management skills that prevent the development of robust forward work programmes
- Do not support forward work programmes with appropriate budgets.

Task Force members debated the nuances around individual items in these lists but believe that they provide a platform on which to build a list of the characteristics that would be exhibited by an RCA that has the capability and the capacity to be a smart buyer.

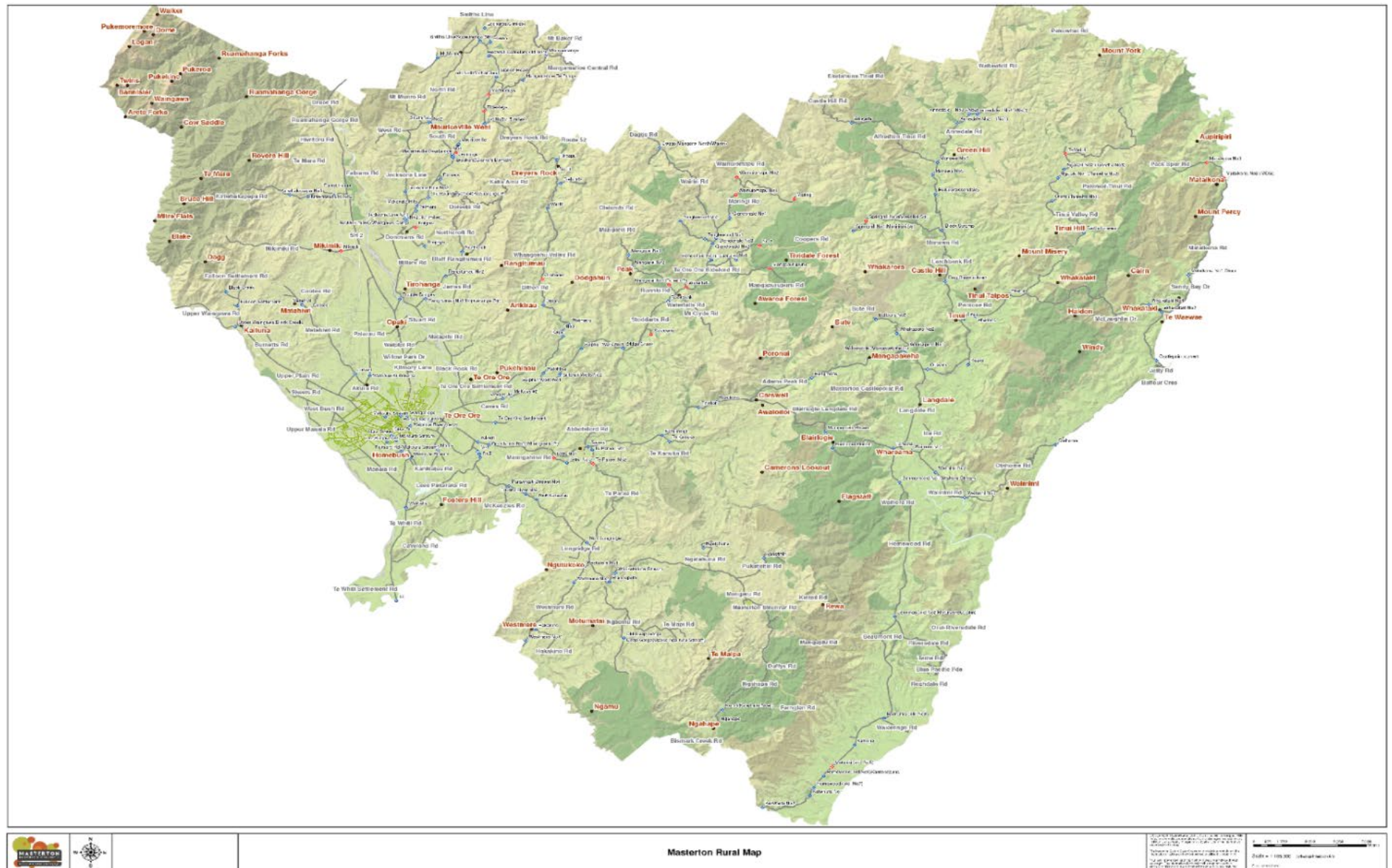
One Task Force member described a smart buyer in the following terms:

A 'smart buyer' RCA ensures its staff are up-to-date, regularly shares best practice experiences with colleagues from other agencies, and supports and resources their teams appropriately in the recognition that getting the strategic direction right is a very small cost compared to the consequence of getting it wrong. This requires staff to be involved in regular training, attendance and participation in sector gatherings, and involvement in NZTA investigating teams and the like. Ironically in the interests of 'cost-saving' many agencies are limiting staff involvement in these activities. A smart buyer does not ask the question – what if I train my staff and they leave? – but rather asks the question – what if I don't train my staff and they stay?

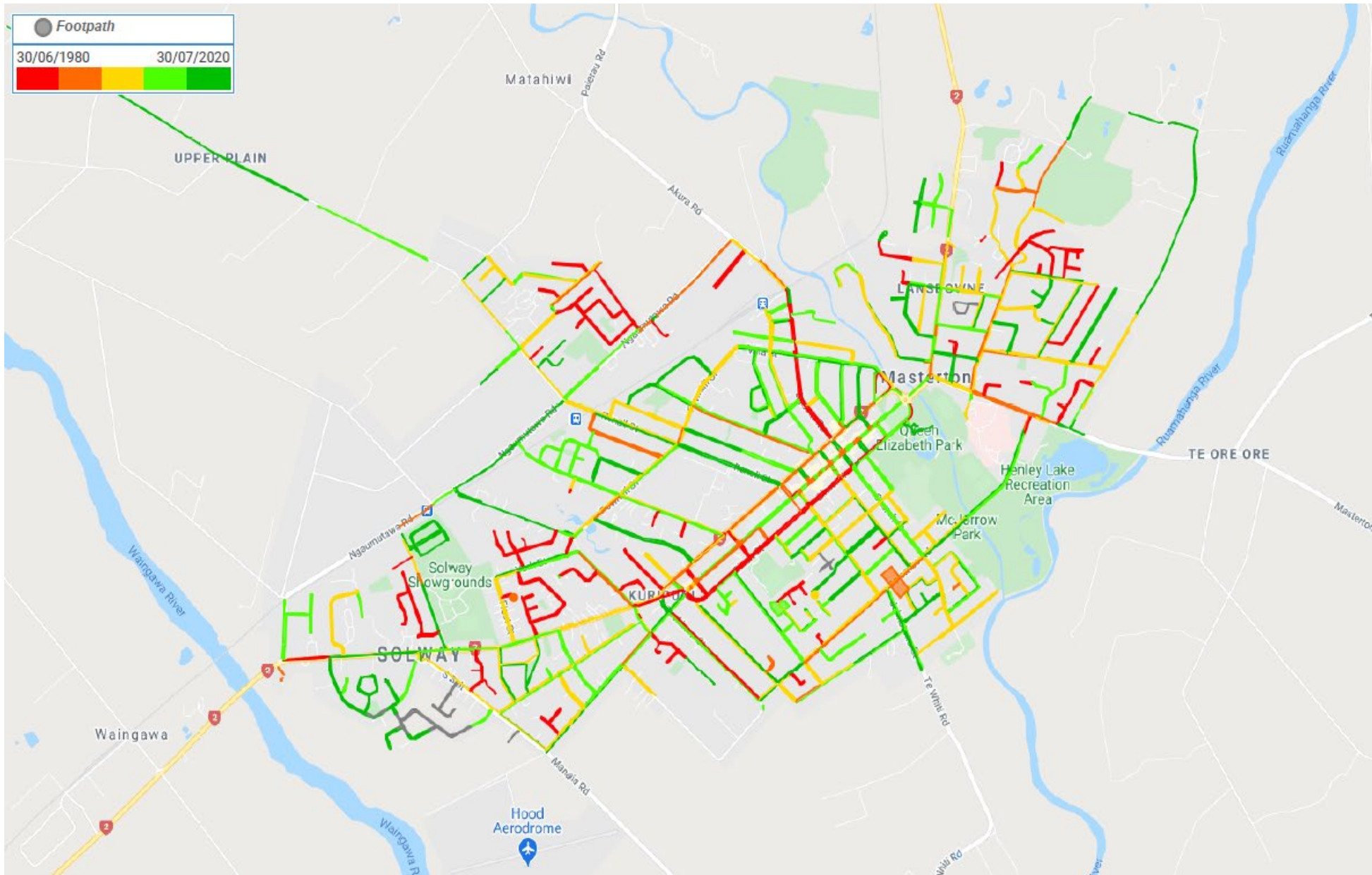
13.4 Appendix 2 Urban Streets



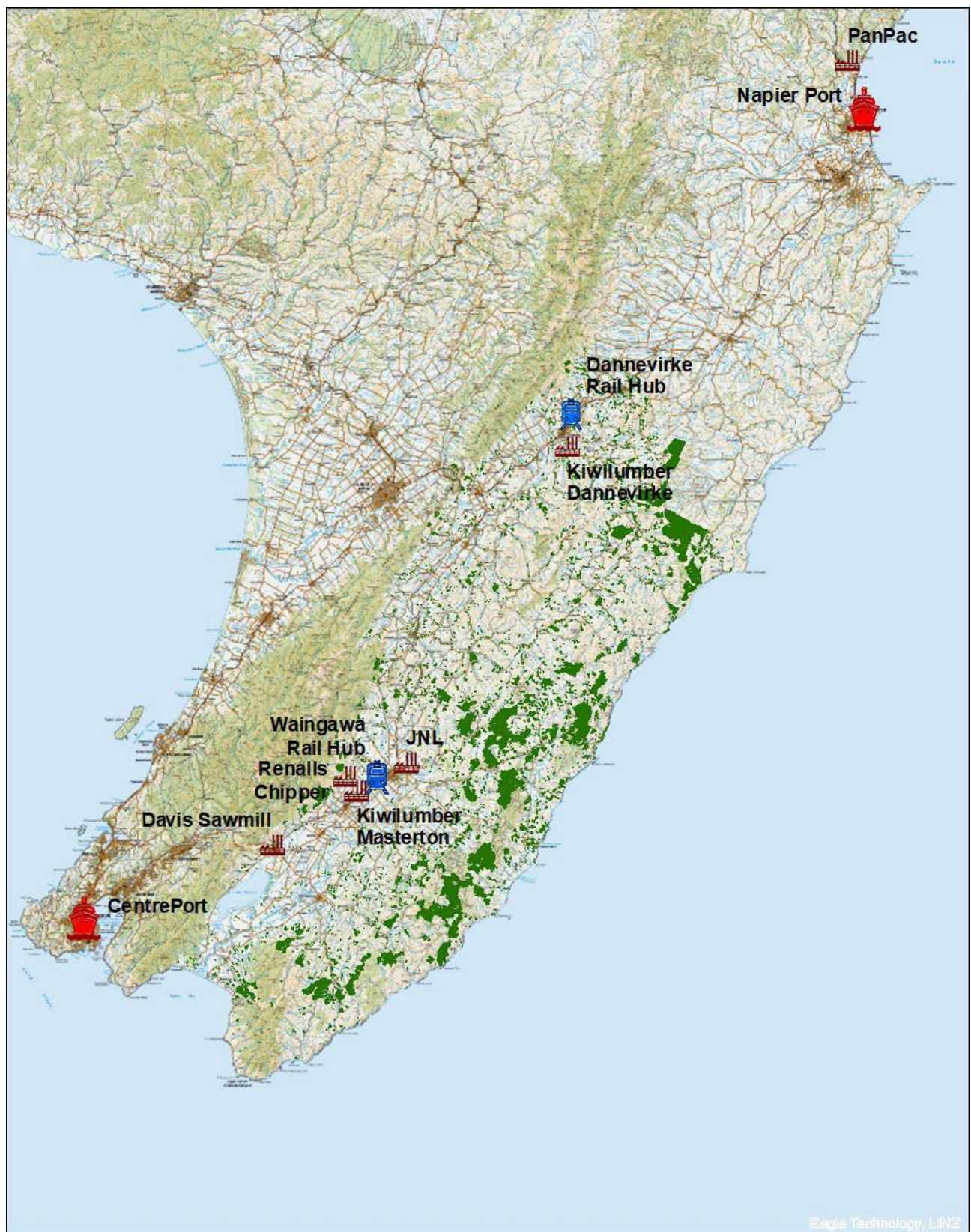
13.5 Appendix 3 Rural Roads



13.6 Appendix 4 Footpaths by Age



13.7 Appendix 5 Foresty and Woodflow Distribution Map

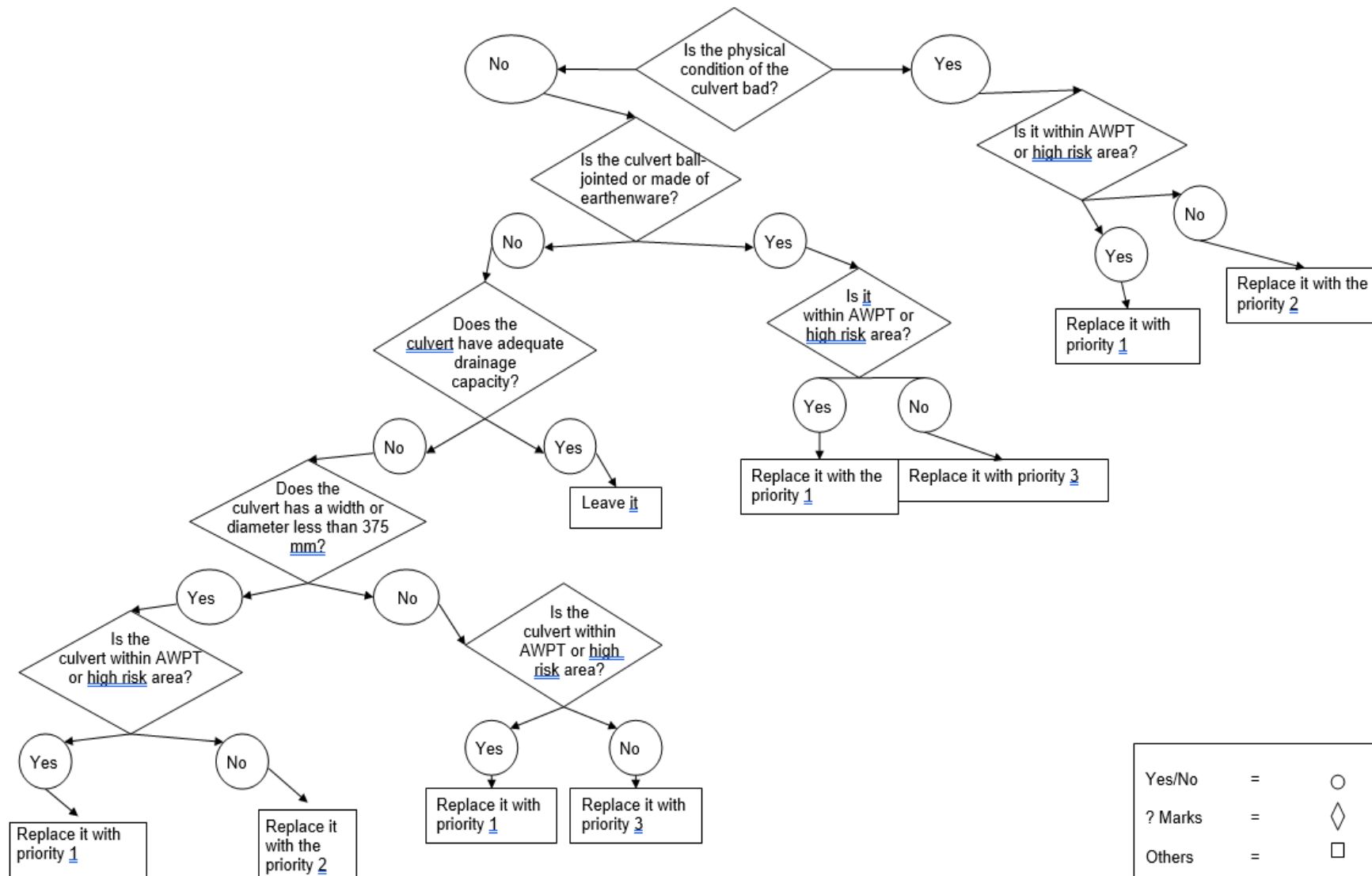


13.8 Appendix 6 Vehicle Crossing Standards 805 A, C, and C

The following link is the Council Website page that takes you to the vehicle crossing application form with standard drawings for Crossing Standards 805A, 805B, and 805C.

<https://www.mstn.govt.nz/repository/libraries/id:2jr77ddvv17q9sn6a3db/hierarchy/Forms%20and%20Applications/Roading/Vehicle%20Crossing%20Application>

13.9 Appendix 7 Culvert Replacement Decision Tree



Yes/No	=	○
? Marks	=	◇
Others	=	□
Priority 1	=	immediately (within a year)
Priority 2	=	within a couple of years
Priority 3	=	within 5 years

13.10 Appendix 8 ONRC Categories

